Resource recovery

Resource recovery

Break out session

Inge Keymeulen – Joint Secretariat, Project Officer

Nicole Skirde-Vural – Contact Point, Luxembourg

Matthew Thompson – Joint Secretariat, Project Officer

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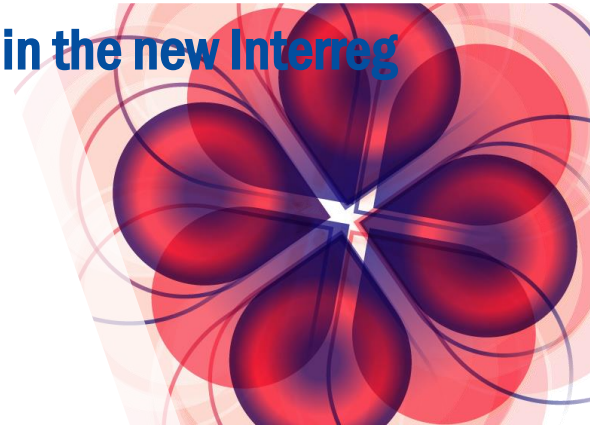
Session agenda

- How resource recovery is addressed in the current programme
- Presentation of two Interreg NWE projects
  - **CEDaCI** - A Circular Economy for the Data Centre Industry, *Dr Deborah Andrews*
  - **RE-DIRECT** - REgional Development and Integration of unused biomass wastes as REsources for Circular products and economic Transformation, *Dr Tim Scholze*
- How resource recovery will be addressed in the new Interreg programme 2021-2027
- Round table sessions of 2 x 20 minutes



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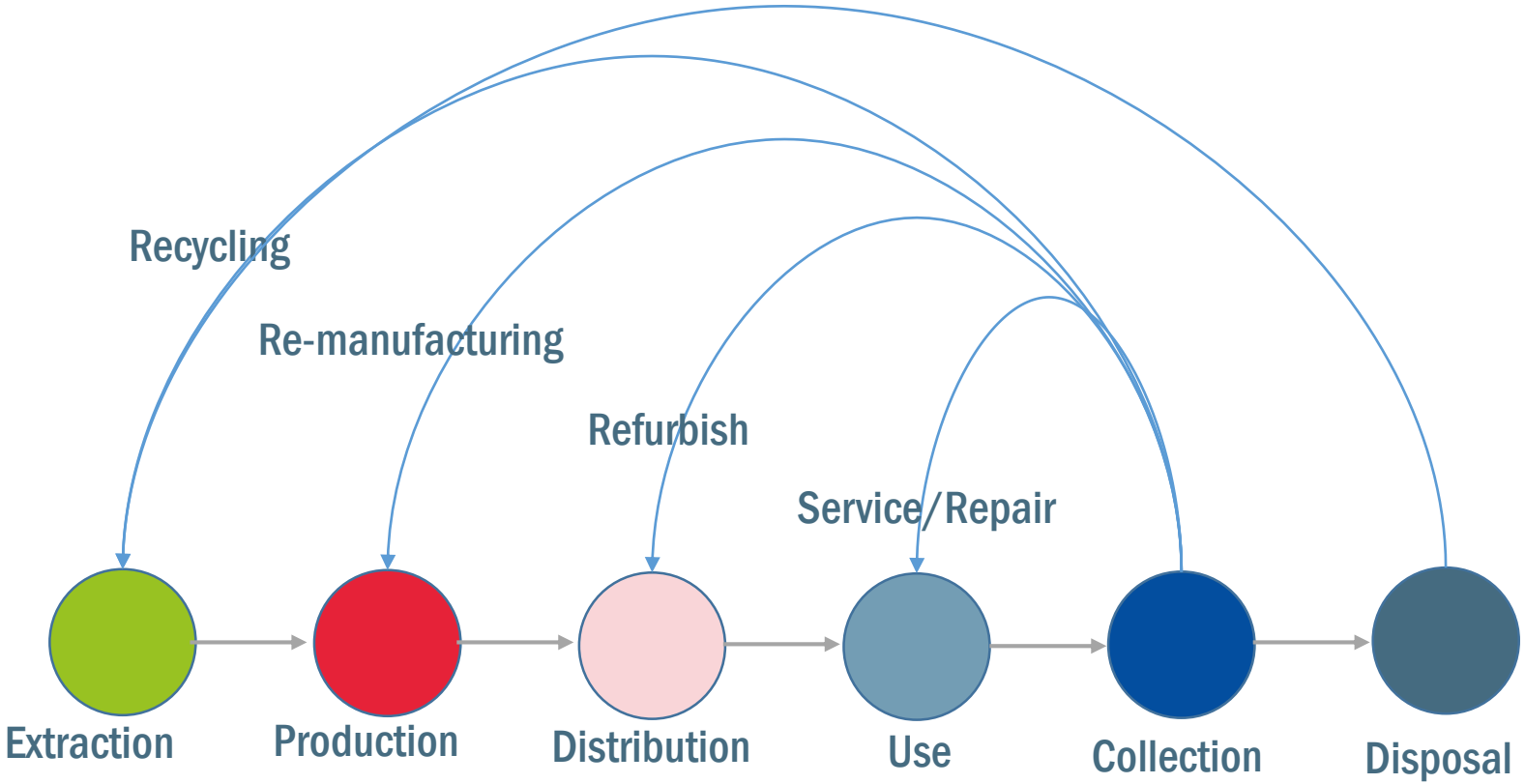
Linear vs circular production



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Frameworks for action

Contributions to other Frameworks	Priority 3: Resource Efficiency
•EU 2020 Strategy for Sustainable Growth •EU Action Plan for a Circular Economy •SDG 12: Responsible consumption and production patterns	• Specific Objective 5: Optimise (re)use of material and natural resources in Northwest Europe

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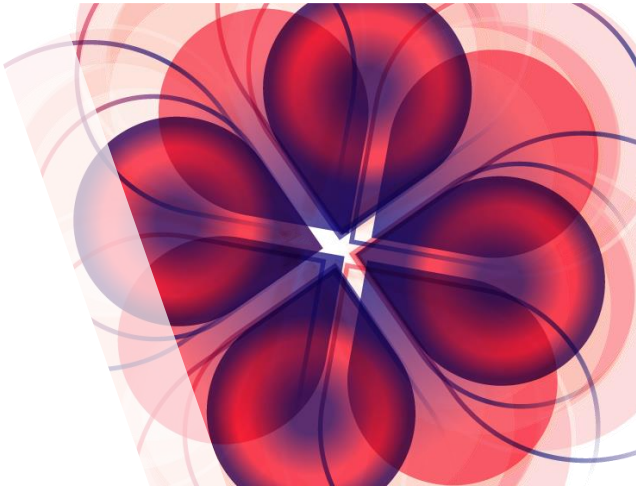
Overview of NWE projects in the field

