

WASTE

W H A T ?

W H Y ? . A P R O B L E M ? . B E I N G S O M E T H I N G . N E W V A L U E S .

WASTE ?

«It is any substance, material, or thing that the producer or holder discards or has the obligation to discard and for which he is responsible until his final outlet.»

Article L. 541.2 of the Environment Code

W H A T ? | W H Y ? . A P R O B L E M ? . B E I N G S O M E T H I N G . N E W V A L U E S .



Crédit : angeldesignsjewelry.com



Crédit : angeldesignsjewelry.com

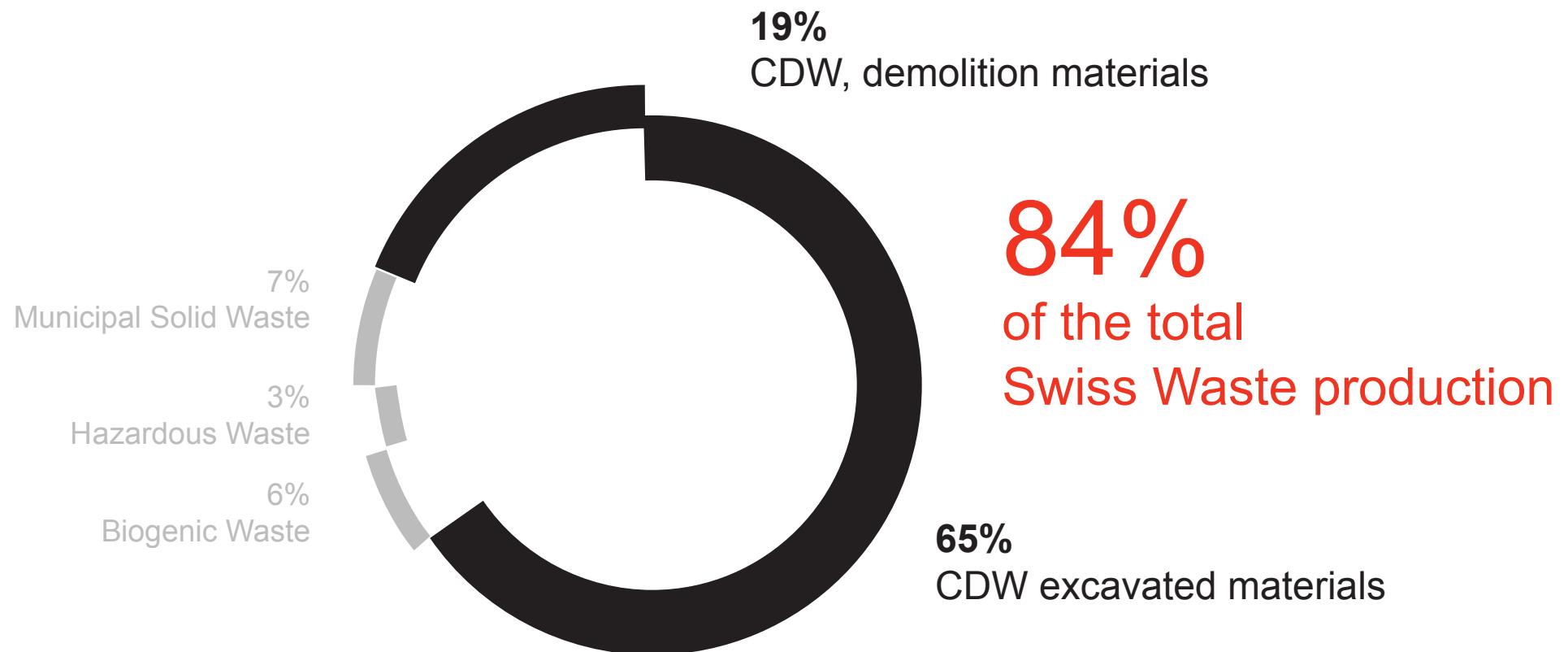
W H A T ? . W H Y ? . A P R O B L E M ? . B E I N G S O M E T H I N G . N E W V A L U E S .



WASTE ?

DEVALUATION **BASED ON CONSIDERATION,** **NOT ON PROPERTIES**

WASTE



Figures from : BAFU, Umweltbericht Schweiz 2018

A PROBLEM ?



AIR POLLUTION

Crédit : poubelledirect.fr



WATER POLLUTION



SOIL POLLUTION

Crédit : pinterest



LAND CONSUMPTION

Credit : poubelledirect.fr

W H A T ? . W H Y ? . A P R O B L E M ?

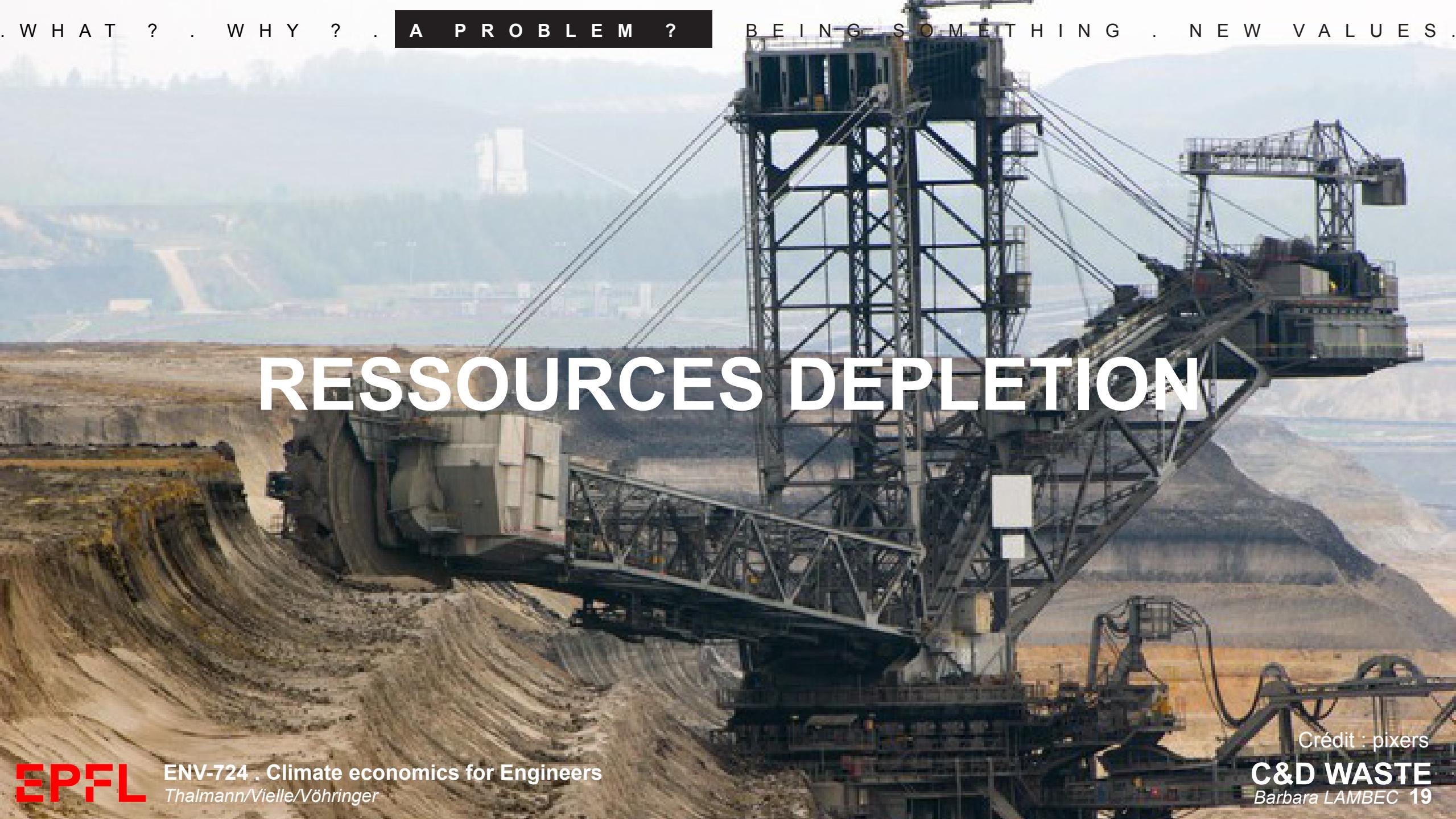
B E I N G S O M E T H I N G . N E W V A L U E S .

WASTE

SOMETHING

RESSOURCES DEPLETION

RESSOURCES DEPLETION



Crédit : pixers

W H A T ? W H Y ? . A P R O B L E M ?

B E I N G S O M E T H I N G . N E W V A L U E S .



Crédit : nara.getarchive.net

A wide-angle photograph of a large industrial complex, likely a refinery or chemical plant. The foreground is dominated by several tall, dark smokestacks from which thick, white plumes of smoke or steam rise into a hazy, overcast sky. The industrial structures are a mix of light-colored concrete and metal, with various pipes, tanks, and scaffolding visible. The overall atmosphere is one of pollution and industrial activity.

AIR POLLUTION

A photograph of an industrial facility, likely a waste-to-energy plant. In the foreground, a group of workers wearing hard hats and blue uniforms walk towards the camera. In the background, a large industrial building with a prominent curved roof and a tall smokestack emitting a thick plume of white smoke. The sky is overcast.

AIR POLLUTION

SOIL POLLUTION



CO² EMISSIONS

Crédit : times.com

C&D WASTE
Barbara LAMBEC 24

W H A T ? . W H Y ? . A P R O B L E M ? B E I N G S O M E T H I N G . N E W V A L U E S .



