Scenarios for Sustainable Lifestyles 2050:

From Global Champions to Local Loops

2015   2020   2030   2040   2050

D4.1 Future Scenarios for New European Social Models with Visualisations

SPREAD
Sustainable Lifestyles 2050

![SPREAD Sustainable Lifestyles 2050]

About SPREAD Sustainable Lifestyles 2050

Report Principal Authors: Juha Leppänen (Demos Helsinki), Aleksi Neuvonen (Demos Helsinki), Maria Ritola (Demos Helsinki), Inka Ahola (Demos Helsinki), Sini Hirvonen (Demos Helsinki), Mika Hyötyläinen (Demos Helsinki), Tuuli Kaskinen (Demos Helsinki), Tommi Kauppinen (Demos Helsinki), Outi Kuittinen (Demos Helsinki), Kaisa Kärki (Demos Helsinki), Michael Lettenmeier (Demos Helsinki/D-mat), Roope Mokka (Demos Helsinki)

With inputs from the project consortium and project advisors

Report Visualisation: Francois Jegou (Strategic Design Scenarios / Politecnico di Milano), Adèle Seyrig (Strategic Design Scenarios), Marta Corubolo (Politecnico di Milano), Anna Meroni (Politecnico di Milano), Christophe Gouache (Strategic Design Scenarios)

Report Layout: Kirmo Kivelä (Demos Helsinki)

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What is SPREAD Sustainable Lifestyles 2050

SPREAD Sustainable Lifestyles 2050 is a European social platform project running from January 2011 to December 2012. Different societal stakeholders – from business, research, policy and civil society – have been invited to participate in the development of a vision for sustainable lifestyles in 2050. This process will result in a roadmap for strategic action that will identify opportunity spaces for policy, business, research and civil society to take action to enable more sustainable lifestyles across Europe.

In recent years, we have witnessed the emergence of more sustainable products, services and experimental bottom-up initiatives. They have signaled new hope that more sustainable ways of living are achievable for all, while celebrating diversity, in post-industrial societies. Despite these developments, existing promising sustainable living practices are not enough. They remain dwarfed by the unsustainable impacts of the average European's current lifestyles.

To overcome the current challenges of our unsustainable lifestyles, the SPREAD project has developed future scenarios of possible societies that support more sustainable ways of living.

How to spread sustainable lifestyles?

Based on Geels 2002
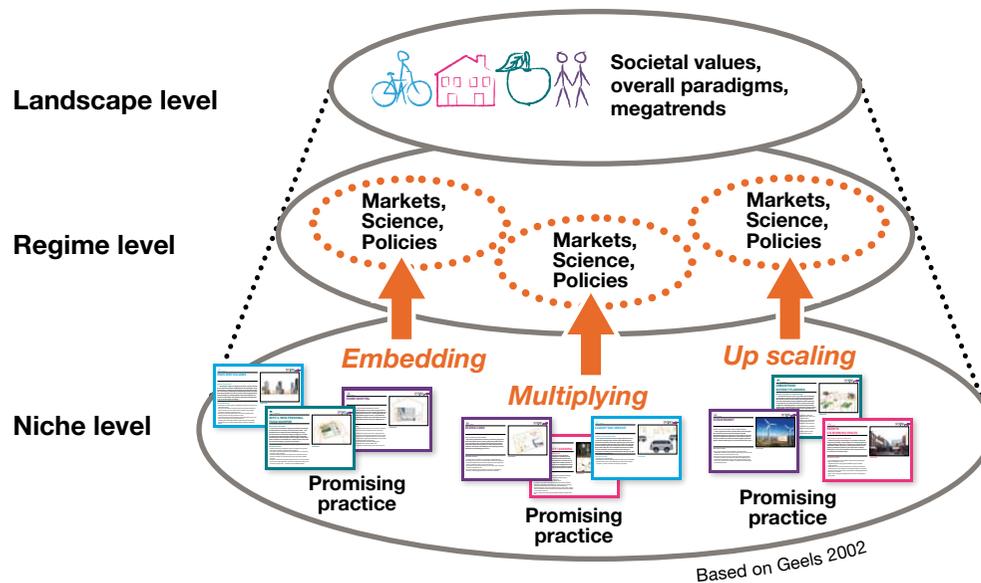
Unsustainable lifestyle impacts to be overcome by 2050: Key findings of the project's baseline research

The SPREAD project's journey to future scenarios for more sustainable lifestyles began by taking stock of existing knowledge on sustainable lifestyles. Through this initial research we identified the challenges and barriers to more sustainable living today, as well as promising trends, drivers and opportunities to encourage more sustainable ways of living in the future. The results of this baseline research can be found in our project report, "Sustainable Lifestyles: Today's Facts and Tomorrow's Trends".

Modern European lifestyles are unsustainable. They have become associated with overproduction and overconsumption. The impacts of our lifestyles are putting too much pressure on our natural resources and have adverse environmental, economic, social and health effects.

The report reveals that lifestyle and household consumption form a significant part of society's environmental burden as a whole. In recent years, sustainable lifestyle choices have started to become a more relevant and accessible option for some European consumers thanks to a rise in localised social innovation experiments, the improved supply of eco-efficient goods and services, and increased coverage of sustainability issues in the media raising awareness in the public debate. We call these signals of progress,

"promising practices" of more sustainable living practices, and they form a good foundation for exploring the future of sustainable lifestyles.

SPREADing sustainable lifestyles in the future will require, on the one hand, a deeper understanding of how to scale up current promising practices. On the other, we need to know how far these practices will take us towards sustainable living for all, and what kinds of new creative solutions, currently unknown or "unthinkable", might get us there.

Our research suggests that in order to make progress in these areas, that focus should be placed on strategies to assist, motivate and inspire behavioural change, as well as the role of infrastructure and enabling sustainable living environments.

The scenarios for sustainable lifestyles 2050 present four different prototypes of possible future societies that all support more sustainable lifestyles. Our lifestyle scenarios are based on the foundations of sustainable systems, and explore different options in an attempt to acknowledge the diversity among European citizens.

The critical impacts of current European lifestyles are:

- Food and drink, private transport and housing together account for 70-80% of Europe's environmental impacts stemming from final consumption (Tukker, A., G. Huppes, et al. (2006)).

- Meat and dairy consumption alone account for almost one quarter (24%) of all final consumption impacts – by far the largest share in the food and drink sector (Weidema et al. 2008).

- Domestic heating, water consumption, appliance and electronics use accounts for 40% of Europe's total energy consumption (with heating alone accounting for 67% of household energy consumption in the EU-27) (EEA 2010).

- Car ownership in the EU-27 increased by more than one third (35%) in the period between 1990 and 2007 (EEA 2010) and EU drivers currently own one third of the world's 750 million cars (IEA 2010).

- In the EU-27, approximately 60% of adults and over 20% of school-age children are overweight or obese. Coronary heart diseases (CHD) often associated with fatty foods and smoking, remain the single most common cause of death in the EU (WHO 2011).

Moving

Living

Consuming

Society

Reference: For more information, please read the full SPREAD Sustainable Lifestyles 2050 baseline report, available to download from www.sustainable-lifestyles.eu.

Our scenarios on sustainable lifestyles

The SPREAD Sustainable Lifestyles 2050 project uses a scenario methodology to explore the diverse ways for potential lifestyle patterns to evolve, and how this evolution can overcome current harmful environmental and social lifestyle impacts. Our sustainable lifestyle scenarios are stories of possible futures where societies support more sustainable ways of living. The scenarios present different options for sustainable living choices that will suit the diverse needs, desires and cultural considerations of citizens from across Europe. The four scenarios present differing pathways to reach alternative societies where sustainable ways of living are supported.

Scenarios are not predictions or forecasts but instead seek to explore the most extreme possibilities, in order to help decision-makers plan for the currently "unthinkable". In order to develop stories of the future, we first identified the most critical variables – the critical drivers necessary to create sustainable lifestyles. Some of the elements of our scenario stories might sound improbable at first. The aim of our scenarios is to help think the unthinkable and plan for sustainable options in the future.

The focus of our scenarios lies primarily on people's lifestyles. As people live within a society, and within global and local systems, we also identify system boundaries such as, geopolitics, national politics, or technology related to each future scenario. It is clear that these factors have immense direct and indirect influence on lifestyles. However, here they are dealt with only to the extent that they directly explain changes in lifestyle patterns.

We have chosen a specific scenario methodology to explore different options for new European social models that encourage sustainable lifestyles in 2050. We further outline our methodology here:

1. Our scenarios aim to demonstrate how various situational and behavioural factors contribute to the development of sustainable lifestyles. Scenarios form a powerful tool for translating how megatrends, such as climate change, rapid technological advancements, and changing demographic patterns could change our everyday lives and the decisions we make concerning how we live, move and consume in the future.

2. Our scenarios enable us to analyse the potential of current promising sustainable living practice in relation to the various factors

Situational and behavioural factors influencing human behaviour
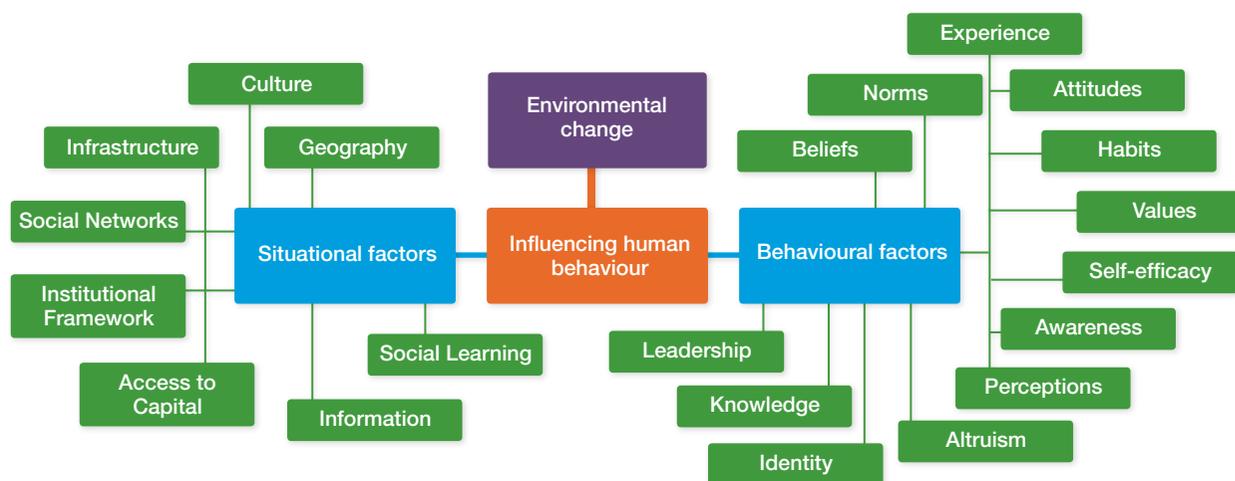
The backcasting method

driving alternative sustainable futures. Through scenarios we aim to explore the ways in which promising niche strategies for more sustainable living could grow into widespread practices that have the potential to decrease the overall environmental stress on our societies.

3. Our scenarios provide a starting point for identifying opportunity spaces for the development of creative strategies to not only mainstream current sustainable practices, but also to develop new solutions for more sustainable living societies. The scenarios offer insights into how different drivers of change interact, shape lifestyles and help in identifying the role of various gatekeepers who facilitate the change through scaling up and multiplying the current, promising practices on different stages of development.

Usual future perspective

Space of opportunities

Now   **2050**

Cylinder model of constructing possible future scenarios

Future perspective with system boundaries

Space of opportunities   **Core vision**

Carbon budget
Peak oil
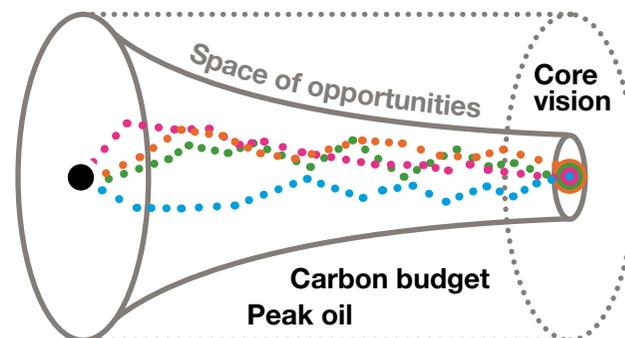
Now   **2050**

Cone model of constructing meaningful future scenarios

In order to establish four sustainable lifestyle scenarios for Europe in 2050, we have used a methodology called backcasting. The backcasting method allows us to address the risk that starting from the present may lead to concentrating on challenges that are irrelevant for the future we aim to achieve.

Backcasting helps us to set our compasses towards sustainable futures by defining sustainable lifestyles, and their elements, as fixed variable goals. This normative goal as a starting point for the scenarios helps us to see the discrepancies between current realities and desirable futures, but also helps us to understand, where disruptive changes are most needed. Backcasting explores alternative pathways to successfully reaching the desired future goals.

Our premise is that there are factors that set limits to meaningful future living such as:

- limited global crude oil reserves that force production to decline at some point (peak oil)

- a limited "carbon budget" of greenhouse gas concentration in the atmosphere

Exceeding these or other relevant limits would create feedback effects that would very likely reduce the resources and capabilities available to people living in the coming decades. Hence the scope of desirable, but achievable futures would also be more limited in the future. To generate future lifestyle scenarios that are relevant and robust, it is imperative to recognize these limits.

The sustainable lifestyle = 8000 kg per annum

In order to create scenarios for sustainable lifestyles in 2050, we need definitions and common targets to specify what is meant by "sustainable lifestyles". In the SPREAD project we have defined the material footprint of a sustainable lifestyle at 8000 kg per annum (p.a.) for one person. This quantified target forms the fundamental assumption on which each of our four developed and previously described scenarios is built. Our scenarios describe what 8 000 kg living can look like in four diverse future societies.

The 8000 kg p.a. of material footprint per person is based on the work of Michael Lettenmeier, Stefan Bringezu, Friedrich Schmidt-Bleek et al from the Wuppertal Institute for Climate, Environment and Energy on a safe and sustainable level of natural resource use.

The material footprint is a tool to measure and manage or optimize the resource consumption of our lifestyles, including the products and production processes behind them (i.e. in the areas of consuming, moving, housing and health). In this context, our sustainable lifestyle material footprint means the use of renewable and non-renewable material resources (excl. water and air) plus the erosion caused by agriculture and forestry. It covers the whole lifecycle from the extraction of raw materials to the processing industry, distribution, consumption, recycling, and disposal.

The idea of the material footprint is to provide a comprehensive and understandable tool to reduce different kinds of present and future environmental challenges (for example in the areas of food, mobility, housing and health).

When the material footprint of an average European lifestyle drops from 27000 – 40 000 (approximate current average lifestyle footprint per person) to 8000 kg per year, the environmental and resulting social impacts of our lifestyles will drop and change considerably. The material footprint thus serves as a tool to comprehensively direct lifestyles to levels within planetary boundaries as described e.g. by Johan Rockström and other scientists (see below). It also provides a way to measure progress and milestones of success towards our future sustainable lifestyle goals.

The material footprint of 8000 kg p.a. consists of household goods, food and beverages, everyday mobility and tourism, electricity, heating and housing. However, the composition of the footprint is not similar for everyone. The share of consumption in a material footprint of 8000 kg p.a. can differ based on the values, needs and aspirations of each person's unique lifestyle. For example, some people may accumulate more of their footprint through mobility while others move less, but live in a larger apartment. Not everyone needs to live the same way, but – at least on average – everyone must live within boundaries of our planetary system in order to realize our sustainable future.

Environmental and social indicators included in the 8000 kg p.a. lifestyle:

1. Environmental boundaries

We draw on the planetary boundaries framework developed by a group of earth system and environmental scientists led by Johan Rockström from the Stockholm Resilience Centre. Due to the complexity of quantifying these planetary boundaries, we only included six of the original nine in the background considerations for the scenarios. As the quantification of the indicators used by Rockström's group on a lifestyle level would have been extremely complex, we used the material footprint (see above) as an indicator for the various kinds of environmental impacts caused by any kind of material and energy use.

2. Social boundaries

We use population growth and human development indices based on statistics and research by UNDP and UN Population Division. These social system boundaries (the goals for 2050) are the minimum requirements for socially sustainable development. The material footprint boundary of 8000 kg p.a. for one person's lifestyle is based on the worldwide recognition of these social system boundaries.

Environmental boundaries

Earth-system process	Current value	Boundary value
Climate change Atmospheric carbon dioxide concentration (ppm by volume)	387	350
Biodiversity loss Extinction rate (number of species per million per year)	>100	10
Biochemical Anthropogenic nitrogen removed from the atmosphere (millions of tonnes per year)	121	35
Land use Land surface converted to cropland (percent)	11,7	15
Fresh water Global human consumption of water (km³/yr)	2600	4000
Ozone layer Stratospheric ozone concentration (Dobson units)	283	276

Reference: **Rockström J**. et all. (2011)

Social boundaries

Human development	Current Value	Goal 2050
Human Developed Index (measure of life expectancy, literacy, education and standards of living)	0,63	0,77
Years of education in less developed countries (average years)	6	8
Life expectancy (global average)	70	>75
GINI coefficient (Measure of the inequality: a value 0 expressing total equality and a value 1 maximal inequality.)	0,7	0,55
Global population (billion)	7	8,9

Reference: UNDP (2011)

Four scenarios, two critical uncertainties

In order to establish four scenarios that would significantly differ from each other, we defined at the outset four future landscapes through which the scenarios would be constructed.

This was done by combining the two critical variables, which we call uncertainties. We use these uncertainties to define lifestyles and societies. The two uncertainties and assumptions about them underlining our work were that:

- Technology is either pandemic or endemic.
- Society's governing principle is either human-centric or meritocratic.

By combining these two sets of alternatives, we reached our four possible future landscapes. The following are descriptions of what these future landscapes would look like on the societal level.

These two critical uncertainties defined the main drivers shaping the scenarios and the scenario process. At later stage of the work we defined four additional drivers for each scenario. With the help of these drivers we were able to give a reasonable explanation on how sustainable lifestyles and the sustainable society can be reached in each scenario.

Pandemic technology

Globally there are a few dominant technologies for any task or human need. Technologies for building, transportation, energy production, and communication exist everywhere and look similar. There's fierce competition on the global markets and commercial dominance yields huge rewards. Technology in 2011 could be called pandemic. Everyone's on facebook and drives a car (produced by a few global manufacturers) that runs on petrol or diesel fuel (globally exchanged goods).

Human-centrism

A human-centric society pivots around widening the use of human capital in all its forms. Both civic and public use of skills is valued. Everyone has something valuable to give or to do. Society's success depends on everyone contributing and on everyone's ability to be good citizens, family members, neighbours and professionals. There is some division of labour, but self-improvement through leisure is also very much appreciated: e.g. through family time, active consumption, civic activities, handicraft, arts. You do what you can – and what you feel motivated to do.

Meritocracy

A meritocratic society circles around professional skills. The most commercially valuable professional skills are the engines of the economy. Members of those professions are paid accordingly. Policies and structures are customized to facilitate the work of the leading industries and professions. Division of labour is at its extreme. You do only what you're really good at.

Endemic technology

The tools, infrastructures, and solutions we use are born and grown locally: technology emerges out of local conditions, resources, and peculiarities. Local living conditions rule technology. Where there is wood, houses are built of timber – where the days are extremely hot, people live in tents. The corpus of global science and technology is wide, yet applications are highly local. The economy is driven by efficiency and innovations gained through thinking and acting locally.

