

Indicators for Circular Economy | ICE-T Tool

Evaluation of Circular Economy implementation in a RTO (Research and Technology Organization)

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Introduction

DTNM department at CEA is developing a tool to evaluate and drive its Circular Economy (CE) strategy. The challenge is to evaluate diverse research projects activities linked to new materials and processes development.

Method

How ICE-T was developed

AFNOR CE XP Standard



ICE-T has been developed to conform to AFNOR experimental standard **XP X30-901** regarding the circular economy (CE) project management system of a company [1]. It addresses the **3 dimensions** of sustainable development and the **7 domains** of CE [Fig 1].

Circular Economy “means many different things to different people” according to Kirchherr [2]. In order to be in line with an **authentic CE definition**, the concept has been detailed according to [1] and [2]. Every aspect of this CE definition is addressed through ICE-T.

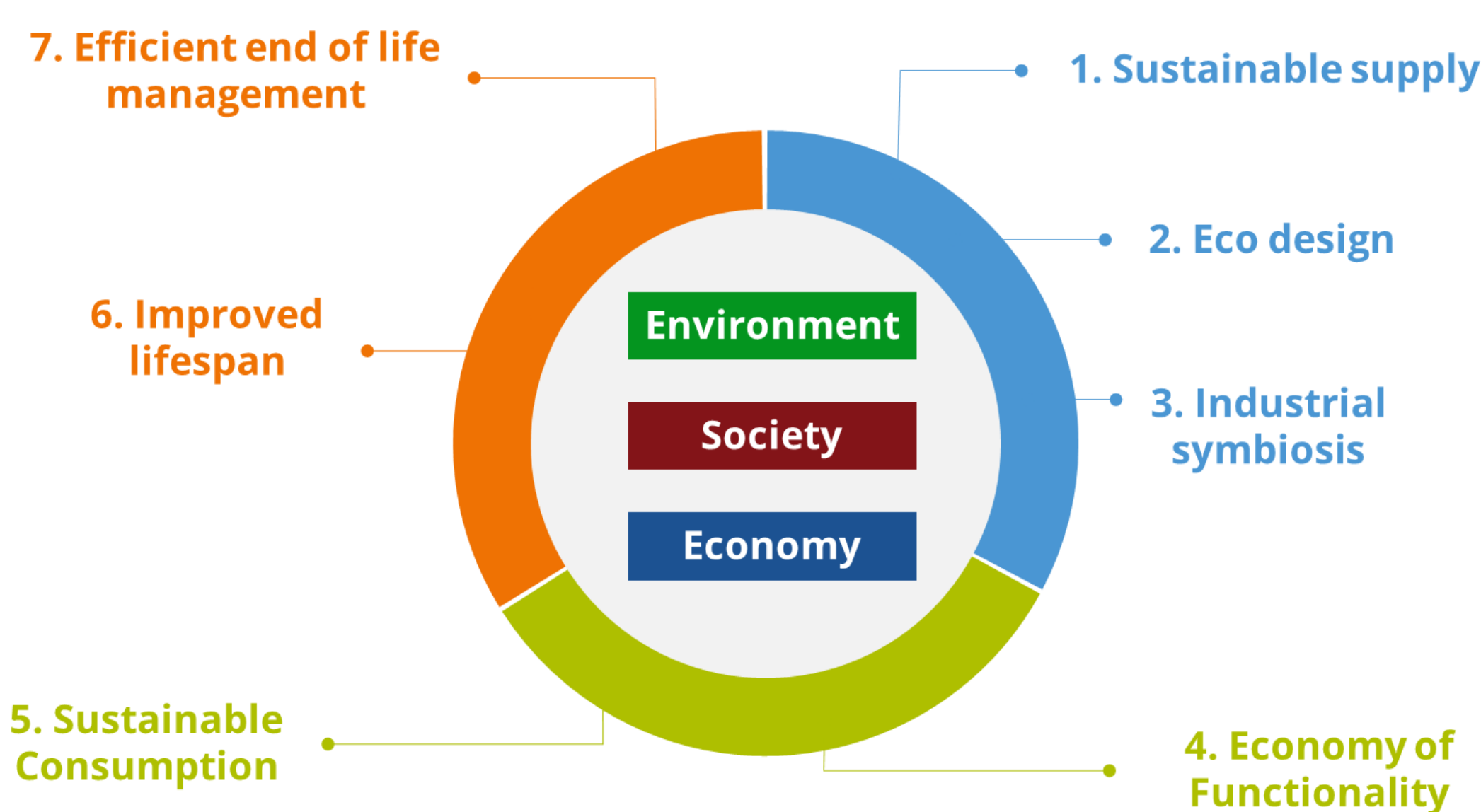


Fig 1 : EC definition from [1]. 3 domains and 7 dimensions. The circle represents the life cycle stages of a product.

