



**2021**

# THE BOOK OF SYNERGIES

.....

INDUSTRIAL SYMBIOSIS  
AND CIRCULAR ECONOMY PROJECTS

**MEMBERS**

SYNERGIE  
Québec

**ctt*éi***  
EXPERT EN LA MATIÈRE

# EDITION

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Views and opinions expressed in the document are only those of their authors.

### Bibliography

Centre de transfert technologique en écologie industrielle (2021).  
The book of synergies – industrial symbiosis and circular economy projects. 29 pages.

**The «Book of Synergies» is a digest from the «Recueil des synergies 2021».**  
**Please read the French version in order to see more synergies.**



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This book is part of the research work of the Chair in Industrial and Territorial Ecology (CRÉIT), an initiative of the Cégep de Sorel-Tracy and the CTTÉI. The CRÉIT aims to support Québec businesses in their transition to circular economy by developing tools adapted to managers and to industrial symbiosis and territorial actors. The CRÉIT's work focuses on three main topics: industrial metabolism, the emergence of industrial synergies and territorial metabolism.

**For more information**

Synergie Québec and their members

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Chair in Industrial  
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[cttei.com/creit](http://cttei.com/creit)

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**SYNERGIE**  
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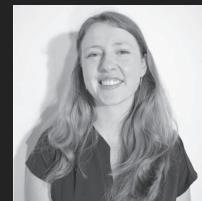
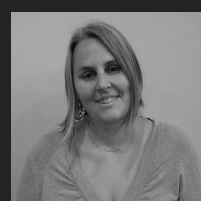
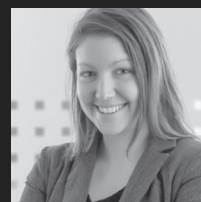
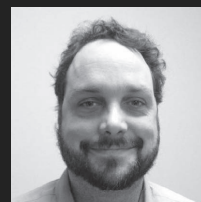
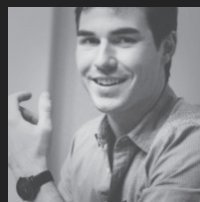


# SPECIAL THANKS

This collection of inspiring examples is the result of applied research carried out by the **Centre de transfert technologique en écologie industrielle (CTTÉI)**. It presents the environmental, economic and social impact of industrial synergies facilitated by **members of Synergie Québec**.

They deserve warm thanks for their generous contribution:

**Karine Thibault**, Circular economy coordinator, Synergie Estrie  
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**Pascale St-Germain**, Advisor in circular economy, Écosynergie d'affaires Vaudreuil-Soulanges



Without their precious collaboration, the publication of this book would not have been possible.



# DID COVID-19 TRIGGER A TRANSITION?

Since March 2020, our way of life has changed a lot. In the media, hundreds of articles have described **the impact of COVID-19** on the much-desired ecological transition. What meaning can we give to this crisis?

Can we link the global ecological crisis to that particular health crisis?

How to respond to those new realities that imposed themselves overnight?

It is difficult to name a company that has not been affected by the pandemic, either positively or negatively. The answers are not always straightforward, nor unique, but one fact remains: there is a widespread need to act quickly.

And our decision-makers acknowledge this urgency to act, as reflected in the Québec Plan for a green economy or in the Residual materials management policy. We are talking, more and more, about resilience, recovery, innovation job retention and transition.

But there are nearly 237,000 companies in Québec. Mobilizing the industrial sector and whole communities represents a huge effort.

## **SYMBIOSIS FACILITATORS**

### **KEY PLAYERS FOR AN ECOLOGICAL AND RESILIENT ECONOMIC RECOVERY**

Industrial symbiosis facilitators have a crucial role to play in this mobilization effort. In recent years, they have become key collaborators to many businesses. Solution catalysts. Innovation accelerators. From the very start of this crisis, some industry issues increased, while new ones appeared. Growth in food waste, alcohol shortage, inventories looking for disposal, these are just a few of the challenges that the facilitators of the Synergie Québec had to look into.

## **SYNERGIE QUÉBEC**

### **A COMMUNITY OF PRACTICE FOR FACILITATORS**

The strengths of this community are: know-how, collective intelligence and diversity of expertise. These assets all together made it possible to anticipate the issues sweeping in waves and at a different pace from one region to the other. They helped companies to meet their needs for supply, logistics and workforce.



## LESSONS FROM THE PANDEMIC

- Dedicated human resources, who know their territories, industries, products and by-products, are of crucial importance.
- These expert advisers play a fundamental role in finding solutions and increasing our collective resilience.



## TESTIMONIALS

« Last spring, in the midst of the global pandemic, we never anticipated that we could be directly affected by the closure of international markets and a shortage of merchandise. And yet, we almost had to give up our activities of production and sale of sprouters because we were unable to obtain plastic lids of a suitable format, fitting with our jars already in reserve. This made it impossible to meet our customers' demand. We were really happy to get support from a resource who guided us in our research for a solution. With their help and through guided networking, we discovered that we could source our lids locally, directly from a company located in Québec. This is how we managed to keep running our activities without incurring losses »

***The company **Au copeau de bois** received the support of Synergie Estrie***

« As a support actor in the circular economy, we constantly work on enhancing our repertoire and knowledge of businesses. That's how we successfully support suppliers and applicants. Local sourcing synergy owes its success to that knowledge of our region and of Québec businesses strengths and challenges. This type of synergy is not always easy to set up and organize. Our role is to support our local entrepreneurs, each and every day. The pandemic made us realize how important it is to foster links between companies in order to ensure the resilience of our economy »

***Synergie Estrie***

« Synergie Montréal was quickly identified and approached by the City of Montréal and was asked to play a front-line role in supporting companies struggling with procurement issues. When a company looks for alternatives or has a specific need to fill, they get referred to us. We answered that call and we will enthusiastically continue to do so! »

***Melissa Stoia, Coordinator of Synergie Montréal***



# WHY A BOOK OF SYNERGIES, AND FOR WHOM?

The Book of Synergies aims at **sharing knowledge in industrial ecology and accelerating the transition to the circular economy**. For a second, consecutive year in French and a first one in English, this unique guide shares the scope and diversity of the synergies achieved in territories covered by members of Synergy Québec.