Pandemic technology

Meritocracy

Human-centrism

Endemic technology

Singular
Super Champions

Governing
the Commons

Local Loops

Empathetic
Communities
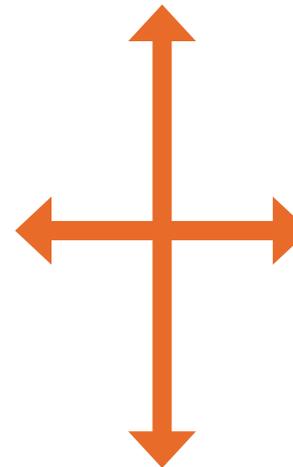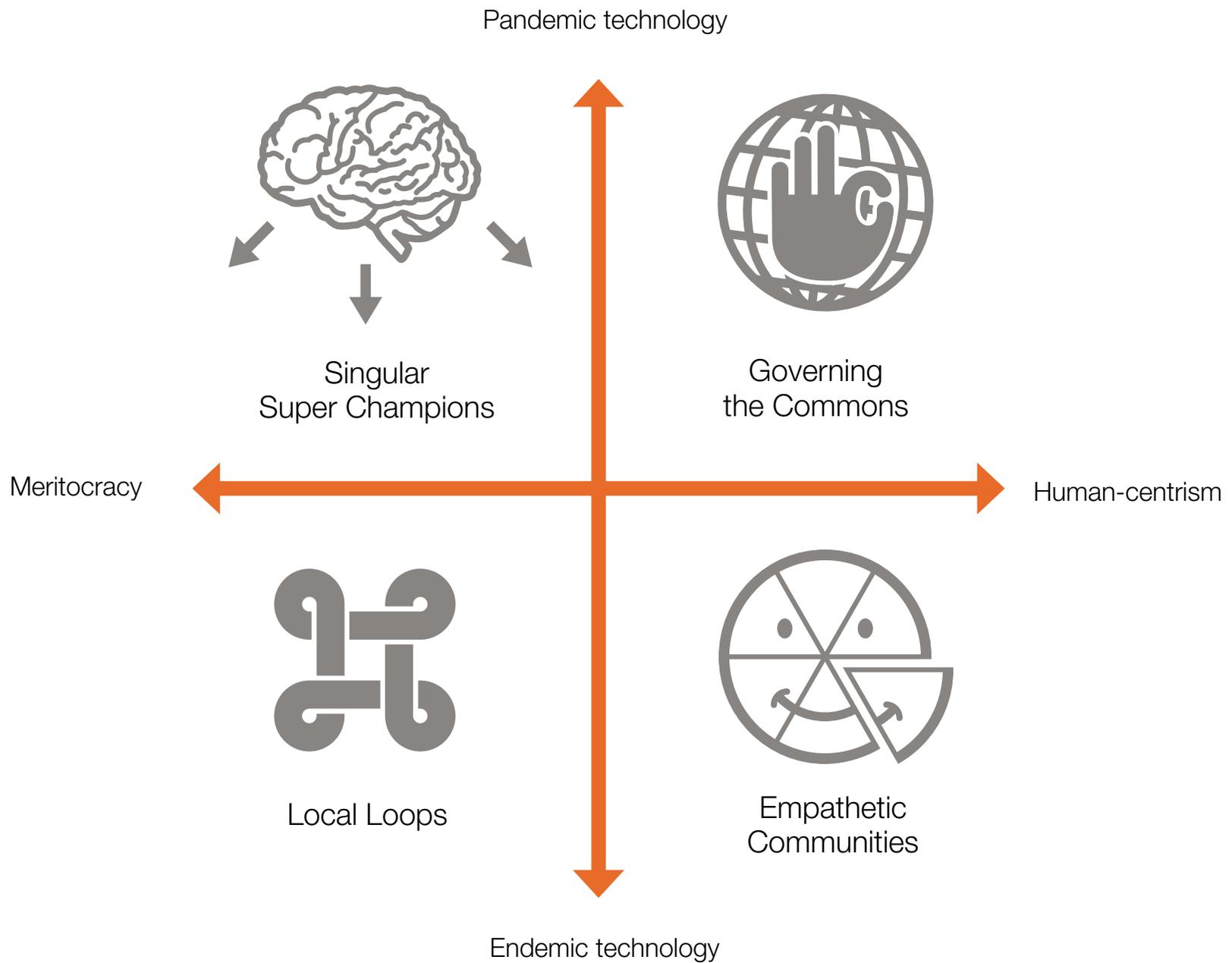
How did we get here?

The development of future scenarios for more sustainable lifestyles in 2050 builds on all previous work in the project. The research conducted on critical lifestyle impacts as well as the barriers and drivers impeding and encouraging more sustainable ways of living provide a solid basis for creating pathways towards possible futures where these challenges can be overcome and opportunities for improved living realised.

Sustainable lifestyle scenarios 2050 – the "making of"

The creation of alternative futures for sustainable lifestyles to as far as 2050 was completed in five phases.

1. Defining the framework (axes of critical uncertainties) for the creation of the scenario quadrants: Baseline research and findings of the SPREAD Delphi survey of expert views.

2. Defining four scenario landscapes.

3. Exploring the pathways to sustainable living: Backcasting workshop in Tuusula, Finland.

4. Qualifying and quantifying the scenarios and pathways: Research & 2nd Delphi survey.

5. Finalising the scenario stories and visualisations.

Phase One:

Defining the scenario framework

The development of our scenario framework included the analysis of the project's baseline research and identification of promising practice on sustainable lifestyles, as well as further input and analysis from a crosscutting group of relevant stakeholders and experts.

In November 2011, following the baseline research, a selective Delphi Survey was conducted amongst a crosscutting group of relevant stakeholders and experts. The survey aimed at finding a feasible framework for the backcasting workshop. The survey questionnaire was formulated based on the findings of the SPREAD baseline report, the SPREAD launch conference report and promising practices cards from the SPREAD Visioning workshop. Around 40 people out of 110 invited responded to the survey.

The survey questionnaire included a formulation of assumptions or "arguments" that participants were asked to evaluate (based on assumptions probability, desirability and importance) and comment (explaining what drivers would cause an assumption to be realised or fail to be realised). Instead of asking for comments on current trends, the respondents were requested to describe things they see in place in 2050, in a world where sustainable lifestyles are the norm across Europe.

Phase two:

Defining four scenario landscapes

Based on the analysis of the research and the survey, we were able to define two critical variables or uncertainties that we combined to produce four alternative future landscapes. We did this using the principles of systems thinking, which helped us map the relevant situational and behavioural factors influencing human behaviour.

The two critical uncertainties are technology and a society's governing principle. We were able to divide technology into either pandemic or endemic, and the governing principle of the society into either meritocratic or human-centred. By combining these uncertainties, we created the scenario quadrants. These were elaborated into four alternative future landscapes, which formed the basis for our work in the backcasting workshop.

Phase three:

Exploring the pathways to sustainable living: Backcasting workshop in Tuusula, Finland

The "Counting backwards workshop" was held on the 24-25th of November 2011 in Tuusula, Finland. There, four alternative scenario pathways from 2012 to 2050 were created with the help of

54 participants from 16 countries, representing stakeholder groups from start-up businesses to governments, multinational companies, NGOs, researchers, entrepreneurs, designers and independent policy experts. These participants were divided into four groups and each defined an alternative scenario narrative and pathways to sustainable lifestyles in Europe between 2012 and 2050.

In the workshop the backcasting method was used to explore the pathways to more sustainable living and to further define each alternative future scenario. Starting with the alternative future landscapes created in phase two, participants "counted backwards" from the 2050 futures to today. Each group was challenged to co-create the pathways to their alternative future where sustainable 8 000 kg lifestyles are societal norms – What would have to have happened 2040, 2025 and 2015 in order to reach different 8 000 kg lifestyles in this scenario? Special focus was put on critical lifestyle impact issues (e.g. food, mobility, housing and health) as well as drivers of lifestyle choices, such as enabling infrastructure and behavior change strategies that were highlighted in the SPREAD baseline research.

Phase four:

Qualifying and quantifying the scenarios and pathways: Research & Delphi survey

To qualify the scenario stories and pathways formulated in phase three, a second Delphi survey, with stakeholders and experts, was conducted. The aim of the second survey was to gather additional assumptions and arguments for each scenario. Respondents were asked to comment from the perspective of his or her expertise. Survey results were fed into a revised draft of the scenarios.

The scenario drafts were further tested and quantified through the SPREAD People's Forum, which we call "iFuture". iFuture enabled us to explore the scenarios with "real people" from across Europe, with focus groups assembled in four European countries from January-March 2012 (Finland, Germany, Hungary and Spain). In the iFuture workshops the SPREAD project was able to connect the scenario stories to peoples' real assumptions, aspirations and ideas about "the good life" and their own sustainable lifestyles, where the size of individual material footprints do not exceed 8 000 kg p.a.

Phase five:

Finalising the scenario stories and visualisations

In the final phase, the scenarios were advanced to final stories and visualisations to show what sustainable lifestyles in 2050 could look like were created. At this stage, the scenarios were further elaborated on to make the differences in each alternative future society explicit with the identification of four drivers of change for each scenario. Further focus was put on defining what life is like for different people in each scenario and how environmental and social changes have impacted their lives, or become catalysts for behaviour change.
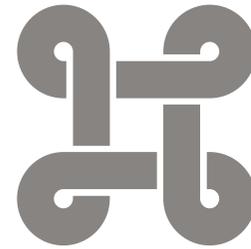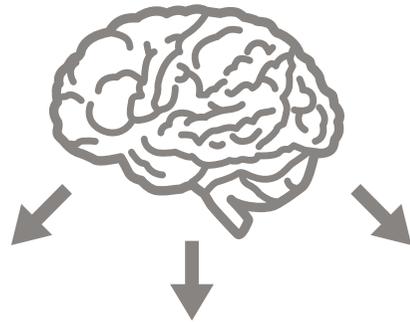
Four scenarios to sustainable lifestyles 2012–2050

Singular Super Champions

Pandemic technology

Singular Super Champions

Governing the Commons

Meritocracy

Human-centrism

Local Loops

Empathetic Communities

Endemic technology
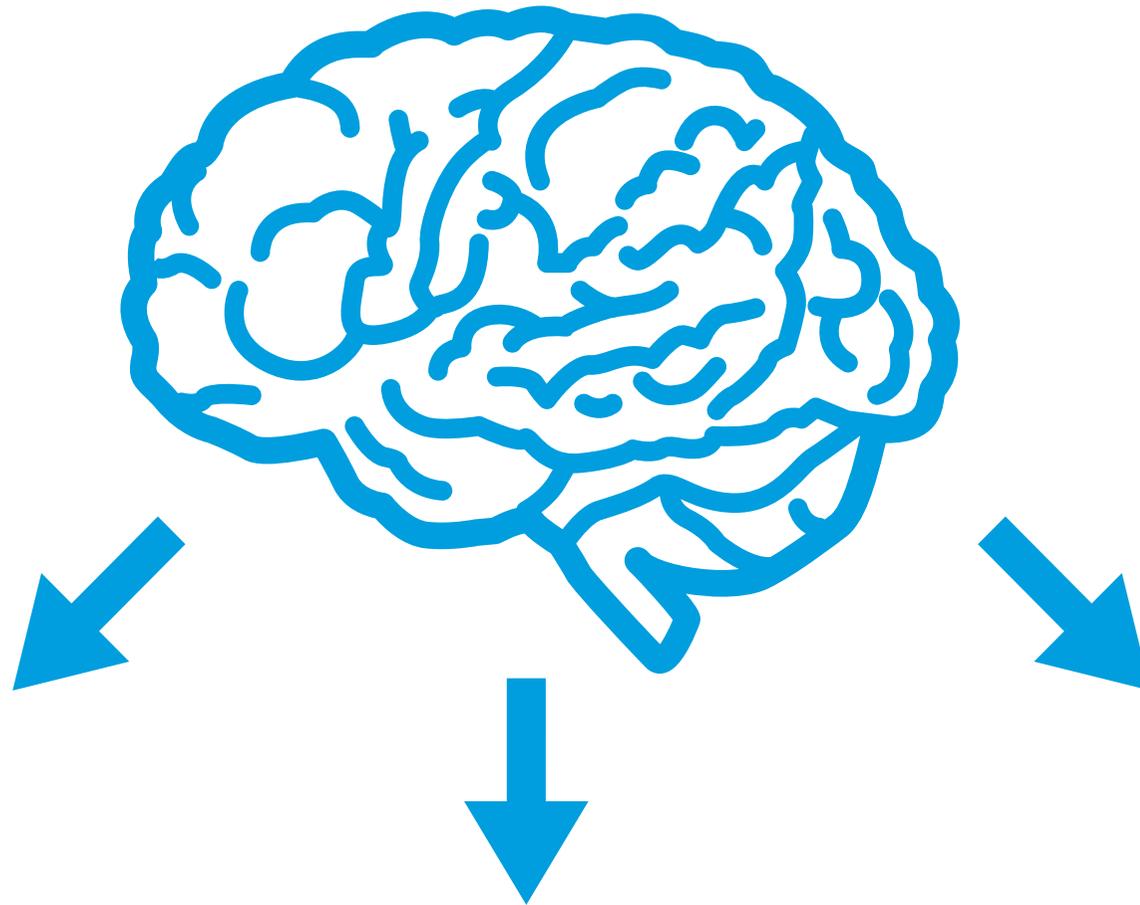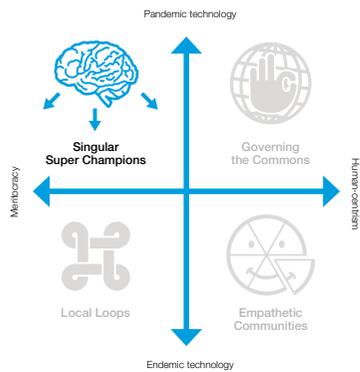
Singular Super Champions

Alternative Sustainable Society 1: Supporting 8 000 kg Sustainable Lifestyles

In the scenario Singular Super Champions Europe has made the leap to a new type of sustainable, competitive and equitable economy: a result of numerous treaties, declarations and official goals starting from 2035. The leap is achieved with the deployment of market instruments that also radically reform many conditions that have shaped European lifestyles over the past decades. Cleantech and upcycling businesses flourish as sustainability has become the business opportunity of the century. Europe of Singular Super Champions is a society that celebrates an ethos of learning, achieving and self-mastery.

An ageing Europe receives a transformative and rejuvenating spark, in order to survive as China began its strides towards gaining total global dominance in cleantech markets at the start of the 2010 decade. At almost the last moment, in 2015, the EU wagered all of its political power and public resources to force companies and consumers into the era of a new industrial revolution. Developing new materials and bringing about a revolution in production technologies comes about through incentives and political measures. European nations agree to remove all subsidies from industries operating with inefficient legacy technologies in the energy and resource intensive fields. All available budget in the member states is invested in massive R&D centres, demonstration projects and especially in education.

This was not a pain-free road to success. Revolutionising technologically and ecologically outdated production processes, as well as, cutting subsidies from fuel and many other commodities means that many people lost their jobs. All transportation, and especially single car use became much more expensive and all associated housing costs rose. The big reform didn't treat every citizen or region equally. This created turmoil in declining regions in the 2020's but, the masses were forced to adapt. Simultaneous reforms in welfare provisions due to budget cuts drove many Europeans to migrate and search for income opportunities from thriving metropolitan regions thus speeding up the concentration of the population and sources of wealth.

Big investments paid off: Scientific breakthroughs in material technology made the up-cycling of raw materials profitable. Firms in the cradle to cradle business started to make solid profits in the latter half of 2020's. Access to the consumption cycle and what was previously called waste became the key determinant of success to the large multinational firms. New service and distribution models were created. They put new emphasis on building lasting relationships with customers. This was the only way to make the valuable resources stored in material products return to production. Consumers experienced this through services that equipped them constantly with up-to-date models of the goods they have once bought access to. For some, these technologically driven lifestyle goods compensated and replaced their past needs for spacious single-family houses and modestly priced cars.

Singular Super Champions is a society in which success, both for individuals and societies alike, is gained through persistent faith in education and enterprise. In job markets expertise is everything because technology develops fast and the only source of success in the era of resource scarcity is expert knowledge.

Everyone has access to basic education, learning and knowledge. But beyond that there is a moral obligation for continuous development of personal and professional skills that drive sustainable societies. Leisure time is therefore quite different from leisure time in 2012. It is spent on learning and education that is self-centred yet

pragmatic. The most affluent people, The Singular Super Champions, have transcended material consumption. Instead of consuming, they make investments in themselves through studying new skills, both to improve professionally and to become champions of their individual lifestyle.

How are sustainable lifestyles achieved?

The road towards sustainability started with people having to pay more for the necessities and luxuries that are less expensive in 2012.

Due to extreme urbanisation, people live in even more dense cities than they did in the 2010's. As the importance of cities and their centres rise at the same time, the most talented people aspire to be in the downtown areas of progress in the metropolis. This raises the prices of apartments and location starts to compensate for space – which leads to more sustainable housing alternatives for the mainstream.

With regards to mobility, rising resource prices started to influence people's behaviour even more directly. As the price of gas hit new peaks, some of the poorest households ended up sacrificing significant amounts of their income for their personal mobility. This drove urbanisation, which again led to people needing to use their resources for mobility less. Only the most wealthy people had the possibility to travel exceedingly as air travel was out of reach for many. Mobility in general has

decreased dramatically over the years. The painful measures provided a catalyst for rapid change.

Sustainability has become the business opportunity of the century. It breathes new life into entrepreneurship, new business models, and people experiment with various aspects of sustainable living at home which saves money in the short term and proves resilient in the long term.

As people started to get access to detailed data on their own behaviour through their smart phones in real time, and science provides increasing amounts of information regarding healthy and sustainable alternatives, people started rationalizing their diets. Instead of taste, nutrition became the key driver of day-to-day food choices.

In addition to price drivers changing the ways people behave, technological innovation has provided many sustainable choices and alternatives not available in 2012. New materials made it possible to build houses that are extremely energy efficient. Breakthroughs in technology enable retrofitting and new construction as viable ways to provide sustainable living possibilities. The post-oil era, in turn, changed cars into mobile solutions for electricity. Locally produced renewable energy is stored in idle car batteries when cars are parked In a society of Singular Super Champions sustainability is accomplished through changes in behaviour patterns and consumption practices and consumer choices along with technological innovations.

Singular Super Champions scenario narrative – how did it all happen?
» The European Green New Deal
» Transparency gets the prices right
» The upcycling economy
» Learning, not earning

These drivers are depicted as events on the timeline.

What is life like in Singular Super Champions

	What changes between 2012 and 2050?
Education	Embedded into everyday life and practices, lifelong instead of short cycles in the beginning of life. Individualized and commoditisized. Basis of welfare provision.
Work	Human resources highlight work. Talent is concentrated in global organizations. Entrepreneur vs. super talented multinationals class.
City	10-15 highly urbanized metropolises in Europe. Extremely dense. Lots of new infrastructure. New specialised areas of excellence.
Health	Preventative public healthcare. Rational diets. Self-diagnosis.
Living	Location compensates size of the flat. New materials and design. Price drives density.
Food	Price and health efficient diet. Large scale organic production.
Mobility	New rail systems within and between metropolises. Personalized rapid transport systems. Smart mobility solutions. High prices.
Consuming	Meanings and symbols get consumed more than products. Education and self-projected me. Price mechanism.
Economy	Large multinational firms. Efficiency. Competition. Eco-industrial revolution. Standardized transparent data
Sense of security	From technological progress. Transparency. Surveillance. Individual choices. Thought leaders.
Leasure time	Investing in own education and training.

The European Green New Deal

2015: EU prime ministers conclude that reforms of unprecedented scope need to be implemented in all EU countries to prevent them from falling into a permanent state of zero growth. Evidence-based policy-making gains prominence and brings politics and research closer together.

2018: People all around Europe invest in large firms that compete over hegemony in sustainable technologies.

2019: Afraid of citizens growing restless, leaders of the Communist party in China announce a new five-year plan which is about investing a great share of China's massive dollar reserves in the clean-tech sector, into which it has already poured a considerable amount of money over the past 10 years.

Transparency gets the prices right

2015: In China, there's an outbreak of problems related to climate change. Natural catastrophes, including drought, eliminate a growing share of crops, causing food prices to rise dramatically.