A generic method

A generic method has been developed in order to be applied to any RTO [Fig 2]. It will guide the RTO into the creation of its own circular indicators.

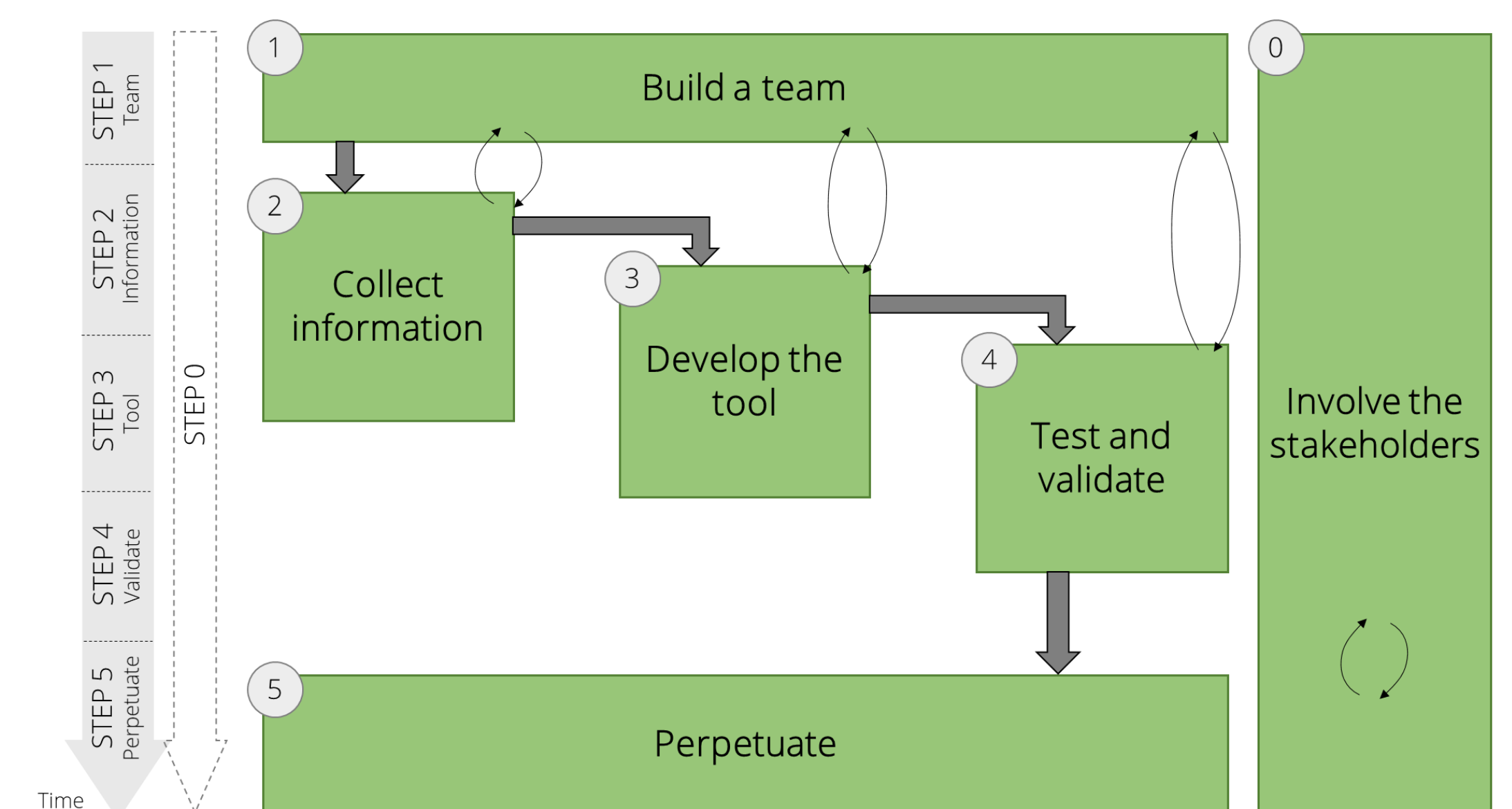


Fig 2 : Generic methodology for developing a circular economy tool

ICE-T tool

How it works

Concept

ICE-T evaluates the **circularity** of R&D projects, operational activities and the strategy of the DTNM [Fig 5]. The calculation is based on different forms addressing the department activities. The forms are made of qualitative and quantitative questions with weighted answers. The scores gained through the questions lead to indicators among which a **circularity indicator** (ranging from 0 to 100%) [Fig. 3 and 4].

