

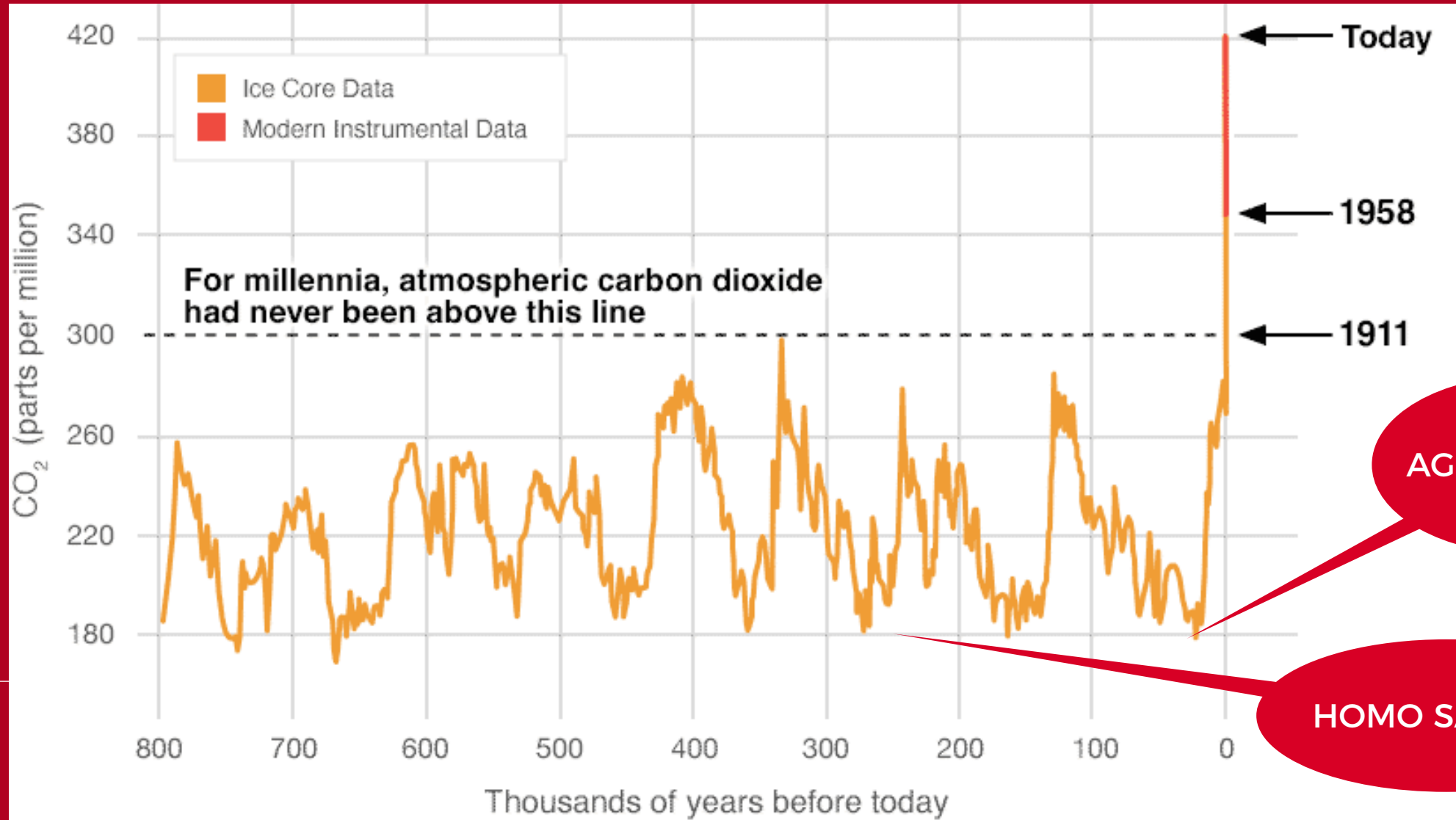


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Governance and ecological transition

Simone Bastianoni

“Climate has always changed” but not like this!!!



AGRICULTURE

HOMO SAPIENS

The situation is not improving...

nature

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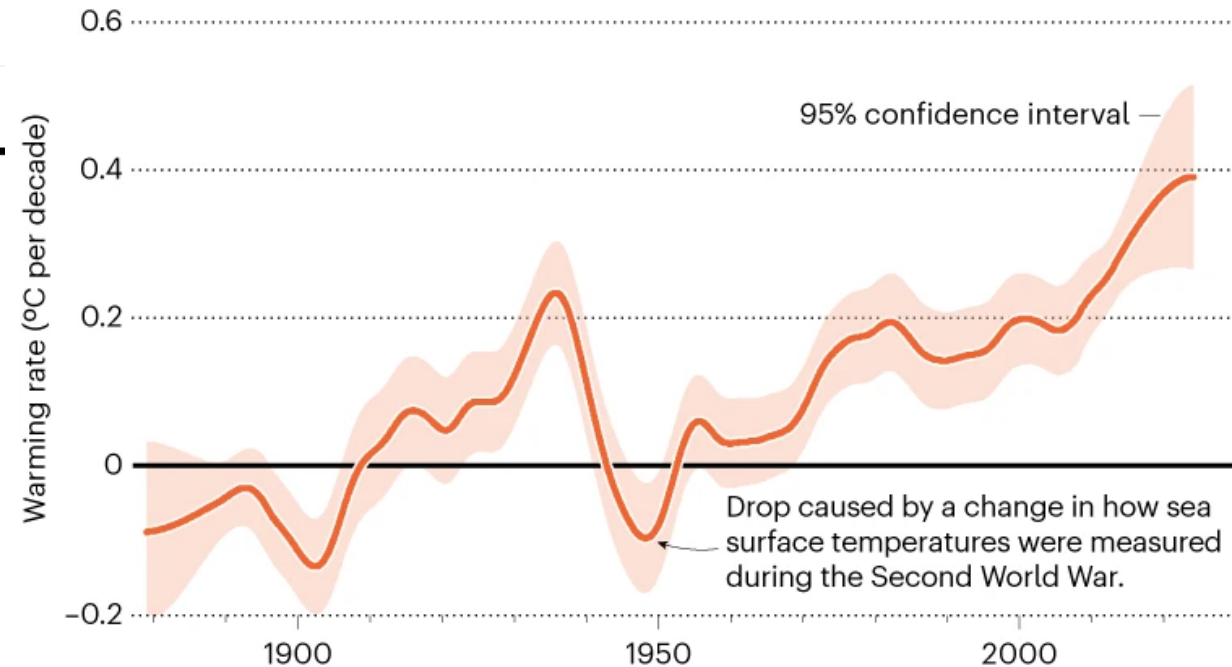
[nature](#) > [news](#) > article

NEWS | 06 March 2026

Climate change is speeding up – the pace nearly doubled in ten years

Earth is now warming at a rate of around 0.35 °C per decade, fresh analysis finds.

By [Alexandra Witze](#)



The Guardian Eur ▾

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Extreme heat

At least 35,000 excess deaths recorded in Europe's back-to-back heatwaves

Jon Henley *Europe correspondent*

Tue 25 Aug 2026 06.00 CEST

True figure likely to be much higher as it only covers about half of continent and does not include August totals

Advertisement

A quick question from The Guardian

How likely are you to consider using the next time you use design and/or productivity tools for work / at your home?

