



Excellence in Higher Education and Research Establishments: Digital Transformation & Waste Management as Twin Vectors for the Transition towards Sustainability

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SUMMARY OF OUR PRESENTATION

We propose ‘twinning’ Waste Management & Digital Transformation, as key ‘virtual’ and ‘material’ dimensions of societal transitions.

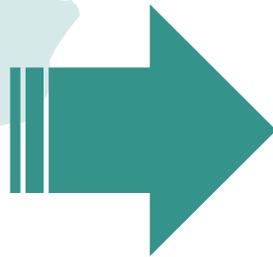
- ***Section §1*** gives an overview of excellence in higher education and research establishments (HERE) as a multi-criteria multi-stakeholder problem.
- ***Section §2*** looks at Waste Management as a theme of the INSEEC U Group’s CSR strategy, situating this with reference to French and international frameworks for transition (e.g., EU circular economy) and excellence (e.g., AASHE ‘STARS’).
- ***Section §3*** reviews INSEEC U strategy at the interface between Digital Transformation (DT) and improved waste management (‘smart systems’ and ‘dematerialisation’).
- ***Section §4*** suggests next steps for exploiting TICE for HERE capacity-building: opportunities for Stakeholder Engagement in INSEEC U Waste Management Strategy.

1. INSEEC U – A Strong Commitment in Sustainable Development Policy and in Digital Transformation

1.1. Who are INSEEC U ?

- Created in 1975;
- President: Catherine Lespine;
- The French leader in private sector higher education.

**MULTI-SECTORIAL
& MULTI-DISCIPLINARY
SCHOOLS**



GREENMETRIC : HERE QUALITY & SUSTAINABILITY

A Multi-stakeholder Multi-criteria Framework

WHO?	WHAT?	WHY?
The Classes of Actors around Science	Categories of Actions or Events	Criteria of Quality & Responsibility
Policy and Funding institutions	“Upstream” Activities providing for R&D capacity	“Extrinsic” Institutional Performance imperatives
Researchers & immediate associates	“Inside” the Research Sector (proposing, performing, reviewing, reporting)	“Intrinsic” considerations of Scientific Integrity
Civil Society “at large”	“Downstream” actions (Uses of knowledge in society)	“Extrinsic” considerations of Societal Acceptability

GREENMETRIC : HERE QUALITY & SUSTAINABILITY

Waste Management in wider HERE Quality Context

- AASHE 'STARS' specifies four domains: *Academics, Engagement, Operations, Planning & Administration*, and has recently added '*Innovation*' as a 5th. Waste management is addressed in the Operations domain: sub-categories of 'Waste' and 'Purchasing'.
- The French 'EVADES' framework ('*Outil d'auto-Evaluation du Développement Durable dans l'Enseignement Supérieur*'), developed during 2009-2013, specifies 5 focus areas: *strategy and governance; training; research; social policy and regional presence; environmental management*. The latter includes: 'Non-hazardous waste'; 'Hazardous waste'; and 'Waste Electrical and Electronic Equipment' as sub-domains.
- GREENMETRIC, focussed on environmental sustainability, defines 6 major performance categories: *Setting and Infrastructure; Energy and Climate Change, Waste, Water, Transportation, Education and Research*. So in this case, 'Waste' is top-level.

Sustainability concerns may also be addressed through teaching and research and through institutional management and governance processes — that is, contributions to capacity building for sustainability at societal and institutional levels.

The INSEEC U Waste Management Strategy: Key Performance Concepts & Categories

WASTE MANAGEMENT AS A FACET OF INSEEC U 'RSE' STRATEGY

INSEEC U has, since 2014, put in place a collaborative approach for continuous improvement in sustainability performance, as a core feature of its CSR strategy. We define Actions, Indicators and Results around 5 commitments:

- **Implement Exemplary Participatory Governance in SD;**
- **Train up internal and external stakeholders and improve their awareness;**
- **Advancing knowledge of CSR and promote responsible research and innovation;**
- **Implement effective and coordinated environmental management;**
- **Develop a social and societal policy.**

Waste management relates, in operational terms, to the 4th of these goals. But it depends also on effectiveness in the 1st, 2nd and 3rd themes.

