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Synergic Circular Economy across European Regions

SCREEN

Deliverable D4.4

SCREEN Cluster Workshop, 21 November 2017

Main Author(s)	Viola Hay, Knowledge Transfer Network
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Project Coordinator: Dr. Carmela Di Giorgio, Regione Lazio, Roma (Italy).
e-mail: cdigiorgio@regione.lazio.it - website: www.screen-lab.eu

This deliverable has been peer reviewed by:

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1. Executive Summary

This document reports the proceedings of the second International Workshop ("Clustering Workshop"), held on the 21st of November 2017- Ambassadors Bloomsbury Hotel, London.

The aim of the workshop was to bring together European stakeholders from across the Circular Economy sector to share some of the excellence and best practice of a number of regional initiatives and state-of-the-art regarding innovative approaches developed in H2020 projects. Furthermore, this workshop helped to identify and encourage collaboration opportunities and facilitate broad stakeholder engagement and input into the SCREEN project. Around 100 delegates from across Europe attended the day.

2. List of Participants

Circular Economy in European Regions:
Synergies and Complementarities

21st November 2017, Ambassadors Bloomsbury Hotel, London

Prefix	First Name	Surname	Company	Country
Miss	Ophelia	Aasa	Reko	GB
Mr.	Jonathan	Abra	KTN Ltd	GB
Mr.	Alexander Paul	Adejoh	TCB Network Limited	NG
Dr.	Victoria	Adesanya-Aworinde	TWI Ltd	GB
Mrs.	Adrijana	Agatić	Primorje-Gorski Kotar County	HR
Mr.	Federico	Albè	AFIL	IT
Mrs.	Harma	Albering	Province of Limburg	NL
Mr.	Alvaro	Amieiro	Johnson Matthey	GB
Ms.	Cres	Anosike	Greenmobil	GB
Mr.	Derek	Bates	Materials Technology Ltd.	GB
Mr.	Martijn	Bijmans	Centre of Expertise Watertechnology	NL
Mr.	Pete	Blake	We are Adult	GB
Mrs.	Gabriela	Bobeanu	North-East Regional Development Agency	RO
Ms.	Kathleen	Boquet	Greenflex	FR
Miss	Iris	Brandstatter		AT
Mr.	Andrew	Broadbent	Hitachi Europe Ltd	GB
Mr.	Simon	Broome	WMG	GB
Mr.	Jeff	Butler	Technovation	GB
Mrs.	Valentina	Caimi	Regione Lombardia	IT
Miss	Paola	Carceles	Rapid Action Packaging	GB

Ms.	Filomena	Caruccio	Regione Lazio	IT
Ms.	Chiara	Catgiu	AFIL	IT
Mr.	Din	Catic	Siemens	GB
Mr.	Richard	Chamberlain	Chamberlain & Partners	GB
Dr.	Eleni	Chatzigianni	Region of Crete	GR
Ms.	Claire	Claessen	KTN Ltd	GB
Mr.	Nick	Cliffe	Innovate UK	GB
Mrs.	Naomi	Cohen	SUEZ R& R UK	GB
Prof.	Marcello	Colledani	Politecnico di Milano	IT
Mr.	Rodrigo	Correa	Exigosolar	GB
Mrs.	Monica	de La Cerda	Regional Directorate for Science and Technology	PT
Mrs.	Valentina	Diana	Lazio Innova	IT
Miss	Deborah	Ferreira de Avelino	Abelha Ecodesign	GB
Mr.	David	Fitzsimons	Oakdene & Holins	GB
Miss	Elena Madalina	Florescu	Microelectronica S.A.	RO
Dr.	Patrick	Fong	Hong Kong Polytechnic University	HK
Mr.	Anisuddin	Gabbur	Aston Business School	GB
Mr.	Giaime	Gabrielli	Lazio Innova	IT
Miss	Emma	Gains	Arup	GB
Mr.	Tara	Ghatauray	London South Bank University	GB
Dr.	Michael	Groves	Topolytics	GB
Ms.	Salome	Haas	Terracycle	GB
Mr.	Clive	Hall	LCRN	GB
Mr.	Nillo	Halonen	Council of Tampere Region	FI
Ms.	Susanne	Hanson	Danish technological Institute	DK
Mr.	Najmal	Hasan	University of Greenwich Business School	GB
Mrs.	Viola	Hay	KTN Ltd	GB
Mr.	Tjeerd	Hazenberg	Province of Frysland	NL
Mr.	John	Hodge	JH Environmental Consulting Ltd	GB
Mr.	Kevin	Hooker	Douglas Winters Associates Limited	GB
Mrs.	Cliona	Howie	Climate-KIC	ES
Dr.	Satu	Huuhka	Tampere University of Technology	FI

Mr.	Cosmin	Jalbă	University of Bucharest	RO
Dr.	Muhammad	Javed	Biotech Consultants Limited	GB
Mr.	Sergiu	Jiduc	Ricardo Energy & Environment	GB
Ms.	Salam	Kaddouh	Sofies UK	GB
Mrs.	Sahera	Kadim	OU	GB
Ms.	Nikki	Kapp	Tala	GB
Ms.	Sarah	Kelly	BSI	GB
Mr.	Gancho	Kolaksazov	ITTI	BG
Dr.	Rembrandt	Koppelaar	Leiden University Institute of Environmental Sciences	NL
Mr.	Maciej	Kowlaczyk	OLP sp. z o. o.	PL
Dr.	Johanna	Lahti	Tampere University of Technology	FI
Dr.	Minna	Lammi	Univ.of Helsinki, Univ. of Cambridge	GB
Prof.	Minna	Lanz	Tampere University of Technology	FI
Ms.	Liliing Helen	Lee	Ocarrt.com	GB
Ms.	Norah	Lewis	WRAP	GB
Mrs.	Ana	Ličanin	Primorje-Gorski Kotar County	HR
Mr.	Lampros	Litos	KTN Ltd	GB
Mr.	Paul	Mackay	Folk Labs	GB
Mr.	Ranjeet	Mahla	UCL	GB
Mr.	Waseem	Malik	Eco Energy Rating Ltd	GB
Mr.	Rob	Maslin	We All Design	GB
Mrs.	Olusola	McKenzie	Learn to Re-create Limited	GB
Ms.	Keti	Medarova-Bergström	EASME	BE
Ms.	Aurore	Medieu	ORDIF	FR
Mr.	Philippe	Micheaux Naudet	ACR+	BE
Dr.	Tatyana	Micic	City, University of London	GB
Mr.	Dejan	Mitrovic	Department 22	GB
Dr.	Carlos	Montalvo	TNO	NL
Miss	Zaneta	Muranko	LSBU	GB
Mr.	Przemysław	Nowakowski	Regional Office of Lodzkie Region in Brussels	PL

Dr.	João	Nunes	BLC3	PT
Ms.	Kathleen	O'Donnell	Worksos	GB
Mr.	Mark	Owen	Consultant	GB
Mr.	Nigel	Partington	Visa	GB
Mr.	Arnoud	Passenier	Dutch Ministry of Infrastructure and Environment (DGTI)	NL
Mr.	Ben	Peace	KTN Ltd	GB
Ms.	Maria Grazia	Pedrana	Regione Lombardia	IT
Mr.	Esteban	Pelayo	Eurada	BE
Mr.	Tom	Petrasovic	Middlesex University	GB
Ms.	Poonam	Phull	KTN Ltd	GB
Mr.	Tito	Piermarini	CASA - UCL	GB
Mr.	Dirk	Plees	Province of Limburg	NL
Mr.	Marcin	Podgórski	Regional Office of Lodzkie Region in Brussels	PL
Mr.	Steve	Podmore	BIGCrowd Ltd	GB
Mr.	Carlo	Polidori	VELTHA ivzw	BE
Mr.	Yuri	Ponzani	Recycle2Trade LTD	GB
Dr.	Sharon	Prendeville	Loughborough University London	GB
Mrs.	Ana	Quintais	CCDRC	PT
Mr.	Chris	Radway	AFW	GB
Mr.	Toby	Richt	IC Strategic	GB
Prof.	Jukka	Rintala	Tampere University of Technology	FI
Mrs.	Cheryl	Robb	Zero Waste Scotland	GB
Mr.	Alec	Robertson	4D-Dynamics.Net	GB
Mr.	Seigo	Robinson	Social Circular Economy	GB
Mr.	Gerard	Roemers	Metabolic	NL
Mr.	Ferdinando	Rossi	Regione Lazio	IT
Prof.	Konrad	Rydzyński	Nofer Institute of Occupational Medicine	PL
Mr.	Raul	Salanueva	Gobierno de Navarra	ES
Prof.	Marko	Seppänen	Tampere University of Technology	FI
Mrs.	Natalia	Silva	FRCT - Regional Fund for Science and Technology (AZORES)	PT
Mr.	Carlos	Silveira	CCDRC	PT
Mr.	Andrew	Simmons	Resilience Brokers, The Ecological Sequestration Trust	GB

Mr.	Kirill	Slavin	Reputation Transfer	GB
Mr.	Kevin	Smith	inventid	GB
Mrs.	Maria	Stefanaki	Region of Crete	GB
Mr.	Sagar A	Sumaria	Sow grow and reap	GB
Mrs.	Ramona	Tanasa	North-East Regional Development Agency	RO
Miss	Katie	Thomas	Opportunity Peterborough	GB
Mr.	Benjamin	Thomas	John Lewis	GB
Dr.	Peter	van der Maas	VHL University of appleid sciences	NL
Mr.	Sergio	Villava Gomez	SODENA	ES
Mr.	Bart	Volkers	Water Alliance Fryslân	NE
Mr.	Eric	Vos	Province of Fryslân	NL
Dr.	Hung	Vu	University of Leeds	GB
Prof.	Shane	Ward	University College Dublin, Ireland	IE
Ms.	Natalie	Withenshaw	KTN Ltd	GB
Mr.	Emre	Yontem	Ekodenge Sustainability Engineering	GB
Mr.	Pedro	Zuazo	Gobierno de Navarra	ES