- **14 projects**
  Recovery of resources from waste, resource extraction from biomass, landfill mining, recycling & repair of digital infrastructure

- Around **160** partner organisations participating

- Overall **€47M** ERDF budget dedicated to topic



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ALG-AD - Creating value from waste nutrients by integrating algal and anaerobic digestion technology

CEDaCI - Circular Economy for the Data Centre Industry

Di-Plast - Digital Circular Economy for the Plastics Industry

WOW! - Wider business Opportunities for raw materials from Wastewater

TRANSFORM-CE - TRANSFORMing single use plastic waste into additive manufacturing and intrusion-extrusion moulding feedstocks and creating a new Circular Economy model for NWE

Re-Direct - REgional Developm and Integration of unused biomass wastes as REsources Circular products and econom Transformation

ReNu2Farm - Nutrient Recycling – from pilot production to farms and fields

Rawfill - Supporting a new circular economy for RAW materials recovered from landFILLs

Agriwaste Value- Implemented zero-waste cascading valorisation chain for the recovery of valuable natural products from agricultural residues.

THREE C - Creating and sustaining Charcoal value chains to promote a Circular Carbon economy in NWE Europe

Sharepair - Digital Support Infrastructure for Citizens in the Repair Economy

NWE - REGENERATIS- REGENERATIon of Past Metallurgical Sites and Deposits through innovative circularity for raw materials

Biowill - Integrated "Zero Waste" Biorefinery utilising all fractions of Willow feedstock for the production of high to medium based Bio-Chemicals/Materials, Renewable Energy in the form of Bio Methane production and Natural Fertilisers.

Phos4You - PHOSphorus Recovery from wastewater FOR YOUr Life

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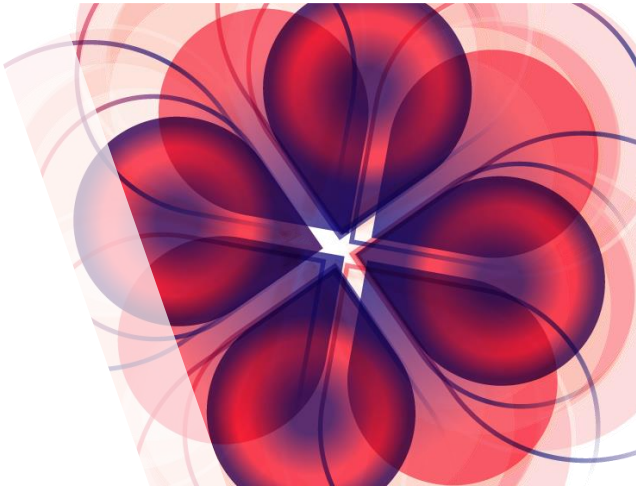
2 examples of Resource recovery projects

- **CEDaCI** - A Circular Economy for the Data Centre Industry, *Dr Deborah Andrews*

- **RE-DIRECT** - REgional Development and Integration of unused biomass wastes as REsources for Circular products and economic Transformation, *Dr Tim Scholze*



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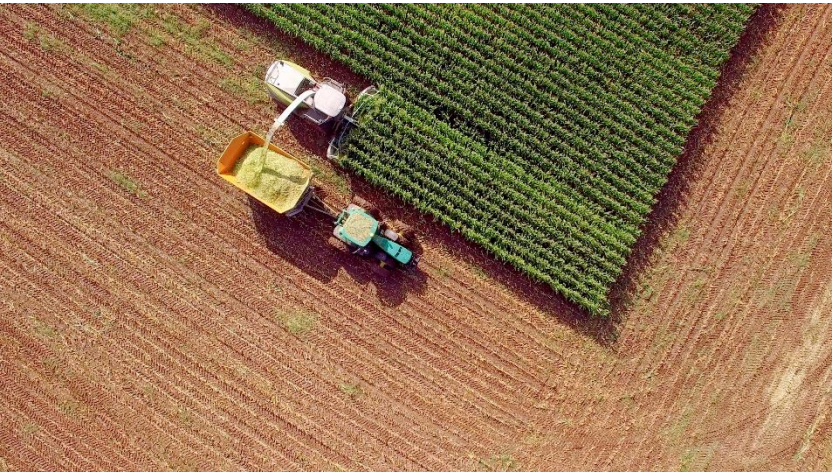
Priority 3

Transition towards a place-based circular economy



SO 2.6: Promoting the transition to a circular and resource efficient economy

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Priority 3: Transition towards a place-based circular economy

3 categories of project activities:

a) **Elaboration and implementation of joint strategies or action plans**

e.g. Place-based strategies for eco-design, waste prevention, circular and reverse logistics, waste-as-a-resource approaches

b) **Pilot actions for testing tools and/or solutions taken up or up-scaled**

e.g. Circularity concepts (including business models, public strategies and financing schemes and incentives)

Demonstration and testing of solutions, services and technologies in a real environment

Definition or upgrading of integrated (data-driven) monitoring systems and observatories to facilitate evidence-based decisions.

c) **Capacity building and awareness raising activities in the field of circular economy**

