iF initiative
carbone4

Imagining futures within planetary boundaries

IF Initiative Step#1 results presentation

Workshop ISA - December 13th, 2024

Enhance & empower companies strategic thinking to ensure their long-term sustainability and accelerate their contribution to the ecological transition

SCENARIO FACTORY

Helping companies **better envision** what a **future shaped by environmental constraints** would look like

SCENARIO LAB

Upgrading traditional corporate strategy tools and methods to better integrate environmental constraints

1

An overview of IF Initiative

WHO ?

IF Initiative develops and tests its methods with pioneering companies and renowned research centers

Research partners

An applied interdisciplinary research project fostered and supported by leading researchers in the earth sciences, economics, management and agronomy, leading to **scientific publications**

Corporate partners

A collective of cross-sector companies involved in **creating and testing new tools** and methods to maximize their impact

IF Initiative develops tools and methods to imagine futures that fit within planetary boundaries

1 A new generation of quantified scenarios

1. **A unique method/process** to create scenarios
2. **A model** to compute resource, climate and biodiversity footprints, based on scientific work with research centers

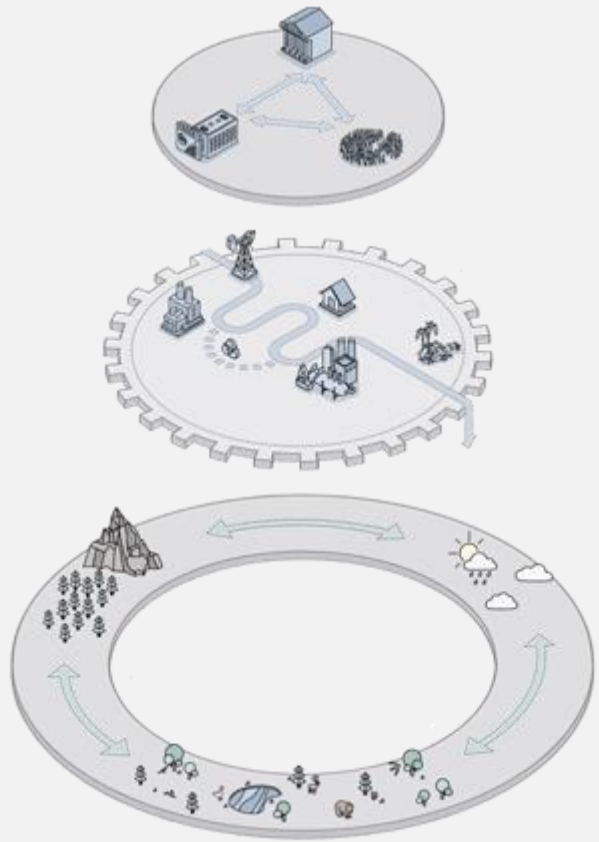
Developed with our partners

UGA Université Grenoble Alpes · cirad · strate ECOLE DE DESIGN · AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

Open source results

Corporate Sustainability Reporting Directive (CSRD)

✓ *compatible*



A physical understanding of the economy at the heart of our scenarios

IF Initiative develops tools and methods to imagine futures that fit within planetary boundaries

2 Understand and take action

- **Develop methods to adopt a physical understanding of economic activities into your strategic thinking,** based on IF Initiative's scenarios:
  - ✓ Designed with our academic partners (EM Lyon Chair, Strate)
  - ✓ Tested and improved with companies
- **Spread the learning** of these methods through a dedicated training program