It testifies of the leadership of local businesses, leaders and symbiosis facilitators supporting them on the spot.

## THIS BOOK IS FOR YOU:

**Entrepreneurs** concerned about saving resources and acting responsibly towards the environment, community and economy

**Development agencies** seeking for tools to bring out complementary activities on their territory

**Municipalities** looking for synergies that will create vitality, innovation and jobs

**Environmental organizations** happy to read about how and why they can encourage their community to lengthen the life cycle of resources and reduce their ecological footprint

**The student community and the research sector** eager to discover examples of creativity and measure the results

And finally, **a large audience sensitive to the challenges of sustainable development.**



# LEXICON

## CIRCULAR ECONOMY

« *System of production, exchange and consumption aimed at optimizing the use of resources at all stages of the life cycle of a good or service, in a circular logic, while reducing the environmental footprint and by contributing to the well-being of individuals and communities* ».

Pôle québécois de concertation sur l'économie circulaire

## INDUSTRIAL SYMBIOSIS

Symbiosis is a circular network of organizations that evolve together **in loops in order to improve the valorization of resources**. Loops can be internal to the organizations themselves or external, with each other. They are dedicated to give birth to synergies, creating economic, environmental and social benefits that go beyond the mere benefit of businesses. With its interactions, the symbiosis is anchored in its community, inseparable.

## SYNERGY

Synergies aim at substituting and pooling products and services through a collaborative and territorial 3RV-E methodology (reduction at the source, reuse, recycling/composting, recovery, elimination). Symbiosis members identify and connect organizations with common or complementary needs, therefore promoting a more efficient use of resources on the territory. A synergy can be temporary or recurring, one-off or permanent.

## RESOURCES

There are many resources conducive to the implementation of circular economy strategies.

- **Inputs, outputs, by-products, industrial residues and consumables:** supply, waste, residual materials, water, energy, unsold inventory, etc.
- **Material resources and equipment:** machines, infrastructures, buildings, storage, refrigerated trucks, software, etc.
- **Human resources:** manpower, self-employed, nomad or salaried employees, experts, technicians, trainers, etc.
- **Intangible assets:** information, data, expertise, skills, know-how, consulting services, research and development capacity, etc.

## SUBSTITUTION / POOLING

There are two main categories of synergies: substitution and pooling. In a synergy of **substitution**, a resource replaces another, in whole or in part, for the benefit of both parties.

For example, a « secondary material » (reuse) replaces a raw material or the initial input. This exchange extends the life cycle of materials that pass from one hand to another.

In a **pooling**, the stakeholders share and make the most of their resources coordinating their needs throughout their processes. They benefit from the power of the group.



# STRATEGIES OF CIRCULAR ECONOMY

There is a great variety of circular economy strategies.  
Browse the Synergy Sheets in this book and discover several of them!



Responsible  
procurement

## RESPONSIBLE PROCUREMENT

Responsible consumption and sourcing consist of integrating sustainable development and social responsibility into the procurement processes of private and public organizations



Donation  
and resale

## DONATION AND RESALE

Supplying goods to a third party with or without remuneration



Eco-conception

## ECO-CONCEPTION

Integration of potential environmental impacts and criteria during the creation and design of a product or service



Industrial  
ecology

## INDUSTRIAL ECOLOGY

Sharing resources and energy between companies in a given territory



Collaborative  
economy

## COLLABORATIVE ECONOMY

A set of exchanges that favors temporary pooling of resources or final redistribution of goods with or without compensation



Functional  
economy

## FUNCTIONAL ECONOMY

Switch from the sale of a good or a service to the production of a customary performance. Users buy the feature, not the product



Sharing  
economy

## SHARING ECONOMY

A set of economic activities (sales or trade in goods or services) carried out by organizations for social purposes, i.e. not for the sole purpose of making a profit, but rather in that of meeting the needs for their members and/or surrounding communities



Maintenance  
and repair

## MAINTENANCE AND REPAIR

Maintain objects in good condition in order to extend its lifespan



Short-term  
rental

## SHORT-TERM RENTAL

Use of goods or services within a defined framework against a remuneration



Optimization  
of operations

## OPTIMIZATION OF OPERATIONS

The improvement of each process of the organization by taking in consideration aspects like: consumption of raw materials and energy, and waste management



Reconditioning

## RECONDITIONING

Refurbishment of an object of the purpose of reselling it



Recycling  
and composting

## RECYCLING & COMPOSTING

Recycling is the fact of using recovered materials as replacement for raw/ virgin materials in order to produce a good or service. Composting is a process of biological treatment which allows for the biodegradation of organic matter under the action of aerobic microorganisms



Upcycling

## UPCYCLING

Recover materials or products that no longer have their initial use and transform them into materials or products of superior quality or utility



Energy and  
resource recovery

## ENERGY AND RESOURCE RECOVERY

A generic term that includes all the techniques that allow reuse, recovery or recycling of residual materials in order to divert them from elimination

# HOW TO READ THE BOOK OF SYNERGIES

In this book, you will find examples of 2 types of synergies:

## 1 MATERIAL SYNERGIES

Resource exchanges: material, industrial residues and consumables.



## 2 HUMAN RESOURCES SYNERGIES

Sharing of workforce.



There is a third type of synergy of which we do not present any example this year.

## 3 RESOURCE POOLING

Synergies basing on equipment sharing.



## A SYNERGY SHEET

### Each synergy sheet features:

- Contributing industrial symbiosis project
- Location
- Participating organisations
- Type of resources
- Funding sources
- Strategies involved
- Background and approach
- Outcome's evaluation according to symbiosis coordinators, involved parties and CTTÉI experts.

In each case, the facilitators also testified to the challenges encountered and the success factors.

