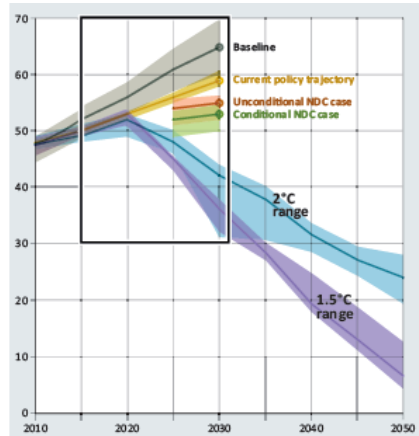
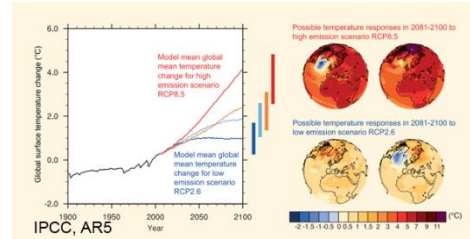
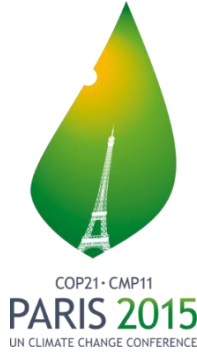




LUXEMBOURG IN TRANSITION

SPATIAL VISIONS FOR THE ZERO-CARBON
AND RESILIENT FUTURE
OF THE LUXEMBOURG FUNCTIONAL REGION





- Le changement climatique est une question de concentration de CO₂ dans l'atmosphère : le monde dispose d'un budget carbone de 890 Gt (60 Gt pour l'UE)

	CO ₂ budget globally from 2015	CO ₂ budget EU-28		
		Emissions share 2015	Share in population	
	Gt CO ₂	Gt CO ₂	2015	2050
1.5°C for 66% of model runs	240	21,7	16,6	12,9
1.5°C for 50% of model runs	390	35,2	27,0	20,9
1.5°C for 33% of model runs	690	62,2	47,7	37,1
2°C at 66% probability	890	80,2	61,5	47,7
2°C at 50% probability	1.000	90,1	69,1	53,6
2°C at 33% probability	1.290	116,2	89,2	69,2
3°C for 66% of model runs	2.240	202,0	154,9	120,2
3°C for 50% of model runs	2.640	238,0	182,6	141,7
3°C for 33% of model runs	3.090	278,6	213,7	165,9

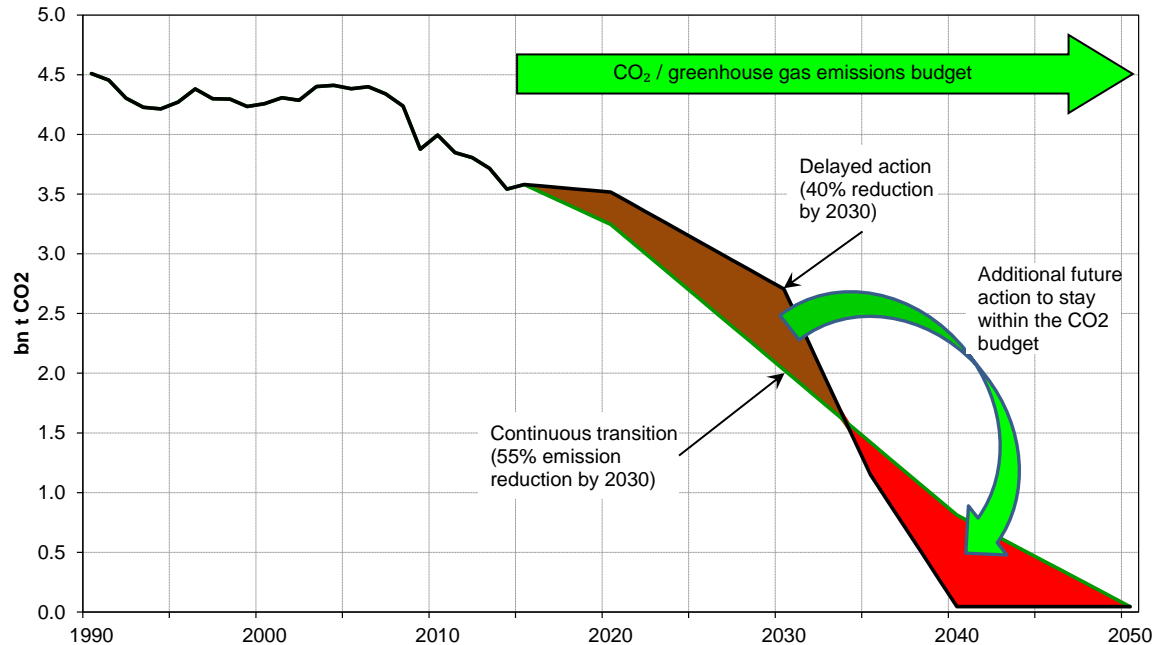
The climate impact of energy and emission pathways can be assessed on the basis of cumulative CO₂ emissions

The IPCC provides CO₂ emission budget specifications that are widely used in analytical exercises on Paris-compatible pathways (e.g. by IEA/IRENA)

The EU's fair share in the global budget is based on a per-capita (equity) basis on the post-Paris (post-2015) CO₂ emissions



- Objectif neutralité climatique pour 2050 au plus tard ("Climate Law"). Cela implique de réviser à la hausse l'objectif intermédiaire de -40% en 2030





