

International Cluster Cooperation for Recycling of Polymers REPORT

Visit to the Canadian Plastics Sector, 31 May -3 June 2022







The PERCY Consortium





Composition of the PERCY delegation

Mission - PERCY			
May 31st to June 3rd			
Nom	titre	Organisation	
		Pôle de compétitivité POLYMERIS	
Olivier GILLE	Administrative and Operational Director		0
	former Hutchinson responsible of partnerships, Innovation Manager pôle	Hutchinson POLYMERIS	
Jean-Pierre BRETAUDEAU	POLYMERIS		je
Jan VACLAV	scientific responsible	SPK Slovak Plastic Cluster	ja
		WFG Heilbronn devlopment Agency	
Daniela ADELHELM	Devlopment manager		a
Jaroslav HADVIG	Business Director, Chairman of the Supervisory Board and Deputy of the CEO	Trens	٦ _{j.}
Marko DANIS	Member of the Board and shareholder	Trens	m

On line, Dorte WALZL BAELUM, Plast Center Danmark

MAY 31st







RENCONTRE INTER CLUSTERS AUTOUR DE LA THEMATIQUE DU RECYCLAGE DES POLYMERES ENTRE 4 CLUSTERS EUROPÉENS ET 3 CLUSTERS QUÉBÉCOIS

Mardi 31 maj 2022 - 9h30 - 17h30

Novotel MONTREAL CENTRE, salle ALSACE 1180 rue de la Montagne, H3G 1Z1 Montréal, Qc, Canada

Time¤	Sujet¤	intervenant¤	¤
		<u>IIIIGI VEITAIII</u> *	
09°:00¤	Welcome-coffee¤		¤
09°:30¤	Presentation-of-the-PERCY-european-project-and-of-the-objectives- of-the-mission,¤	 Olivier·GILLE, French·competitivness·cluster·of·the·polymer sector·POLYMERIS, pilot·of·the·mission¤ 	
	Presentation of the 4-european clusters partners of the PERCY project and of their recycling ecosystems and 2-participating enterprises: -PCD Plast Center Danmark ¶	¶ ¶ Dorte·WALZL·BAELLUM,·CEO·PCD·(visio)¶	¤
09°:45¶	-·WFG·Heilbronn,·development·agency,·Germany·¶	Daniela-ADELHEM,-WFG¶	
1l (14°:45·CET)¤		Jan·VACLAV, scientific manager SPK¶	
	-·Polymeris, ·Polymers·French·competitiveness·cluster¶	Olivier-GILLE, Polymeris¶	
	-·Hutchinson,·a·leader·in·Rubber·and·Polymer·Industry¶	Jean-Pierre·BRETAUDEAU,·Hutchinson·and·Polymeris¶	
	<u>Trens</u> , ·a·Slovakian·enterprise¤	Jaroslav·HADVIG,·Marko·DANIS¤	
	Presentation-of-the-3-canadian-clusters-partners-¶	1	¤
11º:00¤	-·PRIMA·Québec¶	Marie·Pierre·IPPERSIEL, ·Pdte PRIMA·Québec¶	
	-·Alliance·Polymères¶	Simon·CHRETIEN,·CEO·Alliance·Polymères¶	
	-· <u>Vallée</u> ·des· <u>Elastomères</u> ¤	Michel·ROUSSEAU, ·CEO· <u>Vallée</u> ·des· <u>Elastomères</u> ¤	
11°:30¤	Presentation-of-the- <u>canadian-entreprises</u> -(format-pitch,-1- <u>mn</u>)¤	25-enterprises¤	

Following their objective of developing relations with international partners, the 4 European clusters of the Percy project, organized today, May 31st, in Montreal, Québec, Canada a meeting with 3 Canadian clusters and 30 representatives of their members (enterprises and research centers).

The PERCY clusters were represented by Olivier GILLE (Polymeris - France), Daniela ADELHEM (WFG Heilbronn - Germany) and Jan VACLAC (Slovenski PLastikarski Klaster – Slovakia). Dorte BAELUM, coordinator of the project and representative of Plast Center Danmark was on line. The european delegation included Jean-Pierre BRETAUDEAU (Hutchinson – Polymeris) and two representatives of TRENS, a Slovakian industrial company (Jaroslav HADVIG and Marko DANIS).

