

# UNDERSTANDING THE CARBON FOOTPRINT ASSOCIATED WITH COMPANIES SETTING UP IN A REGION

ADERLY EXPLORATORY CASE STUDY



**UTOPIES**®

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Aderly, the economic development Agency working for the Lyon – Saint-Étienne metropolitan area (AMELYSE), has assessed the effect on carbon emissions resulting from establishing new businesses in the area for the last 10 years.

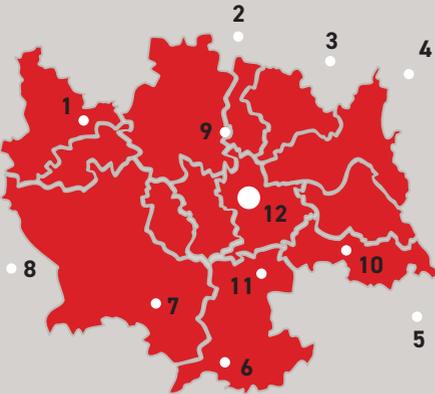
The study was carried out by UTOPIES using the Local Footprint® and Locanomics® modelling tools. It evaluates **the externalities created by the new activities** established by companies with the Agency’s support between 2009 and 2018 within the Amelyse area. It aims at **reinforcing Aderly’s strategy** with two goals:

- Helping to reduce the area’s carbon footprint by attracting companies with an ambitious climate strategy
- Helping to reduce the planet’s carbon footprint with a better understanding of the effects of companies relocating or setting up activities within its area of responsibility.

By comparing the emissions of Aderly’s client companies with the emissions generated outside the Agency’s activities, the study concludes that the local presence of the companies supported by Aderly saves around 70 kt of greenhouse gases per year (based on 2019 figures).

### Scope of the study

- AMELYSE
- 966 municipalities
- 3.3m residents (2019)



- |                     |                            |
|---------------------|----------------------------|
| 1 • Roanne          | 7 • Saint-Étienne          |
| 2 • Mâcon           | 8 • Ambert                 |
| 3 • Bourg-en-Bresse | 9 • Villefranche-sur-Saône |
| 4 • Nantua          | 10 • Bourgoin-Jallieu      |
| 5 • Voiron          | 11 • Vienne                |
| 6 • Annonay         | 12 • Lyon                  |

# Why should we look at the carbon impact of companies establishing activities in the area?

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## Relocation, a leverage for action in the climate crisis

The climate crisis is already happening. One of the tools that could slow it down is business relocation. **Bringing production and consumption closer together** avoids transport emissions, while using local resources strengthens local business resilience and creates positive synergies within a low-carbon economy.

## An increasingly urgent effort

Human activity has already caused global warming of around 1°C above pre-industrial levels. To limit the average rise in temperatures to 2°C, as recommended by the IPCC, the CO<sub>2</sub> level must not exceed 450–480 ppm. **These levels are set to be reached by 2050 if we do nothing** to change our habits and lifestyles. Current national commitments (Paris Agreement, 2015) are inadequate to keep global warming within 2°C (+2.9 to +3.4°C according to UNEP).

## A responsibility for businesses, and thus for development agencies

**Economic players have a responsibility to fall into line:** 75% of the efforts needed to reduce the average carbon footprint of people living in France depend not on individual choices but on public and private-sector players<sup>(1)</sup>.

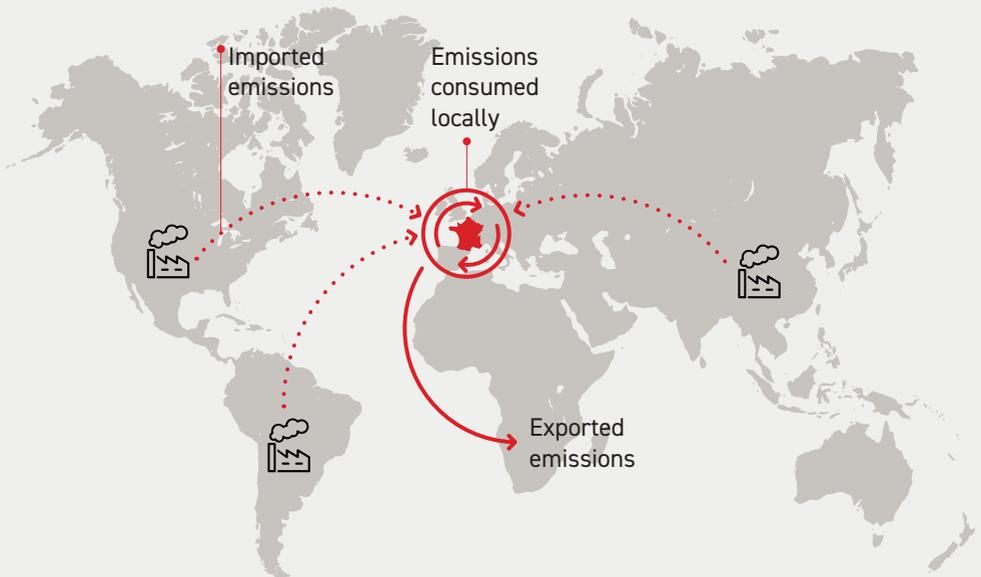
**Local economic development agencies** have a specific role to play in fighting climate change due to their ability to shape the local area by strengthening its networking and its diversity, connecting the companies that serve local demand. They must concentrate their efforts on targeted activities to reduce emissions while boosting local employment. A analysis combining socioeconomic impact with carbon impact shall enable the activities that would benefit from (re) location within the area.