3. Agenda

Circular Economy across European Regions: Synergies and Complementarities

21 November 2017 | Ambassadors Bloomsbury Hotel, London

Time	Session	Speakers
10.30 – 11.00	**Arrival and Registration**	
11.00 – 11.05	Welcome	Claire Claessen, KTN
11.05 – 11.25	European perspective: Circular Economy strategy in the context of Smart Specialisation and Horizon 2020	Keti Medarova-Bergstrom, EASME
11.25 – 11.45	Interregional cooperation: Project SCREEN	Carlo Polidori, SCREEN
11.45 – 13.00	**Session 1: Best practice and lessons from European Regions** 1) *Accelerating Circular Economy in Scotland* 2) *The Dutch policy on the Circular Economy and the value of regional hot spots /* *Circular Economy, the way forward or the way back?* 3) *ECO3 – Tampere, Finland ECO3 – Bio- and Circular Economy Industrial Scale Piloting – Tampere Region, Finland* 4) *Circular Economy and Innovation in Lombardy*	 Cheryl Robb, Zero Waste Scotland Arnoud Passenier, Dutch Ministry of Infrastructure and Environment (DGMI) / Tjeerd Hazenberg, Province of Fryslan Marko Seppänen, Tampere University of Technology / ECO3 Maria-Grazia Pedrana, Lombardy Region, Italy
13.00 – 14.00	**Lunch break**	**Exhibition o.a. SCREEN (initiatives & organisations)**
14.00 – 15.00	**Session 2: Innovation in Circular Economy Approaches** **Presentations from European CE projects and initiatives** 1) *Critical Raw Materials, Closed Loop Recovery Project* 2) *European Remanufacturing Council* 3) *Bioeconomy and Circular*	***Chair: Claire Claessen*** Norah Lewis, WRAP David Fitzsimons, Oakdene Hollins Joao Nunes, BLC3

	Economy: Smart Regions Concept	
15.00 – 15.15	**Tea / Coffee Break**	
15.15 – 16.45	**Session 3: Round table discussions** Introduction to round table discussion **Topics** *Local Analysis and Cross-Regional Opportunities* *Gerard Roemer, Metabolic* *Value-chains* • *Water – Jonathan Abra, KTN Ltd* • *Smart Packaging – Nillo Halonen, Tampere University of Technology* • *Bio-Based Economy – Harma Albering, Province of Limburg* • Manufacturing and Remanufacturing - *Marcello Colledani, Lombardy Region* *CE Business Models and Finance - Ben Peace, KTN Ltd / Lampros Litos, KTN Ltd* *Policy Lab: Funding Synergies - Carlo Polidori, SCREEN*	Gerard Roemers, Metabolic / Viola Hay, KTN **Each topic will be facilitated by a member of the SCREEN consortium.**
16.45 – 17.15 17.15 – 17.30 **17.30 – 19.00**	Feedback from Groups Next steps **Networking & drinks**	 **Exhibition, o.a. SCREEN (initiatives & organisations)**

4. Minutes

Claire Claessen, Head of European Projects at KTN, was the Chair for the day. She welcomed the delegates and introduced the first speaker.

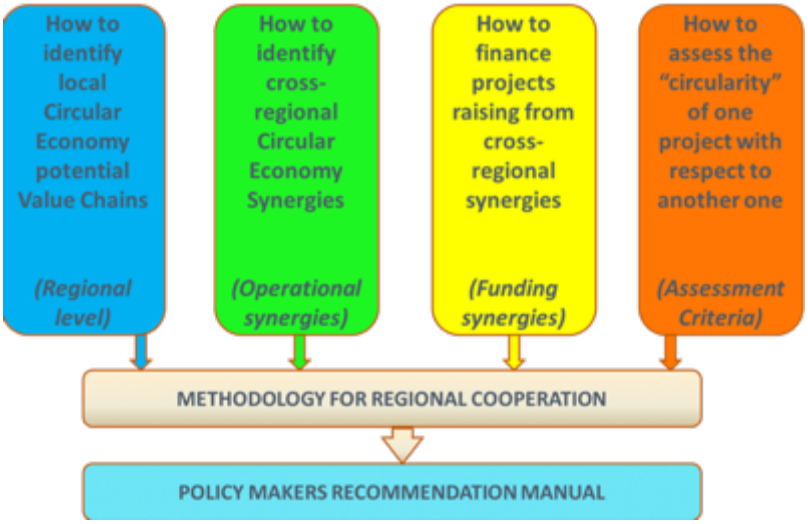
Keynote Address: Keti Medarova-Bergstrom, Project Advisor H2020 Eco-Innovation, EASME

The Executive Agency for Small and Medium-sized Enterprises (EASME) has been set-up by the European Commission to manage on its behalf several EU programmes.

The SCREEN consortium was delighted to be joined for the event by its Project Officer, Keti Medarova-Bergstrom, from EASME, who gave the keynote address.
In her presentation Keti started by giving an overview of EASME and explained the different areas of work they are involved in. She then spoke about the role and importance of Circular Economy in the EU and highlighted what kind of support is available for circular economy through H2020 and ESIF. Finally, she explored synergies between H2020 and ESIF for circular economy projects.

SCREEN Project Presentations: Carlo Polidori, SCREEN Project Coordinator
Carlo Polidori then introduced the SCREEN Project, the partners involved, its objectives and background.

Figure 1: Four steps of the SCREEN project



Carlo also explained some of the tools that the SCREEN project has developed so far and gave an overview of the Policy Lab and its progress to-date.

Session 1: Best practice and lessons from European Regions
The first session on best practice and lessons learned from different European Regions welcomed speakers from Scotland, the Dutch Ministry of Infrastructure and the Province of Frysland, Tampere in Finland and the Lombardy Region.

- **Cheryl Robb, Sector Manager Circular Economy Cities and Regions, Zero Waste Scotland**

  Zero Waste Scotland (ZWS) exists to create a society, where resources are valued and nothing is wasted. ZWS is funded to support delivery of the Scottish Government's circular economy strategy and the European Circular Economy Stakeholder Platform. ZWS goal is to help Scotland reap the environmental, economic and social benefits of making best use of the world's limited natural resources.

  Cheryl introduced "Team Scotland", i.e. the other key strategic partners ZWS works with in order to support Circular Economy activities. They include Scottish Entreprise, the Scottish Environment Protection Agency (SEPA), the Scottish Institute for Remanufacturing, Highlands and Islands Enterprise and Business Gateway.

  Cheryl explained Scotland's Circular Economy Strategy "Making Things Last" and the priority sectors set by Scottish Government. She then gave an overview about the Scottish Circular Economy support landscape with its key components: Circular Economy Business Support Service, Circular Economy Investment Fund and Scottish Circular Economy Business Network. Cheryl also highlighted the wider support network available through organisations such as the Enterprise Europe Network, SMART Scotland and other routes.

  Cheryl finished her presentation by giving examples of Scottish case studies of various Circular Economy Initiatives and projects.

- **Arnoud Passenier, Senior Programme Manager Circular Economy, Dutch Ministry of Infrastructure and Environment (DGMI)**

  The Dutch Ministry of Infrastructure and Environment (DGMI) is committed to improving quality of life, access and mobility in a clean, safe and sustainable environment. The Ministry strives to create an efficient network of roads, railways, waterways and airways, effective water management to protect against flooding, and improved air and water quality.

  In his presentation, Arnoud Passenier spoke about the Dutch policy on Circular Economy and the importance of a regional approach. Arnoud explained that the Dutch Government has set itself the goal to make the Netherlands 100% circular by 2050. The focus for achieving this is on three key developments:

    - High quality use of raw materials in existing value chains;
    - Use of sustainably produced, renewable and generally available raw materials;
    - Fundamental change in production and consumption.

  Arnoud then introduced the National Agreement of Circular Economy, which is based on the programme "The Netherlands Circular by 2050" and signed by 350 stakeholders. Various transition agendas are being developed together by the signatories in five areas:

- Biomass & Food
- Plastics
- Manufacturing & Industries
- Building & Construction
- Consumer Goods

The common goal is to accelerate the transition to a Circular Economy and the most urgent challenges to be addressed are CO2 emissions, wastage of materials and environmental damage (e.g. plastic soup).

Arnoud highlighted that ways in which the Dutch Government is trying to achieve this goal are:

- More demand for recylates
  - Higher tax incineration recyclable waste;
  - Extend producer responsibility;
  - Enhance circular design & procurement.
- More supply
  - Mechanical / chemical recycling;
  - Promoting craftsmanship (Circular Craftmenship Centres);
  - Hot spots for circular business development (Silicon Valleys of the futures).

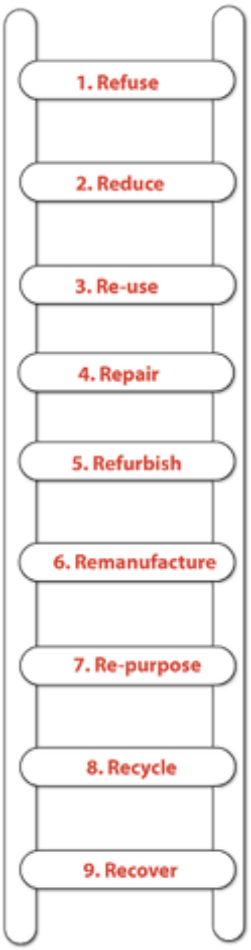


Figure 2: Waste Hierarchy

- **Tjeerd Hazenberg, Policy Advisory, Province of Fryslan**

Fryslan is a province in the northwest of the Netherlands. It is situated in the North East of Holland, and South of the North Sea. The province has a population of 647,000 and over 90% of the businesses situated in the province are SMEs.

The capital and seat of the provincial government is the city of Leeuwarden, a city with 91,817 inhabitants.

Tjeerd Hazenberg from the provincial government introduced the Province of Fryslan and described the successful bottom-up approach to circular economy they have taken and the policy supporting this approach. The two key policy points are:

- Faciltating the regional transition agendas and contribute to the national agenda;
- Lead by example: circular purchasement.

Tjeerd concluded the presentation with a short video about Fryslan and Circular Economy.

Figure 3: Circular Economy, Metabolic

- **Prof. Marko Seppänen, Tampere University of Technology (TUT) / ECO3**

  Marko Seppänen introduced Tampere University of Technology and the ECO3 initiative.

  TUT is located in Tampere, the Nordic countries' largest inland city, some 170 km north of the capital Helsinki. TUT's campus in the suburb of Hervanta is a community of 8,300 undergraduate and postgraduate students and 1,700 employees.