**Do not hesitate to contact them directly to get more information.**

### OUTCOMES CALCULATION

With its quantified data, the outcomes calculation helps to get a better understanding of economic, social and environmental impacts of synergies.

Depending on the case, **the quantity of materials diverted from landfill, emissions of CO2 avoided and dollars saved** were calculated. Figures have been rounded for ease of reference.

Numbers have been thoroughly calculated and verified thanks to a rigorous methodology co-developed by the CTTÉI and the members of Synergie Québec.

For each type of resources, emission factors related to production, transport and disposal have been determined. We based on data and methodology from different trustworthy, public databases: studies on Québec electricity from the *Centre international de référence sur le cycle de vie des produits, procédés et services* (CIRAIG), Ecoinvent, European Reference Life Cycle Database (ELCD) and Agribalyse.



# SYNERGIES



WHAT IS **NOW PROVED**  
WAS ONCE **ONLY IMAGINED**

WILLIAM BLAKE



## ADAPTING WORKPLACE HEALTH AND SAFETY MEASURES DURING THE PANDEMIC

**Symbiosis project:** Synergie Estrie

**Location:** Estrie

**Exchanged resources:** Health and Safety at Work expertise

**Funding:** Table des MRC de l'Estrie (Chantier de main d'œuvre régional) with the financial participation of the Government of Québec

### Participating organizations

Supply offer: Économie Estrie in collaboration with Cégep de Sherbrooke – EnviroSpec – CLD du Haut-St-François – MRC de Coaticook – MRC de Memphrémagog – MRC des Sources – MRC du Val-St-François – SDEG and Sherbrooke Innopole  
Demand: Businesses located in Estrie

## CHALLENGES

### IDENTIFYING EXPRESS SUPPORT EXPERTISE

+

### COORDINATING OF THE HSW TEAM AT THE REGIONAL LEVEL

+

### OFFERING SERVICES ADAPTED TO RAPIDLY EVOLVING GOVERNMENTAL GUIDELINES

## SUCCESS FACTORS

### REGIONAL COLLABORATION

+

### AVAILABILITY OF QUALIFIED TRAINERS, CÉGEP DE SHERBROOKE

+

### PUBLIC FUNDING

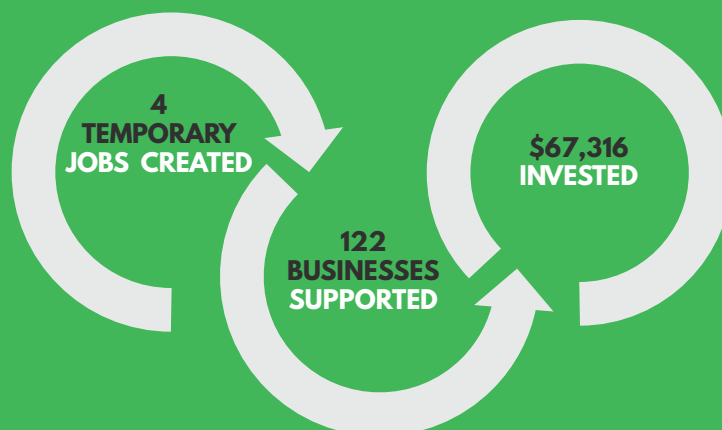
## CONTEXT

During the pandemic crisis, economic recovery and the safe maintenance of jobs required the rapid implementation of new health measures in businesses across all sectors. Temporary expertise needs in health and safety were high and meeting them required a lot of agility. To support businesses, Synergie Estrie was able to adapt its services quickly and coordinate **the deployment of training and the implementation of a network of personalized support officers** who are currently completing the technical program in Environment, Health and Safety at Work of the Cégep de Sherbrooke.

## APPROACH

Thanks to regional collaboration, Economie Estrie carried the project in partnership with seven economic development organizations within the Estrie regional county municipalities (RCM), and the contribution of their circular economy coordinators. Businesses in the region benefited from **adapted and free services**. Synergie Estrie developed partnerships, promoted the service offering and coordinated the health and safety officers' network, providing companies two services: a training given by the Centre de formation continue of the Cégep de Sherbrooke, and personalized support services by officers from the specialized technical training team of the Cégep and supported by EnviroSpec.

## OVERVIEW OF TOTAL IMPACTS





## CRUCIBLES TURNED INTO GIANT FLOWER POTS

**Symbiosis project:** Économie circulaire Arthabaska-Érable

**Location:** MRC de L'Érable

**Exchanged resources:** Crucibles

**Funding:** Autonomous

### Participating organizations

Supply offer: **Fonderie Lemoltech**

Demand: **Brisson Paysagiste**

## CHALLENGES

### VERIFICATION OF REGULATORY CONDITIONS



### AESTHETIC POTENTIAL OF CRUCIBLES



### ADAPTATION OF CRUCIBLES TO A NEW USE

## CONTEXT

Cracked crucibles are **usually sent to landfill**. They have the shape of giant flower pots and some of them have an interesting aged look. Hence the idea to **use them in landscaping**.

## APPROACH

Fonderie Lemoltech asked to find ways to reuse their cracked crucibles. Économie circulaire Arthabaska-Érable targeted the landscaping sector. Brisson Paysagiste turned a sample of crucibles into giant flower pots now located in front of their head office.