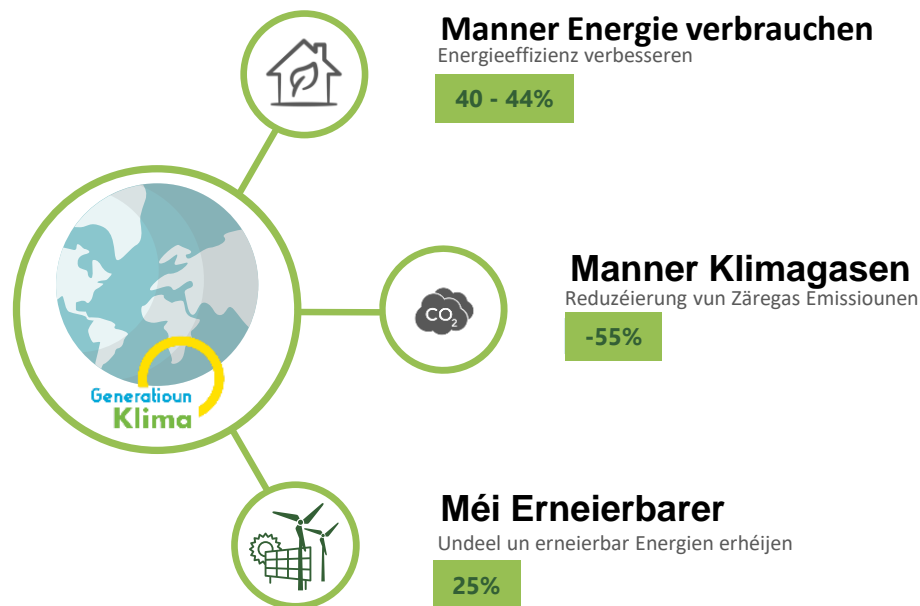
“27-27-40” ARE NOT ENOUGH 2030 TARGETS SHALL BE REVISED UPWARDS

	Reference Scenario					Vision Scenario			
	2015	2020	2030	2040	2050	2020	2030	2040	2050
Share of renewables									
Power generation	29%	37%	43%	45%	53%	39%	70%	84%	100%
District heat*	26%	24%	23%	22%	22%	27%	60%	84%	96%
Final energy*	15%	19%	22%	24%	27%	19%	37%	65%	96%
<i>Industry</i>	18%	24%	30%	34%	38%	24%	47%	67%	88%
<i>Tertiary</i>	18%	23%	28%	31%	36%	23%	48%	69%	99%
<i>Households</i>	25%	28%	29%	30%	33%	29%	55%	78%	100%
<i>Transport</i>	4%	7%	7%	8%	9%	7%	14%	57%	99%
Primary energy	15%	17%	19%	21%	13%	20%	40%	70%	98%
Energy Efficiency	Change from Primes Baseline 2007**								
Primary energy	-	-18%	-23%	-	-	-23%	-44%	-	-
Primary energy imports***	17%	13%	13%	14%	17%	13%	10%	7%	7%
GHG emissions	Change from 1990								
Total****	-21%	-24%	-32%	-37%	-42%	-30%	-54%	-78%	-93%
CO2****	-21%	-22%	-30%	-35%	-42%	-28%	-55%	-82%	-99%
Notes: * The share of renewable energy sources includes indirect contributions from electricity, heat, hydrogen & synfuels. The statistically unaccounted ambient heat delivered by heat pumps represents additional contributions to the final energy supply from renewables. - ** The 2007 Primes Baseline projection for the EU-27 was adjusted for Croatia. - *** Excluding primary energy for non-energy uses, nuclear fuel was fully considered as imported primary energy. - **** Including international aviation and excluding LULUCF.									



Nationalen Energie- a Klima Plang (PNEC)

Ambitiéis Ziler bis 2030

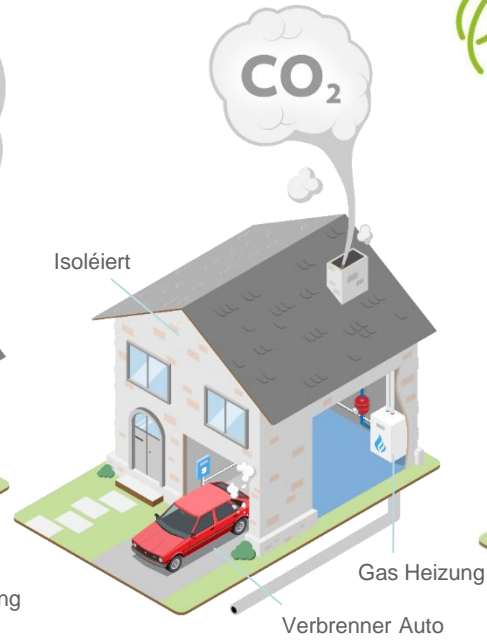




CLEVER
WUNNEN
*Sue
spueren*



**Aalbau
net renovéiert**



**Aalbau renovéiert
Neibau**






**Klimaneutral
wunnen**



NEI START LËTZEBUERG

Gréng Relance

E Plus fir d'Klima, d'Handwierk an d'Bierger

Mesure	 Manner Energie verbrauchen	 Manner Klimagasen	 Méi Erneierbarer
Augmentation des aides financières pour la rénovation énergétique	✓	✓	
Augmentation des aides financières pour la promotion des systèmes de chauffage basés sur les énergies renouvelables		✓	✓
Augmentation des primes d'achat pour les voitures et camionnettes électriques	✓	✓	✓
Augmentation des primes pour les autres véhicules électriques ainsi que pour les vélos et pedelecs	✓	✓	✓
Programme de subventionnement des bornes de charge électriques		✓	✓
Renforcer les programmes de soutien du secteur privé en faveur de l'efficacité énergétique	✓	✓	
Élargissement du cercle des bénéficiaires des aides pour installations photovoltaïques au-dessus de 30 kW		✓	✓



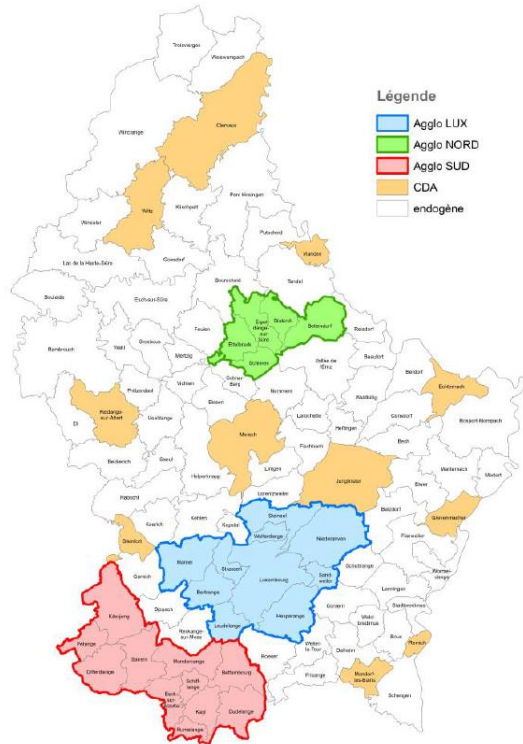
LUXEMBOURG IN TRANSITION

SPATIAL VISIONS FOR THE ZERO-CARBON
AND RESILIENT FUTURE
OF THE LUXEMBOURG FUNCTIONAL REGION



URBAN HIERARCHY AND SOIL SEALING

Left map

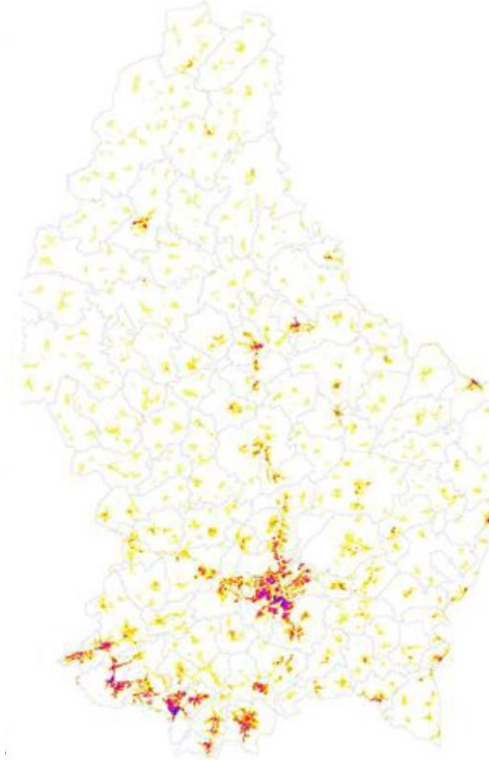


The three urban agglomerations of Luxembourg and the so-called **Centres of Development and Attraction** with key functions for the rural areas.

- 102 municipalities in total
- 37 urban/suburban
- 65 rural (“endogenous”)

Right map

Population density (2019).