The three Canadian clusters partners of the Percy Project are

- Prima Québec, which works on all advanced materials, represented by Marie-Pierre IPPERSIEL
- Alliance Polymères Québec, represented by Simon CHRETIEN
- La Vallée des Elastomères, located in Sherbrooke around rubber industry, represented by Michel ROUSSEAU

The PERCY project, its objectives and all the partners and participants to the meeting have been presented.

Two more presentations have been made over the state of the art of the last innovations on polymer recycling in Europe and north America. The presentations on this last subject have been made by :

- Professor Denis RODRIGUE, of the Department of Chemical Engineering, University of Laval, and animator of the CREPEC (Research Center for High Performance Polymer and Composite Systems)
- Annie ROCHETTE, executive manager of COALIA, Applied and technological research centre on Plasturgy, Mineral technology and Advanced materials

The meeting gave to all participants an opportunity to exchange over their projects during the networking periods and BtoB meeting.

At the end of the afternoon, Memorandum of Understanding have been firmed between the three canadian clusters and the PERCY Consortium with the ambition to develop and reinforce their partnership and the links between their members over polymer recycling.





Presentation of the PERCY Project by Olivier GILLE





Presentation of the participants











Michel Lefèvre, PRIMA Québec

Simon CHRETIEN, Alliance Polymères









Presentation of all the participants

LIST of the Canadian participants

Michel Vaudescal MAYFAIR VILLAGE Inc.
Gino Belleville Plastiques GPR inc
Francis Côté IPL North America Inc

Gillian Sheldon NextGen Annie Rochette Coalia Denis Rodrigue Ulaval

Roger Tambay Entrepreneur indépendant

Normand Lemay Laval Économique

Bendaoud Nohair Cégep de Saint-Jérôme - CDCQ

Guy Jourdain Plastiques Gagnon Thomas Salmon Plastiques Gagnon

Yves Abong Unicor Mohand Guermah Unicor

Mohamed Traore Balcan Innovations

Frédéric Noël Tilton
Serge Longchamps Tilton
Catherine Blanchet Optimoule
Serge Fraser Optimoule
Marianne Lépinoit Polystyvert

Yves Noël Les Investissements Yves Noel Inc.

Heidi Fortin-Trahan Technorol
Olivier Vermeersh Groupe CTT
Claude Maheux-Picard CTTEI

David Courtemanche MERINOV
Jean-Philippe Jacques Innofibre

Lucie Bourgault CSMO Caoutchouc

Philippe Bébin Coalia

Marc Garon Pecca Technologies

Karen Stoeffler CNRC Virginie Bussières Pyrowave

Alexia Barbier Chambre de commerce du Montréal métropolitain



Program of the afternoon

12 :00	Lunch	
13 :30	Presentation of the state of the art and last European innovations on polymer recycling <u>(different innovative ways of recycling, major and new actors, research on the way,)</u>	Olivier GILLE, <u>POLYMERIS</u> , Jean-Pierre BRETAUDEAU, HUTCHINSON, Innovation manager, Pôle POLYMERIS
14 :30	Presentation of the state of the art and last north American innovations on polymer recycling	(waiting for confirmation) Denis RODRIGUE (CNRC) / Annie ROCHETTE
15 :30	BtoB meetings between the members of the européen delegation and the canadian enterprises participating	
16 :30	Conclusions and identifications of the perspectives of future collaboration	
17 :00	Firm of MoU <u>between_the</u> PERCY consortium clusters and the 3 canadian clusters partners	
17 :15	Cocktail around Euro Canadien friendship	



Denis RODRIGUE, Laval University

Plastics recycling:
Applications and opportunities

Prof. Denis Rodrigue

Department of Chemical Engineering Université Laval Québec, Canada

denis.rodrigue@gch.ulaval.ca







Annie ROCHETTE, COALIA



Le recyclage des polymères au Québec vu par les CCTT Recycling of polymers from CCTT point of view