  The University combines a strong tradition of research in the fields of natural sciences and engineering with research related to industry and business. Technology is the key to addressing global challenges.

  An innovative, industrial-scale, multidisciplinary bio- and circular economy business area, ECO3, is being built on the excellently located Kolmenkulma business park in Nokia, situated in the Finnish growth corridor. On 600 hectares of land, ECO3 represents service investments for the area of currently around 60M EUR.

  The core of the industrial activity is being formed from bio- and circular economy companies. Their activities offer possibilities to many other tech and service companies in the bio- and circular economy, water-economy and energy field.

  From this area of independent organisations, a new creative ecosystem has developed, which exceeds traditional sector boundaries, and in which one person's waste is another's commodity.

  This nationally significant competence centre works simultaneously as a demonstration and pilot environment, which was developed by co-operating with both domestic and foreign companies, as well as universities.

  ECO3 offers companies co-operation, shared resources, concepts, platform services and joint visibility.

Smart ECO3 – digitalisation develops the whole area

Smart digitalisation is a part of the development of the ECO3 area. ECO3 provide a platform and possibilities to implement internationally competitive bio- and circular economy-related technological solutions.

How does ECO3 operate?

Verte Ltd. provides the ECO3 platform with allows matchmaking, setting up business and concepts in national and international level and is owned by the city of Nokia.

In terms of the ECO3 Consortium, Marko explained that ECO3 is developed in close cooperation with participating companies, Finnish universities and research centres

- Tampere University of Technology
- Natural Resources Institute Finland (Luke)
- VTT Technical Research Centre of Finland

Other companies and cooperation partners in the area:

Marko also described the key areas that ECO3 focuses on:

- Nutrient Cyle
- Wood-based Economy
- Renewable Energy and Bio-Fuels
- Life-Cycle Extension

Marko concluded with a short video about ECO3.

- **Maria-Grazia Pedrana, Assistant Director at DG Environment, Energy & Sustainable Development of Lombardy Region**

Maria-Grazia introduced the Lombardy Region, see figure 4. She then explained the two key pillars of focus for Circular Economy activities in Lombardy: Innovation and Environment. In line with the Regional strategy framework (RIS3), two strands of activities have emerged:

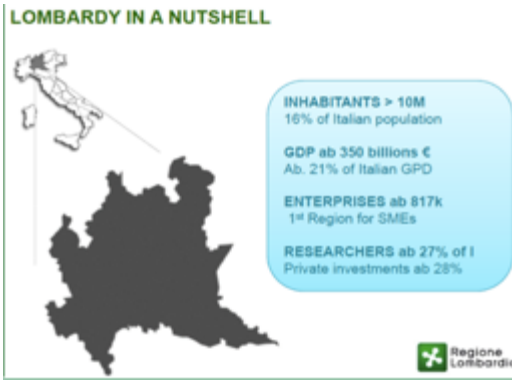


Figure 4: Lombardy in a Nutshell

- tools to support the establishment of Enabling Environments to facilitate the evolution of business into emerging industries (Lombard Technological Clusters, Regional Open Innovation Platform);
- Policy Mix – Direct Measures, giving the companies a series of straightforward tools, supporting them in each life-cycle phase.

Maria-Grazia then spoke about the Vanguard Initiative, which Lombardy Region is a part of. The Vanguard Initiative "new growth through smart specialisation" is driven by a political commitment made by regions to use their smart specialisation strategy to boost new growth through bottom-up entrepreneurial innovation and industrial renewal in European priority areas. The Vanguard Initiative seeks to lead by example in developing interregional cooperation and multi-level governance for supporting clusters and regional eco-systems to focus on smart specialisations in priority areas for transforming and emerging industries. Vanguard regions want to build the synergies and complementarities in smart specialisation strategies to boost world-class clusters and cluster networks, in particular through pilots and large-scale demonstrators. These investments will strengthen Europe's competitive capacity to lead in new industries in the future and develop lead markets that offer solutions to our common challenges.

To conclude, Maria-Grazia gave an example of the Regional plan for waste management and remediation 2014-2020 of the Lombardy Region and highlighted business and job opportunities related to circular economy in the region.

This first part closed with a Q&A panel session.

Session 2: Innovation in Circular Economy Approaches - Presentations from European CE projects and initiatives

The second session featured three presentations from European Circular Economy initiatives / projects: WRAP and the CRM Recovery Project, the European Remanufacturing Council and BLC3.

- **Norah Lewis, Technical Specialist, WRAP**

  In her presentation, Nora Lewis introduced WRAP and the Critical Raw Material (CRM) Recovery project. WRAP's vision is a world in which resources are used sustainably. WRAP works with governments, businesses and communities to deliver practical solutions to improve resource efficiency.
  WRAP's mission is to accelerate the move to a sustainable, resource-efficient economy by:

  - re-inventing how we design, produce and sell products,
  - re-thinking how we use and consume products, and
  - re-defining what is possible through re-use and recycling.

The CRM Recovery Project, aims to address the issue of waste electronic and electrical equipment (WEEE) and focuses on developing policy recommendations using trials and trial evaluation data.

Project summary:

Figure 5: CRM Recovery Project Summary

Key project partners involved:

Figure 6: CRM Recovery Key Project Partners

Norah explained the different WEEE categories and gave a definition of Critical Raw Materials. She then talked through the various collection and treatment trials, which had been carried out as part of the project, and the lessons learned.

- **David Fitzsimons, Managing Director, Oakdene Hollins**

David Fitzsimons from Oakdene Hollins gave an overview of the European Remanufacturing Council.

The European Commission has asked for a coordinated voice from EU-28 remanufacturing businesses. The Conseil Européen de Remanufacture will represent small and large businesses from all remanufactured product sectors.

Along with the other activities detailed in the work programme, the Council will publish its annual recommendations on research priorities for national and EU-level innovation funding that will most benefit remanufacturing in Europe. Council members will have an influence upon the definition of these research priorities. The technical detail of these research priorities will be developed by the European Remanufacturing Network (ERN) of universities and research organisations – a network based upon an existing Horizon-2020 financed research project - see www.remanufacturing.eu. The ERN will also become a permanent repository for the academic evidence base on remanufacturing.

David explained the recommended actions and ambitions of the Council:

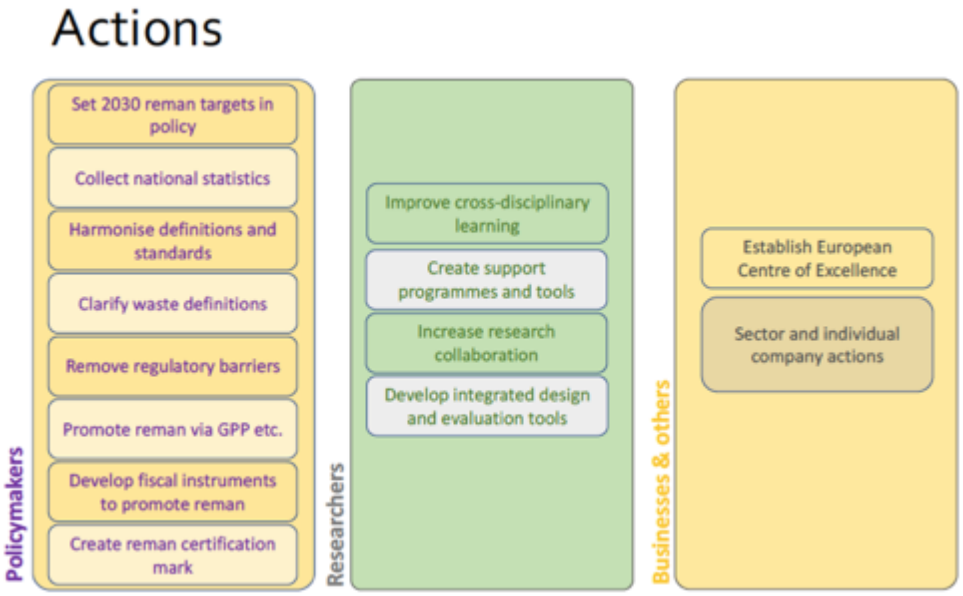


Figure 7: European Remanufacturing Council - Actions

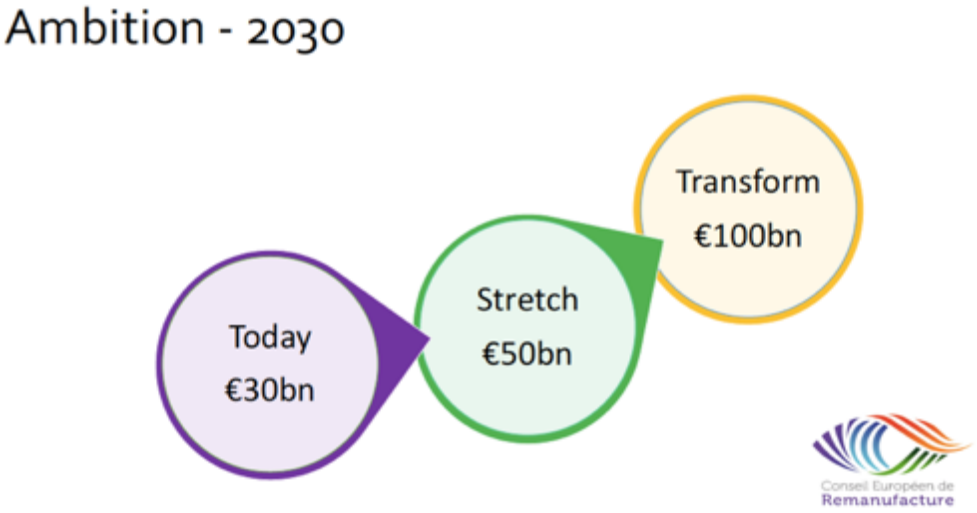


Figure 8: European Remanufacturing Council - Ambition

David continued by giving examples of policy papers and studies carried out, and concluded with a number of case study (Lexmark, Apple).

- **Joao Nunes, CEO, BLC3**

To conclude this second session, Joao Nunes introduced the Association BLC3, which is a non-profitable association founded in May 2010, beginning its activities in September 2011, with a new model of research activities development and excellence in technological enrichment, companies and business ideas incubation and support to the economy fabric of rural inner regions. Its members are mainly from the technical-scientific area. This is the first and only Portuguese entity devoted to the development of Bio-refineries (2nd and 3rd generation), Bio-economy and "Smart Regions", focusing on the Circular Economy concept.

