

I&Nnovability Challenge 2020

Sustainability Toolbox

URBANIZATION



DIGITALIZATION



DSO as enabler of Energy
Global



Transition, meeting
Trends

ELECTRIFICATION



DECARBONIZATION



A sustainable business is at the cross-road of
People, Planet and Profit

enel



A Sustainable Business to create a better future



17 UN Sustainable Development Goals to converge in I&N business priorities

Compared to *business as usual*, a sustainable business solution helps....



Environmental footprint reduction

- Water consumption
- Waste production
- Emissions
- Energy consumption
- Leverage on recycled materials
- Increase life extensions or new life cycle
- *Circular by design*
- Protect biodiversity...

Risk Mitigation

- Improve Efficiency
- Improve quality of service
- Reduce safety exposure
- Drive innovation business practices
- ...

Revenue Growth / Cost Reduction

- New business model
- Increase company value by competitive advantage and investor attractiveness
- Achieve SDGs target
- Cost reduction by:
 - Improved productivity and efficiency;
 - resources conservation and recycling,
-

Stakeholder Trust and Engagement

- Increase Co-design with key stakeholders
- Tackle social problems
- Sharing economy
- New Job opportunities
- Long term value on local communities
- Quality of life
- ...

enel



Focus on Circular Economy

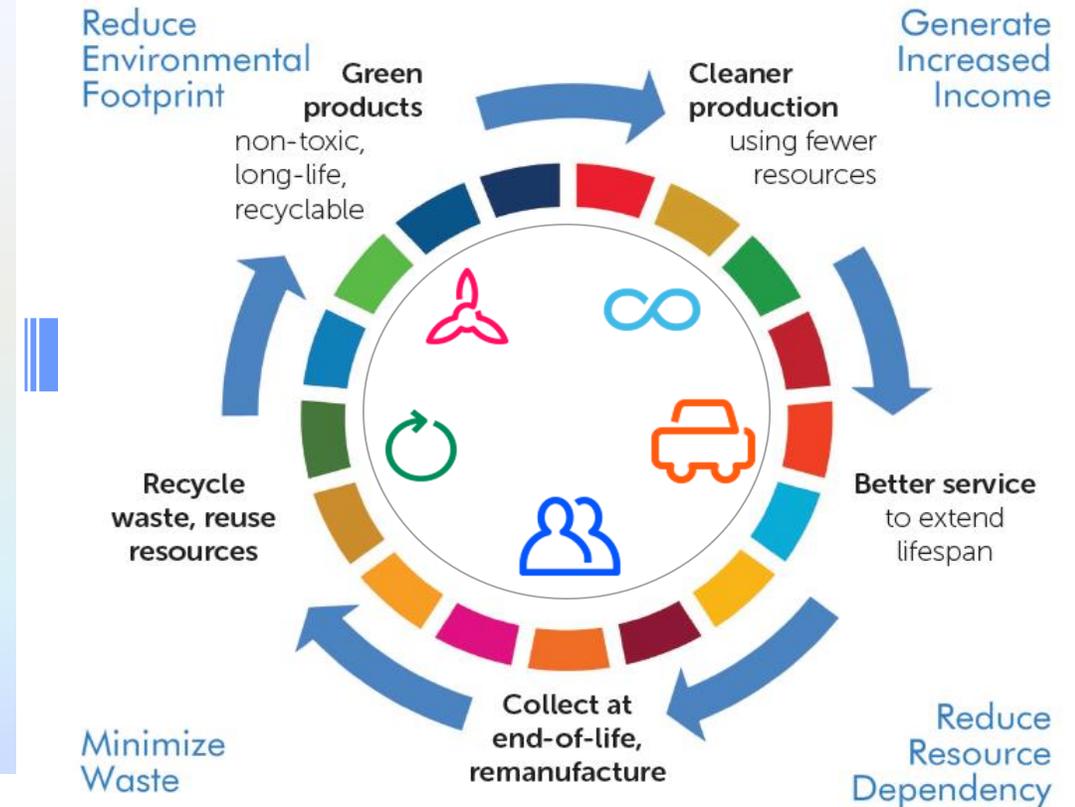
The Circular Economy

More than recycling....



