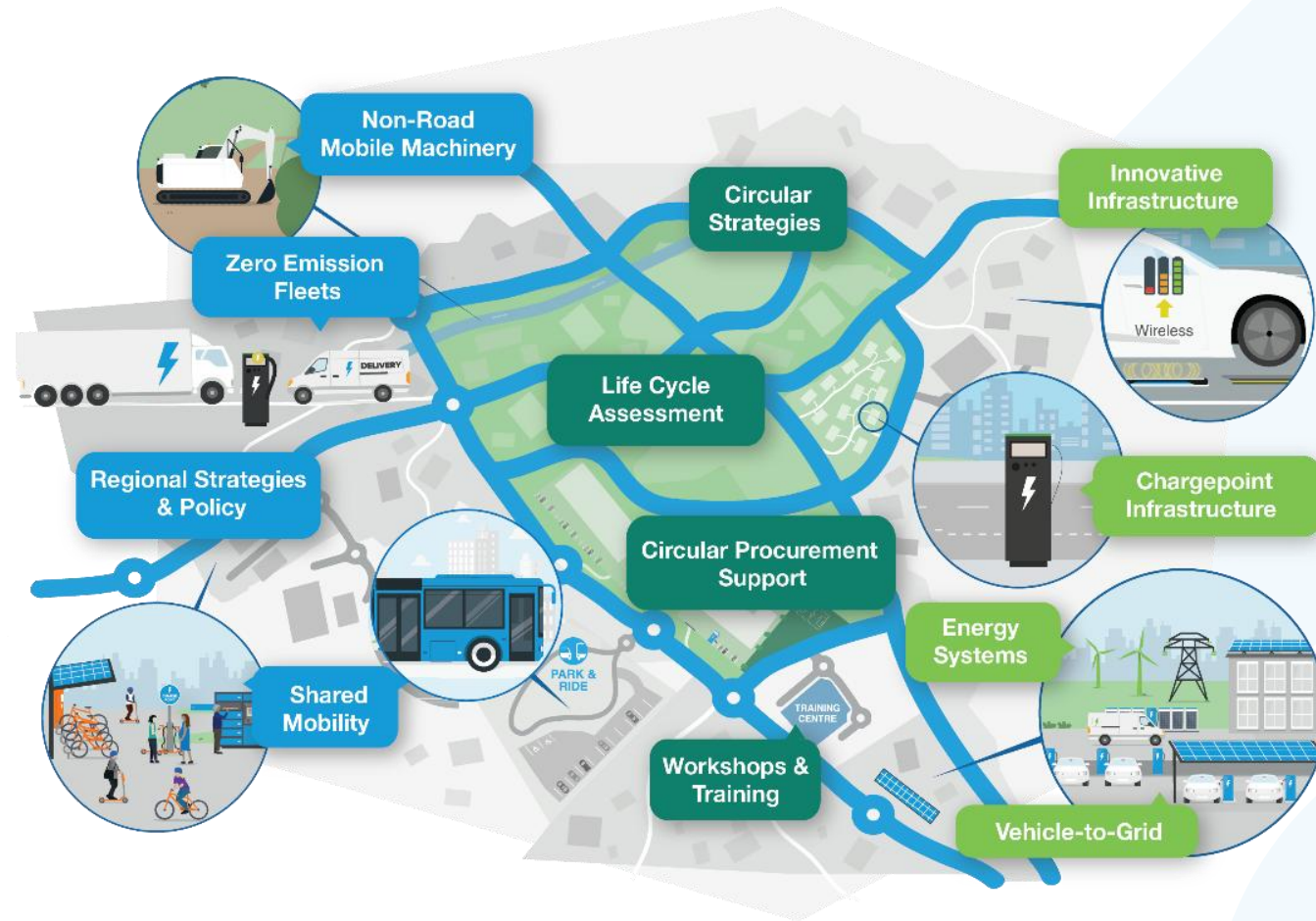


# Circularity and Eco- design in EV Charging Infrastructure

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# Knowledge landscape at Cenex NL



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# Why Circular EVSE matters now?