The INSEEC U Waste Management Strategy

CATEGORIES OF WASTE & WASTE MANAGEMENT

The INSEEC U Waste strategy has focussed on a small number of categories of waste materials with high visibility to staff and students and with high “returns on investment”:

- Collection & recycling of bottles; used plastic cups, paper cups; and aluminium cans;
- Attention to consumption of paper in teaching and administration (including ‘dematerialisation’), and to the recycling of used paper;
- Pro-active strategy for the purchase and use of digital technology equipment, with consideration for ‘life cycle’ disposal as well as energy efficiency in use.

There is a tension in setting priority actions between:

- “Bottom up” actions targeting “low hanging fruit” at institutional, campus or building scales;
- Systematic attention to the full spectrum of classification schemes permitting synthetic views at territorial, national or international scales.

This tension can be exploited as a basis for monitoring and for continuous improvement.

The INSEEC U Waste Management Strategy

The EU Framework for Observing the Circular Economy (1)

The EUROSTAT monitoring framework on the circular economy was set up during 2017-2018 by the EC. It consists currently of 10 indicators, some of which are broken down into sub-indicators.

See: <https://ec.europa.eu/eurostat/web/circular-economy/indicators>.

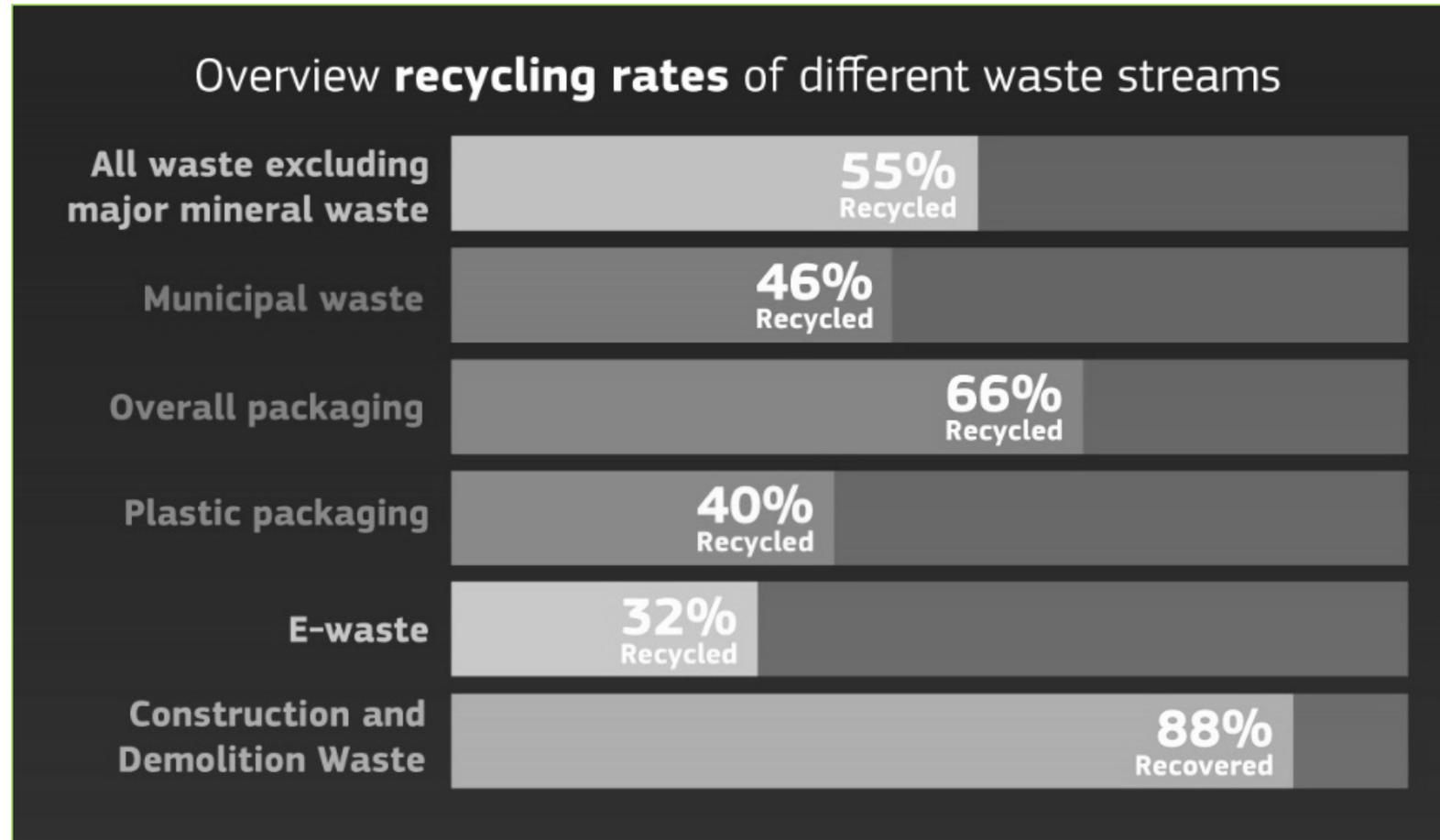
This set of indicators is selected in order to capture the main elements of a circular economy, taking account of statistics measurement and aggregation quality issues. The four domains are:

