SHAPE

Shaping the Green Transition – with net carbon negative surfaces

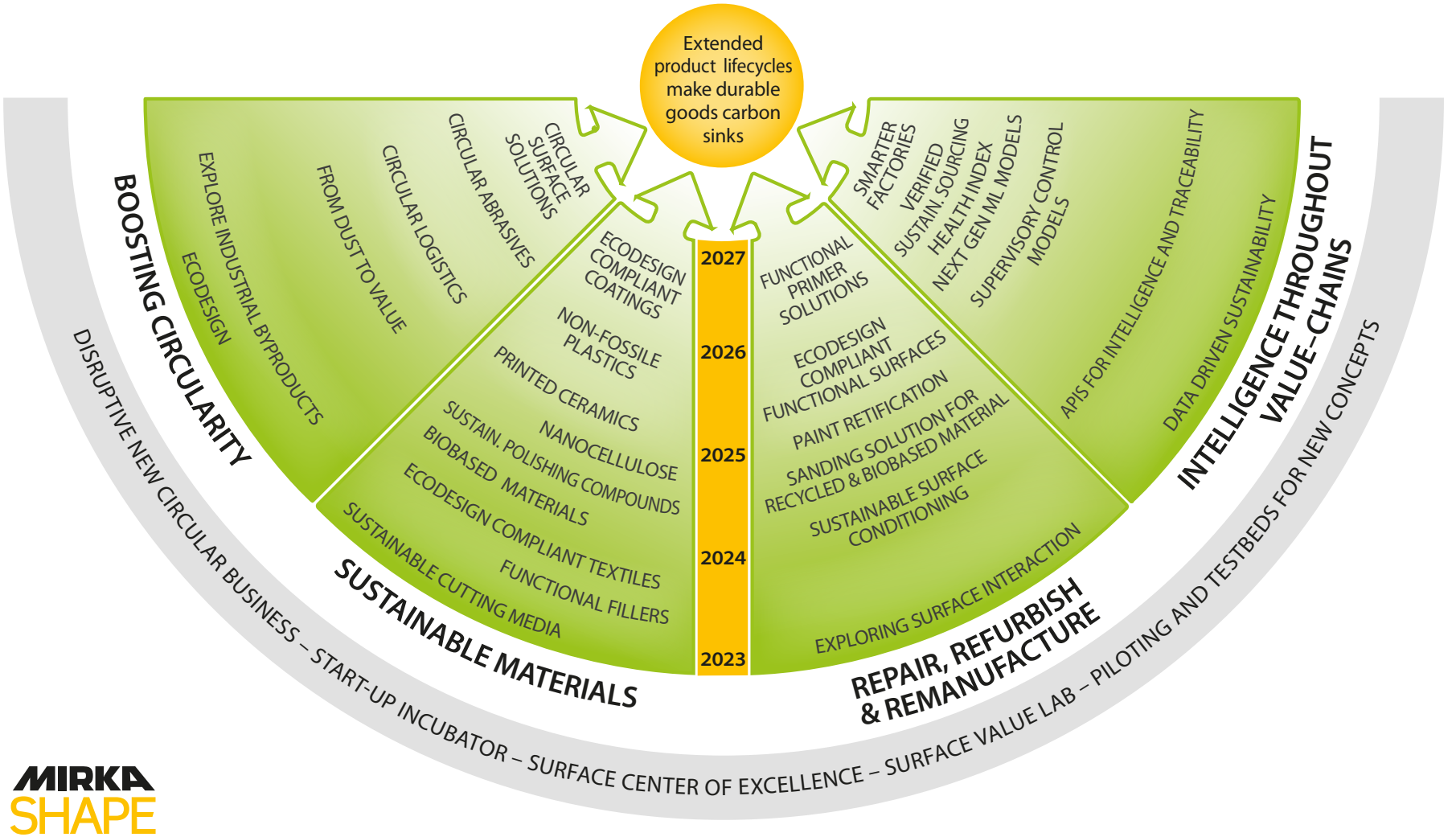
Roadmap

December 2022

SHAPE ECOSYSTEM

MIRKA

Shaping the Green Transition (SHAPE) – with net carbon negative surfaces



MIRKA SHAPE ECOSYSTEM

The Veturi SHAPE ecosystem **aims to take a share** of the remanufacturing business growth which is expected to reach **90 B€ in EU by 2030**

Driving green transition of manufacturing industry by enabling net carbon negative surfaces

Shaping the Green Transition (SHAPE) – with net carbon negative surfaces

BOOSTING CIRCULARITY

Linking value-chains to close resource cycles

From value chain to resource cycles
- Exploring functionality of industrial byproducts in surface finishing applications
- Elaborating the potential and value of different surface finishing waste especially within industries handling wood, construction, plastics and fiber reinforced
- From dust to value.