## Linear transition

### Increases (critical) materials demand

Zero emission transition → BEV growth  
→ EVSE growth → CRM need

### Environmental & waste impacts

High impacts during manufacturing +  
growing waste streams

### Supply chain risks

Dependencies on specific countries and  
regions, vulnerabilities to supply chain  
interruptions and disruptions

## Circular transition

### Value and cost

E.g.: New business models, job creation,  
value retention, TCO reduction,  
Compliance-ready

### Addresses entire lifecycle

E.g.: Reduction GHG impact and other  
emissions and pollution beyond use phase

### Supply resilience

E.g.: Reduces vulnerabilities and creates  
more local availability

# Our work in Dutch Circular EVSE ecosystem

## Policymakers and national agencies

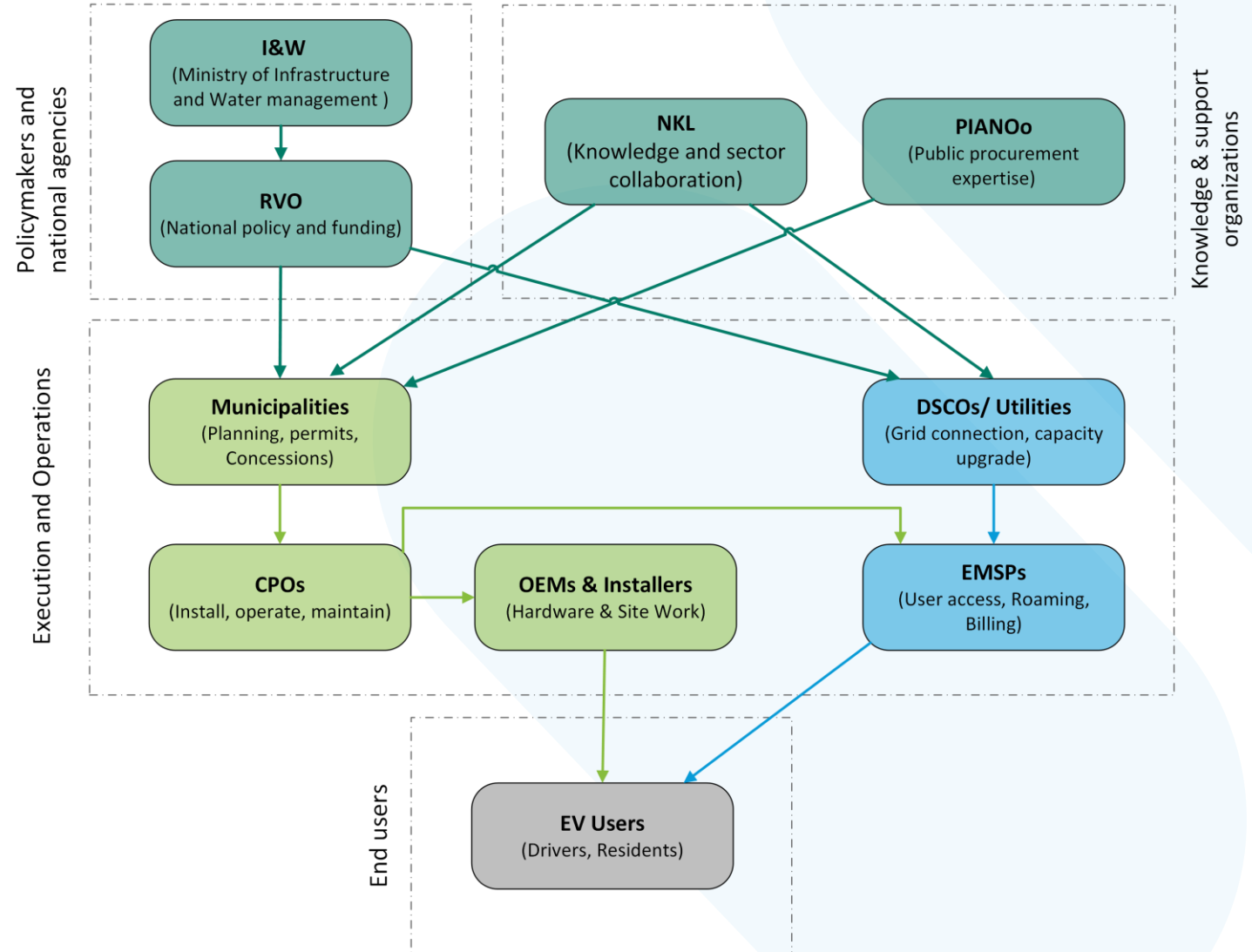
- Roundtables with stakeholder groups
- Roadmap requirements inventory
- Roadmap development core team