*(1) Carbone 4 report, Pouvoir et responsabilité des individus, des entreprises et de l'état face à l'urgence climatique, 2019*

# What is a carbon footprint?

A carbon footprint is the volume of greenhouse gas emissions caused by the activity of a given entity: a company, a country etc. By measuring the carbon footprint, we can understand the impact of its activity on the environment, as the increase in greenhouse gases – including CO<sub>2</sub> – caused by human activity is the main cause of climate disruption. One feature of

the carbon footprint is its comprehensiveness – it takes into account all the emissions associated with an activity (scope 1, 2 and 3), **regardless of where the emissions occur**. This contrasts with more geographically specific emissions analyses, which are limited to the greenhouse gases emitted locally.



**Carbon footprint =**

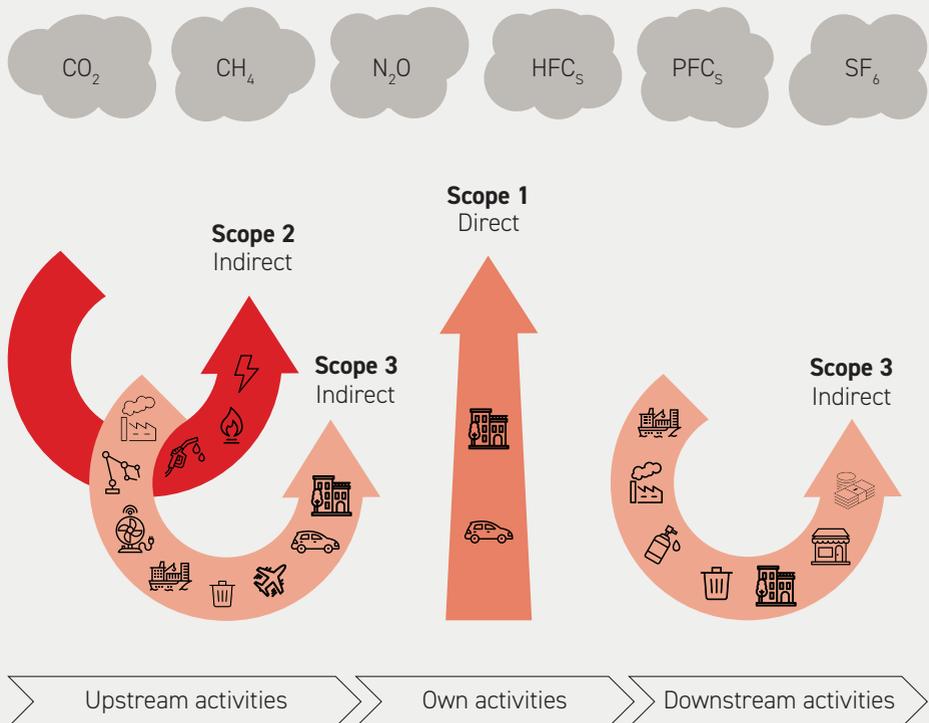
Emissions generated locally  
– Exported emissions  
+ Imported emissions

## The scopes of carbon emissions

In carbon accounting, **scope 1** covers the company's direct emissions, **scope 2** the emissions associated with the energy used (such as electricity or heat requirements) and **scope 3** all the indirect emissions of both upstream activities (by suppliers) and downstream activities (by users of the product or service).



**The carbon footprint is not limited to carbon:** all greenhouse gases are measured and then incorporated as a carbon-equivalent figure.