"Strategy in the Anthropocene" teaching and research chair

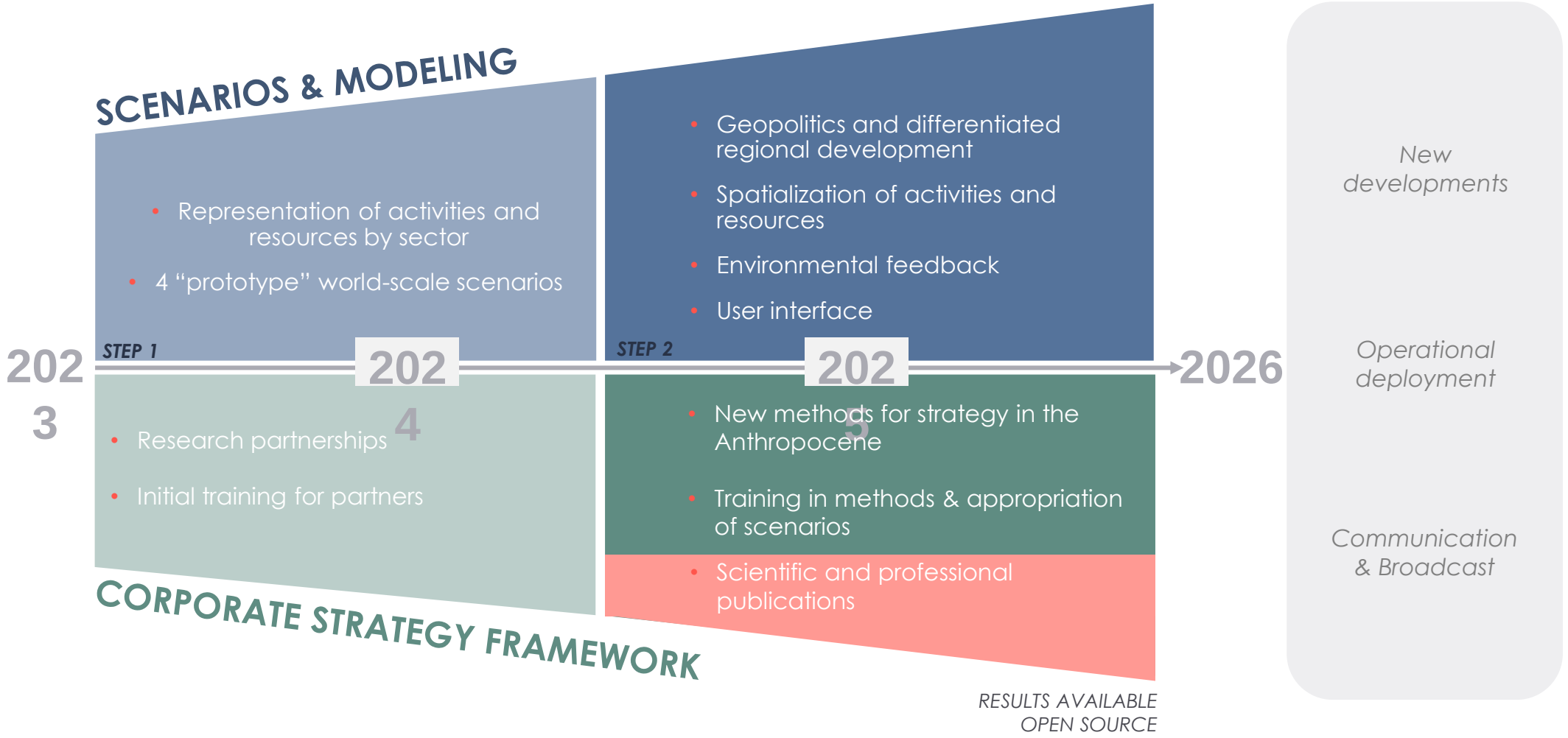
em lyon business school

Research partnership and thesis co-supervision

strate ECOLE DE DESIGN

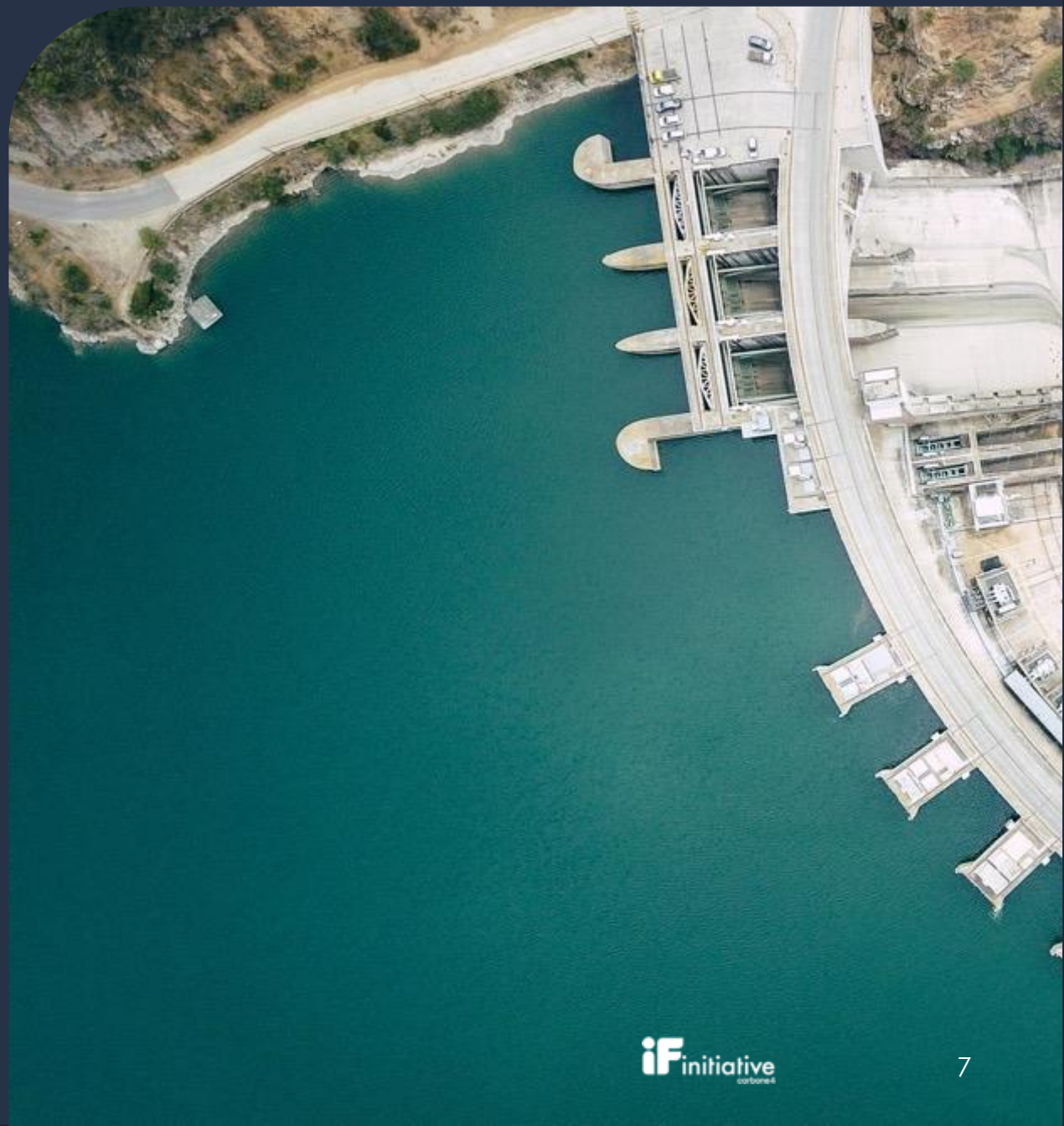
Training session in January 2024

Between 2023 and 2025, two steps to develop and try out a framework for strategic thinking in the Anthropocene.