WASTE

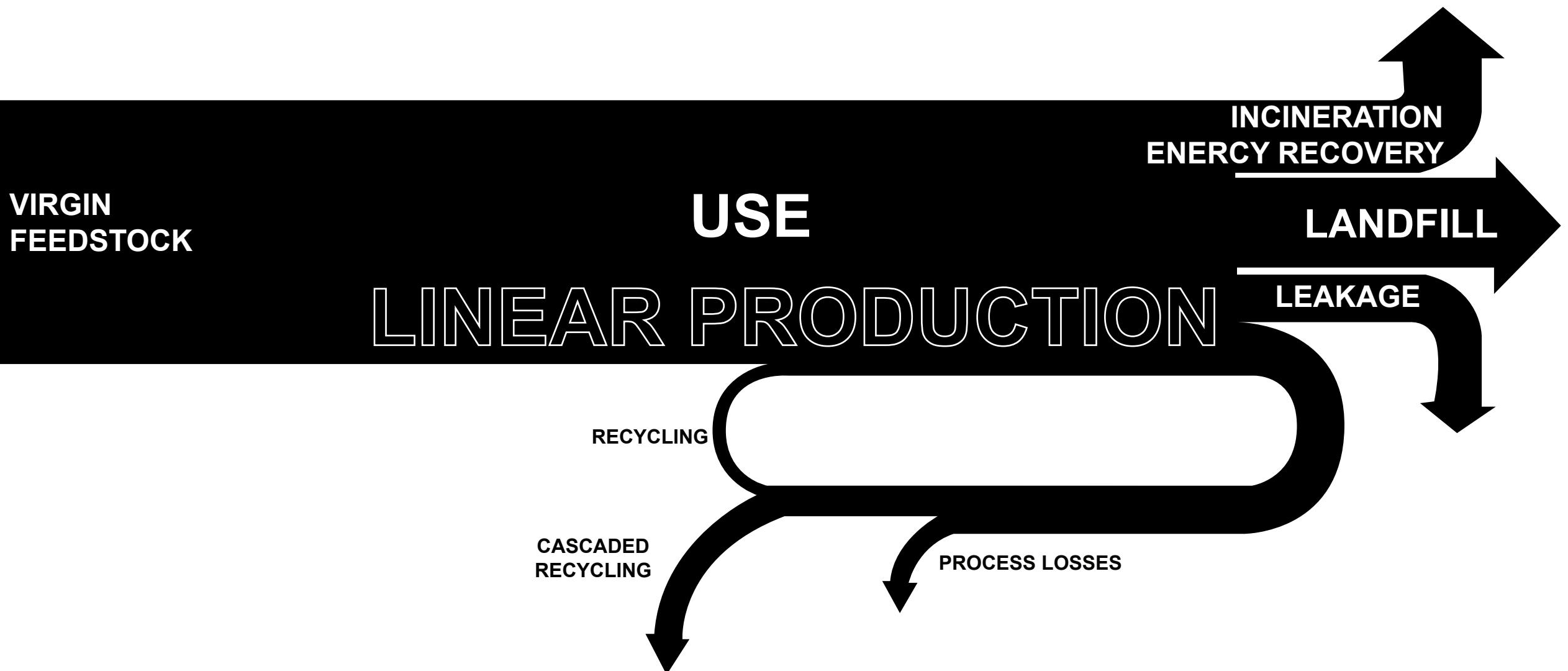
A PROBLEM

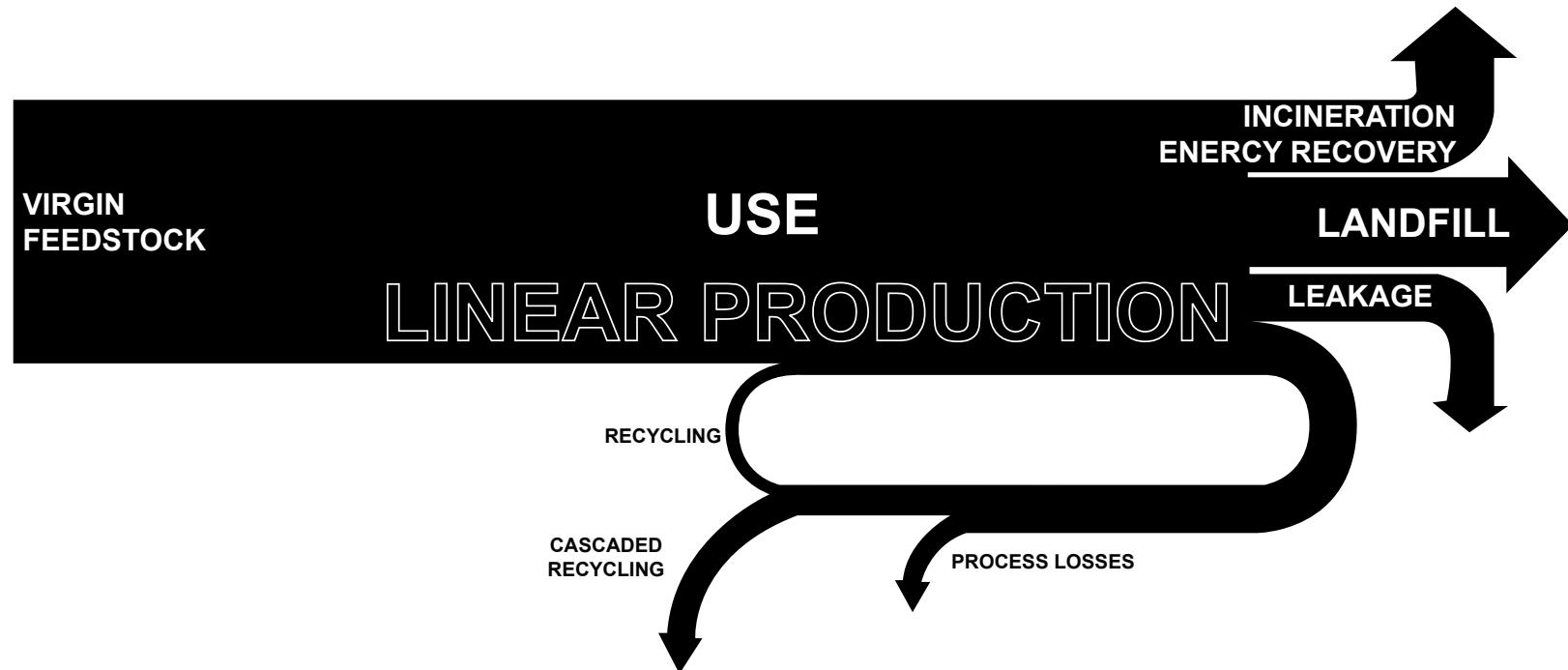
SOMETHING

WASTE

SOMETHING

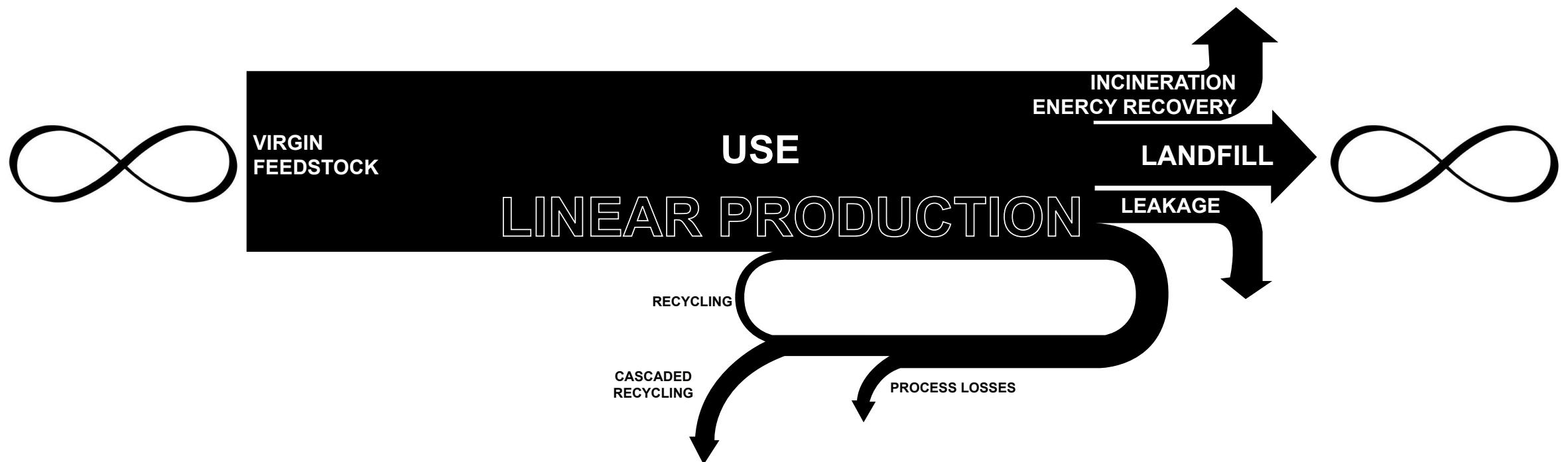
PRODUCTION





INFINITE RESOURCES

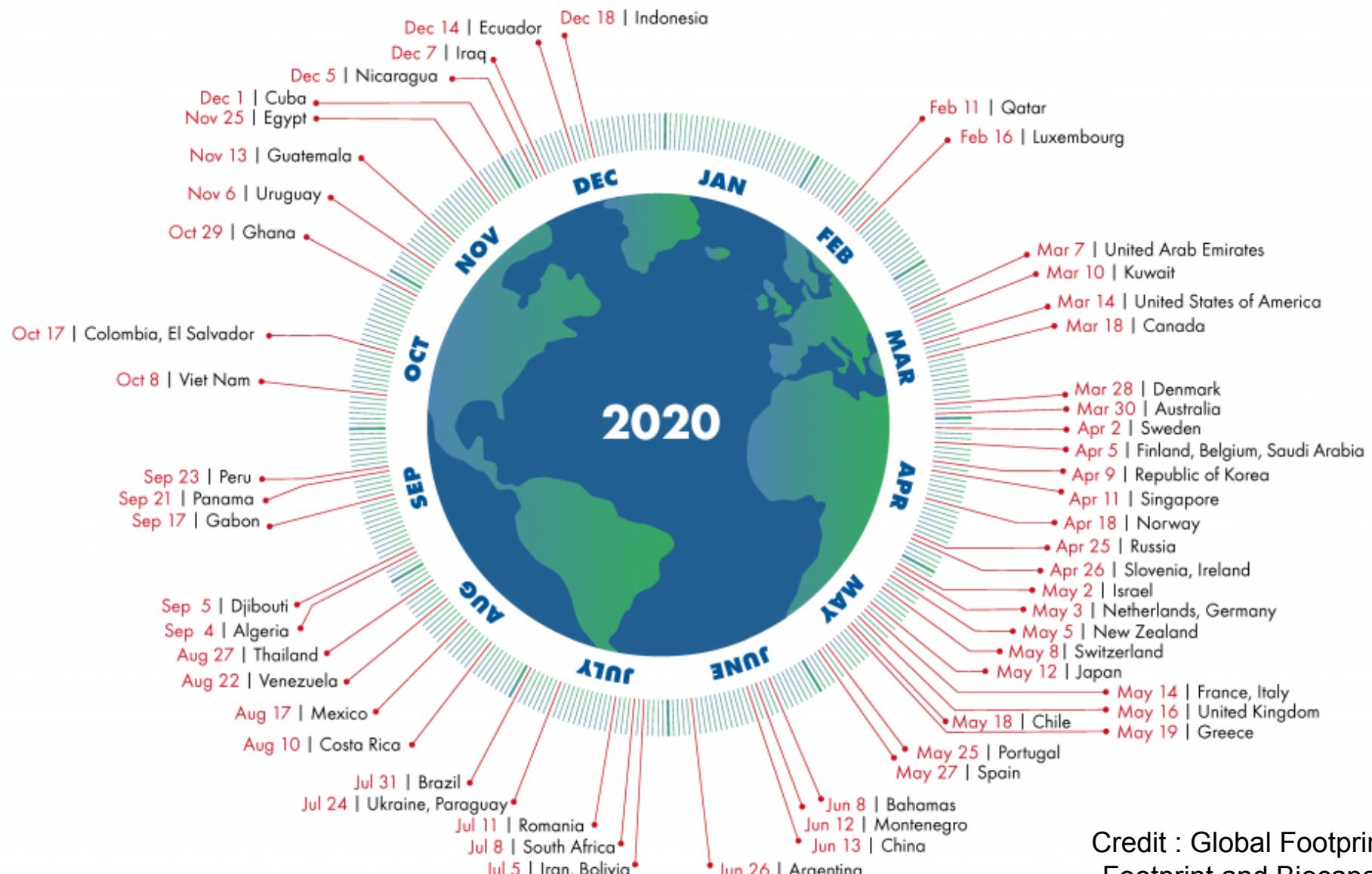
INFINITE REGENERATIVE CAPACITY OF THE EARTH





Crédit : flatscientificamerican.com





Credit : Global Footprint Network National Footprint and Biocapacity Accounts 2020

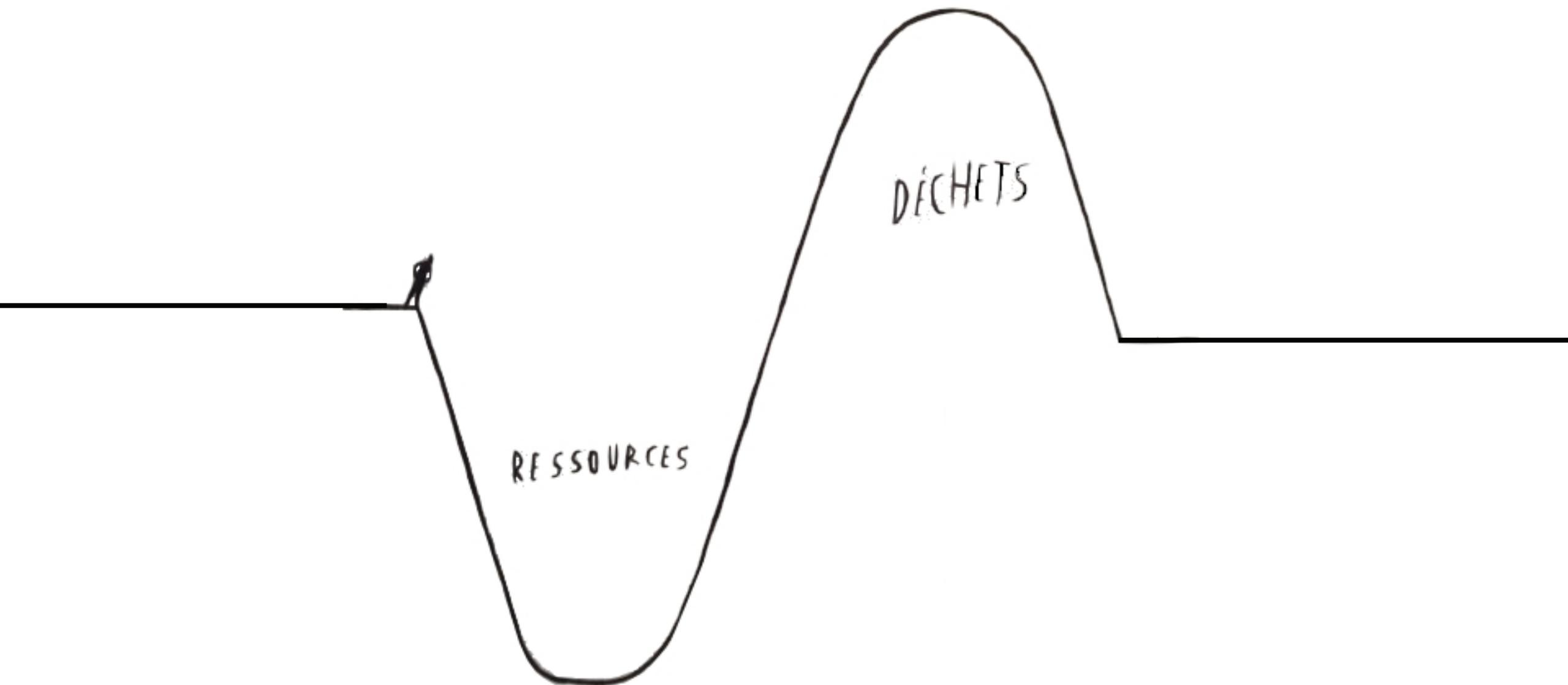
Our century will be the one of scarcity of ressources :
shortage of zinc is estimated in 2025,
lead in 2030, copper in 2040.

Figures are from : Encore Heureux, Julien Chopin & Nicolas Delon, Matière Grise,
Matiériaux / Réemploi / Architecture, Pavillon de l'Arsenal, 2014

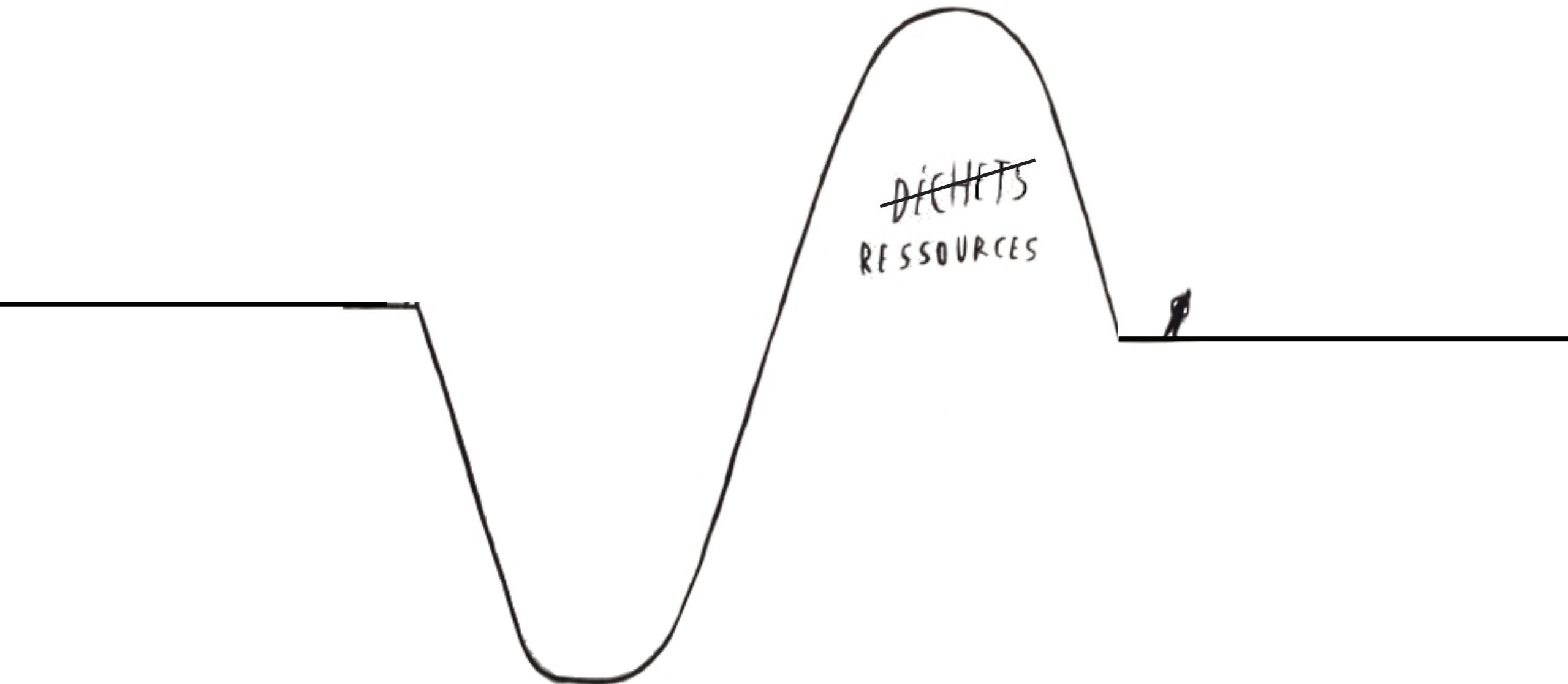
In 2000, the global volume of extracted resources amounted to 60 billion tonnes, while the volume of waste produced amounted to 12 billion tonnes, or 20% of the extraction.

The European construction sector alone accounts for almost **50% of the consumption of natural resources** and nearly **40% of the waste produced** in this area.

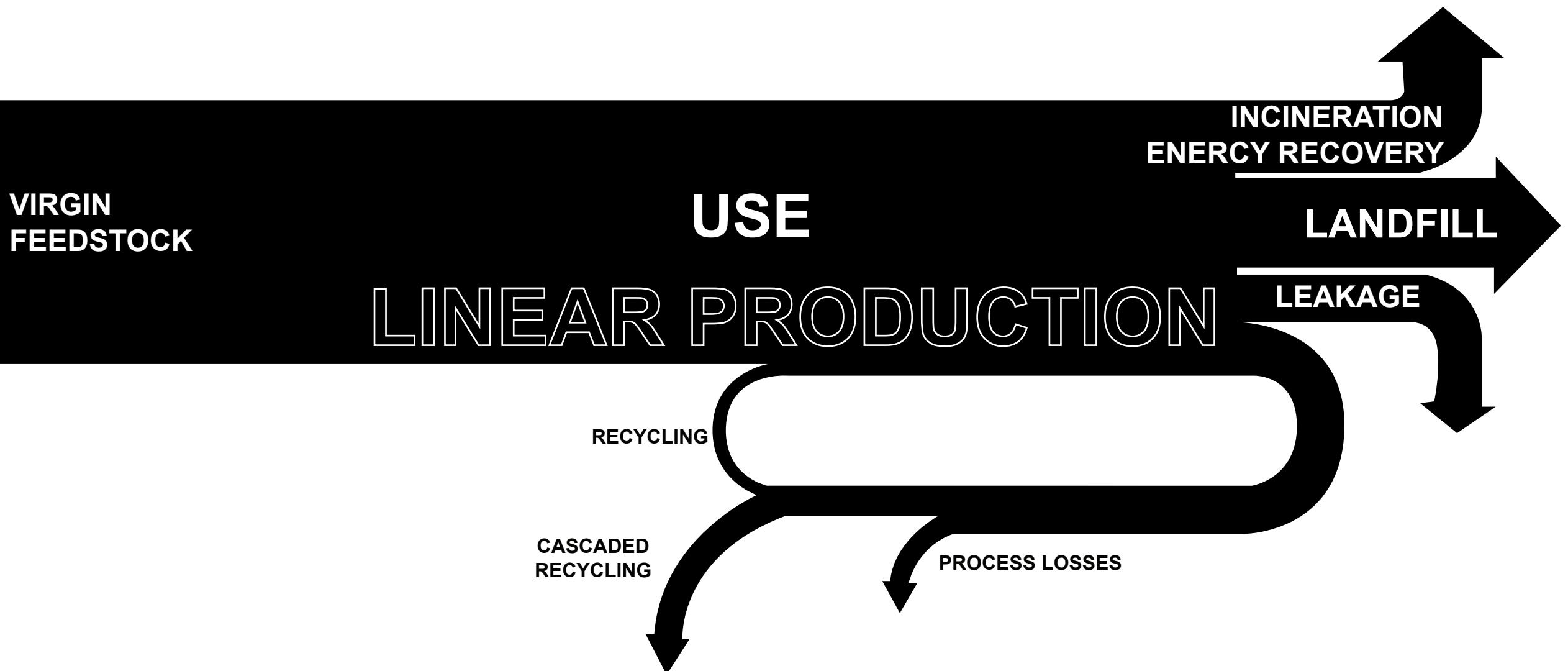
Figures are from : Encore Heureux, Julien Chopin & Nicolas Delon, Matière Grise, Matériaux / Réemploi / Architecture, Pavillon de l'Arsenal, 2014