I just bought an app that allows me to track my consumption. My personal purchase history is my own property now!

It's so cool that the lunch cafe at our work serves food for healthy and cost-efficient diets. It's the hottest food trend around and now I don't have to visit the coolest areas in town to enjoy it. It' right here, where I work!

2020: There is pressure to revolutionise technologically and ecologically outdated production processes and eliminate expensive and harmful incentives. Economic subsidies (e.g. fuel) will be cut and ecological costs will be internalized in prices.

The upcycling economy

2015: The beginning of the financial year started with a remarkable boom in renewables in emerging markets. The vitality of renewables comes largely from a vibrant private sector.

Me and my wife are happy that our 5-year-old daughter got accepted into a specialist maths school for the very talented. This means talent hunters will notice her in no time.

"Education is everywhere in daily life. Kids can log in to any object and access the so-called 'situated education programmes' and learn flexibly all through the day."

Learning, not earning

"Would you like to learn something new" asks the new computer program I just bought. All around Europe we learn the same things from state-of-the-art software.

2016: In Denmark and Norway comprehensive educational reforms aim at improving learning capacity through moving primary education partly outside the classroom.

Diffused learning embedded in everyday products

School programs integrating in daily activities

2018: A coalition of the 5000 biggest enterprises based in the EU launches an initiative to award joint degrees. Leadership and competitiveness are nurtured through international exams and other learning events including e.g. competitions, which are seen as the best way to provide students with the skills they need.

2015

2020: People celebrate the launch of the high-speed rail network that has been expanded to cover all routes between Europe's major cities. These trains start to push airline companies out of the market.

2021: New competitiveness mechanisms are introduced in the Euro zone. Governments support R&D activities to explore ecological production methods.

2022: Desertec attracts solar companies all over the world to conquer spots in the Sahara. One of the largest firms in the sector announces that they will start providing transparent information on the production cycle, energy and natural resource consumption on all their products.

Banks start to provide new energy solutions for people to finance the energy retrofitting of their house.

2022: The majority of EU member states introduce new cross-cutting road pricing for all roads due to the need to compensate for losses in fuel tax revenues that are attributed to increased vehicle energy efficiency and a shift to electric cars. As a result, people start to prefer short commuting distances, service-rich neighborhoods and good location over large living space.

2024: Possessing half of world's phosphorus reserves, Morocco starts to regulate sales of this "new gold". This in turn leads to unforeseen hike in fertilizer prices. Decreased use eventually starts to affect annual crop yields.

2025: The biggest companies in food, construction, ICT, manufacturing and car industries agree on transparency standards on data concerning the energy and natural resource consumption of their production processes. The EU countries, China and USA soon adopt these standards as basis for legislation, which means that practically all production and services have to meet similar transparency standards.

Some of my employees have to spend 40% on travel as long distance commuting and rising gas prices have really hit their budgets. Most of them have already made the move to public transport and many are considering moving closer to our office.

2023: Global digital integration brings product cycles and systems closer together, enabling new innovations to be introduced easily across the globe. This applies to households, too, as specific technological monitoring programmes support individuals in reducing food waste to practically zero.

My cousin Michael bought a farm last week. The global rise of food prices is turning people towards agricultural careers.

Through transparent information and increased education, I'm very knowledgeable about what is healthy to eat, how much exercise is needed and what are the symptoms of different diseases. Healthcare is more preventative.

"Former online games like Biodiv Battle or SimSust turned out to be popular sustainability games that spread eco-consciousness better than any campaign ever did."

Assisted family learning processes

Educative simulation games

2024: Plans to shift the emphasis of welfare programmes gradually towards supporting young people and education passes at an EU summit. On the basis of good examples from Denmark, it is also agreed that basic education should be reformed to include more training on skills for life, e.g. adopting healthy lifestyles.

2020

2025

The European Green New Deal

2025: A new smart grid solution is announced that connects the UK, Germany and France's energy consumption. The amount of energy used in households drops significantly.

One of the suburbs in Bilbao was rebuilt with the newest state-of-the-art energy efficient materials. A friend of mine just moved there. It is attracting people who previously could not have imagined living in such a location.

2028: China, USA and the EU make massive investments in clean-tech that together with drastic price hikes in scarce natural resources bring the prices of ecologically sustainable goods below the prices of their unsustainable, resource-intensive rivals across all sectors. These three global powers drive sustainable industry.

Transparency gets the prices right

2026: Flying changes dramatically as the major airlines agree on minimum service efficiency standards. Planes can now only fly with over 90% passenger capacity; otherwise they must re-schedule or postpone take-off – unless someone is willing to pay full-price for the vacant seats.

I eat only food that's hyper-efficient in terms of nutrition levels. Cabbages, lentils and berries are key elements in my diet. It just makes sense!

2028: With the help of transparent product data people learn to understand how individual consumer choices in food, housing, mobility build their overall lifestyle.

When I flew to Berlin last month, I had to wait 11 hours until the flight was fully occupied. Regardless, it cost me a months's salary, as aviation taxation is steeper than ever.

The upcycling economy

2025: Thanks to major leaps in technology, the first cost-effective large-scale upcycling processes are launched in the European markets. New enterprises start to develop around the provision and distribution of resources. They lease products in order to make sure that they retain ownership of resources used in production. Cradle-to-cradle is the fastest growing business and area of research.

2030: Most of the major economic papers acknowledge that cradle-to-cradle is the most efficient production method regardless of production sector or materials required. It quickly reaches all parts of production systems. As a significant proportion of usable resources is owned by users, they also become part of these networks.

Learning, not earning
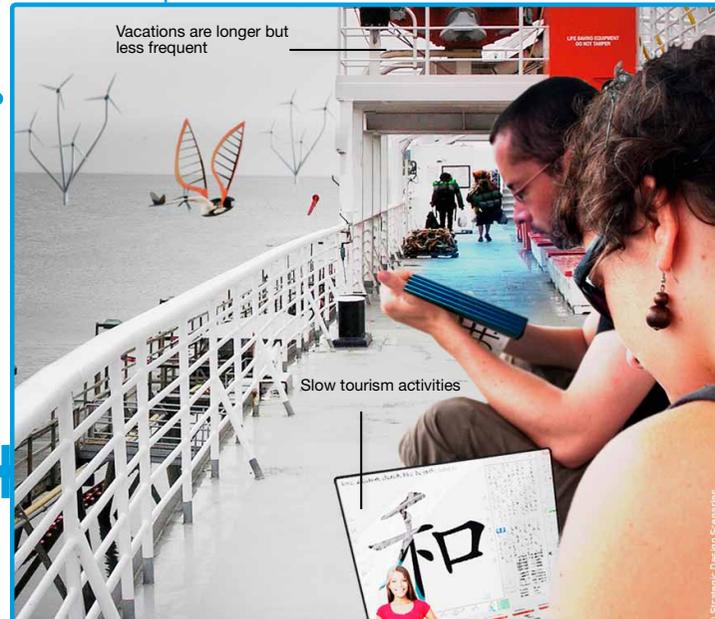
Vacations are longer but less frequent

Slow tourism activities

"…We have carefully prepared a sustainable trip to China. We are going by boat and are starting to learn the language so that we can communicate with the people who will host us there."

2030: Thanks to informatics apps, educational software and online learning networks, people are empowered to make excellent rational choices and their desire for material goods declines. material goods decline.

2025

2030

"I am sure that from clothing care to food preparation everything is done in our family in the most sustainable way. Our home uses its sensors to control everything so it is energy efficient."
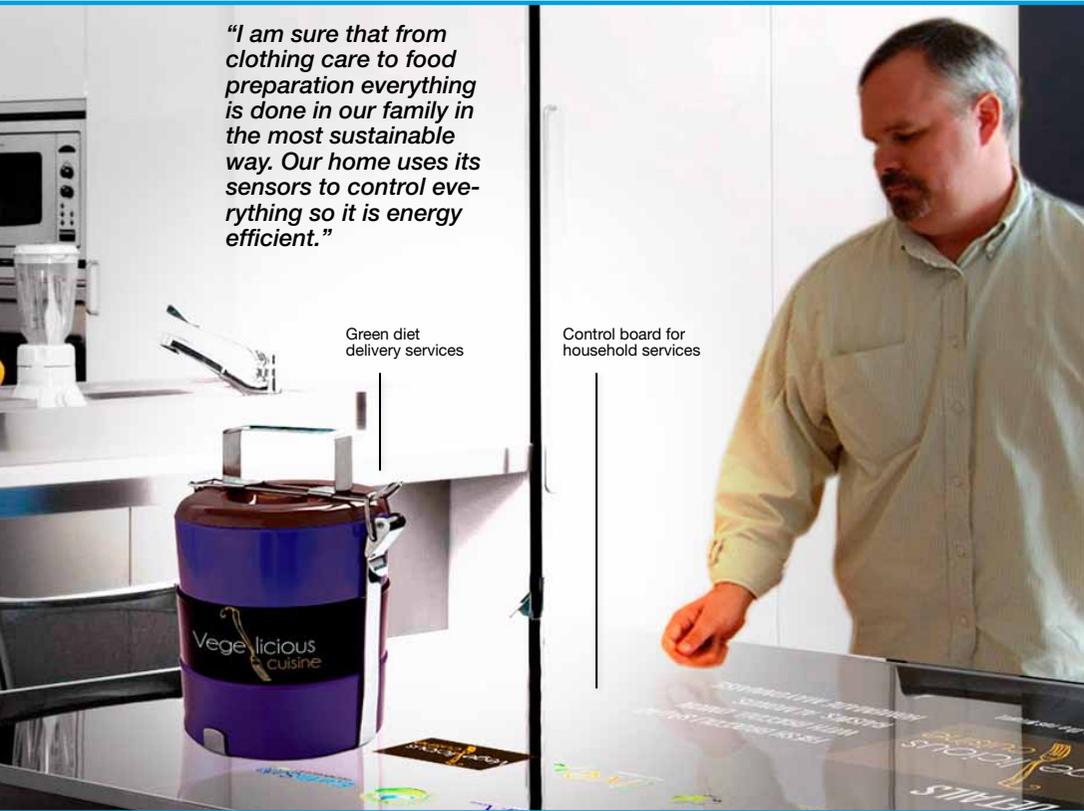
Green diet delivery services

Control board for household services

2035: New concentrations of R&D and production clusters based around large firms, and closely linked to one another, emerge around Europe. One of the best examples of these new clusters is located in Portugal.

We lived in the suburbs when I was a child and drove everywhere. I can't imagine living so far away and having so much space at home now. My parents sold their house seven years ago and now live two blocks from us in a nice one living room apartment.

Intelligent and smart packaging of food for transparency, awareness and less waste.
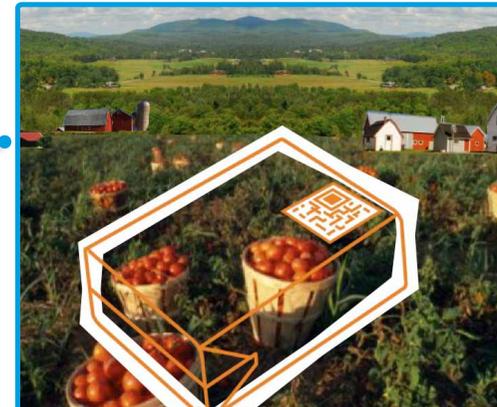
A new waste mine opened nearby. They collect waste from old landfills and provide job opportunities for the locals.

2034: Austrian children with the most potential to become members of the future champions are identified at an early age and hand-picked for future training, i.e. their skills are improved in learning studios and top schools.

☺ *There's a dental club for those who want to learn and take care of their teeth In my apartment building. I go there every month to learn self-dentistry.*

2037: There's a re-allocation of non-productive leisure time into an opportunity to learn, including subconscious learning (e.g. computer games that are linked with the city environment). Schools that hone skills are established, nourishing and nurturing individual skills.

I'm so proud of my daughter. She's so curious about her environment and enjoys the possibilities of the embedded education everywhere. To be honest, I enjoy it personally as well. I learn new things every day!

2035

The European Green New Deal

2040: Due to a shift in tax regulation, information transparency and public pressure, most of the businesses have turned into social enterprises, which are beneficial to the environment and society.

Personal rapid transit rails have revolutionised the way we travel here in Ulm. There is a two minute walk to the stop where the pre-routed cart awaits me. I can reach the railway station in six minutes. We just got rid of the family car and our lives are now much easier.

Copenhagen – Barcelona, 4,5 hours! reads an advertisement for high-speed trainline that just opened in May.

Transparency gets the prices right

2039: All around Europe, technological breakthroughs allow information to circulate without barriers. The development of stocks of natural resources can be tracked in real time by everyone. Resource prices increase hand in hand with decreasing stocks, further encouraging the smart use of resources. Thanks to the transparent information, speculation on natural resources in the finance sector decreases.

"My aluminium usage is taxed!" cries out a woman in Denmark as the country prepares for taxation based on natural resource usage. A group of people gets marginalised from society as they fail to adapt to changing consumption patterns.

Personal water accounts make sure that the water I use for showering always stays at around 38 degrees.

The upcycling economy

2039: Production businesses are competing over rights to exploit waste concentrations, e.g. that of the Pacific Ocean. Large production entities enjoy economies of scale and possess resources extensive enough to lead large waste mining processes.

2043: A handful of large firms dominate cradle-to-cradle business. These super-firms drive sustainable development.

The No-Waste World Cup contest has been one of the most popular leisure time activities in recent years.

Learning, not earning
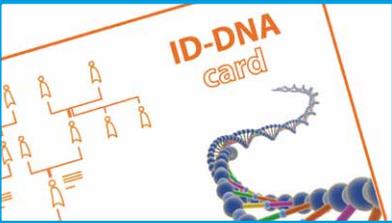
ID-DNA Cards personalise medicine for individuals. Everybody has a card that contains their genetic map, biological data, as well as information about their diet and habits, in order to provide all information necessary for doctors and other caregivers to provide personalised healing solutions.

2042: According to the Euro Facts Survey, time spent doing physical exercise among young people and young adults is soaring. Thanks to education reform and its new focus on health promotion, there are very few young people smoking and overall, the health differences between different social groups have diminished.

I want to spend my leisure time doing something productive. I go to schools for everyone to hone my skills.

2040

Global energy
consumption target
fixed by user

SUBSCRIBE NOW AND GET YOUR
ENERGY BUDGET CARD

ENERGY BUDGET CARD

SIGN UP AND START REDUCING
YOUR ECOLOGICAL FOOTPRINT!

"…In order to live ecologically and economically, I have chosen the 'energy budget card' of master Shashang Shrinivadu. I will follow his training so that my ecological footprint becomes as light as his, and I will save money while doing so."

2049: A global research and knowledge bank creates standards for all national and local level political decision-making. It guarantees a scientific basis for all government action, and can be used to veto any decision that is economically, ecologically or socially irresponsible.

I returned my old shoes to the shoe store and got my store credit returned by doing so. I can now get brand new shoes and I know that it's great for the environment as well!

2047: Access to waste becomes one of the key determinants of success for companies. The most valuable resources extracted from waste, e.g. rare earth metals, are among the items that circulate globally.

My hometown is rather segregated nowadays as Super Champion groups form their own suburbs. They don't have more material wealth than others as they're more aware of sustainability. Instead, they have more political and economic power and better education.

2050: Over 2/3 of the population in European countries spend at least 10 hours a week of their free time in learning institutions in order to network with their field's sustainability elite.

2045

2050

Gatekeepers for lifestyle changes

Manufacturing and retail companies
…provide transparent lifecycle data on their products.

New digital service providers
…help consumers to translate open lifecycle and footprint data into smart consumer choices.

Super Champion lead user group
…change the status system behind consumer culture and spread best practices on sustainable lifestyles.
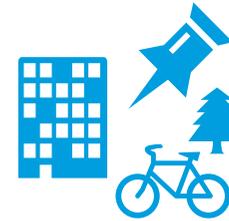
Urban planners
…create urban environments that attract people and enable dense, sustainable living.

Dietary experts
…provide detailed information on nutrition, resource and cost-effective diets.

Six-pack of most influential lifestyle triggers

1. Transparent product data allows people to understand the environmental cost of their personal consumer choices and their overall lifestyle. Comparing the sustainability of choices of food, housing, mobility and consumer goods in 2050 is as easy as comparing prices was in 2012.

2. Road pricing and the overall rise of transportation costs change housing preferences. People prefer short commuting distances, well-serviced neighbourhoods and a better access to spaciousness.

3. Improved design of public spaces and flats draws people to densely populated areas. In all countries, areas around city centres turn into the most desirable places to live. People are willing to trade off a spacious dwelling for the status and comfort provided by a flat in a central location.

4. New dietary alternatives emerge from a combination of rising food prices and increased health consciousness. Media, primary education and catering companies help environmentally rational diets become a mainstream lifestyle option.

5. Apps for personal informatics, educational software, online learning networks and a diversified educational services sector become attractive and influence people's spending. As a result, there is less desire for material goods, as more people have excellent skills in making rational choices.

6. New upcycling approaches to consumer goods have changed product lifecycles. All material goods are sold with an additional deposit on their material resources, which encourages people to return used materials to the retailer.

Others 900 kg
Leisure time 1500 kg
Product consumption 2600 kg
Food 7300 kg
Housing: building 2400 kg
Housing: electricity 3300 kg
Mobility (daily and tourism) 11 000 kg

Leisure time 300 kg
Others 300 kg
Product consumption 500 kg
Food 2500 kg
Mobility (daily and tourism) 2800 kg
Housing: building 1300 kg
Housing: electricity 300 kg
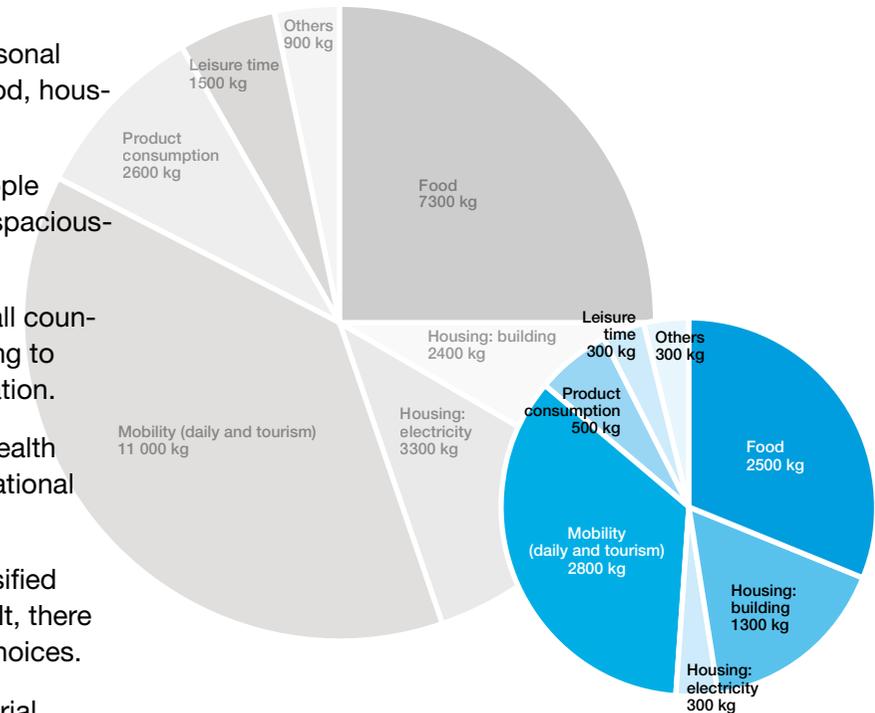
The average material footprint of a European in 2050 in the Singular Super Champions scenario (8000 kg per person in a year) compared to the average material footprint in 2007 (29 000 kg).

Critical challenges and solutions in
the scenario Singular Super Champions

Q1. How to do away with unsustainable status symbols?

1.   A price mechanism includes and quantifies everything: resource use, pollution, health, biodiversity, etc. It is a top motivator of behaviour and influences lifestyles.