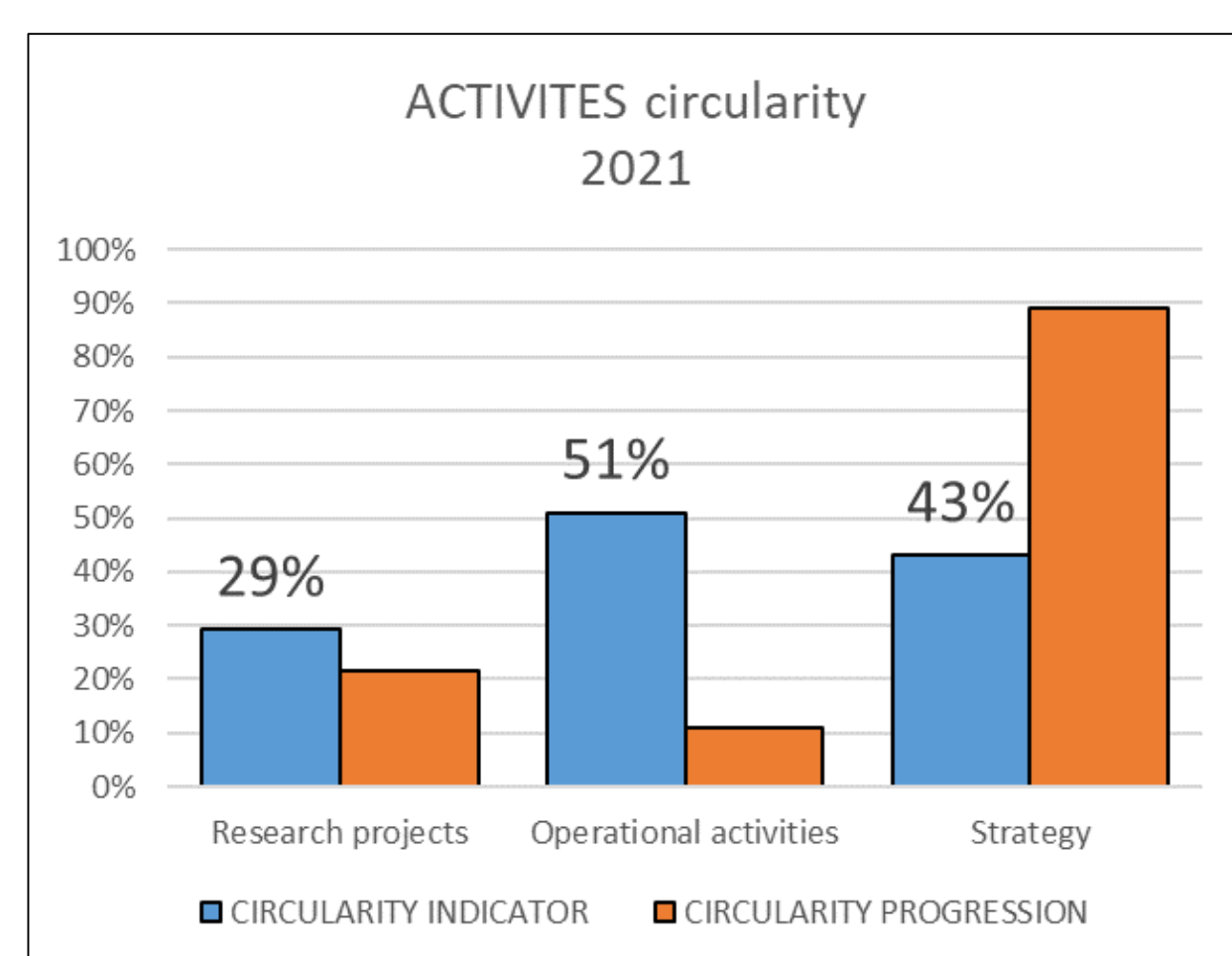


Fig 3 : Fictive example of the circularity indicator (current year and progression).