e.g. Training schemes, public awareness and acceptance campaigns

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Breakout sessions

CEDaCI –

A Circular Economy for the Data Centre Industry

Dr Deborah Andrews

www.cedaci.org/

www.nweurope.eu/cedaci

Circular Economy for the Data Centre Industry

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Challenge: Data Centres

7.7m globally / concentration in EU - UK, Germany, France & Netherlands

2010-2020 – $100bn investment in sector

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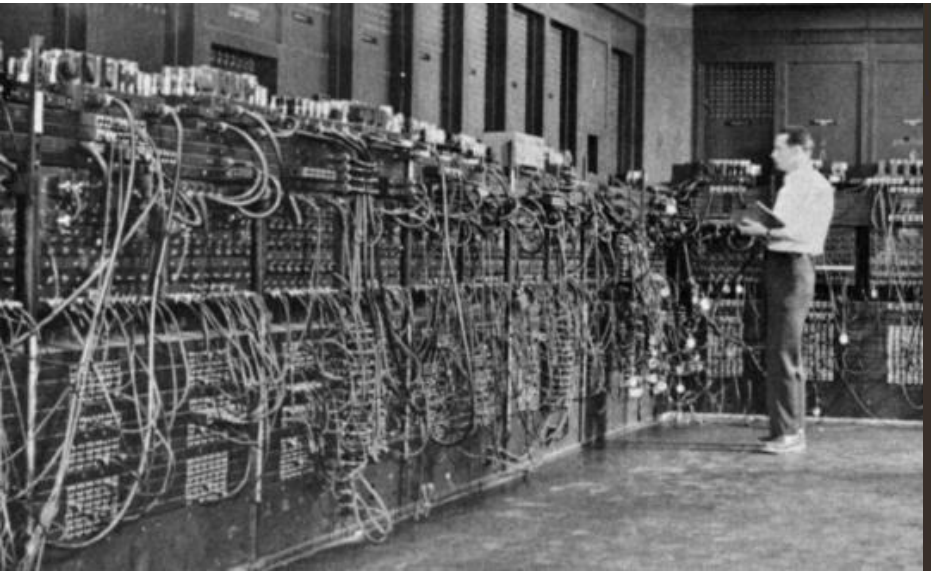
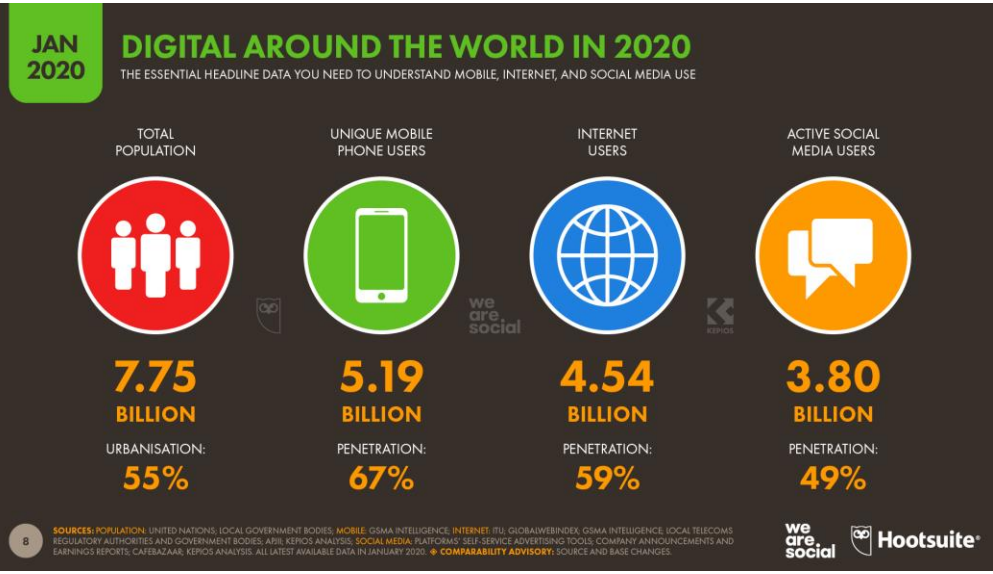
Connectivity – data traffic = 4.2 trillion gigabytes / yr by 2022





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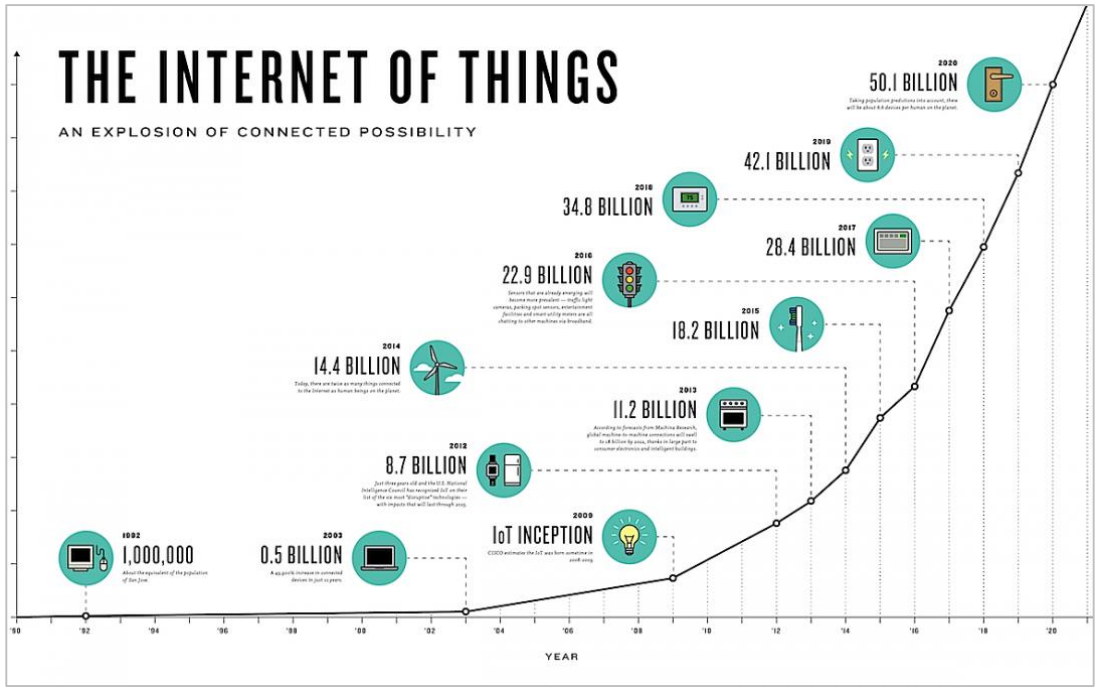
DC growth – 300% in EU by 2025 / 500% global 2030



