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MEASURING IMPACT  
AND  
SELECTING THE RIGHT TECHNICAL KPI





# Agenda

- Why are indicators important in the transition to CE
- What kind of indicators and methodologies are used, where to look for inspiration for the technical KPI in your Up2Circ project
- What is expected in the Up2circ project and what is not
- Best practice with examples
- Bad practice – what to avoid
- Final recommendations
- Resources





# Why are metrics and indicators in CE so important

- **Innovation is a process of trial-and-error:** piloting solutions, identifying and improving business models, assessing impacts, and adjusting plans.
- **We need to know what works, what doesn't and why**—and that means turning to metrics.
- **The innovation towards circular business models will require different measurements and metrics** than the ones that we developed to monitor and innovate the linear economy
- **Measurement and reporting are enablers of the circular economy.**
  - The performance data they generate can provide an economic rationale for circular business models, and demonstrate how these models help tackle global challenges, such as climate change, biodiversity loss, and waste and pollution
  - Design-focused metrics can help businesses to understand the financial value of innovation and develop the business case for investment.



„What gets measured gets managed“



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# CE indicators in disclosure initiatives

<input type="checkbox"/>	Initiative	Voluntary/mandatory st...	Materiality	Metrics related to Elimin...
1	CDP	Voluntary	Double	E, C, R
2	Circelligence (BCG)	Voluntary	Impact	E, C
3	Circle Economy	Voluntary	Double	E, C
4	Circulytics	Voluntary	Double	E, C, R
5	CTI	Voluntary	Double	E, C
6	EFRAG	Voluntary	Double	E, C, R
7	EU CSRD/ESRS	Mandatory	Double	E, C, R
8	EU Taxonomy	Mandatory	Double	E, C
9	GHG Protocol	Voluntary	Impact	E, C
10	GRI	Voluntary	Impact	E, C, R
11	ISSB	Voluntary	Financial	E
12	SBTi	Voluntary	Impact	E
13	SBTN	Voluntary	Impact	E, R
14	TCFD	Voluntary	Financial	E
15	TNFD	Voluntary	Double	E, R
16	TPT	Voluntary	Financial	E

E – eliminate,  
C – circulate,  
R –  
regenerate



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# Metrics classification matrix - descriptions

## EMF Report: Navigating the Circular Economy Reporting Landscape

	Eliminate (by design)	Circulate (by design)	Regenerate (by design)
Resource management <sup>1</sup>	<b>Reduce absolute resource use and waste</b> Reduce absolute resources used to produce goods and services, design out non-recyclable waste and pollution	<b>Increase circulation of resources</b> Source circulated resources and circulate <u>resources</u> <sup>4</sup> in operations	<b>Increase use of regenerative resources</b> Source regeneratively-grown resources, develop regenerative facilities, and build natural capital
Circular products <sup>2</sup>	<b>Design products for longevity, durability, safety, and efficiency</b> Design products to contain no hazardous substances, eliminate unnecessary materials, extended lifetimes, and use-phase efficiency	<b>Design products for circularity</b> Design products to enable reuse, remanufacturing, refurbishment, or recycling of products and materials	<b>Design products for regenerative impact</b> Design products that regenerate natural systems and build natural capital
Circular Business Model <sup>3</sup>	<b>Dematerialize business models</b> Increase revenues and outcomes from dematerialized models (e.g. sharing or pooling)	<b>Scale circular business models</b> Increase revenues and outcomes that are derived from circular models (e.g. repair, refurb, or remanufacture)	<b>Scale regenerative business models</b> Increase revenues and outcomes from restoration of nature or supporting ecosystem services
Value Creation	<b>Improve resource productivity</b> Revenues / outcomes generated from products and services over resource use		

1) Including resource consumption in operations, facilities, infrastructure, and assets

