
CTI
TOOL

CTI REPORT

This report was generated by the CTI Tool, to help organizations go through the Circular Transition Indicators (CTI) process and apply the methodology into their circularity and sustainability strategies.

The CTI is a universal and consistent framework developed by WBCSD together with 26 of their members to measure circularity. Built for business, by business, the framework is a globally recognized methodology that can be applied to businesses in all industries.

In this report, you will find detailed information about your CTI assessment, such as:

- the results from data calculations based on the data your company entered into the CTI Tool
- detailed visualisation for the indicators selected for this assessment, such as circular inflow and outflow, water circularity, energy and financial indicators such as circular material productivity
- the overall company circular performance
- potential opportunities for circular improvement.

You will also be able to see in which step of the CTI assessment your company currently is.

The CTI framework provides businesses with a common language to communicate with both internal and external stakeholders. You can use this document in meetings with your colleagues or to report on the current status of your company's circular and sustainability efforts.

To make the best of this report, we recommend that you study the CTI framework document.

CTI TOOL

Computer mouse

Company name	**CTI DEMO**
Business level	**Product line**
Created by	**CTI DEMO**
Time frame	**31/12/2018 - 31/12/2019**

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7
Define the scope	Define the indicators	Collect data	Calculate	Analyze	Prioritize	Apply

Selected indicators

Close the loop

This set of indicators provides insights on your company's effectiveness in closing material loops.

- % circular inflow
- % circular outflow
- % water circularity
- % renewable energy

Optimize the loop

This set of indicators provides insights on resource-use efficiency.

- % critical inflow
- % recovery type
- % onsite water circulation

Value the loop

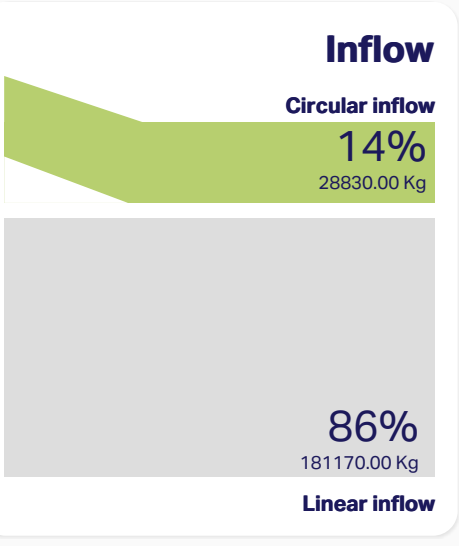
This set of indicators shows the added business value of your company's circular material flows.

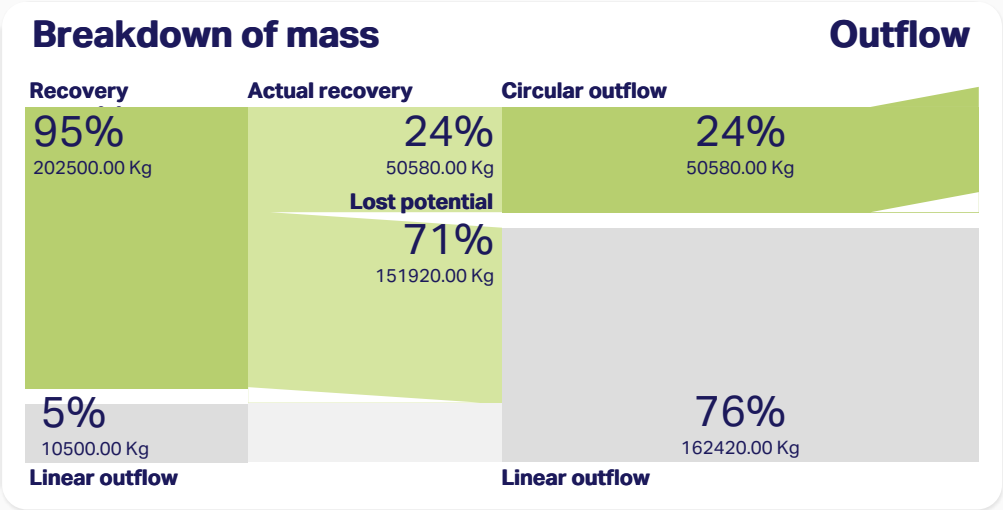
- % Circular material productivity
- % CTI revenue

Excluded from the assessment — Packaging and batteries are not included in the assessment.