In 2016, BLC3 project "Centro Bio" won the RegioStars award, presented by the European Commission in the category of "Sustainable Growth: Circular Economy", having been chosen amongst 23 finalists from all over Europe. This project from Portugal's central region represents a public-private investment of 9.2 million euros, boosted the creation of 24 Research and Development subprojects, 4 spin-offs and 6 new companies.

Joao Nunes explained BLC's main RTD areas and the four Centres they have established to address various challenges.

Figure 9: BLC3 Centres

Joao then presented various case studies, highlighting different global and local challenges and opportunities from urbanisation to bio-refineries and energy efficiency.

In the following, Joao explained the Smart Regions concept aiming at the integration of bio-economy and circular economy.

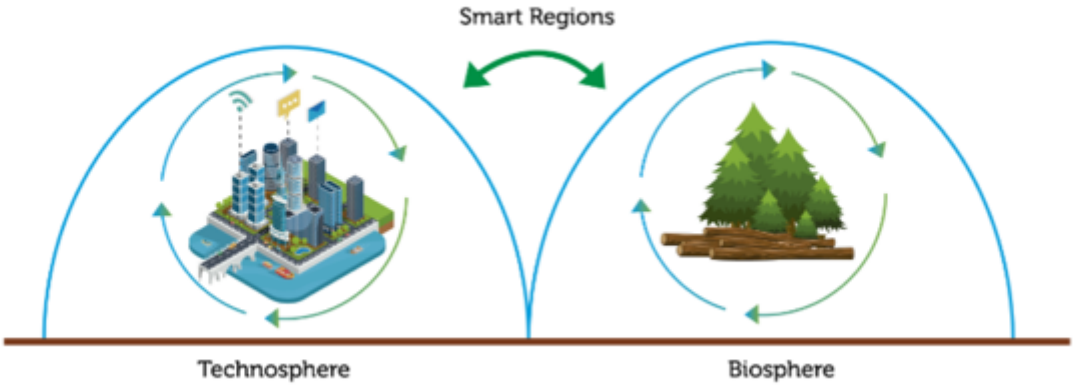


Figure 10: BLC3 Smart Regions Concept

Joao concluded by introducing the BIOREFINA-Ter Project, which is a multidisciplinary project of R&D designed to apply advanced technologies, within a network, to the conversion of wastes from forest exploration and farming, and also from land which does not have any farming potential, to 2nd generation biofuels intended to replace fossil fuels.

The present project has managed to bring together an international knowledge network of 55 R&D organizations from 9 European countries. It started in 2011 with a Portuguese State fund, through IFAP, of 0.5 million euros. The first stage, allowed progression of the scientific and technical knowledge regarding the conversion of heathland biomass and forest residues to 2nd generation advanced biofuels (direct replacements for gasoline and diesel).

The BioREFINA-TER project aims the construction of an industrial demonstration bio-refinery unit, with a capacity of 25 million litters per year of 2nd generation biofuels, which do not compete with the food sector or the wood processing industry. The pilot territory will cover the cities of Arganil, Góis, Oliveira do Hospital and Tábua. It represents an investment of 125 million euros in 4 municipalities and the pilot unit will be used for replication throughout Portugal. Also aims to create the first internationally country with full energy autonomy, meaning that the natural resources existent are enough to generate energy for the current economic activity consumption.

This second session ended with a panel and another Q&A opportunity for the delegates.

5. Round-table discussions and outputs

Following the presentations delegates were able to join round-table discussions, to feedback and input into the SCREEN project, on the following topics:

- Circular Economy Business Models and Financing
- Cross-Regional Collaboration Opportunities
- Policy Lab
- Value chains:
    - Bio-based Economy
    - Remanufacturing and Manufacturing
    - Smart Packaging
    - Water

The discussions were introduced by Gerard Roemers, who explained SCREEN's methodology on value chains and how to identify synergies.

Each table was hosted by a member of the SCREEN Consortium, and delegates were able to choose two topics of interest, i.e. attend two different tables. Templates with four key questions were used to help structure and capture the discussions. Outputs from each table are below. These have been provided to the SCREEN consortium and will feed into current and future work of the SCREEN project.

Table topic Bio-based economy
Chair: Harma Albering, Limburg

Session 1

Names and Organisations
- Marcin Podgórski, Regional office of Lodzkie Region in Brussels
- Nathalia Silva, FRCT, Regional Fund for Science and Technology – AZORES
- João Nunes, BLC3
- Monica de la Cerda, Regional Directorate for Science and Techology
- Pedro Zuazo Navarra
- Harma Albering (facilitator)

Session 2

Names and Organisations
- Muhammed Javed, Biotech consultants limited
- Derek Bates, Materials technology Ltd
- Sagar A Sumaria, Sow Grow and reap
- Harma Albering, province of Limburg (facilitator)

We started with a more general discussion about the relationship between bio-economy, circular economy and sustainable development and how they interconnect. The workshop members stressed that we should be aware of 'greenwashing'.

1. What are the opportunities for cross-regional collaborations in the same value chain
Example; bio refinery as a business model at the regional – local scale (ecosystem). Bio-economy can bring vitality to rural areas and the country side.

   - collaboration should be formed around knowledge sharing, skills and technology export.
   - also important is the collaboration around social innovation aspects (cultural aspects at the local level)
   - it is important to scale up from pilot to demo scale, to unlock the market for mature technology (business modelling)
   - lead by example: show cases

2. What opportunities for cross-regional collaboration do we see across different value chains
   - biofuel – aviation
   - bioplastics
   - energy – industrial scale
   - waste water - bio refinery (bio-algae) – food sector (compost -> market failure)
   - hemp- building materials, health, remediation of the soil, CO2 capture

Possible synergies are related to knowledge transfer, working group and business modelling.

3. Have we missed any barriers and collaborations between regions. barriers to benefiting from synergies that are possible

Only one barrier has been discussed the market failure of compost.

4. Are there any other interventions you can think of to enable collaboration between regions, which interventions are most appropriately implemented at regional, national of European level?

Not discussed.

CIRCULAR ECONOMY BUSINESS MODELS AND FINANCE
CHAIR: BEN PEACE

1. Where is the cutting edge in business models for CE?

    - 4 CLUSTERS could be identified

BIZ	START UP	CONSUMER	UNI, KNOWLEDGE CENTERS i.e.
H&M	KEMBO Coffee (system level approach)	ZERO Waste movement-bottom up approach	*Ellen* MacArthur *Foundation*
Rolls Royce	PARTO (wool, Italy)	APPLE-example off consumer preassure for change	ASTON Uni
British Sugar	ART Leasing		BRADFORD Uni
Desso Carpets	RIVER SIMPLE (fuel sell cars)		
HP printers and catridges			

2. **Opportunities for collaboration?**
    - Academics and SME's: challange led approach
    - Innovation consultants: on a commercial basis or local goverment funding, gather knowledge and disseminate, developing connections and resolving problems
    - Local companies promoting business and innovation = innovation consulatancy, example in Finaland- consultant companies promote chain system-sharing knowledge, testing new ideas
    - Big industries working with innovative SME's
    - Innovative accelartors
    - Economic growth hubs: regional, seed fundings, links to the knowledge base
    - Proving the net benefits: enivornmental, social, economic. Question: is circular always a wise strategy? Demands collaboration across diciplines and different part of the system (eg. City, transport, manufactures etc.) Are business models of CE always good-example when people hire cars?
    - Terminology? Circular economy or resource efficiency?
    - There should be concensus on drivers development on EU policy

3. **Financing for CE?**
    - Circularity capital
    - A.B.N. Amro (bank)
    - ECO Machines Vnetures
    - H&M Foundation
    - European Union: Horizon 2020, ESIF, ERDF

AMBASSADORS

Article 70

N° Business models and financing – PARTICIPANTS:

JOHN HODGE
KIRIL SLAVIN
ALEC ROBERTSON
KATHLEEN BOQUET
MICHAEL GROVES
NIKKI KAPP
LAMPROS LITOS (Leader)
ANA LICANIN (taking notes)
PHILIPPE MICHAUX NAUDET