*Production and consumption;
Secondary raw materials*

*Waste Management
Competitiveness and Innovation.*

The INSEEC U Waste Management Strategy

The EU Framework for Observing the Circular Economy (2)



Positioning INSEEC U relative to the French Plan for Transition to a Circular Economy

In May 2018 the French government published its *Roadmap for the Circular Economy*. This sets out “50 Measures for a 100% Circular Economy”: *Better Production* (7 measures); *Better Consumption* (9); *Better Managing Our Waste* (24); and *Mobilising All Actors* (10).

No.	Measures for Better Consumption
8	Strengthen the range of services offered by actors involved in reuse, repair and the economy of functionality (product-service systems)
10	Mandatory simple information logo on reparability from 1 Jan 2020 for electrical and electronic products
13	Improve consumer information
14	Step up the fight against food waste
No.	Measures for Better Managing Our Waste
17	Launch a "general mobilization" drive to accelerate the collection of recyclable packaging, plastic bottles and cans through returns for charitable purposes.
18	Extend the scope of the EPR “packaging” scheme to professional packaging and aim to increase the percentage of bottles and cans collected in the cafe, hotel and restaurant sector.
31	By 2019, study the deployment of a financial mechanism to promote the recovery of old mobile phones.
No.	Measures for Mobilizing all Actors
42	Raise awareness and educate
47	Mobilize the scientific and technical community with a multidisciplinary approach

Positioning INSEEC U relative to international HERE Frameworks

The GreenMetric framework establishes *6 sustainability performance categories*, including *Waste (WS)* weighted as 18% of the overall GreenMetric score. The 'WASTE' indicators address:

- *Recycling program for university waste; Program to reduce the use of paper and plastic in campus; Organic waste treatment; Inorganic waste treatment; Toxic waste handled; Sewerage disposal.*

The GreenMetric framework also highlights the pertinence of 'Education and Research' activities in support of sustainability.

The AASHE 'STARS' framework covers similar categories to GreenMetric, and gives emphasis to operational considerations, notably under Purchasing, where sub-categories include:

- *OP 12: Electronics Purchasing; OP 13: Cleaning Product Purchasing; OP 14: Office Paper Purchasing; OP 15: Inclusive and Local Purchasing; OP 16: Life Cycle Cost Analysis.*

INSEEC U strategy has components for: (1) Recycling of wastes on campus, (2) Reduction of waste streams through purchasing policy, and (3) Building of capacity through teaching and research programmes.

Exploiting TICE for HERE

Capacity-building in Managing Waste

The INSEEC U Strategy of Digital Transformation (DT)

- **An innovative ecosystem of digital learning at INSEEC U since 2012.**
- **During 2018 a strategic reorganisation of these activities has been implemented, with the creation of a *Digital Learning Department* whose cross-cutting mission is “... to conceive, develop and integrate digital learning services dedicated to our students on campus and to new markets.”**