## SUCCESS FACTORS

### MOTIVATION OF ORGANIZATIONS



### CREATIVITY OF BRISSON PAYSAGISTE



### CTTÉI'S TECHNICAL EXPERTISE

## OVERVIEW OF TOTAL IMPACTS



### OTHER IMPACT

• 1 new product

## CIRCULAR ECONOMY STRATEGIES



Industrial  
ecology



Donation  
and resale

### TO LEARN MORE

David Verville – Project manager, circular economy  
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## SUGAR BUSH TUBING TRANSFORMED INTO RUBBER MATS

**Symbiosis project:** Brome-Missisquoi Symbiosis

**Location:** MRC Brome-Missisquoi

**Exchanged resources:** Maple sap tubing

**Funding:** Autonomous

### Participating organizations

Supply offer: Local sugar bushes and Pleins Rayons

Demand: DeltaGomma

## CHALLENGES

### LOGISTICS FOR THE COLLECTION AND SORTING OF TUBING



### TRANSPORTATION TO THE RECYCLER



### SEPARATION OF SPOUTS FROM TUBING

## SUCCESS FACTORS

### COLLECTION PROMOTION BY THE LOCAL PARTNERS



### COLLECTION CARRIED OUT FOR FREE



### LOCAL MATERIAL CONDITIONING THANKS TO PLEINS RAYONS

## CONTEXT

The Centre local de développement de Brome-Missisquoi and the MRC collaborated with the local Union des Producteurs Agricoles (UPA) to distribute information to its members for the **collection of maple sap tubing**. The Brome-Missisquoi Symbiosis then put DeltaGomma in contact with the organization Pleins Rayons for disassembling the tubing.

## APPROACH

4.5 metric tons of tubing provided by our local maple producers were collected, sorted and disassembled, then incorporated in the production of recycled rubber-based products. Pleins Rayons, an organization promoting the social inclusion of young adults with an intellectual disability, an autism spectrum disorder or who are at risk of dropping out of school, provided their services for disassembling the materials. Finally, the manufacturer processed the material to create their **100% recycled rubber mats**.

## OVERVIEW OF YEARLY IMPACTS



### CIRCULAR ECONOMY STRATEGIES



Responsible  
procurement



Sharing  
economy



Recycling  
and composting



Energy and  
resource recovery

### TO LEARN MORE

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## COLLECTIVE EFFORT FOR GLASS RECYCLING

**Symbiosis project:** Brome-Missisquoi Symbiosis

**Location:** MRC Brome-Missisquoi

**Exchanged resources:** Glass bottles and jars

**Funding:** Autonomous

### Participating organizations

Supply offer: **10 municipalities of the Brome-Missisquoi MRC**  
Demand: **2M Ressources**

## CHALLENGES

**FINANCING  
THE COLLECTION  
EQUIPMENT**

+

**LOGISTICS  
FOR THE COLLECTION  
AND USE OF DEPOSIT SITES**

+

**TRANSPORTATION  
OF CONTAINERS TO THE  
PROCESSING FACILITIES**

## CONTEXT

The 2018 mutualization project, which brought together 10 manufacturers, stores and institutions, laid the groundwork for collecting glass containers in Brome-Missisquoi through a voluntary delivery approach. Within the present glass valorization crisis context, the community mobilized its citizens to offer a **collection service** for its MRC. The elected officials answered the call and 16 glass container deposit sites were installed in 10 municipalities.

## APPROACH

Since March 2019, **residents can bring their empty glass bottles and jars, on a voluntary basis**, to one of these 16 collection sites. The glass is sent to 2M Ressources, a sorting centre which **processes and sends the material forward to be valorized regionally**.

## SUCCESS FACTORS

**FAVOURABLE  
ECONOMIC CONTEXT**

+

**CITIZEN MOBILIZATION**

+

**CLIENT-SUPPLIER RELATIONS  
ALREADY ESTABLISHED**

## OVERVIEW OF TOTAL IMPACTS

**553 TONS  
DIVERTED**

**\$52,024  
SAVINGS**

**400 TONS  
EQ. CO<sub>2</sub>  
AVOIDED GHG**

### CIRCULAR ECONOMY STRATEGIES



Industrial  
ecology



Recycling  
and composting



Energy and  
resource recovery

### TO LEARN MORE

Oriana Familiar and Marie-Pier Lussier – Sustainable development and circular economy advisors – [ofamiliar@cldbmqc.ca](mailto:ofamiliar@cldbmqc.ca) – [mplussier@cldbmqc.ca](mailto:mplussier@cldbmqc.ca)

## SOAP MADE OF RECYCLED COOKING OIL

**Symbiosis project:** Synergie 138

**Location:** Baie-Comeau and Chute-aux-Outardes, MRC Manicouagan

**Exchanged resources:** Cooking oil used in a restaurant

**Funding:** Autonomous

### Participating organizations

Supply offer: **Riviera Pub n' Grill**

Demand: **Cadelli**

## CHALLENGES

### SATISFYING THE DEMAND



### PROMOTING THE PRODUCT'S CLEANLINESS



### SOAP'S COLOUR

## SUCCESS FACTORS

### CREATIVE BUSINESSMEN



### MARKETING



### HYGIENIC PRODUCT ADAPTED TO THE PANDEMIC'S CONTEXT

## CONTEXT

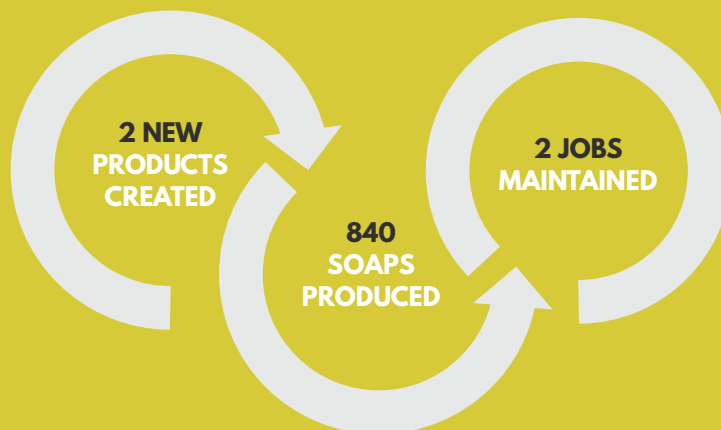
The Riviera Pub n' Grill approached the natural cosmetics company Cadelli for a promotional item. After taking time to brainstorm, Cadelli **came up with the idea of reusing used cooking oil** from the restaurant to produce soap. The restaurateur donated the oil and came up with a visual concept in the blink of an eye, with a nod to the cult movie «Fight Club».