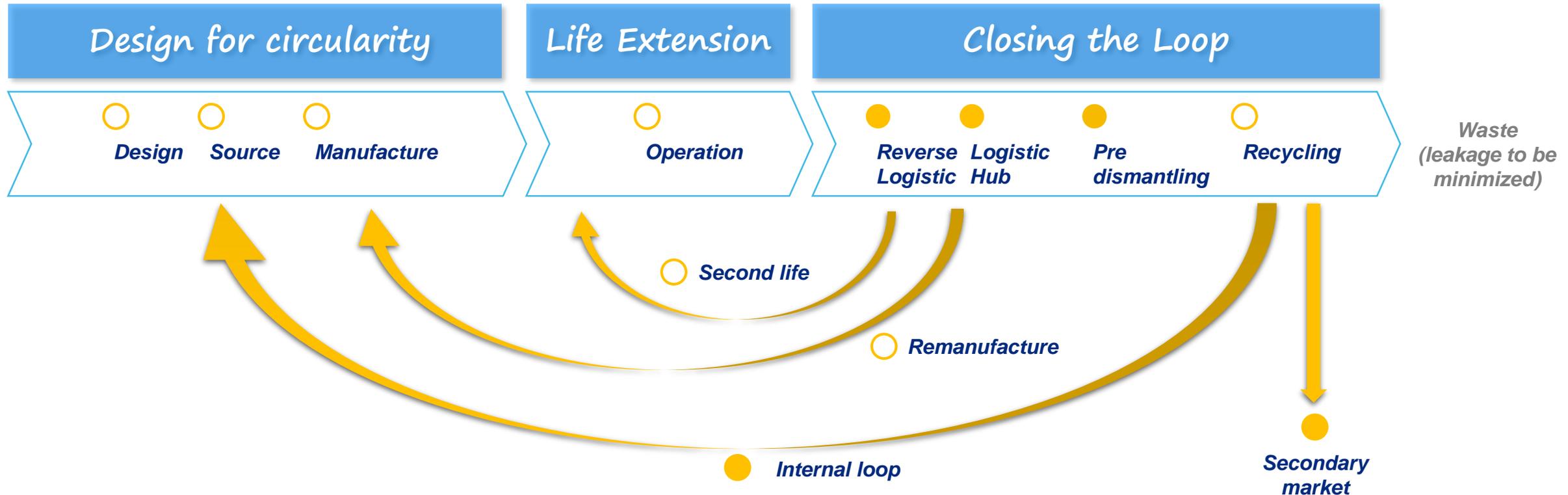
The Enel's five pillars of Circular Economy

-  **Sustainable inputs:** from renewable, reuse, recycle
-  **Increased product life:** Extending life through design, maintenance and repair
-  **Sharing:** increase utilization rate through shared use/access/ownership
-  **Product as a service:** sell to clients a service instead of a product
-  **End of life:** maintain value through upcycling, reuse and recycling



Transformative journey “from linear to circularity”

Closing the loop along the value chain



- High synergies between different technologies
- No synergies between different technologies

Sustainability and Circular supply chain



Develop new products based on circular economy concepts, means looking at their value chain on design, disposal and recycling to find out areas of improvement and opening new business models.

Existing linear process



New circular processes



Identification of materials, composition, structure and volume of waste generated by the rollout plans

Evaluate the current steps, different waste treatment alternatives

Current process of Smart meters reuse, deconstruction and recycling of materials and components