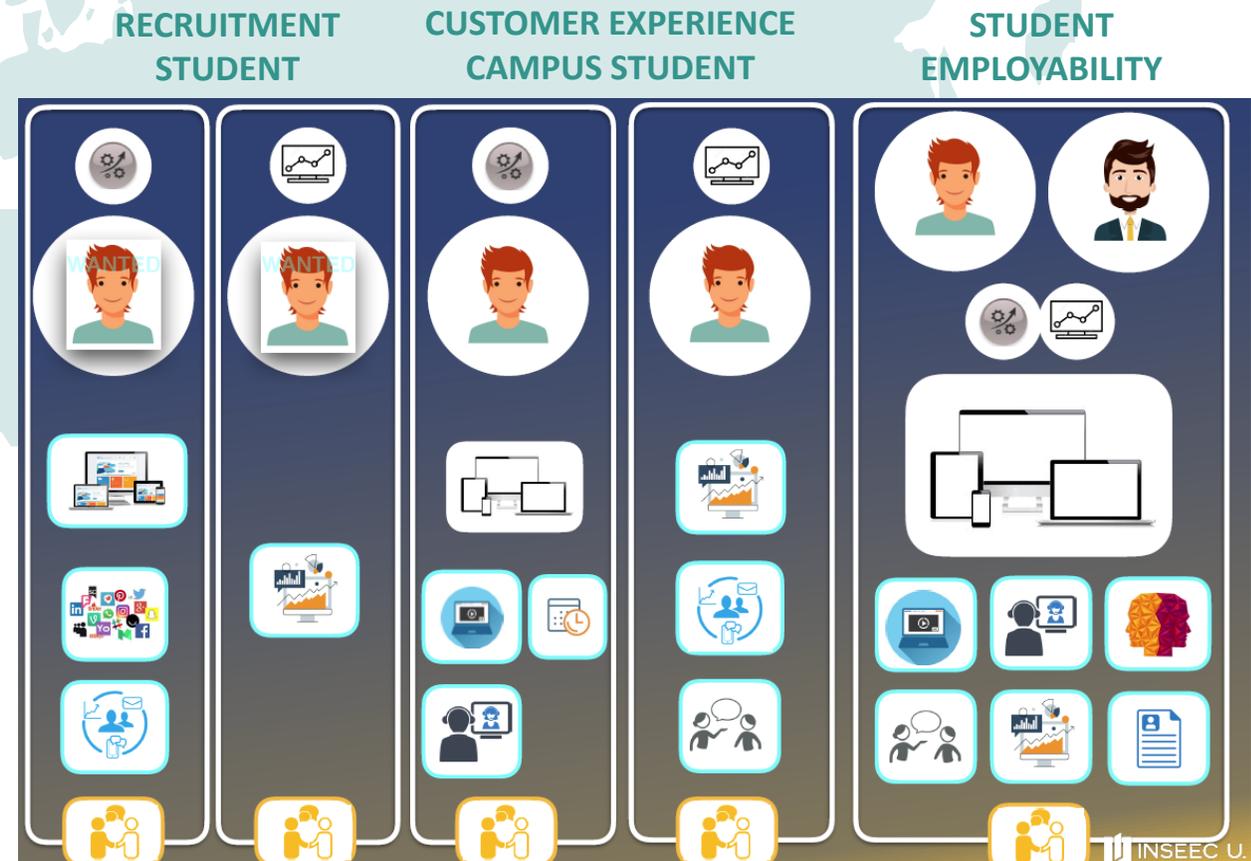
In parallel with pedagogic DT strategy, we are experimenting with the use of “smart systems” and other digital technologies in order to improve performance of the group in Waste Management as well as other sustainability challenges.

INSEEC U : Sustainable Development & Digital Transformation

Digital Transformation – A Transversal Challenge

At INSEEC U - Strategic reinforcement and an integrated digitalization organization since 2018:

- ❑ Director for Digital Transformation
- ❑ 7 millions euros in digitalization investment for 3 years
- ❑ Smart and Sustainable Buildings
 - Campus of Lyon : BREEAM
 - Headquarter (paris) : HQE, BBC, BREEAM