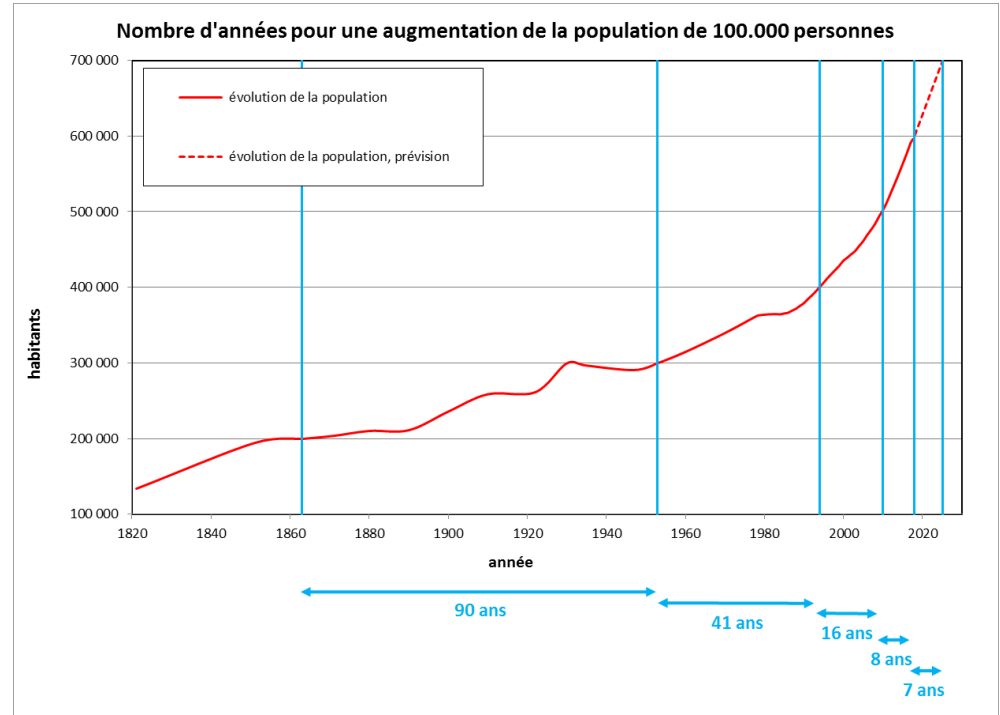
EXPONENTIAL DEMOGRAPHIC GROWTH

In January 2021, Luxembourg had 634.000 inhabitants.

Between 2003 and 2017, there were 146.000 new inhabitants (which corresponds to an average growth rate of 1,9 % per year).

Between 2010 and 2017, the average growth rate reached 2,3 % per year.

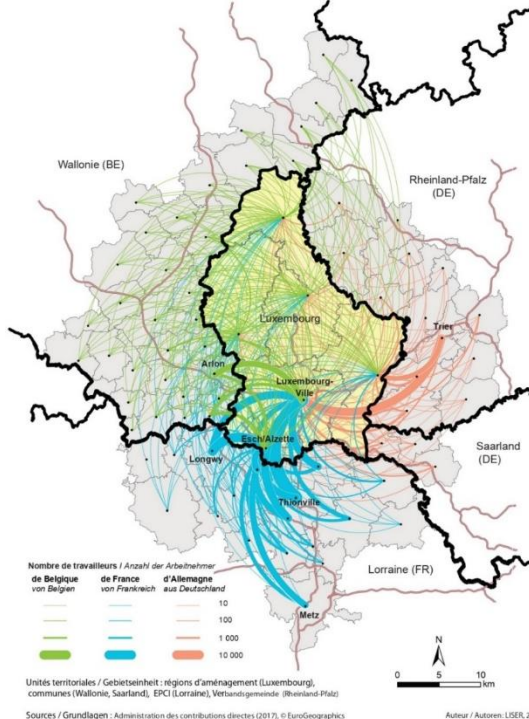
The timespan for the population to grow by 100.000 has decreased from 90 years to roughly 8 years and less.





CROSS-BORDER COMMUTERS AND JOBS

Flux domicile - travail des actifs frontaliers vers le Luxembourg en 2017
Pendlerströme der Grenzbeschäftigten nach Luxemburg im Jahr 2017



Left map

About 200.000 people from the neighbouring countries commute to Luxembourg for work.

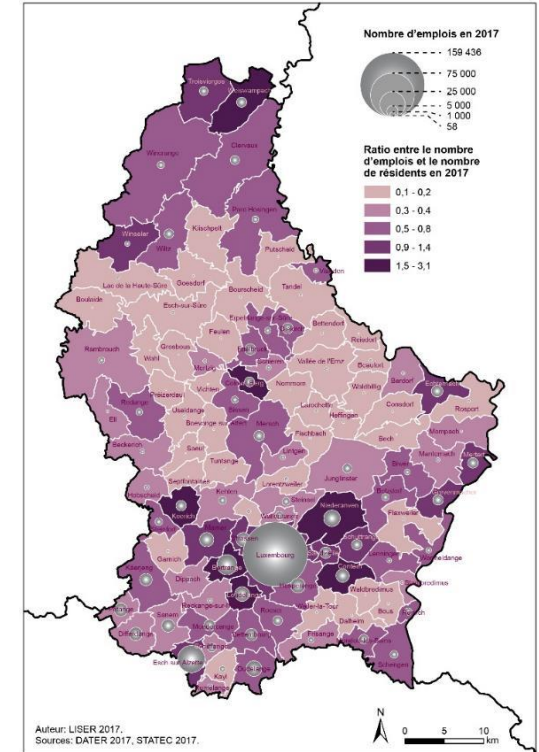
$\frac{1}{2}$ from France (106.000)

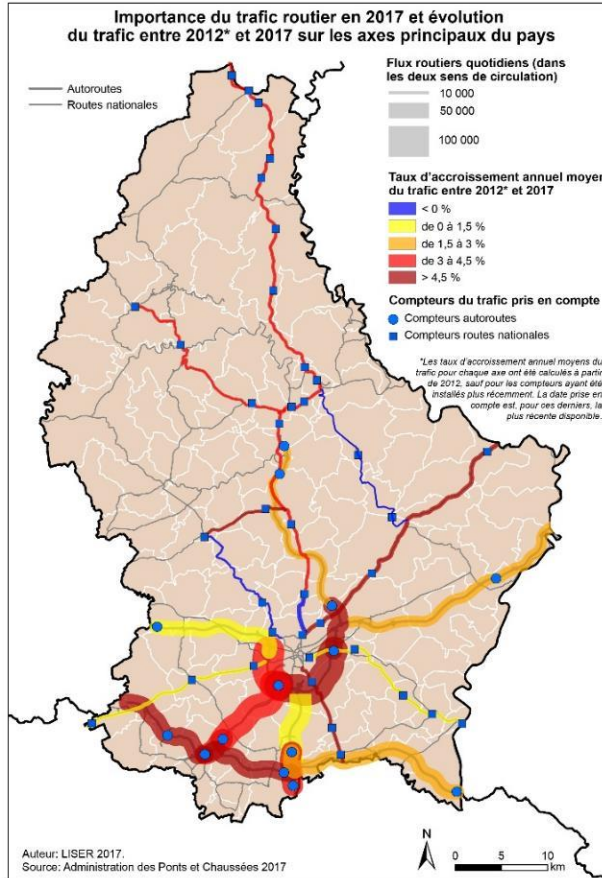
$\frac{1}{4}$ from Germany (48.000)

$\frac{1}{4}$ Belgium (47.000)

Right map

In 2017, there were about 160.000 jobs in Luxembourg-City. This corresponds to 1,4 jobs per inhabitant of the city and 37% of the country's total jobs.