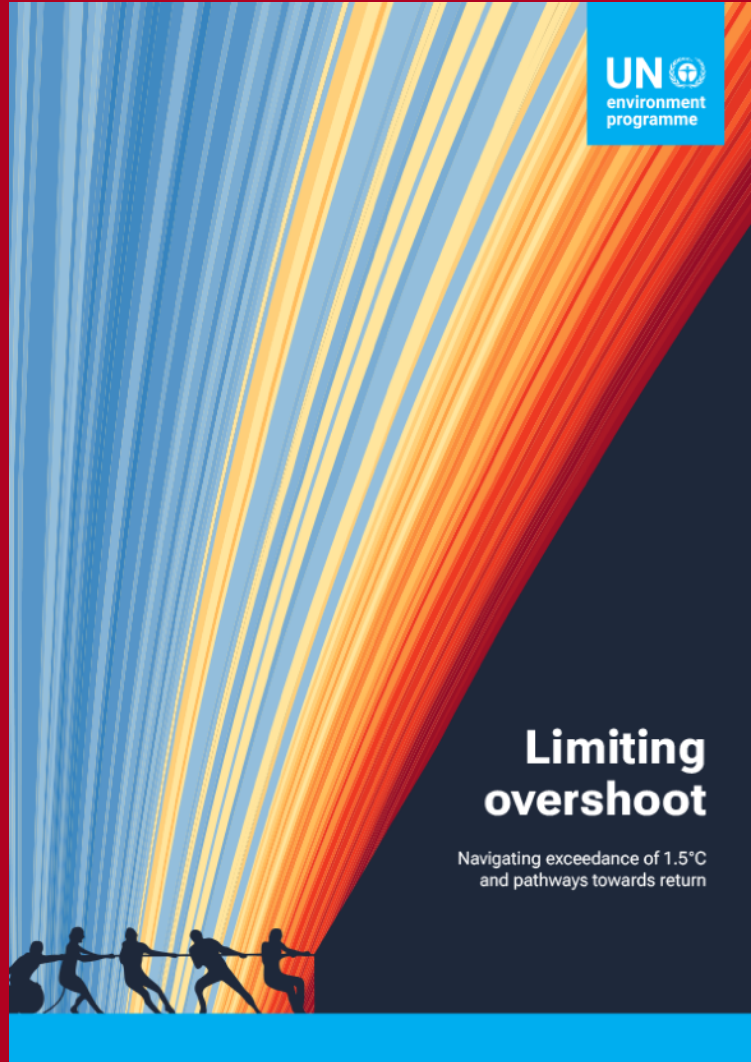
☐ Very likely

☐ Somewhat likely

"At least 35,000 more people died during Europe's four record-breaking, back-to-back heatwaves this summer than would normally be expected, according to incomplete figures from barely half the continent [...]"

The death toll is highest in Germany, which late last week reported an estimated 14,000 heat-related deaths from 6 April to 9 August. The Robert Koch Institute (RKI) public health agency said 9,600 people had died in the week of 22-28 June alone."

2 September 2026



“The evidence consistently indicates that higher peak warming and longer durations of exceedance are associated with greater risks for people and nature.

Today’s decisions are therefore critical: the lower the peak warming reached, the lower the risks faced by **people, societies, economies** and ecosystems; and the shorter the duration of overshoot, the lower the probability of crossing irreversible thresholds and adaptation limits.

The central message is clear: **mitigation and adaptation must advance together.**”

- 
1. **A success story**
 2. **How to support administrations towards a climate neutral world**

The beginning

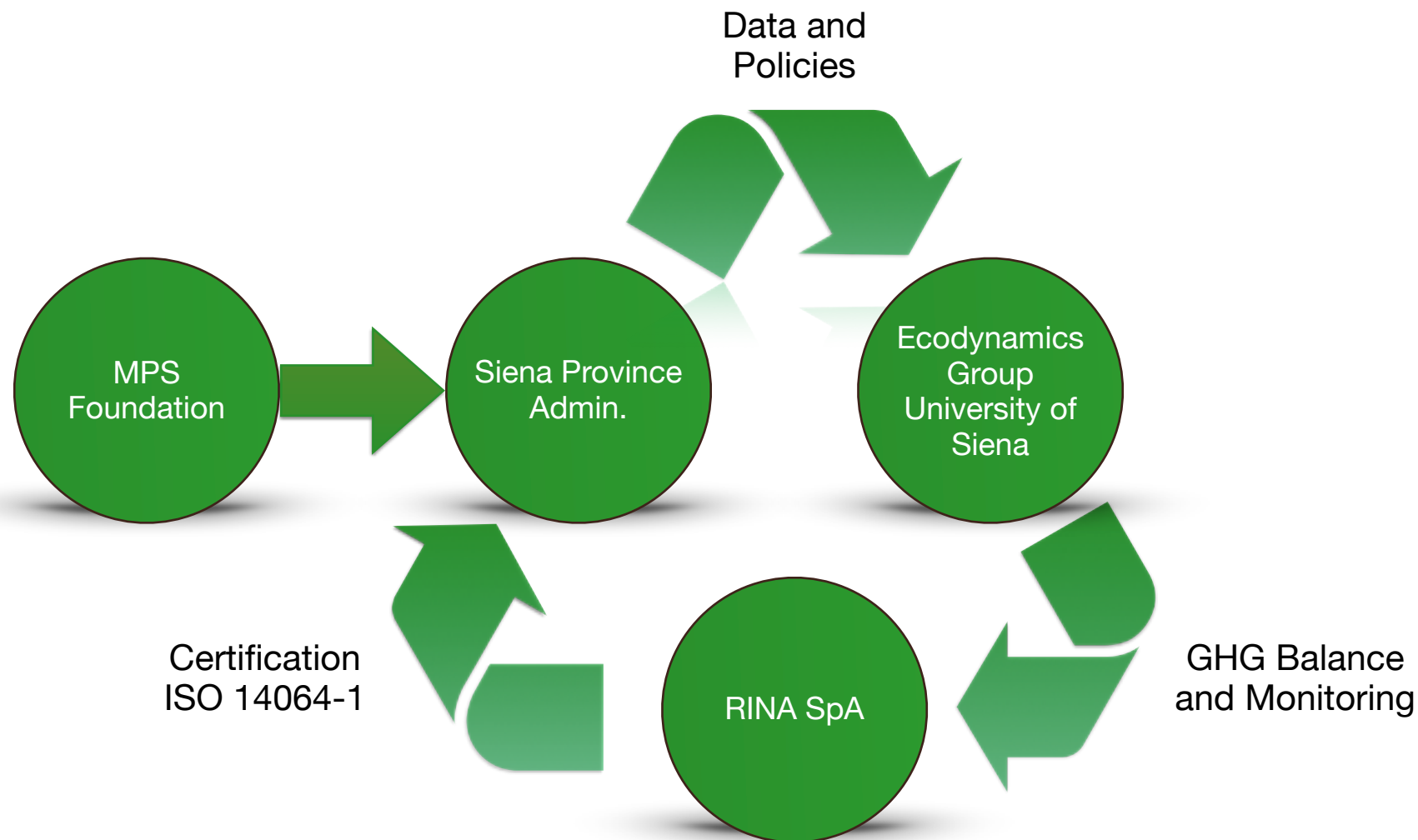


After 5 year of research on sustainability indicators in the Siena Province, since 2008 the REGES project has produced yearly greenhouse gases inventories (emissions and absorptions) according to ISO 14064-1 standard, in order to support Province administration in policy making towards Carbon Neutrality.