## APPROACH

The restaurateur first filters the oil using a metal sieve and then brings it to Cadelli's. The cosmetic company then filters the oil for a second time and uses it to make the soap. 5 % of the total oil content in the soap comes from this filtered cooking oil. **These soaps are sold online or at Cadelli's physical stores.** The restaurant also buys soaps for its own promotional use.

A second, hunting-themed, fir-scented soap was created and released in September. The Manicouagan Chamber of Commerce and Industry ordered 225 soaps for the Discovery Christmas gift box project which was initiated by the local retail association. The Circular Economy Project Manager of Synergie 138 is a member of this committee.

## OVERVIEW OF TOTAL IMPACTS



## CIRCULAR ECONOMY STRATEGIES



Responsible procurement



Industrial ecology



Upcycling

### TO LEARN MORE

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## DOG TREATS THANKS TO AN ASSOCIATION OF ADULTS WITH DISABILITIES

**Symbiosis project:** Synergie 138

**Location:** Baie-Comeau, MRC Manicouagan

**Exchanged resources:** Spent grain from local microbrewery and bruised bananas from the grocery store

**Funding:** SADC Manicouagan, Desjardins

### Participating organizations

Supply offer: **St-Pancrace microbrewery**  
Demand: **North-Shore Association of Adults with Disabilities**

## CHALLENGES

### SATISFYING DEMAND FOR THE PRODUCT



### RAISING AWARENESS FOR THE PRODUCT



### DISPELLING PREJUDICES

## SUCCESS FACTORS

### COLLABORATION FROM THE LOCAL POPULATION



### EVENT MARKETING



### LOCAL PRODUCT

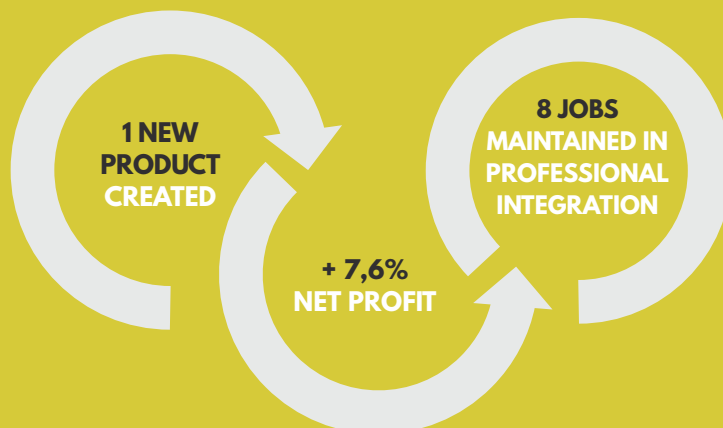
## CONTEXT

The MAVIE project is a initiative of the North Shore Association for Adults with Disabilities that aims at helping young adults with disabilities to take their rightful place in our community. The creation and sale of «Les Sains Biscuits de MAVIE» dog treats allow the organization to **increase its financial autonomy**.

## APPROACH

The dog treats are made from the St-Pancrace Microbrewery's spent grains and bruised bananas from Provigo. **The treats are sold at the association's shop**, the Régie de gestion des matières résiduelles Manicouagan, and the pet store Scoubizoo. The Manicouagan Chamber of Commerce and Industry ordered 1000 treats for the Discovery Christmas gift box project which was initiated by the local retail association. The Circular Economy Project Manager of Synergie 138 is a member of this committee.

## OVERVIEW OF TOTAL IMPACTS



### CIRCULAR ECONOMY STRATEGIES



Responsible procurement



Industrial ecology



Upcycling



Sharing economy

### TO LEARN MORE

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## HASKAP BBQ SAUCE: A NEW CREATION

**Symbiosis project:** Synergie 138

**Location:** Pointe-Lebel and Chute-aux-Outardes,  
MRC Manicouagan

**Exchanged resources:** Haskap pulp

**Funding:** Autonomous

### Participating organizations

Supply offer: **Riviera Pub 'n Grill**

Demand: **La Ferme Manicouagan**

## CHALLENGES

### MAKING PRODUCT KNOWN TO THE POPULATION



### REDUCING PRODUCTION COSTS



### DISTRIBUTION

## SUCCESS FACTORS

### CHEF'S EXPERTISE (RECIPE)



### FARM'S EXPERTISE (PROCESSING)



### LOCAL PRODUCT

## CONTEXT

The agriculture and agro-food sectors play an important role in **forging the culinary identity** of the Manicouagan region. Interest and demand for local and creative flavours contribute to the **growing innovation trend on our territory**. The partnership between the Riviera Pub n'Grill and the Ferme Manicouagan was established in this context.

## APPROACH

The first North Shore barbecue sauce is made of haskap pulp coming for the Ferme Manicouagan. This residue is extracted from the fruit grown on the farm's land. It is then used to make juice. Chef Jean-Philippe Ouellet suggested **using this pulp and incorporating it into a new and unique local product**: a Nordic-flavoured sauce, perfect for pork, beef and game meat grill. This sauce is sold at many local stores and is used by the chef in several dishes on his menu. The Manicouagan Chamber of Commerce and Industry ordered 125 bottles for the Discovery Christmas gift box project which was initiated by the local retail association. The Circular Economy Project Manager of Synergie 138 is a member of this committee.

## OVERVIEW OF TOTAL IMPACTS



## CIRCULAR ECONOMY STRATEGIES



Responsible  
procurement



Industrial  
ecology



Upcycling

### TO LEARN MORE

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## WOODEN BOATS SAILING TO A MUSIC FESTIVAL

**Symbiosis project:** Écoscéno

**Location:** Montréal, Laval

**Exchanged resources:** Plywood sailboats and set pieces

**Funding:** Autonomous

### Participating organizations

Supply offer: **Montréal-based creative agency**

Demand: **Diapason Festival**

## CHALLENGES

### FINDING A BUYER FOR SPECIALIZED ITEMS



### AVOIDING LANDFILL



### DEMONSTRATING THE IMPORTANCE OF REUSING THE SET PIECES

## CONTEXT

A Montréal-based creative agency mandated Écoscéno **to handle the remaining decor items that were left after the agency moved out**. The stock was quite heterogeneous: office furniture, decoration, walls and countertops. Écoscéno has been providing assistance to the cultural sector around eco-design and the reuse of objects and materials since 2019.