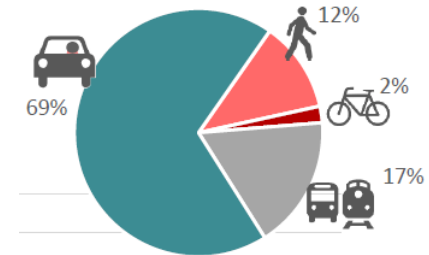
SATURATION OF ROAD NETWORK

Between 2007 and 2015, motorised transport has increased by 15 %.

The situation has worsened on the ring road around the capital and the motorway in the Southern part of the country due to the concentration of jobs in these two agglomerations (72% of the country's total jobs).

With a steady population growth in the rural areas, individual transport has also increased.

Modal split for commuting (2017)





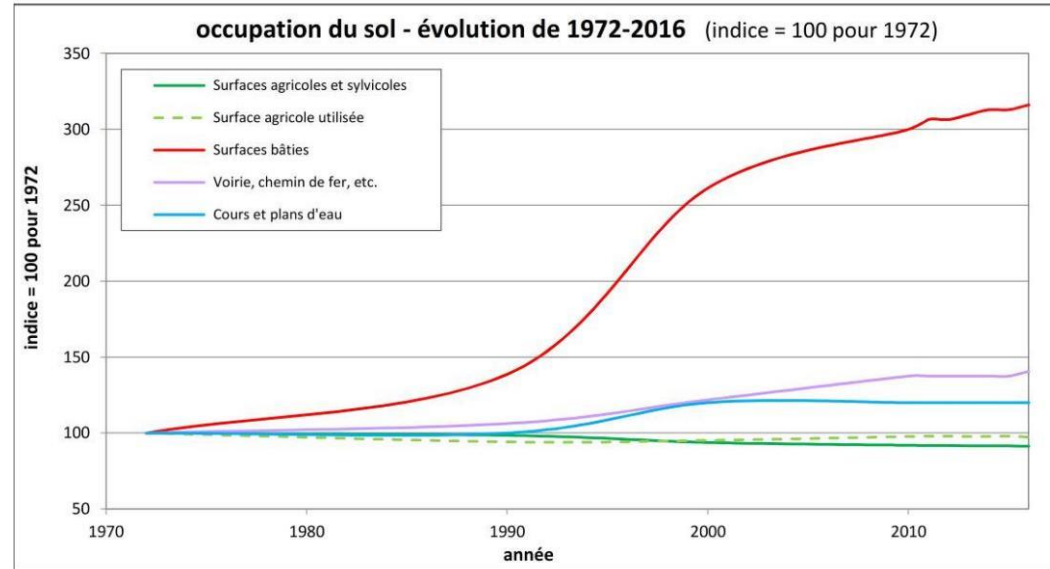
SOIL SEALING IS INCREASING

Increase in built surfaces between 1972 and 2016.

Soil sealing puts biodiversity at risk, contributes to global warming, increases the risk of flooding and water scarcity, increases land fragmentation.

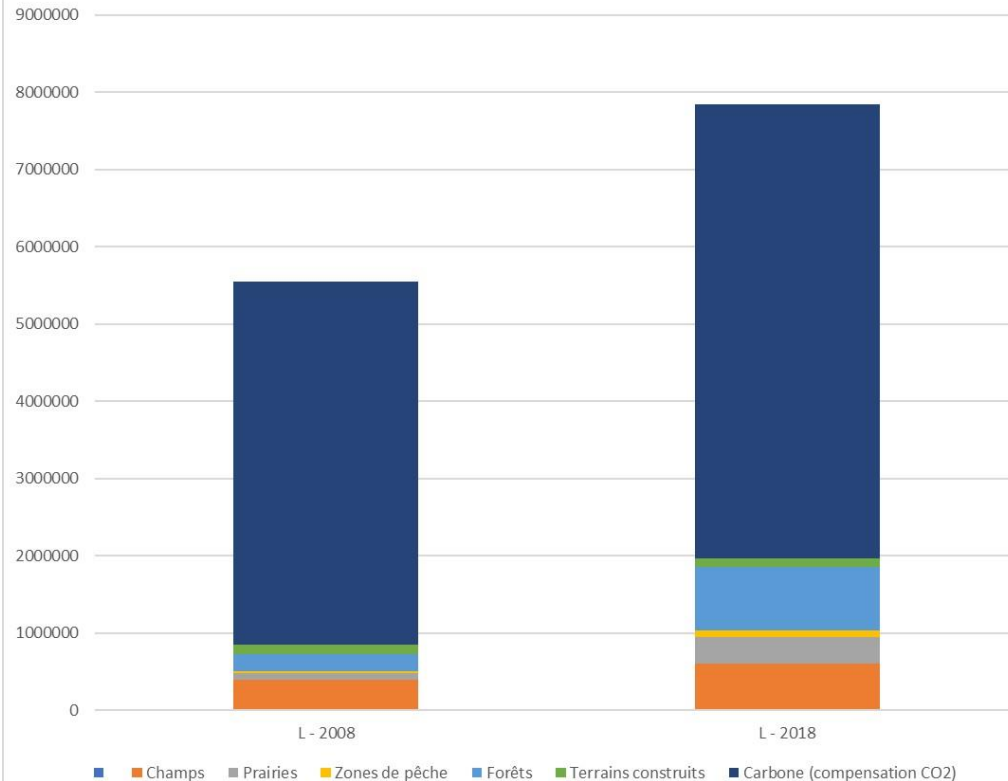
The level of land take was extremely high in the 1990s, but is still high today due to soaring land prices.

There are less and less farmers in rural villages, as there is a process of “rurbanisation”.





Empreinte globale du Luxembourg, comparaison entre 2008 et 2018 en hectares globaux



ECOLOGICAL FOOTPRINT

Overall ecological footprint of Luxembourg in 2008 and 2018 in global hectares.



The Master Programme for Spatial Planning (*Programme directeur de l'aménagement du territoire, PDAT*) defines an **integrated strategy for sector policies** having a territorial impact and states the political objectives for a sustainable development of the territory.

The coalition agreement of the government 2018-2023 stipulates the elaboration of a **new PDAT** based on **two time horizons**:

- **Horizon 2035** : defines the **short- to medium-term objectives and strategies**. This section is developed by the Department of Spatial Planning in close collaboration with sector policies.
- **Horizon 2050** : determines the **long-term orientation of spatial planning**.

Through the results of the international consultation “Luxembourg in Transition”, the government will define its own strategy for implementing the ecological transitions in the framework of spatial development policy.