Greenhouse balances of Siena Province



A virtuous cycle





Energy Plan of Siena Province



Electric energy independence



From 115 GWh import to 400 GWh export



Waste Management



From 40 to 1 landfills

Modernization of incinerator

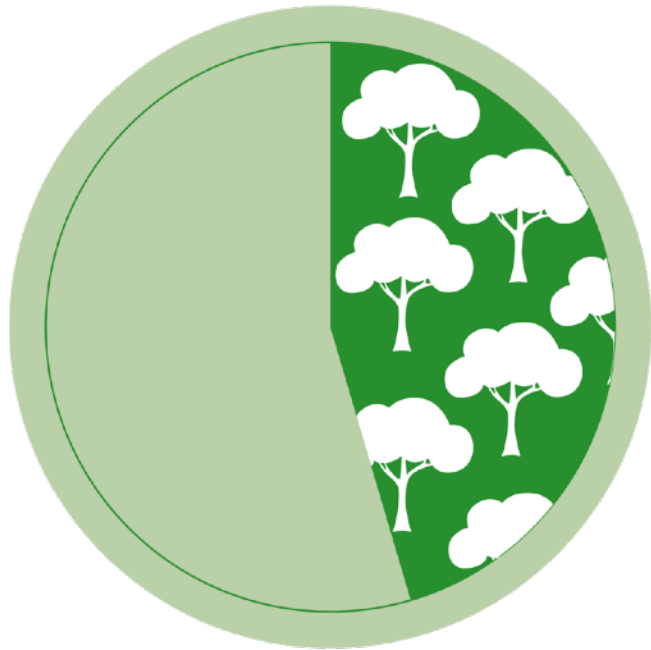


Annual maintenance of heating systems



- 30% natural gas consumption per household

Examples of policies



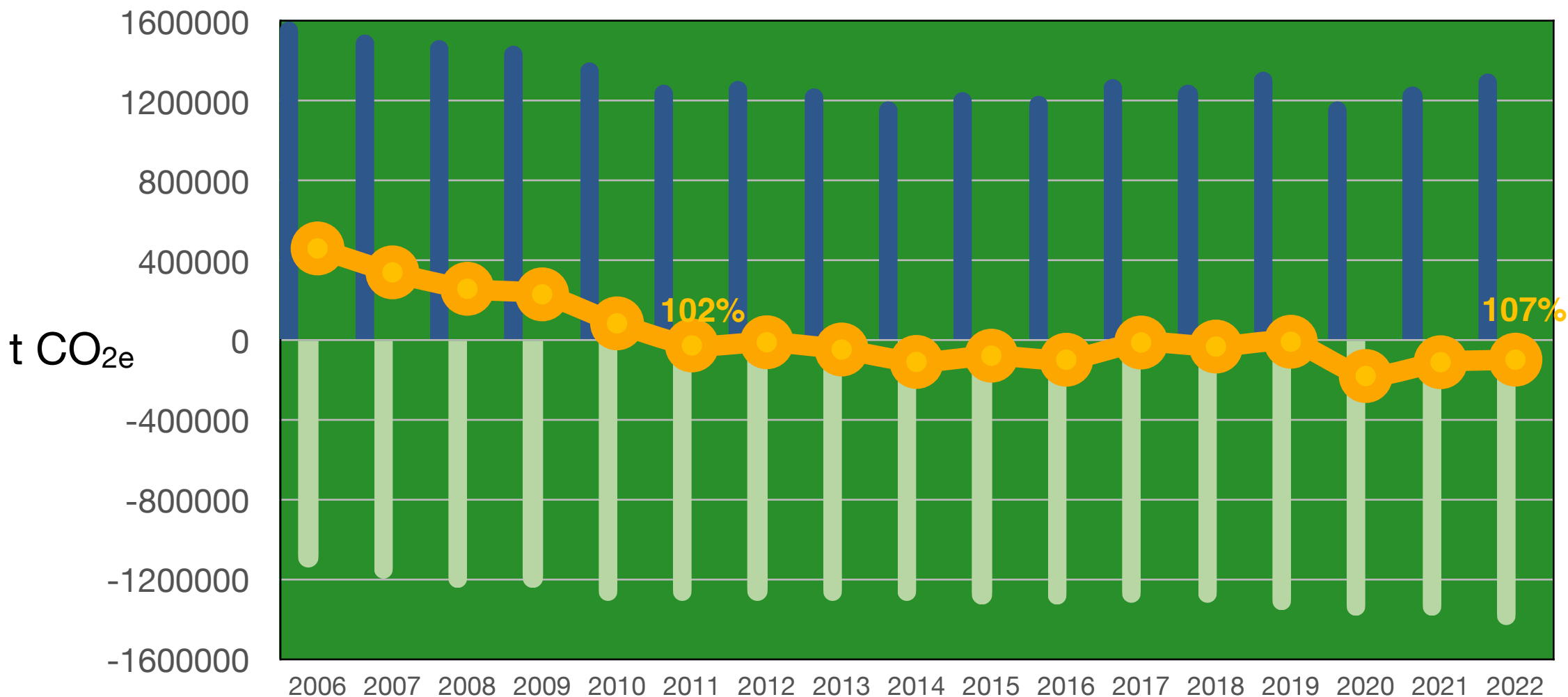
Forest Area



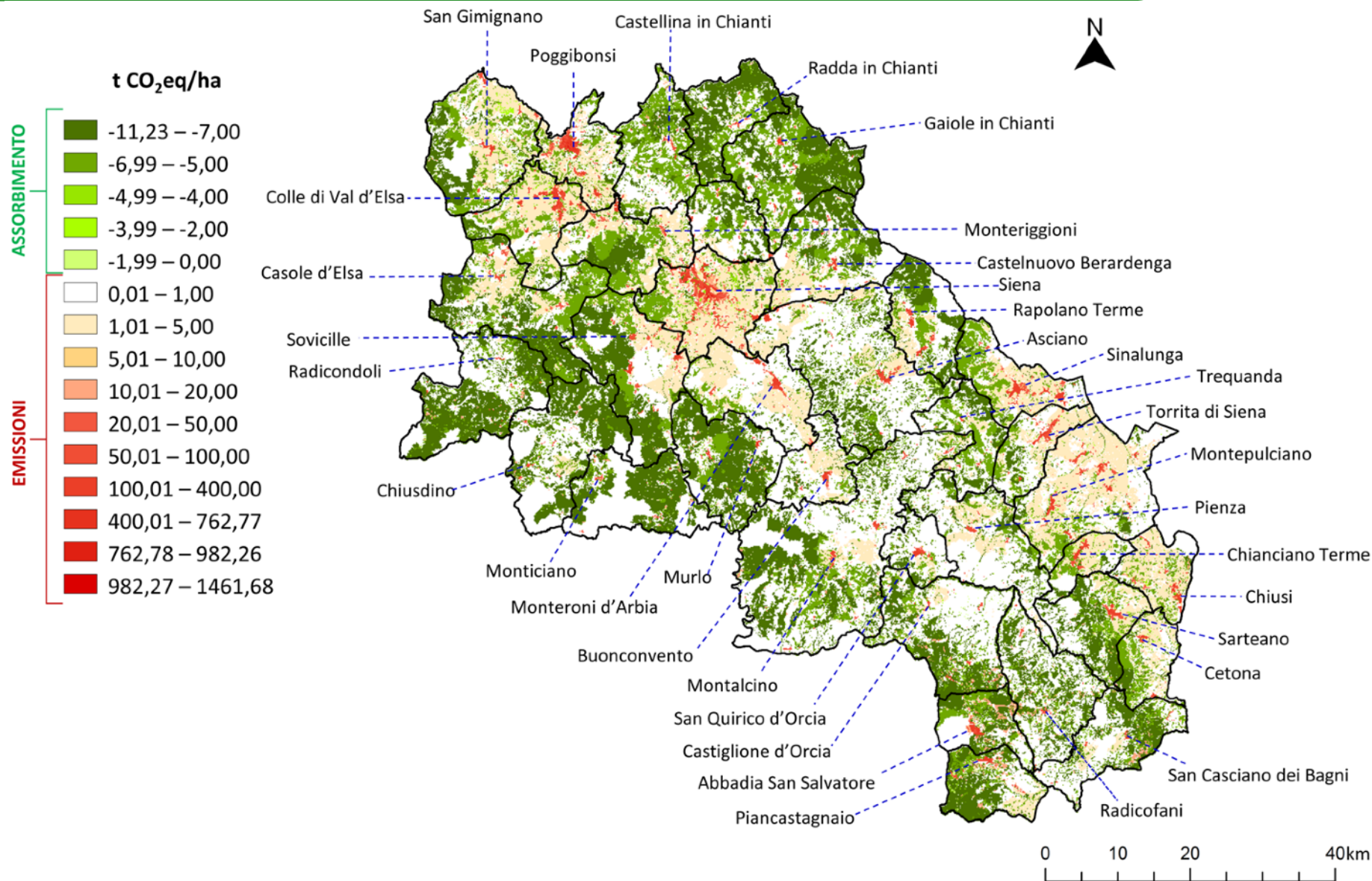
+ 19%



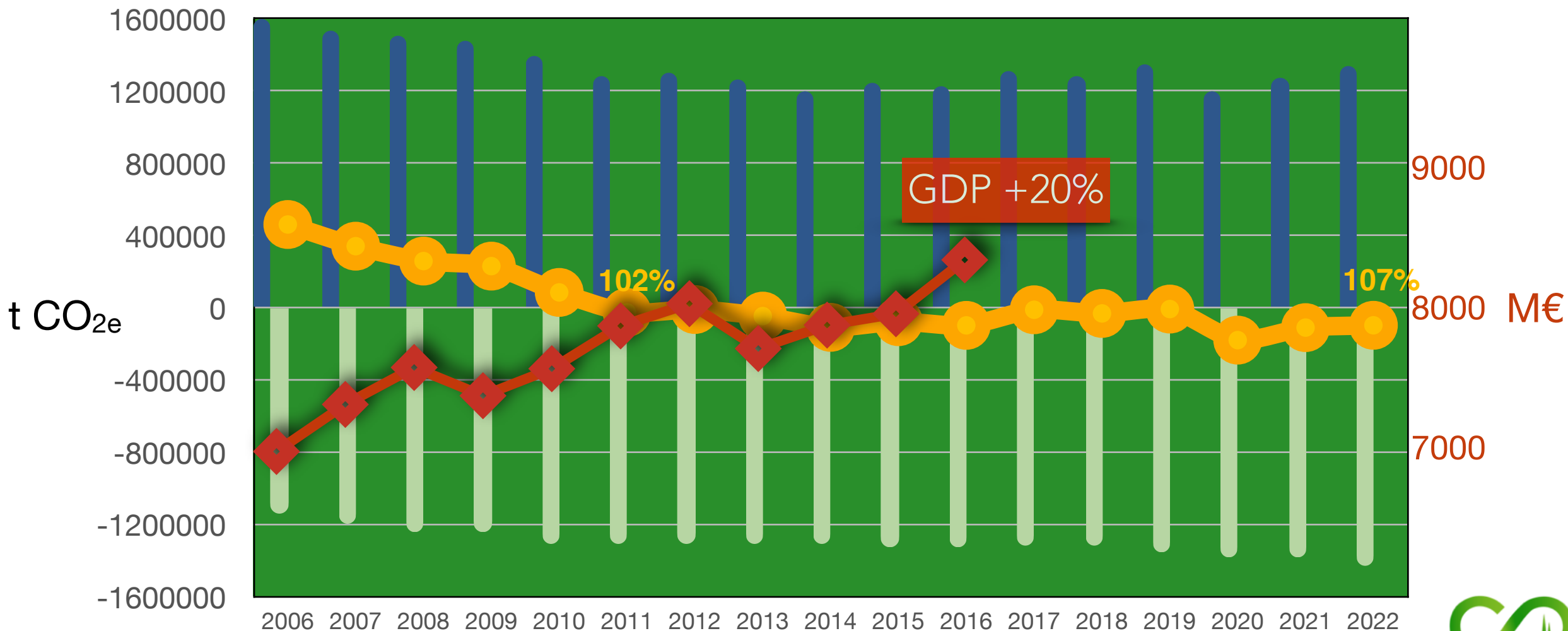
Greenhouse balances of Siena Province 2006-2022



Map of emissions/uptake Siena Province 2006-2022



Greenhouse balances of Siena Province 2006-2022



Pros

and

Cons



- It can be done
- Political will
- Convergence of views (policy makers and technical counterpart, research, philanthropy)

- Top-down approach
- Lack of communication
- Lack of awareness of citizens, enterprises

Since 2017



<https://www.carbonneutralsiena.it/en>

Siena Alliance for Carbon Neutrality



The **Alleanza Territoriale Carbon Neutrality: Siena** was founded in 2017 and is now composed by:

FOUNDERS



SUPPORTERS



PARTNERS



AMBASSADORS



Aims of the Alliance



Enhance knowledge about CN



Stimulate the involvement of citizens



Maintain or improve the result in the future



Transfer the approach to other territories

Global Protocol for Community-Scale Greenhouse Gas Inventories Certification



STATEMENT

DNV Business Assurance (DNV) has been commissioned by the governance of the Alleanza Territoriale Carbon Neutrality Siena to carry out an independent verification of its Greenhouse Gas (GHG) emissions Inventory relative to the 2022 (Baseline Year) as described in Siena Province's GHG emission report entitled "Bilancio delle emissioni di gas ad effetto serra per il territorio della Provincia di Siena - anno 2022 rev. 12/02/2025.