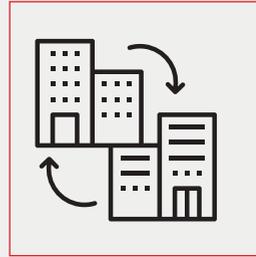
# Overview of the study methodology

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To evaluate the carbon impact resulting from Aderly's activities in helping companies to establish in the area, the used methodology **compared the carbon emissions produced** by the activities of the companies supported with the **theoretical** carbon emissions that would have occurred if the production was located outside AMELYSE.

By comparing these two amount of emissions (actual and theoretical), Aderly's contribution can be estimated, giving a comprehensive, global view of the CO<sub>2</sub> emissions resulting from its activity.

Utopies modelled the economic behaviour of all the companies established between 2009 and end of 2018. As part of the work to assess the Agency's socioeconomic footprint over the last 10 years, the estimates showed that the 574 companies set up with Aderly's support and still active in 2019 generated revenues of around €1.3 billion in 2019.



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574

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**COMPANIES**  
SET UP BY  
ADERLY

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**GENERATED**  
**REVENUES**  
**OF**

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€1.3\*  
billion

*\* 2019 estimate*

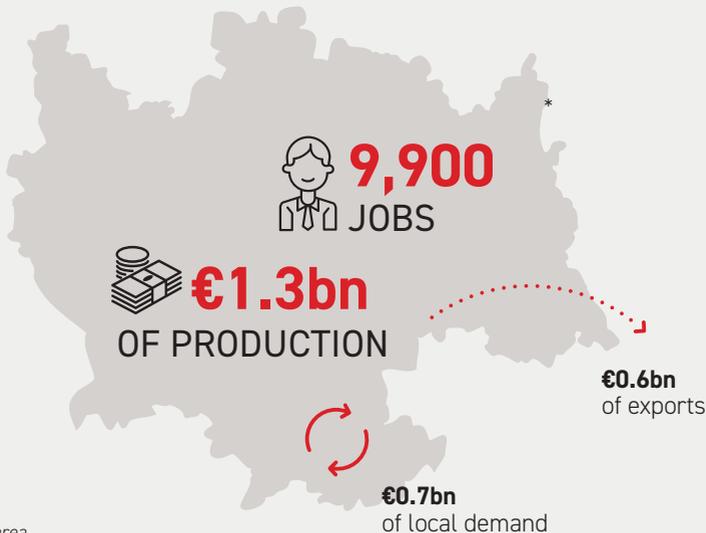


The ratio of the supported companies' production used to serve local needs and the ratio exported outside Amelyse were evaluated on the basis of the companies' sectoral components.

Average statistical data led to an estimate that the €1.3 billion in revenue was made up of:

- €0.7 billion from local demand (AMELYSE)
- €0.6 billion from markets outside AMELYSE (the rest of France and abroad).

These theoretical economic flows were converted into carbon impacts based on a carbon equivalence scale using the Local Footprint® tool.

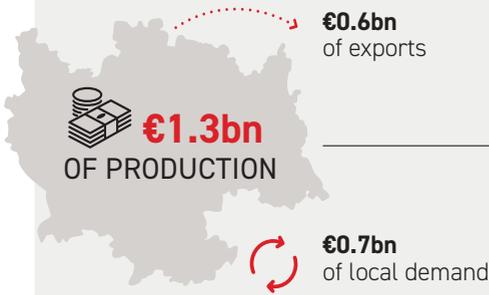


\* AMELYSE area

# What is the estimated carbon footprint of the companies set up with Aderly's support?

**Scenario 1**

Carbon footprint calculation **with Aderly**



		<b>63</b> ktCO <sub>2</sub> e
		<b>6</b> ktCO <sub>2</sub> e
		<b>51</b> ktCO <sub>2</sub> e
		<b>0</b> ktCO <sub>2</sub> e
<b>TOTAL = 120</b> ktCO <sub>2</sub> e		

**€0.6bn**  
of exports

Company revenues associated with exports outside AMELYSE (rest of France and abroad)

**€0.7bn**  
of local demand

Company revenues corresponding to local demand



CO<sub>2</sub> emissions associated with economic activity (goods and services)



CO<sub>2</sub> emissions associated with transport (goods only)

# What would the overall carbon footprint be if these companies had not been set up in AMELYSE?

## Scenario 2

Carbon footprint calculation **without Aderly**

		
 	63 ktCO <sub>2</sub> e	35 ktCO <sub>2</sub> e
 	3.8 ktCO <sub>2</sub> e	0.5 ktCO <sub>2</sub> e
 	56 ktCO <sub>2</sub> e	19 ktCO <sub>2</sub> e
 	12 ktCO <sub>2</sub> e	0.3 ktCO <sub>2</sub> e
<b>TOTAL = 190 ktCO<sub>2</sub>e</b>		