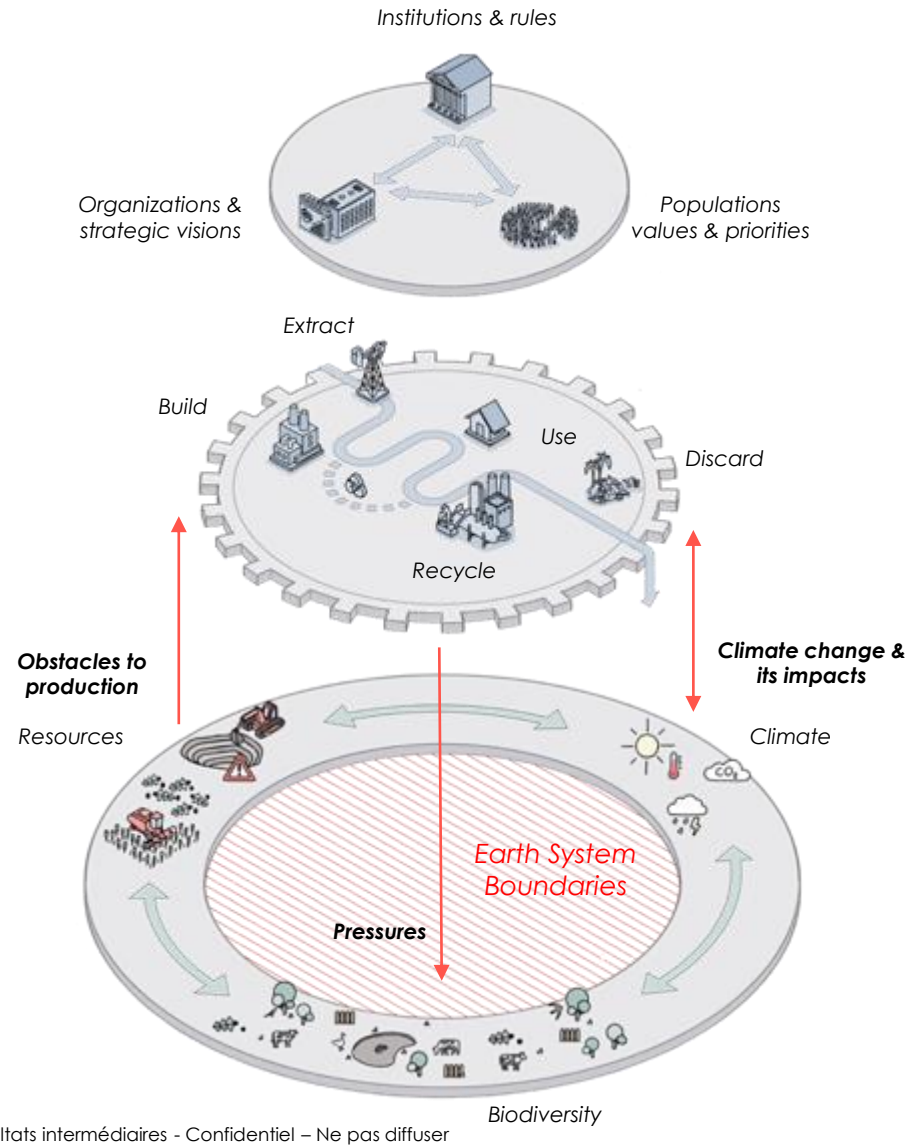


2

IF Initiative Scenarios : how does it work?