Alleanza Territoriale Carbon Neutrality Siena has sole responsibility for preparation of the data and external report. DNV, in performing our assurance work, is responsible to the management of Alleanza Territoriale Carbon Neutrality Siena. Our assurance statement, however, represents our independent opinion and is intended to inform all stakeholders including Alleanza Territoriale Carbon Neutrality Siena.

Verified GHG Emissions (tCO₂-eq)	
Greenhouse Gas Emissions Scopes	2022
Stationary Energy Scope 1 GHG Emissions	416 038
Transportation Scope 1 GHG Emissions	587 752
Waste Treatment in Siena territory Scope 1 GHG Emissions	89 524
Industrial Processes and Product Use (IPPU) Scope 1 GHG emissions	43 197
Agriculture, Forestry and Other Land Use (AFOLU) Scope 1 GHG emissions	196 404
Stationary Energy Scope 2 GHG Emission (Located Based)	0
Stationary Energy Scope 2 GHG Emission (Market Based)	0
Waste Treatment outside Siena territory Scope 3 GHG Emissions	827
CO ₂ -biogenic Emissions	97 946
CO ₂ -biogenic Removals	-1 427 280

Assurance Opinion

Based on the verification process conducted by DNV as explained in the annex of this statement, we provide a reasonable assurance that the above reported GHG emissions have been found:

- o materially correct;
- o a fair representation of GHG emissions information; and
- o in accordance with the Verification Criteria

DNV Business Assurance USA, Inc.
XX June 2025

Lead Verifier
Francisco Zamarron

Technical Reviewer
Piergiorgio Moretti

Approver
Shruthi Bechamanda



Fundamental questions that arise

1. Why is it so difficult to **plan** for Climate Neutrality?
2. Is it possible to provide **tools** that help in this effort?
3. How to prevent the general public's frequent **skepticism/opposition** towards renewable energy located nearby?
4. Are **schools/universities** ready to teach students how to approach decarbonization?
5. Is it possible to facilitate this transition **financially**?





CO2 PACMAN

Interreg
Euro-MED



Co-funded by
the European Union



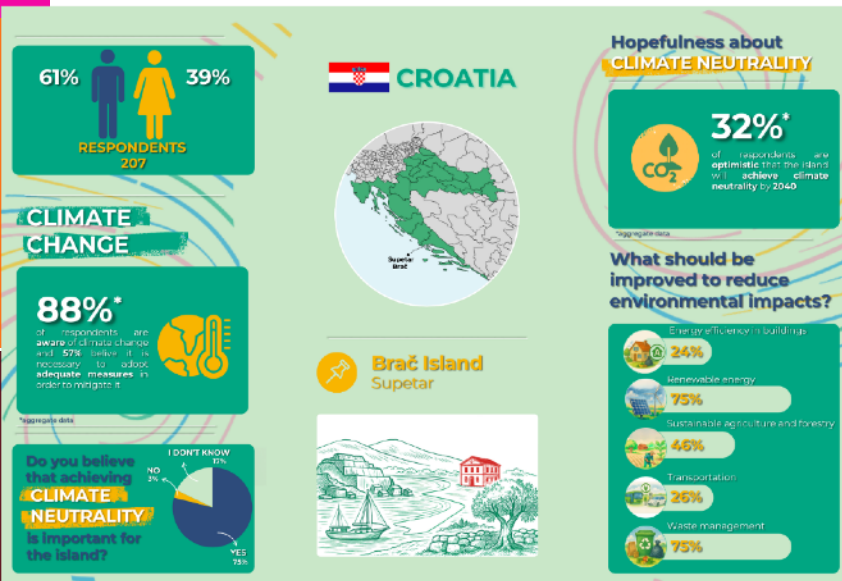
CO2 PACMAN

COoperation and CO-designing PArtnership for CLiMAtE Neutrality



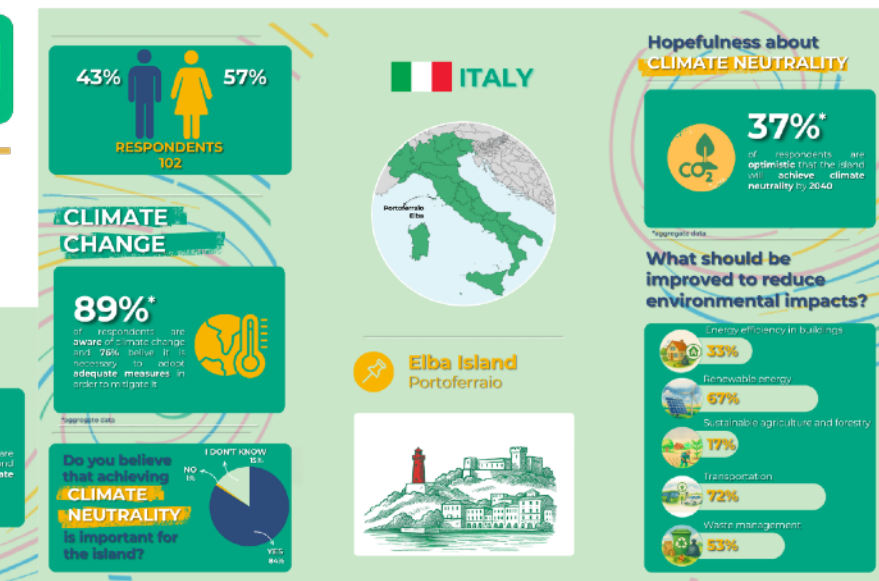
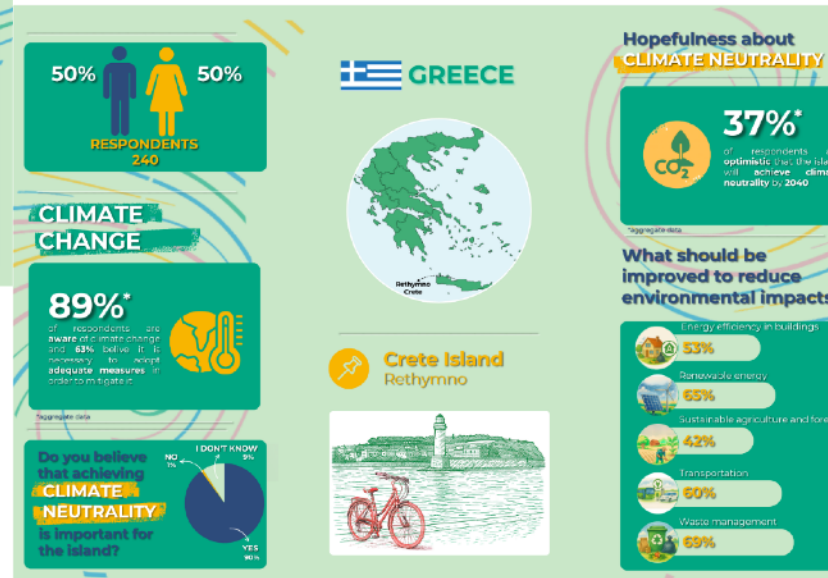
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Initial situations: what populations think