An international consultation

- in the framework of revising the **Master Programme for Spatial Planning** (*Programme directeur de l'aménagement du territoire, PDAT*) and its **process of public participation** (2017-2018)
- in keeping with the **Rifkin Report**, the strategic study of the Third Industrial Revolution in Luxembourg
- in relation with the **Green Deal** of the European Union
- in line with the **National Energy and Climate Plan 2030** (*Plan national intégré en matière d'Énergie et de Climat 2030, PNEC*) and developing a zero carbon strategy 2050
- in accordance with the **17 Sustainable Development Goals** of the 2030 Agenda of the United Nations

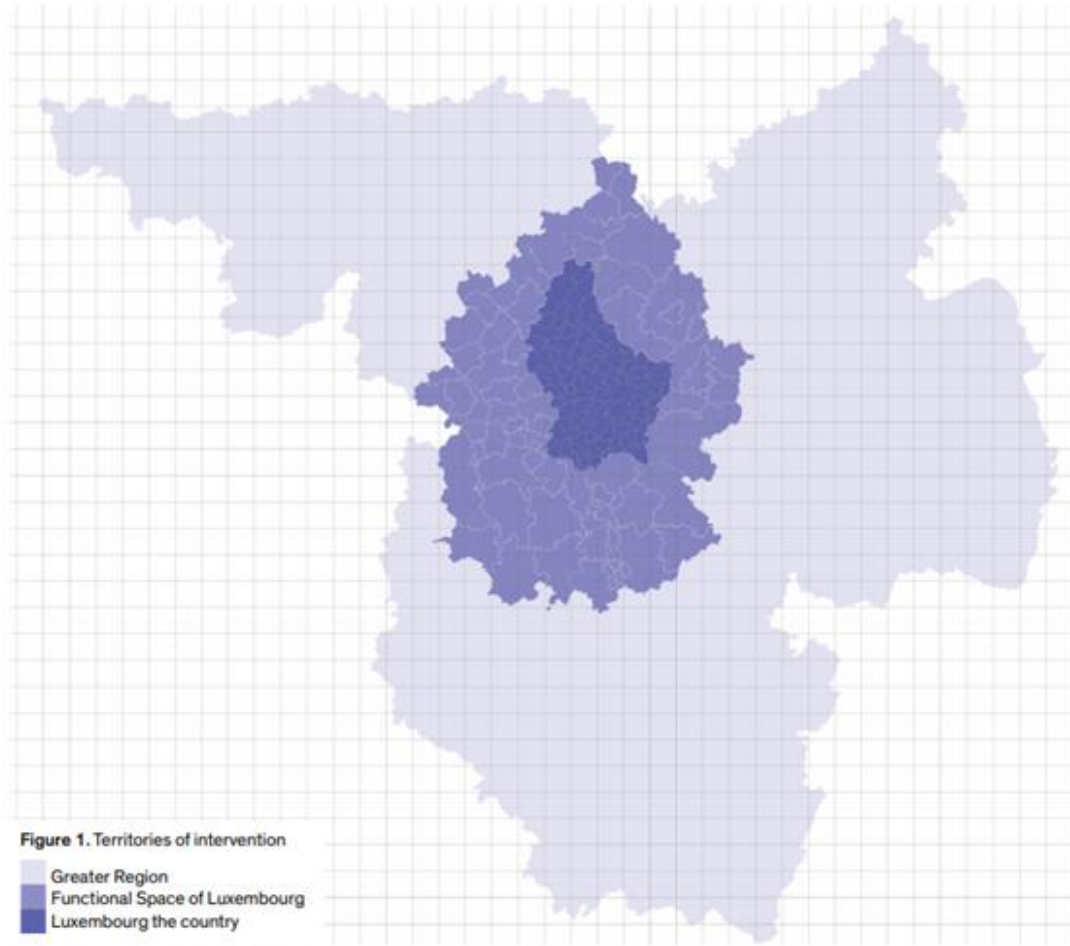


Figure 1. Territories of intervention





The **urban-architectural and landscape consultation**

- ➔ aims at bringing together the strategic proposals of spatial planning and producing scenarios for the ecological transition, with a time horizon of 2050, of Luxembourg and its cross-border functional territories, i.e. its cross-border metropolitan area.
- ➔ addresses practitioners, universities, technical colleges and research institutes with expertise in the areas of spatial planning, urban planning, landscape planning or architecture, with the support of environmental studies, the social sciences and the humanities.
- ➔ encourages the formation of multi-disciplinary teams with different backgrounds who will work in parallel during three stages until December 2021.
- ➔ is a call for ideas for desirable futures and concrete actions in order to
 - accompany the measures taken by decision-makers in the years to come and
 - reinforce the acceptance of citizens for the collective project of profoundly transforming their lifestyle.



- 1 Defining a **territorial vision** that contributes to
 - ➔ the reduction of our ecological footprint, which means
 - achieving the objective of **zero carbon emissions by 2050** and holding the increase in global average temperature at **below 1,5°C**
 - achieving the objective of **no net land take by 2050**
 - ➔ the creation of an integrated cross-border functional region



- ② Developing a **spatial planning strategy across borders** and concrete instruments/concepts to promote the ecological transition by:
- ➔ supporting **biodiversity**, improving ecosystem quality and preserving natural capital
 - ➔ integrating the aspects of **transport, housing, energy** and **digitalisation**
 - ➔ developing models for a **resilient territory**
 - ➔ designing tools for an **economic development** that is **stable, equitable** and **solidary**
 - ➔ promoting **social cohesion** in line with **territorial cohesion**

Territorial visions for the zero-carbon and resilient future of the Luxembourg cross-border functional region

- SC Scientific Committee** - 15 national and international members - Assessment of the teams' reports.
- CC Consultative Committee** - 18 members from Luxembourg and the Greater Region - Opinion on the teams' reports
- IC Inter-ministerial Committee** - 6 members - Analysis of the assessment and opinion
- BK Biergerkomitee (Citizen Committee)** - 30 members from Luxembourg and the Greater Region - Comments and suggestions on the teams' reports.
- CA Contracting Authority** - Department of Spatial Planning - Final decision.

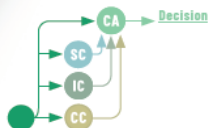
PRELIMINARY STAGE
CALL FOR APPLICATIONS
16.06.2020 - 31.08.2020

30 applications submitted.



represents 1 team

Decision-making procedure



1 STAGE
16.10.2020 - 22.01.2021

The methodological framework for the transition project

10 teams selected.



représente 1 projet



2 STAGE
01.02.2021 - 04.06.2021

The transition project adapted to the cross-border functional region.

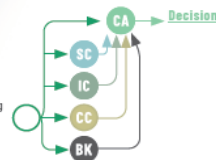
6 teams selected.



BK
18.02.2021

The „Biergerkomitee“ joins the process

Decision-making procedure



3 STAGE
14.06.2021 - 24.12.2021

The transition project phased and broken down into pilot projects

3 teams selected.