2.   Low-cost, low-impact options in terms of both environment and health have become the social norm in food and leisure activities. Healthy mobility patterns are a major part of daily exercise. Improved infrastructure, good availability and competitive prices have made it easy for people to choose healthy options.

Q2. How to manage increased urban concentration while decreasing resource use?

1.   EU-wide policy incentives and rising energy prices have made zero energy building the norm. People are persuaded to retrofit their homes with tax incentives and proliferation of Do-it-Yourself retrofit kits.

2.   Buildings and infrastructure which are not used any more (due to increased energy and mobility costs) are upcycled into new, highly efficient and dense urban centres. People are therefore incentivised to recycle all the material from structures they deconstruct while refurbishing their homes.

3.   Progressive property taxes and subsidies for construction of small flats provide incentives for people to reduce their domestic space. This leads to increased leisure activity outside the home.

4.   The shift in innovation and urban infrastructure policy from car traffic to smart mobility including PRT systems. These new mobility options are by far the most convenient ones in dense urban areas with high lifestyle status.

5.   Prices reduce both long- and short-distance travelling.

Q3. How to manage the consumption of resources in terms of power production and ICT production?

1.   Due to adoption of tax incentives, all the appliances and construction material products available in the markets are highly energy and resource efficient. As a result, people have increased the energy and resource efficiency of their homes, applications and mobility patterns.

2.   Highly resource-efficient wind and solar power production dominates energy production as the old energy modes have disappeared due to heavy taxation and phasing out of subsidies.

3.   Innovation policy accelerates the use of abundant instead of scarce materials for ICT in combination with sophisticated recycling. Pricing motivates people to adopt new innovative solutions.

4.   Extremely efficient ICT solutions (sensors, centralized computing, cloud farms) have enabled people to realise personal optimisation. Optimisation of consumption levels is also a source of social and professional reward.

Governing
the Commons

Pandemic technology

Singular Super Champions

Governing the Commons

Meritocracy

Human-centrism

Local Loops

Empathetic Communities

Endemic technology
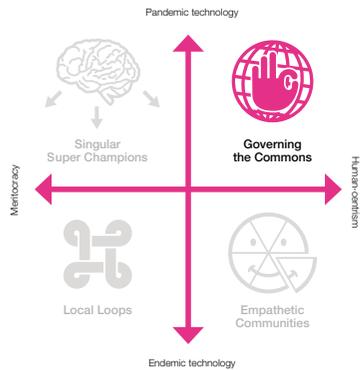
Governing the Commons

Alternative Sustainable Society 2: Supporting 8 000 kg Sustainable Lifestyles

Governing the Commons is a scenario mostly in digital reality that helps people to break free from many cultural constraints and, eventually, to reach sustainability. Ubiquitous computing enables the smart use of resources and, at the same time, redirects people's behaviour and focus of attention from material consumption and their physical surroundings to interaction in the digital realm. People abandon many institutions of the 20th century, liberate themselves in order to lead more meaningful lives and engage in new forms of collaboration.

You can manufacture products based on your very own design at the nearest corner shop! The rise of 3D printers made it possible for the first time for people to control their own production and consumption. In 2015, 3D technology was seen as something of a niche, but from the early 2030s it has altered lifestyles, and many businesses permanently. The drivers of mass consumption in the latter half of the 20th century are replaced by a culture of "self-creation" assisted by 3D printers and other similar tools. It offers endless possibilities to mould and re-create one's identity. People grow more aware of what is their own, either purchasing carefully selected items they like or constantly molding the same material into new versions of goods. New forms of do-it-yourself manufacturing would not be possible without the rich presence of the digital space.

The entire built environment can be seen through two separate layers, a digital and an actual, physical one. Billions of microchips embedded in machines, walls and pavement bring a new type of data to users and create new opportunities to live smart, sustainable lifestyles through powerful feedback mechanisms. Social networks continue to gain power and very soon traditional institutions that are outside of meaningful networks nearly vanish from sight for many people.

In the world of Governing the Commons, people have found new relationships with their peers both in virtual and material reality. This offers immense opportunities for different types of meaningful interaction, both economic and non-economic alike. People start to look for more

meaning in jobs and life in general. Learning new skills is easy with all of the information, digitally assisted training tools and peer support. This gives rise to a new kind of entrepreneurship in which the next generation starts to redefine their expertise and source of motivation.

Multi-professional self-employment has replaced a steady income and employment in a company or public institution: The peer-to-peer (P2P) service economy has replaced big corporations and their offerings. New models of work and welfare have been formed.

Once people started seeing the collective potential of the new combination of highly skilled self-starters with digital communication, new political movements started to gain power. Networks of people with enthusiasm towards a shared issue gathered their skills and resources and directed their efforts to experimenting with new solutions, instead of just campaigning for change through political structures.

Experimenting with the help of thousands of volunteers turned out to have persuasive power in the field of politics. Therefore, "interest networks", combining policy with doing things gradually, replaced traditional parties as powerhouses of representative democracy. As a result of this new collaboration and tools, many parts of the political agenda are totally reformed and political participation is brought back into peoples' daily lives. This type of "wikidemocracy" has revived trust in politics and its capability of changing society towards positive social change.

How are sustainable lifestyles achieved?

The transition to people-power through different networks, models of wikidemocracy and ubiquitous technology are becoming part of everyday life, altering behaviour towards more sustainable lifestyles in the 21st century.

The impacts of ubiquitous technology continue to shape people's day-to-day practices even more strongly than many thought in the early 2000s. Different applications and personal services influence lifestyle decisions, consumer choices and motivate behaviour change that supports the 8 000 kg goals. Take mobility for instance – once personalized digital services are in place, co-using of cars and public transit starts to work, based on what is most practical for its users.

Energy efficient housing became the norm in the early 2020s as a new way to collect and mine data. Open energy consumption data gave a big boost to retrofit markets. Companies could easily identify inhabitants with significant potential for efficiency gains and savings. Homes turned into smart systems with easy to use gadgets to control energy consumption from lighting, heating, use of appliances and even the contents of the fridge. Ubiquitous technology started providing instant feedback loops that helped to change behavioural choices towards ones that support 8 000 kg sustainable lifestyles.

As the virtual environment is more and more prominent, physical consumption decreases sig-

nificantly. Urban space is freed out of old unused offices and remote work becomes a mainstream alternative. Infrastructure becomes a closed loop system combined with services taken over by the virtual world. Augmented reality services, along with 3D printers, make consumption more sustainable through the personalisation and digitalisation of lifestyles.

Governing the Commons scenario narrative – how did it all happen?
» The 3rd industrial revolution
» Ubitech economy
» Better work creates well-being
» Wikidemocracy

These drivers are depicted as events on the timeline.

What is life like in Governing the Commons?

	What changes between 2012 and 2050?
Education	The main focus of education is on Peer-to-Peer skills sharing. Learning by doing is emphasized, in iterative ways. Pandemic technology enables instant feedback loops, which accelerate sharing of knowledge. Focus on informal education where classrooms don't exist.
Work	People's sources of income have fragmented. Comprehensive use of skills are valued. Everyone has something to offer to society. Key words describing work include micro-tasks, crowdsourcing and being useful to one's peers.
City	Cities are based on already existing infrastructure. Office and school buildings have been converted into flats and public spaces. Urban experiences are enriched by augmented reality. People find personalized solutions to fulfil their needs and aspirations on both the physical and virtual layers.
Health	Peer-to-Peer network support is characteristic of both preventative and reactive health care. Public funding is provided for healthcare cooperatives. A wide variety of healthy lifestyles have become routinized. Digital feedback tools are used by everyone.
Living	People live in small flats and work in new office lofts. The digital layer is key to provide people with quality in their lives. Smart homes, austere furniture and digital services characterize domesticity.
Food	Food production and distribution are managed by global food systems and smart food storage mechanisms are in place. A multitude of diets are offered and energy intake is reduced. Vegetable choices and synthetic meats form differentiations in diets.
Mobility	Mobility is greatly reduced by the use of digital tools. Commuting is minimized and the construction of new traffic infrastructure has become unnecessary. Smart public transit and car and ride sharing are the main forms of transport.
Consuming	3D-printing personalizes consumption. Material consumption is reduced by using modular appliances, which enable do-it-yourself (DIY) repair and upgrade of products. High degrees of appliance personalization, virtual consumption and recyclable generic materials form new design and producer cultures, helping to reduce the overall number of appliances.
Economy	Micro-tasks characterize economic organization. New businesses are created in and by data-rich environments. Open source, open data and free distribution of information drive new innovation. Personal optimization, DIY, peer services and manufacturing are drivers of the new economy.
Sense of security	Sense of security is heightened by membership in Peer-to-Peer communities. Democratized data empowers people. Easy access to services, products and global knowledge-bases promote equality. Personalized appliances and direct participation increase a sense of belonging and security.
Leisure time	Leisure time is formed around a multitude of digital interactions. Home consumption, high quality household capabilities and digital crowd experiences are the main ways of spending free time.

The 3rd industrial revolution

2015: The first 3D printers for the mass market arrive. At first, consumers have to buy specifically packed materials for the printers to work. They are inspired by work at MIT's Fab Labs. Soon consumers start to come up with their own solutions.

2017: The Christmas markets see a flurry of excitement over 3D printing.

2018: Customised 3D printers that can use recycled materials start to dominate the markets and more traditional companies struggle to compete with goods produced at home.

My son never buys anything that is mass-produced. He wants to customise it all by himself. I think all of his clothes are custom made.

Ubitech economy

2014: Social media dominates global narratives. Peer-produced content starts to emerge in the global media. The events of the 2011 Arab Spring highlight the growing importance of accessible global information networks. People get increasingly acclimated to the idea of existing online and building their personal identity through virtual means. Media moderated reality hits new heights as the internet starts to define everyday life and connect communities worldwide, producing more interest-based social groups that only ever connect in the virtual realm.

2017: The use of mesh networks (community data systems) is spreading to recycling and green "interest groups". Initially these sub-networks were developed in Living Labs and were used by the anti-corporate activists of the 2010s economic downturn.

2018: Thanks to crowd-sourcing, we know that the economic impact of nearly everything: Ecopidia is created. Eventually this transforms into GEKS, the Global Exchange and Knowledge System, a tool that connects information and helps support sustainability worldwide.

"I found your flat to be very inefficient in energy use," states an energy repair service that has monitored my apartment.

Better work creates well-being

2015: The crises that started in 2008 eventually changes production structures and people's working patterns, especially in many European countries. Fewer and fewer people work permanently for one company. Diversification in work patterns increases.

2016: Companies promoting sustainability begin to dominate the markets: Several technology companies introduce Green Earth policies and sustainability indexes, as they are seen as as the only way to gaina a position as market leader.

2017: A Europe-wide study reveals that sustainability and ethics are the main motivational drivers for workers.

2019: Companies have embraced sustainable practices in order to increase employee motivation. Step by step this leads to a behaviour change in peoples' lives as well. Work and home behaviours start to overlap with each other.

Wikidemocracy

2013: Boycotts of politics taking worldwide help tackle climate change. Global treaties are out of reach, which drives people to express their frustration with governments' and corporations' inability to genuinely intervene in the increasingly apparent effects of climate change and rising resource prices.

2015: A global network of energy-conscious consumers starts openly using electric cars, smart consumption solutions and to monitor their personal everyday climate impact.These early adopters help create growing platforms for emerging technologies and momentum for supportive policies.

2019: Earth treaty by UN: national democracy has to respect the limits of the earth.

When I look outside the window, I can enjoy green walls blooming with flowers, the pump cleaning the water, the solar panels slowly turning to the sun.

I can use the highly efficient urban mobility system to buy groceries and have them delivered straight to my home.

2015

Augmented reality glasses

Multi-players open-air games

"My kids say there are enough exciting things to discover in digital schools, virtual tourism services and augmented reality games. You don't need to travel to have new experiences as I once did."

2019: Thanks to GEKS, diverse data regarding peoples' homes is gathered. Based on this data, inhabitants receive feedback which encourages home repaires that help to maximize energy efficiency.

2024: Consumer brands that have not yet started to operate sustainably start to overproduce. This cycle dramatically decreases the quality of the products and more people turn towards self-customization.

2024: City 3.0 and the "internet of things": sending information to apartment block-based 3D printers in order to create any objects e.g. computers. Reproduction starts at city level, which defines the structure of the physical space.

2020: The biggest company online launches its "smart life" and "smart cities" services offering several programmes that help make smart choices regarding things like healthy and resource efficient food, identifying the most sustainable mobility choices, setting the optimal temperature and lighting levels in your home or deciding when to retrofit your house or call someone to repair your inefficient fridge.

A friend of mine came to take a look at my apartment with his heat camera. She checked my energy consumption and I ordered energy retrofitting from her on the spot!

2020: Companies redesign their human resources strategies as an increasing number of talented individuals start looking for entrepreneurial opportunities.

I'm a part of a No-Impact Group that was formed 5 years ago. It really showed people that it is possible to live within planetary limits.

2023: Augmented-reality services become available in 300 European cities. These services alter world-views and lifestyles significantly as the need to travel and construct decreases.

2025: Based on the citizens' acts of the early 2020s, all EU countries reform their taxation to include environmental impacts in prices.

2021: A network of energy conscious consumers who have openly published their climate impact information, propose as a citizens' act to scale up their behaviour. Hackathon events power similar citizen initiatives across all EU countries. The goal is to reform taxation so that it supports sustainable consumer choices.

Every village and suburb has a remote co-working space that allows people to get together, share thoughts and reduce the need to commute. Every municipality sets up these spaces for people to work or even to get new jobs, based on earlier shared brainstorming session and cooperation.

2025: People across different networks find a wide range of means to secure an income by doing different kinds of microwork.

2020

2025

The 3rd industrial revolution

2026: Due to the 3D-printing market, the Nasdaq succeeds the Dow Jones as the globally relevant market index.

The Wise Personal Food Shopper -application analyses user's genetic data and proposes healthy diets.

2029: 80% of Estonian citizens own a personal appliance that optimizes their mobility, diets and electricity consumption through constant recognition and feedback of their consumer choices. These personal appliances, for example, help people to optimise public transportation use and enable different types of vehicle and ride sharing schemes.

To be honest, I haven't seen a new building constructed in my town in the past five years. Instead, all of the office buildings have been retrofitted for residential use.

2031: Smart technologies and augment services have produced a new business doubles its size each year for the next tl According to studies this sector employ people Europe-wide.

Ubitech economy

I only buy books with virtual money. It makes no sense for me to use "real" currencies anymore to buy books.

2027: A car sharing company that uses an "access" business model rivals traditional market leaders in mobility and acquires one of the traditional car companies.

"You should meet up on Wednesday instead of Tuesday as there's very little difference in your preferences, but a huge gap in efficiency in regard to mobility, for instance." says my phone when I set up a meeting with my friend.

Better work creates well-being

2026: A new company that facilitates different microwork opportunities, is among the biggest companies in Europe.

2027: Recognition is given to people in ways that do not make narrow assumptions about individual's work.

There's a high efficiency inter-modality system that lets me travel by bike, train and shared car – all within the same network.

Wikidemocracy

2026: User group oriented hospitals emerge and people who share similar genetic risk profiles for certain diseases help provide best possible care, knowledge and reaction time for its customers.

2027: The example of peer power that produced the famous citizen movement for sustainability in the early 2020s, inspires many more of these citizens' acts. Large numbers of people draft citizen movements that are based on noted best practices – these movements soon start to shape mainstream lifestyles.

2030: Universal translator apps make it possible for communities worldwide to communicate with everyone everywhere.

"I often log on to these participative governance programs in order to meet people with whom I share common

Deliberative processes on local governance

2030

"When I finish picking up and customising items from virtual catalogues, I can just go downstairs and pick them up from the 3D printer space."

3D printing and self-prototyping facilities.

I don't even have to use repair services as I can just upgrade my modular appliance by printing off a new part for it.

-reality
s sector that
ree years.
s eight million

2032: Copyright is found to be redundant, as the best method to map solutions is to crowdsource inputs to problems from relevant online communities. An explosion of immaterial creativity follows.

"I spend most of my time very efficiently. Even when travelling, I'm completing a multitude of different microtasks."

2036: People move beyond the division between real-life and virtual identities; whatever happens in one automatically follows into the other as well. People -not corporations- are in charge of the networks.

My friend who's been partially disabled for the past 10 years is an active participant in society, as digital tools have empowered him to access information and services as efficiently as anyone could imagine.

2033: Value is crowdsourced through every piece of meaningful or meaningless action. It is gathered through different sensors and now exceeds the amount of time people spend explicitly working. The virtual environment has made it possible for neighbours not to compete within the material realm, which leads to, incredible amounts of new online content creation.

This old office building is renovated and will become a highly energy efficient home for many families. These are among the most wanted homes available!

A new book comes out describing how the last of the political parties is still hanging on in there. I find these parties to be a remnant of past. Now political decisions start from, and are intimately linked to, everyday practices.

interests. We regularly propose initiatives that later become the basis of new policies."

Local citizenship networks

2033: User group oriented hospitals initiate a citizens' act to allocate most available healthcare funds to supporting these hospitals specifically.

2034: The climate change denial of the 21st century is viewed as something comparable to the witch hunts of the 17th century.

2035

The 3rd industrial revolution

2040: Different interest groups provide blueprints for individuals to gather resources and "print" their own items, although in highly customised ways. Most corporations have been succeeded by such interest groups.

Ubitech economy

2042: A global act for self-surveillance takes place, initiated by many of the peer-to-peer networks. Every digital item connected to the global network operates within sustainable parameters. Exceeding these parameters is only possible outside the digital realm (which for the majority of the people is impossible).

Better work creates well-being

Sensors and feedback systems

Situated advise on energy consumption

"Our Active House is constantly optimising the way we live, from suggesting green cooking recipes and automatically preventing food waste to implementing Energy Watcher dieting programs for the family."

2045: Newly set standards are formed for digital networks to serve as a platform for providing manufacturing blueprints. The internet is one of these ad-hoc networks of knowledge exchange.

I monitor my health constantly through these sensors that are installed in my arm. It's a relief. Whatever happens, my hospital is aware of my condition and I save a lot of money, energy and effort since I don't have to do the evaluations myself. I can trust my doctors to do them – no more futile visits to the hospital!

Wikidemocracy

2040: Sustainability is not even talked about anymore as by 2034 global knowledge of what can and cannot be done within the boundaries of one Earth became apparent to everyone. What were seen as sustainable lifestyles in 2012 are simply rational choices in 2040.

2044: Citizen movements replace traditional political mechanisms in decision-making. Peer-to-peer power forms the basis of "wikidemocracy."

I am a member of a health centre with my peers. This specific centre is optimised for people who have the same genetic risk profiles as I do.

2040

2045

My wife and I have some old cooking books that we use for home decoration as we have no other practical use for them. It amuses us that so much emphasis was once placed on the preparation of food. Instead, we just use our 3D printers to print synthetic food that has very high nutrition value.

2049: Consumers recycle everything in their "printers." The only traditional factory left in Europe produces apartment block-scale 3D printers.

Online task offers

Working agenda composed everyday.

Organic Growers of Brussels

I design my home's new interior by putting my old chair into my printer so that I can get a new one as a result.

The Domestic Feedback Service allows seniors in households to use user friendly smart home solutions to control and educate their families on sustainable living.

"My father studied bio-engineering and organic farming and now he is a cook. Every morning he looks for micro-job offers he can respond to, from coaching young farmers to doing sustainable assessments of the food chain. And he loves it!"

2046: The value of life comes from networks. To exist is to be part of a specific network. People build their reputations virtually and those with a good reputation can join networks more easily than others. While the rules and guidelines of different communities differ, interacting in the virtual realm is one of the basic forms of human behaviour.

2050

Gatekeepers for lifestyle changes

Consumer networks

…first organise into decision makers that affect local and global policies.

Agile marketing agencies

…make use of the peer information available in purchasing decisions.