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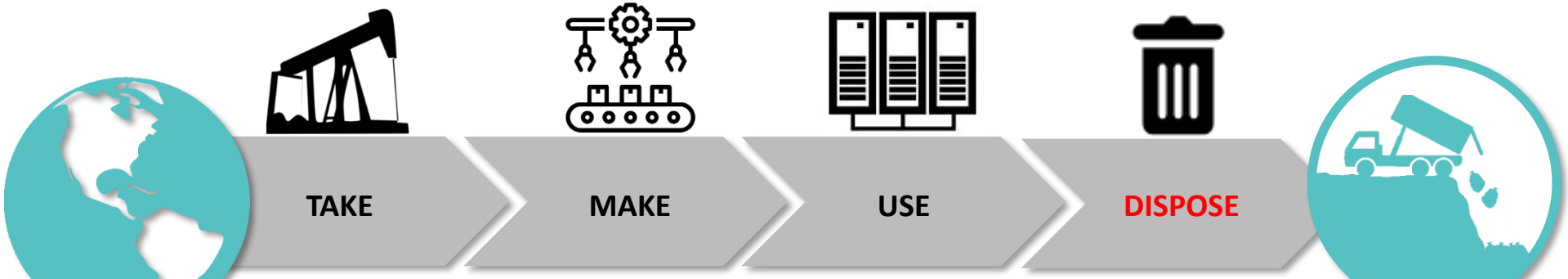
Linear Economy - model of consumption



TAKE	MAKE	USE	DISPOSE
Finite resources Critical	Planned obsolescence Reuse/refurbishment - difficult by design	Short lifetimes Stockpiling Procurement barriers	Growing e-waste Low recycling rates Underdeveloped infrastructure

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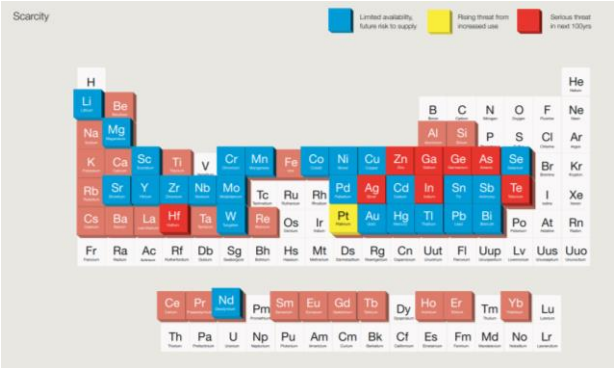
e-waste

Annual – 2020 ~50 million tonnes – 6kg per person
Business as usual - 2050 – 120 million tonnes

Current value - >$62.5 billion
100 x more Au in e-waste than ore

69 elements in EEE
7-10 Critical Raw Materials

Export of e-waste



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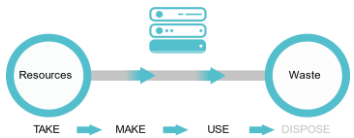
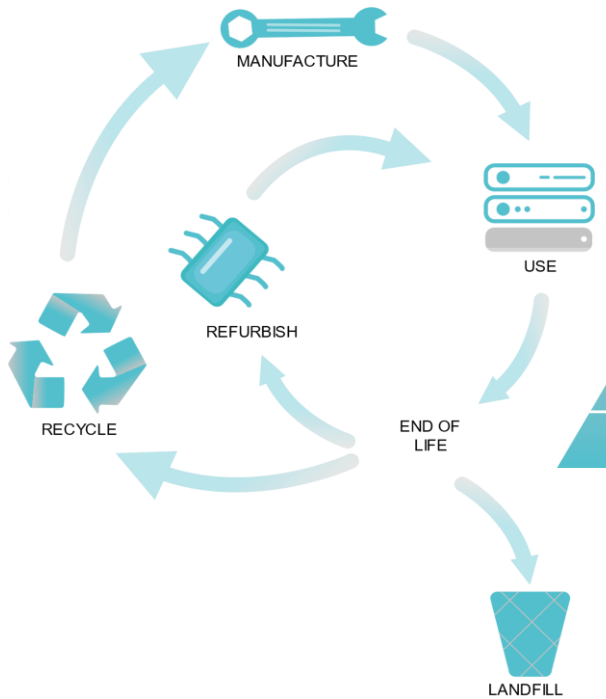
Objective

Linear Economy



Circular Economy



Waste Management Hierarchy

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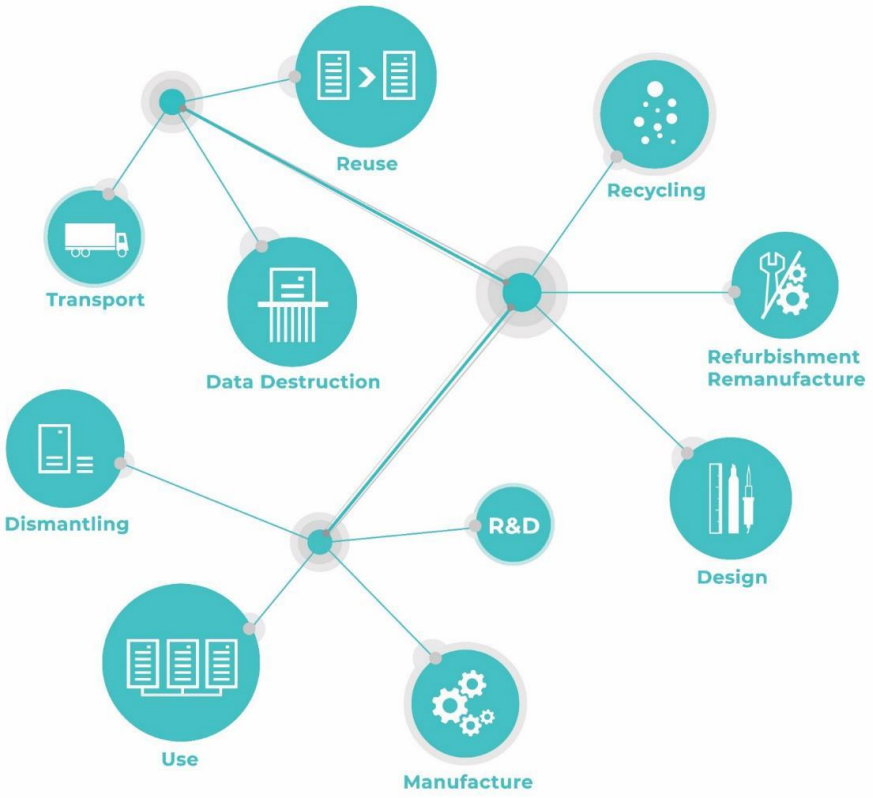
Resource recovery

Objective

To create a unique, interdisciplinary, multi-output initiative that uses **whole-life thinking** and **brings together representatives from all DCI sub-sectors** to share knowledge and **accelerate development of a sectoral Circular Economy.**

It will reduce waste and prevent supply chain problems to secure uninterrupted DC operation and service in the future.