AMBASSADORS

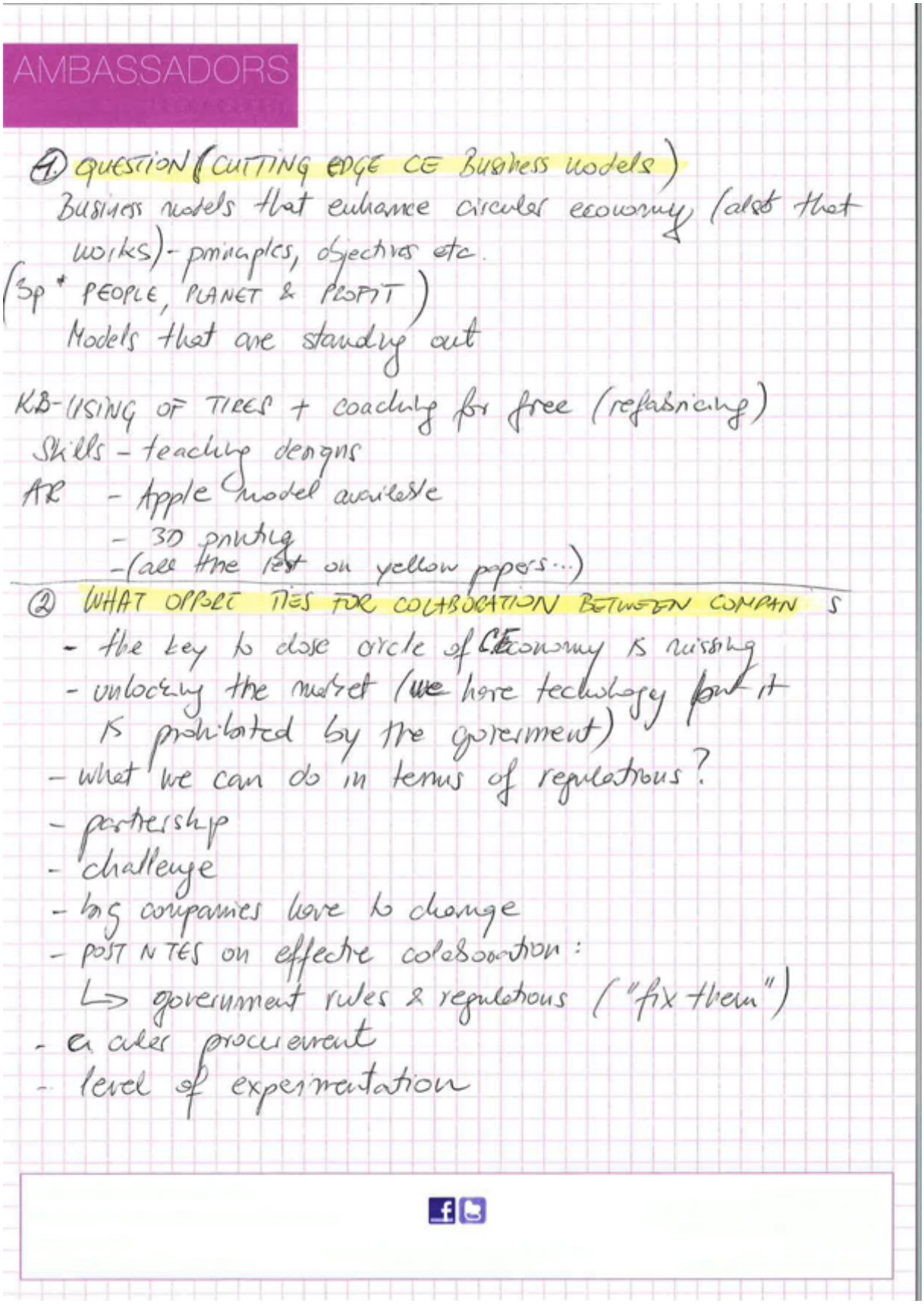
21st November 2017

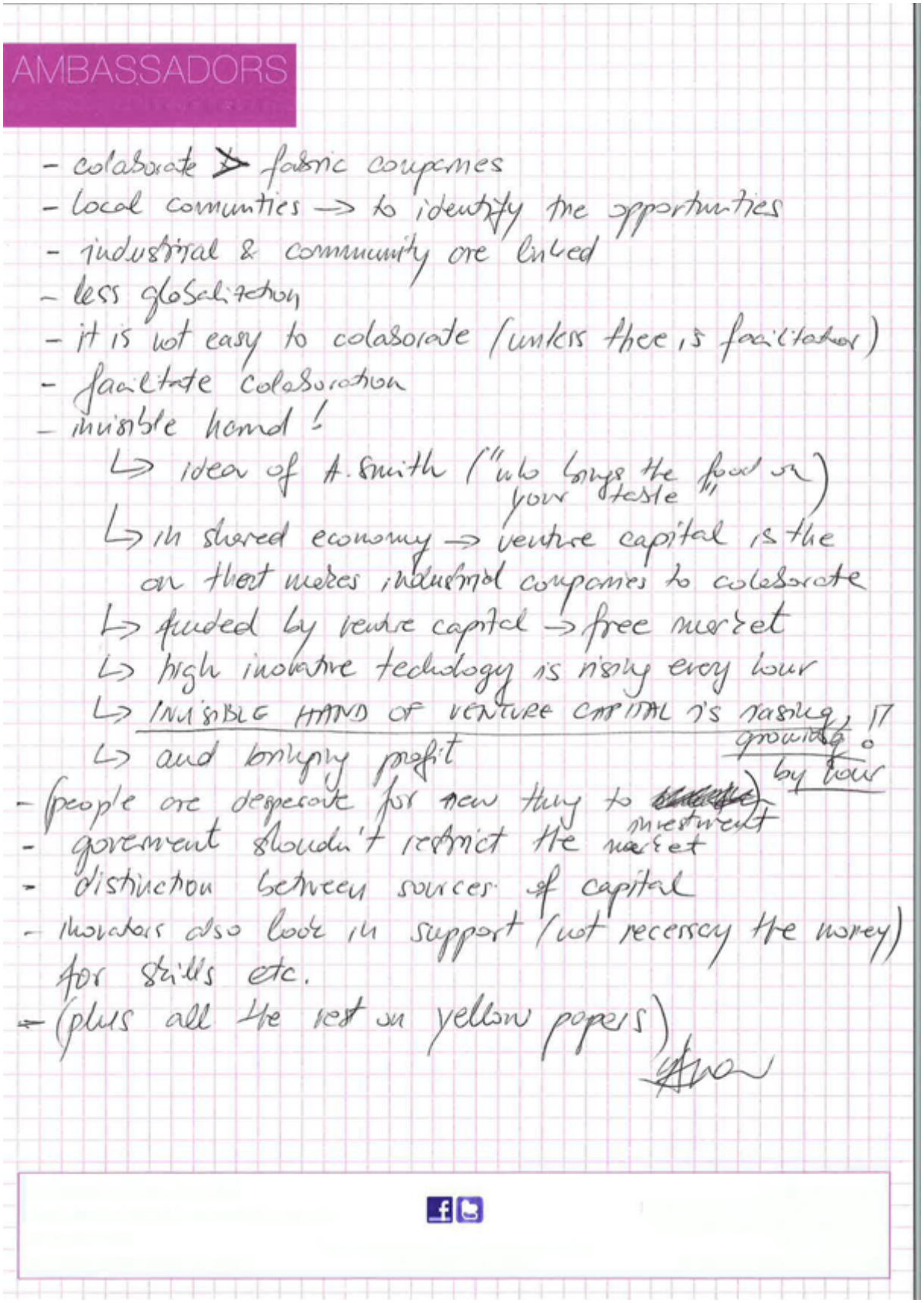
CIRCULAR ECONOMY BUSINESS MODELS AND FINANCING
Table N°1

- connect companies with investors → Leader (LAMPROS LITOS)
4 questions:

Introduction first:

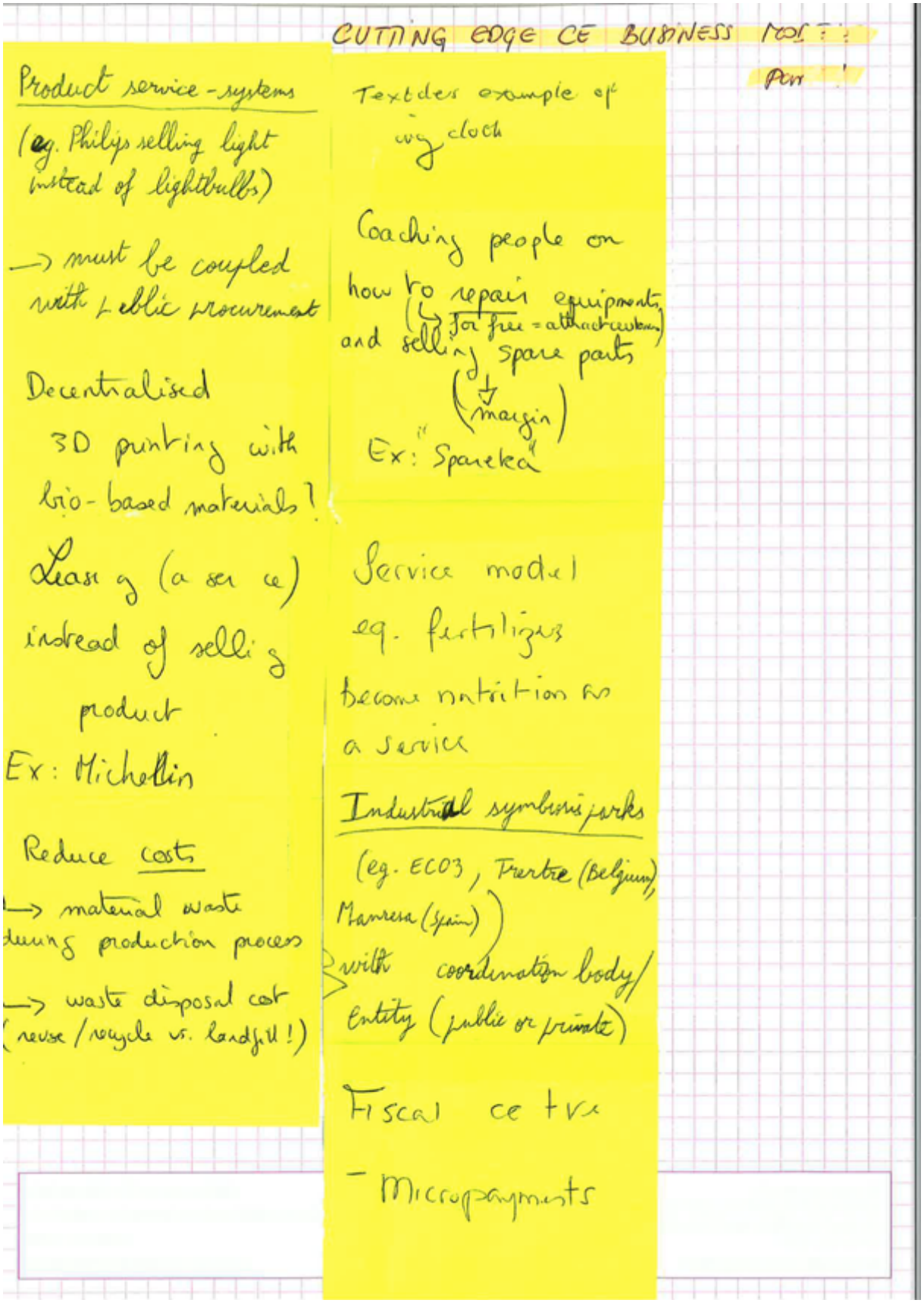
KS - shared economy is the least expensive thing in circular economy
JH - helping companies, taking on principles, using existing software system to link all together
N - looking into circular design & business models
AR - design area, design (how can things be redisigned)
KL - consultant to help companies to find environmental strategies & implement plans, measuring impact, dedicated to energy efficiency, looking for good projects
MG - building digital map, working with companies, "closing" what happening in waterers
- facilitate participatory regions & cities