Construction companies

…start selling small scale energy retrofitting services to homeowners
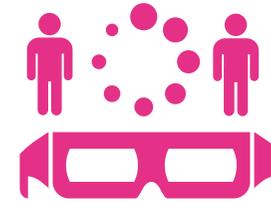
Gaming industry

…grows in significance and turns into a giant crowdsourcing mechanism that combines playing and work.
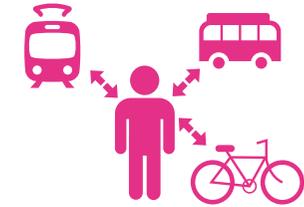
Smart mobility companies

…come up with personalized solutions that let people optimize their mobility based on their needs.

Six-pack of most influential lifestyle triggers

1. All appliances and buildings are equipped with the technology to advise their users on smart use and maintenance requirements. Smart, energy efficient use is the default option. With the help of diverse and plentiful data about their own and their peers' homes, people receive feedback that encourages them to repair their homes so they reach maximum energy efficiency.

2. Smart mobility services change the way people plan their time, and how they combine routes and modes of transport. These services help to optimize public transportation use and enable the development of vehicle and ride sharing schemes.

3. Ubiquitous technologies give rise to a new ecosystem of Peer-to-Peer—services that are available for people whenever they need or want them. These services with retrofitting homes or choosing sustainable dietary options, among other things.

4. A new generation of virtual reality and online communities becomes popular, which means a decrease in needs for large living spaces, furniture and even foodstuffs.

5. The scale up of 3D-printing changes the way people seek self-actualisation. Consuming goods designed and made by someone else is no longer the most elaborate way to express one's identity and style. Instead, people collectively design the goods they desire and want to be identified with.

6. Online networks built on a shared interest in lifestyle issues enable people to realise their potential and to constitute themselves as groups with political power. The example and support of other network members encourages experimentation with new sustainable lifestyle patterns. Gradually these networks and experiments grow into movements that start reforming the political agenda.

Others 900 kg
Leisure time 1500 kg
Product consumption 2600 kg
Food 7300 kg
Housing: building 2400 kg
Housing: electricity 3300 kg
Mobility (daily and tourism) 11 000 kg

Others 200 kg
Leisure time 400 kg
Product consumption 500 kg
Food 2500 kg
Housing: building 1400 kg
Housing: electricity 300 kg
Mobility (daily and tourism) 2700 kg
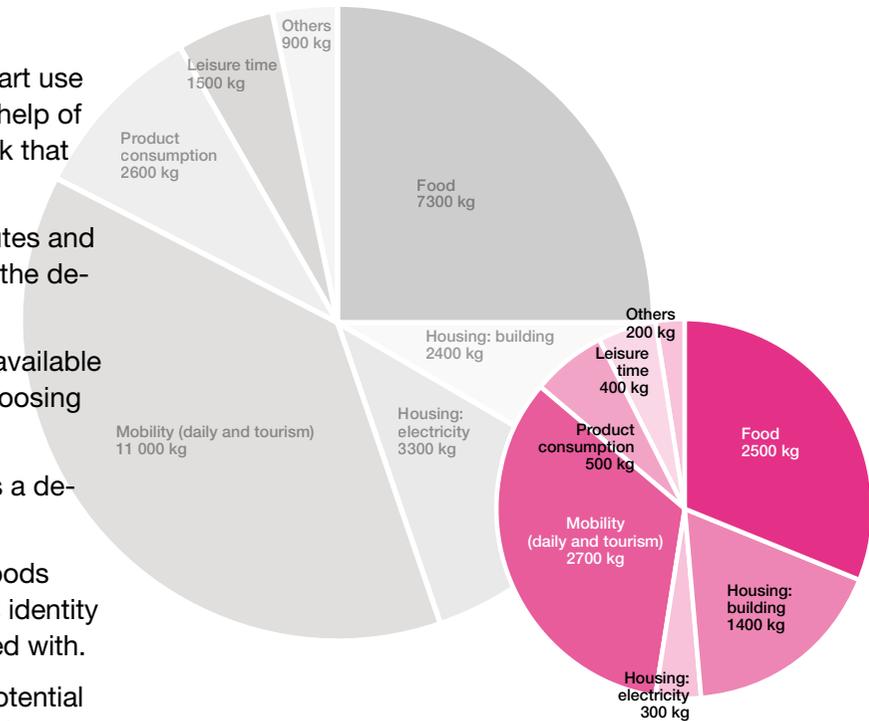
The average material footprint of a European in 2050 in the Governing the Commons scenario (8000 kg per person in a year) compared to the average material footprint in 2007 (29 000 kg).

Critical challenges and solutions in the scenario Governing the Commons

Q1. How to minimize the consumption of resources in terms of power production and ICT production?

1. Energy is produced from diverse renewable sources and distributed with the help of a Europe-wide super grid.

2. Fossil fuels phased out following a global treaty. Lots of players in energy markets harnessing various sources.

3. Virtual services, entertainment and communities are so attractive that it has reduced the need for space in homes. Ubiquitous technologies have enabled growth of services that increase smart and efficient use of homes.

4. People use less ICT appliances, because there is only need for one device you always carry. Modular appliances and centralized cloud farms with optimal location ensure long life-cycle for appliances, as well as efficient resource use.

Q2. How to limit mobility and the environmental impacts of information technology in a ubiquitous society?

1. Virtual consumption, personal optimization and direct behavioural feedback reduce commuting and travel needs. Meeting virtually is cheaper, smarter and cooler.

2. Although people don't feel there is much need for travelling any more, smart and flexible public transport, car-sharing and slow air travel (e.g. solar Zeppelines) are in use to some extent.

3. Cities are dense. There are few new buildings and retrofitted flats. The basic infrastructure of the 2010's remains.

4. Changing production and employment patterns make a large part of office building stock redundant in their previous use. This has enabled smart urban growth: affordable new homes in central locations.

Q3. How to make sure that decentralized production of items promotes sustainability?

1. Although 3D component printing and 3D shopping culture have become popular, virtual consumption ensures that people own only a small amount of tailored personal goods. These are mainly made out of recycled materials in order to comply with the global treaty on resource efficiency.

Local Loops

Pandemic technology

Singular Super Champions — Governing the Commons

Meritocracy — Human-centrism

Local Loops — Empathetic Communities

Endemic technology
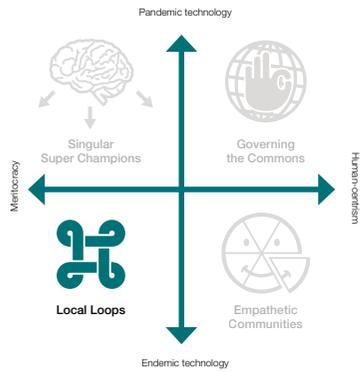
Local Loops

Alternative Sustainable Society 3: Supporting 8 000 kg Sustainable Lifestyles

Local Loops is a scenario in which a radical energy crisis forces societies to re-evaluate fundamentally the foundations of their well-being. Energy and resource systems are increasingly seen though "Local Loops", which is a technical concept that can be applied in the context of local and regional production cycles. People build their lifestyle and ways of belonging around their work, while technology is better adapted through local design solutions, which create room for new kinds of professionalism. A new ethos of craftsmanship and professional communities shape the way people live, organize their work and spend their leisure time.

The dramatic rise of resource prices and the scarcity of oil finally arrives in late 2010s, though it comes as a great surprise to many. Several companies, politicians and citizens were ill-prepared for an era of radical rise of resource prices and oil scarcity. The rise of logistics costs meant a shift towards local production. This makes people view local resources, like soil, in a new light.

As a reaction to the new era of growing resource prices in the 2020s, there was a citizen uprising, which forced several European states and the EU to launch new programmes to re-define policy structures to support the resource constrained reality. The new programmes were based on an idea of "local resource loops", referring to local regions that are self-sufficient in key resources. These programmes found inspiration in transition town and eco-village experiments that had been growing steadily in the previous decades. This does not mean that all production of food or energy necessarily happens within the city limits, but rather that cities have management systems helping to map resource flows and maintain close ties with production facilities creating a Local Loop with them.

In the world of Local Loops scientific expertise still dominates global structures. The technological and scientific knowledge base is global and evenly distributed. But the emphasis of many businesses and professions is on user-centred design that produces smart and creative local adaptations. In their hearts and minds people still recognize their dependence on global networks, but they value local products and culture more

than perhaps preceding generations did. Consumer choices become more uniform – only a few would buy furniture, clothes, cheese or cereals produced outside their Local Loop. Foreign designs and flavours just are not appealing to the average consumer anymore. This all marks a new phase of global culture and globalization.

All loops have their own combination of influential professional groups. Local professional guilds form the core of local innovation systems and competitiveness. They are also an extremely important force in politics helping to prepare legislation that is based on local resources, medical practices and the boundaries within which global sustainability is possible.

In societies of Local Loops work has a special value, partly because local value chains are very clear. People understand that they are dependent on each others' skills. This underlines that everyone's work is meaningful. Others know that they need your work; your work solves common issues. The boundaries of work and free time are unclear.

How are sustainable lifestyles achieved?

People spend most of their time adding value to their communities, which is something they can best do through engaging in guilds as members. A flourishing service sector within the loops helps people to outsource everyday routines such as

cooking or doing laundry, which in turn releases time for collaboration. The centralized execution of the forementioned household tasks reduces the material footprint at the community level, by ensuring there is less food waste and more efficient use of appliances and indoor spaces.

A breakthrough in solar panel technology and efficient neighbourhood combined heat and power (CHP) systems helps to bring carbon emissions of living spaces down. As people spend most of their time in working hubs, collaborating with their guild peers, less space is needed for homes than in 2012. Collaborative consumption is personified as most home appliances are shared amongst neighbours, and are located in the shared spaces of buildings. Realizing that the locally designed goods meet their needs better (technological innovations have focused on local solutions), people prefer them over their international substitutes. Local adaptations are very appealing to people, their maintenance is easier and convenient recycling and up-cycling services are in place.

There is no need to leave one's neighborhood often as people live nearby their work, family and peers. Cycling routes and walking lanes are in good condition and are built around the best possible scenery to meet multiple user needs. This easy access to convenient and healthy mobility led to resilient behaviour changes, nudging people to walk and cycle to get around instead of using cars or other impactful transport.

For holidays and leisure time, new social norms incentivise people to stay close to home. Local tourist destinations have increased in number and provide desirable recreational value such as local biodiversity reserves or farms producing their favourite food products. In 2050, members of some families might still live in different cities. To see each other, family members may take longer holidays together in one of the local tourism destinations.

Local Loops scenario narrative – how did it all happen?

» Peak-oil game-changer
» Rediscovery of local resources
» Local turn
» Craftsman attitude

These drivers are depicted as events on the timeline.

What is life like in the Local Loops?

What changes between 2012 and 2050?	
Education	Education is about transmitting and sharing skills. Craftsmanship and specialization are promoted through mutual teaching and problem-based learning.
Work	Work is characterized by engagement with issues and collaboration within and among guilds. Needs met by applying design thinking and formulating local solutions.
City	Cities are multicentred and formed into their own loops. Guilds working and living in the loops lay their own strong characteristics on their loops.
Health	Work places provide health-care and skilled doctors. There are basic rights that all regions agree to prioritize with regard to health-care.
Living	Living in the loops is characterized by shared spaces, existing infrastructure and co-working spaces. Guild members often live in the same neighbourhood
Food	Food production and distribution are marked by locality, minimized transportation and neighbourhood canteens. Energy used for food production is optimized.
Mobility	Transportation is about walkability and cycling. Existing infrastructure is optimized. Intercity mobility is needed less and services are home-delivered. Local tourism and long vacations are favoured by people.
Consumption	Consumption drivers include a mass quest to reduce the overall volume of appliances needed through sharing schemes and replacement services. Products are made with high-quality local materials and design. Availability of foreign goods is limited. All products are repairable.
Economy	The economy is based around local user-centric adaptations and efficient local clustering.
Sense of security	Sense of security is generated through guilds and understanding of how the system, i.e. the closed cycles, work. People identify themselves primarily as part of their work communities.
Leisure time	People have outsourced their housework in order to be able to maximize their inputs in work communities. Leisure time is mostly spent with guild members.

Peak-oil game-changer

2014: Rise in global energy prices and other commodity prices start a new cycle of indebtedness for many European countries. This impacts upon people's lives in the form of soaring interest rates as well as more expensive food, transportation and electricity prices.

2016: Many seminars debating the European debt crisis concern themselves increasingly with the revealed link between a country's high energy dependency and public debt.

2018: Several European countries reform their economic policies and governmental structures. After the reform, energy and natural resource policies form the core of economic policy.

Some of the large districts here in Amsterdam are completely car free. This means I can enjoy it either by walking or cycling better than ever before.

I thoroughly enjoy living in the "ten minute city" that we have here in Stockholm! I don't have to worry about spending time in transit as all the services I need are just ten minutes away.

TEN MINUTES CITY
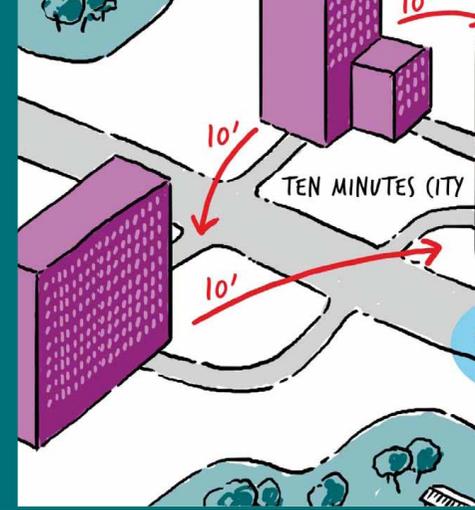
Rediscovery of local resources

2015: The first reports are published citing untapped local resources and emerging technologies that present new opportunities for community self-sufficiency.

2017: Twelve European cities publish a joint initiative on the "Local Loops Economy" based on the earlier 2000W society initiative that aimed at energy independence. Each of these cities starts implementing the initiative with their own programmes and defining measures and standards for the fields of building, energy and food.

2019: Groups of companies and universities join the Local Loops Economy initiative and announce the creation of partnerships where the cities develop and test new technologies and service models that support Local Loops.

Local turn

2014: European Parliamentary elections catalyze a series of new expressions on long term goals for the region of what the EU is all about. Several parties campaign with slogans and topics that highlight the EU as a safeguard that secures progress that is embedded in local resources and traditions.

2019: In Germany, some progressive cities with well-travelled international populations start a movement of cyber-localism that celebrates global culture and technology together with traditional ways of building and agriculture.

Craftsman attitude

2015: A group of workers in Ireland launches the New Craftsmanship-Index to measure employee engagement, motivation and a sense of usefulness and purpose in their work.

Open kitchens promoting local gastronomy

Food lessons of green cooking

I've heard about this new type of craftmanship culture. Apparently it has emerged recently and has started to define an era of user-led design. It looks like a good thing, as the majority of appliances, clothes and furniture are locally produced yet they come in diverse designs fitting different user groups.

2015

"For my husband and me, leisure means visiting one the Local Gastronomy Guilds around, who are reinventing new recipes from local seasonal food."

2023: Oil prices continue to rise beyond belief, pushing great numbers of logistics companies out of the market or forcing them to sell their operations to the few remaining large ones. As a result, a small number of firms dominate transport markets in many countries, which ultimately leads to significant price increases.

2023: Oil prices become very volatile, new peak prices are reached in four consecutive years and there are occasional supply shortages. These drastic price shifts persuade people to start exploring more local and secure production alternatives.

2025: The financial market system is in turmoil, resulting in a new wave of bankruptcies and bailouts of big companies in strategic sectors (logistics, banks, construction industry and retail).

It's hard for me to find coffee in stores nowadays. Instead, I drink good varieties of coffee substitutes that have been developed using modern technology.

2024: A new field of research that models local ecosystems and the spread of technological applications between regions emerges in Latvia.

2021: A number of regions and even some nations have managed to make their building, energy and agricultural sectors self-sufficient through local resources.

"Local food only" towns attract plenty of attention with their vibrant markets and rich food culture.

2023: A group of top European universities opens satellite campuses in Lusaka, Bamako and Bogota supported by their home cities and by some of the world's biggest companies in mining and farming. The intent is to secure the universities' role as places of social and technological innovation since previously existing global systems and technological regimes are eroding. These new universities are seen as a way of adapting some of the most long-lasting global structures, like science, to the new era of localism.

2020: A study published in London proposing a new management method that focuses on the integrity of professional groups and on agile division of labour between professionals becomes a bestseller, revolutionising management and leadership in many companies.

Here in Copenhagen in our co-housing flat, we just bought a windmill that provides us with enough energy to support everyone's needs.

It amuses me that just a while back, there were so many inefficient appliances on the market. Nowadays, it's such a pleasure to go and buy a new refrigerator, since I know all of them are high-quality and consume very little energy.

2025: Leading economists in Slovenia launch the concept of the "Guild Economy" that builds on findings concerning productivity gains provided by strong guild-like structures present in many neighbourhoods in European cities.

In order to get a master degree of social sciences from the university, I have to complete a two-year professional internship. I have to admit that this puts some pressure on me.

2020

2025

Peak-oil game-changer

2026: People start to look for towns and cities that are capable of implementing smart adaptation plans that help their inhabitants cope with peak-oil better than people in other parts of the country.

2028: There are no safe havens for investments now that countries agree on limiting and regulating trade in commodities derivatives. The volume of trading on the global financial markets decreases.

2029: It is a widely accepted fact that the era of oil and modest energy prices is over.

I love living in my Danish town. We haven't had to worry about buying energy in ages. I know lots of other towns that enjoy the same situation.

Rediscovery of local resources

I enjoy living in these brand new blocks made out of the finest wood in Europe. Construction companies in our region here in Western Austria have a well-known tradition in wood architecture to draw upon.

2029: In Northern Europe the number of villages that are self-sufficient exceeds the number of those that are based on centralized energy solutions.

2030: The European Union re-defines its structure based on an idea of "local resource loops", referring to regions that are self-sufficient in key resources and that operate within the same local technological paradigm.

Guild Canteen where Guild members enjoy their lunches and dinners

"This is our Guild Canteen. It's where we usually get our meals. It is also here that we have our shared refrigeration space and equipment."

Local turn

2026: Some universities are restructured around an idea familiar to design. This design-thinking is about applying the best available knowledge to local conditions.

We take pride in supporting local design and goods.

Repair and upscale services are something I use almost every month. I've had my video projector for 10 years now, since I know I can get the best possible maintenance for it.

2030: In many European countries, national governments have delegated a substantial part of their budgeting power to cities and regions that have great freedom to decide on how to build new infrastructure, provide public services and define levels of taxation. However, there are certain EU-wide goals and minimum requirements that regions have to meet.

Craftsman attitude

My guild takes care of all my health care related practicalities. They ensure that both diagnostics and treatment are preventive in manner.

2027: The Guild Economy speeds up the rise of a new movement in urban planning that focuses on creating dense working-living "ecosystems" that inspire the formation of guilds.

Equipments for local production

Local design and production workshop

2030: European education policy recognizes guilds as part of the education system and guarantees them the right to give degrees that can be considered equivalent to MA and PhD -degrees.

Our employer hired a professional who takes care of our children while we work. This allows us and our kids to be in the same place all the time.

"My eldest daughter was always hanging around the clothes design guilds' workshops and now she's doing her apprenticeship there. She wants to enter the guild that's produced most of the clothes I wear."

2030

2032: People increasingly put their money into land and property that they themselves or their families intend to use. Specifically in Italy, people are very excited about this return to local values.

2034: Adaptation to new conditions after peak-oil happens quite unevenly – not only because some countries and regions have more resources, but because some benefit from better starting points than others in terms of natural resources, previous experiments, or more agile innovation systems.

2035: Some nations and regions benefit from the decline of global markets. Many resource-rich but previously underdeveloped African, Asian and South American nations have been able to collect investments and taxes from international companies harnessing their resources.