Scenario Building Steps



1 **LIFESTYLE & CONSUMPTION PATTERN EVOLUTIONS**

DEMAND

2 **INDUSTRY EVOLUTION**
- 2.0: TECHNICAL PARAMETERS
- 2.1: UPSTREAM & DOWNSTREAM PRODUCTION MIXES

SUPPLY

3 **ENVIRONMENTAL LIMITS & RESOURCES CONSTRAINTS**

Physical boundaries

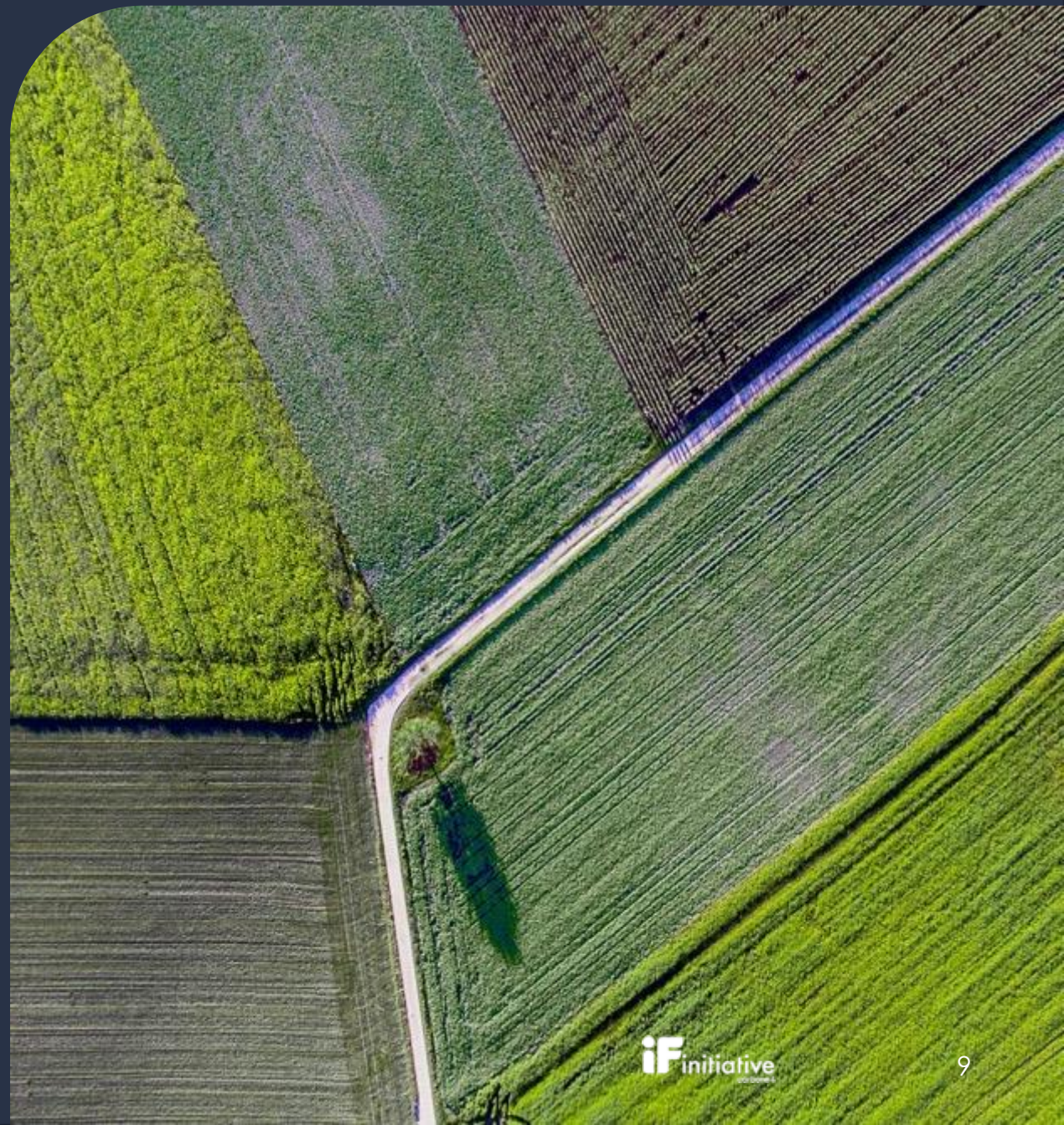
4

Resources or **externalities** boundaries **overshoots solving**

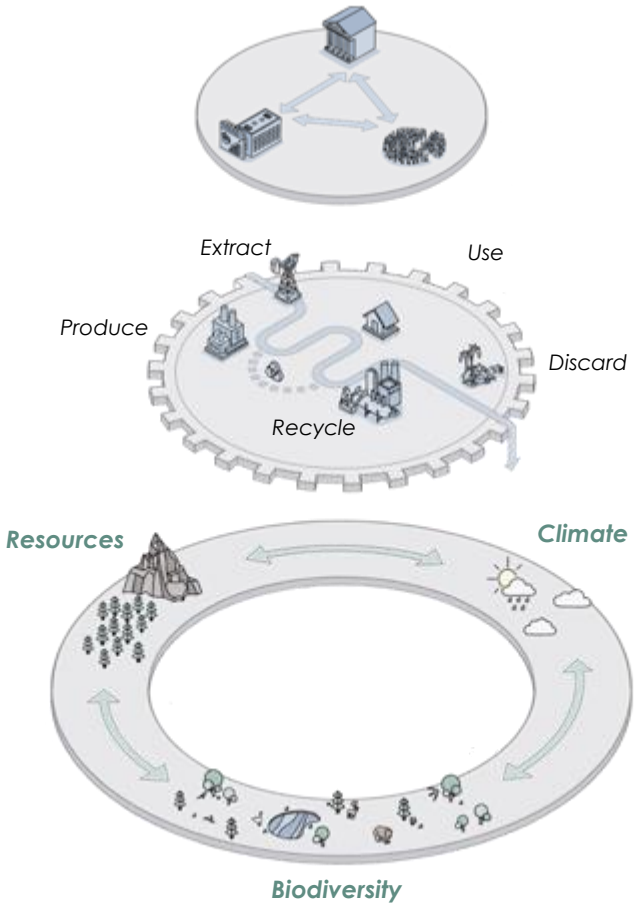
Overshoot solving impacting lifestyle & industry evolution

3

Introduction to IF Initiative « preserie » scenarios



Lifestyles & technical performance evolutions + environmental targets as entries to the model



	S1 EQUILIBRIUM	S2 SLOWTECH	S3 SKYRISE	S4 TERRA INCOGNITA
1				
2	**High** tech performance hyp.	**Low** tech performance hyp.	**Low** tech performance hyp.	**High** tech performance hyp.
3	+ 1.5°C Biodiv. Renegerated	+ 2°C Biodiv. In Danger	+ 2°C Biodiv. In Danger	+ 3°C Biodiv. In Danger
	UN Median hyp. on population growth			

(1) Source: UN (2017), "World Population Prospects: key findings and advance tables".
(2) Level of warming in 2100 (IPCC AR6-WGIII trajectory reference)

Time pressure, speed
Nature as a protected resource
Individual freedom
Utilitarian tech.