2) Substitute is a strategy that applies across ECR principles

3) This includes business models that enable circularity e.g traceability

4) e.g recycled processing waste





# Metrics classification matrix - examples

## EMF Report: Navigating the Circular Economy Reporting Landscape

	Eliminate (by design)	Circulate (by design)	Regenerate (by design)
Resources <sup>1</sup>	<b>Reduce absolute resource use and waste</b> <ul style="list-style-type: none"> <li>Zero Waste World Programme at CHEP (<b>Brambles</b>)</li> <li>50% absolute reduction of GHGe (<b>H&amp;M</b>)</li> <li>Total of ~95 KT waste generated of which ~21 KT was non-hazardous waste and ~74 KT was hazardous waste (<b>Umicore</b>)</li> </ul>	<b>Increase circulation of resources</b> <ul style="list-style-type: none"> <li>17% of r-content in private brand packaging (<b>Walmart</b>)</li> <li>25% of plastics from recycled content (<b>Volvo</b>)</li> <li>100% recycled tin in the Fairphone 4 (<b>Fairphone</b>)</li> </ul>	<b>Increase use of regenerative resources</b> <ul style="list-style-type: none"> <li>Sourcing of fabrics from cert. org. cotton (<b>GANNI</b>)</li> <li>100% of products from regenerative agriculture (<b>Danone</b>)</li> </ul>
Circular products <sup>2</sup>	<b>Design products for longevity, durability, safety, and efficiency</b> <ul style="list-style-type: none"> <li>Applying additive manufacturing to increase resource efficiency (<b>Siemens</b>)</li> <li>Products with lifelong repair (<b>Rimowa</b>)</li> <li>Reduction in process emissions by phasing out cobalt in batteries (<b>Tesla</b>)</li> </ul>	<b>Design products for circularity</b> <ul style="list-style-type: none"> <li>Design out multi-materials (<b>Unilever</b>)</li> <li>Develop digital product passports (<b>Northvolt</b>)</li> <li>Aim to have 25% of beverages in refillable/returnable packages by 2025 (<b>Coca-Cola</b>)</li> <li># of devices refurbished and resold through trade-in programs (<b>Apple</b>)</li> </ul>	<b>Design products for regenerative impact</b> <ul style="list-style-type: none"> <li>Carbon negative building (<b>Arup</b>)</li> <li>10m shoes from ocean plastic (<b>Adidas</b>)</li> <li>Regen. rubber supply for footwear (<b>Timberland</b>)</li> </ul>
Circular Business Model <sup>3</sup>	<b>Dematerialize business models</b> <ul style="list-style-type: none"> <li>Revenues generated from car sharing services (<b>Miles</b>)</li> <li>Revenues from refill business model (<b>PepsiCo</b>)</li> </ul>	<b>Scale circular business models</b> <ul style="list-style-type: none"> <li>Revenues from products x % recycled content (<b>BASF</b>)</li> <li>Revenues from traceability enabling CE (<b>Circularor</b>)</li> <li>Revenues from Takeback Program (<b>Cisco</b>)</li> </ul>	<b>Scale regenerative business models</b> <ul style="list-style-type: none"> <li>Revenues from products that are regeneratively produced (<b>Lush</b>)</li> <li>Planting trees from proceedings (<b>Ecosia</b>)</li> </ul>
Value Creation	<b>Increase resource productivity</b> <ul style="list-style-type: none"> <li>CO<sub>2</sub>/km (<b>Volvo</b>)</li> </ul>		

Sources: Company websites, Note: Examples demonstrate the use of individual metrics at the company level without Systemiq's assessment of the effectiveness of the metric or the overall circularity of a company.

1) Including resource consumption in operations, infrastructure, and assets

2) Substitute is a strategy that applies across ECR principles

3) This includes business models that enable circularity e.g. traceability



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# TECHNICAL KPI





# Why do we require a technical KPI?

- Compare impacts
- Showcase understanding of circular economy
- Trustworthiness
- Assist you in planning and directs your focus
- Tracking to what degree you managed to implement the project







# Requirements

Environmental and social impact

2000 characters

Quantify the potential impact by establishing baseline and target values for at least one recommended Key Performance Indicator (KPI) related to Sustainable Development Goals (SDGs) 7, 12, and 13, which will contribute to making your company more circular. Describe the methodology used to calculate these values. Additionally, describe any additional expected environmental or social impacts along with qualitative indicators.

**SDG 7 Affordable and Clean Energy:** Improvements in energy efficiency can be measured with a ratio of energy consumption per economic output.