2035: A number of forerunner regions in Europe, China and the USA have been able to develop well-functioning local energy and food systems. Many of them are practically energy independent and have replaced many energy-intensive import products with local, less energy-intensive ones (e.g. concrete and steel with timber and stone as construction material). Northern Europe is a prime example.

An old friend of mine now works as a local adaptor. He knows a lot about global mobility solutions and brings them into the local context very well.

I work as an expert in solar panels that are best suited to conditions here in Spain. I just got an invite to join the best guild of my profession.

2035: In France, the number of people working in farming has increased due to the slow development of new agricultural methods based on local resources. This is one of the reasons why food prices remain high.

2034: While the transition to local distributed energy systems and the use of local construction materials is well on its way, creating reliable local food/nutrition systems seems to be much more difficult.

"I love the fact that there's so much more you can do in our neighbourhood. The Urban Planning Guild has really done a great job making the area more compact."

Recent passive house build for densification

Garden plot

© Strategic Design Scenarios

At 78, I still work 4 hours a day at our office. Most of my work there is evaluating projects and talking with my colleagues. Training programmes, diets and different types of medicine have helped me retain my mental vitality.
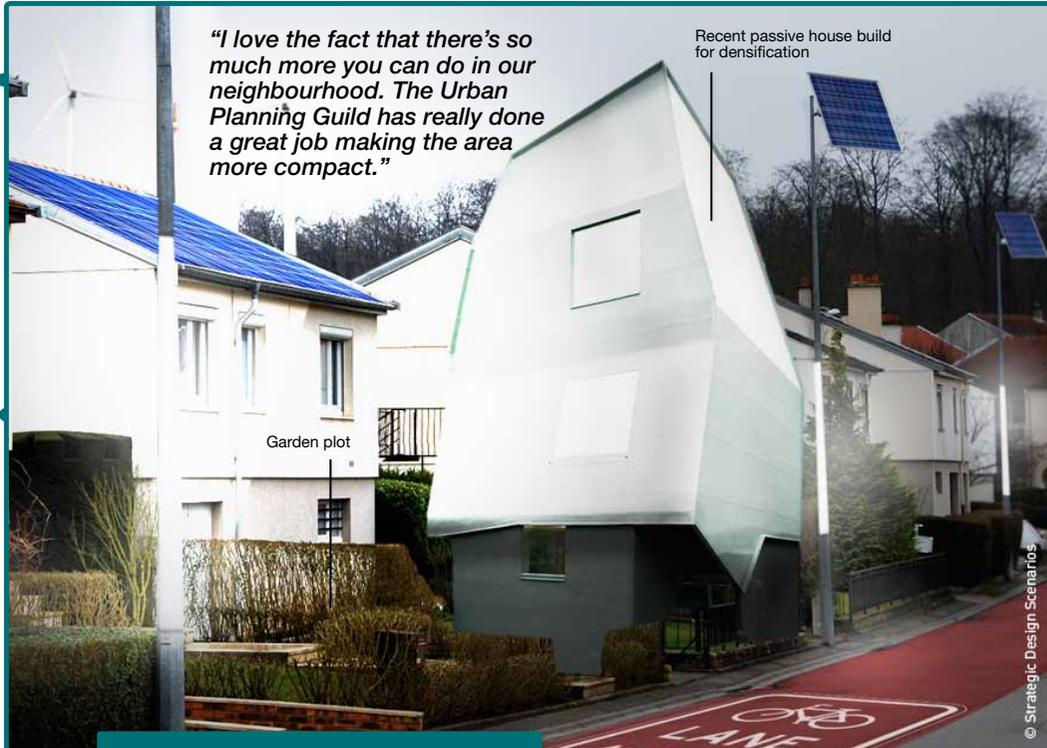
2031: More and more people live in the same neighbourhood with other members of their guilds. Less space for living is required as many appliances are shared and provided by the guild for large group of people.

There's a new bicycle route that just opened outside the city. It allows me to get to the local winery and appreciate the scenery here in Bavaria. We typically try to leave the city for long weekends.

My husband and I wanted to get a blender. We managed to buy a very good Spanish one from a local company that had customised it to fit well with our Slovakian ingredients.

2035

Peak-oil game-changer

2037: The EU is putting more power and resources into transferring knowledge in the field of "Local Loops management". However, the global economy has been stagnant for over a decade, unemployment is high in many European regions and the power of national governments is eroding even as there is less public resource to invest.

I have allocated a set amount of money each month for expensive foreign products, such as coffee and tea. Prices are high, as the transport market is dominated by a few global companies.

2040: Many countries that used to have a low standard of living have managed to raise the general level of their infrastructure, education and health care. This encourages many professionals from the developed world to migrate to these countries as international markets start to decline. The skills gap between "developed" and "developing" countries and regions starts to narrow.

2040: After years of negotiations, cities agree on a new global financial regime based on local currencies and tangible assets such as energy, strategic minerals or skills.

Just last year, we managed to turn some old city railway tracks into state-of-the-art bicycle lanes. Cycling is a pleasure in Bratislava now!

Rediscovery of local resources

I can quickly move within cities and between different areas of the cities inhabited by guilds with the new Super-bus system.

2042: A new global treaty on the openness of research is negotiated. It defines the new thinking on science and technology, highlighting the benefits of the traditional virtues of science (openness, freedom, tentativeness…) and of the open-source approach to technology while at the same time bolstering a technological regime in which most technological applications are very local.

Local turn

2036: Cities agree on global evidence-based frameworks for regionally implemented policies on such key issues as health, environment and safety.

☺ *All workplaces in Sweden introduce a happiness index to measure employee satisfaction. This leads to a more fulfilling work environment and starts to reshape Swedish work culture.* ☺

My guild bought me a service robot that takes care of cleaning and cooking so that I don't have to.

Craftsman attitude

In the area I live in, lots of workshops and workplaces have disappeared as there are many people here who don't belong in guilds.
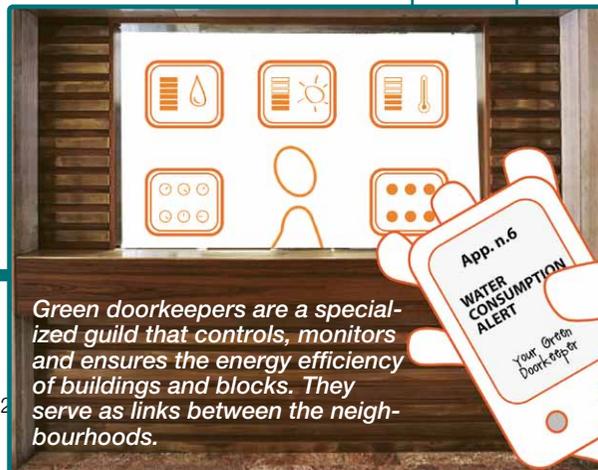
Green doorkeepers are a specialized guild that controls, monitors and ensures the energy efficiency of buildings and blocks. They serve as links between the neighbourhoods.

2040: 2/3 of the population live in neighbourhoods that are defined according to a profession and a guild. These neighbourhoods also form the basic political units that have the right to elect their own representatives to regional council.

2040

Inter-generational furniture is a new design trend that promotes local design that lasts for generations. It's easy and cheap to re-assemble and adaptable to a user's needs.

2043: There is still a significant amount of global trade in energy, food and other basic commodities, but compared with levels in 2012, many of the most flourishing regions do not import many tangible goods. In these regions a discourse on the "crisis of 2020s" is already part of collective memory as people consider themselves to be part of a new era of development.

2044: A global guild of scientists is formed, with the right and duty to secure that technological knowledge is spread evenly across the world.

2046: Many Europeans feel that currently the EU is an interim solution on the way towards global government.

Home waste-management opportunities allow households to turn into suppliers of raw materials for local companies.

2044: Technically, people are still citizens of a nation. However, national politics is understood to be a ceremonial tradition that reminds citizens of such values as democracy, equality, freedom and solidarity.

My daughter just set off on her journeyman year to Bucharest to work in a local construction company. She's taking the international train.

Offices and local production plants

Building for work-life integration

2045: People spend much of their leisure time within their own neighbourhood. They work long hours and often see their fellow guild members as their closest friends.

Tomorrow, our guild will set up guidelines for zero net energy in construction. Our guild has the most expertise in this issue and our guidelines are expected to become the basis of legislation to be passed later this year.

"I met my husband when I was doing my internship at Energy Saving Doctors, one of the town guilds for energy preservation and production. It was easy to find an apartment for our family. Now we have access to convenient lodging connected to our workspace."

2045

2050

Gatekeepers for lifestyle changes

Food, energy and construction companies

…focus on local alternatives and local markets to offer secure choices.

Profession specific networks and associations

…acknowledge their capacity and inluence as experts and networks who have a shared responsibility to society.
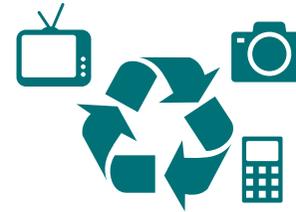
Appliance industry

…turns towards business models that take local context into account and include repair in their products.

Service industry

…leases products that were previously available only as purchases and creates a leasing economy.

Six-pack of most influential lifestyle triggers

1. Extremely high energy and food prices persuade people to focus their choices on local and secure alternatives.

2. Tight workplace and neighbourhood-based communities enable and encourage people to share spaces and equipment. The need for living space is reduced.

3. People live close to their guild peers. Ample service options mean minimal need to commute outside the neighbourhood.

4. People prefer appliances, furniture and clothes to be sold as services. Maintenance and adaptation services are improved and they significantly prolong the lifecycle of products.

5. Consumers can no longer make mistakes: policies built on scientifically backed environmental and health objectives eliminate bad choices.

6. People eat out more. Better food services ensure a healthy diet, adjust portions to optimal size, eliminate food waste and help people focus on their work and social life.

Others 900 kg
Leisure time 1500 kg
Product consumption 2600 kg
Food 7300 kg
Mobility (daily and tourism) 11 000 kg
Housing: building 2400 kg
Housing: electricity 3300 kg
Leisure time 400 kg
Product consumption 400 kg
Others 700 kg
Food 3300 kg
Mobility (daily and tourism) 1500 kg
Housing: electricity 400 kg
Housing: building 1300 kg
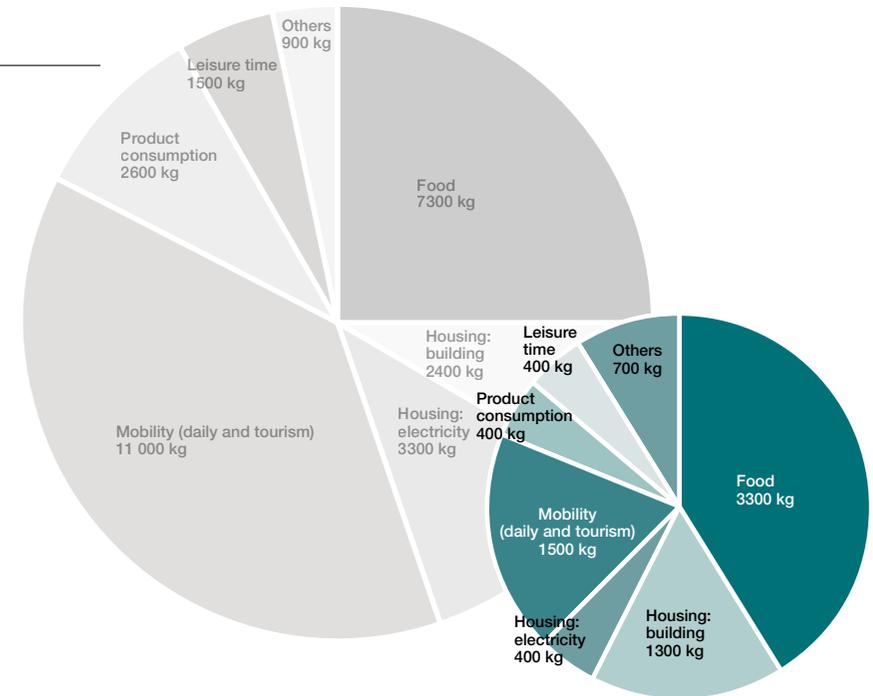
The average material footprint of a European in 2050 in the Local Loops scenario (8000 kg per person in a year) compared to the average material footprint in 2007 (29 000 kg).

Critical challenges and solutions in the scenario Local Loops

Q1. How to avoid biodiversity decline and soil fertility loss caused by local resource overuse and competition for land allocation between energy and food production?

1. There is strict regulation based on global treaties on biodiversity and other environmental issues. These treaties are linked to a global trading scheme on the limits of globally traded commodities. Regulation ensures that everywhere 10% of the land and water areas are protected as biodiversity reserve. This limits the use of these areas for building, farming, transportation or recreational use.

2. Living in resilient mid-sized towns with surrounding production areas and nature reserves make people aware of and able to enjoy biodiversity and different types of living ecosystem services.

3. Values of localism steer people to favour local tourism. Local biodiversity reserves come to have great recreational significance and to be sources of regional pride.

4. Breakthroughs in solar technology enable roofs, walls and windows to be used as local, customized means of energy production. Locally developed technologies offer reference solutions.

Q2. How to avoid inefficiencies that result from the decrease in global competition?

1. Technology focuses on local, bottom up solutions that use resources efficiently as a result of high expertise and experience of local professionals. Benchmark cases on best solutions are provided with public support and are open for everyone to utilise.

2. Local maintenance, reuse and recycling services are widely available and supported by product design. People favor the use of these services. Longevity and user-centric tailoring of products is ensured by a broad range of local professionals.

Q3. How to avoid status competition based on material consumption triggered by elites and their access to natural resources?

1. Work is seen as a more interesting field for status competition than consumption, which further strengthens the impetus to use more services instead of material goods.

2. People value local, service-based consumption and are aware of its role as the engine of the local economy.

3. Tight guild and neighbourhood communities result in shared ownership of goods and spaces so that people's homes are smaller and less equipped. People appreciate individual and tailored, long-living products maintained and personalized by the local service providers.

4. As a result of the insecurity caused by peak oil and global resource use, people have placed their trust in expert-oriented local decision-making. People appreciate transparent Local Loops and trust in the self-regulation of guilds.

Empathetic Communities

Pandemic technology

Singular Super Champions — Governing the Commons

Meritocracy — Human-centrism

Local Loops — Empathetic Communities

Endemic technology
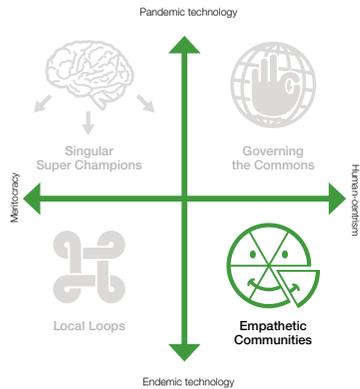
Empathetic Communities

Alternative Sustainable Society 4: Supporting 8 000 kg Sustainable Lifestyles

Empathetic Communities is a scenario where Western societies faced a crisis they had long dreaded, and how the change turned out to be easier and more fruitful than anyone had expected. It is a story in which the global economy as we knew it in 2012 fails, followed by paralysis of nation states and their political decision-making structures. By 2050 this all leads to lifestyles in which the community and neighbourhoods have an important role in everyday life. New forms of collaboration and governance grow on the level of cities and towns making them the most powerful level of public decision-making. In Empathetic Communities the many fruits of global culture and advancements in latest technologi-

cal innovation are enjoyed, although people in general focus on communicating and developing solutions on the local level.

The breakdown of the economic system and nation states has its roots in resource constraints, decline in trust in financial institutions and the public debt crisis. Many European regions never recovered and a growing number of people faced difficulties finding jobs, income and livelyhoods. Increased risks in the financial markets led to dramatic interest rate hikes, which drove several major industries into bankruptcy and evoked a breakdown of value chains.

Most of the governments could simply not afford to bail out these companies as they had before. The result was a political crisis where cabinets stepped down and the formation of new, trusted government turned out to be impossible. When both the economy and national politics were in a state of paralysis, people started organising "Plan B" solutions on local and regional levels. This development pushed forward reforms that helped companies, individuals and local authorities to refocus on nurturing the local economy. Gradually cities and towns increased their political power over dysfunctional nation states.

The birth of a society of Empathetic Communities was not, however, only the result of an economic crisis. In the early 2020s a new view on human nature started to gain popularity. New research at that time showed an increasing amount of evidence on genuinely altruistic features in primate and human behaviour. The way people perceived

their own place at work, in their community, in their families and in society at large started to change.

New types of collaborations and innovation both technological and social, emerged and helped people to reform political decision-making and workplace practices. This created huge efficiency gains in organizations. Compared to preceding generations, people in 2050 feel that collaborating and sharing duties, spaces and goods with other people is a natural and pleasant part of their life.

The simultaneous decline of nation states and the global economy, together with the new rise of collaborative norms in all aspects of human life, gave impetus to new local governance models. During an era of high unemployment many people started exploring new and alternative ways to improve living conditions for themselves and their peers. Hundreds of experiments with local energy and food production, energy retrofitting and different types of peer-to-peer services provision started to take place all over Europe. Gradually these projects grew into larger local initiatives in which entrepreneurs, community leaders, civil servants and politicians joined forces to build the new foundations for a local economy. Cooperatives developed step by step into providers of local education, health and social services, sources of secondary income and platforms for local infrastructure and construction projects.

In Empathetic Communities people spend a great part of their leisure time in activities that take place within their neighbourhood. It is through these gatherings that co-created innovations de-

velop. This in turn creates new types of (economic) activity. Frequent encounters in public spaces create opportunities for ideas and initiatives on new collaborative projects, services and businesses. Daily practices and lifestyles are formed strongly around collective activities and sharing.

One of the greatest changes people experienced over one generation relates to the use of their surroundings and physical infrastructure. People understand courtyards, streets and different types of shared indoor-spaces as something that is in their shared possession and in active use.

How are sustainable lifestyles achieved?

The breakdown of the global market economy changed people's lives permanently. As global and national structures could no longer be trusted, people increasingly turned to look after themselves and each other. Communities and neighbourhoods became key elements in people's lives as global transactions decrease in number. Apartments and public spaces are shared and used for many functions.

There is a real scarcity of energy, food and many other products in Empathetic Communities. When prices soar to ridiculously expensive levels new solutions start to emerge. After all, people still have the high skill-levels and access to information that industrial and knowledge economies delivered in the 20th century. People and their communities learned to cope with new circum-

stances and some of the most wasteful lifestyles patterns were abandoned.

The infrastructure in Empathetic Communities is mainly the same in 2050 as it was in 2012. However, what has changed is the way it is used. For example transportation and mobility is of little significance. Hence, streets and roads built in the 20th century and in early 21st century, are either transformed to farming land or adjusted to support healthy mobility, such as cycling and walking.

There is smart housing design and diverse retrofitting of existing buildings. As global production chains lose significance, local production rises in importance. Food and other necessities are provided locally. Urban farming spreads everywhere. People helping one another becomes an essential element of the society and a guiding principle for everyday life. Cities fragment into villages that aim for self-sufficiency meaning that food people eat is seasonal and locally grown.

> **Empathetic Communities scenario narrative – how did it all happen?**
>
> » The system breaks down
>
> » "We can" generation works together
>
> » Public, private and people (PPP) – the new welfare
>
> » Communitisation of urban planning

These drivers are depicted as events on the timeline.

What is life like in the Empathetic Communities?