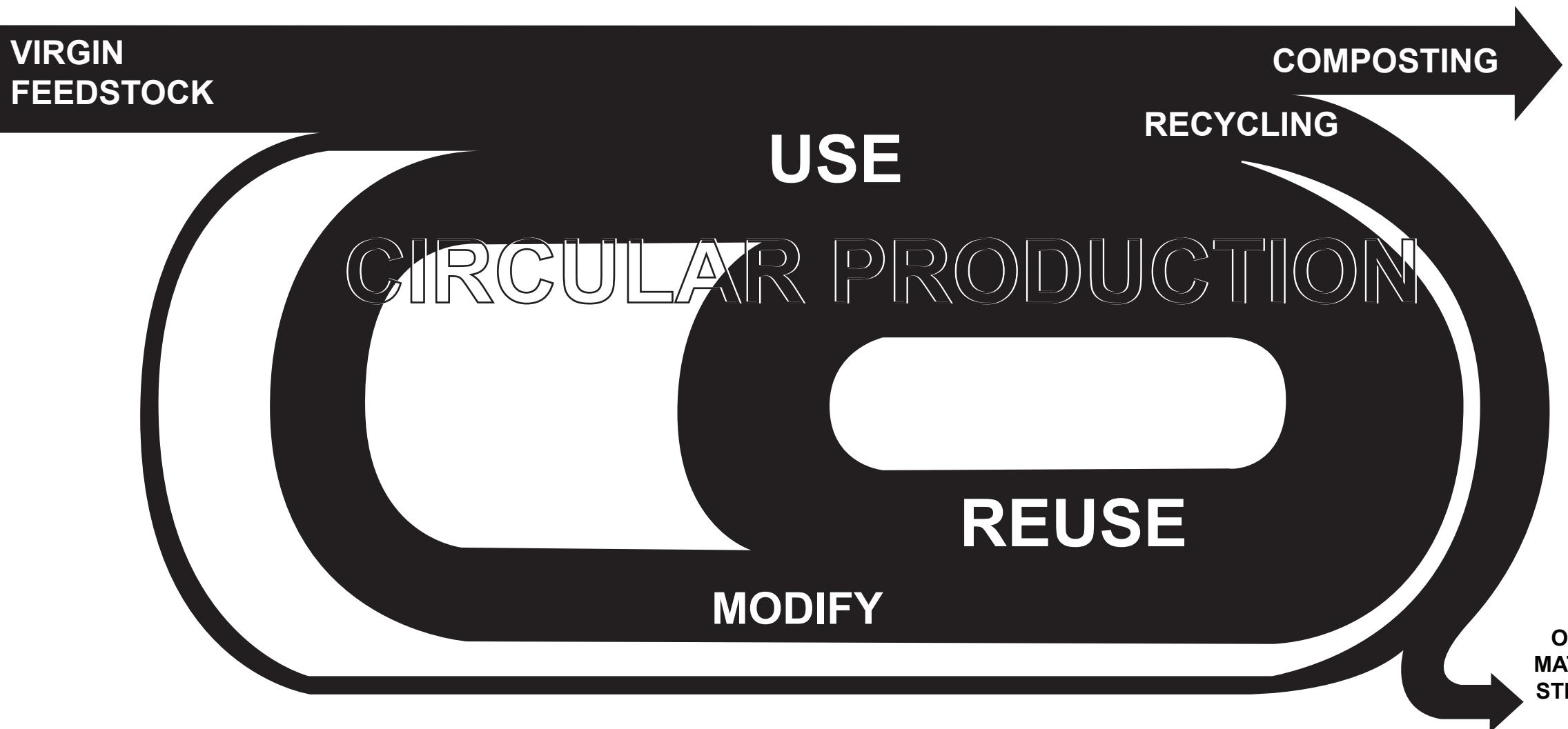


Credit : Encore Heureux, Julien Chopin & Nicolas Delon, Matière Grise, Matériaux /
Réemploi / Architecture, Pavillon de l'Arsenal, 2014



Based on Encore Heureux, Julien Chopin & Nicolas Delon, Matière Grise, Matériaux / Réemploi / Architecture, Pavillon de l'Arsenal, 2014

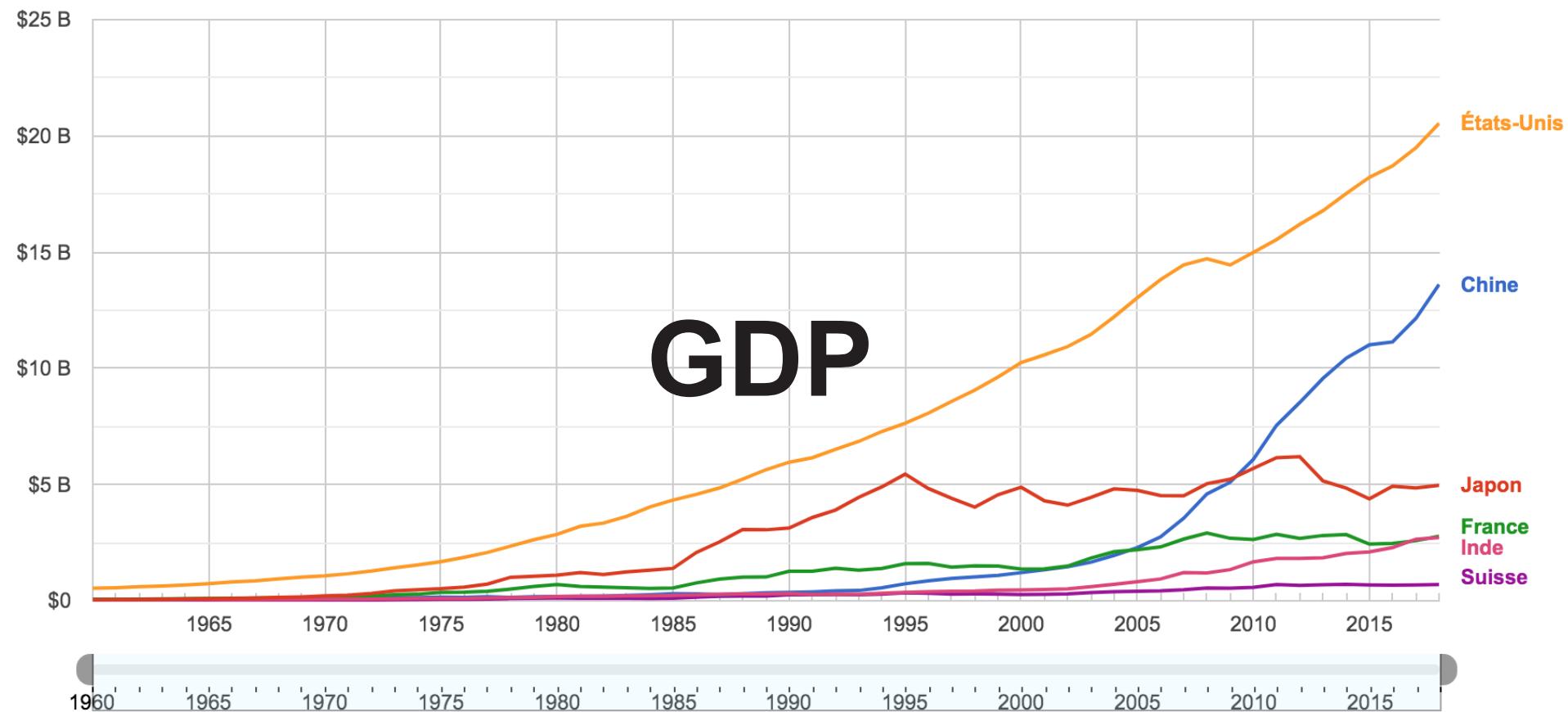




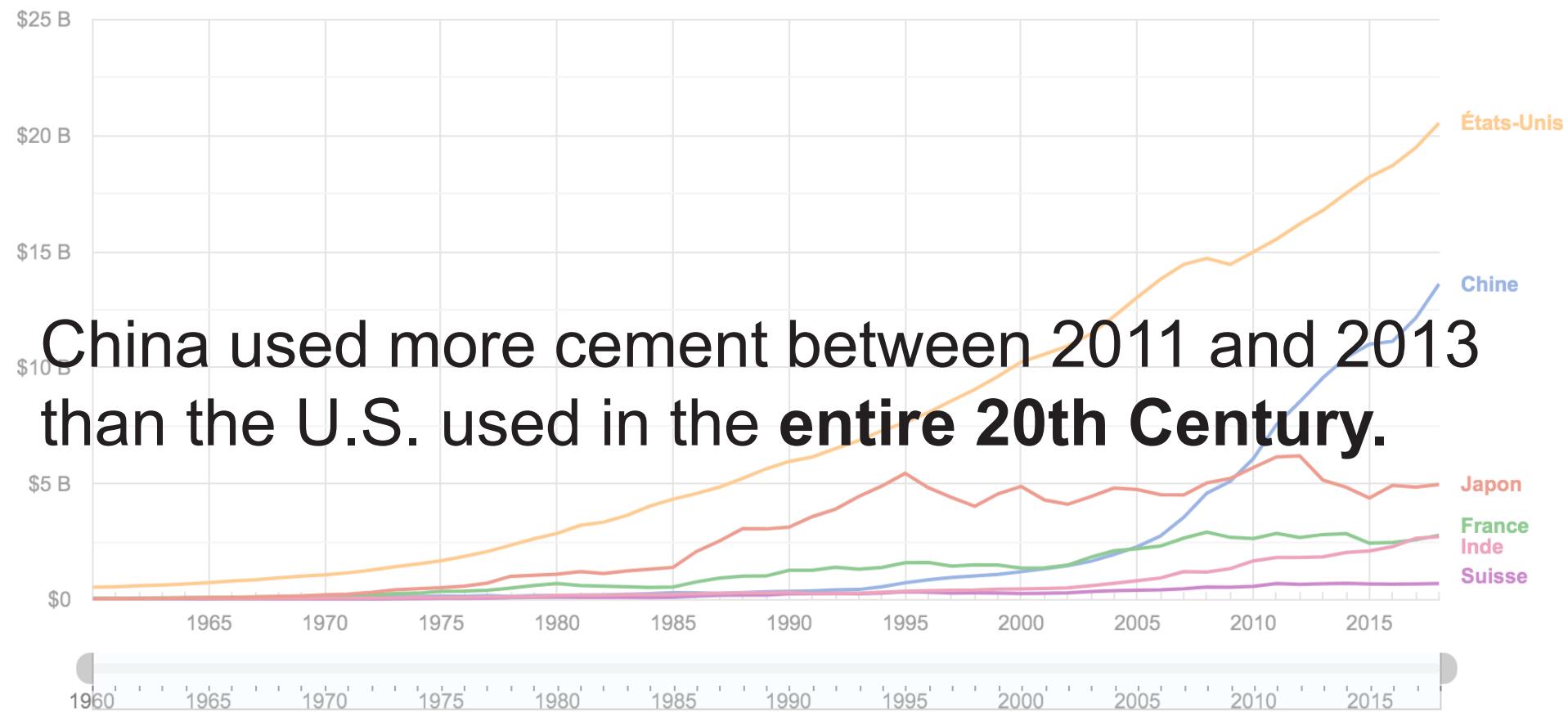
PRODUCTION SYSTEM

ECONOMICAL HEALTH

GDP



Crédit : Banque mondiale / Google



Ana Swanson, How China used more cement in 3 years than the U.S. did in the entire 20th Century, The Washington post, March 24th 2015

Crédit : Banque mondiale / Google

consumption, gross investment, government expenditure on goods and services and net exports.

RESSOURCES DEPLETION



Crédit : pixers

W H A T ? . W H Y ? . A P R O B L E M ? .

B E I N G S O M E T H I N G .

N E W V A L U E S .



Crédit : nara.getarchive.net



AIR POLLUTION

LINEAR  CIRCULAR

LINEAR NEW VALUES CIRCULAR

LINEAR **MONEY VALUE** **NEW VALUES** CIRCULAR

LINEAR

CIRCULAR

PRIVATE
PUBLIC AUTHORITIES

USERS

PUBLIC AUTHORITIES

EXOGENOUS ACTIONS
Worldwide

First ministries of environment :

1970 USA and UK
1971 france canada
1973 belgium

DEDICATED MINISTER
PUBLIC AUTHORITIES

EXOGENOUS ACTIONS
France

Ademe, French Agency for the Environment and Energy Management, has been created in 1991.

DEDICATED MINISTER
PUBLIC AUTHORITIES

DEDICATED MINISTER PUBLIC AUTHORITIES

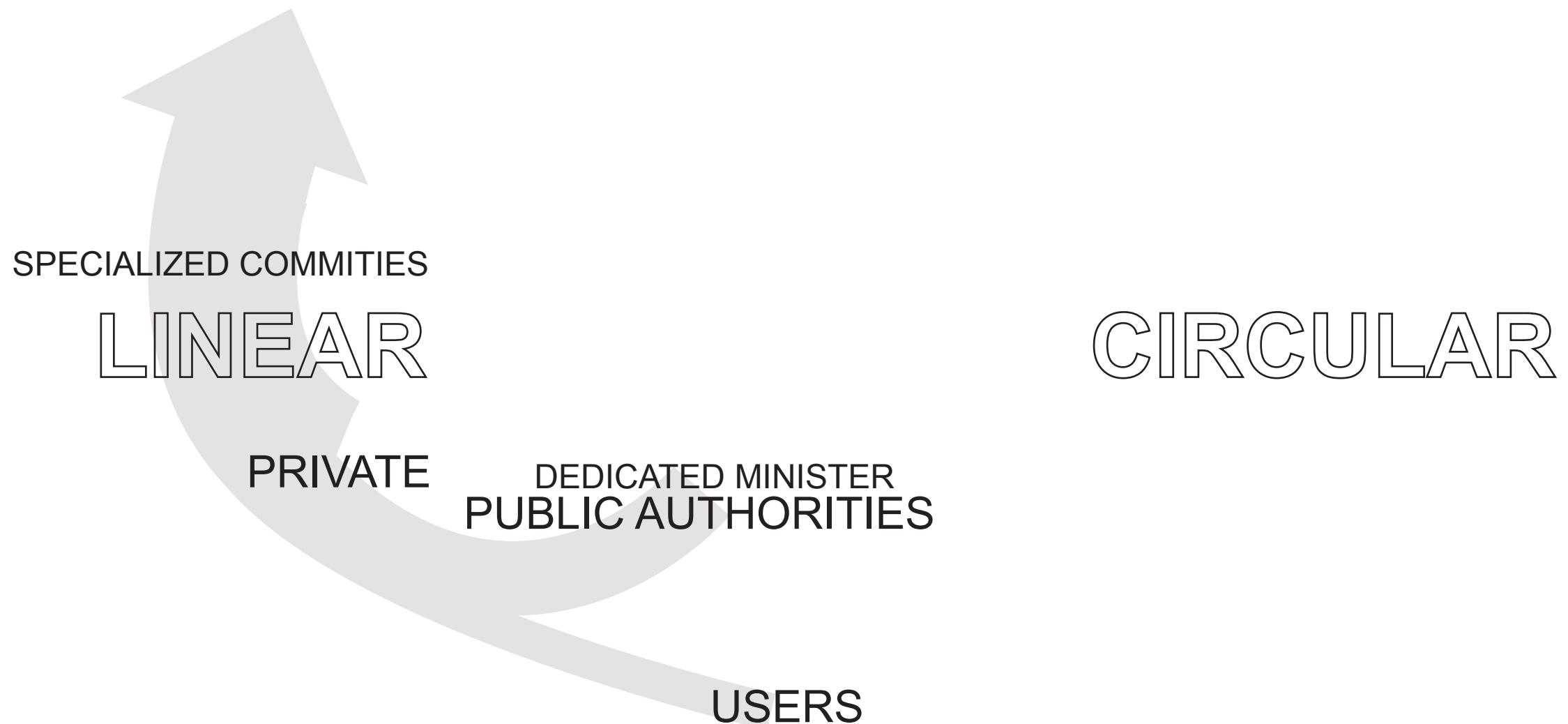
LINEAR

PRIVATE

DEDICATED MINISTER
PUBLIC AUTHORITIES

CIRCULAR

USERS



SPECIALIZED COMMITIES

EXOGENOUS ACTIONS **Worldwide**

In 1992 the United Nations Conference on the Environment takes place in Rio (UNFCCC).