## APPROACH

Écoscéno established an inventory of all available material and decor items, and displayed them on its online store. Diapason Festival identified the entire bundle of boats as a relevant purchase. **The transaction was completed on Écoscéno's online store**. The Diapason Festival team then rented a truck to convey the items to their warehouse.

## SUCCESS FACTORS

### ÉCOSCÉNO AS A MEDIATOR



### AN EFFICIENT AND WELL-REFERENCED ONLINE STORE



### THE SUSTAINABLE PROCUREMENT POLICY OF DIAPASON FESTIVAL

## OVERVIEW OF TOTAL IMPACTS



### CIRCULAR ECONOMY STRATEGIES



Responsible procurement



Donation and resale



Optimization of operations

### TO LEARN MORE

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## SCRAP WOOD RECYCLED IN CHILDREN'S FURNITURE AND TOYS

**Symbiosis project:** Synergie Montréal

**Location:** Montréal

**Exchanged resources:** Scraps of hardwood/plywood

**Funding:** Autonomous

**Participating organizations**

Supply offer: **Le Boulot vers...**

Demand: **Matérialiste**

## CHALLENGES

### EFFICIENT COMMUNICATION



### VARIABILITY OF THE WOOD DONATIONS (FREQUENCY, TYPE, QUANTITY & FORMS)



### LIMITED STORAGE SPACE AT THE BUYER'S PREMISE



### SUPPLY & STORAGE INSECURITY FOR THE BUYER

## SUCCESS FACTORS

### GEOGRAPHIC PROXIMITY



### AVAILABILITY OF A DELIVERY TRUCK



### DESIGN FLEXIBILITY AND RECYCLING IN THE BUYER'S BUSINESS MODEL

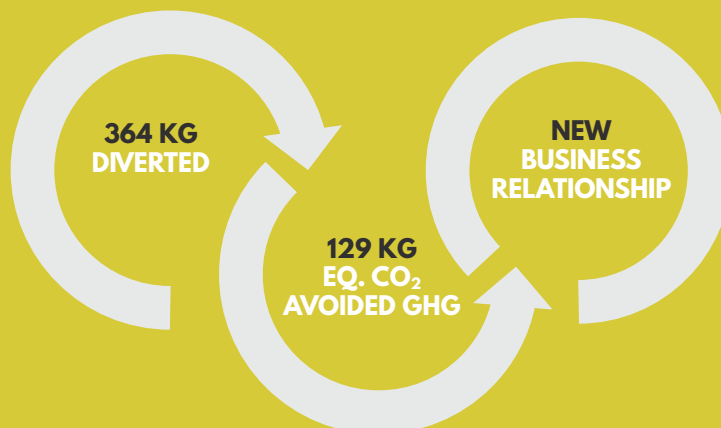
## CONTEXT

Le Boulot vers... and Matérialiste are both cabinetmakers, but they target different markets. Le Boulot vers... is an integration business helping young people to come back onto the labour market. Their manufacturing furniture activity generates scraps of hardwood and Russian plywood. This scrap is big enough to be **reused in children's furniture and toys** made of recycled wood by the company Matérialiste.

## APPROACH

Matérialiste's interest in getting supplies of reclaimed wood was known by Synergie Montréal, as was the availability of scraps of varied species of wood at Le Boulot vers.... Once the connection was established, Matérialiste took possession of a first shipment to test the adequacy between their needs and the available wood supply. Following conclusive results, a new exchange occurred the following month. The two trials resulted in an agreement profitable to the two businesses and in iterative evolution of the exchange formula over the course of the following months. Currently, **the supplier calls the beneficiary once enough wood** has been accumulated to justify a trip.

## OVERVIEW OF TOTAL IMPACTS



## CIRCULAR ECONOMY STRATEGIES



Responsible  
procurement



Industrial  
ecology



Recycling  
and composting

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**TO LEARN MORE**



## SURPLUS AND SCRAP TEXTILES MAKING A DESIGNER HAPPY

**Symbiosis project:** Synergie Montréal

**Location:** Montréal

**Exchanged resources:** Ties and various textile scraps

**Funding:** Autonomous

### Participating organizations

Supply offer: **Ateliers Créatifs – Couturoscope (Mtl)**

Demand: **EcoLeo (Trois-Rivières)**

## CHALLENGES

### FIBRES MIXED IN THE SCRAPS



### SUPPLY IRREGULARITY

## CONTEXT

One of the projects of Atelier créatifs, Couturoscope, is a rental space with over 20 workshops occupied by fashion designers and emerging or established textiles artisans. Occupants share equipment, cutting tables and a showroom. Couturoscope **promotes the internal reuse** of its occupants' waste fabrics, then offers them to external purchasers. EcoLeo is the business of designer Léonie Désilets from Trois-Rivières, who reclaims ties to transform them into multicoloured scarves, aprons and bags.

## APPROACH

Informed about Couturoscope's offer of textile materials, Synergie Montréal posted an advertisement on its Facebook page. An employee of the Centre de transfert technologique en écologie industrielle (CTTÉI) saw the advertisement and shared it with EcoLeo, a business from their network. Since EcoLeo was interested in the offer, the two organizations got connected by Synergie Montréal and then **coordinated the collection of materials by themselves**.