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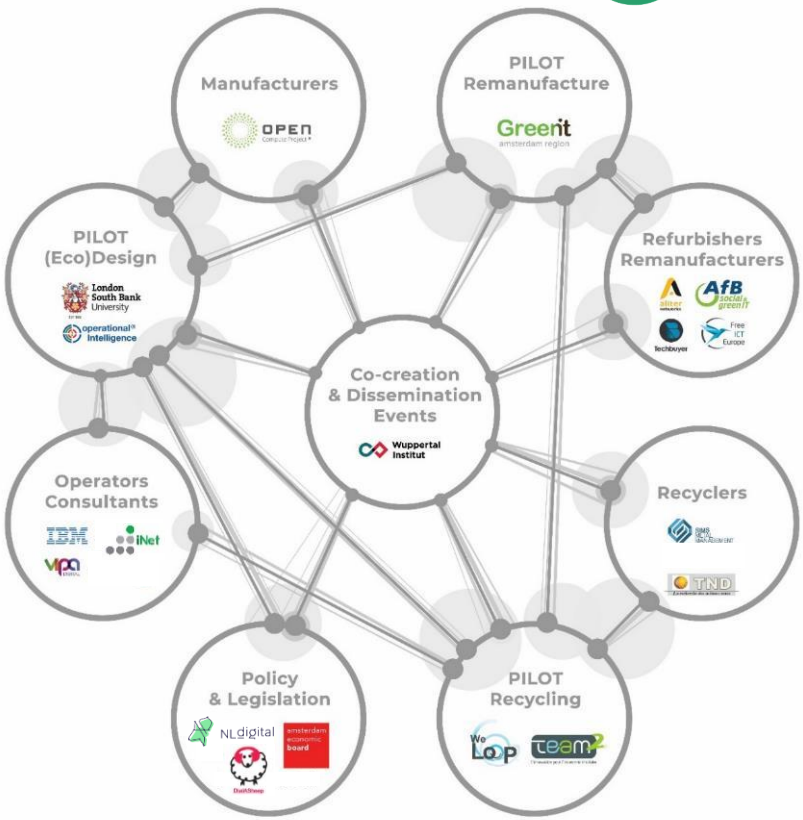
Transnational cross-sectoral collaboration

Engagement – CCWs, WG, Network 100+ members

Runner up DCD Global Awards – non profit initiative 2019



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Achievements and Outputs

3 integrated pilots that focus on

1. Design and manufacture
2. Life extension – second use & refurbishment
3. End-of-life – recycling and CRM reclamation

OUTPUTS

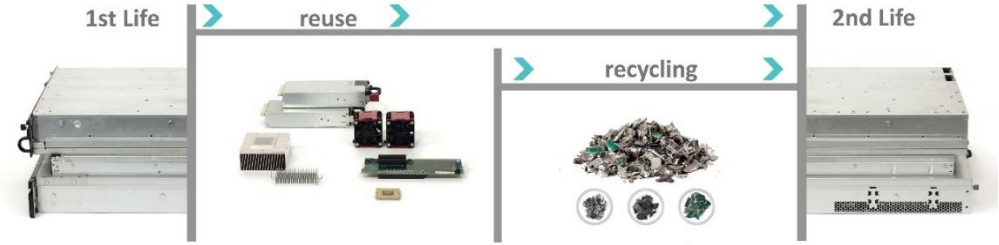
- LCA methods and database
- CDCC – the Circular Data Centre Compass
- improved refurbishment, recycling and reclamation strategies and business models
- EcoDesign/Design Guidelines for Circular Economy

FEED INTO

- bespoke 1-2-1 technical assistance for 50 SMEs
- advice and guidance for policy-influencers and makers
- a physical and virtual demonstrator
- development of a Circular Economy for the DCI

CDCC

Circular Data Centre Compass



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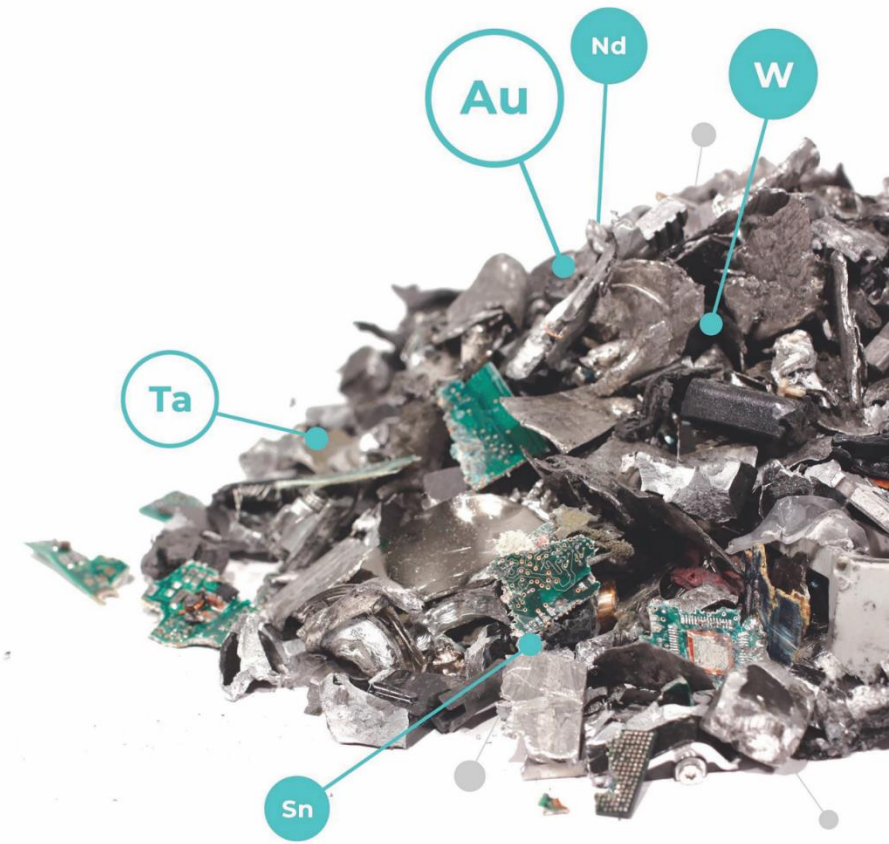
Results – capitalisation initiative

At end of project (April 2022)
CEDaCI: 80 pieces equipment/3.8 kg CRM recycled
After 10 years - 309 t/y CRM recycled
CE / CDCC training – 50 SMEs