Overview of your circular performance

Close the loop — % circularity 18.77%





The diagram above illustrates the circular performance of the business level selected for this assessment. It includes total inflow and outflow of materials, with the percentage based on material weight.

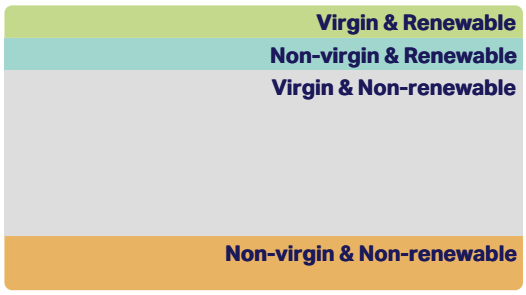
Inflow will be marked as circular if flows are non-virgin and/or renewable, and outflow will be marked as circular if it is both potentially recoverable and will be actually recovered.

Lost potential refers to the percentage of material that has recovery potential but is not currently being recovered, therefore losing recovery potential.

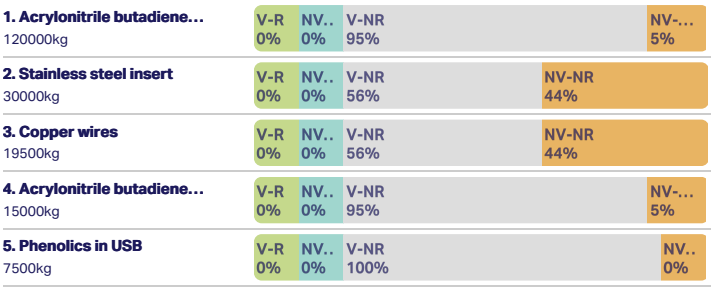
Close the loop: Inflow details

The diagrams below show the circular performance of the inflows of the business level analysed in this assessment. Flows are sorted based on the largest mass, most circular inflow, and most linear inflow. These breakdowns are useful to identify hotspots in your dataset and to determine where your focus areas are.