## SUCCESS FACTORS

### EASY EVALUATION OF THE PURCHASER'S GAINS



### WILLINGNESS OF THE ARTISAN COMMUNITY TO RECYCLE TEXTILE SCRAPS



### SINGLE POINT OF CONTACT AT COUTUROSCOPE



### STRENGTH OF SYNERGIE MONTRÉAL NETWORK

## OVERVIEW OF TOTAL IMPACTS

For 80 ties and 20 kg of mixed textiles



### CIRCULAR ECONOMY STRATEGIES



Responsible  
procurement



Industrial  
ecology



Donation  
and resale

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TO LEARN MORE

## POST-INDUSTRIAL PACKAGING REUSED TO HELP FOOD ASSISTANCE

**Symbiosis project:** Synergie Montréal

**Location:** Montréal

**Exchanged resources:** Bread bags, cardboard boxes, isothermal paper rolls and newsprint

**Funding:** Autonomous

### Participating organizations

Supply offer: **ORCA Flexible Packaging**, **LOOP Mission**, **SAQ**, **TC Transcontinental**

Demand: **Centre de ressources et d'action communautaire de La Petite-Patrie**

## CHALLENGES

### LARGE SIZE OF CERTAIN SUPPLIERS



### COMMUNICATION BETWEEN ORGANIZATIONS



### LOCATION OF THE SUPPLIERS OUTSIDE THE SCOPE OF CRACPP'S REGULAR DELIVERY CIRCUIT

## CONTEXT

The Centre de ressources et d'action communautaire de La Petite-Patrie (CRACPP) is a **food security organization mindful of environmental practices**. Families and individuals in need usually pick up their bags on site. During the pandemic, considering the vulnerability of their clientele, the CRACPP had to resort to delivery and single-use packaging. This has rapidly eaten away its budget.

## APPROACH

Synergie Montréal assessed CRACPP's packaging needs and identified possible links with businesses that had non-compliant packaging, ends of batches or unsold products. Several contacts were made, finally enabling the CRACPP to be supplied with previously recycled or ready-to-go packaging:

- ORCA Flexible Packaging: bread bags
- SAQ: woven insulating membrane
- LOOP Mission: cardboard boxes
- TC Transcontinental: newsprint

By adapting their management of residual materials, these 4 businesses responded to the CRACPP's urgent and longer-term packaging needs.

## SUCCESS FACTORS

### CRACPP'S AGILITY AND MOTIVATION



### AVAILABILITY OF A DELIVERY TRUCK



### SUPPLIER'S SOLIDARITY TOWARDS CRACPP'S MISSION



### RAPID COORDINATION BETWEEN SYNERGIE MONTRÉAL AND THE PARTICIPANTS

## OVERVIEW OF TOTAL IMPACTS



### OTHER IMPACT

- Supporting delivery to one hundred of households/week for approx. 1 year

## CIRCULAR ECONOMY STRATEGIES



## REUSING LEATHER TRIMMINGS TO PRODUCE ACCESSORIES

**Symbiosis project:** Synergie Montréal

**Location:** Montréal

**Exchanged resources:** Leather trimmings

**Funding:** Autonomous

### Participating organizations

Supply offer: **Les Artisans d'Azure**

Demand: **Veinage**

## CHALLENGES

**VARIABILITY OF SIZES AND SHAPES OF TRIMMINGS DEPENDING ON THE SUPPLIER'S PROJECTS**

## CONTEXT

Les Artisans d'Azure creates and sells products for life-size game enthusiasts (costumes, accessories). The leather trimmings represent the majority of their waste. This business asked Synergie Montréal to help them to **find local buyers interested in reusing this material**. Veinage offers bags and accessories made out of recycled leather. Each piece is designed, created and manufactured in a Montréal workshop with a concern for the environment. The business joined Synergie Montréal's industrial symbiosis hoping to expand his network of post-industrial leather suppliers.

## APPROACH

**Synergie Montréal was mandated to characterize the leather output** for Les Artisans d'Azure. Following Veinage's needs analysis, several types of leather and materials from different sources were suggested. Prospects were matched and a positive connection was soon established, with a leather offer perfectly matching the demand. A first purchase of 70 pounds of leather was finalized right on the spot. It is expected that this synergy will be repeated bimonthly.

## SUCCESS FACTORS

**MOTIVATION OF THE TWO BUSINESSES**



**GEOGRAPHIC PROXIMITY**



**MATERIAL CHARACTERIZATION**



**COLOUR- AND LEATHER-TYPE SORTING**

## OVERVIEW OF TOTAL IMPACTS



### CIRCULAR ECONOMY STRATEGIES



Responsible  
procurement



Industrial  
ecology



Donation  
and resale



Upcycling

### TO LEARN MORE

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## WOOD FOR SOCIAL INTEGRATION AND SAILING

**Symbiosis project:** Synergie Montréal

**Location:** Montréal

**Exchanged resources:** Scraps of hardwood

**Funding:** Autonomous

**Participating organizations**

Supply offer: **Le Boulot Vers...**

Demand: **Jeunes Marins Urbains**

## CHALLENGES

### DATA COLLECTION



### SORTING LOGISTICS AND MANAGEMENT OF NON-REUSABLE SCRAP WOOD



### SLOWDOWN OF ACTIVITIES DUE TO THE PANDEMIC



### VARIABILITY OF THE DONATED WOOD (FREQUENCY, TYPE, QUANTITY AND FORMS)

## SUCCESS FACTORS

### GEOGRAPHIC PROXIMITY



### COMMON SOCIAL AND ENVIRONMENTAL VALUES



### STORAGE CAPACITY (SUPPLIER)



### DELIVERY TRUCK AND STORAGE SPACE AVAILABLE (BUYER)

## CONTEXT

Le Boulot vers... is an integration business helping young people to come back into the labour market. Their furniture activity generates scraps of hardwood and Russian plywood. Jeunes Marins Urbains is promoting and building a fleet of artisanal sail and oar boats and uses navigation as a tool for social integration. This organization is developing its mission further by seeking **to give a second life to building materials**.

## APPROACH

Following an analysis of building material needs with Jeunes Marins Urbains and a search for supplies within the industrial symbiosis, **a wood synergy was identified, and then verified with the two companies**. In November 2020, Jeunes Marins Urbains fetched a first shipment of maple and ash scrap wood in order to reuse them to build boats and storage shelves in their workshop.