« Everything is measured and optimized to make the best choice »

S3 - SKYRISE

+2°C in 2100

Biodiversity in danger

S3 - SKYRISE: OVERVIEW

	↘	↗
Energy	-10% Final energy consumption	x2 Power generation vs. 2020
	÷4 Fossil fuel consumption	75% Share of renewable energies in the mix
Transport	Reducing the use of combustion-powered cars	+25% Car occupancy rate
	Modal shift to rail and active modes	x2 Aircraft fleet
		Growth in the electric vehicle fleet
Building	-40% of new buildings vs. 2020	42% m^2 are high constructions
	-8% m^2 per person	1/5 Homes equipped with heat pumps
	13% Housing stock renovated for energy efficiency	50% Consumption of electrical appliances including air conditioning
Agriculture	-30% Cattle herd	White meat (pork and chicken)

Long time, natural cycle
Interdependence with the living
Collective logic
Utilitarian tech.

« Humanity flourishes by taking care of the community of nature »

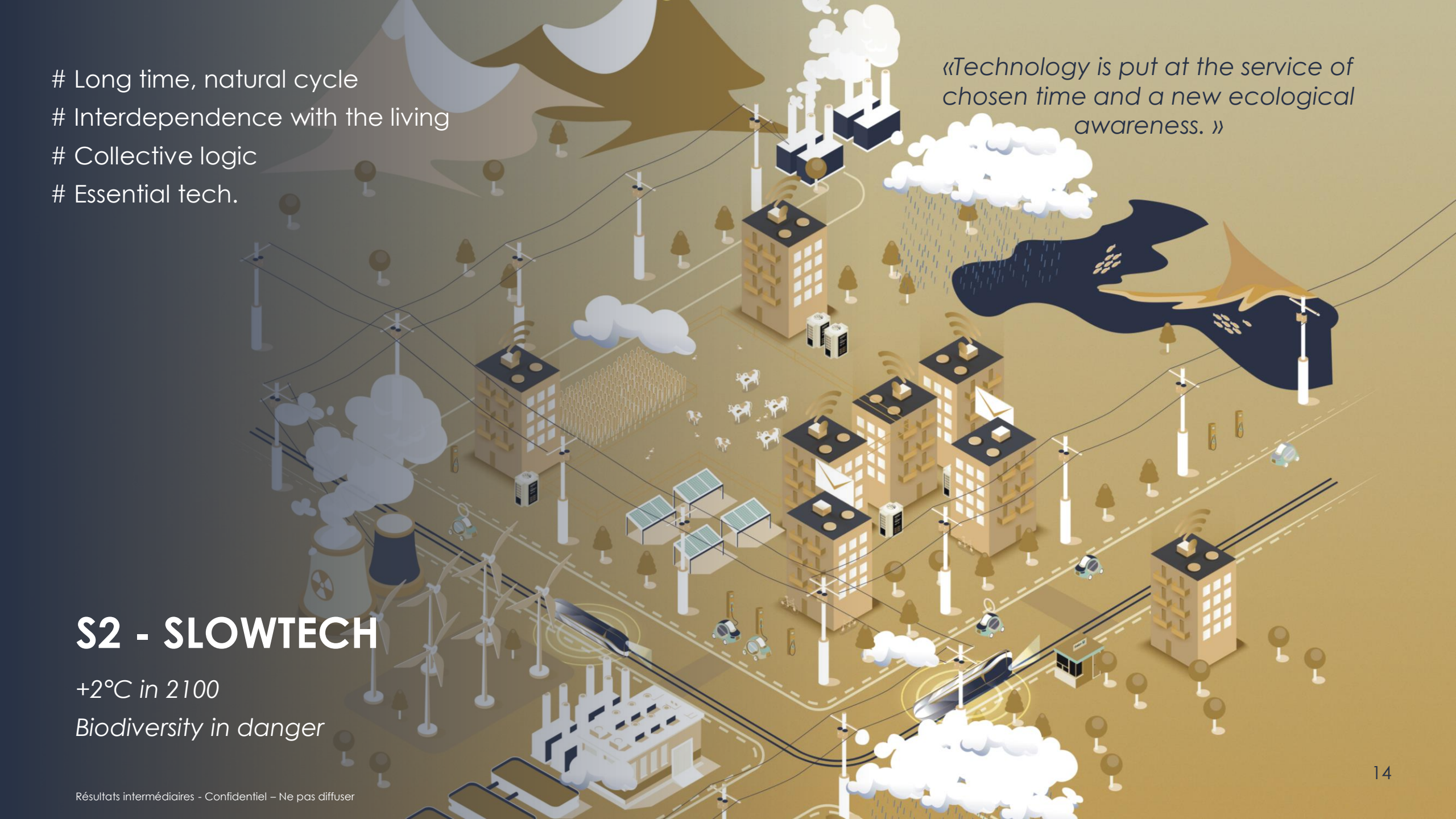
S1 - EQUILIBRIUM

+1,5°C in 2100

Regenerated Biodiversity

Long time, natural cycle
Interdependence with the living
Collective logic
Essential tech.

«Technology is put at the service of chosen time and a new ecological awareness. »



S2 - SLOWTECH

+2°C in 2100

Biodiversity in danger

Time constraint, speed
Nature as a resource
Individual freedom
Essential tech.