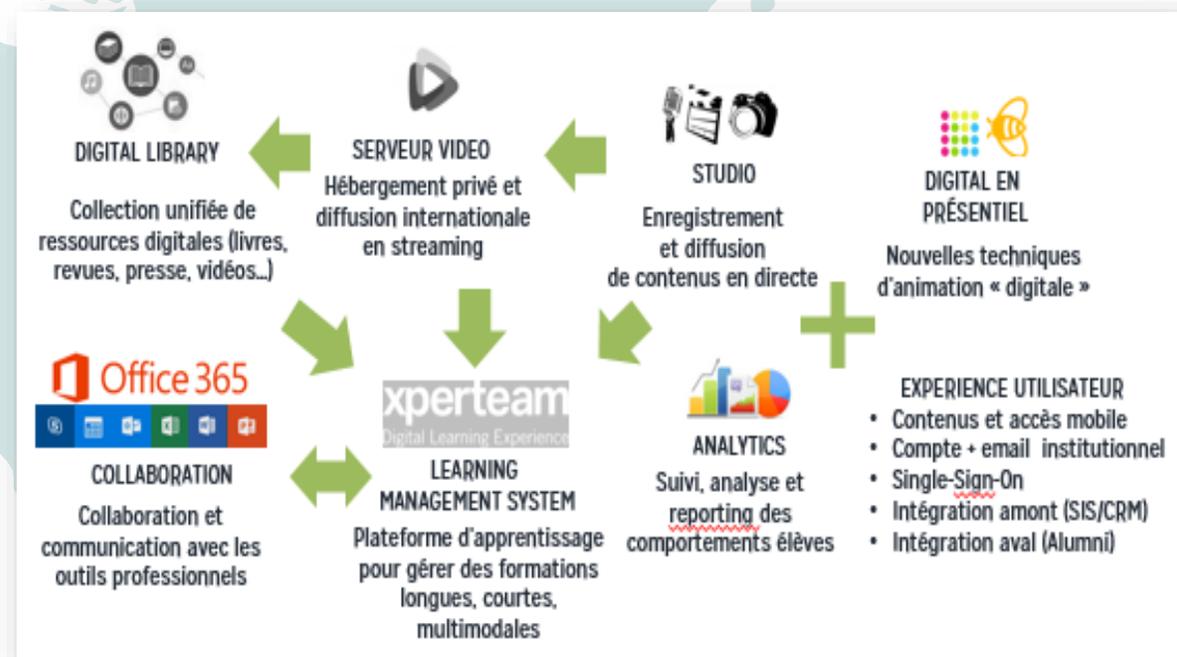
Sustainable Development & Digital Transformation

“Green IT” and “IT for Green”

- “GREEN IT” signals a low or decreasing environmental impact profile of IT production and activities themselves (e.g., laptops or portable telephones).
- “IT FOR GREEN” signals the application of IT in order to improve environmental performance in other sectors.

Some actions of the INSEEC U group fall into the category “Green IT” category, e.g., the down-sizing and upgrading of the group’s servers. But most are instances of “IT for Green”.

ECOSYSTEM of DIGITAL LEARNING



Green IT for Digitalization Strategy

Overview of “Green IT” actions initiated at INSEEC U

The IT Department applies solutions proposed by our partner Econocom: Watt's Green. Actions initiated since 2015 involving the implementation of INSEEC U's smart methods for estimating energy consumption of digital and IT equipment.

Ex. Employee tools

Consommation énergétique 2016

297 632 kWh / an

Consommation énergétique 2017

214 590 kWh / an

BONNE PRATIQUE

Les postes fixes et portables ont été changés par des postes moins énergivores de classe A

Ex. Infrastructure tools

Consommation énergétique 2016

187 151 kWh / an

Consommation énergétique 2017

142 790 kWh / an

BONNE PRATIQUE

Rationalisation des équipements
notamment des imprimantes multifonctions
locales

Tous les genres d'équipements sont en diminution ce qui engendre une forte baisse de la consommation énergétique

INSEEC U : Sustainable Development & Digital Transformation

Positive Environmental Impacts expected from “IT for Green” (Digital Transformation for SD)

- ❑ Visio-conferencing -- Drop in transportation for general meetings in France and abroad, and for students and teachers in courses, etc....
- ❑ Drop in overall paper use (through elimination of paper registration forms, of internship agreements, of contracts and pay slips);
- ❑ Drop in water and energy consumption with generalization of smart buildings;
- ❑ Drop in waste production thanks to our general smart re-use policy.