At end of Capitalisation Initiative (Sept 2023)
20+ units/1kg CRM recycled = 25% increase
After 10 years: 340 t/y = 10% increase
CE / CDCC training – 50 SMEs



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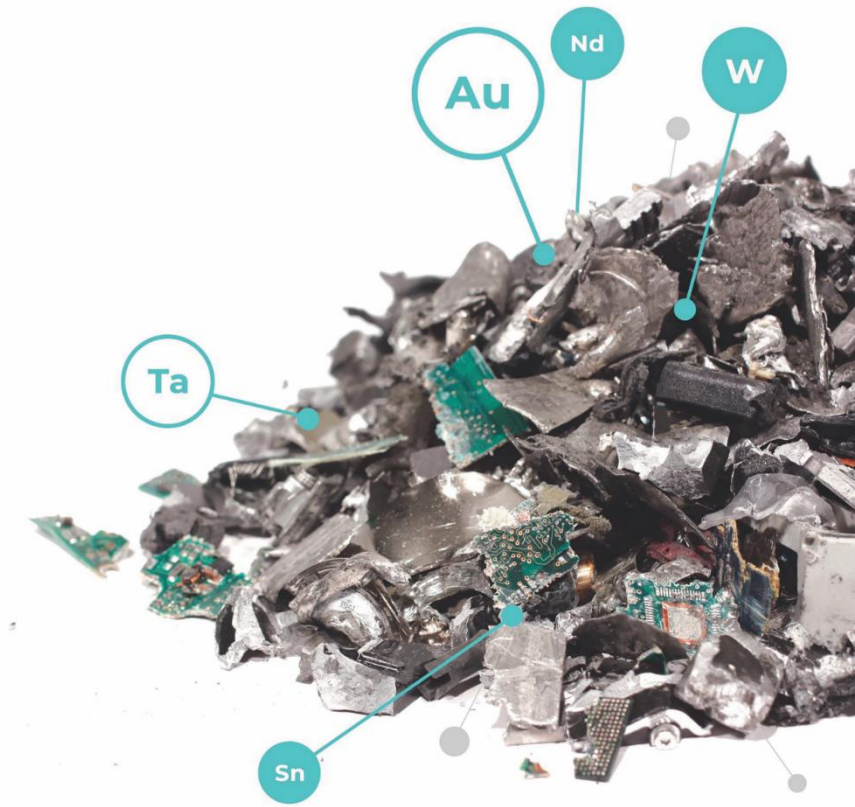
Breakout sessions

CEDaCI – A Circular Economy for the Data Centre Industry

Dr Deborah Andrews

www.cedaci.org/



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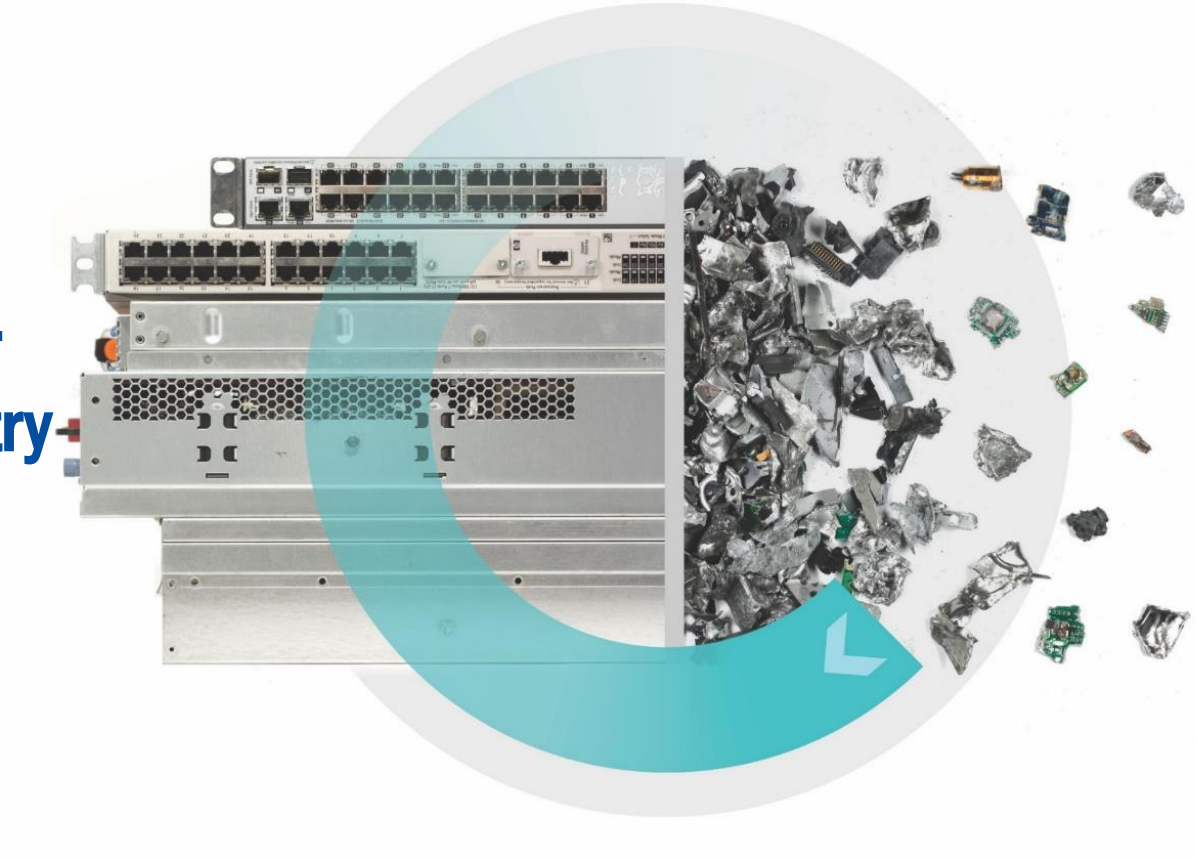

Circular Economy for the Data Centre Industry

Breakout sessions

REgional Development and Integration of unused biomass wastes as REsources for Circular products and economic Transformation