	What changes between 2012 and 2050?
Education	Education and learning are problem-based and collaboration-driven.
Work	Work happens collaboratively in hubs and people learn through asking for input from colleagues. Hands-on work is highly valued. Work is neighbourhood-based and aims at contributing to the community.
City	Village infill from sprawl to farm village. Parking lots are turned into places of food production. The public space gains great significance. Villages within cities are key elements in the urban fabric.
Health	Paradigm of quality over quantity characterizes the health-care system. This means that the meaningfulness of a person's lifespan is seen as more important than the amount of years lived. Local administration prioritizes health-care and healthy living. Every municipality has a hospital. Healthy-living-circles share preventative knowledge locally.
Living	Farming opportunities raise property values. People live in shared apartments and make use of shared spaces.
Food	Growing food in urban farming circles meets local food demand. Food transportation needs are very low. In addition to production, high importance is also placed on food quality, and distribution.
Mobility	Local mobility is emphasized and less road space is devoted for private vehicles. Old and new infrastructure is adapted to cycling.
Consumption	Consumption is geared towards meeting people's basic needs. Sharing, swapping and renting succeed private ownership.
Economy	The economy is organized around the self-sufficiency of small units. Food production is prioritized. Experimentation happens on the local level and high value is given to community activities.
Sense of security	Sense of security is generated by communities, closed circles, cooperatives as well as by health and food circles. PPP-systems guarantee participation and sense of ownership in public and social affairs.
Leisure time	Leisure time is mostly public and used for social activities, e.g. in gardening circles. Vacations provide time for self-reflection.

The system breaks down

2015: Unemployment in many European countries and in the USA remains high due to the effects of austerity measures on public budgets, and because of a hesitant mood in the business world, an ageing pool of consumers and a continuing decline in manufacturing jobs.

I get most of my daily groceries through urban farming pools that exist around the city. Some of the food I receive directly from our neighbourhood garden. I only buy from supermarkets what I cannot get easily get through these channels.

2017: The high price of energy and other natural resources affects household budgets with prices of food, mobility and electricity soaring.

2018: GDP is replaced with more adequate indicators for tracking social development and progress in sustainability. Health, happiness and an individual's ecological footprint are among the aspects measured.

Together with my family, I participate in huge demonstrations to support energy efficient policies and protest against the inability of government to provide people with a decent livelihood in this era of expensive oil.

The "We can" generation works together

2015: A new television show format, "The Altruist", turns out to be a huge success all over the world. The concept is created in the Netherlands, but within couple of years it spreads across Europe and becomes localized. Contrary to the hundreds of competitive TV-show formats of the past 50 years, the show celebrates empathy and the capacity for collaboration. For many, this symbolizes a turning point in prevailing thinking about human nature.

2018: People's interest in studying examples and experimental projects around the "science of empathy and compassion" grows rapidly.

Public, private and people (PPP) – the new welfare model

2015: The organization of work changes due to long recession and high unemployment. More and more people start to work outside of traditional companies.

Mix of new active constructions

Insulation based on DIY solutions

Retrofitted passive housing

"I know a lot about easy and cost-efficient energy retrofitting jobs such as insulation. Our co-operative is very good at these quick fixes and we enjoy sharing our knowledge with the community."

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2018: People in many regions are stimulated to find new ways to secure income, built on mutual help and affordable access to basic resources such as energy and food. The result is a new boom in cooperatives that employ people and help them to create local versions of sustainable lifestyles.

Communitisation of urban planning

2016: A large public stimulus package is announced in support of developing urban habitats. It is aimed at improving public space, basic transportation and energy infrastructure, especially in neighbourhoods built in the second half of the 20th century. The rationale behind it is to enable the creation of local service economies through the creation of more attractive public spaces and employing people to do construction work.

Here in Nijmegen children grow up participating in communal activities from a young age as part of the local social environment. Learning by doing is emphasised.

2015

2020: Due to high unemployment and rising prices, people have time to start experimenting with local production of energy and food.

2021: New models of local collaboration emerge around energy and food safety.

2020: Applications of the Science of Empathy have had a significant supportive impact on such fields as collaborative consumption and the organisation of work.

At school, kids want to do their homework and even exams together with other kids. This is because the hugely popular TV series The Altruist is running in its fifth year and is being copied in schools.

2022: The financial markets face severe crisis. Several big banks collapse as a result of the bankruptcies of big companies, the bubble in energy markets, turmoil in real estate markets, uncontrolled risk-taking and perverse incentives for managers and CEOs working in hedge funds.

"Most of the space outside our building is for farming use. We had to pay a substantial amount for a plot to grow our food, but now we produce enough for our neighbours, as well."

Optimization of orchard space

Former street transformed into orchard

2024: Governments are unable to help banks out of insolvency. Stock markets are closed and re-opened again, several times. Governments fail to create policies that would help the markets out of the crisis.

I used to work in the finance sector, but I gained and lost money at an incredible speed, which led to a horrible personal situation. I want to work hands-on from now on.

2025: As the 'Twin crisis' of financial markets and national politics persists for several years, an increasing number of towns decide that energy and food security must be addressed through new policies and ways of organizing at the local level.

2025: A new Europe-wide network of "villages in towns" is established. Members of the network establish urban farming cooperatives in their neighbourhoods and start negotiating with municipalities, real-estate owners and inhabitants for access to under-used land for farming purposes.
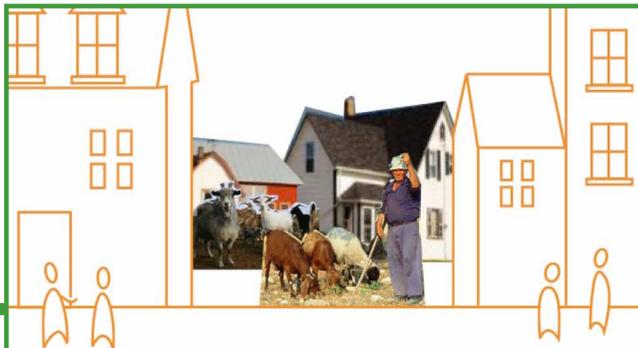
2020

2025

Micro-producers of food are organised in co-ops that allow them to trade food on a very local basis. These networks become hugely popular in everyday life.

The system breaks down

2026: In many countries governments resign and it turns out to be impossible to form new coalitions, which paralyzes national politics and public investments.

2028: The absence of dynamic global markets results in extreme energy and food scarcity. People rely on their immediate circle to guarantee access to food and other basic commodities. Products are used as efficiently as possible.

The "We can" generation works together

I do most of my work at hub-like office spaces that exist everywhere. I like these collaboration spaces as I find them stimulating. They spur on new innovations as I meet more and more new people.

2027: Given the high and persistent unemployment, many local communities have adopted new practices for peer-to-peer networking based on the latest understanding of people's capability for empathy and collaboration. The shift from ownership to access is fostered. This means more and more products are shared and consumption is very needs-based.

2030: While lack of both public and private money in R&D slows down the dissemination of new innovations, applications of the 'technology of empathy' seem to be an exception and they pick up pace in comparison to other fields.

Public, private and people (PPP) – the new welfare model

2028: Visionary politicians, entrepreneurs and civic leaders gather and unite local (human, material and financial) resources to reform existing infrastructure and service provision to match the new political reality.

New suburban farming installations

"When we have days off we like to find a host family in the farming loops nearby. I cycle there with my husband and kids."

Agro-forestry and fields

Living spaces offering agro-tourism facilities

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Health is of the highest importance in local administration and in every municipality here in the Netherlands, as it is in all other European countries.

Communitisation of urban planning

I am really looking forward to the BBQ night next week. I like it when co-housing communities decide to cook and eat together on a regular basis. This builds community

2028: "Villages in towns" start to develop local nutrition cycles through collecting organic waste and helping inhabitants build their own dry-toilets. The idea of town villages spreads fast and soon shapes the geography of many European towns and cities.

My monthly output of soil is enough to support my own farming needs. I get my soil through my super-efficient dry toilet and compost.

2030: The most successful modifications of the new Public-Private-People-model (PPP) gain plenty of attention at a time when most of the regions of Europe are hampered by rocketing energy and food prices and occasional shortages.

2030

At any given time, I'm part of at least five different co-operatives that are involved in hobbies, food and elderly care – all of the necessities of life are provided for by making communities resilient. The rapid decline of public welfare has forced people to start looking after themselves.

2035: Towns and regional councils in different countries resize their power to compensate for the dysfunction-ality of national governments and global markets.

Every day I actively offer my tools for other people to share. This means that when I have a vacuum cleaner, my community can use it as well.

2034: The biggest technological boom since the arrival of the internet and mobile phones is created as new applications are developed at local and global level. These include many things from neural scanners that help to detect when you are feeling empathy to network tools that reflect how other people are feeling andw training courses in reinforcing the benefits of compassionate actions within groups.

Here in Croatia spontaneous neighbourhood dancing sessions are a sign of trust and healthy community.

I frequently use public transport that is accessible on demand from the countryside to the city. Small buses make it effortless to travel within villages. There are also lots of modular micro-trams that provide efficient mobility.

At election time, I support acts, like a lowert tax on local food, not a person or a party. This leads to a more participatory political system, as elected politicians are no longer the key.
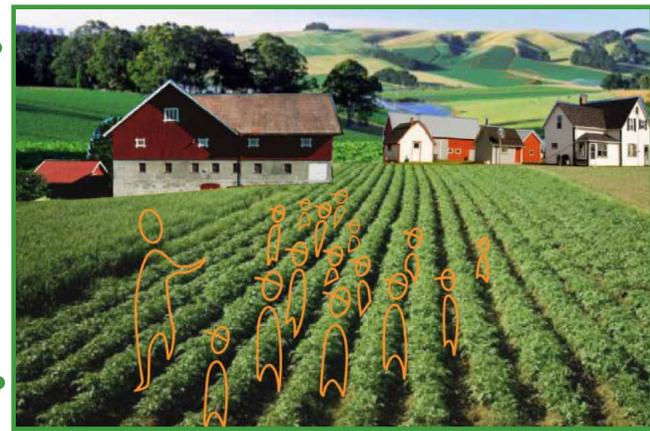
Active farming classes educate children to become adequate farmers knowledgeable in sustainable methods. This type of education emerges in schools all over Europe.

"Our family loves the fact that there's so much of shared space in our neighbourhood. Kids can play together in the Toy House and we can also cook together with our community."

Shared kids' Toy House

Community cooking space & dining area

I share a 140m^2 apartment with my parents, my friend Christina and her parents and my mother's long-time friend Jan. 20 years ago the same apartment was home to an elderly couple. Apparently their design for using the space wasn't as clever as ours. My parents built me my own room last month. It took us one weekend.

2035: In many cities and towns local PPP-councils have focused their efforts on establishing accessible public spaces for every neighbourhood and village.

Unfortunately we had a series of conflicts between different neighbourhoods here in Madrid, over how to share land that was freed up from car use.

2035

The system breaks down

2038: Solutions of emerging cities, towns and regions focus on creating a new kind of local economy and new type of shared power between the public sector, companies and individuals.
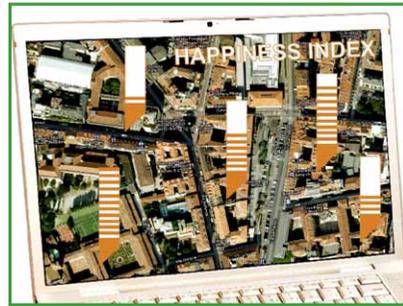
HAPPINESS INDEX

Each neighbourhood's average level of happiness is something I follow closely when I'm looking to change apartments. The index allows me to spot the happiest areas to live in – I want to know about more than the material offerings of the area.

2040: The United Nations is practically transformed into United Cities, Towns and Regions as the significance of the nation state diminishes. A new Global Trade Council is formed through which micronations manage trade and commerce.

2040: Political participation takes place at the local level and new methods of direct decision-making are introduced.

As most of my time is spent working and collaborating in very social settings, I spend my holidays going somewhere where I can be by myself in silence and reflect on past experiences and feelings.

The "We can" generation works together

2038: A group of initiators that allocate local resources emerges. They set up experiments on ways to take of care of local resources through new types of long-term planning of e.g. rare minerals.

I use a new service that provides efficient intra-city product logistics through a network of bicycles that deliver products wherever and whenever.

2040: The generation of people who have grown up within the empathy paradigm gain permanent positions in politics, companies and communities.

2041: Several micronations have adopted new decision-making processes assisted by Technology of Empathy tools. These tools make it possible to engage citizens at new levels, and they help in creating consensus on many far-reaching issues that in the previous era of party politics became locked in stalemate.

Public, private and people (PPP) – the new welfare model

2037: One of the most successful methods of PPP has been the formation of neighbourhood cooperatives. These structures were kickstarted with the help of municipalities and PPP voluntary groups that went to advise neighbourhoods on how to organize peer-to-peer services, start their own energy and food production, gather resources for infrastructure alterations and how to form sustainable models for collaboration.

Some of my friends are educated to help the elderly. They're the most respected individuals among my friends.

2040: One million European cooperatives agree on open source standards for their technologies and ways of organizing. The standards require mutual help from cooperatives in teaching the best possible methods. The history of the new agreement goes back to open source entrepreneurs from the Nordic countries in the early 2000. These entrepreneurs argued that everybody would have something to offer for the society if only they were provided with the access to the data.

I'm pursuing an option to attend a program that allows me to move into a better functioning neighbourhood. I know I have to work hard there, but I really appreciate that more prestigious communities arrange these type of PPP possibilities.

Communitisation of urban planning

2037: Funds are collected from individuals, local enterprises and municipalities to form plazas, inner courtyards, meeting spaces and neighbourhood assembly halls where people can join their neighbours, start planning for local energy and food production, and learn how to form timebanks, peer-to-peer services and other types of sharing systems. Reorganising public space also helps reduce the need for individual space.

Former council blocks operate like self-sufficient villages. Parking lots have been turned into agricultural fields, new infill provides modern, well-designed flats and new types of communal space.

2040: 'Sharing the village', a collaboratively created manual on planning local energy, food production and smart sharing of neighbourhood indoor and outdoor spaces, gains immense popularity all over Europe.

People who are ill can quarantine themselves from their wider community in flu hostels, thus reducing their impact on community's resources.

I've heard that they just started to slash and burn land to create better farming possibilities here in Finland. That's an old and local tradition, but it's now done by applying new technology.

2040

Today is the final match of the World Cup for Cities where football clubs compete in this most prestigious of tournaments, held every four years.

In my neighbourhood, there's a neighbour resources' management system so that everyone can share necessary tasks and appliances efficiently.

VEGETABLE DISHES = 5 POINTS

BIKE SHARING = 3 POINTS

HOUSE

HOUSE

BANK OF SOCIAL CULTURE CREDIT

LOCAL

FARM
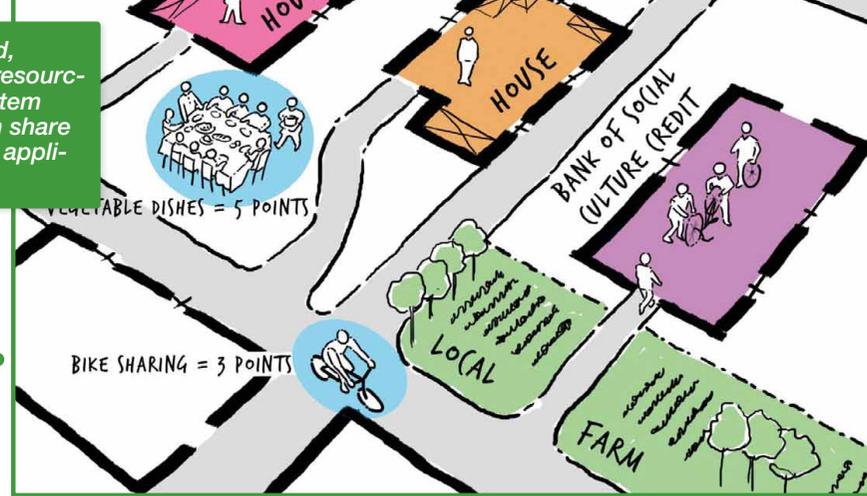
2043: The new generation that now dominates the work life has greater experience working collaboratively than ever before. These people understand that brains also need some time off.

2045: The notion of leisure time changes. People seek 'reflection time', time when they are free from information flows and social roles. Addressing this need for 'reflection time' requires special services, because the majority of people live in such close neighbourhoods.

2047: People spend time that would previously have been called 'vacations' in solitude in cabins located in the midst of nature.

I work for a local council coordinating a network of neighbourhood health programmes. My routine working day is 6 hours long. In addition to my day job I spend two hours every day (occasionally a little bit more on weekends) working with my neighbours on farming and different types of maintenance work.

There's a monthly preventative health circle in my community. We discuss topics such as nutrition, diets and sleep cycles. These health circles are very popular.

"I love the fact that the old streets are now turned into urban farming plots while still maintaining plenty of space for walking and cycling."

Provides complementary food resources for houses and apartments nearby

Minor streets transformed and divided into local neighbourhood gardens

Re-appropriation of public space regenerates local social life

2044: Most of the villages in Europe have trained one or two of their inhabitants to be their "sharing architects". They take care of developing a village's buildings and spaces to serve the needs of the new era.

My grandparents are still active members of society and their efforts in taking care of community well-being are very much valued. They take care of children in the street park outside our building.

Former sidewalks maintained for local mobility

2045

2050

Gatekeepers for lifestyle changes

Local leaders from business, politics and civil society

…emerge as key decision makers pushing for alternatives after the breakdown of the global system.
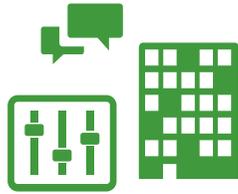
Architects

…focus on designing opportunities for flexible housing and public space.

Neighbourhoods

…start co-ops to support self reliancy in energy and food security.

Journalists and media producers

…conceptualise the new notion of human nature that spreads empathy and human centrism.
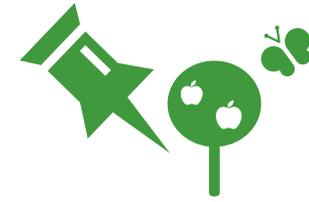
Urban planners

…help people and communities in adapting to the new regime by changing streets and public spaces to new uses.

Six-pack of most influential lifestyle triggers

1. Rising energy and food prices combined with a long economic downturn lead to people becoming more interested in and aware of the structures that underpin their lifestyle patterns, as well as of alternative, cost-effective solutions to current food, housing and mobility patterns.

2. Do-it-yourself (DIY) farming, energy production and retrofitting solutions gain popularity among many of the unemployed. The internet and social networks help spread best practices quickly and create space for alternative economies.

3. New local partnerships empower people to shape their neighbourhoods to better facilitate self-sufficiency in food and energy production, and in different forms of communal consumption (shared use of tools, appliances and spaces).

4. Health ceases to be an individual issue and becomes a communal one. People practice preventive healthcare in workplaces and in neighbourhoods together with their peers.

5. New tools and services for interior designs make people think about their homes in new ways. The functionality and flexibility of homes are features that people in 2050 are able to compare and improve as easily as people used to compare living space in 2012.

6. Occasional shortages change attitudes and expectations. A reduction in food, living space, consumer expenditure, travel and other leisure time activities is compensated for by the richness of social life and a sense of purpose in one's work and communal activities.