New Life Cycle



Sustainability and Circular I&N supply chain

Different streams being part of the same value chain



Stream definition & description

Stream I



Circular by design

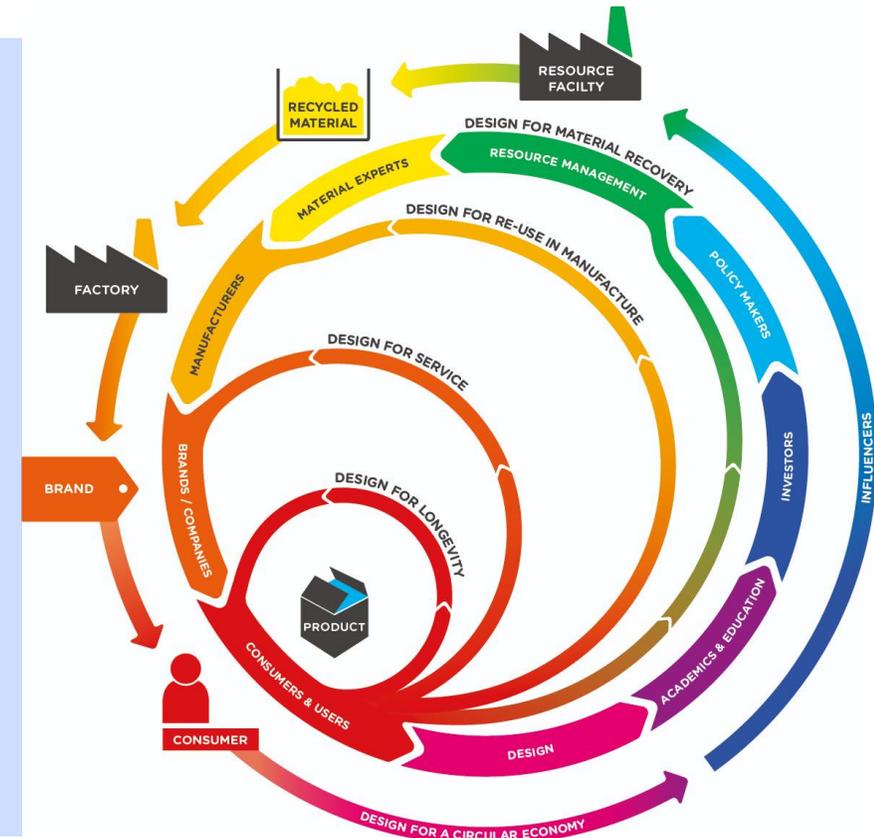
Designing products oriented to modularity and longevity, thus extending their useful life.

Main circularity aspects

- Reparability
- Durability
- Upgradability
- Re-use of product
- Re-use of components
- Recyclability of materials
- Choice of materials

Inner cycles:

- Product Life Extension
- Reliability
- Maintenance
- Re-use
- Remanufacturing
- Recycling
- Disassembly
- Risk reduction (i.e. environmental impacts)



Stream definition & description

Stream II



Packaging & logistics

How circular design principles can be applied to create “closed loop” packaging systems?

- *Re-thinking packaging design focusing on:*
 - **Conceiving** the product/packaging combination **in an eco-friendly way**
 - **Reusing** packaging
 - **Reducing** used **sources**, particularly non-renewable ones
 - **Preventing** waste by improving packaging recyclability
- *Re-thinking **logistics supply chain** from a sustainability point of view;*
- *Optimizing **Reverse Logistics** process to collect back materials/packaging*