Rencontre interclusters / Interclusters Meeting

Montréal - 31 mai 2022

Annie Rochette, Ph.D., Directrice générale / Executive Manager









PERCY - MISSION TO CANADA - JUNE 2022



SIGNATURE OF THE MoUs





2 new memoranda of understanding firmed After the signature of a first one with Prima Québec at the beginning of 2022













Memorandum of Understanding

Between

- PLAST CENTER DANMARK, Niels Bohrs Vej 6 DK-6700 Esbjerg Denmark, Danish polymer cluster and PERCY's project coordinator representing:
 - POLYMERIS, association support of the French Rubber, Plastics and Polymers Competitiveness Cluster
 - WFG Heilbronn, regional development agency from Heilbronn, Germany
 - SLOVENSKY PLASTIKARSKI KLASTER, Slovakian plastic cluster

hereinafter individually and collectively referred to as "the Parties".

and

- ALLIANCE POLYMÈRES QUEBEC, 846 rue de l'Escarboucle - Québec - QC G2L 3A5 -

hereinafter referred to as "the Partner"















Memorandum of Understanding

Between

- PLAST CENTER DANMARK, Niels Bohrs Vej 6 DK-6700 Esbjerg Denmark, Danish polymer cluster and PERCY's project coordinator representing:
 - POLYMERIS, association support of the French Rubber, Plastics and Polymers Competitiveness Cluster
 - WFG Heilbronn, regional development agency from Heilbronn, Germany
 - SLOVENSKY PLASTIKARSKI KLASTER, Slovakian plastic cluster

hereinafter individually and collectively referred to as "the Parties", represented by Polymeris

- la Vallée des Elastomères, 520 Boul. Poirier, Magog, Québec, J1X 0A1 - Canada, Represented by its director, Mr Michel ROUSSEAU





CANADA MISSION

PERCY Recycling of Polymers

Montréal, 30 mai-3 juin 2022

30 mai	Mardi 31 mai	Mercredi 1 ^{er} juin	Jeudi 2 juin	Vendredi 3 juin
Voyage- Aller	Session plénière - Table ronde	Visits (pour la délégation)	Visites (pour la délégation)	Matinée libre
Vol Air Canada 871 au	Novotel MONTREAL			
départ de Roissy CDG	9h00 Accueil	7h45	9h30	
	9h30 Présentation projet PERCY et objectifs de la mission	Départ de <u>l'hôtel vers</u>	Départ de <u>l'hôtel vers</u>	
Départ 14 h 45	9h45 Présentation des 4 pôles partenaires du projet PERCY et entreprises (Hutchinson, TRENS)	<u>Boucherville</u>	<u>Polytechnique</u>	
Arrivée 16 h 10	11h00 – Présentation des 3 clusters québécois	8h30@10h50	<u>10h@12h</u>	
	11h30 – Présentations des entreprises québécoises (format	Visite installations du	Visite laboratoire associé au	
	pitch	CNRC	CREPEC	
		(Boucherville)	Polytechnique (Montréal)	
	Déjeuner - Networking (12h00 – 13h30)			
Hébergement prévu au Novotel Montréal	13h30 Présentation – état de l'art et des dernières innovations européennes en matière de recyclage des polymères	11h00@11h15 Trajet vers Polystyvert	12@13h00 Déjeuner (lieu TBD)	
1180 rue de la	14h30 Présentation – état de l'art et des dernières innovations	11h15@13h30	13h@14h	
Montagne	nord-américaines en matière de recyclage des polymères	Visites des installations de	Trajet vers Pyrowave	
MONTREAL	15h15: pause café	<u>Polystyvert</u>		Voyage-Retour
	15h30 Échanges bilatéraux BtoB entre les membres de la	Boîtes à lunch offertes par	14h@15h	vol air Canada
	délégation européenne et les participants canadiens	l'entreprise	Visite des installations de	870
	16h30 Conclusions et identifications des perspectives de collaborations futures		Pyrowave (Valleyfield)	
	Collabol ations futures	14h30@16h00		Départ 21h05
	17h00 Signature de MoU/conventions de coopération entre les	Visite des installations de	15h15-17h	Aunit de Deien
	clusters partenaires de Percy et les 3 clusters québécois	l'entreprise (TBD)	Retour sur Montréal 17h-18h30	Arrivée Roissy CDG 9h45 le
	partenaires de la mission		Cocktail dinatoire	samedi 4 juin
	17h15 Verre de l'amitié euro canadienne	18 h back to the hotel	(PRIMA Québec)	Sameur 4 Julii