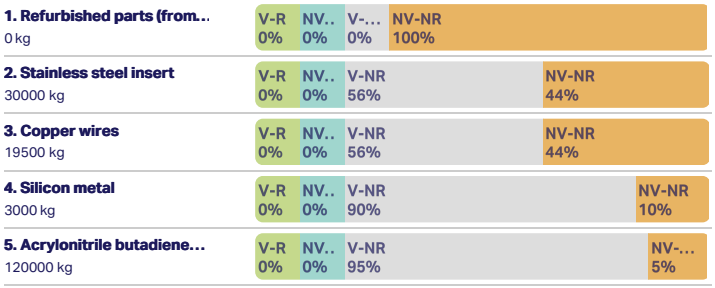
Breakdown of mass



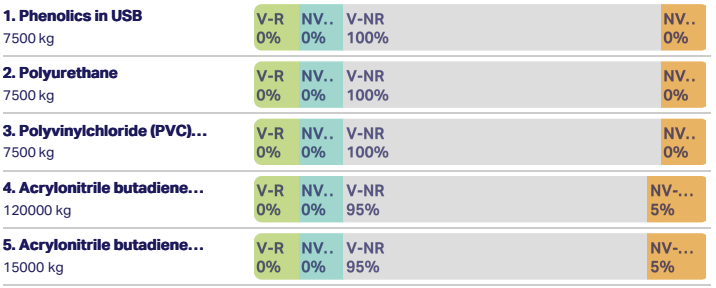
Largest inflow



Most circular inflow



Most linear inflow

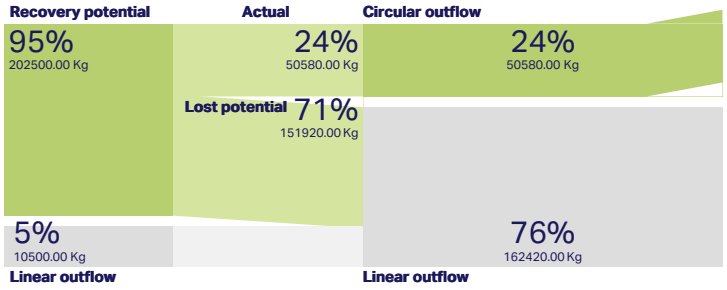


Close the loop: Outflow details

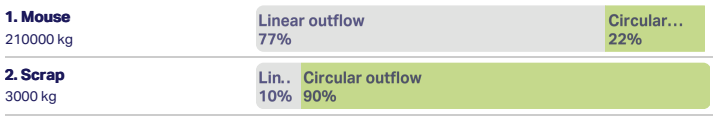
The diagrams below show the circular performance of the outflows of the business level analysed in this assessment. The percentage of recovery potential reflects your company's ability to design or treat its outflow to ensure materials can be technically recovered. The percentage of actual recovery reflects the amount of materials actually recovered.

Recovery is not the same as collection, because after collection materials can still end up in landfill or incineration. Thats why this'indicator requires actual data. The breakdown of mass visually shows the lost potential of the circular out flow due to partial actual recovery. Flows are sorted based on the largest mass, most circular outflow and most linear outflow.

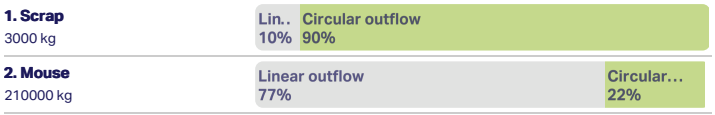
Breakdown of mass



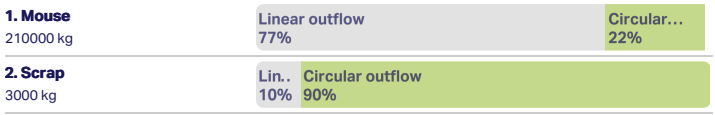
Largest outflow



Most circular outflow



Most linear outflow



Water

Water circularity 14%

Water circularity = Average (water inflow + water outflow)

Water circularity refers to water use on local level and aims at lower freshwater demand. Circularity of water is determined through the % circular water inflow and % circular water outflow,

Energy

Renewable energy 10%

$$\frac{\text{Renewable energy}\ n}{\text{total energy}\ n} \times 100\%$$

Energy refers to the use of renewable energy for business operations. Your goal should be to reach 100% renewable energy use by decreasing overall energy consumption or substituting use of fossil fuels for renewable options.

Optimize the loop

Critical inflow 1%

$$\frac{\text{mass of inflow defined as critical}\ n}{\text{total mass of inflow}\ n} \times 100\%$$

Critical inflow highlights the share of linear inflow considered critical or scarce. This will help your company access the risk level of certain specific material flows and to prioritize actions accordingly.

Critical Materials

Name	Mass	Virgin Renewable	Non-Virgin Renewable	Virgin Non-renewable	Non-virgin Non-renewable
Silicon metal	3000 kg	0	0	90	10

Onsite water circulation 900%

$$\frac{\text{Q water use - Q total water withdrawal}\ n}{\text{Q total water withdrawal}\ n} \times 100\%$$

Onside water circulation refers to the internal reuse and recycling of water of a product facility or the location of the company. It is the average between % circular water inflow and % circular water outflow (assuming the volume is the same).

recovery type

Breakdown of recovery cycle

Technical
213000.00kg

Biological cycle non-food | Biological cycle food | Unknown / Other

Technical 213000kg

Re-use

Repair / Refurbish 210000.00 Kg **99%**

Repurpose / Remanufacture

Recycle 3000.00 Kg **1%**

Landfill / mixed waste incineration

Unknown / other

Biological cycle non-food 0kg

Re-use

Repair / Refurbish

Repurpose / Remanufacture

Recycle

Landfill / mixed waste incineration

Unknown / other

Nutrient absorption through biodegradation

Biogas / biomass energy recovery

Biological cycle food 0kg

Consumption

Consumption alternative

Nutrient absorption through biodegradation

Biogas / biomass energy recovery

Landfill / mixed waste incineration

Value the loop

Circular material productivity €5.50/kg

$$\frac{\text{Revenue}_{n}}{\text{total mass of linear inflow}_{n}} \times 100\%$$

This indicator expresses the monetary value per unit of mass. This absolute value is best used to compare performance over time. An increase in circular material productivity demonstrates a decoupling of financial growth from material use.