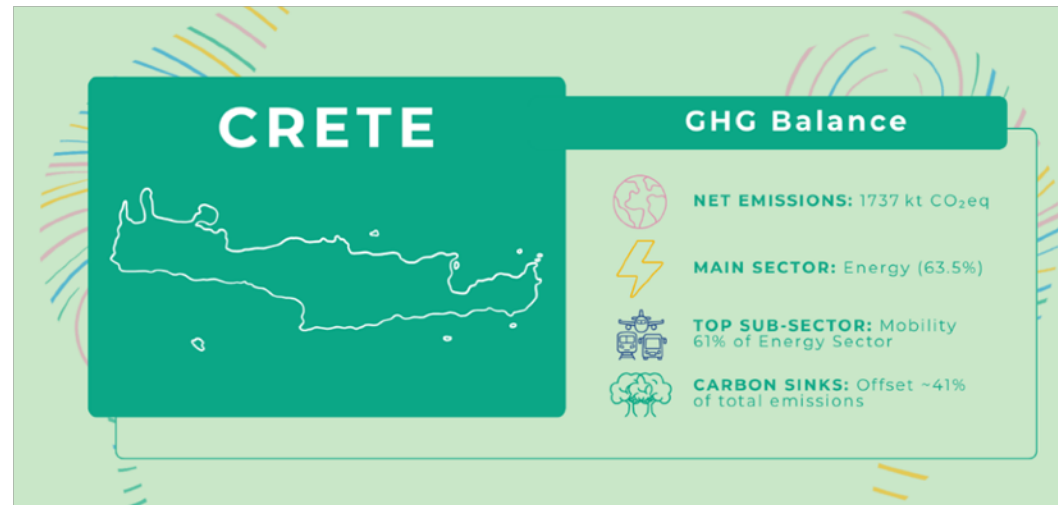
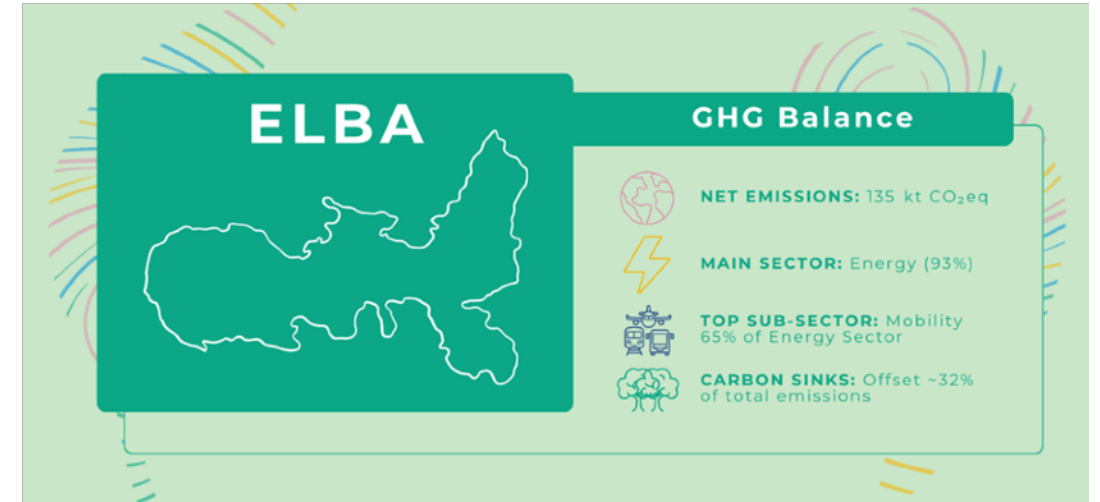
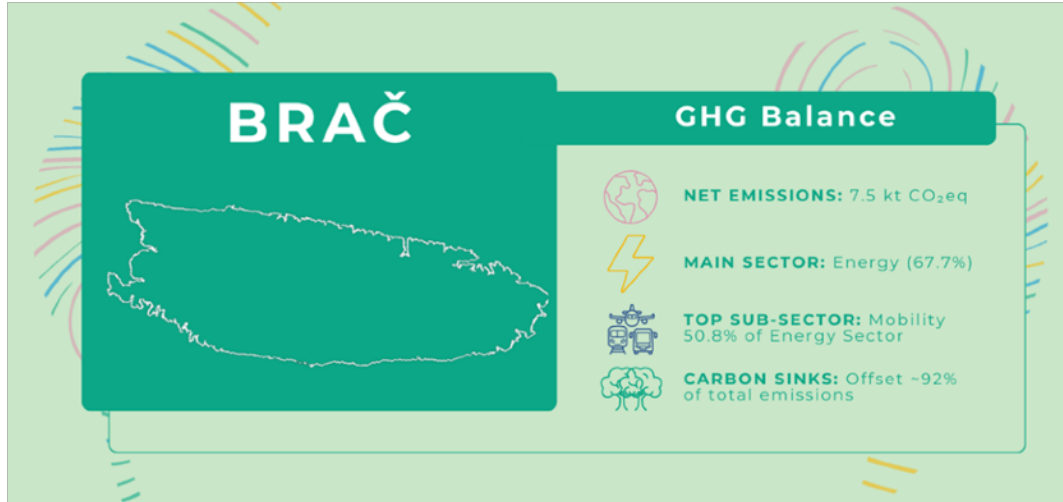


ASK your citizen ONCaN

Discover the survey results



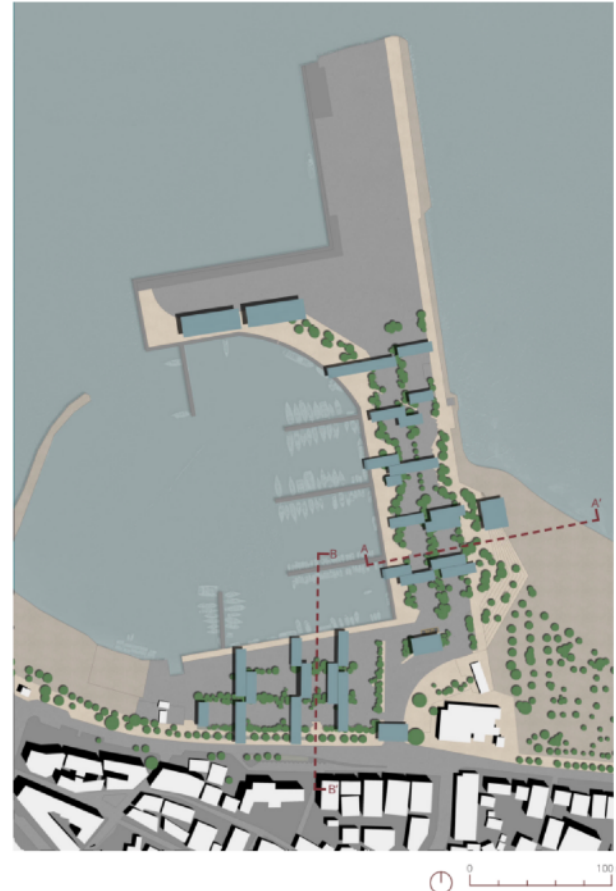
Initial situation: a GHG balance of the territory



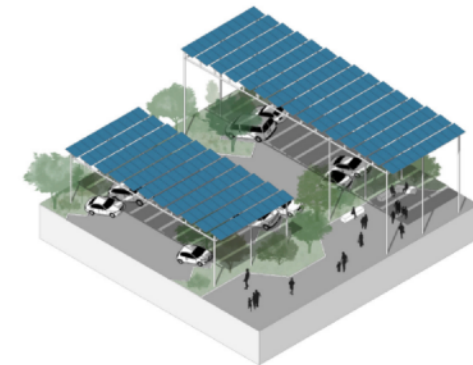
To see becomes to will



MASTERPLAN



PERSPECTIVE VIEW



- PV technology
Photovoltaic modules on pergolas
- PV surface
4.300 m²
- Installed capacity
520 kW



From visual to vision: the CO2 PACMAN tool

Il tool può essere usato al sito:

<https://www.co2pacman.eu/p/co2-pacman-tool> or
co2pt.unisi.it

CO2 PACMAN Tool | Guide and FAQ

What is the CO2 PACMAN Tool?

