LLM4CVC – Large Language Models for Circular Value Creation

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Eureka Call for Circular Value Creation

Call for circular value creation R&D projects

International R&D&I projects enabling circular value creating systems with implemented ecologically meaningful, value-retaining methods

Deadline: 30.09.2025

Funding Period: 3 years

Innovative products, services and processes enabling circular value creation

Involvement of people as critical success factor in transformation processes, systemic consideration of value creation systems, development of new viable, feasible and desirable business models, enabling data technologies, data ecosystems and cross linking

Stage 1 of 2: Project Outline

Submission

- Electronic submission by **30.09.2025** via Eureka-Portal
- one application form per consortium, additionally one partner form per partner
- **Summary:** Impact (business case), excellence (innovation and R&D), quality and efficiency

Evaluation

- Relevance for industry and plans for commercialisation
- Degree of innovation
- Impact on value creation
- Benefits from technological cooperation between partners from different countries

Contents

- application-orientated, pre-competitive R&D on products, services or processes enabling circular value creation
  - Development of business models
  - Technological cooperation
  - Incorporation and consideration of human perspectives
  - Systemic perspective

Project Organisers

- Eureka
- Depending on country different national or regional ministry or funding agencies

Funding Overview

Country	Max. Contribution per Project	Funding Rate	Funding for Research Institutions	Funding for Large Companies
Austria	€400,000	55–85%	Yes	Yes
Canada	CAD$ 500,000	50% for SMEs	Only subcontracted	No
Chile	$CLP 220,000 / €205,000	40–80% (plus 10% for female-led)	Only as collaborators	Yes
Denmark	€500,000	25–90%	Yes	Yes
France	€50,000 – €3M	up to 80% SMEs, 40% large	No	No
Germany	€25M	up to 100% research, 60% SMEs	Yes	Yes
Lithuania	€300,000	up to 100% research	Yes	No
Luxembourg	-	<80%	No	Yes
Portugal	-	40–80%	Yes	No
Slovakia	€150,000	65–100%	Yes	Yes
South Korea	€1M	33–100%	Yes	Yes
Spain	€50M	Up to 85% / grant of 22.5% (18.75% for large)	Only subcontracted	Yes
Sweden	€300,000	Up to 100% universities	Yes	Up to 30% of eligible project costs
Switzerland	€2M	Up to 100% research	Yes	Yes
Ukraine	UAH 199,000	-	Yes	Yes
Türkiye	€500,000	75–100%	Yes	Yes

Source: https://tubitak.gov.tr/sites/default/files/2025-06/Eureka_Network_Dongusel_Deger_Zinciri_Uluslararasi_Cagri_Metni.pdf

Motivation

Need for automated processes in disassembly

- Reduction of safety-critical manual operations
- Improvement in resource conservation through separation by type
- Scalability through technical replication
- Increased throughput with growing return volumes

Challenges in the automation of disassembly processes

- Lack of or unclear product information
- High product diversity and varying states of returns
- High investment costs for automation technologies
- Product design not suitable for disassembly

Enabler

- Automated Disassembly Planning
- Cognitive Instruction
- Skill-Based Robotic System

Project Vision - LLM4CVC

Input

… and more

Business Case & CVC Assessment

- Recover valuable Parts / Materials
- Optimize Process time
- CO_2 Assessment

Condition Assessment

Condition-based Feasibility Assessment

- Cognitive description
- Vision-based evaluation
- Sensor-based evaluation

Simulation

Information

- Digital Product Passport (DPP)
- Digital Twin
- Dis- /Assembly Instructions
- Engineering Documentation (CAD)

Unstructured Information

Information Processing

Multimodal Input

LLM

GNN

Graph Input

Automatability analysis

Scheduler

Structured Task- List

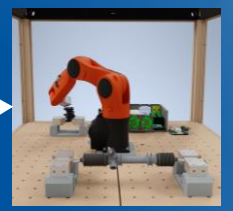
Selective / Full Disassembly-plan

Real World Validation

Output

1. Inspection
2. Unscrew plate
3. Handling
4. Remove cable

…



Data Acquisition

- Product Classification (AI)
- Web Crawler

Expert Input + Knowledge

- Disassembly Stage Selection
- Part Selection
- Recource Selection

Capabilities

…

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Your Role

Idea

This project facilitates the practical implementation and development of battery disassembly at your location. It supports the creation of a modular, scalable disassembly system that can easily adapt to future battery generations and variants. This system contributes to a higher degree of automation in end-of-life processes.

Achieving Impact Together – Your Input

- Use Case - *Provide transparency regarding your batteries, existing disassembly processes, and manual handling challenges*
- Access to key contacts - *Relevant stakeholders across departments*
- (Non-confidential) data or representative examples - *CAD models, Disassembly steps, work instructions*
- On-Site Integration - *Willingness to host and test robot-assisted disassembly modules on-site*

Your Benefits

- Real-world piloting of automated battery disassembly at your location
- Develop a scalable system architecture - enables simple onboarding of new battery generations and variants
- Increase your degree of automation - step-by-step reduction of manual effort and rework
- Promotion of cooperation with your partners along the value chain
- Expansion of your network through (international) cooperation with excellent partners from research and development
- Proportional financing of your project-related expenses (funding rate depends on the country)

  e.g., for Sweden:
  SMEs can apply for up to 50%, large companies 30% of the eligible costs. The maximum funding per project is SEK 3,300,000.

Your contact at the WZL of RWTH Aachen University

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