**SDG 12 Responsible Consumption and Production:** Decrease in waste generation through prevention, reduction, recycling and reuse

**SDG 13 Climate Action: Reduction of GHG emissions,** e.g., striving for 55% reduction of GHG emissions by 2030 in line with the EU's "Fit for 55" and Green Deal targets

Business and broader impact

2000 characters

Describe the expected economic impact of the project on your company. Quantify this impact by establishing baseline and target values for the recommended Key Performance Indicator (KPI) related to Sustainable Development Goal (SDG) 8. Explain how your project is expected to influence the relevant industrial sector. Additionally, detail the anticipated impact of your project on the region where it will be implemented, including its potential for replication.

**SDG 8 Decent Work and Economic Growth:** Improvements in resource efficiency and in decoupling economic growth from environmental degradation. You can e.g., compare the decrease in consumption of primary materials with the number of jobs created and preserved or with increased turnover



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# What we do not require

- A complex LCA – although this would add credibility
- Overly sophisticated calculation on hardly accessible data
- Not everything needs to be recalculated to CO<sub>2</sub> emissions – although it is helpful but when backed up by data or comparative studies



# Evaluation Criteria

- Impact: Does the funding have the potential to significantly contribute to enhancing the sustainability of your business?
  - Environmental and social impact: Have the potential environmental and social impacts been **quantified and justified by sound Key Performance Indicators KPI(s) related to sustainability? Are the calculations of the baseline and target value(s) of the KPI(s) clear and realistic?**
  - Business and broader impact: What is the expected economic impact of the project for the applicant's company? To what extent is the project expected to influence the relevant industrial sector? What is the anticipated impact, of the project on the region where it will be implemented, and what is its potential for replication?



# How to go about setting up the KPI for your Up2Circ project

- It's not about what it's made of, but which one will have less impact on fulfilling its function.



# Basic principles

- Functional unit
  - It defines what exactly is being evaluated and **quantifies the utility delivered by the product**
  - Provides a reference to which inputs and outputs can be related
  - Basis for comparison with other products or services

## Laundry Detergents:

- **Well-Defined FU:** Washing 100 standard laundry loads.
- **Poor FU:** One liter of detergent. (fails to specify the cleaning performance or number of uses.)

## LCA of Building Materials (e.g., Insulation)

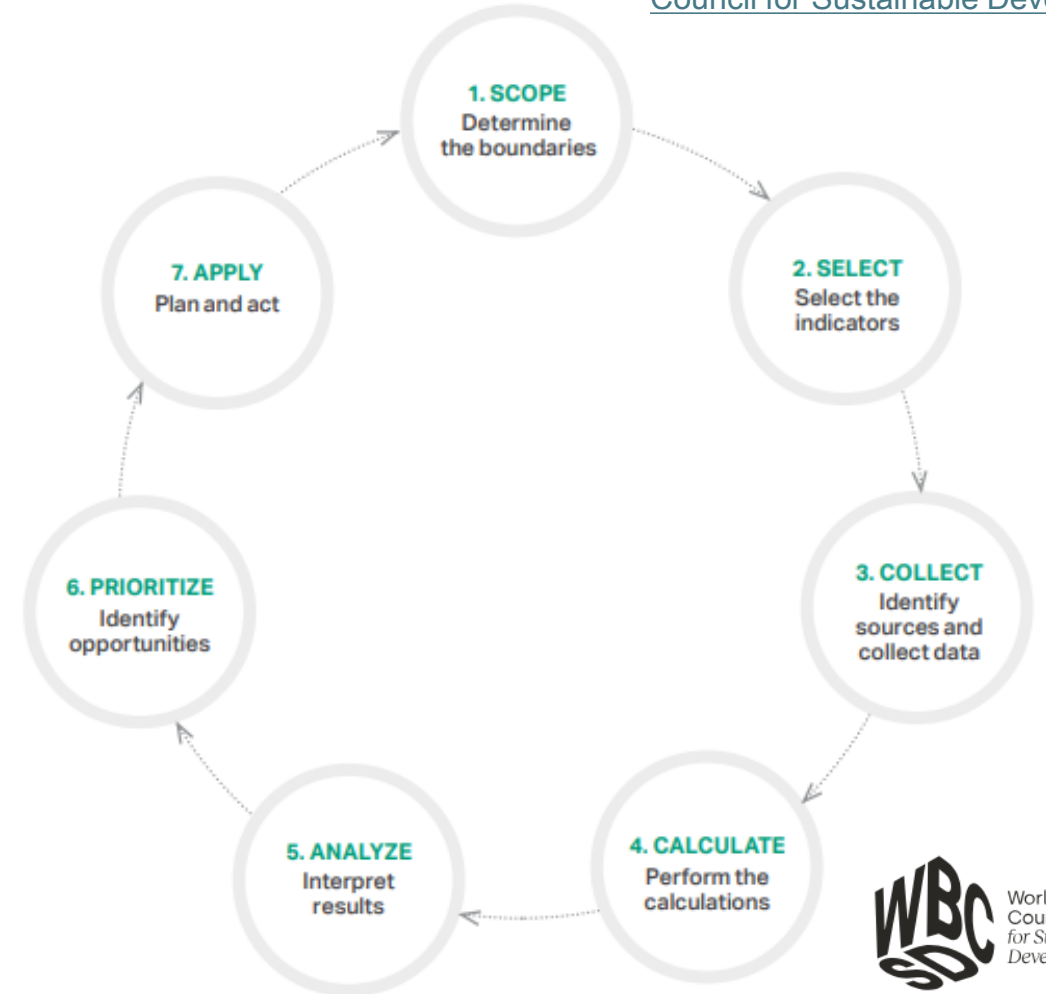
- **Well-Defined FU:** Maintaining a specified indoor temperature in a 100 square meter area for one year.
- **Poor FU:** One square meter of insulation material. (This doesn't account for performance or application context.)