S4 - TERRA INCOGNITA

+3°C in 2100

Biodiversity in danger

CONCLUSION

A range of formats for different audiences & needs

PROJECTION INTO THE FUTURE

- Design fiction
- Short stories

DETAILED DATA FOR EACH SECTOR

- Demand data
- Product characteristics
- Environmental impacts
- Resource requirements
- Sector interdependency

UNDERSTANDING KEY FACTORS

- Impact of demand & industry evolutions on planetary boundaries indicators

4

Short focus on aviation

Long time, natural cycle
Interdependence with the living
Collective logic
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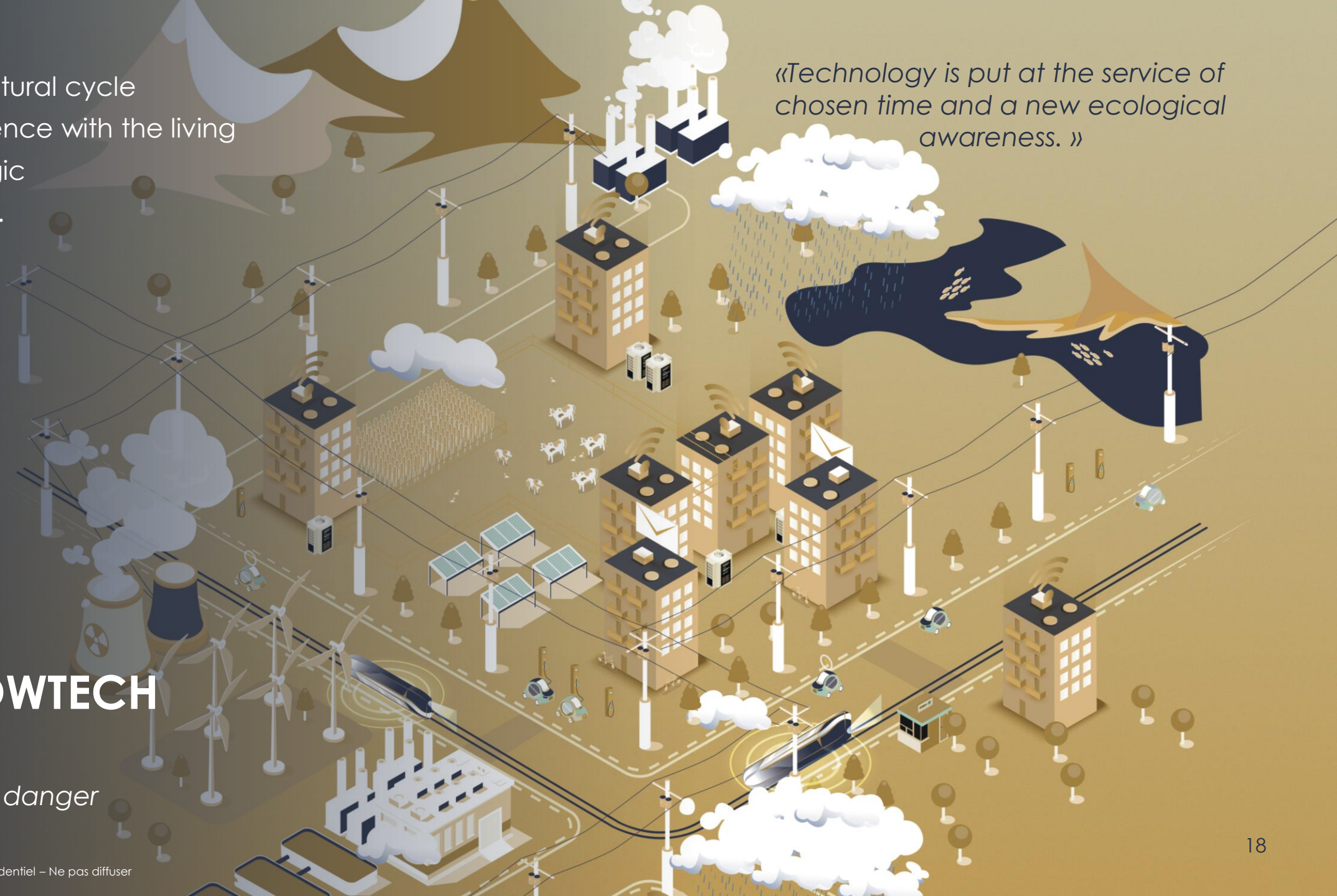


S2 - SLOWTECH

+2°C in 2100

Biodiversity in danger

Dominant lifestyles in the "transportation" category

N1

Modes doux, Achicourt

Quarter-hour city
Active & slow modes
Enjoy the journey

- We prioritize living near daily activities and using active transportation modes.
- Commuting is reimagined for personal growth and social connections, **with long-distance travel becoming rare and purposeful.**

N2


JAM capsule on Japan in Lyon

Choice of experiment
Connected & Optimized
Remote

- Digital technology and shorter working hours reduce the need for daily commuting.
- Nomadism **involves regular and frequent long-distance travel, with slow journeys** that are much appreciated.
- Technology is also becoming our window on the world (eg. virtual reality), enabling us **to become tourists close to home**.

N3

Modular utility cycles, N55

Robust
Modular
Customized

- Active transport modes are growing, providing reliability, autonomy, and energy efficiency.
- Public transport is optimized for comfort
- **Long-distance travel is a strong aspiration**, but our choices of modes of transport take environmental impact into account.

