

THE SEARCH FOR “FACTOR 4 INNOVATION”



Editorial product

Identifying the role of radical innovation in the pursuit of the ecological transition

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Keeping the Earth's average temperature increase below 2°C will require extraordinarily profound systemic change, and a delicate balancing act between public policy, innovation (technical, organizational, usage, business model), and behavioral changes.

If we focus on innovation, it is clear that:

"Green" innovations have significantly improved energy efficiency in many sectors, made a number of renewable energy sources more economically viable, etc.

Innovations from the digital world (open, agile, continuous, collaborative, "ecosystemic", etc.) regularly demonstrate their ability to radically and irreversibly transform entire sectors, professions, social practices, and regions, and enjoy the participation of a large portion of the population...

Thus, in relation to the ecological challenge we face, innovation fulfils one of its traditional roles (improve productivity, solve problems, etc.) but not the other (change the rules of the game)!

BUT...they have not caused any significant downturn in the curve of CO2 emissions growth; their overall focus remains on resource efficiency rather than disruptive change; their "behavioral" effects are modest; and they often depend on public policies intended to stimulate demand.

BUT...this kind of innovation continues to act as though our planet had no boundaries – limiting ecological impact is not of prime concern, or even a secondary objective.

> OUR HYPOTHESIS

We believe that things could be different if the proper conditions were met. There is a space for radical innovation whose "value proposition" integrates an ecological impact that is profound ("Factor 4", "zero emissions/waste etc.", "net positive energy" etc.), broad (scalable) and lasting (robust to "rebound effects").

We have provisionally called this "Factor 4 Innovation".

>> The term "Factor 4" is a simple (albeit simplistic) way to illustrate the extent of the transformations needed to limit climate change: reduce greenhouse gas emissions (GHG) to one quarter of their current levels by 2050, through a combination of reducing energy requirements and substituting fossil fuels with renewable energies.

A "Factor 4 Innovation"...

...is an innovation, first and foremost: it meets a need or solves a problem; it brings something new to its recipients; it differentiates its initiator from its competitors;
... is a radical or disruptive innovation, at least in terms of its ambition: the changes it intends to bring about are broad and irreversible; it has the potential to lead to further innovations;
...does not necessarily require advanced technologies (can be low-tech); can be an innovative product, service, organization, process, etc.
...has at its core the pursuit of explicit and credible environmental objectives – it is ambitious ("Factor 4") in depth and scope – and is serious about measuring whether those objectives are being met;
... pays attention to its impacts on other domains and industries, as well to possible "rebound effects" that could reduce their environmental benefits.

We believe that the potential of Factor 4 Innovation exists, and that a number of projects and ventures have begun to unlock it. Nevertheless, that potential remains largely untapped for several reasons:

- Projects with Factor 4 potential typically do not fall into existing categories of innovation (social/commercial, product/process, etc.);
- We do not have the tools needed to evaluate (or even identify) Factor 4 innovations; as a consequence, we are unable to support them; and,
- Sometimes, because they disturb entrenched interests!

> THE EXPEDITION (JULY 2016 - MARCH 2017)

Within the framework of the [Transitions2](#) program, we want to invite you on an expedition in search of Factor 4 Innovation. Together, we will seek to answer three main questions:

1. What role do innovation and entrepreneurship play in an ecological transition of such magnitude?
2. What are the distinguishing characteristics of a "Factor 4" innovation?
3. How can we drive innovation – and innovators – in this direction?

This project is spearheaded by [Fing](#), [Iddri](#) and [Ouishare](#), with the support of [Ademe](#) and [Bpifrance](#).

3 Objectives

1. Collaboratively map the risks, challenges and potential inherent in innovations that deliberately address systemic ecological impact,
2. Identify and analyze emblematic Factor 4 innovations (on a global scale), infer common characteristics, and compare any differences with "standard" innovation criteria and routes to implementation,
3. Pave the way for a "Factor 4 Innovation Strategy" that can (1) steer innovation and innovators in its direction, and (2) provide them with the tools, infrastructure, and financial resources needed for their development.

20 Flagship Projects

Our research will identify and examine international initiatives that exemplify "Factor 4 Innovations" according to the definition proposed above. These initiatives may be in development or operational, and they may be successful or unsuccessful – as long as they have been properly documented and their initiators can be contacted.

>> Two successive simplifications will serve to channel our efforts: a focus on environmental impact (economic and social impacts being part of the journey, rather than the final destination); and more specifically, a focus on climate change (energy and GHG emissions).

>> Also for the sake of focussing our collective effort, our investigations will mainly concentrate on four main areas:

- mobility
- regional economies (for example: urban farming, local sharing economies, "The Internet of Energy", circular economies, etc.)
- lifestyles (sharing, low-tech, frugal, etc.)
- "political" innovations (how can we facilitate decisive arbitration between conflicting goals, and the making of collective decisions that will have a significant environmental impact - and then carry them out!)

>> The above restrictions only apply to our active search for Factor 4 initiatives. At the same time, we welcome any proposal that fits the definition of a Factor 4 Innovation, even if it focuses on a different environmental challenge (biodiversity, water scarcity, pollution) or comes from another domain.

Join our Expedition!

If you are...

- An innovator with an ambitious idea
- A network of innovators
- An organization whose mission is to support and/or fund innovation
- A large business conducting your own ecological transformation,
- A researcher or a research organization,
- A person who is interested in and committed to these transitions...

...you can contribute by:

- Sending us details about your project or a project you are familiar with (French or not!) that you think fits the definition of a Factor 4 Innovation
- Participating in the discussion: point us toward a reference resource, share your ideas on the Transitions² platform, take part in workshops...

Interested? [Contact us!](#)

In your opinion, are they Factor 4 Innovations?

One way to pinpoint Factor 4 Innovation is by immediately seeking out potential flagship projects.

- [Current](#) (the Netherlands): an energy supplier that encourages energy exchange and load balancing among its customers – with the aim of offering a flat rate, independent of actual energy consumption, that encourages the company to sell as few kWh as possible!
- [Open Source Ecology](#): an open initiative that seeks to design and share "free" versions of the 50 machines needed for rural village life – each designed to be manufactured, used and repaired locally.
- [Blablacar](#), and/or a dynamic urban carpooling project: car sharing on a large scale.
- [Tesla Powerwall](#): a residential "battery" that targets energy self-sufficiency by storing unused household solar energy during the day for use in the evening.
- The autonomous electric vehicle, designed as the starting point of a "[cluster of innovations](#)" that involves mobility, energy, urban organization, etc.

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