# Best practice

CTI: [Circular Transition Indicators v4.0 – for business, by business - World Business Council for Sustainable Development \(WBCSD\)](#)

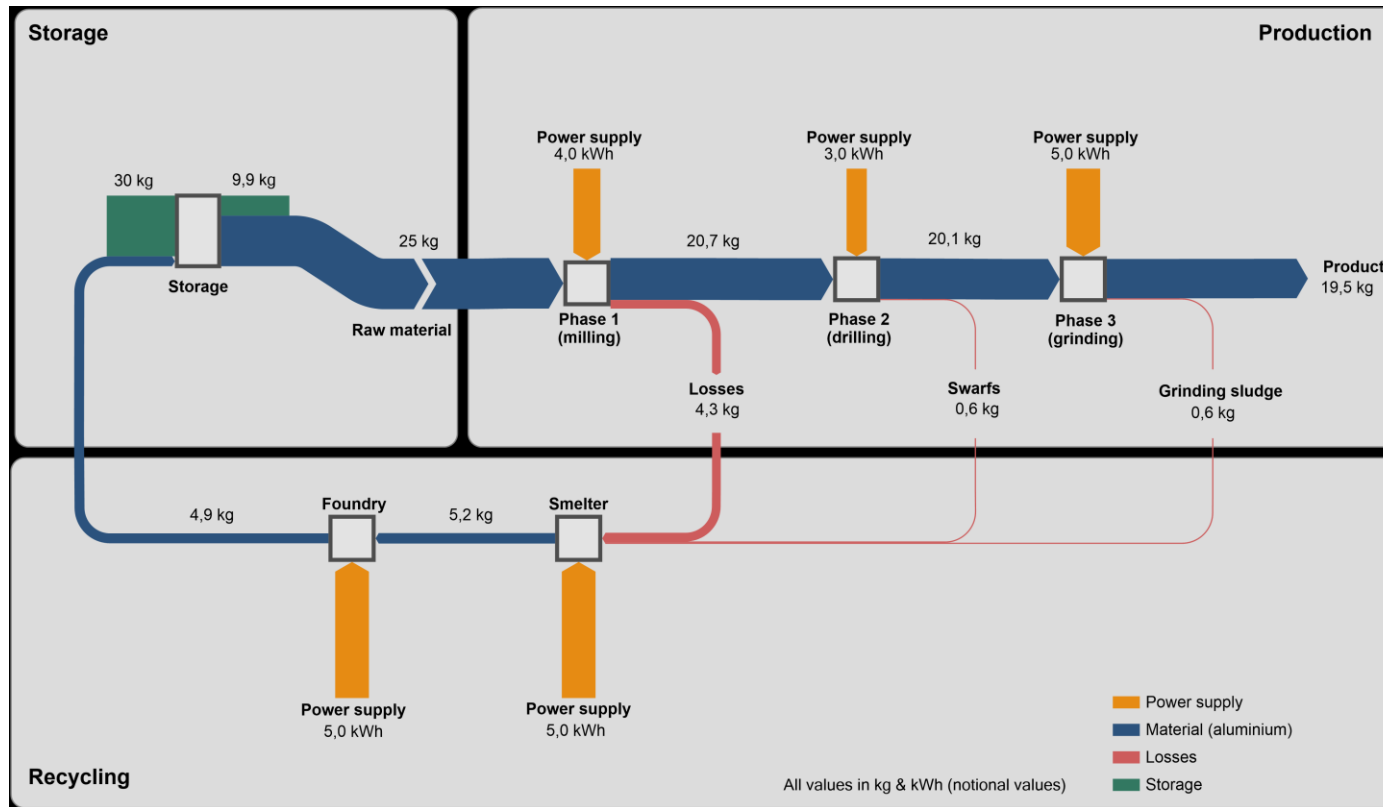
- Define your functional unit
- Set system boundaries
- Base the KPI on accessible data
- Translate to impact as related to said SDGs
- Choose baseline and target
- Translate to impact: build a story around your KPI (ambition)