The CO2 PACMAN Tool is an interactive platform designed to support citizens, students, businesses, and public authorities in the transition to climate neutrality. Inspired by a classic video game, it turns complex climate data into an engaging experience: each time you select a policy or technology, your choices can reduce emissions or increase CO₂ uptake.

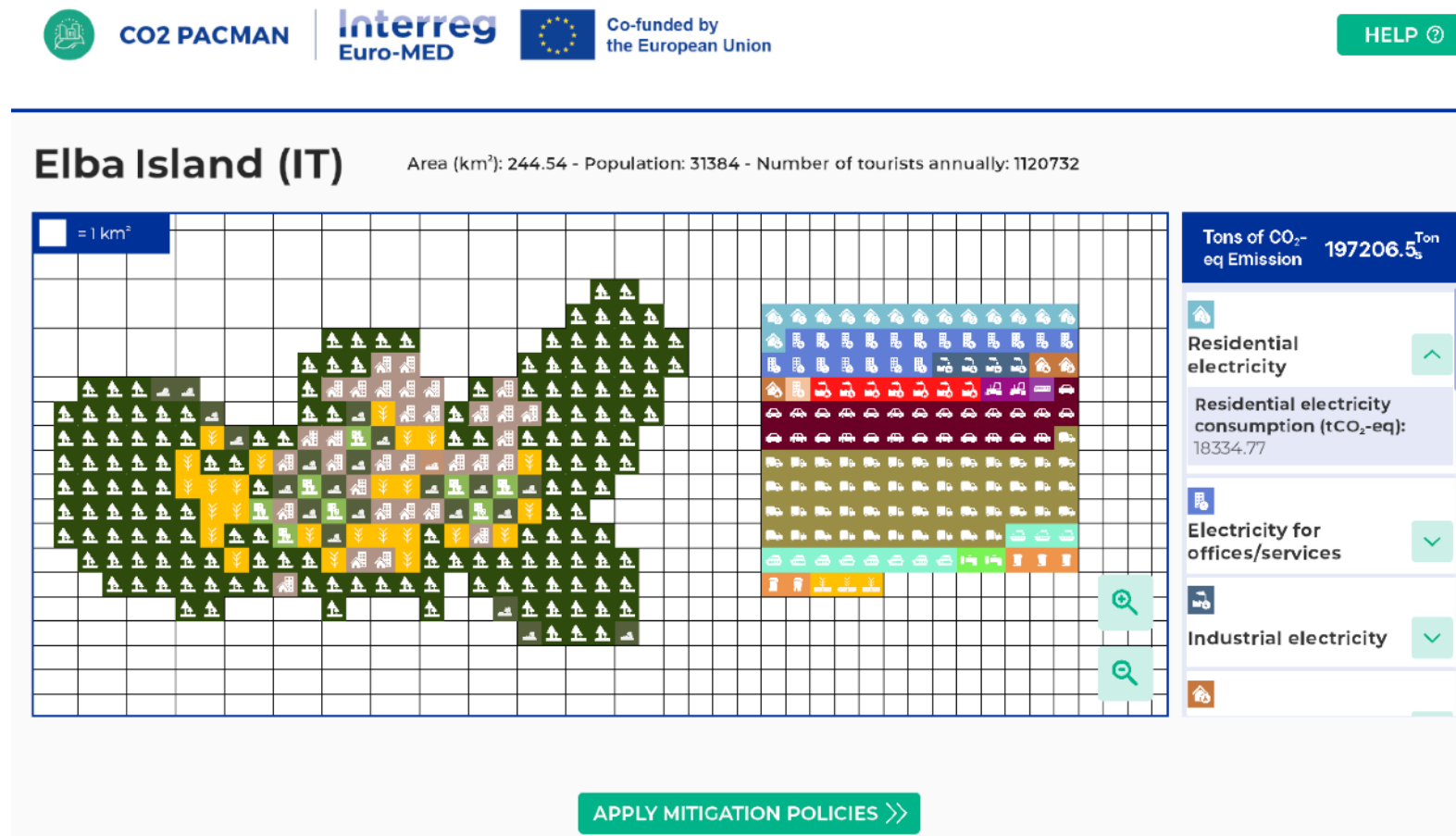
 [Let's play >](#)

 [Download Manual >](#)



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Emissions are tiles to be “eaten”