SPECIALIZED COMMITIES

It led to the Kyoto Protocol (1997) concerning the reduction of greenhouse gases.

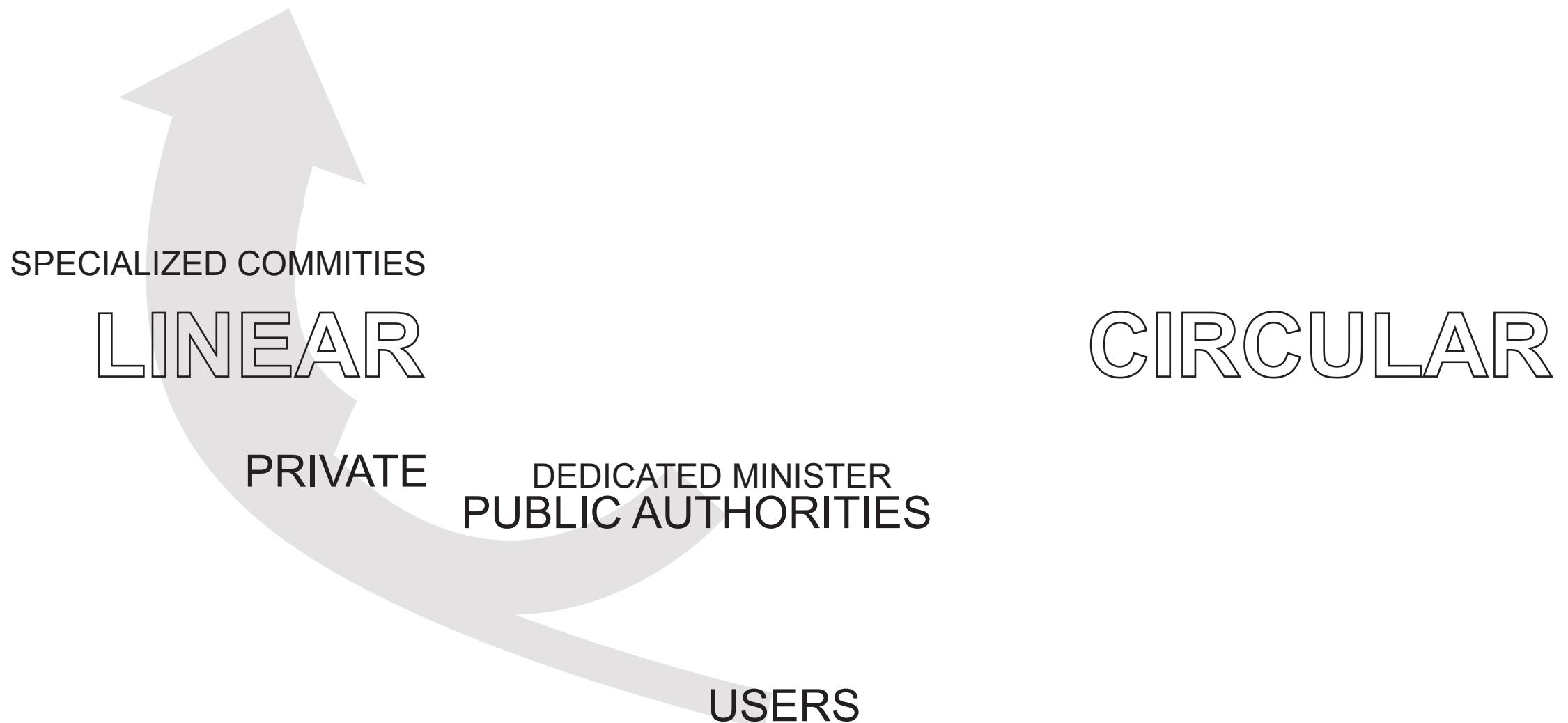
SPECIALIZED COMMITTEES

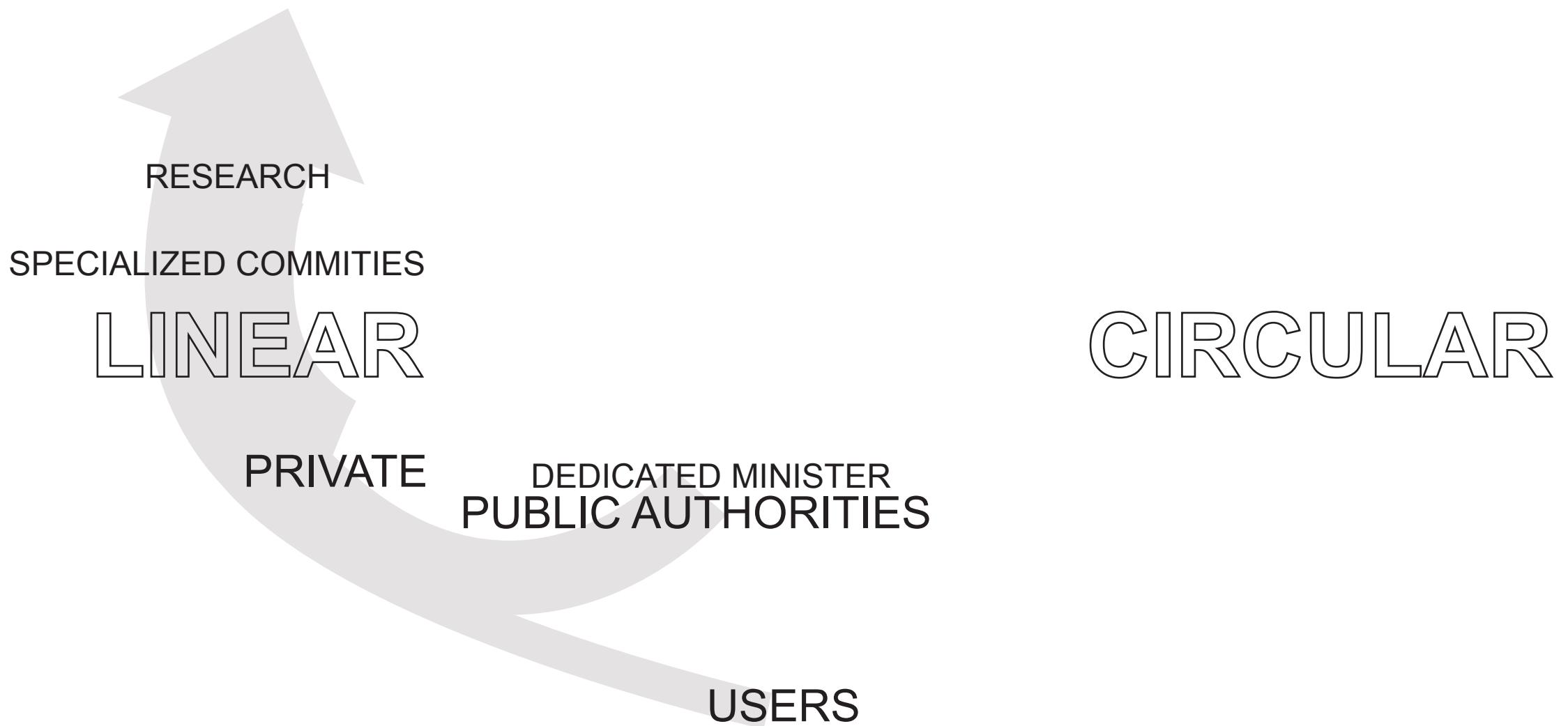
EXOGENOUS ACTIONS

France

In 2012, the Committee for Sustainable Territorial Activity and Industrial Ecology (Catei) support Ademe's researches and management.

SPECIALIZED COMMITIES





RESEARCH

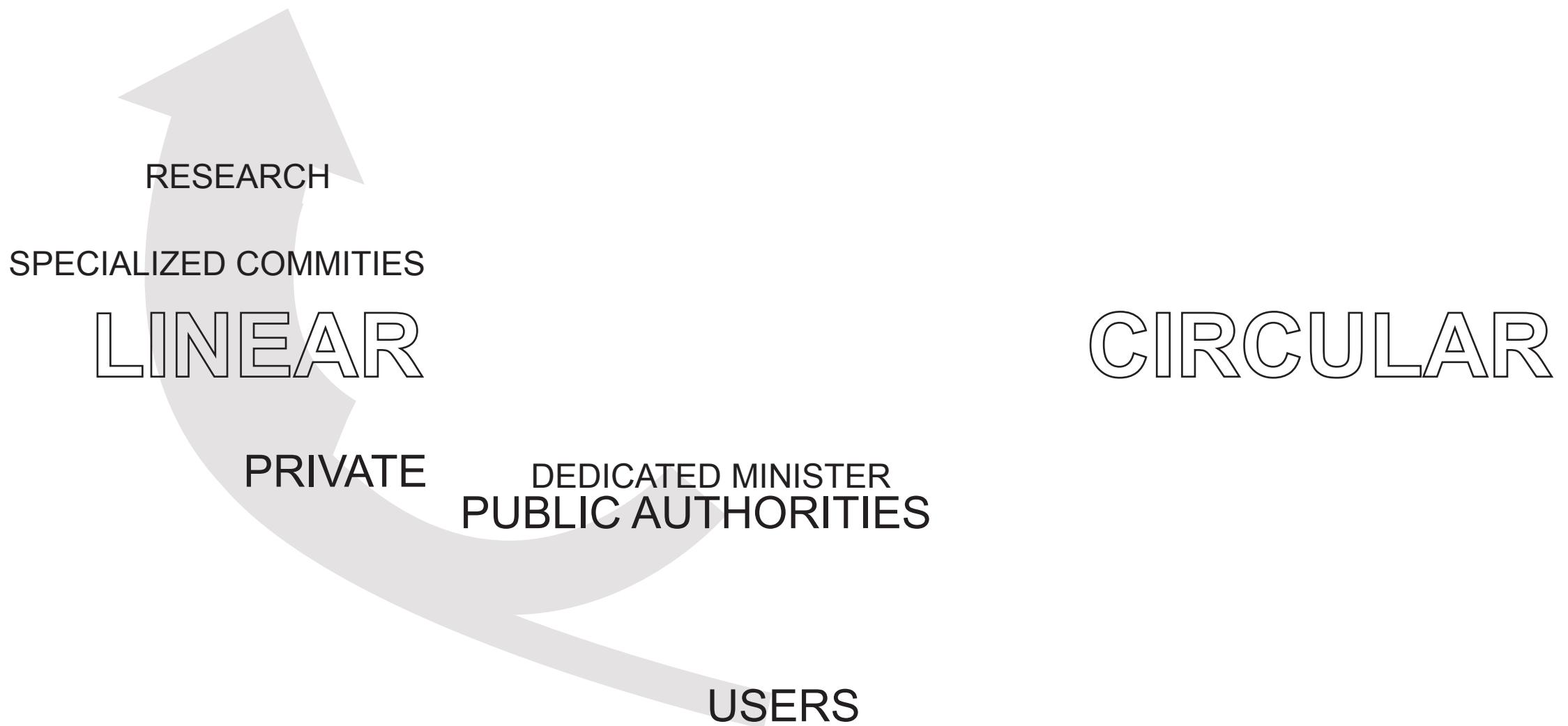
RESEARCH

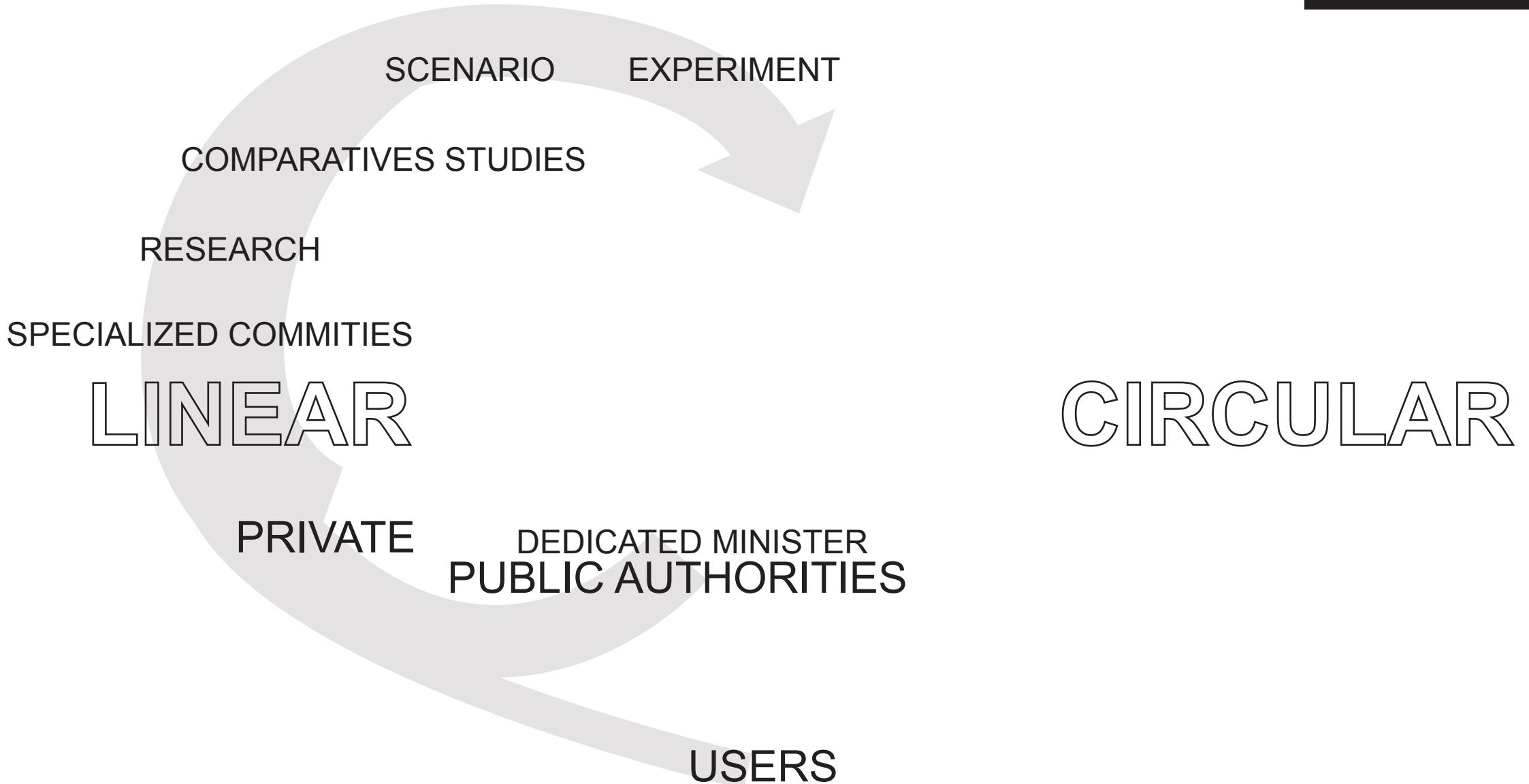
EXOGENOUS ACTIONS

France

In 2014, Paris, through ADEME and Catei initiatives, launched a project to improve the Parisian urban metabolism with, for example, recycle pavers and curbs in granite.
It leads to Architectural contests.

RESEARCH





SCENARIO EXPERIMENT

COMPARATIVES STUDIES

SCENARIO

EXPERIMENT

COMPARATIVES STUDIES

VALUATION**Endogenous study****BELLASTOCK Project** : the wasteland of spring warehouses, St-Denis Island

Repar + Actlab = field of re-use in situ. Followed by 2 years the deconstruction.

> proposed **new disciplines** :

+ assistant to the project owner, **expert of matter** and start of construction

+ **collector-enhancer agent**, which interests the actors of the **social and solidarity economy (ESS)**

SCENARIO

EXPERIMENT

COMPARATIVES STUDIES

VALUATION**Endogenous study**

As part of a university research program, the architecture firm WHS has been exploring since 2002 the re-use potential of concrete slabs resulting from the demolition of HLMs in the former Germany of the 1970s. The Plattenpalast, presented at the Venice Biennale in 2007 is a **prototype** of individual house thus realized.