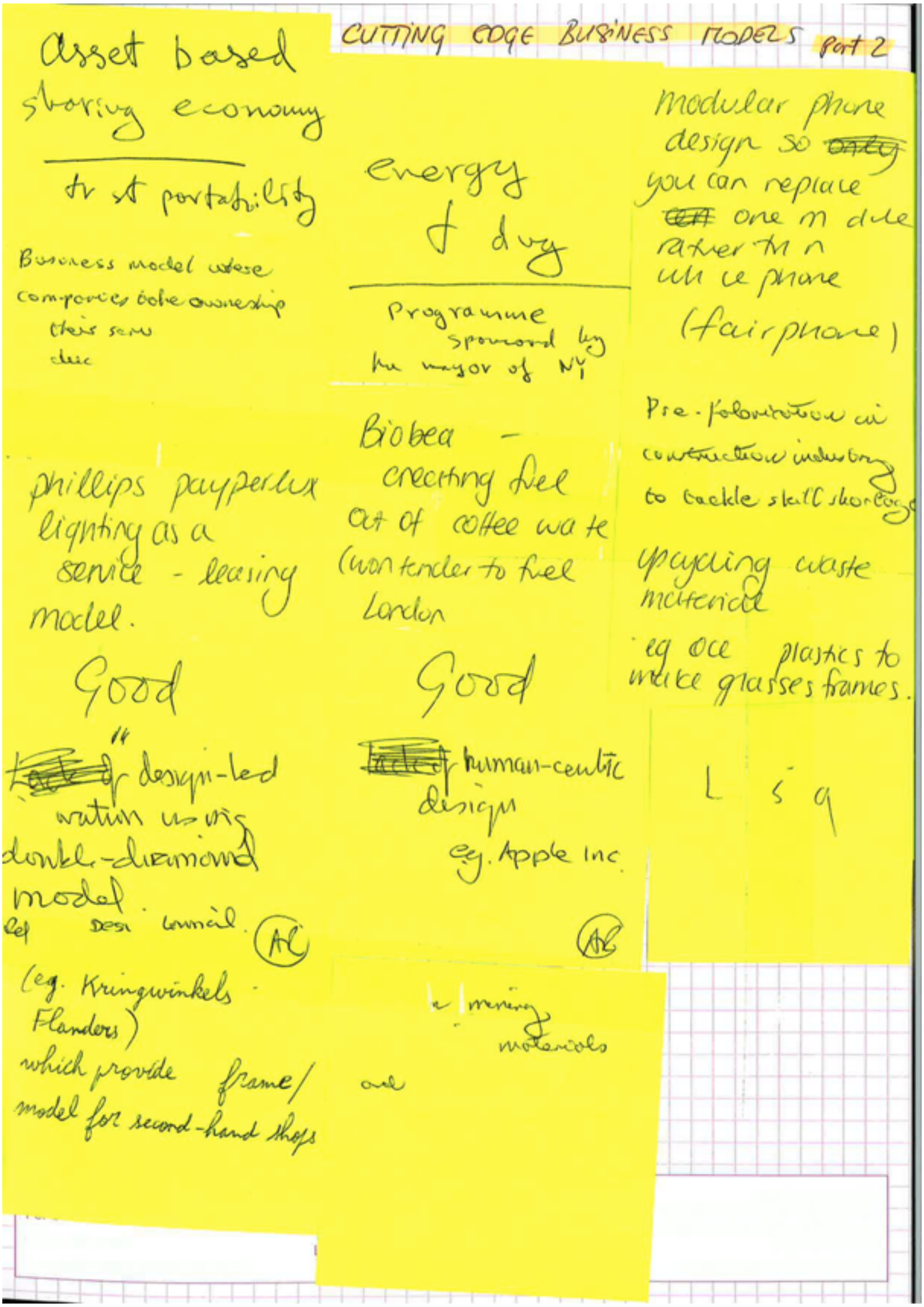

AMBASSADORS
① QUESTION (CUTTING EDGE CE Business models)
Business models that enhance circular economy (also that works) - principles, objectives etc.
(3p * PEOPLE, PLANET & PROFIT)
Models that are standing out
KB - USING OF TREES + coaching for free (refabricing)
Skills - teaching designs
AR - Apple model available
- 3D printing
- (all the rest on yellow papers...)
② WHAT OFFSET TIES FOR COLLABORATION BETWEEN COMPANIES
- the key to close circle of CE economy is missing
- unlocking the market (we have technology but it is prohibited by the government)
- what we can do in terms of regulations?
- partership
- challenge
- big companies have to change
- POST NOTES on effective collaboration:
↳ government rules & regulations ("fix them")
- a clear procurement
- level of experimentation



AMBASSADORS

- colaborate ⇒ fabric companies
- local communties → to identify the opportunities
- industrial & community are linked
- less globalization
- it is not easy to colaborate (unless there is facilitator)
- facilitate colaboration
- invisible hand!
  - ↳ idea of A. Smith ("who brings the food on your table")
  - ↳ in shared economy → venture capital is the one that makes industrial companies to colaborate
  - ↳ funded by venture capital → free market
  - ↳ high inovative technology is rising every hour
  - ↳ INVISIBLE HAND of VENTURE CAPITAL is raising IT growing by hour
  - ↳ and bringing profit
- people are desperate for new thing to ~~consume~~ invest
- goverment shouldn't restrict the market
- distinction between sources of capital
- inovators also look in support (not necessary the money) for skills etc.
- (plus all the rest on yellow papers)


CUTTING EDGE CE BUSINESS MODELS
Product service-systems
(eg. Philips selling light instead of lightbulbs)
→ must be coupled with public procurement
Decentralised 3D printing with bio-based materials?
Leasing (a service) instead of selling product
Ex: Michelin
Reduce costs
→ material waste during production process
→ waste disposal cost (reuse/recycle vs. landfill!)
Textiles example of wig cloth
Coaching people on how to repair equipments (→ for free = attractiveness) and selling spare parts (→ margin)
Ex: "Spareka"
Service model eg. fertilizers become nutrition as a service
Industrial symbiosis parks
(eg. ECO3, Frerbre (Belgium), Manresa (Spain))
with coordination body/ entity (public or private)
Fiscal ce tve
- Micropayments


CUTTING EDGE BUSINESS MODELS Part 2
Asset based sharing economy
Business model where
Good
design-led
(eg. Kringwinkels Flanders)
which provide frame/ model for second-hand shops
phillips payperlux lighting as a service - leasing model.
Good
energy
Programme sponsord by the mayor of NY
Biobea - creating fuel out of coffee waste
London
Good
human-centric design
eg. Apple Inc
modular phone design so you can replace one module
(fairphone)
Pre-fabrication in construction industry to tackle skill shortage
upcycling waste material
eg ocean plastics to make glasses frames.

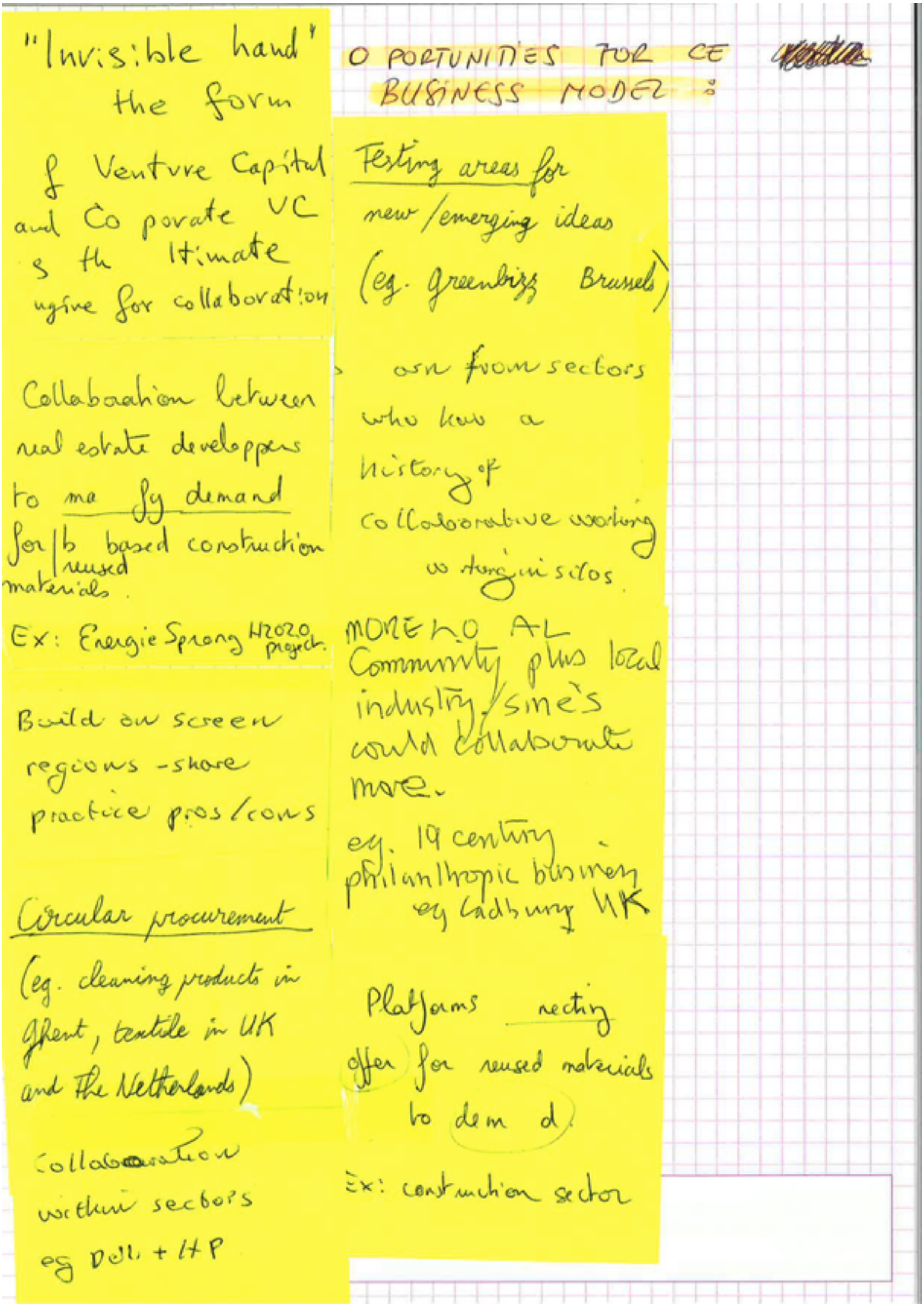

"Invisible hand" the form
Venture Capital and Co porate VC
ugine for collaboration
Collaboration between real estate developpers to
demand for
based construction materials.
Ex: Energie Sprong H2020 project.
Build on screen regions - share practice pros/cons
Circular procurement
(eg. cleaning products in Ghent, textile in UK and The Netherlands)
Collaboration within sectors
eg Dell + HP
O PORTUNITIES FOR CE BUSINESS MODEL:
Testing areas for new/emerging ideas
(eg. greenbizz Brussels)
from sectors
who
history of
collaborative working
silos
Community plus local industry/sme's could collaborate more.
eg. 19 century philanthropic business
eg Cadbury UK
Platforms
offer for reused materials
Ex: construction sector

TABLE TOPIC: Business Models and Financing – 2

Please list the people at your table here: Names and Organisations

Ben Peace, KTN Ltd
Chiara Catgiu, AFIL
Rembrandt Koppelaar, Leiden University
Satu Huuhka, Tampere University of Ttechnology
Lampros Litos, KTN
Monica de la Cerda, Regional Directorate for Science and Technology
Joao Nunes, BLC3
Natalia Silva, FRCT (Azores)

Where is the cutting-edge knowledge in Circular Economy Business Models across Europe?