Tim Scholze

RE-DIRECT & THREE C

Videos (~2:50):

https://www.youtube.com/watch?v=irxpA7hXtC0

www.nweurope.eu/threec

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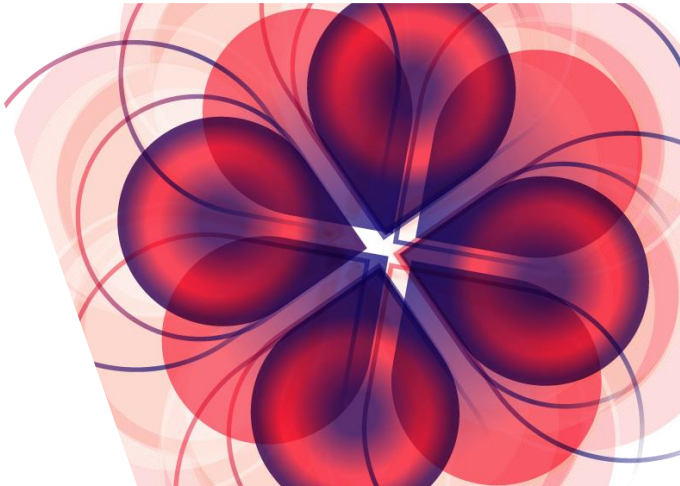
Challenge

- How to turn unused biomass into energy and biochar?
  - 34 Mio t of biomass are wasted per year in NEW
  - 70.000 t Activated Coal is imported



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Project PROGRASS aiming at

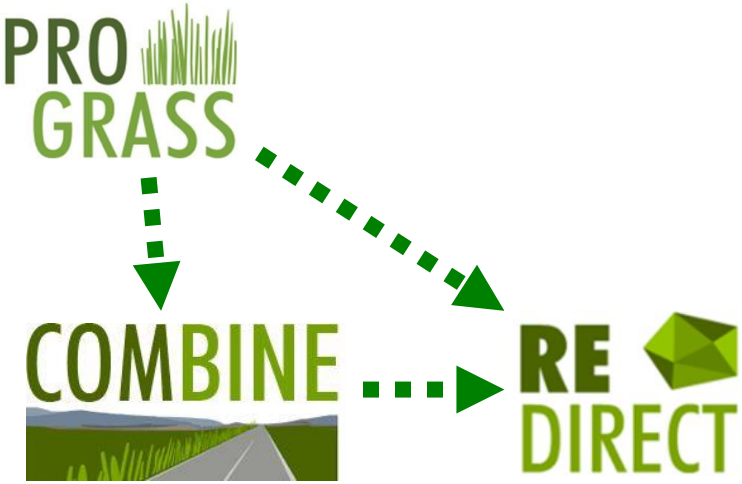
- *upscaling a laboratory method to use grass waste as a fuel for combustion and for biogas*
  - *(IFBB producing press-fluid and press-cake*
  - *demonstrating the feasibility in a mobile demo unit*

Project COMBINE

- *Developing a large scale plant for experimenting the IFBB*
- *Using roadside material to convert it into (storable) thermal energy*
- *To explore the feasibility of biomasses and the recovery in these urban environment*

In RE-DIRECT a next process step was introduced

- *To add pyrolysis units to convert the presscake into biochar*
- *on both large-scale urban and small-scale farm level*
- *to explore the regional potentials in 5 scenarios in DE, BE, UK, IR and FR*



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Processing Modes and Plants

- Large Scale, small scale, mobile
- IFBB / non IFBB
- Charcoal /Activated Charcoal

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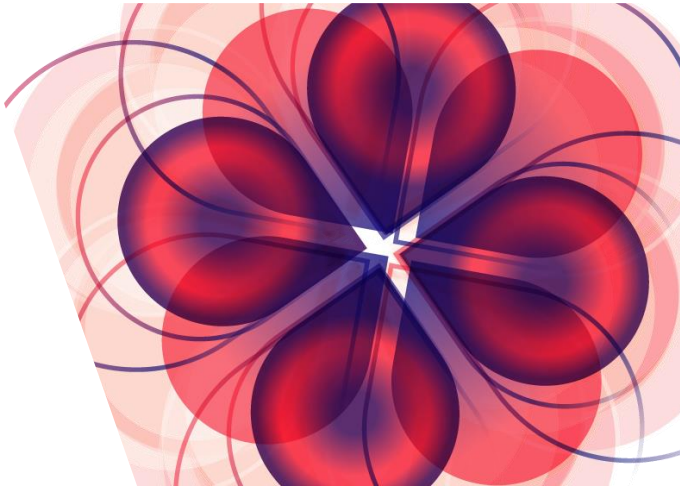
Objective

“RE-DIRECT aims to increase the use of residual low value and waste biomasses and their conversion into carbon products for use in filtration treatment and environmental management. In a highly transferrable approach 5 NWE partner regions will establish new biomass-to-product value chains and regional integrated biomass concepts; creating employability in and around conversion plants of different sizes for waste/waste water treatment and with it new income generating opportunities for local SMEs.“

- 2 conversion plants of different scales
- Different Feasibility and Sustainabilty studies
- > 20.000t of waste biomass recovered



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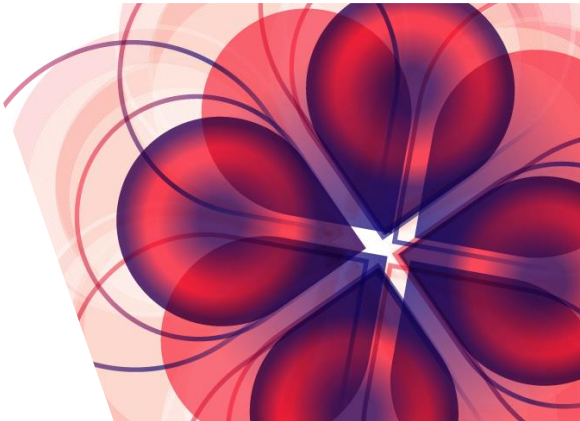
Results

- 2 investments (large scale / farm scale pyrolysis plants)
- Proven Feasibility (in the plants and at lab scale)
- Proven sustainability (LCAs, economic simulations)
- Regional Development plans
- Decreased raw material use: 24.000t (biowaste, green-cut, nature conservation materials)
- Outputs: 1.500 t press cake, 50 t activated charcoal
- 25 Jobs
- Green economy approaches (social circular economy)
- Regional Capacity Building Programme