SCENARIO EXPERIMENT

COMPARATIVES STUDIES

VALUATION

Cost-benefit analysis

A city like Brussels (1.1 million inhabitants) produces almost 600,000 tons of construction and demolition waste annually (excluding embankments). If 2% of this mass were diverted to re-use channels, this would already represent 12,000 tonnes of potential elements.

In 2007, the re-use sector in Great Britain handled 2.23 million tonnes of construction, which corresponded to a turnover of around 410 million euros.

Thus, applied in Brussels, **diverting 2% of C & D waste to re-use channels would generate 2.2 million euros.**

Figures are from : Rotor, Michaël Ghyoot, Lionel Devlieger, Lionel Billiet & André Warnier, *Déconstruction et réemploi, Comment faire circuler les éléments de construction*, Presses polytechniques et universitaires romandes, Lausanne, 2018

SCENARIO

EXPERIMENT

COMPARATIVES STUDIES

**Exogenous study
(± Pareto improvment)**

The CSTC within the research project *The Brussels building, source of new materials*, analyzed the waste produced on a site of complete demolition of a building of office of more than 23,500m², dating back to the 1960s in the city center. Consisting of a skeleton and concrete facades, the waste represents 92% of inert mass.

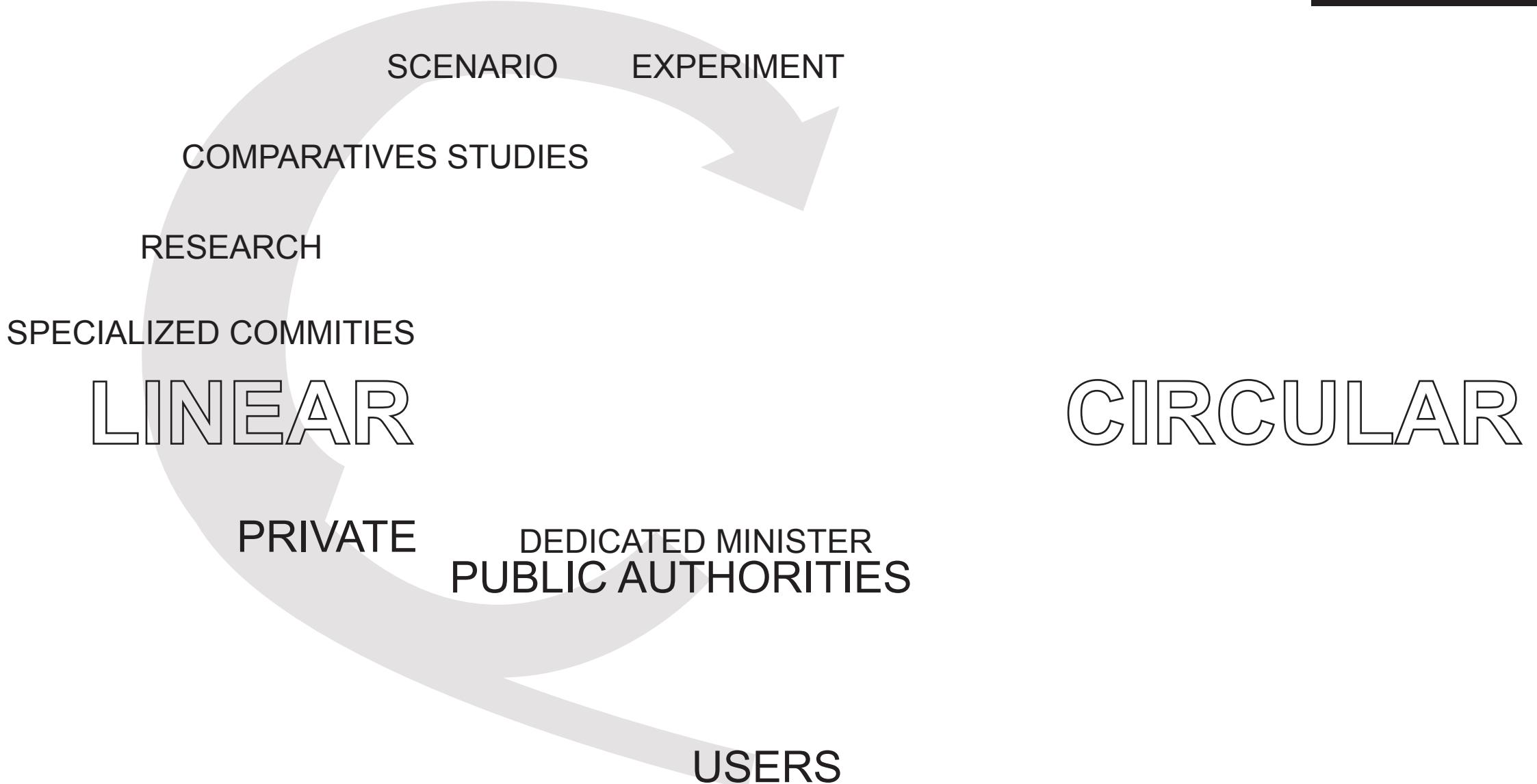
According to an inventory, if all the elements identified were reused, **re-use would constitute a 1.1% mass of waste** compared to 92% for recycling, 5.4% for landfilling and 1.3% for incineration.

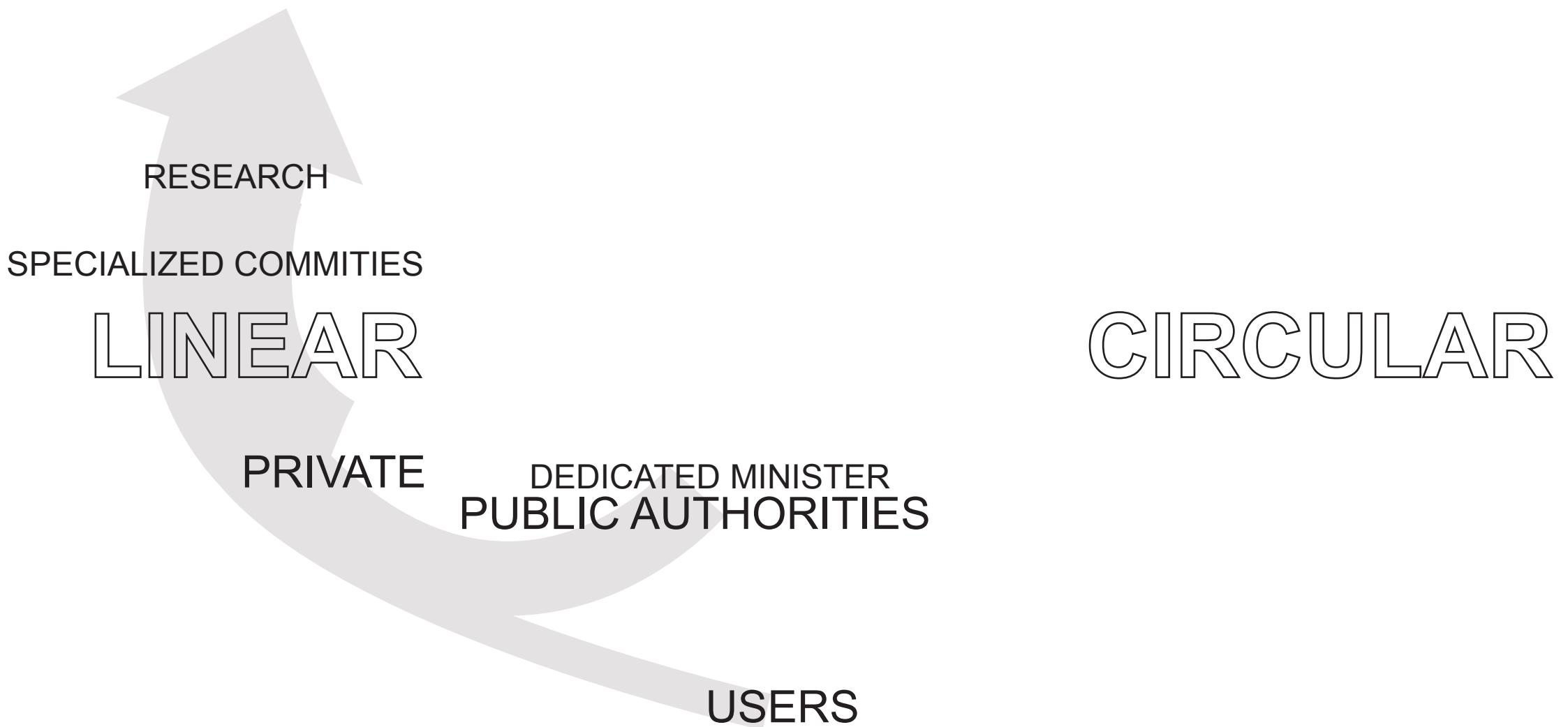
But, **compared to the market value it obtained 80 000 euros** of profits and if one takes into account the collection and the evacuation spared by the re-use one brings to 117 000 euros.
That is 2 jobs during 1 year.

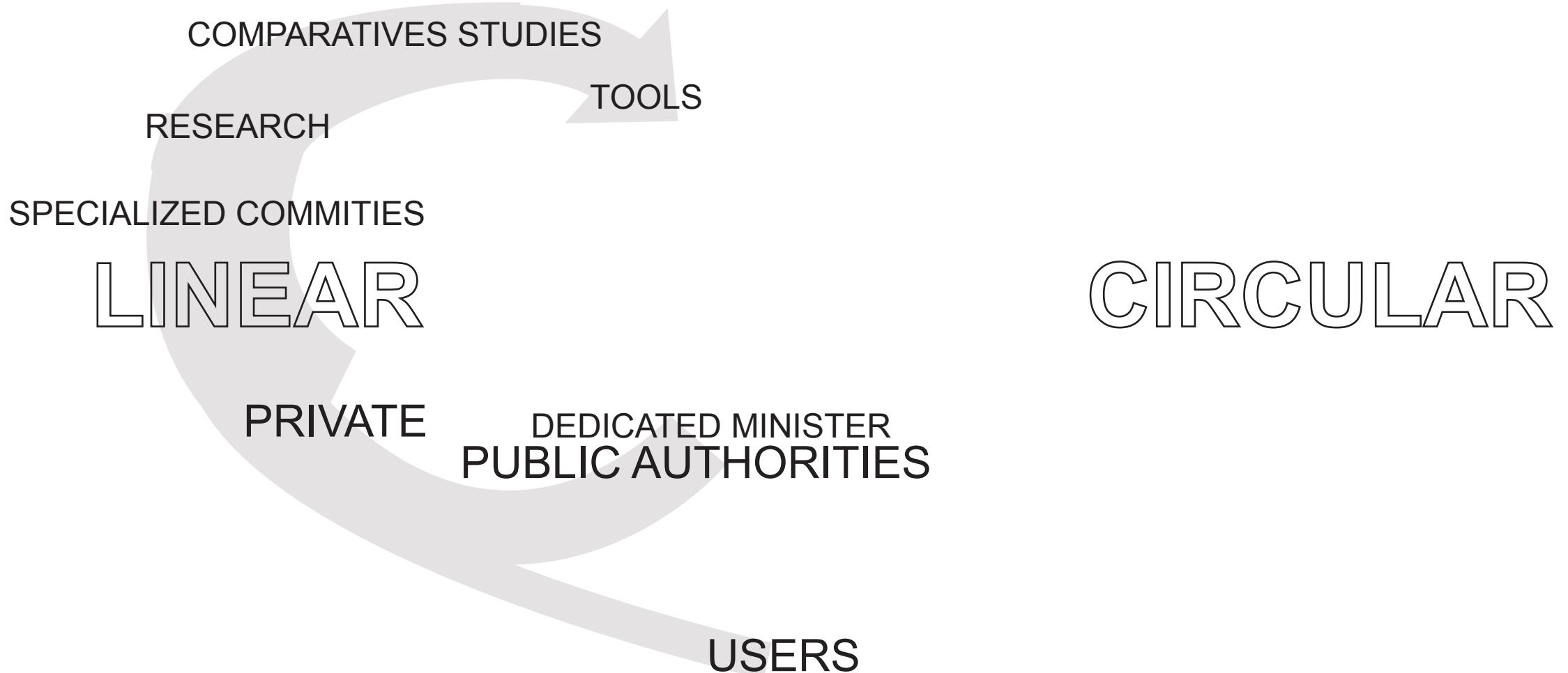
Figures are from : Encore Heureux, Julien Chopin & Nicolas Delon, *Matière Grise, Matériaux / Réemploi / Architecture*, Pavillon de l'Arsenal, 2014

SCENARIO EXPERIMENT

COMPARATIVES STUDIES







TOOLS

TOOLS

EXOGENOUS ACTIONS

EU

Mitigation and adaptation

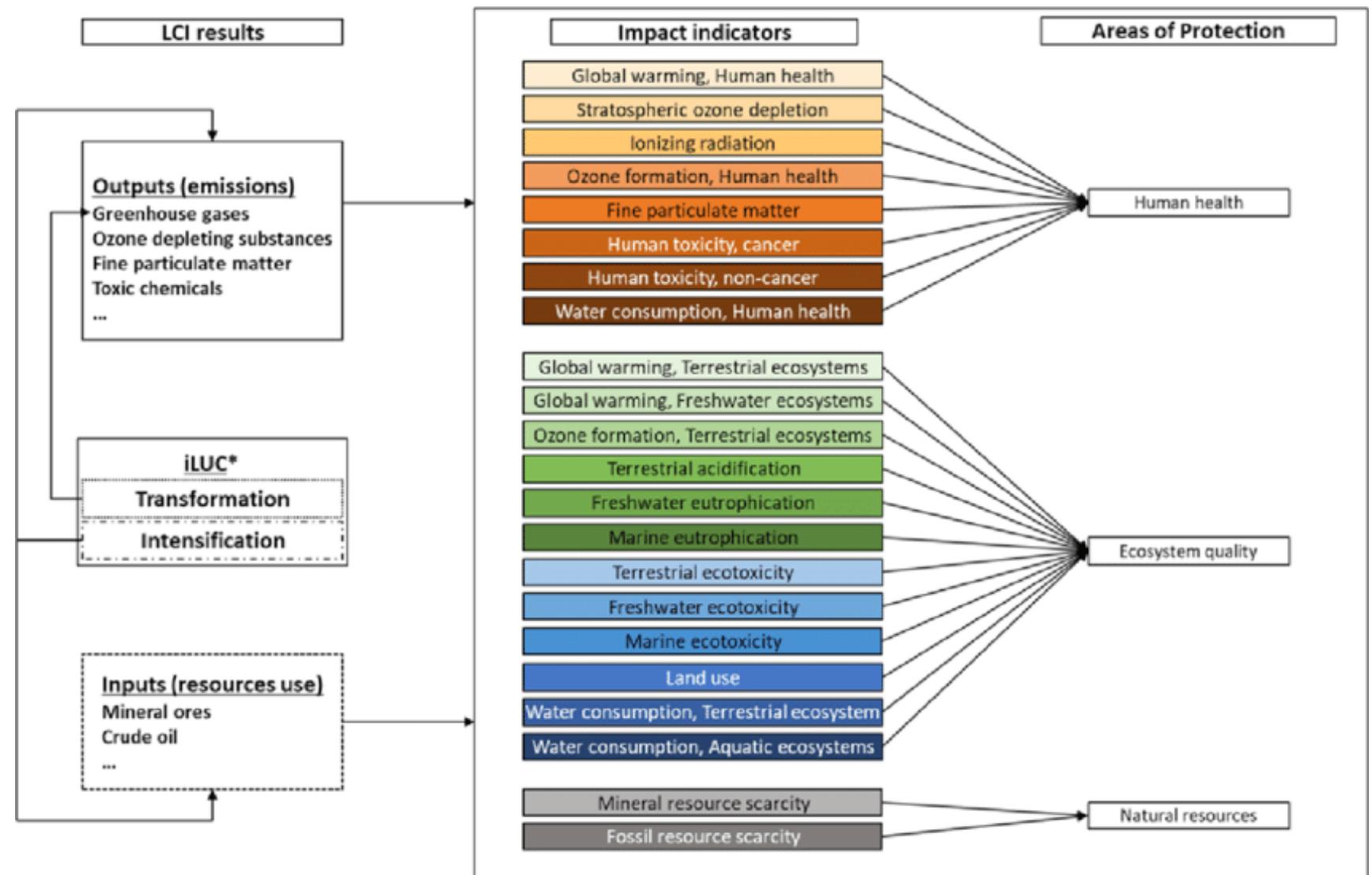
It existe a Regional plan for prevention and management of site waste (precedently introduced by Grenelle 2 (2010)) with European Policy and Prevention of the Horizon 2020.