A Smart Circular Economy Policy : a pro-active strategy

Since 2015, INSEEC U. has been firmly committed in a circular economy policy:

- *We work with service provider Elise.*
- *We can follow directly our results as well as environmental and societal impacts thanks to a smart system using sensors and other digital means.*

LES DÉCHETS COLLECTÉS EN 2017



22 174 kg

ont été collectés au total sur les sites du Groupe INSEEC U.

21 920 kg

de papier

176 kg

de bouteilles

27 kg

de canettes

51 kg

de gobelets

LES BÉNÉFICES ENVIRONNEMENTAUX



7 306 kg

de CO₂ non rejetés :

1 345 A/R en TGV Paris - Marseille

148.9 litres

de pétrole épargnés :

1 066Km en Clio essence

112 795 kWh

non utilisés :

la consommation de 24 foyers / an

504 641 L

d'eau économisés :

2 523 baignoires de 200 litres

Sources gains environnementaux : Ecofolio, Ecoemballages, Veolia, ADEME

L'IMPACT SOCIAL



Notre action a permis de contribuer à l'emploi de **402 heures de travail pour des personnes en situation d'handicap**

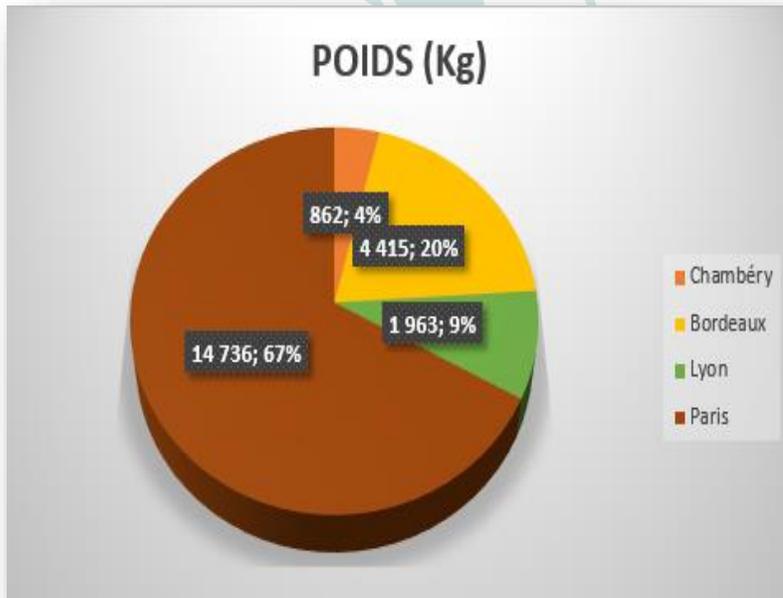
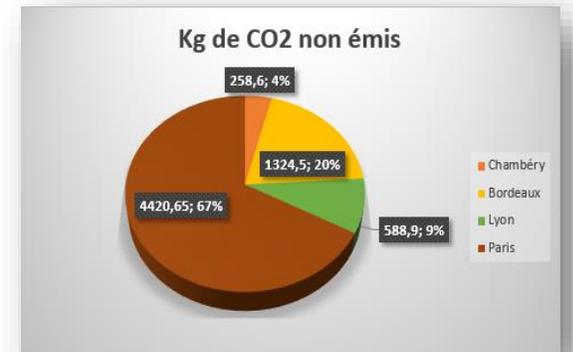
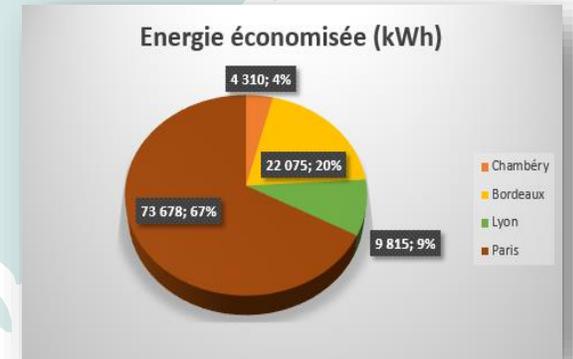


« IT for Green » : A Smart Circular Economy Policy

In 2017, 22 tonnes of paper, bottles, cans and cups were collected by ELISE on the 19 sites of INSEEC U. Group.