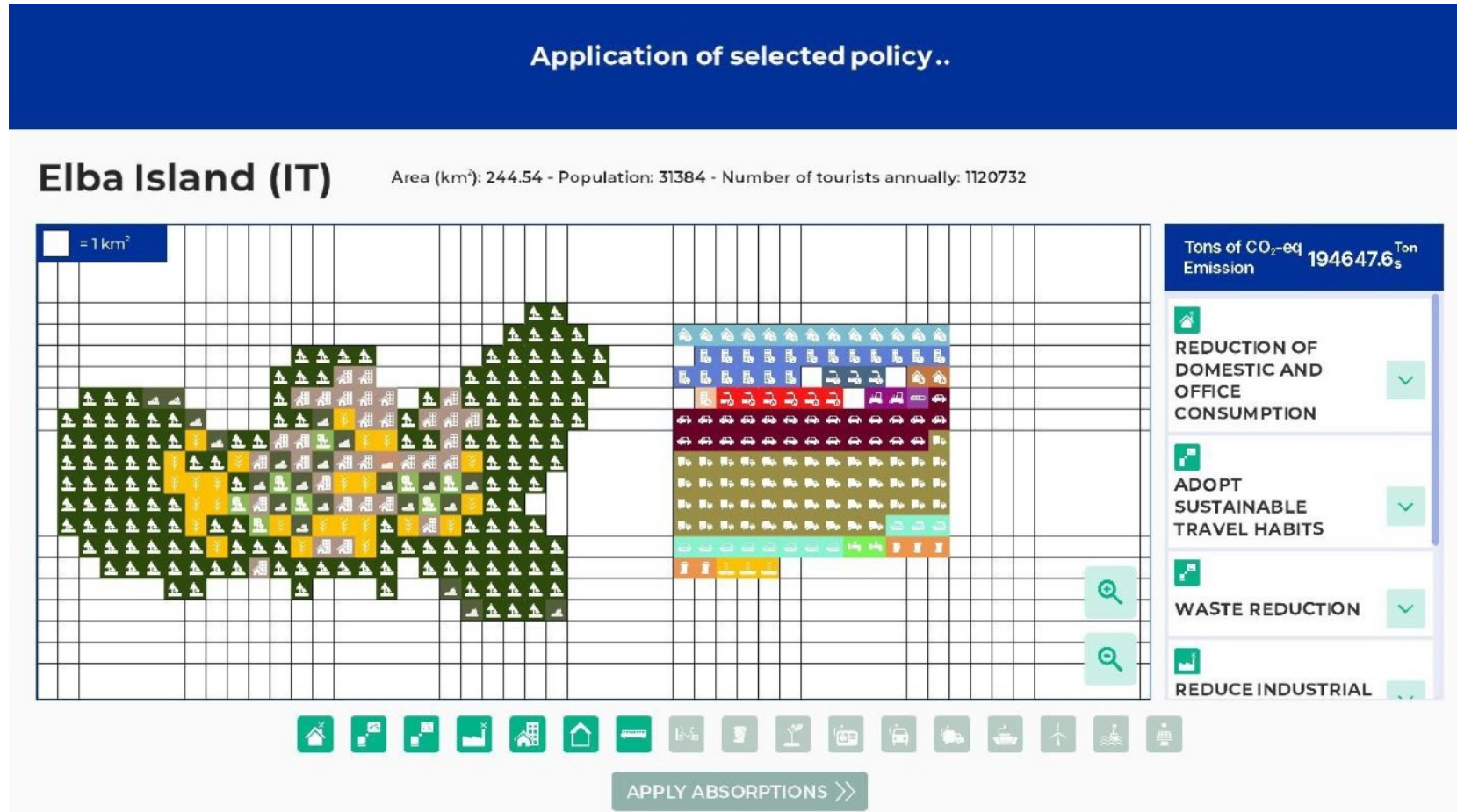


How can we “eat” the tiles? Behaviours and policies

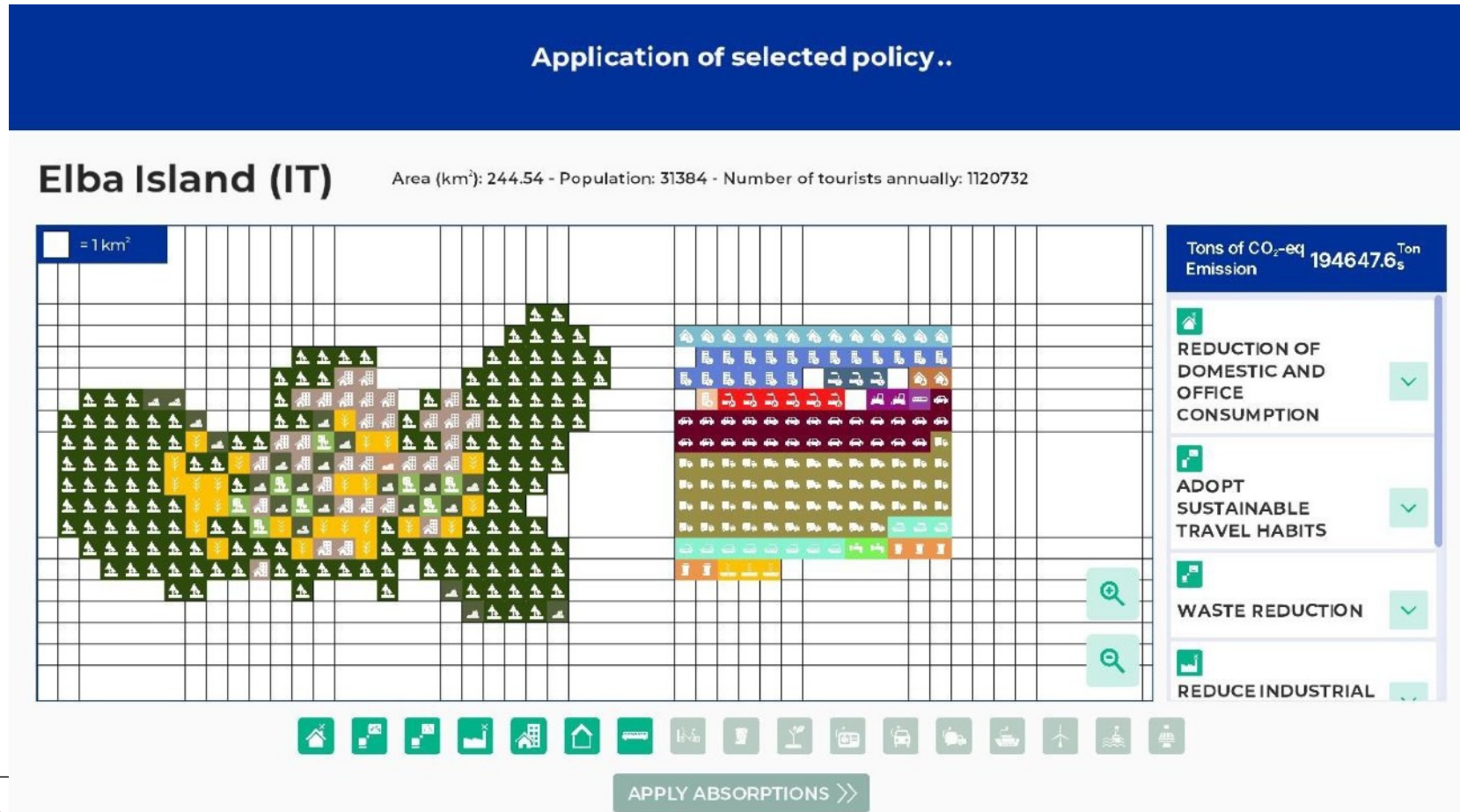


	REDUCTION OF DOMESTIC AND OFFICE CONSUMPTIONS		CONSERVATION AGRICULTURE
	ADOPT SUSTAINABLE TRAVEL HABITS		ELETRIC-POWERED HEAT PUMPS (REDUCTION IN GAS USE)
	WASTE REDUCTION		SUBSTITUTION WITH ELECTRIC CARS
	REDUCE INDUSTRIAL CONSUMPTION		SUBSTITUTION WITH ELECTRIC TRUCKS
	INSTALL SOLAR THERMAL SYSTEMS		SUBSTITUTION WITH ELECTRIC MARITIME TRANSPORT
	RESIDENTIAL EFFICIENCY IMPROVEMENT		INVEST IN WIND POWER PLANTS
	INVEST IN PUBLIC TRANSPORTATION		INVEST IN BLUE ENERGY PLANTS
	INVEST IN BIKE-SHARING SERVICES		INVEST IN PHOTOVOLTAIC PLANTS
	INVEST IN WASTE MANAGEMENT SERVICES		PLANTING OF NEW TREES

OK. Let's "eat!"



And for what remains there can be forests...



Feedback from the labs

- Two **students**: “So it is possible!!! We didn’t think it was possible to make transition!”
- One **mayor**: “Then with this instruments, if I have 1 million € for a project, I can decide how to invest the money to be more effective!”
- A group of **stakeholders**: “Please don’t hurry up: we need to discuss all the alternatives in depth!”
- Technical **experts of another territory**: “Can we have the same for us?”»



Grazie a tutte e a tutti per l'attenzione!

Vielen Dank an alle für die Aufmerksamkeit!

bastianoni@unisi.it





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