Circular logistics
- Mapping, assessing and modelling to secure sustainability of logistics solutions enabling circularity.
- Modelling abrasive waste streams.
- Dust handling.

Ecodesign compliant surface finishing
- Fully ecodesign compliant abrasives
- Circular and functional surface material solutions enabling full ecodesign compliance throughout value chain.
- Building markets and business models for circular products

SUSTAINABLE MATERIALS

Beyond ecodesign

Ecodesign compliant coatings
- Sustainable resin formulation development
- Biocomposites with unique properties
- Nano and micron sized cellulose materials
- Functional fillers
- Circular fillers for resins, e.g. carbon side streams or incineration dust

Non-fossile plastics
- Sustainable plastic like concepts

Ecodesign compliant textiles
- Develop for circularity
- Evaluate/Develop biobased fibers and yarns
- Cellulosic materials for textiles and recyclability

Sustainable cutting media technology & Printed ceramics
- Printing techniques for sustainable manufacturing
- Super hard materials
- Exploring the potential of by-product side streams
- Shaped ceramics by printing

Sustainable surface conditioning materials
- Biobased additives
- VOC free formulas for healthy work environment

REPAIR, REUSE and REMANUFACTURE

Catching carbon by prolonging product life

Life cycle
- Prolonging product life cycle through development of new refurbish and repair technologies

Surface engineering
- Deepen the understanding of surfaces and surface interaction through analysis and optimization
- Create ecodesign compliant functional surfaces for durable long-life products.

Surface finishing of sustainable materials
- Surface finishing solutions for new biobased or circular materials such as green concrete, biobased plastics, materials reinforced with natural fibers, biobased paint and coatings

Sustainable surface conditioning
- Functional primers and coatings.
- Self-destructive primers or unzip surfaces
- Paint rectification.
- Restoring wind mill component and other fiber reinforced structures.
- Polishing - Surface finishing restoring surfaces and prolonging service life of for example consumer electronics

INTELLIGENCE THROUGHOUT VALUE-CHAINS

Data driven value creation

Machine learning & Advanced analytics

Next generation machine learnings models
- Combine data-driven models with domain expert created physics centred models

Data models and APIs for intelligence and traceability
- Modular solutions of models for easy reuse and maintenance

Supervisory control models
- High level multi-input multi output controls for complex system optimization

Data driven sustainability management

Sustainability performance ratio
- Method for comparing different products based on total solution footprint

Dust measurement (Health Index)
- Index to evaluate the long-term effects of work environment

Verified sustainable sourcing
- Technologies centred around verification of sourced raw materials

Future of manufacturing
- Intelligent surface finishing
- Smarter factories through robotization, inkjet and 3D printing

Disruptive new circular business – Start-up Incubator – Surface Center of Excellence – Surface Value Lab – Piloting and testbeds for new concepts

SHAPE 2023 objectives

BOOSTING CIRCULARITY	SUSTAINABLE MATERIALS	REPAIR, REUSE and REMANUFACTURE	INTELLIGENCE THROUGHOUT VALUE-CHAINS
Linking value-chains to close resource cycles	**Beyond ecodesign**	**Catching carbon by prolonging product life**	**Data driven value creation**
• Exploring the potential of industrial byproducts as raw material in surface finishing applications • From dust to value: elaborating the potential and value of dust, focus on wood and construction • Circular logistics: Abrasive waste streams Co-innovation: • From dust to value	• Functional fillers - Evaluating existing circular materials • Circular ceramics with printing technology • VOC-free compounds • Ecodesign compliant textiles Co-innovation: • Functional fillers • Ecodesign compliant textiles	• Deepen the understanding of surfaces and surface interaction through analysis and optimization • Surface finishing solutions for new biobased or circular materials • Functional surfaces for remanufacturing Co-innovation • Functional surfaces	• Data driven sustainability management • Modelling sustainability performance ratio Co-innovation: • Data driven sustainability management

Cross cutting topics: Start-up Incubator – disruptive new circular business. Surface Center of Excellence – materials technology,. analytical solutions, ecodesign. Surface Value Lab – piloting and testbeds for new concepts.