CTI revenue €187375

CTI revenue = Average (% circular inflow + % circular outflow) * revenue

Your company's CTI revenue is its revenue adjusted for the % circularity (weighted average of the % circular inflow and % circular outflow) of its product portfolio. The greater the CTI revenue, the better your company can generate revenues from its circular products/business. This metric also reflects decoupling as revenues increase from circular flows.

STEP 5

Analysis: Inflow

This section shows the results from the CTI calculation performed in Step 4. This is the quantitative foundation for identifying, prioritizing and implementing circular initiatives, therefore crucial for your decision-making. This overview shows your selected flows and scenarios for improving circular performance. It also includes impact on your circular inflow performance, which can be achieved by adopting these inflow optimizations.

Inflow questions

The questions below will help you interpret the results of your data calculations.

Why is our circular inflow 14% ?

Mostly influenced by ABS and the metals. ABS has 5% non-virgin content and the metals have ~50% non-virgin content.

What are the first impressions about where we should focus our improvement efforts on?

Finding an ABS supplier that is able to use a higher percentage of non-virgin content.

Is it higher or lower than expected?

It is lower than expected as ABS is the dominant material, and has only 5% non-virgin content.

Why?

Which inflows have limited options to improve due to external limitations?

(Sub-)assemblies that are procured as such are hard to influence.

Why?

There is complexity in the supply chain.

Inflow analysis

Name	Mass(Kg)	circular inflow	Impact on total circular inflow
Refurbished parts (from mail-back program	21300.00 kg	100 %	+10.13%
Acrylonitrile butadiene styrene (ABS) USB casing	13501.49 kg	5 %	-0.04%
Acrylonitrile butadiene styrene (ABS) housing	108000.00 kg	15 %	+4.85%
Copper wires	17550.00 kg	44 %	-0.41%
Phenolics in USB	6750.00 kg	0 %	
Polyurethane	6750.00 kg	0 %	
Polyvinylchloride (PVC) insulation wire	6750.00 kg	0 %	
Silicon metal	2700.00 kg	10 %	-0.01%
Stainless steel insert	27000.00 kg	44 %	-0.64%

The circular inflow of
the business unit
Computer mouse
will increase by

▲ 14%

if all changes above are implemented.

	Change	New value
% circular inflow	13.87 %	27.60 %
Critical materials	-0.13 %	1.16 %
Circular material productuvity	-12.73 %	€ 4.80 /kg
CTI revenue	57.01 %	€294206.38

STEP 5

Analysis: Outflow

The circular outflow of the business unit Computer mouse will increase by 7.49% if all changes above are implemented.

Outflow questions

The questions below will help you interpret the results of your data calculations.

Why is our circular outflow 24% ?

The mouse is almost completely refurbishable, but only 25% of the mouses are recovered.

Is it higher or lower than expected?

It is what we expected, but there is room for improvement.

Why?

What are the first impressions about where we should focus our improvement efforts on?

Increasing the number of mouses returned.

Which outflows have limited options to improve due to external limitions?

The scrap.

Why?

Because it is already 100% recovered through partnerships.

Outflow analysis

Name	Mass(Kg)	Recovery potential	Actual recovery	Impact on total circular outflow
Mouse	210000.00 kg	95 %	32 %	+7.49%

The circular outflow of
the business unit
Computer mouse
will increase by

▲ **7%**

if all changes above are implemented.

	Change	New value
% circular outflow	**7.49 %**	**31.24 %**
CTI revenue	**57.01 %**	**294206.38 %**

STEP 5

Analysis: Energy

Energy measurement includes all the energy carriers that flow into your company (including, but not limited to, gas, electricity and fuels). In line with WBCSD's approach, CTI allows companies to use existing policies and procedures, permitting the reuse of existing data sets.