- Slovenia washing machine company do leasing (GORENJE)
- Integration of urban waste in production in Portugal for furniture (30% from urban waste) – SONAF
- Challenging technical cycles
- Logistics must be improved (Inverse Logistics)
- Tecnovia, enterprise working with wood in the building industry – pellets from waste and they sell it
- Quality and assurance of data
- New projects (e.g. H2020 FIBEREUSE, Life NoWaste => Biomass Recovery in Portugal) to change the business models
- H2020 R2PI on research on circular business models

What opportunities for collaboration do you see?

- Big data companies
- Industrial symbiosis
- Logistics companies
- European projects already funded on new circular economy business models research
- Society, work through bottom-up approach (prosumer, FABLABS, co-design, education, programs, user-driven products, incubators, living labs)
- Designers => Eco-design
- See Europe unite and collaborative "vision" => See Europe as a "bigger picture"; possibility of transporting goods within European Regions; not easy and self-sustainable to collaborate within regions if funding stops => needs to be sustained

WHO does this require? (STAKEHOLDERS)

- EU Funding
- Events
- Regions have to be continuative and sustained too
- Policy consistent sustained
- Entrepreneurial spirit
- Connections of evidence, case studies from companies
- Crowd-funding
- Social economic benefits needed to drive scalability

Who is financing Circular Economy projects?

(If relevant)
STARTING TRL:

END TRL:

- Private funding (and public)
- Micro loans for companies from banks
- European investment banks
- EU Commission
- Circular Economy finance support platform (3 pillars, advisory)
  - Financial instruments will be provided for Circular Economy

⇨ Under Development

How do we work with these players to increase their impact?

TABLE TOPIC: Cross-Regional 1 and 2

Please list the people at your table here: Names and Organisations	
John Hodge, JH Environmental Consulting	Ana Quintais, CCDRC
Raul Salanueva, Gobierno de Navarra	Esteban Pelayo, Eurada
Kathleen Boquet, Greenflex	Eleni Chatzigianni, Region of Crete
Olusola McKEnzie, Learn to Recreate	Maria Stefanaki, Region of Crete
Maciej Kowlacyk, OLP sp. z.o.o	Ramona Tanasa, North-East Regional Development Agency
Gerard Roemers, Metabolic	Gabriela Bobeanu, North-East Regional Development Agency
Hung Vu, University of Leeds	Konrad Rydzynski, Nofer Institute
Minna Lammi, University of Helsinki	Rembrandt Koppelaar, Leiden University
Viola Hay, KTN Ltd	

What are the opportunities for cross-regional collaborations in the same value chain?

1) **Agriculture**

- Project aiming to extract starch from potatoes and use in paper industry
- Agriculture from plastics
  - Agricultural plastic waste that are left on the sides of the field: How to organise collection and re-uptake?
  - Cellulose packaging instead of plastics
- Waste from agriculture
  - Biomass
  - Construction
    - Sheep wool
    - Hemp
- Agri-food and healthy living
- Peel of lemons and agriculture

2) **Glass / Ceramics**

- Recyclable any time
- Good material for industrial symbiosis
- Structural Ceramics

3) **Raw materials**

- Mining of raw materials
- Valuable raw materials
- Substitute metals / conflict metals
- Textile (non-silver)
- Textile: Hemp value chain
- Using wool as material for buildings rehabilitation
- Textile: Large employer.

- Challenge => Textile waste: quantity, quality, use.
- Non-woven textiles => regional centre

4) Shipping

- Port Regions: with ships that need end of life. Deconstruction & re-use / re-uptake of materials

5) Wood => Furniture

- Challenge: reuse of the furniture industry outputs

6) Water

- Challenge => Sludge from Water: quality and use
- System to take nutrients from water-flows

7) Other

- Wineries
- Cheese producers
- Hotel-waste management

What opportunities for cross-regional collaborations do we see across different value chains?	WHO does this require? (STAKEHOLDERS)

Have we missed any barriers to collaborations between regions? Barriers to benefiting from synergies that are possible?	(If relevant) STARTING TRL: END TRL:
• High-value recycling of agricultural plastics • Data on amount and quality of waste • Technology for retrieving nano-fibres • Lack of understanding of material flows • Lack of knowledge of where things are • Need for knowledge sharing • Quantifying flows and make info available • Circular economy at scale => mainstream • Glass value chain. Challenge => High levels of energy consumption; heavy material • (MURCIA) Re-use of plastic material waste in intensive agriculture: pipes, covers • (MURCIA) Denitrification and eliminating organic charges in water-flows (rivers) to eliminate entrophisation of lagoon	
Are there any other interventions you can think of to enable collaboration between regions? Which interventions are most appropriately implemented at regional, national or European level?	
• Legislation & Regulation • Investment / Venture Capital • VC to move freely through UK => move beyond sectors & traditional value chains • Technology as enabler • "Stakeholder Platform"	

TABLE TOPIC: Manufacturing and Remanufacturing - 1

Please list the people at your table here: Names and Organisations	
Deborah Ferreira de Avelino - Abelha Eco-Design	Naomi Cohen – Suez R&R UK
Chiara Catgiu – AFIL	Derek Bates – Materials Technology Ltd
Federico Albe – AFIL	Satu Huuhka – Tampere University of Technology
Marcello Colledani – Politecnico di Milano	

What are the opportunities for cross-regional collaborations in the same value chain?

1) Testing, inspection and repair techniques should be increased at all levels to prevent materials go to waste
2) Failure analysis to prevent fracture and do it preliminarily to remanufacture
3) Reuse and / or extending the life of products
4) Increase market for secondary raw materials
5) Lithium-ion batteries in automotive, reuse and recovery

What opportunities for cross-regional collaborations do we see across different value chains?	
	WHO does this require? (STAKEHOLDERS)

Have we missed any barriers to collaborations between regions? Barriers to benefiting from synergies that are possible?	(If relevant) STARTING TRL: END TRL:
Barriers 1) Possible CO2 emissions related to transport of waste from one region to another 2) Absence of policy 3) Absence of incentives 4) Legislation boundaries 5) Short time and trade-off with costs 6) Too many actors in the value chain (from manufacturers to recyclers there is a lot of time in between)	
Are there any other interventions you can think of to enable collaboration between regions? Which interventions are most appropriately implemented at regional, national or European level?	
1) Promote the reuse of products 2) Encourage the collaboration	

TABLE TOPIC: Manufacturing and Remanufacturing - 2

Please list the people at your table here: Names and Organisations

Seigo Robinson, Social Circular Economy
Bart Volkers, Wateralliance Frysland
Carlos Silveira, CCDRC
Emre Yontem, Engineering & Consultancy SME
Rob Maslin, We all Design
Sarah Kelly, UK national Standards Body
Przemslaw Nowakowski, Lodzkie Region

What are the opportunities for cross-regional collaborations in the same value chain?

- Service design – user-centred approach
- Energy Efficiency and Industrial Strategy
- Design for Remanufacture / Standards and Certification
- Internal logistics
- Waste Management Systems (pharma waste innov.) and reuse in cosmetics
- Water challenges
- Forrest bio-refinery, construction, ceramic and glass (CCDRC)

What opportunities for cross-regional collaborations do we see across different value chains?

- Design software to support productivity and circular application (We all Design)
- Develop business cases => Are requirements in CE different? => It's about connectivity / understanding flow of information going with the materials
- Materials w/o information is worthless / info management in VC => in Ja;a is done / start from failures to design
- (Individual producer responsibility)
- Extended producer responsibility drives the case in Japan
- Secondary materials market makes sense with scale – how it is broker-enabled, not market (free)-based?
  - Need a market place of products embedding secondary raw materials
- Platform by itself does nothing / need to involve stakeholders and data sharing
- Conceptualise circular factories of the future (waters, discrete parts manufacturing)

WHO does this require? (STAKEHOLDERS)

Info integrators (stakeholders to connect stakeholders)

Have we missed any barriers to collaborations between regions? Barriers to benefiting from synergies that are possible?	(If relevant) STARTING TRL: END TRL:

Are there any other interventions you can think of to enable collaboration between regions? Which interventions are most appropriately implemented at regional, national or European level?