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# Material flow analysis/Inventory Analysis



Design option:	Functional unit: life span 200.000 km					
item	database name	Eco-intensity (impacts per kg)	Mass per item (kg)	Items per func. unit (#)	Uncertainty %	Notes
Steel, primary	Idemat2023 Steel (21% sec	0.21	1000	1.3		105% a factor 1.3 to cop
steel, rolling	Idemat2023 Rolling steel	0.15	1000	1		33% includes mfg proc
Aluminum, primary	Idemat2023 Aluminium trad	2.21	700	1.3		30% a factor 1.3 to cop
Aluminium, processing	Idemat2023 Forging aluminu	0.04	700	1		30% data in IDEMAT, b
polymers (take PP)	Idemat2023 PP (Polypropyler	1.13	100	1		30% type of polymer n
polymers extrusion	Idemat2023 extrusion, Incl p	0.06	100	1		10% assumption
li-ion battery (take NMC811) excl elec	Idemat2023 Lithium NMC 81	6.79	375	1		10% exact data in IDEP
electronics	Idemat2023 Computer desk	159.44	5	1		30% assumption
copper	Idemat2023 Copper wire, pla	2.28	20	1		30% for wires this is th
magnets	Idemat2023 Neodymium ma	76.45	2	1		30% weight is estimate
others (tyres, glass, etc)						
<b>subtotal</b>						<b>6126</b>
<b>Manufacturing</b>		Eco-intensity (impacts per MJ)	Energy per activity (MJ)	Items per func. unit (#)	Uncertainty %	Notes
electricity dummy	Idemat2023 Electricity Gene	0.02	40,000	1		30% to match carbon fi
heat dummy	Idemat2023 Industrial Heat	0.02	40,000	1		30% to match carbon fi
<b>subtotal</b>						<b>1583</b>
<b>total manufacturing</b>						<b>7709</b>
<b>Transport</b>		Eco-Intensity (impacts/ton-km)	Mass per item (ton)	Distance per item (km)	Uncertainty %	Notes
ship ocean	Idemat2023 Container ship (	0.0014	2	20000		30% parts from china t
ship coaster	Idemat2023 Coaster Class A	0.0038	2	3000		30% from manufacturir
truck	Idemat2023 Truck+trailer 24	0.0260	2	1000		30% from manufacturir
<b>total transport</b>						<b>130</b>
<b>Use</b>		Eco-Intensity (impacts/MJ or other)	Amount per item (MJ or other)	Items per func. unit (#)	Uncertainty %	Notes
Electricity Use (NL avg.)	Idemat2023 Electricity Neth	0.019	144,000	1		30% Assumed Dutch el
Electricity Use (France)	Idemat2023 Electricity Franc	0.019	144,000	1		30% Assumed Polish el
Electricity Use (Sweden)	Idemat2023 Electricity Swed	0.010	144,000	1		30% Assumed Swedish
Electricity Use (Norway)	Idemat2023 Electricity Norw	0.001	144,000	1		30% Assumed Norwegi
<b>End of Life</b>		Eco-Intensity (impacts/kg)	Mass per item (kg)	Items per func. unit (#)	Uncertainty %	Notes
Steel - open loop recycling	Idemat2023 Scrap, collector	0.009	1000	1		30% open loop recyclin
batteries - open loop recycling	Idemat2023 Scrap, collector	0.009	375	1		30% open loop recyclin
Aluminium - open loop recycling	Idemat2023 Scrap, collector	0.013	700	1		30% open loop recyclin
Copper - open loop recycling	Idemat2023 Scrap, collector	0.013	20	1		30% open loop recyclin