THE 10 TEAMS SELECTED (IN ALPHABETICAL ORDER)



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG

Title of transition project	Team / Lead partner
Tracer la voie d'un futur décarboné, résilient et désirable pour le Luxembourg	<i>AREP Ville SAS (France)</i>
Métaboliser les réseaux du territoire	AWP, Agence de reconfiguration territoriale (France)
LUXEUROPE 2050 - Le Grand-Duché en transition	Interland Sàrl (France)
Se développer au-delà des frontières & fermer la boucle	KCAP Architects&Planners GmbH (Switzerland)
The Luxembourg region as the most liveable, responsible and sustainable in Europe	<i>MVRDV B.V. (Netherlands)</i>
Energyscapes	Raum404 GmbH (Switzerland)
Une vision pour le Luxembourg - EUROPE, TERRE.	Studio Paola Viganò (Italy)
Infrastructures biorégionales : matières, circuits, coalitions	TVK architecte et urbaniste Sàrl (France)
Luxembourg 2050 - Prospects for a Regenerative City-Landscape	<i>University of Luxembourg (Luxembourg)</i>
Caring for soil : Reimagining a territory while empowering the collective	<i>2001 Sàrl (Luxembourg)</i>

ÉQUIPE : 2001

Caring for soil : Reimagining a territory while empowering the collective

2001 Sàrl * *Luxembourg* ♦ 51N4E bvba *Belgique* ♦ LOLA *Pays-Bas* ♦ Systematica *Italie* ♦ Transsolar SAS *France* ♦ Endeavour *Belgique* ♦ ETH Zürich *Suisse* ♦ TU
Kaiserslautern *Allemagne* ♦ Yellow Ball *Luxembourg* ♦ Waltersdorfer Gregor *Luxembourg* ♦ Maxime Delvaux *Belgique* ♦ Office for Cities *France*



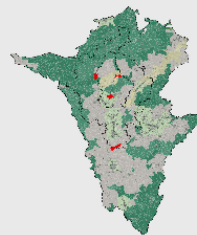
Principales thématiques

the 3 shifts



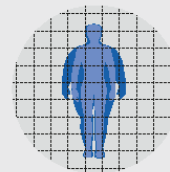
a diet shift

led by citizens
to reduce land/
CO2 footprint



a biofunctional shift

led by politicians
to prioritize
resources



a cultivation shift

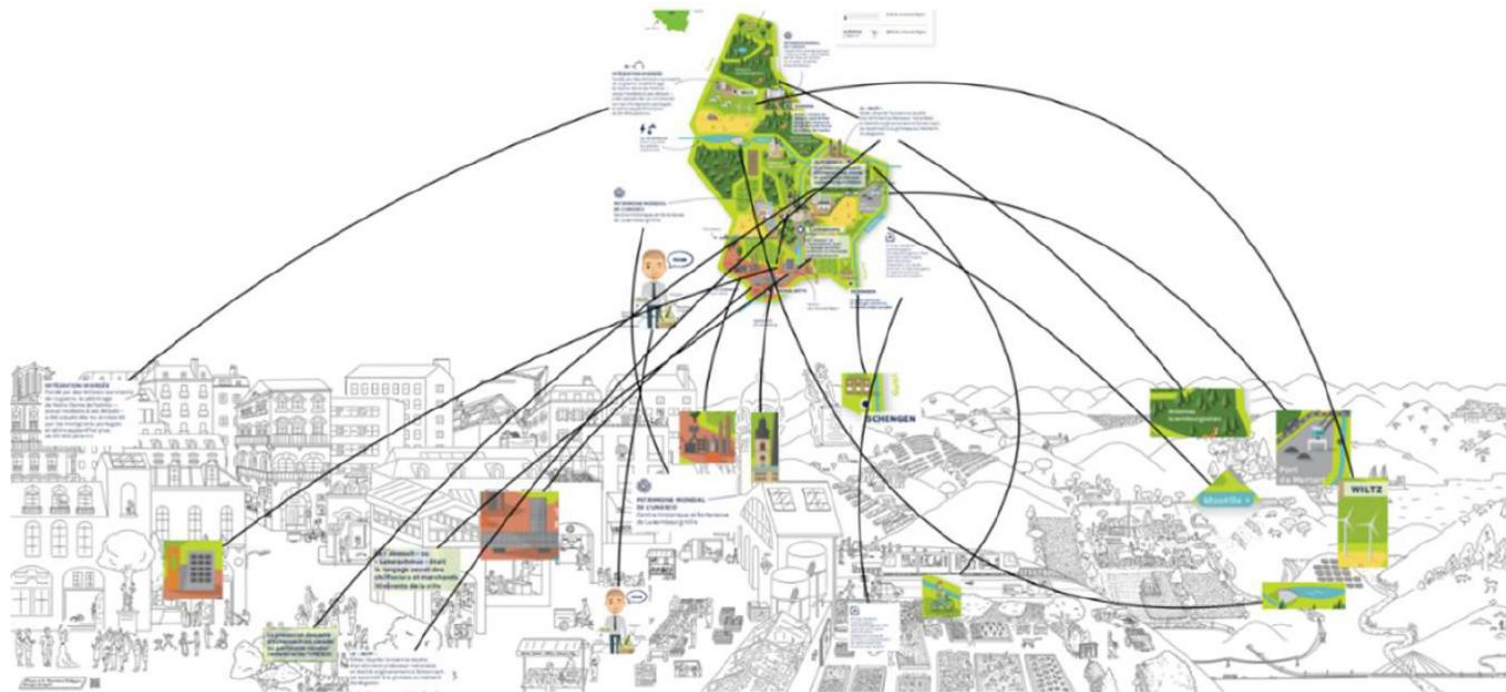
led by farmers
to maximise
sequestration

ÉQUIPE : AREP

Tracer la voie d'un futur décarboné, résilient et désirable pour le Luxembourg

AREP Ville SAS * *France* ♦ Sorbonne Université *France* ♦ TAKTYK Sàrl *France* ♦ Mobil'homme Sàrl *Suisse* ♦ QUATTROLIBRI EURL *France*

Outil: Fresque





Un urbanisme post-croissance pour un paysage post-carbone

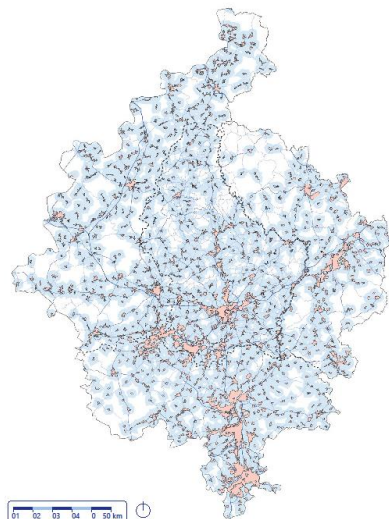
— UN URBANISME POST-CROISSANCE POUR UN PAYSAGE POST-CARBONE

SOBRIÉTÉ

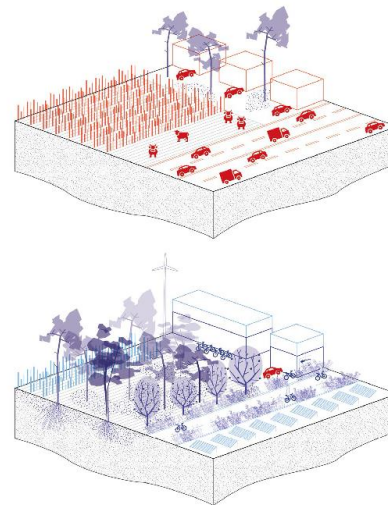


PRIORITÉ
CLIMAT

ZÉRO ARTIFICIALISATION BRUTE



RÉAFFECTATION DE SOLS AU
SERVICE DE LA TRANSITION



ÉQUIPE : KCAP

Se développer au-delà des frontières & fermer la boucle

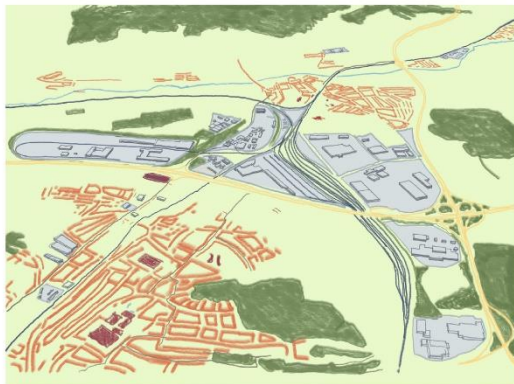
KCAP Architects&Planners GmbH * Suisse ♦ Arup Deutschland GmbH *Allemagne* ♦ Cabane Partner Urbane Strategien und Entwicklung GmbH



