Gaïa VL equation
Well-being for all

For fair and peaceful diverse Sufficiency Efficiency Decarbonation Trajectories

These are the questions that Gaïa V-L equation seeks to answer.

- Is there a tool that can be used to assess the trajectories of territories, from the local to the global level, with regard to the three challenges (natural resources, energy and climate) ?
- Can this tool also incorporate a social justice dimension (taking into account human needs such as housing, food and mobility …. of the poorest) in our highly unequal territories?
- Will this tool enable us to embark on virtuous trajectories without waiting for decisions from above (the state, the COP, etc.) or miracle technological solutions?
- Using units of account such as Gaia's needs, kWh, time or CO_2, can the tool foster solidarity and create win-win situations between people and territories with very different lifestyles?

Unlike the Kaya equation, the Gaia equation goes beyond the 'sustainable development' and 'green growth' approach because it enables us re-embedding our economies within the social and biospheres [1].

A study of building renovations in France reveals that policies pursued over the last 50 years have focused solely on energy performance (kWh/m²). While aiming to reduce our energy footprint (kWh per cap), the surface footprint (m² per cap) is overlooked. However, growth in this area has a rebound effect on our energy consumption. This focus on performance alone has led to a great injustice towards the poorest. This work resulted in the following equation: kWh/cap = kWh/m² x m²/cap. This equation produced the first map (Fig. 1).

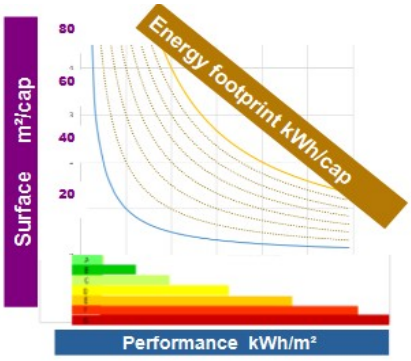
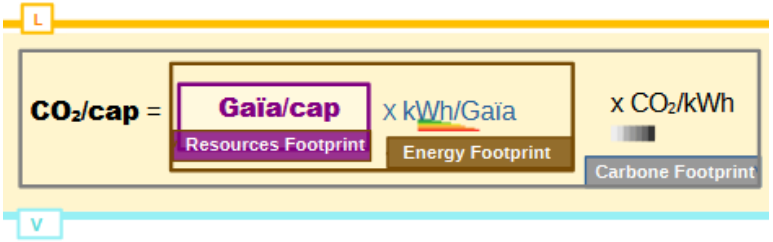


Fig 1: first map

If we apply this equation to mobility and food and add the carbon footprint: CO_2/cap = CO_2/kWh × kWh/cap, we can see that energy efficiency has been overlooked in our policies. Focusing solely on greenhouse gases conceals an injustice against farmers compared to other food producers, and in the case of mobility, against those who are frugal by choice or circumstance.

This work resulted in the equation below and three proposals that encourage us to reconsider our economic thinking in order to address our three global challenges.
How can we preserve and restore natural resources?
How can we share energy resources?
How can we reduce greenhouse gas emissions?



Proposal 1: Measure the value of our lifestyles' impact on resources using **a social and ecological unit[2]. The Gaia** of a human need[3] is quantified using a physical unit (m², km, etc.) that is decided collectively. This unit of measurement is a bit confusing at first, because it is contextualized and evolving over time.
The block representation of equation[4] facilitates its popularization (fig 6). The tricolour block (Fig 2) shows the resource footprint (height of its edge on the purple axis), the energy footprint (the brown surface of the rectangle delimited by this edge and the energy performance on the coloured axis), the carbon footprint (the grey volume). Scissors can be

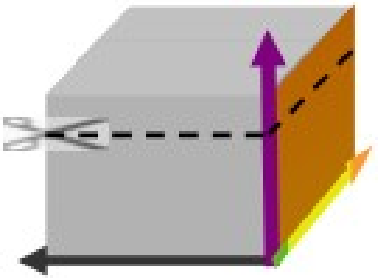


Fig 2: Block used to simplify the equation, here sufficiency trajectory

1 The Gaia equation owes everything to the work of négaWatt, Patrick Viveret, Bernard Lietaer, Kate Raworth, René Dumont... and other transition thinkers.
2 This proposal enables us to quantify our lifestyles and their impact using non-monetary values. Without a price, it is only possible to compare quantities of the same thing. It is also no longer possible to add or substitute values for different needs. For example, an excess of food cannot compensate for a lack of mobility.
3 Economic studies are no longer done by sector of activity, but by needs (housing, travelling...).
4 Multiplication of three factors which are the resource footprint (violet axis), the energy performance (coloured axis), and the carbon intensity (black axis)

used to visualize the sufficiency, efficiency and decarbonation trajectories on the three footprints and understand the rebound effects.