In CTI, it's not possible for a company to achieve greater than 100% renewable energy. This way, even if your company generates more renewable energy onsite than it uses and sells it back to the grid (utility), it's necessary to cap the renewable energy indicator at 100%.

Energy analysis

Name	Amount	Improvement
Renewable energy	1234 kWh	+ 2468 kWh
Total energy	12345 kWh	12345 kWh

The renewable energy of
the business unit
Computer mouse
will increase by

▲ 10%

if all changes above are implemented.

	Change	New value
% renewable energy	**10 %**	**20 %**

STEP 5

Analysis: Water

It's necessary to assess water circularity on a local level for a water catchment area or local watershed. The circularity of water is determined through the % circular water inflow and % circular water outflow, which in turn depends on local water conditions.

Water analysis

Name	Volume	Improvement
Total circular water inflow	1234 m3	+ 1357 m3
Total circular water outflow	2345 m3	+ 2666 m3
Total water use	123455 m3	123455 m3
Total water withdrawal	12345 m3	12345 m3

The water circularity of
the business unit
Computer mouse
will increase by

▲ 2%

if all changes above are implemented.

	Change	New value
% total water circularity	**2 %**	**16 %**
% onsite water circulation	**0 %**	**900 %**

STEP 5

Prioritization:Inflow

In this section, you can look at the opportunities and risks associated with your assessment. The section below demonstrates how the circular performance relates to your exposure to linear risks.

By assessing exposure to risks and evaluating your opportunities (via a business case), you can work on scenario-planning and prioritize actions. You can also link your findings to dynamics in the market, operations, business and legal aspects.

risks

Market

Scarcity of the materials might result in a higher resources price in the future.

THREAT

1 2 3 4 **5** 6 7

VULNERABILITY

1 2 3 **4** 5 6 7

Operational

The fluctuating quality of recycled ABS may influence the quality of the product's look & feel.

THREAT

1 2 3 4 **5** 6 7

VULNERABILITY

1 **2** 3 4 5 6 7

Business

Public opinion on electronics producers may put a stronger pull on circular electronics., with a risk of losing market share if we don't increase our circularity.

THREAT

1 2 3 **4** 5 6 7

VULNERABILITY

1 **2** 3 4 5 6 7

Legal

Non-compliance to coming eco-design directives, that require a minimum % recycled content, may result in fines or lawsuits.

THREAT

1 2 3 4 **5** 6 7

VULNERABILITY

1 2 3 **4** 5 6 7

opportunities

Market

There can be a cost advantage for the non-virgin resources.

Operational

We can set-up or improve our take-back and collection schemes in value chain to increase return flows (and reduce cost).

Business

Distinguishing the product with recycled content is already seen to be strong marketing strategy, with increased market share and premium pricing.

Legal

We can make use of subsidies for secondary material use.

STEP 5

Prioritization:Outflow

risks

Market

The Basel convention for border crossing of electronic waste makes it harder to dispose of linear outflow.

THREAT							VULNERABILITY						
1	2	**3**	4	5	6	7	1	2	3	**4**	5	6	7

Operational

Internal process failures.

THREAT							VULNERABILITY						
1	**2**	3	4	5	6	7	**1**	2	3	4	5	6	7

Business

Increased scrutiny of WEEE and the amount going into landfill.

THREAT							VULNERABILITY						
1	2	3	4	5	6	7	1	2	3	4	5	6	7

Legal

More requirements on eco-design principles and EPR schemes for electronic equipment.

THREAT							VULNERABILITY						
1	2	3	**4**	5	6	7	1	2	3	4	5	**6**	7

opportunities

Market

Valorizing returned mouses to refurbish, thus increasing circularity and saving costs.

Operational

Increasing our circular image may help attracting and retaining millennial talent.

Business

Discount voucher for returning goods in the store.

Legal

Making use of subsidies and incentives for business model innovation.

STEP 5

Prioritization: Energy

risks

Market

Scarcity of fossil resources

THREAT: 1 **2** 3 4 5 6 7

VULNERABILITY: **1** 2 3 4 5 6 7

Operational

Worker safety issues

THREAT: 1 **2** 3 4 5 6 7

VULNERABILITY: **1** 2 3 4 5 6 7

Business

Increasing fossil energy prices.