En date du 20 mai 2022

JUNE 1st CNRC Boucherville + POLYSTYVERT



On the second day of our Canadian mission, our delegation still driven by our 3 canadian cluster partners has been received in the morning at the <u>CNRC (Canadian National Research Council) in its plant of Boucherville, next to Montreal.</u>

This plant is dedicated to Automotive and surface transport sectors. We were welcomed by Milena SEJNOHA, Director R&D Material and Processes who presented the organization of CRNC and of the site of Boucherville.

Then Karen STOEFFLER, team leader on Polymer bioproducts, and Michel CHAMPAGNE, team leader on Advanced Polymer Composites, presented their activities. The Boucherville center works a lot on the use of lignine in polymer processing. Some informations were given on the possibility to transform Automotive Shredders Residues in graphen or syngas.... Then the delegation visited two laboratories, one equipped of a high pressure press to produce composites.

The next step was the visit of the Polystyvert company, a SME specialized in recycling of styrenic plastics (and priorily PS) using different solvents (Cymene and ethylbenzene) and a performing purification process with more than 99% of purity for the final product. Polystyvert has developed a breakthrough technology for recycling polystyrene, using a dissolution process that works on all types of polystyrene: expanded, extruded and injection-moulded. Its recycled polystyrene product is of very high quality and can easily be re-extruded or re-injected, allowing many applications to incorporate 100% recycled materials. Marianne LEPINOIS and Roland COTÉ, explained the innovative process developed by the company whose demonstrator produce 125 kg of recycled PS per hour and which is searching for a plant to build a new factory around Montreal. The company search for licensed partners....



VISIT to CNRC, Canada National Research Center, BOLICHERVILLE

Milena Sejnoha Director, R&D
Material & Processes
Team Leader
Polymer Bioproducts
Team Leader Advanced
Michel Champagne Polymer Composites











JUNE 2nd

Polytechnique Montréal

+

PYROWAVE



FOllowing its visits, the PERCY 's project delegation in Canada was on June 2nd on Polytechnique Montreal site. The delegation met:

- Pr Abdellah AJJI, director of the Chemical Engineering Department who works on thermal recycling of polymers and on intensified depolymerization and upcycling
- Pr Marie-Claude HEUZEY, in charge of the CREPEC, Research center on polymers systems and high performance composites. Promoting the principles of circular economy, Canada targets the objective of 0 plastics wastes in 2030.
- Pr Gregory PATIENCE, in charge of the Canadian Research Chair in High temperature, high pressure Heterogenous catalysis.

The delegation visited some of the Polytechnique Montreal laboratories dedicated to Polymers.

During the afternoon, the delegation visited the plant of the Pyrowave company, in Salaberry de Valleyfield, 60 km west from Montreal. PYROWAVE uses microwaves to recycle polymers and mainly Polystyren. Stéphanie BUSSIERES, vice-president communications and marketing of the company presented the technology.

The end of the day, we had a final meeting with PRIMA QUEBEC in their Montreal offices and we did a first debriefing of the mission with a lot of interesting contacts and the identification of multiple projects possibilities. The next step should be a meeting proposed to the international partners of Percy in Dusseldorf during the next K Fair in October. A work 'll be done on the identification of specific possibilities of financing research and innovation projects between Europe and Canada.











Visit Canada Not only For its industry!







Thank you for your attention And special thanks to our Canadian partners And particularly to Marie Pierre IPPERSIEL Manager of PRIMA

Project website: https://percy.spklaster.sk/
https://www.linkedin.com/company/percyrecycling/
Olivier.gille@polymeris.fr +33 (0)2 38 45 31 81



DISCLAIMER:

© PERCY Consortium Partners.

The content of this presentation represents the views of the author only and is his/her sole responsibility; it cannot be considered to reflect the views of the European Commission and/or the Executive Agency for Small and Medium-sized Enterprises (EASME) or any other body of the European Union. The European Commission and the Agency do not accept any responsibility for use that may be made of the information it contains.