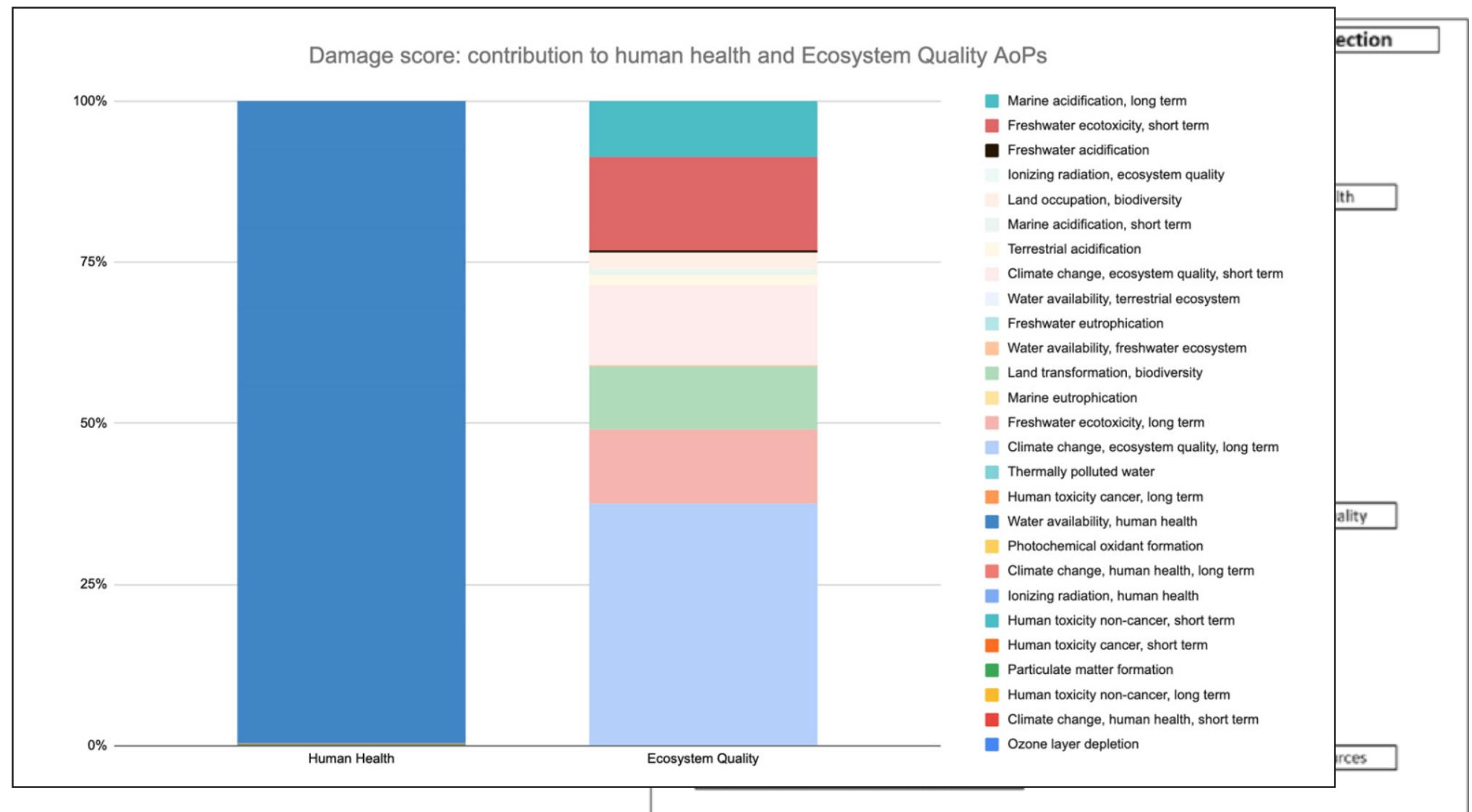
TOOLS

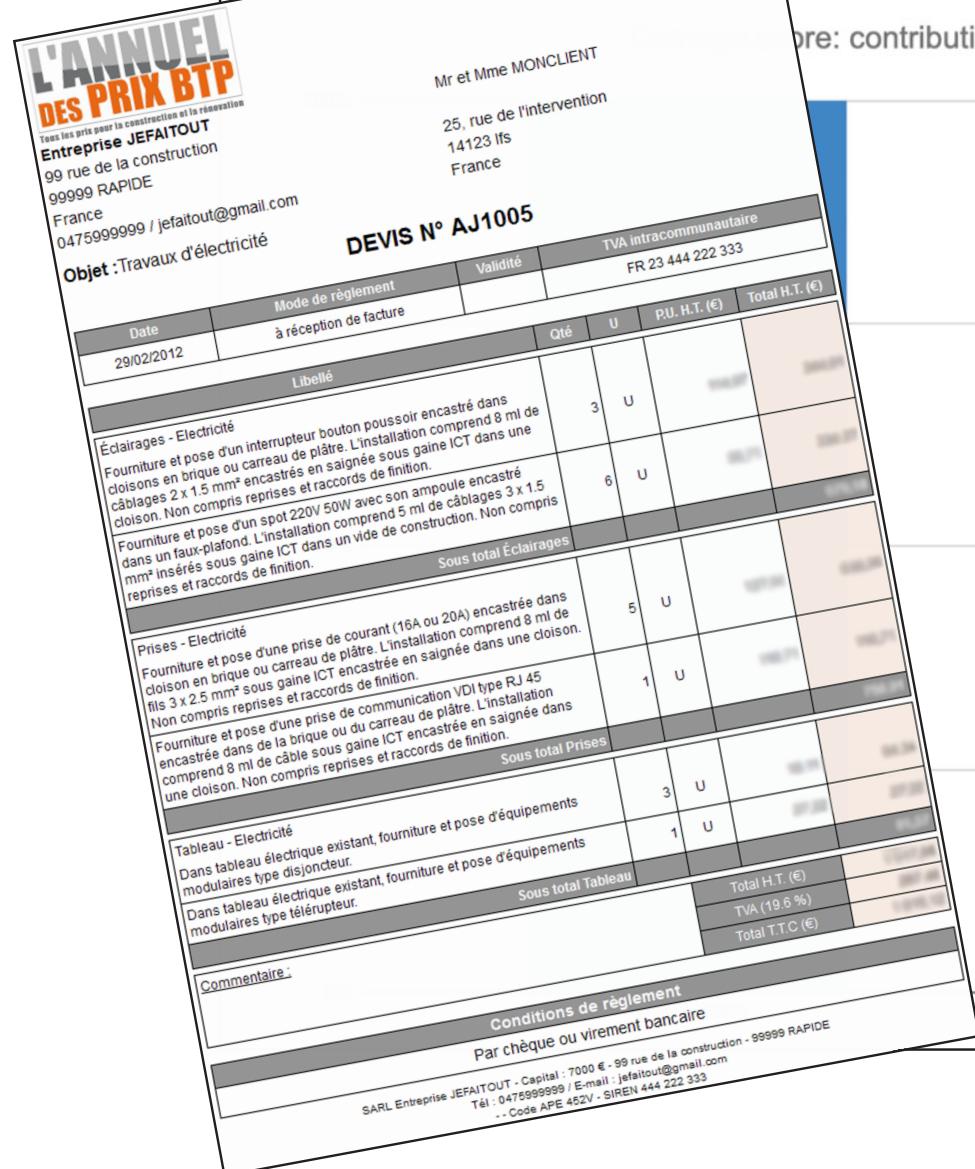
EXOGENOUS ACTIONS**Mitigation****LCA: Life Cycle Assessment**

Tools Ecolizer and the Netherlands Institute for Building Biology and Ecology (NIBE) offers a ranking. Ratios are the **CO2 equivalence** the impact and measured in kg of CO2.

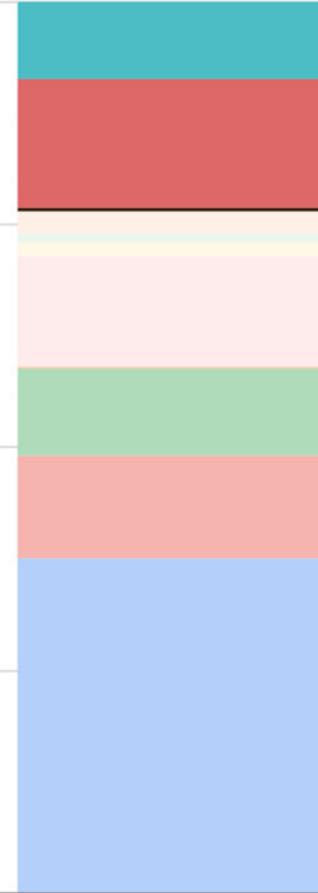
Also, the ReCiPe impact analysis method is developed, it takes into account 17 indicators and the results are expressed in **environmental points.**





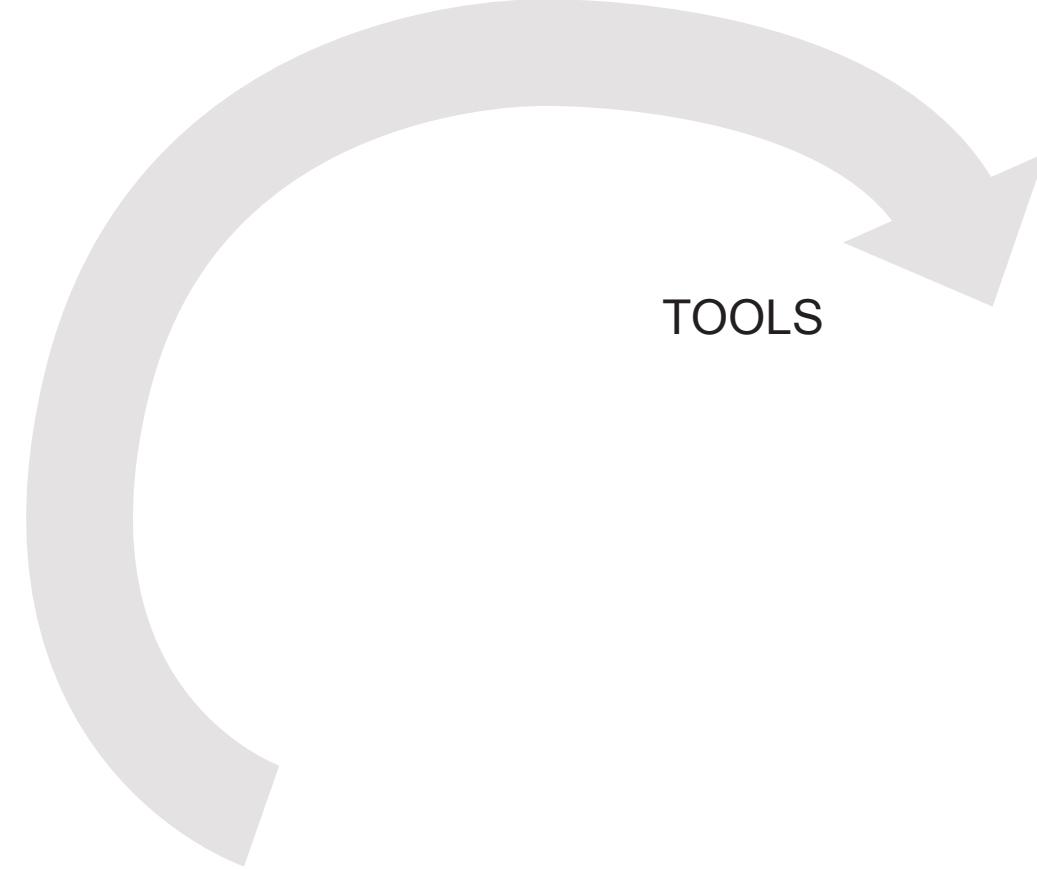


More: contribution to human health and Ecosystem Quality AoPs

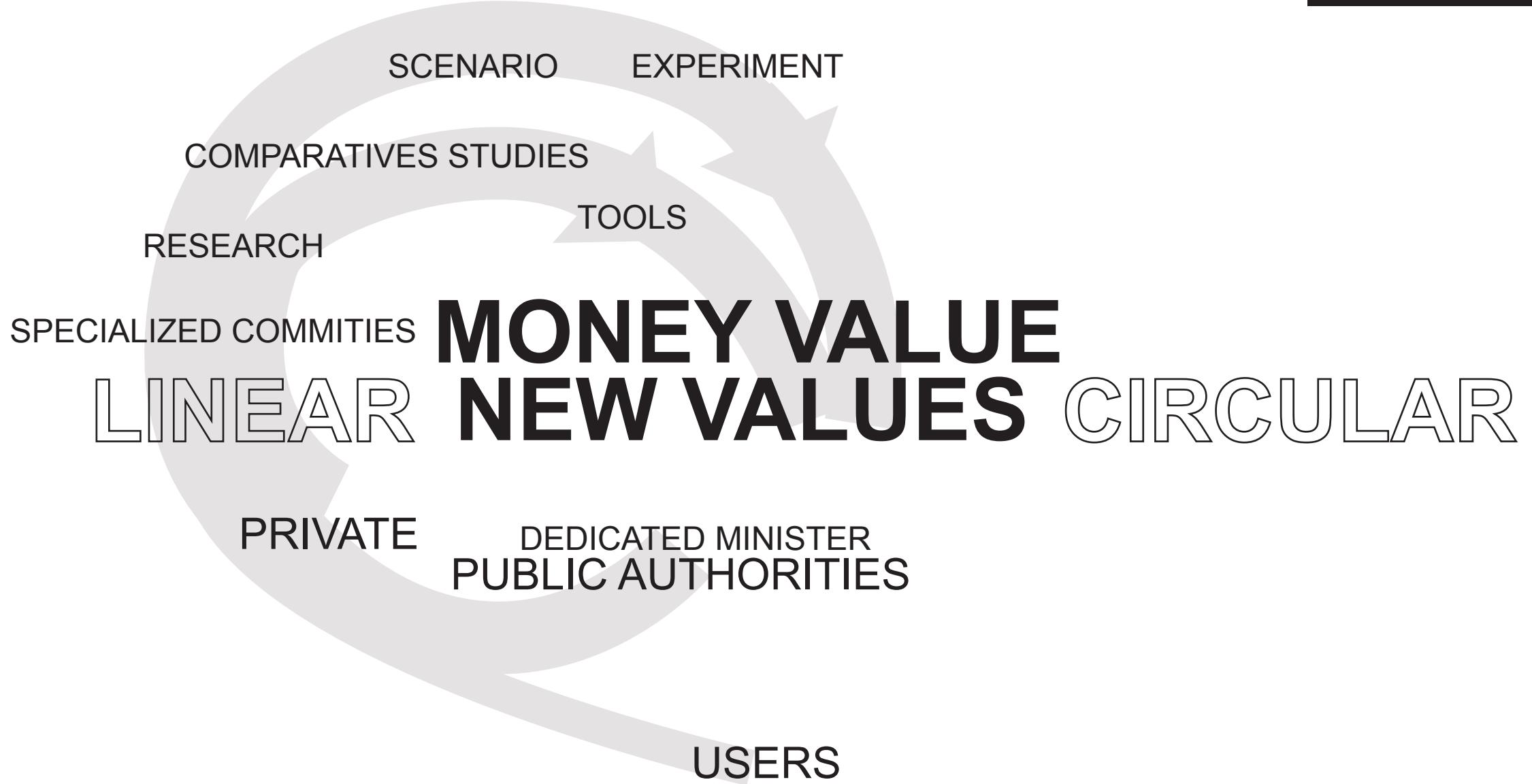


Ecosystem Quality

- Marine acidification, long term
- Freshwater ecotoxicity, short term
- Freshwater acidification
- Ionizing radiation, ecosystem quality
- Land occupation, biodiversity
- Marine acidification, short term
- Terrestrial acidification
- Climate change, ecosystem quality, short term
- Water availability, terrestrial ecosystem
- Freshwater eutrophication
- Water availability, freshwater ecosystem
- Land transformation, biodiversity
- Marine eutrophication
- Freshwater ecotoxicity, long term
- Climate change, ecosystem quality, long term
- Thermally polluted water
- Human toxicity cancer, long term
- Water availability, human health
- Photochemical oxidant formation
- Climate change, human health, long term
- Ionizing radiation, human health
- Human toxicity non-cancer, short term
- Human toxicity cancer, short term
- Particulate matter formation
- Human toxicity non-cancer, long term
- Climate change, human health, short term
- Ozone layer depletion







RESEARCH

MONEY VALUE NEW VALUES

PRIVATE

**ENDOGENOUS ACTIONS
Companies**

During 2019, Geminor saved emissions of around 416,400 tonnes of carbon dioxide equivalents across Europe.