## OVERVIEW OF TOTAL IMPACTS



## CIRCULAR ECONOMY STRATEGIES



Responsible procurement



Industrial ecology



Donation and resale



Sharing economy

## TO LEARN MORE

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## ALCOHOL TRANSFORMED IN GEL SANITIZER DONATED TO MAURICIE'S KINDERGARTENS

**Symbiosis project:** Économie circulaire Mauricie +

**Location:** Mauricie and Montérégie

**Exchanged resources:** Expired beer

**Funding:** Autonomous

### Participating organizations

Supply offer: **Trou du diable**

Demand: **Distillerie Mariana**

Processing: **Trybec**

## CHALLENGES

### KINDERGARTEN DELIVERY LOGISTICS



### PRIORITIZATION OF THE PROJECT DURING THE HEALTH CRISIS

## CONTEXT

During the pandemic of spring 2020, the initiative was to **transform expired beer in ethyl alcohol intended for the production of sanitizer gel** for Mauricie's kindergarten. Initiated by Économie circulaire Mauricie +, the collaboration was established between Trou du diable and Distillerie Mariana, as well as Trybec, in Montérégie.

## APPROACH

Trou du diable donated 5000 litres of expired beer to Distillerie Mariana. The latter extracted 200 litres of ethyl alcohol and added an additional 800 litres from its own stocks. 1000 litres were finally transported at Trybec in Montérégie. They produced and packaged **1000 litres of gel sanitizer**. Trou du diable and Distillerie Mariana jointly distributed this gel to Mauricie's kindergarten in June 2020 – free of charge.

## SUCCESS FACTORS

### COMMITMENT AND GENEROSITY OF STAKEHOLDERS



### PROXIMITY BETWEEN ORGANIZATIONS



### DAIRY TRUCK AVAILABLE FOR TRANSPORTATION

## OVERVIEW OF TOTAL IMPACTS



### CIRCULAR ECONOMY STRATEGIES



### TO LEARN MORE

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## UPCYCLING LAMINATED GLASS

**Symbiosis project:** Synergie Montmagny L'Islet

**Location:** Montmagny and Trois-Rivières

**Exchanged resources:** Laminated glass

**Funding:** Autonomous

## Participating organizations

Supply offer: **Teknion**

Demand: **Bellemare group**

## CHALLENGES

## FINDING

## A VALUATION METHOD



## FINDING AN APPLICANT

CAPABLE OF DEALING WITH  
THE MATERIALEXPENSIVE TRANSPORT  
(HIGH-DENSITY MATERIAL)

## SUCCESS FACTORS

## MOBILIZATION

## OF THE ENTREPRENEUR

NO CONDITIONING  
REQUIREDENTREPRENEUR /  
COORDINATOR  
COLLABORATION

## CONTEXT

Teknion is an international leader in the design, manufacture and distribution of office systems and office furniture products. In 2014, the Montmagny plant took a major turn to create **architectural products and office spaces in glass and aluminum**. This new production gained momentum very quickly, which led to a sharp increase in the quantities of laminated glass residue (a 'plastic' sheet between 2 glass layers) sent to landfill.

## APPROACH

Since 2017, Teknion has been researching for an outlet for its laminated glass residues. Several steps have been taken: brainstorming activities, consulting, internal research. Finally, **three meetings took place with Synergie Montmagny L'Islet**, in 2018 and 2019. Many solutions were explored and finally, a recycler who could crush the laminated glass in order to give it a second life was found. The final product is mainly used as a sandblasting abrasif and swimming pool filtration media.

## OVERVIEW OF YEARLY IMPACTS



\*Eq. 280 round trips Québec / Montréal avoided

## CIRCULAR ECONOMY STRATEGIES



## TO LEARN MORE

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# VISION

## INDUSTRIAL SYMBIOSES ON THE RISE

In their early days, industrial symbioses supported companies in the management of some common residual materials: recovery of pallets, reuse of cardboard boxes or containers. What a progression today! As evidenced in this book, industrial symbioses now integrate many strategies of the circular economy.

They participate in the **pooling of resources**, for example maple pipes, agricultural plastics or even labor. They encourage **eco-design** for a variety of products such as alcohol, soaps and road abrasives. They help give industrial equipment a **second life**.

Industrial symbioses play a critical role in deploying synergies when recovery channels are not yet established. They even participate in the deployment of **innovative strategies** such as the **functional economy**, still a little-known prospect in Québec.

It is logical to conclude that the industrial symbiosis model should be encouraged in order to become accessible to each and every company in Québec. A study by Sia Partners published in 2020 estimated that **125 industrial symbioses** will be needed in our province by 2030! This scaling up might end up in the annual recovery of **665 kt of residual materials**; not to forget about the wealth creation on our territory. If we want to achieve these outcomes, we need to diversify industrial symbioses models; at the scale of cities, districts, industrial parks or even buildings!

What about facilitators? Sometimes, we would dream about finally making the role of symbioses animation obsolete. What if companies could autonomously manage industrial synergies? Isn't the circular economy now well-known to decision-makers, managers and the general public – thanks to the vast communication efforts of the *Pôle de concertation en économie circulaire*?

We aren't there yet. We can testify that companies still need daily guidance and tools in order to transpose the prospects of circular economy into their operations.

The future expansion of symbioses will therefore require, among other things, a real **professionalization in the animation role**. Professional training in the field of circular economy remains currently limited; only high-level strategies are taught. In the coming years, post-secondary education establishments will play a large role in the professionalization of that service.

And there shall remain no doubt that facilitators will remain central resources to develop the agility and resiliency of organizations; break down intercompany silos; and ensure the transfer of know-how.

In the same way that each territory employs economic developers to support businesses and local-elected officials in carrying out larger-scale projects, industrial symbiosis facilitators will **play a central role in improving the efficient use of resources** in all regions.

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EXPERT EN LA MATIÈRE