Exemple de transformation : Bettembourg-Dudelange

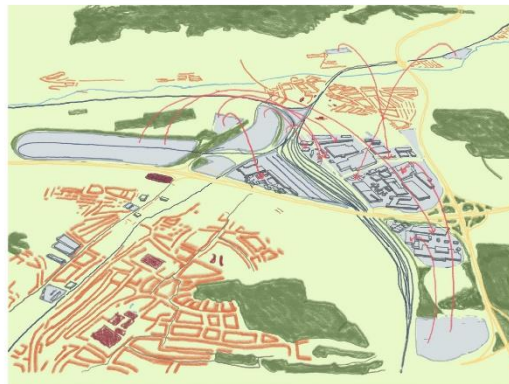
Status quo

- Buildings loosely scattered in a 4.42km² brown-field, low energy and spatial efficiency
- Blocking the spatial connection between the towns of bettembourg and Dudelange.
- Bettembourg terminal as a mono-functional block serving mainly the heavy industries



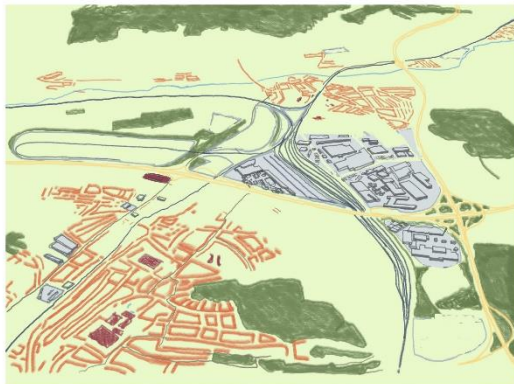
Phase 1

- Cancel any green-field urban extension
- Promote relocation of scattered industrial and logistics activities into new, mixed and densified facilities
- freeing up around 50% of brown-field.



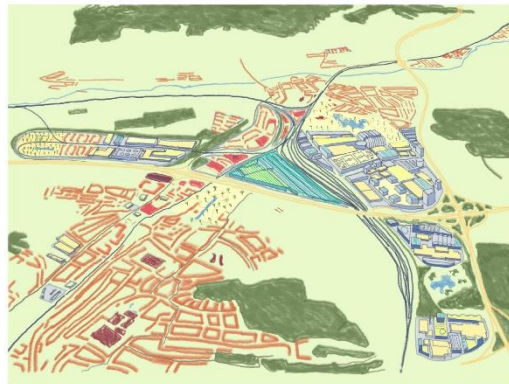
Phase 2.1

- Obsolete and remote brown-field surfaces be converted into agricultural land, woodland, or nature
- CO₂ gains are expected through the renaturalization of the land



Phase 2.2

- Deploy the well-located freed-up brownfield for urban renewal to reorganize and connect the villages' centralities
- Make diverse centralities with housing, public amenities, etc.
- Gain CO₂ emissions by developing compact and efficient urban area.



ÉQUIPE : MVRDV B.V.

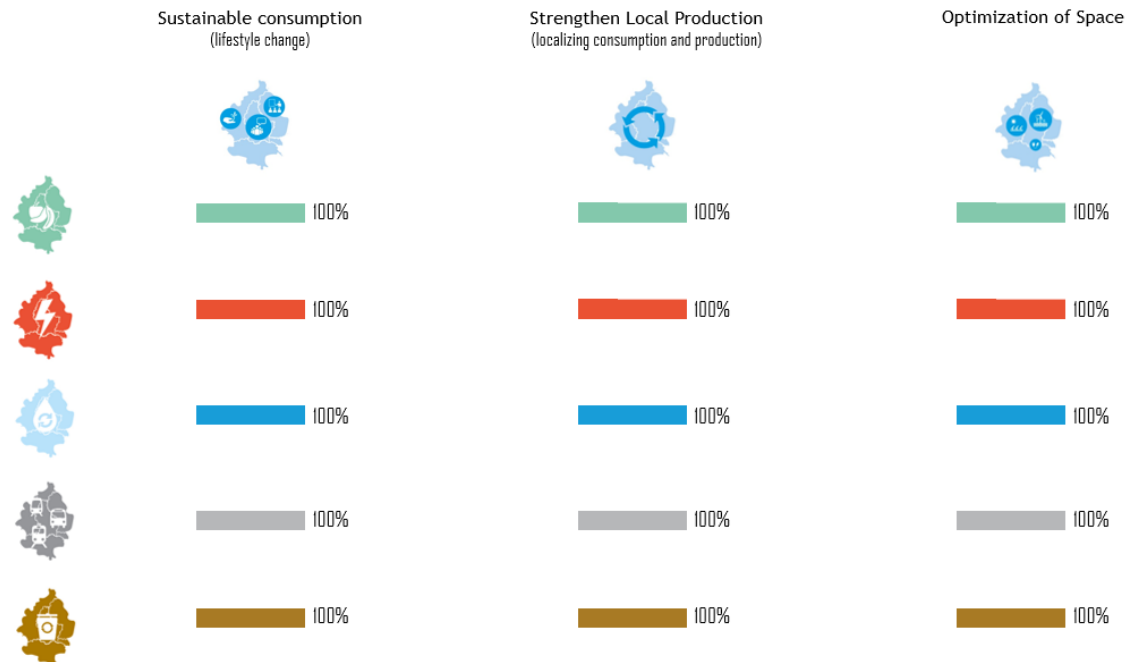
The Luxembourg region as the most liveable, responsible and sustainable in Europe

MVRDV B.V. * Pays-Bas ♦ Goudappel Coffeng Pays-Bas ♦ Transsolar Inc. États-Unis ♦ H+N+S B.V. Pays-Bas ♦ Deltares Pays-Bas ♦ DRIFT B.V. Pays-Bas ♦ University of Twente, ITC Faculty Pays-Bas

Un outil de décarbonisation



What if... we take all actions to 100%?



ÉQUIPE : UNIVERSITÉ DU LUXEMBOURG

Luxembourg 2050 - Prospects for a Regenerative City-Landscape

Université du Luxembourg * *Luxembourg* ♦ LIST, Luxembourg Institute of Science and Technology *Luxembourg* ♦ CELL, Centre for Ecological Learning Luxembourg
Luxembourg ♦ IBLA, Institut fir Biologësch Landwirtschaft an Agrarkultur asbl *Luxembourg* ♦ OLM, Office for Landscape Morphology Co. Ltd. *France*



More....