Stream definition & description

Stream III



New Life Cycles

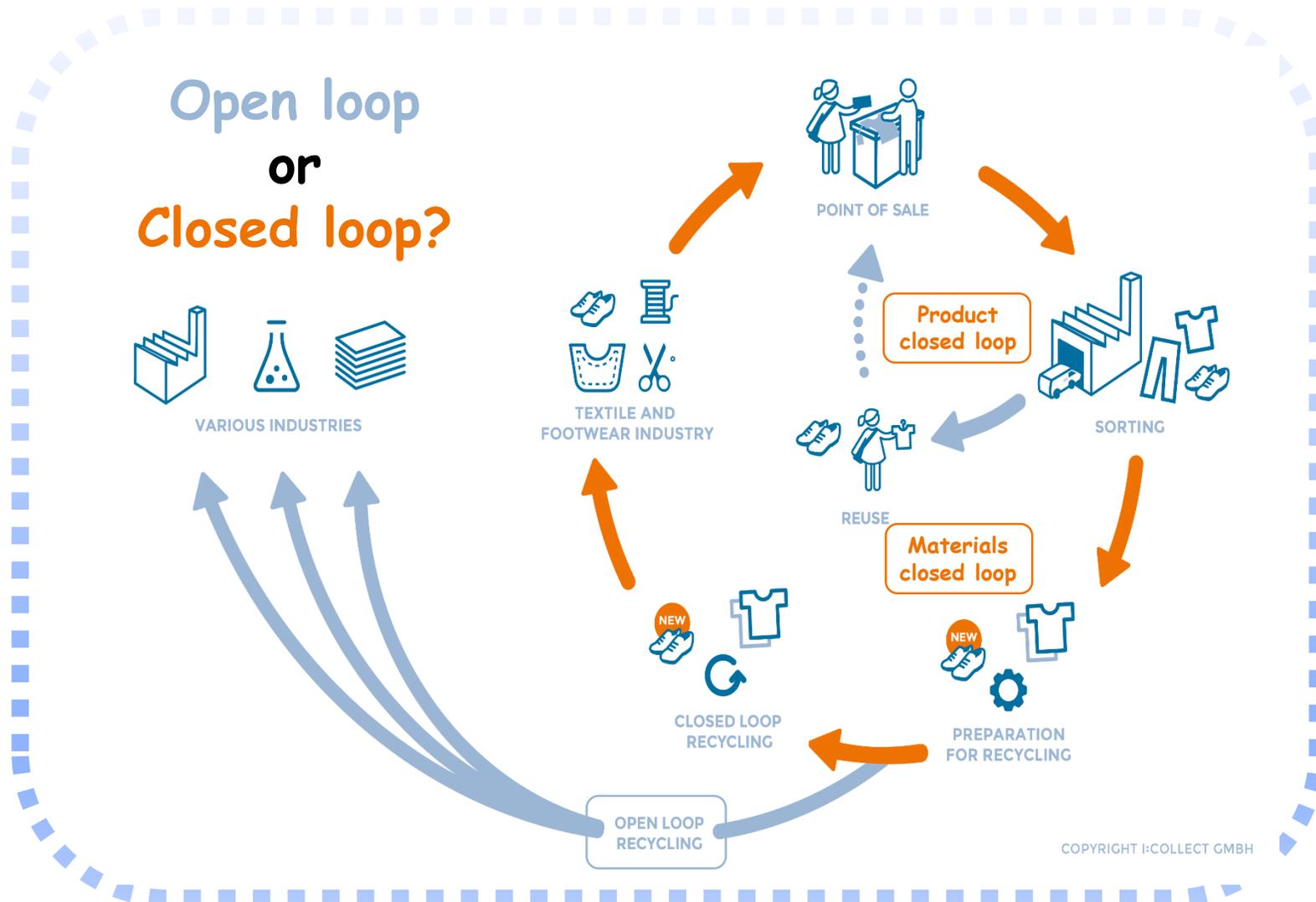
Maintain value through upcycling, reuse and recycling

- ✓ *Finding new solutions for products at the end of its life, focusing on:*
 - **Closed-loop:** *products collected, recycled and used to make new products which are the same as before, targeting **supply chain sustainability***
 - **Open-loop:** *products reused for new purposes by recycling components or raw materials.*
- ✓ *Re-thinking the **product supply chain** starting from design phase to foresee its **new second life**.*
- ✓ *Focus on product **end of life management identifying new solution to create value***