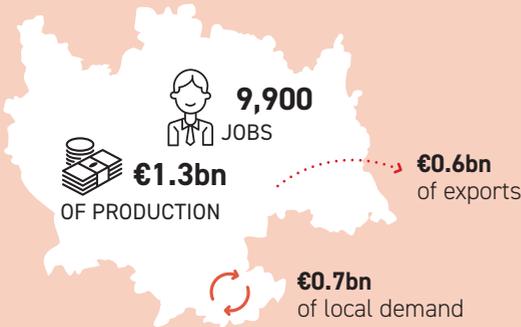


Theoretical production that would have taken place abroad (outside France)



Theoretical production that would have taken place in France (outside AMELYSE)

# Summary of the study



Aggregating the impacts of exports and local demand, we estimate that Aderly's actions over the last 10 years have saved 70 ktCO<sub>2</sub>eq of emissions.

# 52%

Associated with local demand

# 48%

Associated with exports outside AMELYSE

$$\begin{array}{r} 190 \\ \text{ktCO}_2\text{eq} \\ \text{OF THEORETICAL} \\ \text{EMISSIONS} \\ \text{WITHOUT ADERLY} \end{array} - \begin{array}{r} 120 \\ \text{ktCO}_2\text{eq} \\ \text{OF ESTIMATED} \\ \text{EMISSIONS} \\ \text{WITH ADERLY} \end{array} = \begin{array}{r} 70 \\ \text{ktCO}_2\text{eq} \\ \text{SAVED} \end{array}$$

EMISSIONS SAVED  
EQUIVALENT TO



THE PRODUCTION OF

**11,500**  
CARS

OR



**132,000**  
RETURN FLIGHTS  
LYON - STOCKHOLM

## Specific features of the French economy

Electricity in France is relatively low-carbon, largely due to the significant presence of nuclear power, with its very low carbon footprint, in the French energy mix.

By comparison, the carbon footprint of production with the electricity mix in

Germany (362 g CO<sub>2</sub>eq/kWh) is almost nine times higher than in France (42 g CO<sub>2</sub>/kWh).

This partly explains **the emissions avoided by locating certain activities in the region** rather than in other “higher-carbon” countries.

# And now?

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## **Better understanding for greater commitment**

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This study provides a new perspective that reinforces **the purpose of an economic development agency**, going beyond attracting and supporting businesses in the area. Its contribution shall evolve thanks to its strong potential for **relocating or establishing economic activities in a rational, enlightened way** to contribute to the global fight against climate change.

The study also underlines **the Agency's climate strategy**, countering the preconceived assumption that attracting businesses necessarily involves an increase in emissions and ultimately contributing to the area's low-carbon strategy.

## **The environment as a driver of development**

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The study confirms the need to incorporate the environment/carbon factor even further into the decision-making criteria when supporting investment and activity (re)location projects.

This new perspective completes another study already carried out by Aderly, based on an economic metabolic analysis (Locanomics®) to the needs of AMELYSE to **identify the most relevant companies to bring to the area** in the context of global carbon "compensation". The aim is to benefit from the French economy low carbon intensity without increasing the distances travelled by goods and without bringing natural competition with local producers.

## Details of the study's scope and limits of the used methodology

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€1,340m

OF OVERALL  
REVENUE,  
INCLUDING **40%** FROM  
FOREIGN CAPITAL-OWNED  
COMPANIES

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The calculation methodology and results are presented in a transparent manner. These results should be read, understood and analysed with all the necessary caution that applies to modelling and the humility required with any exploratory approach. Much of UTOPIES' work involves theoretical reasoning and statistical methods, but these are based on verified hypotheses taken from tested models (Local Footprint® and Locanomics®), and use data sources known for their renowned value (Harvard, the World Bank, INSEE, Exiobase, etc.).

€675m

OF PROCUREMENT,  
**64%** SOURCED  
WITHIN AMELYSE

# Methodological steps in estimating the theoretical carbon impacts if these companies had not been set up in AMELYSE by Aderly

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## 1. Separating economic production:

Production for domestic demand and production for export – calibrated locally, the Locanomics® model can estimate (i) the proportion of production\* by companies set up with Aderly's help that meets local demand (BtoB + households) and (ii) the proportion that is exported to the rest of France or abroad.