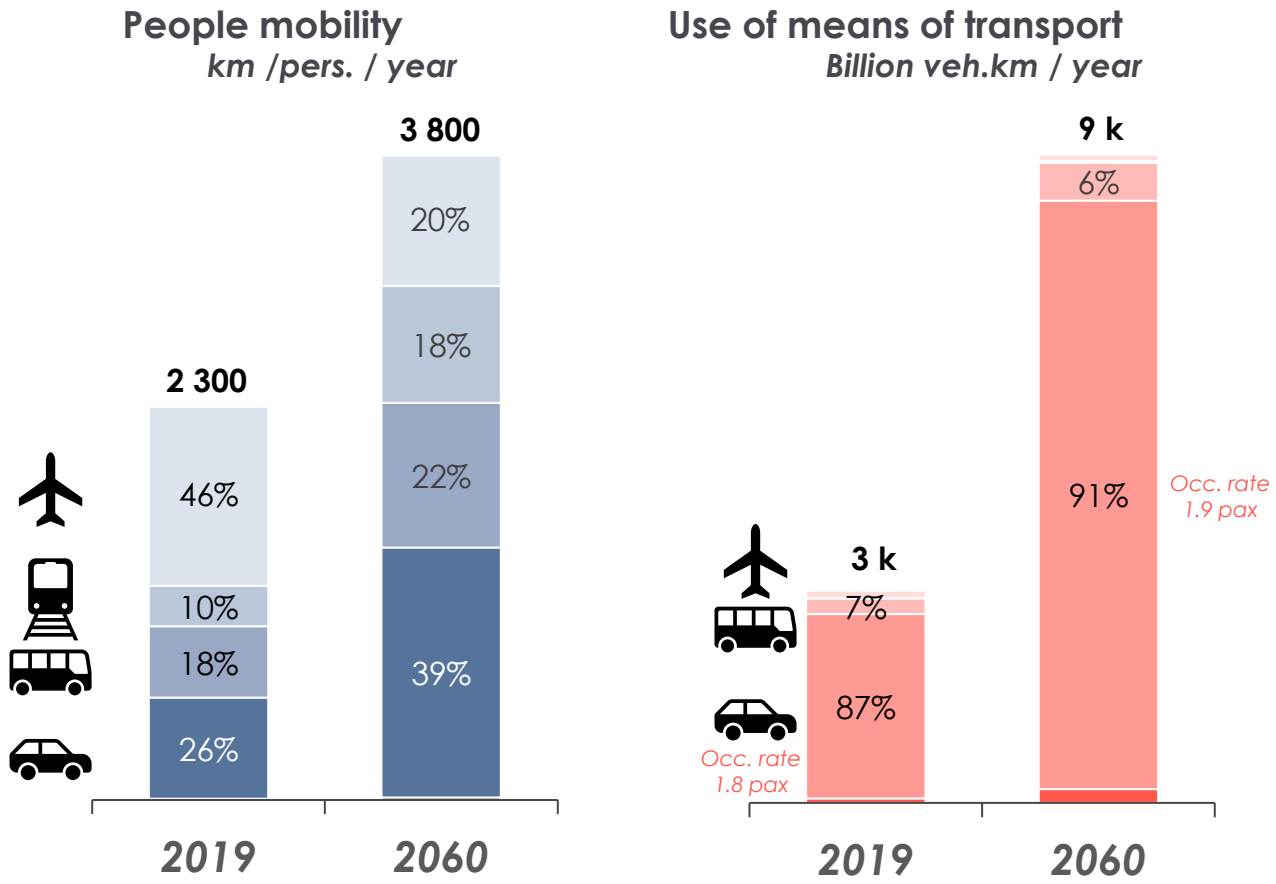
N4

Stratoflight, space tourism concept

Reliability & comfort
Autonomy
Speed & productivity

- In cities, Mobility as a Service (MaaS) and autonomous vehicles play key roles, while rural areas retain individual cars for freedom to move around.
- Public transport needs to be fast and comfortable.
- For holidays, **we aspire to travel fast and far**, even into space if possible, and **more frequently**.

Nomadism and a new relationship with travel are underpinning the boom in long-distance travel by train and car.



- Nomadic lifestyles **limit the urban sprawl** of major cities and daily commuting, but increase inter-city travel.
- **Long-distance business travel reduced** in favour of virtual exchanges
- Leisure travel is still in demand but is less frequent

- **Doubling of distances travelled** by car and train combined
- **A third fewer** distances travelled by air.

Source of 2019 data: ITF Transport Outlook 2023 for intercity and international mobility (between urban areas and across borders). It should be noted in this scenario that the "catching up" of mobility uses by the countries of the South reinforces the growth of the indicators presented.

A limited increase in vehicle fleets and a strong effort to decarbonise road transport.

	Vehicle fleet (millions of units in 2060)		Share of engines (% fleet 2060 and 2020)	
	2060	Diff. 2020	Electric	Combustion
	1 460	+22%	85% 1 %	15% 99%
	33	+56%	62% 3 %	38% 97%
	0,027	-19%	Turboprop 11% 12%	Turbofan 89% 88%

- **Increase in** vehicle **fleet limited to +20%.**
- **Weak decarbonisation effort in aviation** to free up biomass and reduce the airline fleet
- **Tensions over metals:** limited electrification and the rise of **Na-Ion batteries**
- **Strong use of biofuels** thanks to lower meat consumption

Fuels used in internal combustion engines (% 2060 & 2020)				
	Fossils	*Biofuels*	*E-fuels*	*H2*
	32% 95%	68% 5 %	-	-
	36% 97%	64% 3 %	-	-
	87% 100%	11% -	2% -	-