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# Good practice – examples of CE indicators



- **Product Durability/Longevity:** Percentage and total weight of the output materials of the product that has been designed for maintenance, longevity and durability (% , physical unit)
- **Total waste generation:** Total weight of waste generated in metric tons, broken down by waste composition (materials present in the waste: biomass, metals, non-metallic minerals...) (% , physical unit)
- **Total Material use (company):** Total weight of materials that are used to produce and package the organization's primary products and services (% , physical unit)
- **Recycled/Renewable Input materials (company):** Percentage and total weight of input materials used for the final product or service that are recycled (secondary sources), or reused (% , physical unit)
- **(Non)Hazardous waste diverted from landfill:** Total weight of hazardous waste diverted from landfill (in tonnes), broken down by waste composition (% , physical unit)

\*Not all of the indicators are useful in the circumstances of Up2Circ, they should serve as inspiration

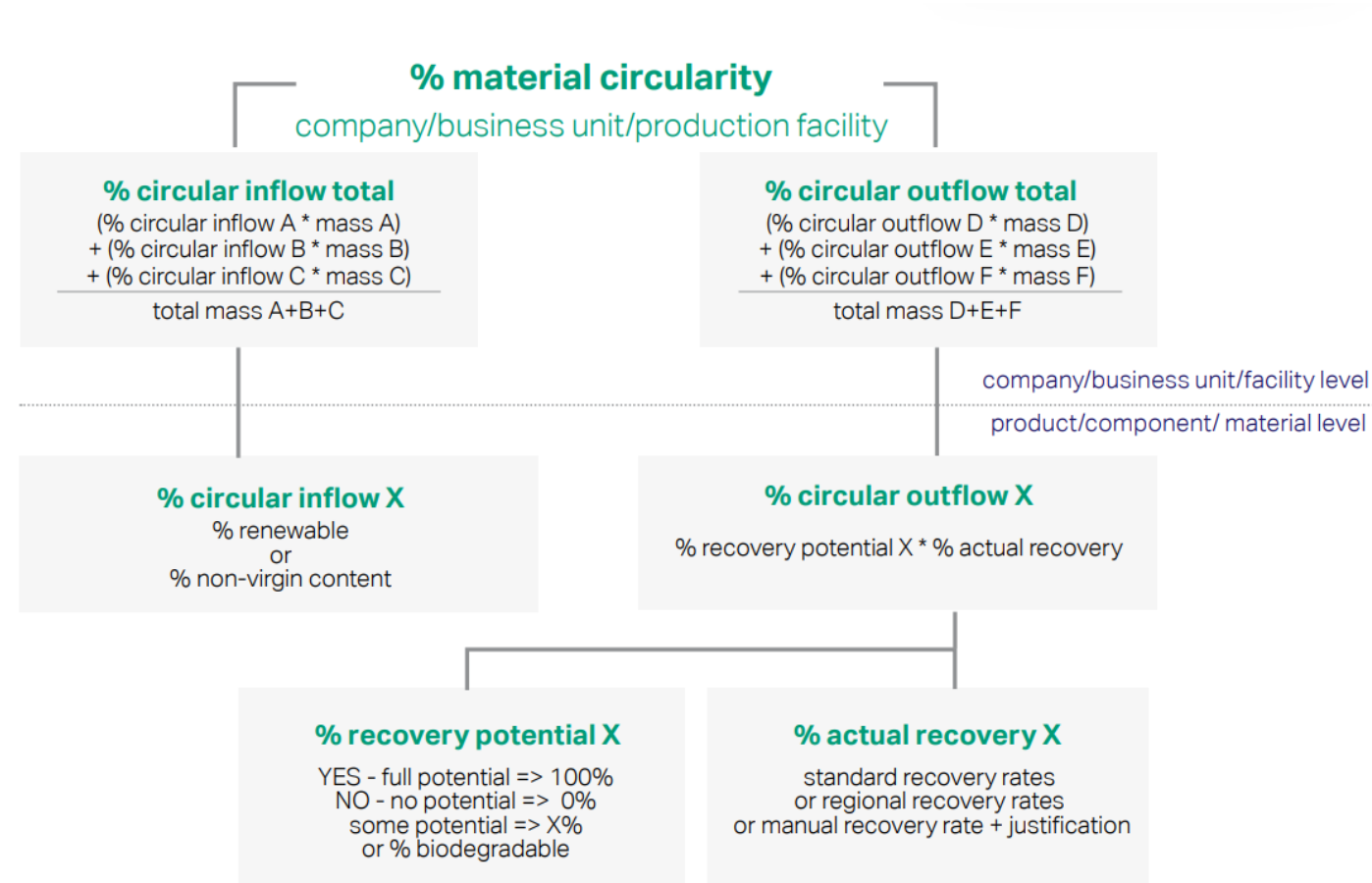
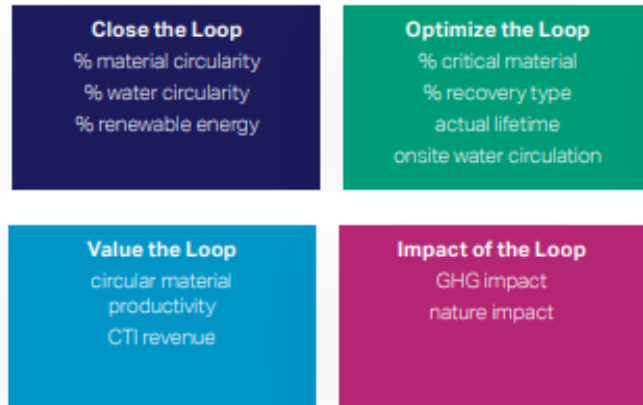