## 2. Theoretical location of the substitute production:

Supposing that the companies supported by Aderly were absent from the Amelyse area, local demand for these goods and services would have to be met by other companies, whose location has to be estimated. Depending on the activity sector, the Locanomics® model can produce a theoretical breakdown of how much of the supply would be located in the rest of France (outside Amelyse) and how much abroad. Similarly, the production located abroad can be broken down by country using international trade data from Harvard <sup>(1)</sup> and the World Bank <sup>(2)</sup>.

## 3. Correcting the costs of foreign production:

The purchase price of a specific product or service will vary depending on whether the supplier is based in France, Australia or Chile. The costs of production abroad were corrected by applying the OECD Purchasing Power Parities (PPPs) <sup>(4)</sup>.

## 4. Calculating production CO<sub>2</sub>eq emissions:

CO<sub>2</sub>eq emissions factors per monetary unit were calculated for each of the 380 sectors and 220 countries making up the Local Footprint® model. These coefficients draw on data from Exiobase <sup>(5)</sup> and the BEA <sup>(6)</sup>.

## 5. Calculating additional emissions associated with transport:

The distances travelled by the goods (excluding services) were modelled based on the theoretical import and export locations. Data from French customs <sup>(3)</sup> giving an average weight value of the goods per monetary unit and the weight of the goods exchanged in each sector of economic activity were incorporated into the calculations.

*\* Given the theoretical reasoning applied to part of this study, this clearly remains a provisional, imperfect and theoretical measure of a development agency's potential carbon impacts.*

<sup>(1)</sup> Harvard: International Trade Data, Atlas of Economic Complexity

<sup>(2)</sup> World Bank: Customs data by country

<sup>(3)</sup> Customs: French imports/exports in 2017 by product type, quantities and prices

<sup>(4)</sup> OECD: Purchasing Power Parities (PPP) for each country

<sup>(5)</sup> Exiobase EE MRIO

<sup>(6)</sup> BEA Inputs-Outputs Account Data

# Methodological hypotheses

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## **The size of the companies Aderly has helped to set up does not affect the balance of either global or local trade**

– Given the number of companies supported by Aderly over the last 10 years, in comparison with global trade as a whole, we assume that the behaviour of international (or local) trade remains constant even after these companies set up or relocate to the Amelyse area.

## **The price of a product or a service does not vary from one place to another within France**

– The study assumes that a product or service of equivalent quality produced within two separate areas of France has the same price. Only the price increase or reduction due to the transport needed to carry the goods produced is estimated and taken into account.

## **Employee transport is not included in the study**

– The carbon impact associated with employee transport is not included, either for travelling between home and work or for business trips. The study assumes that these emissions would be the same anywhere.

## **Changes in living standards in the Lyon-Saint-Étienne metropolitan district due to Aderly's activity are not taken into account**

– Even though the companies supported by Aderly help to increase the wealth of Amelyse (through the taxes they pay, for example), any impact of this change on the area's emissions is not taken into account.

## **Special cases for service companies**

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### **● The geographical location of “imports” is based on economic constants that are applied internationally, with no specific local focus**

– As UTOPIES has no information on the other possible locations where the companies supported by Aderly could have based their activities, the study relied on international constants, as described in the study's specific methodology. This considers that the area's economic constants in terms of imports remain unchanged, with or without the companies set up with Aderly's help.

### **● The sectoral macroeconomic analysis used does not take the specific characteristics of the products bought and sold into account**

– All the reasoning in the study is based on the 380 sectors of the Local Footprint® model, due to the lack of sufficiently precise macroeconomic data on the activity sectors of the Agency's client companies, which implies a measured level of uncertainty about the theoretical geographical locations of the economic production.



Local Footprint®: A RIMS (Regional Input-Output Multipliers)-type statistical tool for evaluating environmental and socioeconomic impact, this leading model aggregates several geographical and sectoral analysis modules as well as Input-Output tables. It reproduces the operation of a regional economy as realistically as possible and draws on a variety of sources: statistical data from

## UTOPIES®

UTOPIES was founded in 1993, originally in the form of an association, to encourage organisations to incorporate social and environmental priorities into their strategies and support them through this revolution. UTOPIES has set itself the mission of raising awareness by arguing for a change in the narrative and opening minds to sustainable development.



Eurostat, INSEE, Exiobase and BEA with details of 380 sectors and local calibration to the specific features of the area being analysed (INSEE employment data for specific activity sectors). It also uses work from the University of Hamburg on concentration indices and regional economics work from the University of the West of England in Bristol.

UTOPIES contributes to the public debate through its think tank activities. In line with their activist principles, its 50 consultants and experts work every day with regional development players and businesses to help them evolve their practices.