New Life Cycles approach

New solutions to create value and new business model

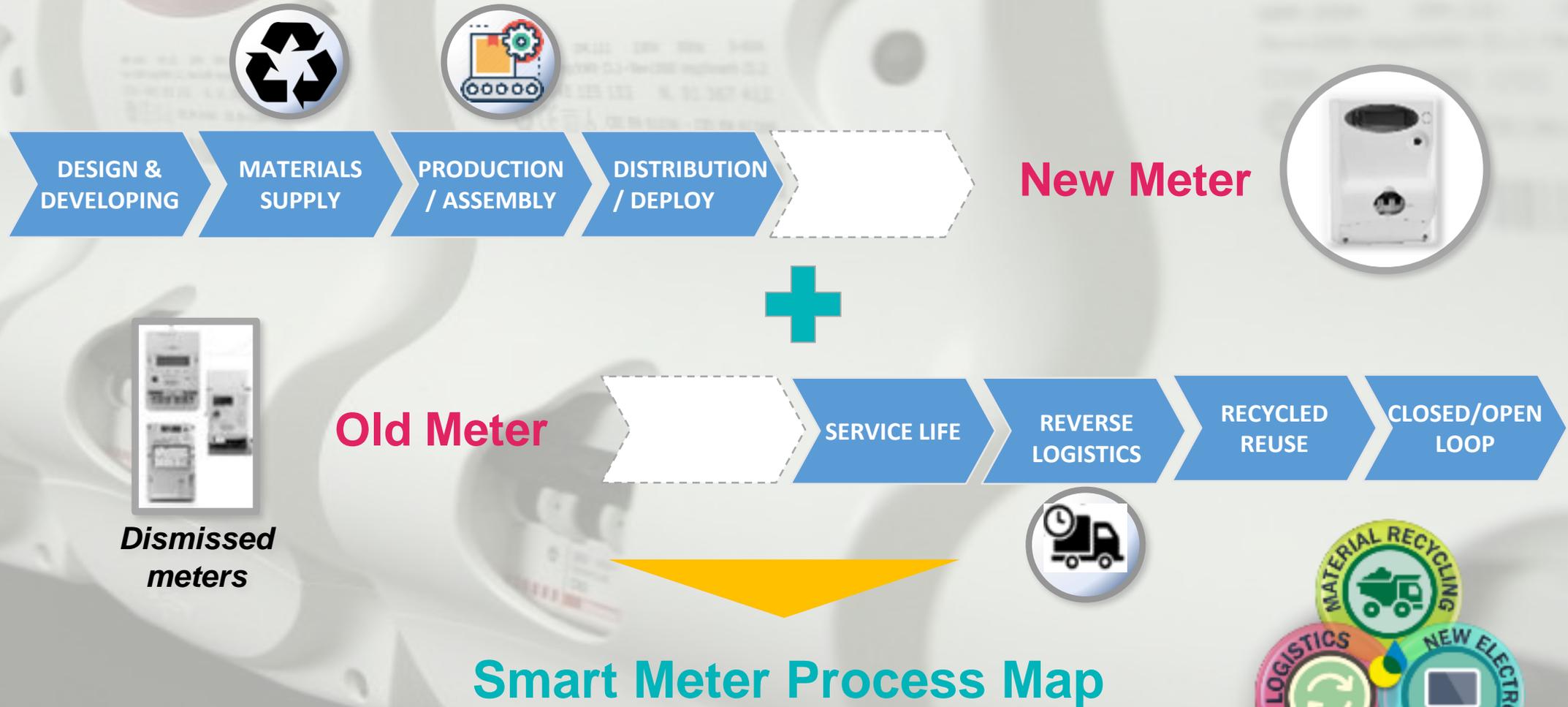




“Circular Smart Meter” case study

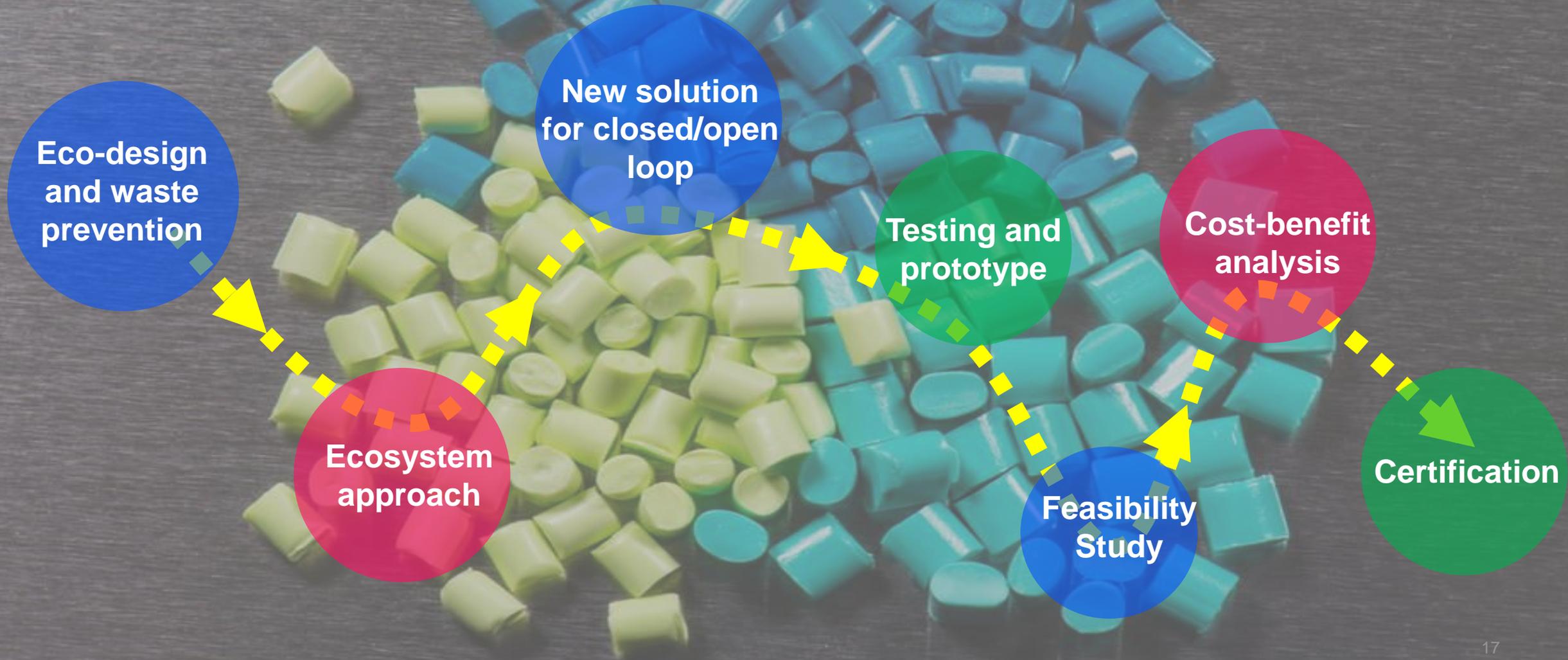
enel

A new value chain approach to the circular economy: Smart meter



Smart Meter Process Map

Technical improvements: Process step on materials to be reused



Testing old meter plastic to catch new opportunities

Old meters to be recycled



- ✓ **meters models** selected for component analysis
- ✓ About **95% of the plastic can be reused**
- ✓ The plastics present a **small variation** (approx.10%) on **fluidity** and **impact of the materials**
- ✓ The **variations can be corrected with additive** and can achieve a similar quality to a virgin plastic.



Circular Economy Matrix «AS-IS» vs «TO-BE»



The CE Matrix maps the circular economy concepts characterizing smart meter **business model** and principal processes identified and clustered as **circular inputs, product & process design, inverse logistics and circular flow**.

	AS-IS	TO-BE
Business model	Relationship with providers: Build Relationship with clients: Service Operative models: Sell&recycle 	Relationship with providers: Exchange Relationship with clients: Service Operative models: Self- recycle 
Circular inputs	Materials typologies: virgin recyclable Energy management: Not renewable 	Materials typologies: recycled/bio-materials Energy management: Renewable 
Product & Process Design	Design oriented to: energy optimization/CO2 emission reduction Improve recycling at end of life Energy management: Not renewable 	Design oriented to: energy optimization/CO2 emission reduction #materials reduction & life extension Improve recycling at end of life Energy management: Renewable 