RESEARCH

MONEY VALUE NEW VALUES

PRIVATE

The annual assessment on the environmental impact of the company's operations, shows the total emissions savings over the year were **roughly equal to the average annual emissions of around 62,000 EU citizens or close to 293,300 cars.**

The report highlights that the waste firm has reduced its emissions by around 131,742 tonnes compared to 2018, providing an average climate factor of -0.313 tonnes of carbon dioxide per tonne of waste – this marks an improvement from -0.213 tonnes of carbon dioxide per tonne in 2018.

Credit : [Futurnetzero.com](https://futurnetzero.com)

C&D WASTE
Barbara LAMBEC 94

ENDOGENOUS ACTIONS Companies

Geminor CEO Kjetil Vikingstad said: “*In 2019 we handled 1.4 million tonnes of waste feedstock for material recycling and energy production all over Europe.*

RESEARCH

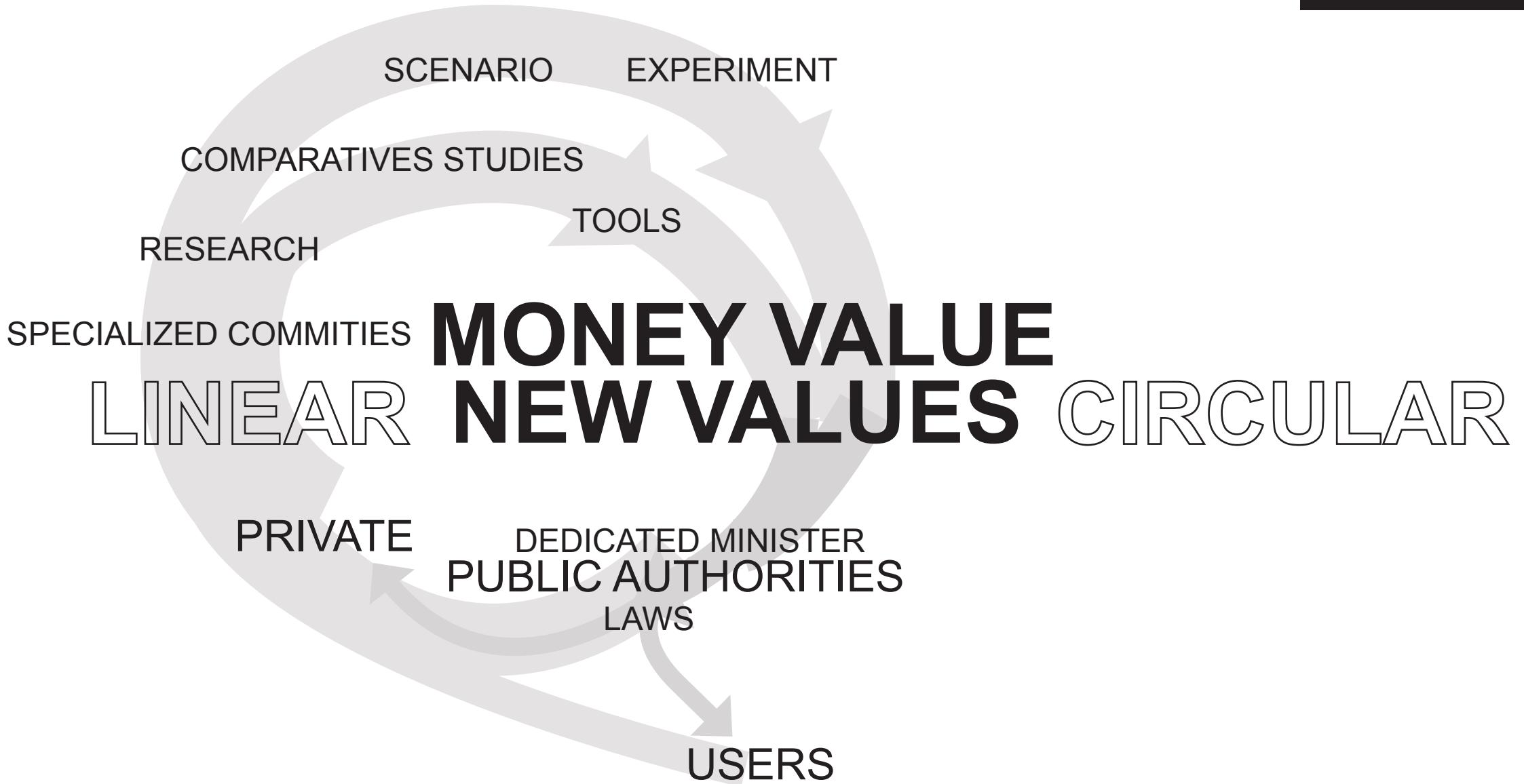
MONEY VALUE NEW VALUES

But while the total volume is approximately the same as in 2018, the total carbon dioxide savings has increased dramatically.

PRIVATE

This is due to increased volumes of treated refuse-derived fuel from the UK which is diverted from landfills, and other factors such as more recycling of waste wood and an increase in metals recycling. We are very pleased to see that waste management services are proving more sustainable than ever.”





LAWS

EXOGENOUS ACTIONS

USA

Mitigation and adaptation

CALIFORNIA, SAN FRANCISCO :

In 2006, the city **obliges all building professionals to recycle at least 65% of their debris**, such as concrete, metal or wood, in approved centers ...

At the same time, the city is committed to use only materials recycled for public works related to asphalt, sidewalks or gutters.

LAWS

EXOGENOUS ACTIONS

USA

Mitigation and adaptation

WASHINGTON, SEATTLE :

In 2014, Seattle passed a bylaw requiring homeowners to prepare a **«salvage assessment»** for each demolition permit application.

LAWS

EXOGENOUS ACTIONS

USA

Mitigation and adaptation

LAWS

Figures are from : Encore Heureux, Julien Chopin & Nicolas Delon, *Matière Grise, Matériaux / Réemploi / Architecture*, Pavillon de l'Arsenal, 2014

WASHINGTON, SEATTLE :

In 2014, Seattle passed a bylaw requiring homeowners to prepare a **«salvage assessment»** for each demolition permit application.

There is **no obligation of result nor choice concerning the person who draws up the inventory.** However, the potential that a building represents is subjective and depends on the person who esteems it.

A materials resale business has up to 75% potential, an outside consultant 62%, traditional contractors 31%, demolition 22% and owner 5%.

EXOGENOUS ACTIONS
EU
Mitigation and adaptation

In 2008, the Directive 2008/98 / EC of the European Parliament and of the Council about waste and repealed of certain directives implement a **70% ambition in recycling of C & D materials** (construction and demolition).

Risk perceptions + «rationality»
in decision-making
STRATEGIC INTERACTION

Those objectives do not lead to dissuasive measures if this objectives wasn't achieved.

LAWS

EXOGENOUS ACTIONS
EU
Mitigation and adaptation

Creation of **standards** such as ISO14001 for the environment and OSHAS18001 for safety.

LAWS



LAWS







TAX

EXOGENOUS ACTIONS

Worldwide

Willing to pay or

willing to accept

TGAP (general tax on polluting activities) is an incitive government tool.

TAX

EXOGENOUS ACTIONS

Worldwide

Willing to pay or

willing to accept

TGAP (general tax on polluting activities) is an incitive government tool.

But in France or Belgium, those taxes are 4 times lower than in the Netherlands in order not to generate wild dumps.

Risk perceptions + «rationality»
in decision-making

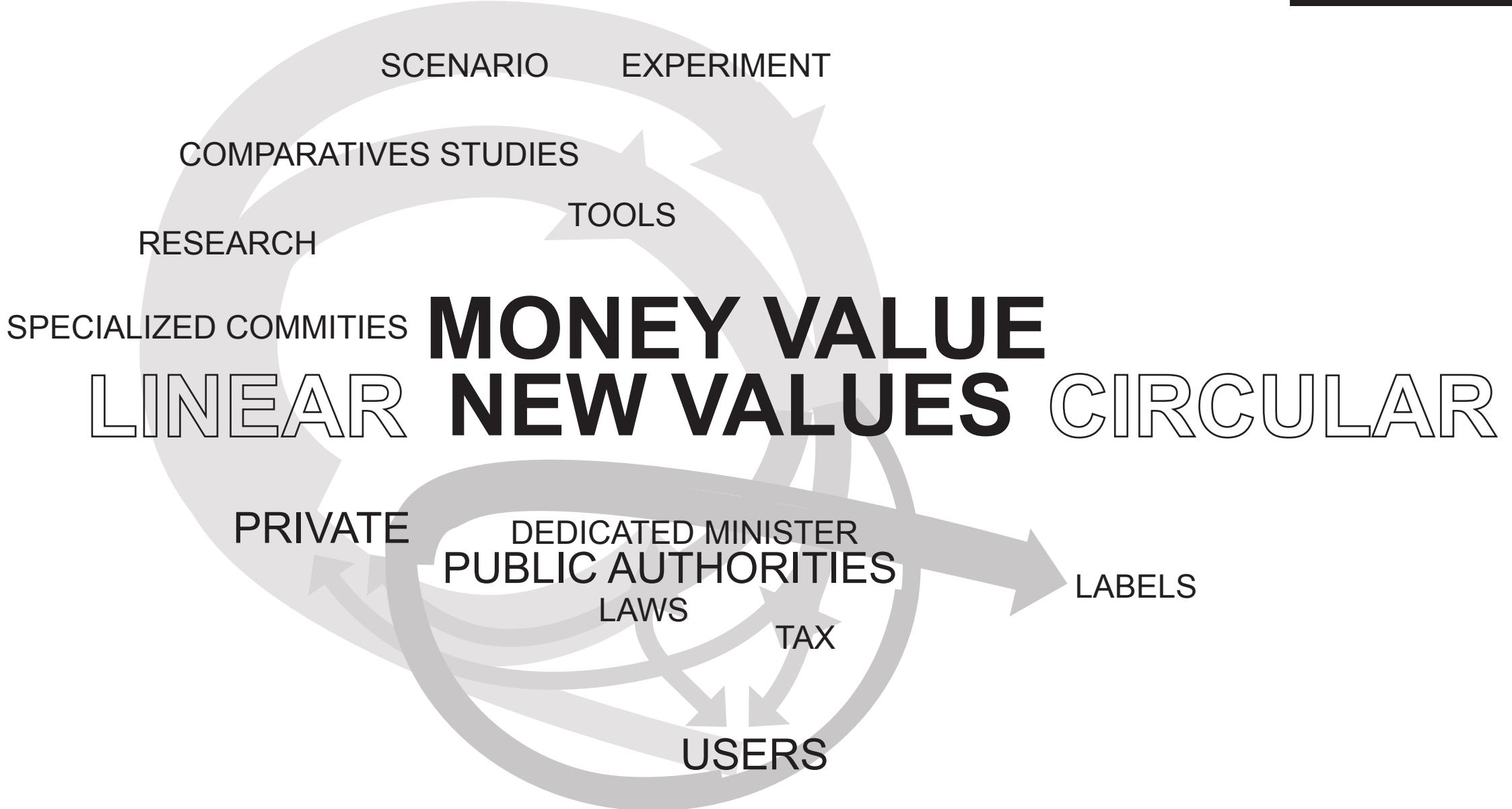
STRATEGIC INTERACTION

It does not encourage to look for other alternative
(reuse for instance).

TAX

TAX





LABELS



Concerning wood, FSC and FSCrecycler are labels in the re-use field providing guaranties about timber origin, **sustainable management of resources along the production chain, properly remunerated labor, resources outside conflict zones...**

LABELS

ENDOGENOUS ACTIONS

Denmark

Adaptation

In Denmark, Gamle Mursten, a reseller, has put in place a **performance certification scheme for bricks**, including a **voluntary certification process** through the establishment of a European Technical Assessment.

LABELS

ENDOGENOUS ACTIONS Companies

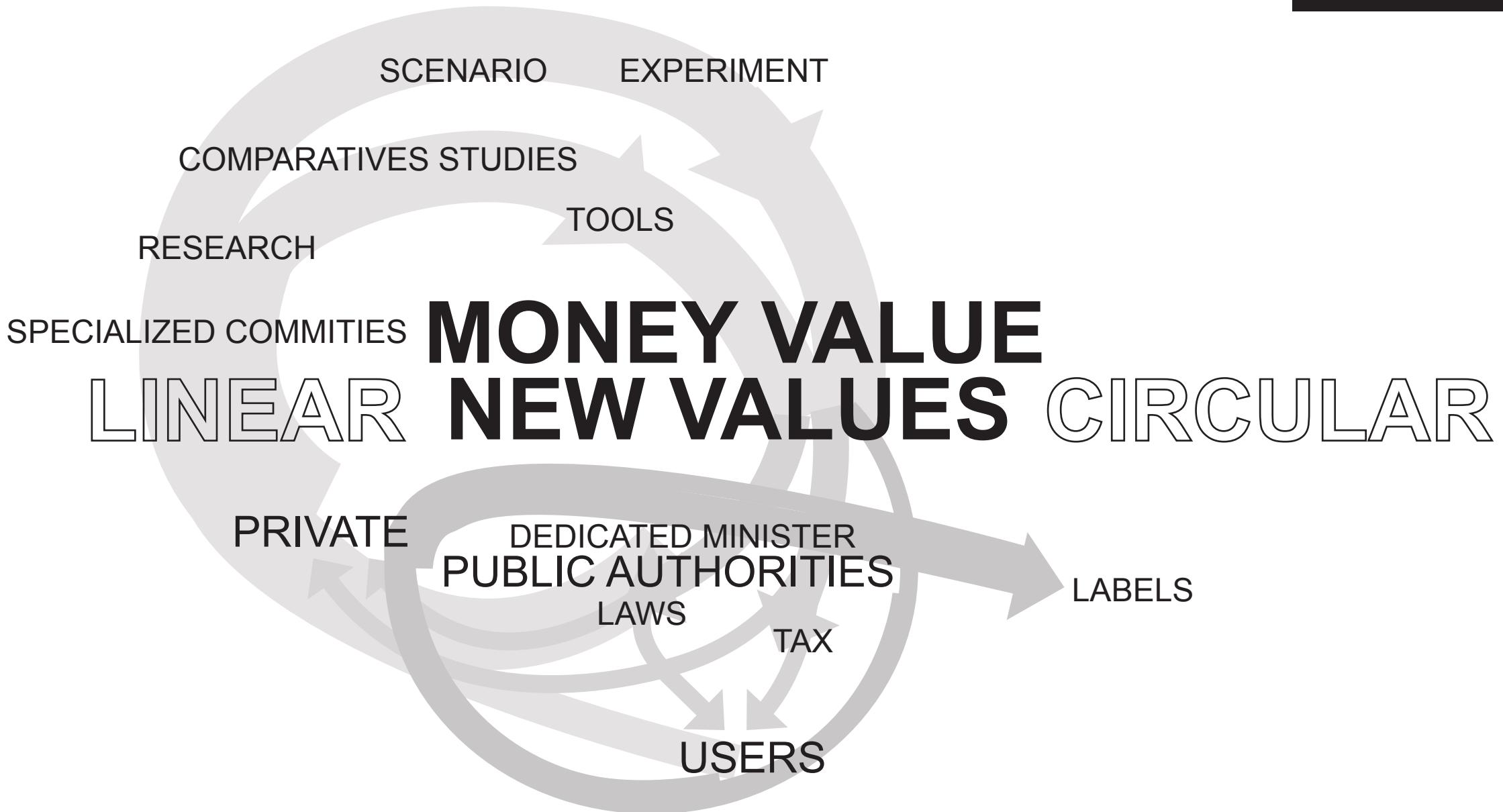
LafargeHolcim joins the Science Based Targets initiative **(SBTi)** “**Business Ambition for 1.5°C,**” becoming the first global building materials company to sign the pledge with intermediate targets for 2030, validated by SBTi.