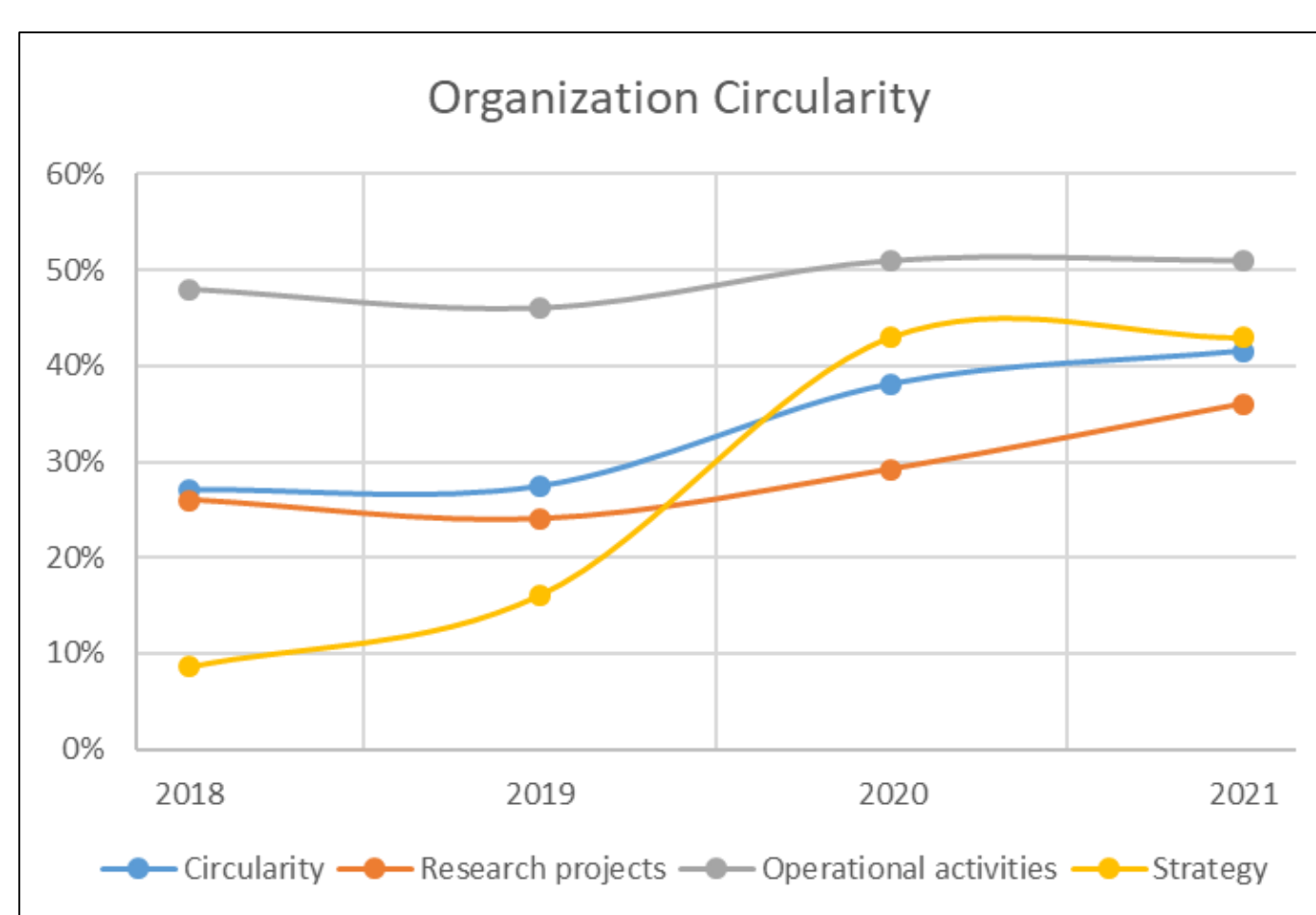


Fig 4 : Fictive example of the circularity indicator evolving over the 3 activities during the years.