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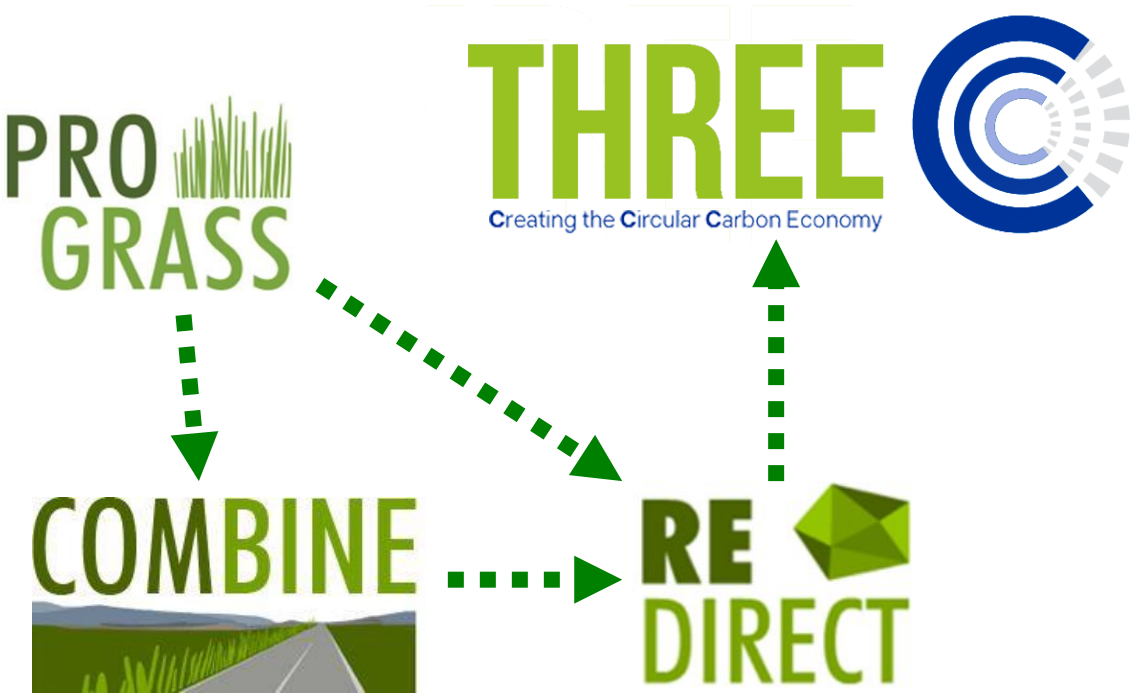

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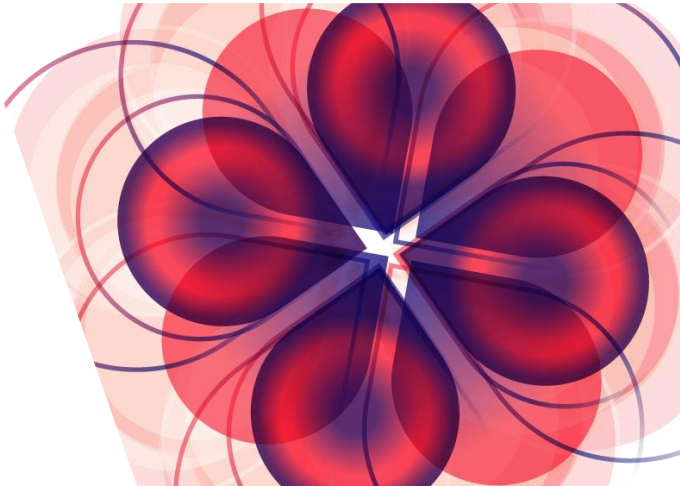
Pushing results one step further to…

THREE C - Creating and sustaining Charcoal value chains to promote a Circular Carbon economy in NWE Europe

- *Not just processing materials*

- *Combination of:*
  - *Product development*
  - *Service development*
  - *Regional Development*



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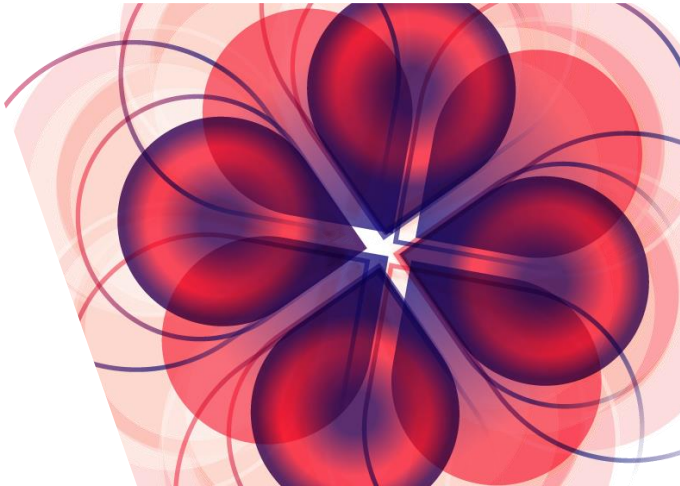
Pushing results one step further to…

THREE C - Creating and sustaining Charcoal value chains to promote a Circular Carbon economy in NWE Europe

- *CC Hubs*
- *CC Labs*
- *CC Net*
- *Start into a Circular Carbon Economy*



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How the topic will be covered in 2021-2027

Target audience:

- Individuals as well as organisations that will be involved or positively affected by the introduction of more circular loops and a more resource efficient economy.

Beneficiaries / project partners:

- Local/regional/national authorities, EGTCs
- Governmental agencies, public equivalent organisations with responsibilities relating to rivers, environment, natural protection, public green, waste management / resource efficiency etc.
- Universities, public research centres, private research units, schools and higher education
- SMEs, businesses and business support organisations

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How the topic will be covered in 2021-2027

Added value of cooperation

Input from the stakeholder analysis:

- Mutual exchange / learning / new skills /complementary collaboration networks
- More opportunities for value chain creation and local replication / roll-out (if possible)
- Tackling regulatory discrepancies between countries
- Testbeds and demonstrators based on cross-sectoral and society-wide approaches
- Critical mass to justify new business models

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How the topic will be covered in 2021-2027

Expected results

- ***key principles*** *of circular economy (CE)* ***better embedded*** *into territorial strategies, community-led initiatives, manufacturing processes or business models;*
- ***citizens*** *are* ***more engaged*** *in supporting the transition to a CE;*
- ***stakeholders*** *are more capable to* ***adopt innovative solutions*** *for supporting the transition to a CE*
- *innovative* ***solutions*** *for supporting the transition to a CE* ***tailored to local or regional needs;***
- *innovative technologies, solutions, products and services that enable a more CE are* ***taken up by different sectors****;*
- ***eco-design approaches*** *are better* ***supported and promoted*** *in different economic sectors or across sectors.*