## Local & Regional governments

- Circular procurement support
- Awareness Workshops

## CPOs/ OEMs

- LCA & Eco-design
- Circular expert support for bids
- Expert lead within Dutch Branche organisation (DOET)





# National Roadmap for Circular EVSE

## Requirements inventory

Stakeholder mapping, Drafting R-ladder strategies

## Stakeholder Engagement & Buy-in

Consultations, workshops, interviews to gather input and build consensus and commitment among actors

## Steer & Coordination Mechanism

Defining governance and coordination roles, aligning stakeholders' priorities, ensuring clarity of responsibilities

## Implementation Planning

Translating roadmap ambitions into actionable steps, ensuring follow-up mechanisms so that the roadmap does not disappear into a drawer



# Procurement as Change leverage



- Procurement as a lever: balancing cost, circularity, and innovation in local tenders.
- Mindset shift from Recycling only to R-ladder
- Replicability in other sectors and systemic transition

# Design & manufacturing insights from LCA



Material choices and modularity directly shape lifetime impacts



Eco-design: Integrate life-cycle and circular thinking in early stages of design



Utilization, grid electricity mix and charger efficiency

	Climate change, default, excl biogenic carbon [kg CO2 eq.]	Fine Particulate Matter Formation [kg PM2.5 eq.]	Fossil depletion [kg oil eq.]	Metal depletion [kg Cu eq.]
Silicone-resin plaster (A1-A3)	0.68257	0.00043	0.28426	0.06624
Polyethylene terephthalate fibres (PET)	2.91601	0.00085	1.76209	0.00305
Styrene-butadiene rubber (S-SBR)	3.49924	0.00092	2.11031	0.00262
Polycarbonate granulate (PC)	4.33911	0.00111	2.16308	0.00627
Polypropylene fibres (PP)	2.63330	0.00116	1.84002	0.00176
Thermoplastic polyurethane (TPU, TPE-U)	4.70007	0.00116	2.38101	0.01466
Acrylonitrile-butadiene-styrene granulate (ABS)	3.65572	0.00130	2.09685	0.00263
Polyamide 6.6 granulate (PA 6.6)	8.30146	0.00192	3.47360	0.00492
Polyamide 6 fibres (PA 6)	7.09974	0.00221	3.16815	0.00517
Polyvinylchloride pipe (PVC)	3.55161	0.00348	1.43806	0.00075

# Technology Shifts, Environmental Implications

- The shift towards faster and smarter charging solutions increases dependency on critical and strategic materials, particularly silicon carbide (SiC), gallium (Ga), and rare earth elements (Nd, Dy).
- Strategies for recycling and material substitution will be crucial to ensuring the sustainability of charging infrastructure





# Implications for UK Context



## Regulatory compliance

- Eco-design and ESPR
- Environmental impact and LCA
- Material selection criteria



## Circularity roadmap

- Stakeholder mapping
- R-ladder strategies
- Buyer group workshops



## Circular procurement

- Circular procurement criteria in EVSE and beyond
- Circular KPIs
- Bid evaluation

Thank you  
for your  
time



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