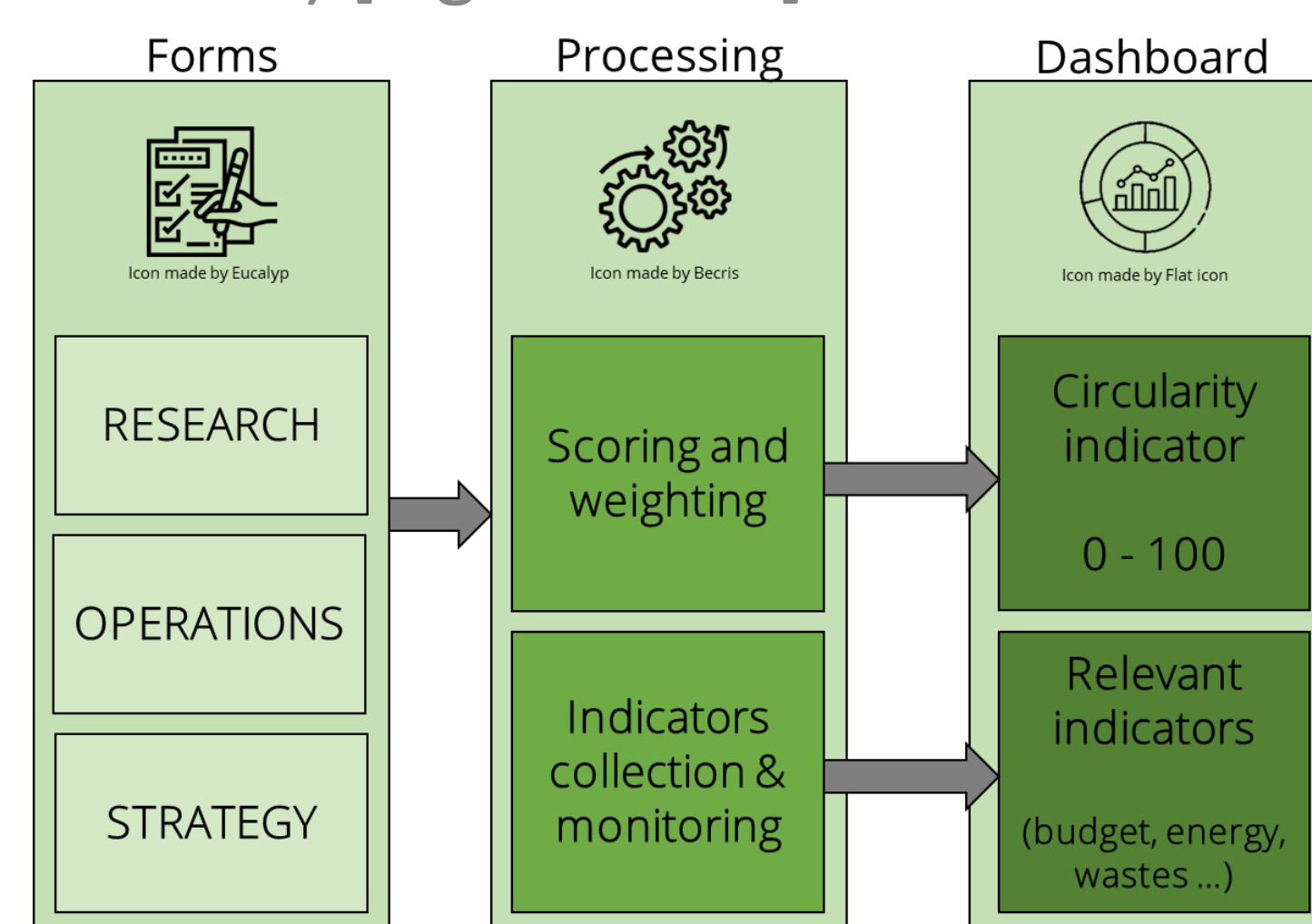


Fig 5 : ICE-T overall functioning, 3 kind of activities are evaluated, a processing leads to indicators.

ICE-T strengths

- 10-20min to fill out
- Evaluation of **any Research Project**
- **Authentic evaluation of CE** : every aspect of CE is considered
- An evolving tool **compliant with continued improvement**
- Adapted to an **organization scale with existing quality or environmental management system**
- Customized CE questions according to DTNM situation
- Promotes CE to the users thanks to a self learning process

Results & Feedbacks

What is the user experience

Results

The tool has been tested for 1 year on Research projects and Strategy.

- The tool is suitable for non CE experts.
- It provides improvements paths for the circularity of the activities.
- It provides an overview of the DTNM department CE situation, identifying a lower knowledge of CE than expected.
- Researchers are asking for CE training.

Improvements

- Integrate ICE-T into a global project management system to drive CE from an upstream perspective.
- Let ICE-T collect ideas and proposals.
- Strengthen the strategy which was focused on the standard deployment (continued improvement).

- References
- [1] AFNOR NF XP X 30-901, Circular economy — Circular economy project management system — Requirements and guidelines, 2018.
 - [2] J. Kirchherr, D. Reike, et M. Hekkert, « Conceptualizing the circular economy: An analysis of 114 definitions », Resources, Conservation and Recycling, vol. 127, p. 221-232, déc. 2017, doi: 10.1016/j.resconrec.2017.09.005.



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Conclusion

ICE-T is able to evaluate RTO Circular Economy activities whatever the diversity of the projects. It provides clear indicators helping to drive the circular economy strategy. It has many strengths such as an authentic evaluation of CE and a continued improvement design. This tool has still room for improvement as it needs to be integrated into a project management system and could be used for collecting ideas and proposals.