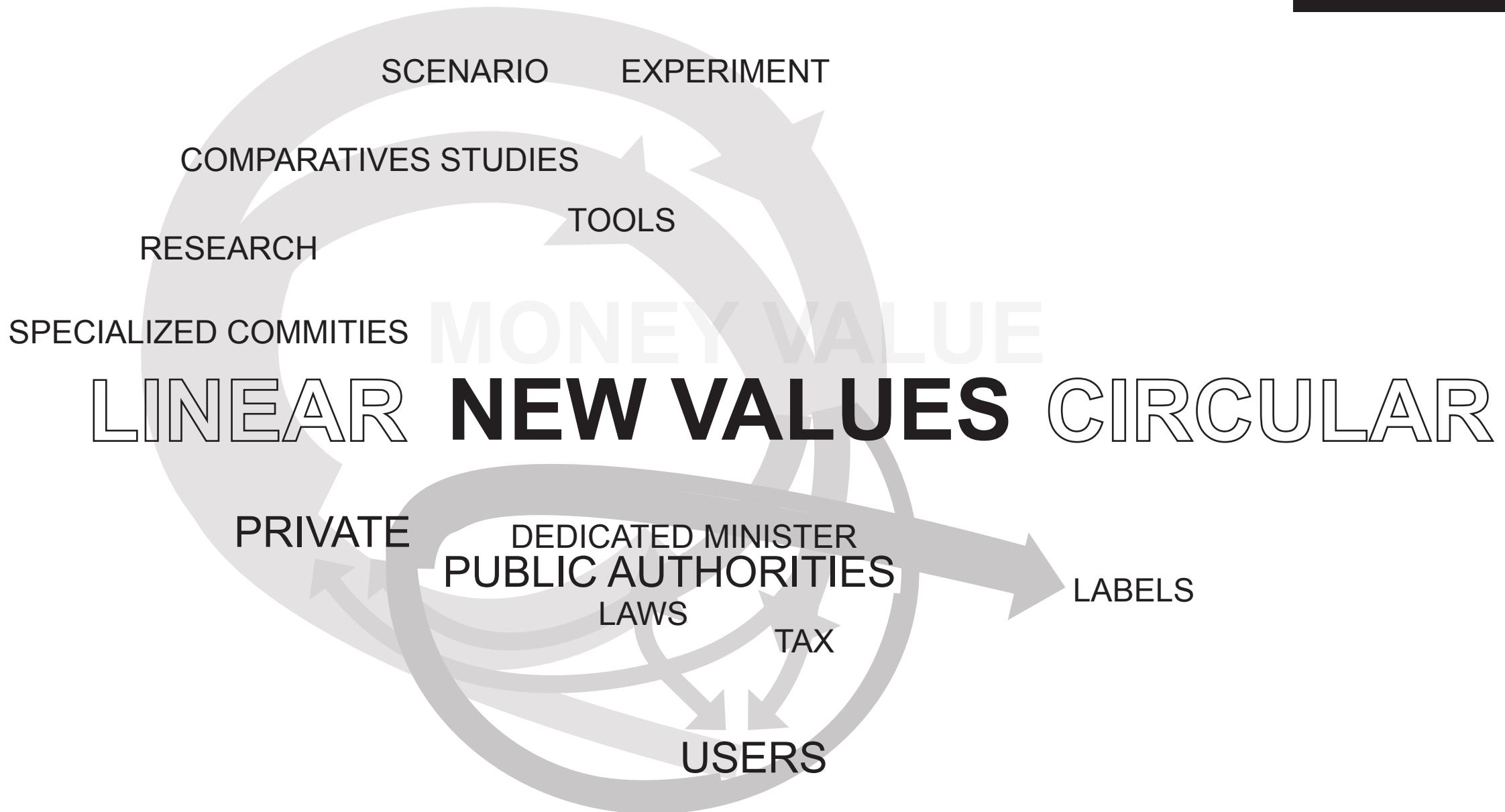
This commitment builds on LafargeHolcim’s leadership in green construction with cutting-edge solutions such as **ECOPact, its green concrete, and Susteno, its leading circular cement.**

In its 2030 goals, LafargeHolcim is further lowering its target for CO2 intensity in cement to 475kg net CO2 per ton of cementitious material (net CO2/t. cem.).

LABELS

LABELS





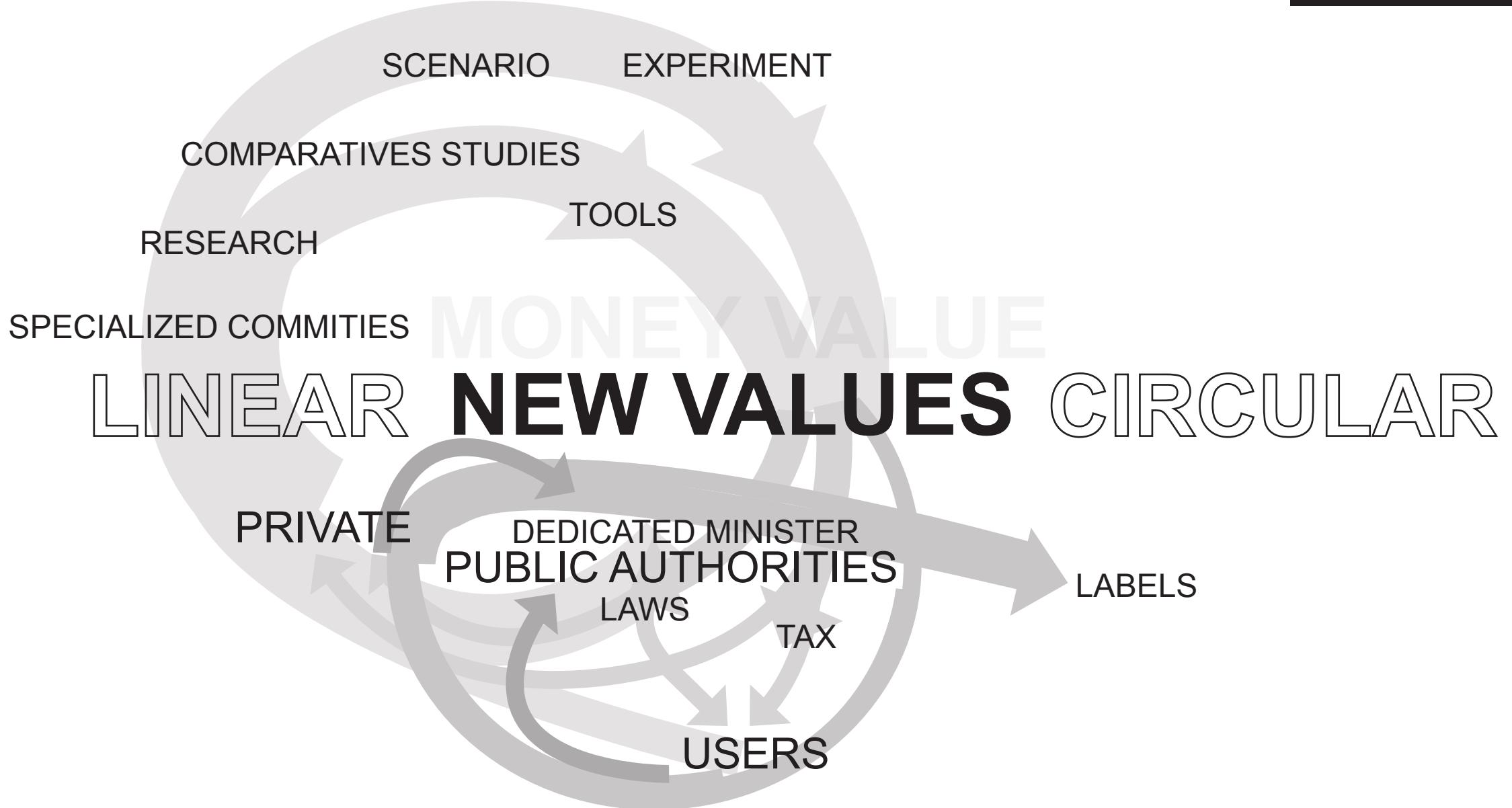
PRIVATE

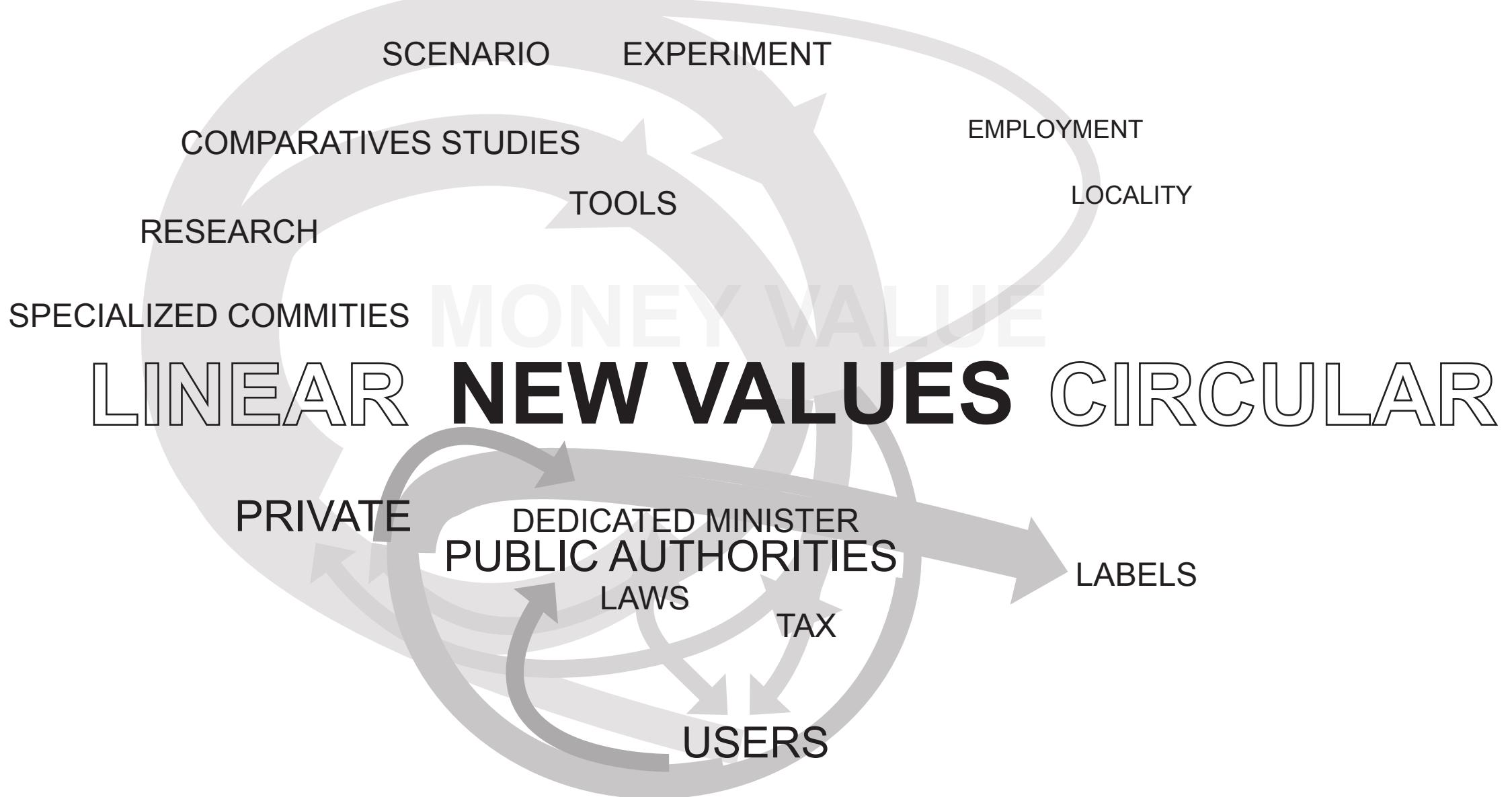
ENDOGENOUS ACTIONS PARADIGM SHIFT

Michelin offers the carrier **a price per km of tire use** and ensures the recruiter and retreaders.

Thus, the company has every interest in extending the life of its products as much as possible. By remaining the owner of the product, **the producer remains responsible for its life cycle** unlike the current market, where the gains of the producer are the largest when it flows a large amount of material without future, or even near obsolescence.

The **economics of functionality** advocates an economic model to the principle of sustainability, adaptability and reusability, encouraging potential gains.





EMPLOYMENT

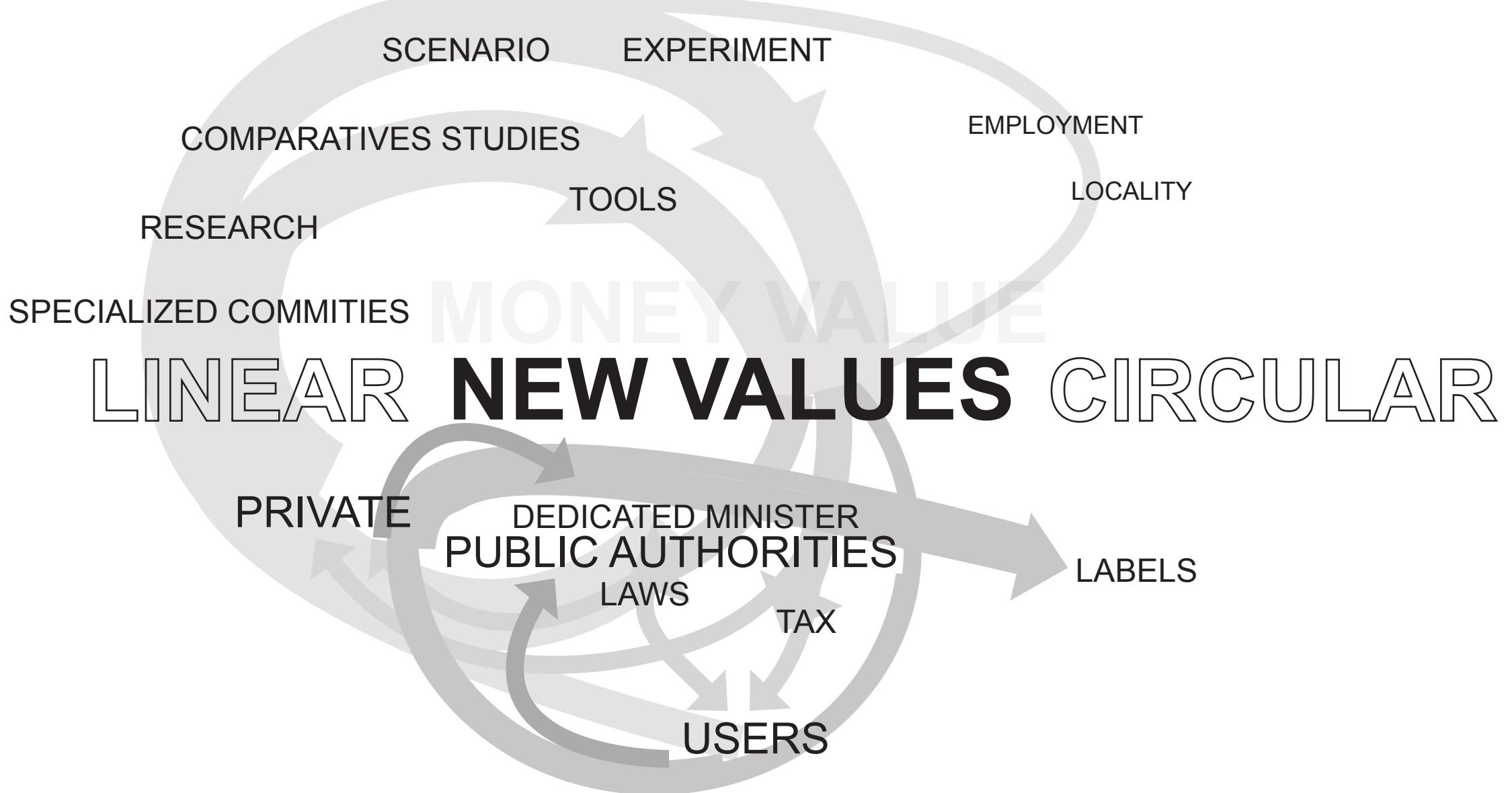
LOCALITY

Positive Cascading

It is also a vector of employment, the specificity of the tasks related to reuse can not be reduced to the mass nor performed by machines only.

10 000 tons of inert waste generate a job to bury them, three jobs to incinerate them, thirty-one jobs to sort them.

Also, tools associated with its development and its intrinsic environmental vocations bind it to territories.



NEW VALUES CIRCULAR

CIRCULAR



CIRCULAR