THREAT: 1 2 3 4 **5** 6 7

VULNERABILITY: 1 2 3 **4** 5 6 7

Legal

More stringent laws around fossil energy use.

THREAT: 1 **2** 3 4 5 6 7

VULNERABILITY: 1 2 **3** 4 5 6 7

opportunities

Market

Abundance of renewable resources.

Operational

Green image may help attracting and retaining millennial talent.

Business

Decreasing cost of renewable energy sources.

Legal

Renewable energy subsidies.

STEP 5

Prioritization: Water

risks

Market

Dependency on low water prices, which can rise when scarcity increases.

THREAT

1	2	3	4	**5**	6	7

VULNERABILITY

1	2	3	4	5	**6**	7

Operational

Water shortages disrupting operations and unforeseen mitigation cost

THREAT

1	2	3	**4**	5	6	7

VULNERABILITY

1	2	3	4	**5**	6	7

Business

Local reputation and loss of social license to operate, may result in activism

THREAT

1	2	3	**4**	5	6	7

VULNERABILITY

1	2	3	4	5	**6**	7

Legal

Upcoming tightening of regulations with rising water scarcity.

THREAT

1	2	**3**	4	5	6	7

VULNERABILITY

1	**2**	3	4	5	6	7

opportunities

Market

Trading water rights in states with formal water markets.

Operational

Reliability of water inflow with consistent flow and pressure.

Business

Advantages over competitors.

Legal

Potential for more secure water rights due to demonstrable sustainable management.

STEP 5

Prioritization: Critical materials

risks

Market

The supply of silicon metal might be unstable, as two thirds of the world's supply comes from a single area in China.

THREAT

1	2	3	4	5	**6**	7

VULNERABILITY

1	2	**3**	4	5	6	7

Operational

There may be worker safety issues at the limited supply locations for silicon metal.

THREAT

1	2	3	**4**	5	6	7

VULNERABILITY

1	2	3	**4**	5	6	7

Business

Investment interest may decline because of dependency on critical materials.

THREAT

1	2	**3**	4	5	6	7

VULNERABILITY

1	**2**	3	4	5	6	7

Legal

Phasing out critical materials due to US legislation is expected to happen within the next 5 years.

THREAT

1	2	3	4	5	**6**	7

VULNERABILITY

1	2	3	**4**	5	6	7

opportunities

Market

The price of recycled silicon metals is likely to go down in the next decade, due to increase WEEE recycling efficiencies.

Operational

-

Business

-

Legal

There may be federal subsidies for phasing out critical materials.

STEP 7

Application

After analyzing the results of your data calculations, prioritizing the risks and opportunities, and assessing the circular solutions, the next step is to formulate targets for improvement and execute related actions.

In this section you can formulate S.M.A.R.T. targets to help you roll out your circular improvement actions according to each target.

S.M.A.R.T Targets = 1

1 Increase refurbishment by increasing collection.

what needs to happen

a Set-up collection in shops

b Improve effectiveness of mail-back scheme

when it needs to be happen

a Q2

who needs to take action

a Account managers for the bigs shops

Departments to involve

1 Account management

Other parties to consider

1 Retailers

2 Refurbishment partners

Considerations when executing

1

Appendix inflow materials

Name	Mass	Virgin Renewable(%)	Non-Virgin Renewable(%)	Virgin Non-renewable(%)	Non-virgin Non-renewable(%)
Silicon metal	3000 kg	0	0	90	10
Acrylonitrile butadiene styrene (ABS) USB casing	15000 kg	0	0	95	5
Acrylonitrile butadiene styrene (ABS) housing	120000 kg	0	0	95	5
Copper wires	19500 kg	0	0	56	44
Phenolics in USB	7500 kg	0	0	100	0
Polyurethane	7500 kg	0	0	100	0
Polyvinylchloride (PVC) insulation wire	7500 kg	0	0	100	0
Refurbished parts (from mail-back program	0 kg	0	0	0	100
Stainless steel insert	30000 kg	0	0	56	44

Appendix outflow materials

Name	Mass	Recovery potential	Actual recovery
Mouse	210000 kg	95	24
Scrap	3000 kg	100	90