Paris accounts for 67%, followed by Bordeaux (20%), Lyon (9%) and Chambéry (4%).

These collections are estimated as equivalent to:
over 505 m³ of water, 6.5 T of CO2 not emitted, and 110 MWh.



TONNAGE COLLECTE PAR ELISE EN 2017 & EQUIVALENCES DD

Site	POIDS (Kg)	Litres d'eau économisés	Kg de CO2 non émis	Energie économisée (kWh)
Chambéry	862	19 826	258,6	4 310
Bordeaux	4 415	101 545	1324,5	22 075
Lyon	1 963	45 149	588,9	9 815
Paris	14 736	338 917	4420,65	73 678
Total	21 976	505 437	6 593	109 878
soit:	22 t	> 505 m³	> 6,5 t	110 MWh

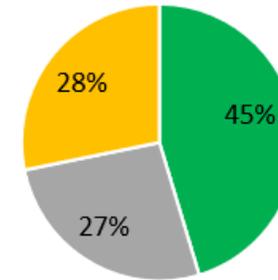
A Smart *and Convivial* Circular Economy Policy

With our partner, LEMON TRI, we use “smart machines” appealing to students with several different waste types collected in the same place, in a fun way.

Incentives in form of tokens convertible into coffee, encourage participation.

Our students become our “ambassadors” for good practices in eco-gestures.

Emballages triés dans les machines EASY



- Canettes
- Bouteilles
- Gobelets

Vous avez trié
20 566 emballages

Bravo !

Vous avez collecté :

12 250 canettes
soit l'équivalent de

18,3 vélos



7 159 bouteilles
soit l'équivalent de

265,1 pulls



7 618 gobelets
soit l'équivalent de

63,5 cintres



Attestation de recyclage :

Déchets	Nom	Adresse	N° SIRET	Mode de traitement
Bouteilles PET	Plastipack	21200 Sainte Marie la Blanche	81198605800030	Recyclage des bouteilles plastiques PET selon le principe <i>bottle to bottle</i>
Gobelets plastique	Atlan	72210 La Suze sur Sarthe	51913210400018	Lavage, broyage et recyclage en granulats (<i>compound PVC</i>)
Gobelets carton	Papeterie Emin Leydier	26240 Saint Vallier	41346459500086	Recyclage des papiers et cartons
Canettes acier	SAM Montereau SAS	77130 Montereau	78497572400013	Recyclage des déchets métalliques

A Smart *and Convivial* Circular Economy Policy

THE RECYCLING PERFORMANCE for each category (bottles; plastic cups; paper cups; metal cans) is certified by independent partners, e.g.,

- **SAM Montereau SAS** for metal recycling;
- **Papeterie Emin Leydier** for paper cups and cardboard materials;
- **Atlan** for plastic goblets ground up for the fabrication of plastic composite products;
- **Plastipack** for plastic bottles recycled).

EQUIVALENCES:

The importance of the quantities recycled can be expressed not just in mass terms, but also with various “equivalences”.

- The 12 250 metal cans collected, correspond to the metal needed for 18 bicycles.
- The 7618 plastic goblets recycled are enough to fabricate 63 composite coat-hangers.

A Sustainable Campus Social Network ?

Consider HERE stakeholders as members of a knowledge-innovation community.

- A corporate or campus-level sustainability strategy is made up of many bricks, the **ACTIONS**.
- Participating members of the community can be invited to contribute suggested Actions, and to give their opinion on the **pros and cons** of existing or proposed Actions.
- Each of these Actions (and, in a composite way, a Strategy as a whole), can be situated in one or more domains (or sub-domains) in the HERE life cycle.
- An Action is to be judged — *ex post* (for an existing or past situation) or *ex ante* (for any scenario) — for its **QUALITIES** relative to an agreed spectrum of Sustainability Performance Considerations (e.g., GreenMetric, 'STARS', the UN SDGs).

AUTO-EVALUATION

Evaluation of the **quality of actions** can be undertaken by people in community.