Proposal 2: By need and footprint decide collectively on the **vital** minimum **(V)** to be made accessible to everyone in the territory, as well as a reasonable **limit** **(L)** to preserve future life. So that the implementation of a transition policy will necessarily involve discussion and acquisition of new knowledge (fig 6) such as energy management, carbon intensity, orders of magnitude of footprints and rebound effects. By setting V as the footprint standard **(V=1)**, the maps are normalized In 1, 2 or 3 dimensions, they then allow to project using points representing the current situation of an individual or a group, arrows representing trajectories and zones (fig 4 and 5)

Proposal 3: Adopt a **fractal vision** of the world in nested territories[5], from micro-local to the global scale (Fig. 3).

The emblematic map (fig. 4) valid at each level of the fractal shows vital, limit and trajectory of the territory to the left of the axis and those of its sub-territories to the right. It facilitates a comparative analysis (benchmark) of intra- and inter-territorial diversity, the search for good practices, cooperation and subsidiarity.

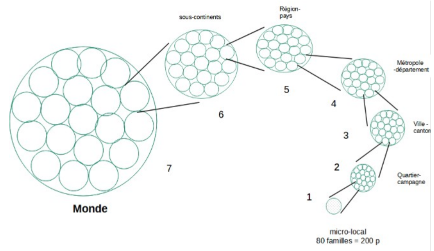


Fig 3 fractal vision, similar structure at every scale from micro-local to global

Thus, each territory becomes an actor on its own level of global change. It is invited to experiment with new economic rules adapted to its human diversity and biodiversity. It is invited to manage its transition in interdependence with the territory on which it depends and with its member sub-territories.

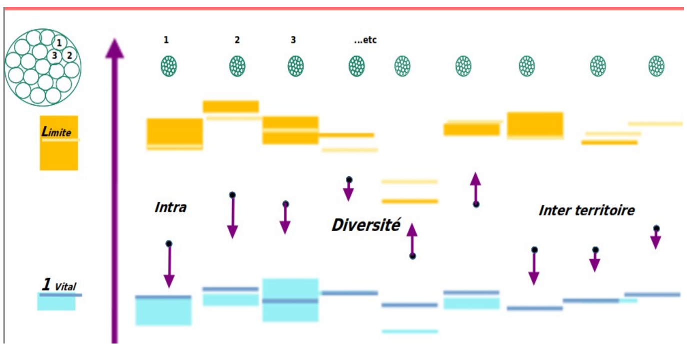


Fig 4: Decide on fair and diverse policies between members at a territorial level

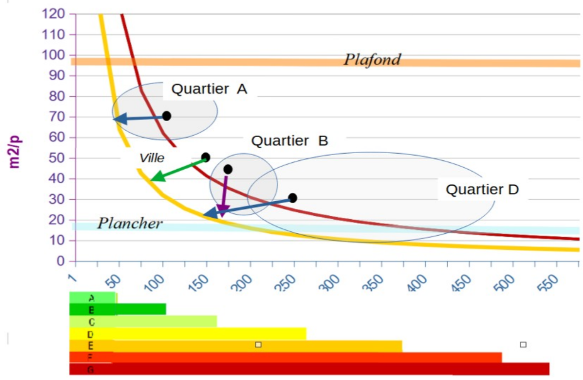


Fig 5: Planning a city's housing renovation policy

By replacing the Kaya equation[6], which is deaf to social injustice and blind to environmental damage and speaks only to experts, with the Gaia equation, territories can transition from competition to cooperation. In this way, we can hope to gradually meet together our three challenges peacefully.

You can find more information in French at: *http://www.renoveco.org/equation-de-gaia* . You can also watch a 30-minute video *https://vimeo.com/ 1 0 5 9 2 8 3 6 2 9*

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The Gaia-VL equation is of interest to people looking for indicators of wealth other than GDP, such as those involved in the good life.

Research: A report entitled '« Indicateurs de bien vivre et cobénéfices de la sobriété »' is available to download from the Ademe bookshop. A study is underway with the European Environment Agency.

Together, an international network of co-responsible territories is testing the Gaïa equation in cities in France, Portugal, and Cape Verde.

Fig 6: Approach and game by Together

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together
Territories of coresponsibility

cap BIEN VIVRE

5 Leave behind the current geopolitical vision of a world made up of sovereign countries in economic competition for their GDP and consider instead a new vision for global cooperation.

6 CO_2/cap = CO_2/kWh x kWh/GDP x GDP/cap : identical equation where the term Gaïa is replaced by GDP (see note 2)