Inverse logistics	Logistic oriented to: monitor and register all smart meters from deployment to end of life End of life: traditional asset tracking 	Logistic oriented to: energy optimization/CO2 emission reduction Packaging reduction New life cycle: circular asset tracking Close or open loop recycling 
Circular flow	Operative models: maintain and reuse asset 	Operative models: remanufacture components Recycle materials 

Legend: level of circularity

-  **Not circular**
-  **Low circular**
-  **High circular**

Circular Economy Smart Meter: focus on sustainable impacts - preliminary outcomes



ECONOMY



- ✓ Expected cost-saving respect to traditional meter thanks to materials recycling
- ✓ Identification of new business opportunities based on tolling model aimed at:
 - Keeping ownership of recycled materials
 - Creating value from recycled materials

ENVIRONMENT



- ✓ Minimizing waste from polluting materials (e.g. plastics)
- ✓ Recovery of rare and scarce resources such as precious metals and critical materials
- ✓ Estimated reduction of CO2 emission*:
 - use of recycled plastic VS use of virgin plastic

SOCIAL



- ✓ Economic development of the territory and growing of micro-enterprises, with benefits at a direct and indirect level
- ✓ Development of new skills related to regeneration process and new business model

GLOBAL



- ✓ GI&N positioning strengthened as a leader in the circular business
- ✓ Achievement of SDGs targets

ILLUSTRATIVE