With current **social networking** technologies, we can envisage **nested judgements**:

- (a) moving upwards from individual Indicators, to Actions, to an overall vision of a HERE sustainability strategy; and
- (b) moving from Individual participants to Stakeholder Classes, and to an overall judgement about a HERE's sustainability performance.

SUMMING UP:

The challenge of an alliance of ‘Bottom-up’ and ‘Top-down’ initiatives for Digital Transformation and Transition towards Sustainability.

The new digital networking technologies offer new opportunities for collaborative *learning* about sustainability challenges, for *monitoring* performance, for sharing suggestions for *action*, for materially *improving energy, material flows and environmental performance*, and for *evaluating* the quality of institutional strategies — action by action — in a multi-stakeholder vision relative to multiple excellence considerations.

THANK YOU



ANNEX

**Overview of INSEEC U Expertise
in Teaching, Training, Research
and Innovation at the interface of
Sustainability and Digitalization**

INSEEC U: Expertise in Training as well as Research and Innovation at the interface Sustainability and Digitalization

New Academic & Executive training: Examples of new programmes

- ❑ **For all students** : since 2017 Start-up Factory Programs in San Francisco Campus for trainings and visits of enterprises in Silicon Valley for Big Data, Cloud, Artificial Intelligence And in same time a certificate on line on "Sustainable Development and CSR Management".
- ❑ **Engineering School (ECE)** : Programs : “New Energy and Environment”; “Health Quality and IT Technology”
- ❑ **Executive School (IFG)** : eMBA "Management of Smart Energy Transition", eBachelor in "Smart and Sustainable Building Management".
- ❑ **Learning Expeditions**: for Alumni and Executive students in our San Francisco Campus on the topics on Renewable Energy and Digital & Smart City Management.

INSEEC U - Expertise in Training as well as Research and innovation at the interface Sustainability and Digitalization

A "Sustainable & Digital" Innovation Cluster

INSEEC U. set up, in 2015, an innovation & entrepreneurship ecosystem, INNOV'INSEEC U, with a network of 6 Incubators focused on digital technology and artificial intelligence solutions with strong environmental and societal impacts. For example:

- ❑ **E-Health Life-Lab, created in 2017 in Paris.**
- ❑ **Annual Tech for Goods competition in partnership with “la Ruche” (the French top incubator for social entrepreneurship in France) to select winners starts-up in acceleration programme with professionals in social innovation and new technologies.**

Tech for Goods concerns digital solutions applied to societal entrepreneurship needs, primarily solving environmental, social and local needs.

INSEEC U - Expertise in Training as well as Research and Innovation at the interface Sustainability & Digitalization

- Partnership since 2016 with incubator at **UC Berkeley** dedicated to technological innovations of the energy transition
- This partnership has specifically translated into investment in Blue Bear Ventures (BBV), a venture capital fund intended to help start-ups use digital and artificial intelligence in the fight against climate change. This focuses on innovation in smart grids, smart buildings and smart mobility.
- Partnership with Savoie Technolab : incubator of start-ups in smart grids and e-Health

A "Sustainable & Digital" Innovation Cluster



INSEEC U - Expertise in Training as well as Research and Innovation at the interface Sustainability and Digitalization

Research dedicated to Smart Eco-innovation

Chair of Research about "Digital and Artificial Intelligence" on Lyon Campus in partnership with Cegid Group and Asker for Research and Innovation to prepare Digital Transformation of Human Resources Management in a CSR context.



INSEEC U - Expertise in Training as well as Research and Innovation at the interface Sustainability and Digitalization

Research dedicated to Smart Eco-innovation (2)

Smart Ecomobility Program for our Engineering School (ECE)

Since 2015, ECE has been a member of **VEDECOM** a French public-private partnership research and training institute dedicated to low-carbon and smart sustainable individual mobility.

Project "New secure communications and cooperative safety" of the ecomobility programme

DEFORM EUROPEAN Research PROJECT

Since 2016, DEFORM analyses the impact of research projects (and particularly digital ones) funded by Europe that do not include SD and highlights the financial and social impacts.



The logo for DEFORM consists of the word "DEFORM" in a green, sans-serif font, with a stylized green and yellow globe icon replacing the letter "O".