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# Good practice - Circular Transition Indicators, material circularity





# Best practice – examples, lessons learned from Pilot Call

- Simple KPI that is easily understood that demonstrates real impact:
  - Amount of water saved (consumption reduced)
  - CO2 emissions reductions (using GHG calculator)
  - Units of/mass of recycled plastic processed, fossil fuel reduced, processed agricultural waste (amount of GHGe saved compared to alternative)
- KPIs explicitly related to SDGs (7, 12, 13, – 8)





# Bad practice – examples (AVOID!)

- Unfounded calculations of GHG emissions
  - KPI expressed in units without estimating the impact
    - „how many products we sell each month. Before we started this project, we sold only a few products“
  - Overly ambitious and unrealistic KPIs
  - vague arguments "significantly lower CO2 footprint,"
    - by how much? What basis? Is this argument backed-up by science?  
Show sources...






# Up2Circ Final recommendations

- Quantifiable and measurable and self-explanatory
  - Better to use simple metrics than obscure ones that you won't be able to track properly
- Well-defined functional unit and boundaries.
- Based on facts – convert to impact using secondary data possible
- You can use more than 1 KPI when it makes sense
- Explicitly relate to SDGs
- Be ambitious but realistic in setting your impact/KPI





# Up2Circ Resources

- Up2Circ Academy
- EMF
- [Search results - Knowledge Hub | Circle Economy Foundation \(circle-economy.com\)](#)
- [5faa4d272e1a82a1d9126772\\_20201029 - BCG Metrics - White Papers - The Landscape - 210 x 297 mm - bleed 3 mm.pdf \(website-files.com\)](#)
- [Circular Transition Indicators v4.0 – Metrics for business, by business - World Business Council for Sustainable Development \(WBCSD\)](#)
- [Circulytics: Measuring circular economy performance \(ellenmacarthurfoundation.org\)](#)





Q & A

When in doubt you can always ask your Up2Circ advisor