TABLE TOPIC: Smart Packaging - 1

Please list the people at your table here: Names and Organisations	
Nillo Halonen - Tampere Technical University Johanna Lahti - Tampere Technical University Emre Yontem – Raul Salanueva – Gobierno de Navarra	Sarah Kelly
What are the opportunities for cross-regional collaborations in the same value chain?	
Opportunities could be evaluated through three aspects: • Problems / hotspots • Emerging ideas / areas of development • Models for synergies - Recyclability of smart packaging (especially 'smart' components) - Recycling streams => new ways to re-use, e.g. instead of energy some high value-added products - Recycling of multi-materials => how to recycle (e.g. separation technologies) - Issues on how to inform people on packaging disposal / collection => more clarity - Regulations / legislation promoting the usage of materials or to improve recyclability - Interlink better the different life-cycle phases and optimise o new set of indicators o innovative assessment o to evaluate the generated value through the waste value chain (not just for one single / specific party)	
What opportunities for cross-regional collaborations do we see across different value chains?	
Related value chains: food, cosmetics, etc.	**WHO does this require? (STAKEHOLDERS)**

Have we missed any barriers to collaborations between regions? Barriers to benefiting from synergies that are possible?	(If relevant) STARTING TRL: END TRL:
1) Financing opportunities / benefits 2) Legislation 3) Big data (availability of data) 4) Confidentiality (especially confidential company information, IP issues, development of new materials / products / processes)	

Are there any other interventions you can think of to enable collaboration between regions? Which interventions are most appropriately implemented at regional, national or European level?
1) Cellulose packaging instead of plastic 2) Multi-materials / multi-layers 3) Labelling / standardisation to help recycling 4) How to introduce plastics (recycled) as raw materials

TABLE TOPIC: Smart Packaging - 2

Please list the people at your table here: Names and Organisations Nillo Halonen - Tampere Technical University Johanna Lahti - Tampere Technical University Ana Quintais – Ana Licanin - Adriana Agatic	
What are the opportunities for cross-regional collaborations in the same value chain?	
• Logistics • Traceability of materials / products • How to integrate on a material / product • Too much plastic • Overpacking • Recycling "habits" vary between regions, some regions recycle a lot and some not so much • People are not aware of recycling	
What opportunities for cross-regional collaborations do we see across different value chains?	
- Construction - Waste water treatment (separation of cellulose) - Infrastructure of waste / recycling - Glass as an alternative	**WHO does this require? (STAKEHOLDERS)**

Have we missed any barriers to collaborations between regions? Barriers to benefiting from synergies that are possible?	(If relevant) STARTING TRL: END TRL:
- Implementation of new things is different, cultural differences - Normative / legal differences	

Are there any other interventions you can think of to enable collaboration between regions? Which interventions are most appropriately implemented at regional, national or European level?
- To increase the consciousness / awareness of people about recycling - Need for successful pilots

TABLE TOPIC: Water - 2

Please list the people at your table here: Names and Organisations

Bart Volkers, Wateralliance Frysland
Muhammad Javed, Biotech Consultants
Sagar A Sumaria, Sow, grow and reap
Stefano Bonfa, Oxford Sustainable Development
Peter van der Maas, VHL University Leeuwarden
Valentina Caimi, Regione Lombardia
Maria-Grazia PEdrana, Regione Lombardia
Jonathan Abra, KTN
Martijn Bijmans, Centre of Expertise Water Technology
Eric Vos, Province Fryslan

What are the opportunities for cross-regional collaborations in the same value chain?

- Sludge issue in common for all regions – see the common practices -> **sector analysis** based on existing knowledge / **Working Group**
  - Reduce production; improve the quality for re-use; recover resources
- Water re-use
- Energy: Thermal, Chem, Kinetic
- Bulk commodities
- Struvite => **Business Model** for Economic Sustainability
- Recovery of metals => economic scale, business cases => Value of the recovered materials for other process
- Recovery of salt
- Recovery of humic acid – **Knowledge Transfer**
- Fat oils + grease recovery / processing **Research Consortium**

Protein production, cellulose, polymer precursors (What are the conditions that make this worthwhile?)

What opportunities for cross-regional collaborations do we see across different value chains?

- Agriculture – blending agri-waste with sewage sludge to optimise cellulose recovery model
- Energy
- Food Industry – Industrial Symbiosis
- Smart Packaging (Cellulose from wastewater) – OTHER END-USE MODELS FOR CELLULOSE?
- Business Models based around urban farming and closing nutrient loops – removing the barriers due to distance (disconnect between where food is grown and consumed)

(Any sector that uses water)

WHO does this require? (STAKEHOLDERS)

Safe space for demonstration at scale to overcome reticence / demonstrate risk mitigation (WETSUS?)

Have we missed any barriers to collaborations between regions? Barriers to benefiting from synergies that are possible?	(If relevant) STARTING TRL: END TRL:
• Regulation • Acceptance by end-users • Different regions have different constraints – water isn't the same everywhere o This does offer opportunities to learn through examining the differences • How are EU / National regulations being applied in Lombardy vs. Frysland vs. Scotland (for instance)	

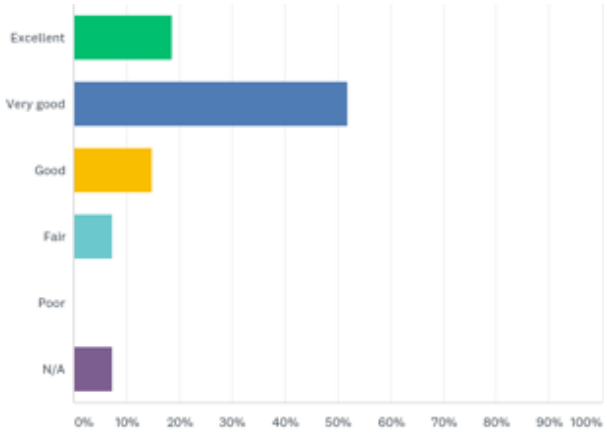
Are there any other interventions you can think of to enable collaboration between regions? Which interventions are most appropriately implemented at regional, national or European level?
Stop BREXIT Drive on the right in the UK! But seriously … • Change the investment case to permit longer RoI periods; • Demonstration at scale with showcase events to engender trust across EU; • Badge / certification of products (c.f. ETV)

6. Feedback

We had 27 respondents to our event's feedback survey. Below a summary of the key findings. Please note: The survey link was sent to all registrants, two of which have not attended the event, but still completed the survey. This explains the non-applicable responses and the two people who didn't make any new connections.

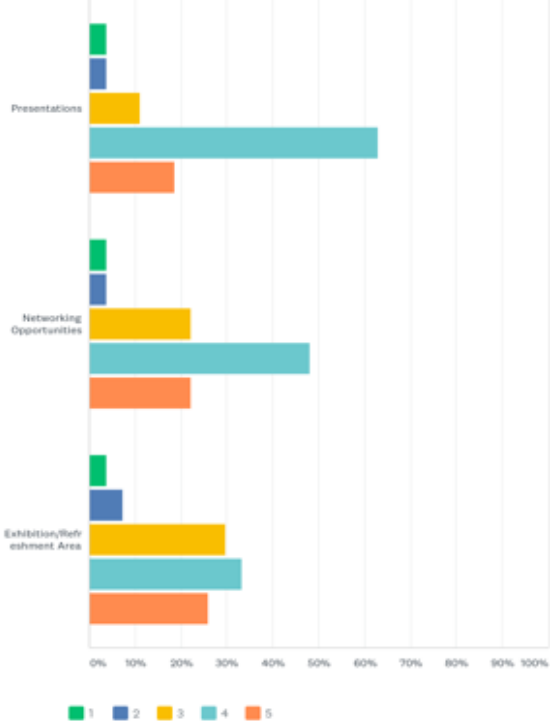
Over 70% of the respondents rated the event very good or excellent.

Figure 1: How would you rate the event overall?



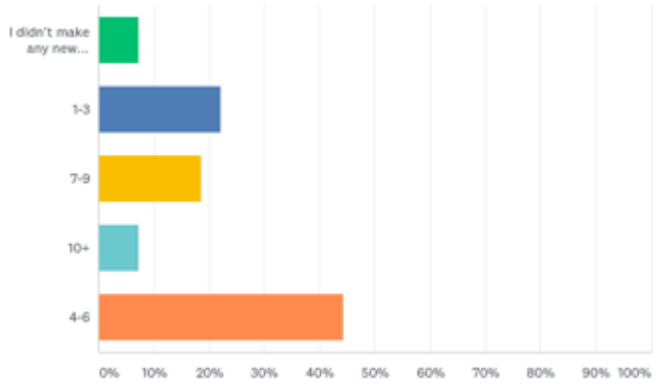
81% of the respondents gave a score 4 or 5 out of 5 for the presentation of the day. Around 70% of the respondents rated the networking opportunities 4 or 5 out of 5.

Figure 2: How would you rate the following aspects of the programme (1 = poor, 5 = excellent):



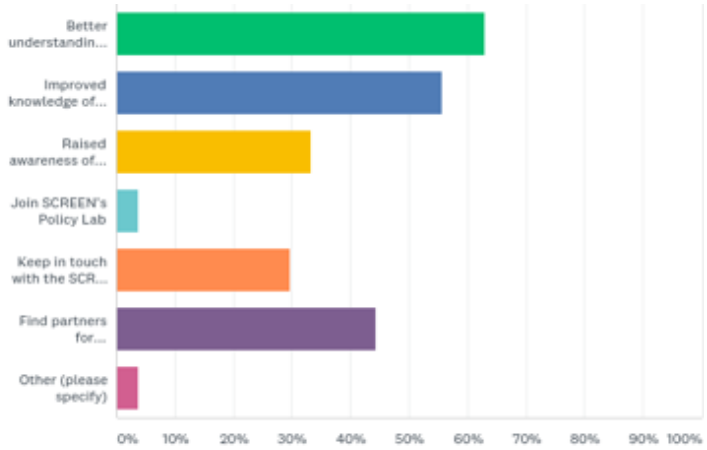
The majority of respondents made between 4 and 6 new connections. Taken out the two respondents, who didn't attend the event and therefore didn't make any new connections, a good third of respondents made over 7 new connections.

Figure 3: How many new connections did you make?



In terms of outcomes people are expecting to get from the event, over 40% of respondents said that they anticipate finding partners for collaborations / proposals. Over 60% said that they have a better understanding of Circular Economy Initiatives in other European countries. 55% indicated that they have improved knowledge of opportunities for cross-regional collaborations.

Figure 4: From these connections and the information you received, which of the following outcomes do you anticipate?



7. Social Media

8. Photos

Welcome

Claire Claessen, KTN

Keynote Speaker

Keti Medarova-Bergstrom, EASME

Regional Speakers

Carlo Polidori, SCREEN Project Coordinator

Arnoud Passenier, Dutch Ministry of Infrastructure and the Environment

Cheryl Robb, Zero Waste Scotland

Regional Speakers

Maria-Grazia Pedrana, Lombardy Region

Marko Seppanen, Tampere University of Technology

Tjeerd Hazenberg, Province of Frysland

Round Table Discussions