—
Less Emissions
More Resilience

—
Less Sealed Soil
More Biodiversity

—
Less Monocentrism
More Spatial Justice

—
Less Mobility
More Quality of Life

—
Less Fragmentation
More Proximity

—
Less Space for Cars
More Space for Life

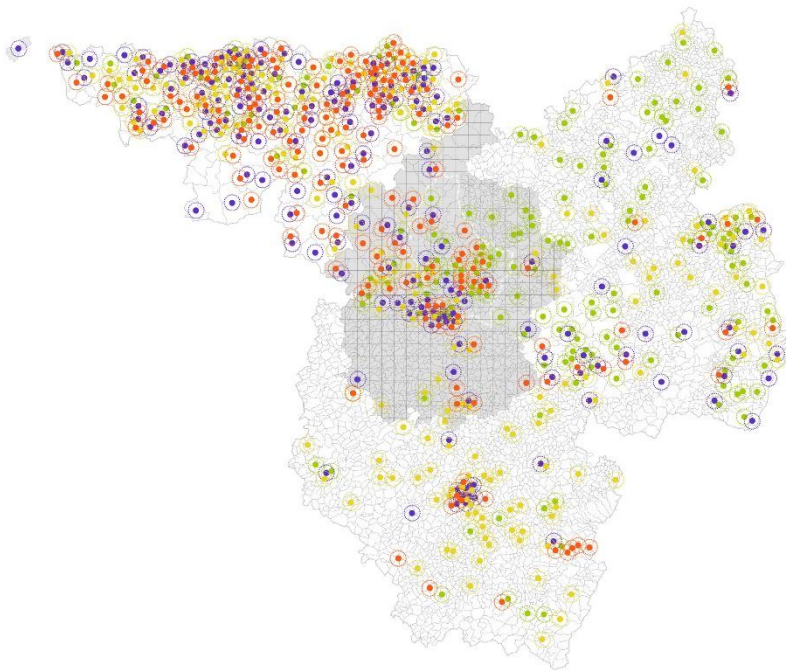
—
Less Feed
More Food

—
Less Waste
More Re-use

—
Less Top-Down
More Co-Creation

Civic Empowerment

— 2021

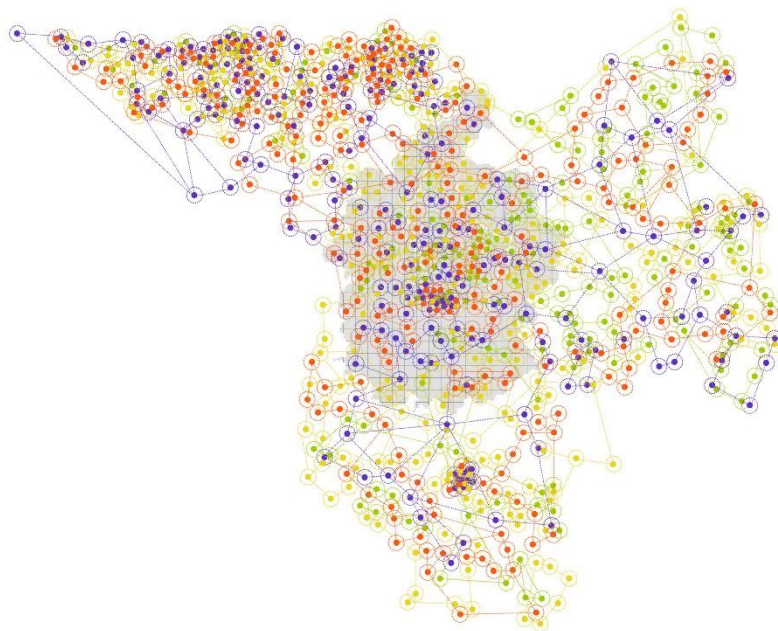


- Energy Cooperatives
- Community-Supported Agriculture
- Community Gardens
- Repair Cafés



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG

— 2050



LUXEMBOURG IN
TRANSITION



Exemple de transformation: Foetz

— 2021



— 2047



Exemple





SCIENTIFIC COMMITTEE

with 15 eminent scientists and practitioners

CONSULTATIVE COMMITTEE

with important (cross-)sectoral stakeholders as well as representatives from the partner authorities in the Greater Region

INTER-MINISTERIAL COMMITTEE

with representatives from the relevant sector ministries

CITIZEN COMMITTEE / *BIERGERKOMMITEE LËTZEBUERG 2050*

representing all the facets of society in Luxembourg



Launched in January 2021, the *Biergerkommittee Lëtzebuerg 2050* accompanies the work of the consultation.

With **professional guidance and scientific training** in the most relevant fields (spatial planning, climate, etc.) for the period from January until December 2021, a group of 30 citizens, representative of the Luxembourgish society and living in Luxembourg or its cross-border functional territories, **participate in the discussions** of the consultation and **follow a series of conferences and talks**, which are specifically organised for this consultation and will deal with the different aspects of the transition.

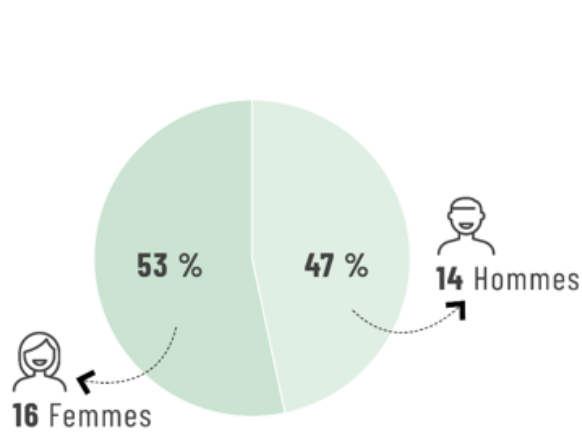
This Committee can thus be compared to a **people's university**.

The Committee is in **contact with the teams** of the consultation. Through open debate in roundtables, the missions of the Citizen Committee are to:

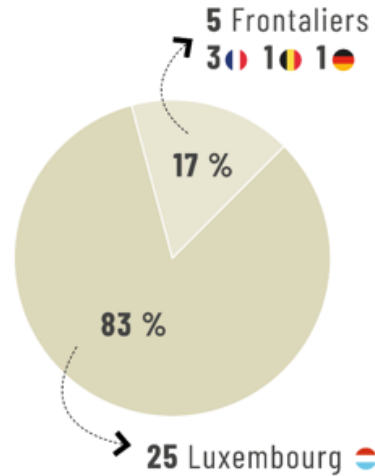
provide feedback to the teams in the context of their work,

develop their own proposals to address the challenges faced by spatial planning in Luxembourg, and

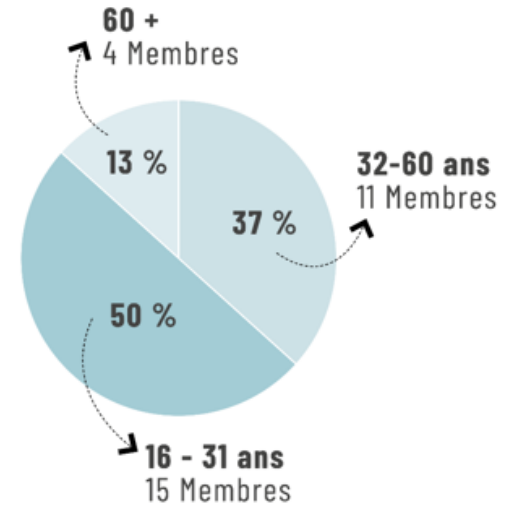
provide input for the elaboration of the new PDAT.



Répartition
hommes / femmes



Lieu de résidence



Tranche d'âge
de 19 à 73 ans



#luxembourginttransition

@lux_transition