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- Public transport needs to be fast and comfortable.
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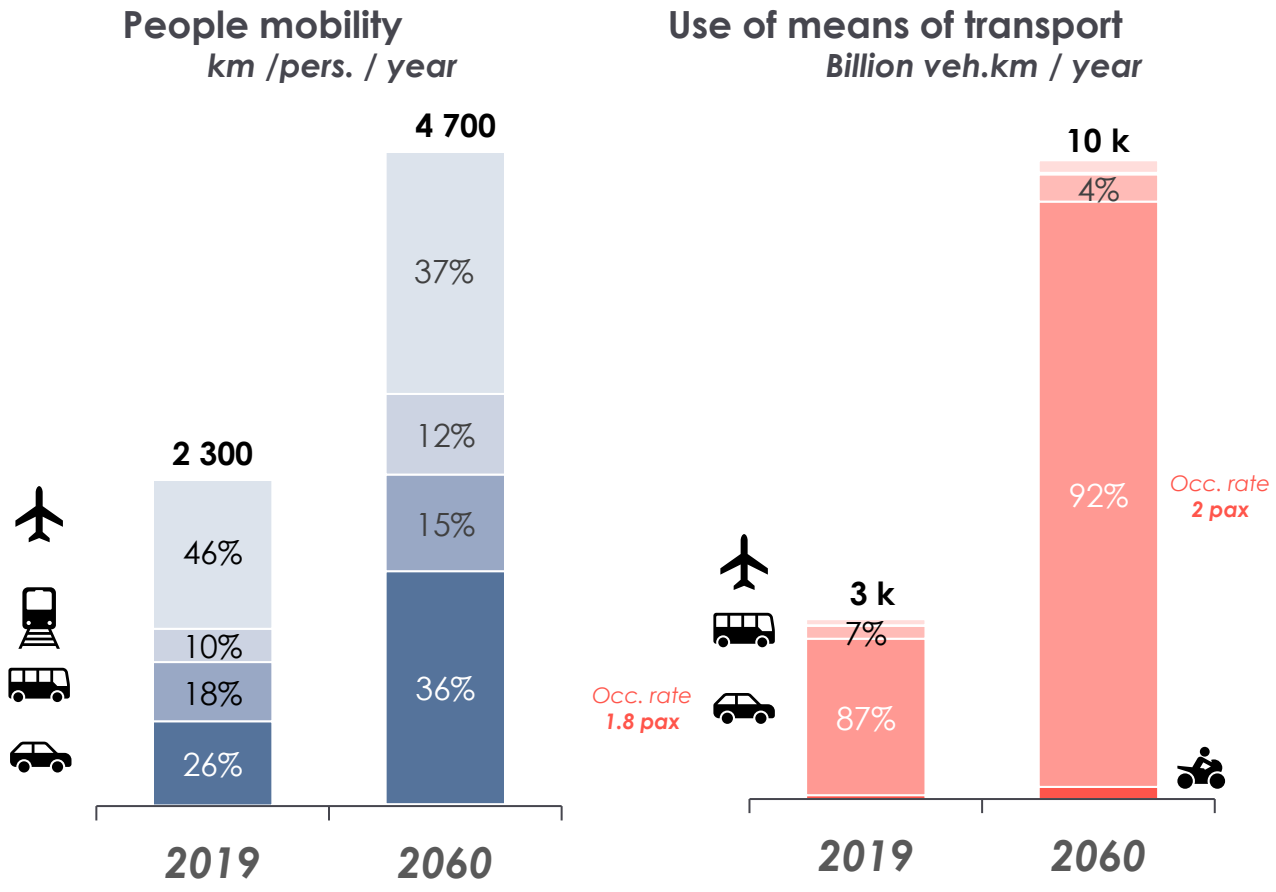
Long-distance mobility is growing rapidly, reflecting the value system, and is decarbonising on a massive scale.



- Strong attachment to the freedom to travel, but a desire for **"responsible" mobility**.
- Appetite for **air travel** (+60% vs 2019), if **flying can be done in a low-carbon way**.
- Sharp change in the energy mix of air transport.
- Very **strong growth** in land-based modes: car x2.8, train x2.4
- Means of transport make **low-carbon travel** possible.
- Reinforcing the very **high penetration of alternatives** to fossil fuels ... to accelerate **the reduction of methane emissions**

Source of 2019 data: ITF Transport Outlook 2023 on intercity and international mobility (between urban areas and across borders).

Strong growth in fleets, made possible by electrification and the use of e-fuels.

Vehicle fleet (millions of units in 2060)	2060	Diff. 2020	Share of engines (% fleet 2060 and 2020)	Electric	Combustion
	1 690	+41%		85% 1 %	15% 99%
	29	+40%		86% 3 %	14% 97%
	0,067	+100%		Turboprop 35% 12%	Turbofan 65% 88%

- **Maximum decarbonisation of vehicles** to minimise the need for sufficiency
- Growth in the car fleet and **doubling of the aircraft fleet**
- **Massive electrification** of land transport and **massive use of e-fuels** in aviation.
- Stronger penetration of alternatives to fossil fuels … to accelerate **the reduction of methane emissions**

Fuels used in internal combustion engines (%2060 & 2020)	Fossils	Biofuels	E-fuels	H2
	39% 95%	61% 5 %	-	-
	41% 97%	59% 3 %	-	-
	2% 100%	24% -	63% -	11% -

5

Preliminary take aways and next steps

WHAT'S IN FOR SPONSORS ?

1. **Shape and own a new strategic framework**: Actively contribute to guiding and validating the work while leveraging collective expertise.
2. **Benefit from a pioneering business collective**: Access networking, shared best practices, and cross-sector insights.
3. **Accelerate internal transformation**: Premium tools, training programs, and tailored support to meet CSRD requirements and boost strategic planning.
4. **Enhance reputation and be cost-efficient**: Strengthen your brand as a leader in the Anthropocene transition while reducing costs through mutualized efforts.

PROJECT NEXT STEPS

- **By end of 2025**:
  - Regionalize scenarios, expand the scope of sectors and resources covered, and enhance robustness (including CSRD applications).
  - Develop and share operational use cases for the scenarios.
- **From 2026 onwards**:
  - Continue developments (modeling/scenarios).
  - Strengthen support for operational implementation.
  - Promote and disseminate the strategic thinking framework.

Imagining futures within planetary boundaries