Others 900 kg
Leisure time 1500 kg
Product consumption 2600 kg
Food 7300 kg
Mobility (daily and tourism) 11 000 kg
Housing: building 2400 kg
Housing: electricity 3300 kg

Others 300 kg
Leisure time 300 kg
Product consumption 500 kg
Mobility (daily and tourism) 1200 kg
Housing: electricity 800 kg
Housing: building 1300 kg
Food 3600 kg
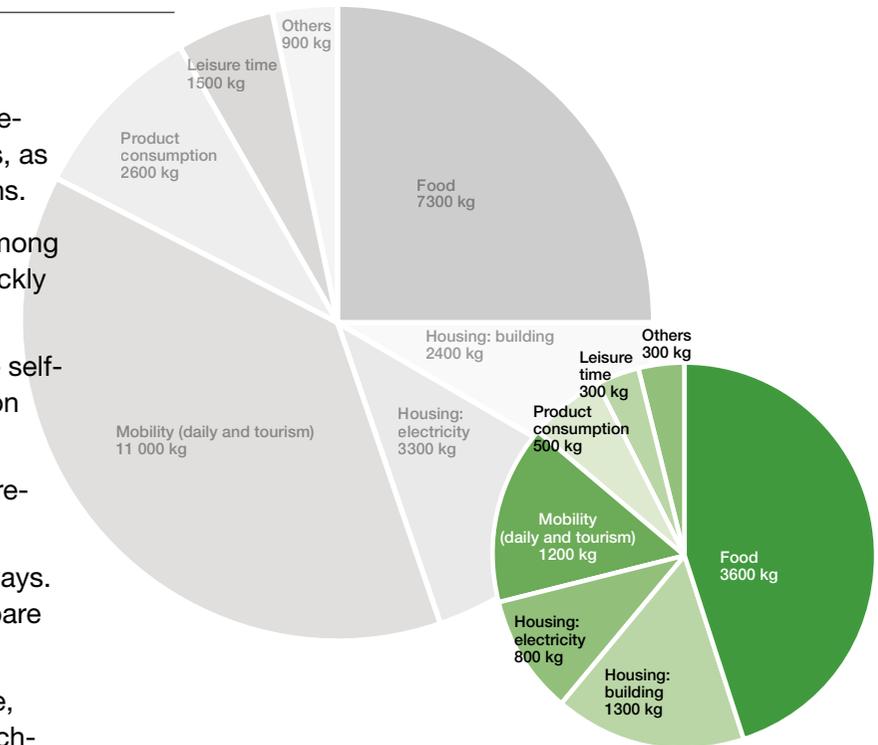
The average material footprint of a European in 2050 in the Emphathetic Communities scenario (8000 kg per person in a year) compared to the average material footprint in 2007 (29 000 kg).

Critical challenges and solutions in the scenario Emphathetic Communities

Q1. How to avoid biodiversity decline and soil fertility loss caused by local resource overuse and competition for land allocation between energy and food production?

1. The imperative of self-sufficiency makes communities plan the villages around nutrition cycles. Different communities network and exchange solutions on how to make nutrition cycles work.

2. Reduced level of mobility and increased need for farming land result in local initiatives to convert former traffic infrastructure into green spaces. This has allowed biodiversity to come back into villages and towns while also facilitating food production e.g. with local fruit varieties on former infrastructure space.

3. Municipal partnerships offer services, peer help and support in money and materials for neighbourhoods to build up new village infill, new social practices and community spaces. Urban sprawl decreases.

4. Local communities utilize local low-tech energy solutions. Best practices are exchanged between communities in global online networks that encourage communities to experiment and innovate. High prices and high levels of unemployment push people towards communal ways of living which enable lower levels of energy consumption and smaller living spaces

Q2. How to avoid global resource overuse, regional conflicts and inefficient use of local resources?

1. Occasional scarcity of certain foodstuffs, products and resources foster lifestyles based on sufficiency. People learn to share spaces and goods and enjoy communal ways of living. Different types of swapping systems make people feel sense of sufficiency and increase efficiency of material use.

2. Open source exchange systems for certain natural resources and manufactured products increase cooperation between regions and provide some additional value to local communities thus avoiding conflicts.

Q3. How to avoid unhealthy diets and lifestyles?

1. Equal access to preventative health information and services is a major field of public sector on the local level. Municipal partnerships and neighbourhoods collaborate in creating series of interventions aiming at pro-health culture within communities. Life is based on physical work so people are in good shape.

2. Mobility based on walking and cycling and a do-it-yourself lifestyle promote good health.

3. Scarcity of imported foodstuffs make people adopt seasonal diets that constantly utilize varying sources of protein and vitamins. Therefore people's nutrition is mostly sufficient and balanced, but not excessive or overabundant as in earlier decades.

Matrix on lifestyle differences in the four scenarios

	Singular Super Champions	Governing the Commons	Local Loops	Empathetic Communities
Education	Embedded into everyday life and practices, lifelong instead of short cycles in the beginning of life. Individualized and commodified. Basis of welfare provision.	The main focus of education is on peer-to-peer skill-sharing. Learning by doing is emphasized in iterative ways. Pandemic technology enables instant feedback loops, which accelerate sharing of knowledge. Focus on informal education where classrooms do not exist.	Education is about transmitting and sharing skills. Craftsmanship and specialisation are promoted through mutual teaching and problem-based learning.	Education and learning are problem-based and collaboration-driven.
Work	Human resources highlight work. Talent is concentrated in global organisations. Entrepreneur vs. super talented multinational class	People's sources of income have fragmented. Comprehensive use of skills are valued. Everyone has something to offer to society. Key words describing work include micro-tasks, crowdsourcing and being useful to one's peers.	Work is characterised by engagement with issues and collaboration within and among guilds. Needs met by applying design thinking and formulating local solutions.	Work happens collaboratively in hubs and people learn through asking for input from colleagues. Hands-on work is highly valued. Work is neighbourhood-based and aims at contributing to the community.
City	10-15 highly urbanised metropolises in Europe. Extremely dense. Lots of new infrastructure. New specialised areas of excellence.	Cities are based on already existing infrastructure. Office and school buildings have been converted into flats and public spaces. Urban experiences are enriched by augmented reality. People find personalised solutions to fulfil their needs and aspirations on bot the physical and virtual layers.	Cities are multicentred and formed into their own loops. Guilds working and living in the loops lay their own strong characteristics on their loops.	Village infill fom sprawl to farm village. Parking lots are turned into places of food production. The public space gains great significance. Villages within cities are key elements of the urban fabric.
Health	Preventative public healthcare. Rational diets. Selfdiagnosis.	Peer-to-peer network support is characteristic of both preventative and reactive health care. Public funding is provided for health-care cooperatives. A wide variety of healthy lifestyles have become routinised. Digital feedback tools are used by everyone.	Work places provide health-care and skilled doctors. There are basic rights that all regions agree to prioritise with regard to health-care.	Paradigm of quality over quantity characterises the health-care system. This means that the meaningfulness of a person's lifespan is seen as more important than the amount of years lived. Local administration prioritises health-care and healthy living. Every municipality has a hospital. Healthy-living-circles share preventative knowledge locally.
Living	Location compensates size of the flat. New materials and design. Price drives density.	People live in small flats and work in new office lofts. The digital layer is key to ovide people with quality in their lives. Smart homes, austere furniture and digital services characterise domesticity.	Living in the loops is characterised by shared spaces, existing infrastructure and co-working spaces. Guild members often live in the same neighbourhood.	Farming opportunities raise property values. People live in shared apartments and make use of shared spaces.
Food	Price and health efficient diet. Large scale organic production.	Food production and distribution are managed by global food systems and smart food storage mechanisms are in place. A multitude of diets are offered and energy intake is reduced. Vegetable choices and synthetic meats form differentiations in diets.	Food production and distribution are marked by locality, minimised transportation and neighbourhood canteens. Energy used for food production is optimised.	Growing food in urban farming circles meets local food demand. Food transportation needs are very low. In addition to production, high importance is also placed on food quality, and distribution.
Mobility	New rail systems within and between metropolises. Personalized rapid transport systems. Smart mobility solutions. High prices.	Mobility is greatly reduced by the use of digital tools. Commuting is minimised and the construction of new traffic infrastructue has become unnecessary. Smart public transit and car and ride sharing are the main forms of transport.	Transportation is about walkability and cycling. Existing infrastructure is optimised. Intercity mobility is needed less and services are home-delivered. Local tourism and long vacations are favoured by people.	Local mobility is emphasised and less road space is devoted for private vehicles. Old and new infrastructure is adapted to cycling.
Consuming	Meanings and symbols get consumed more than products. Education and self-projected me. Price mechanism.	3D-printing personalises consumption. Material consumption is reduced by using modular appliances, which enable do-it-yourself (DIY) repair and upgrade of products. High degrees of appliance personalisation, virtual consumption and recyclable generic materials form new design and producer cultures, helping to reduce the overall number of appliances.	Consumption drivers include a mass quest to reduce the overall volume of appliances needed through sharing schemes and replacement services. Products are made with high-quality local materials and design. Availability of foreign goods is limited. All products are repairable.	Consumption is geared towards meeting people's basic needs. Sharing, swapping and renting succeed private ownership.

	Singular Super Champions	Governing the Commons	Local Loops	Empathetic Communities
Economy	Large multinational firms. Efficiency. Competition. Eco-industrial revolution. Standardised transparent data.	Micro-tasks characterise economic organisation. New businesses are created in and by data-rich environments. Open source, open data and free distribution of information drive new innovation. Personal optimisation, DIY, peer services and manufacturing are drivers of the new economy.	The economy is based around local user-centric adaptations and efficient local clustering.	The economy is organized around the self-sufficiency of small units. Food poduction is prioritised. Experimentation happens on the local level and high value is given to community activities.
Sense of security	From technological progress. Transparency. Surveillance. Individual choices. Thought leaders.	Sense of security is heightened by membership in peer-to-peer communities. Democratised data empowers people. Easy access to services, products and global knowledge-bases promotes equality. Personalised appliances and direct participation increase a sense of belonging and security.	Sense of security is generated through guilds and understanding of how the system, i.e. the closed cycles, work. People identify themselves primarily as part of their work communities.	Sense of security is generated by communities, closed circles, cooperatives as well as by health and food circles. PPP-systems guarantee participation and sense of ownership in public and social affairs.
Leisure time	Investing in own education and training.	Leisure time is formed around a multitude of digital interactions. Home consumption, high quality household capabilities and digital crowd experiences are the main ways of spending free time.	People have outsourced their housework in order to be able to maximise their inputs in work communities. Leisure time is mostly spent with guild members.	Leisure time is mostly public and used for social activities, e.g. in gardening circles. Vacations provide time for self-reflection.

How did the SPREAD scenarios reach lifestyles of 8000 kg material footprint?

In the SPREAD Sustainable Lifestyles 2050 project we have defined the material footprint of a sustainable lifestyle at 8000kg for one person per year. This forms the fundamental assumption on which each of our four developed and previously described scenarios are built.

The material footprint of 8000 kg consists of household goods, food and beverages, every-day mobility and tourism, electricity, heating and housing. However, the composition of the footprint is not the same for everyone. The share of each consumption domain in the annual material footprint of 8000 kg depends on the changes the drivers have brought about.

All four scenarios, however, share the following assumptions about technology and lifestyle patterns:

- virtually zero-emission electricity production
- radical reduction of energy required for heating and cooling of buildings, both in new and existing ones
- decreased need for mobility and radically reduced levels of private car use
- reduced consumption of meat

The following table provides an explanation on how each scenario differs in terms of reaching the 8000 kg target in the different lifestyle domains.

Material Footprint (kg/person/year)	Singular Super Champions	Central assumptions on technology	Central assumptions on lifestyle	Governing the Commons	Central assumptions on technology	Central assumptions on lifestyle
Food	2500	Hi-tech organic.	Price mechanism, sustainable elite, low to no meat, efficient diets (economy-ecology-health).	2500	High-yield plants, synthetic meat, less waste.	Smaller energy intake, no appetite for meat, healthy diets.
Housing: building	1300	Global zero energy technology (no heating or cooling), longevity of buildings, but mostly newly built, flexibility of flats, upcycling of construction materials.	Small, smart flats, flexible space use, dense living.	1400	Smart homes, retrofitting functional, space-efficient flats.	Few new buildings, efficient space use, mainly from wood, virtual services reduce need for space at home, home replaces office.
Housing: eletricity	300	The energy demand of housing and ICT has decreased, thanks to efficient technological solutions. Highly resource-efficient and carbon-neutral wind, as well as solar power.	Energy demand has decreased in housing and ICT, but not substantially, as ICT is everywhere.	300	Reduced energy consumption but ubiquitous ICT, based on electricity and super grid, diverse renewable resources, distributed production, fossil fuels phased out, lots of players in energy market.	Ubiquous ICT, homes replace offices and meeting locations, limited amount of 3D-products.
Mobility (daily and tourism)	2800	0.2-0.4 kg/km. Dense local service network as a result of economic efficiency and super-efficient logistics systems, shift in urban infrastructure from car traffic to smart mobility based on efficient Personal Rapid Transportation systems, expensive high-volume fast rail network between agglomerations (new but efficiently used infrastructure).	5000-15000 km/yr. People live near and move after work in(to) extremely dense areas of excellence, healthy mobility patterns major part of daily exercise, transparent pricing boosted awareness and phased out car use in urban areas, prices reduce traveling in general, but many people still travel occasionally, only full planes and other vehicles.	2700	0.3 kg/km. Smart and individually customised public transport, car-sharing, slow air travel (e.g. solar zeppelins). Maintenance of existing basic infrastructure.	9000 km/yr. Car-sharing, minimal commuting (e.g. no more offices), personal optimisation, direct behavioral feedback, virtual consumption reduces travel needs.
Product consumption	500	Extremely efficient ICT solutions (sensors, centralized computing, cloud farms), use of abundant instead of scarce materials for ICT, combination of longevity and sophisticated recycling.	Low to no-material elite: dematerialisation is cool. People invest in themselves.	500	Modular appliances. Centralized cloud farms, optimal location. 3D component printing. Recycled materials.	Less ICT appliances. Virtual consumption reduces overall resource use. Small amount of tailored personal goods. 3D shopping culture.
Leisure time	300	Improved resource efficiency of ICT.	Educational services.	400	Improved resource efficiency of ICT.	Virtual entertainment.
Others	300			200		
Sum	8000			8000		

Material Footprint (kg/person/year)	Local Loops	Central assumptions on technology	Central assumptions on lifestyle	Empathetic Communities	Central assumptions on technology	Central assumptions on lifestyle	Average European in 2008 (Lähteenoja, S., Lettenmeier, M., Salo, M. (2008))	Reference goal: Sustainable Material Footprint 2050 (Lettenmeier, M. (2012))	Central assumptions on technology	Central assumptions on lifestyle
Food	3300	Efficient production and plants, less transportation	Optimal food intake, use of food services, no leftovers	3600	Local nutrition cycle, very low transport.	Sufficient and healthy lifestyle, occasional scarcity, self-sufficiency.	7300	3000	Lower resource intensity (9=>5-6kg/kg), e.g. less waste.	Low meat and dairy(9=>5-6kg/kg), low intake (500-600kg), less waste.
Housing: building	1300	Modular infills help in using existing infrastructure. Wooden construction increases.	Less appliances, less rooms, less living space, more shared spaces outside the home.	1300	Resource-saving housing design, diverse retrofitting of existing buildings, longevity of buildings, infill on yards makes housing denser and allows more community-based living.	Clever housing design allows living in less space, dense living, new social practices, community space.	2400	1300	Zero energy and low resource intensity (longevity, new materials) =>65kg/m2 (about 2012 in building resource intensity but in 2050 as a zero energy building incl. energy).	20m2/person, no built yards.
Housing: eletricity	400	Breakthrough in solar panel technology, local energy sources, no or few energy exports, different CO2 and resource intensities, efficient neighbourhood-level CPH production for home and work.	Less appliances, less rooms, less living space.	800	Local low-tech solutions, distributed production, low-tech solutions using wind, solar and residues of biomass.	Significant voluntary reduction in consumption levels, less appliances.	3300	300	1000 kWh 0.3 kg/kWh, wind and solar, efficient appliances	Less appliances through smaller room space.
Mobility (daily and tourism)	1500	0,25 kg/km. Cycling routes, reduced travelling means that old railroad and ship stock and infrastructure are still sufficient and in use.	6000 km/yr. No need to go far, regional holiday, high recreational value of local biodiversity reserves. Home delivery of everything. Work and home in the same place. Journeyman, travel once in your lifetime.	1200	0.3 kg/km. Less road space, streets converted to food production lanes.	4000 km/yr. Minimal mobility and traveling, walking, cycling. Village infill, from sprawl to farm village.	11000	2000	0.2kg/km (1,5-2 more efficient than present bike, bus, local rail, boat, flight).	10,000 km/yr, no car use.
Product consumption	400	Local maintenance, reuse and recycling services. Longevity and user-centric tailoring of products. Light ICT.	Services replace owning. Less goods at home.	500	Occasional availability of imported goods. Do it yourself. Regional manufacturing.	A smaller number of product (group)s in use. Collective household activities, shared ownership.	2600	500	12 product groups 42 kg/a, indreasing longevity, decreasing material intensity.	Decreasing ownership, increasing sharing options, reuse, second hand.
Leisure time	400	Dense urban structure.	Services widely used.	300		Collective leisure time activities.	1500	400		
Others	700			300			900	500		
Sum	8000			8000			29000	8000		

Annex A:

SPREAD Sustainable Life-styles 2050 Delphi survey Questionnaires

1st round of the Delphi suvey

A) MEGATRENDS
How relevant is the megatrend?
What kind of impact do you see this trend has on sustainable lifestyles in Europe?

1. Global population growth
2. Urbanisation
3. Climate change
4. Increasing resource constraints
5. Technological innovation
6. Aging population
7. Increase of mental and physical illness in Europe
8. Rising resource and energy consumption levels
9. 'Beyond GPD/economic growth' thinking

B) BEHAVIOR CHANGE
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

10. STATEMENT: In 2050 one third of over 65-year-olds lives in a co-operative community.

Senior citizens form communities which combine co-housing, service production and co-operative business. These communities have gathered senior people to inhabit towns and villages while reducing living in single-family houses. Co-operative businesses are a relevant source of income for aging people and harness the vast skills of experienced people while allowing working at a pace suitable for individual capacities.

11. QUESTION: What are the average proportions of income spent to housing, transport and food in 2050?
• to housing, electricity and gas in 2050
• to transportation in 2050
• to food and non-alcoholic beverages in 2050

12. STATEMENT: In 2050 the proportion of people in Europe who recognise needs and motives outside their immediate self has risen from approximately 25 % in 2010 to 55 %.

According to the value surveys, people who take environment into account in their everyday choices, represent very often "universalist" value positions. (See for example Theory of basic human values by prof. Sholom Schwartz)

13. STATEMENT: In 2050 Europeans eat a meal containing meat on average twice a week.

14. STATEMENT: In 2050 number of goods owned by an average European is around 1 000.

C) CITIES AND ENABLING INFRASTRUCTURES
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

15. STATEMENT: In 2050 90% of Europeans live in a place where they can reach work, daily services, diverse leisure activities and green spaces by walking in 10 minutes.

16. STATEMENT: In 2050 the average housing space per person in Europe has decreased from the level of 2011 by a third.

17. STATEMENT: In 2050 majority of big cities in Europe are self-sufficient in terms of energy from local renewable sources.

18. STATEMENT: In 2050 many of the suburbs built in the latter half of the 20th century in European cities have turned to be the most sought-after and energy efficient neighbourhoods.

D) POLITICS AND PUBLIC LIFE
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

19. STATEMENT: In 2050 supporting people living in areas constantly suffering from climate change-related extreme weather conditions (extended heatwaves, storms, floodings) is one of the priorities in the European social policy.

This kind of vulnerability has emerged as one of the biggest sources of inequality. Policy measures help people to move to less vulnerable areas, to refurbish homes to sustain extreme weather conditions and to protect themselves from newly spread diseases.

20. STATEMENT: In 2050 inhabitants of European cities spend annually several days contributing to urban planning processes shaping their own neighbourhood.

21. STATEMENT: In 2050 global compacts defining personal quotas for GHG emissions and natural resource usage are in place and have a great impact on consumption patterns and public investments.

22. STATEMENT: In 2050 road toll is collected from all road traffic in EU countries, both within and outside cities.

23. STATEMENT: Developing sustainable energy, transport, communication and urban infrastructure has required long-term public investments 2012-2050 that are manyfolded compared to e.g. The stimulus packages launched by many nations in 2009-2010.

24. STATEMENT: In 2050 GDP has been replaced by other indicators measuring such phenomena as happiness, environmental stress and social equity.

E) BUSINESS SUPPORTING SUSTAINABLE LIFESTYLES
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

25. STATEMENT: In 2050 the food and retail industry supports customers in making healthy and sustainable choices and has agreed on self-regulation that limits marketing and pricing of items such as candies, potato snacks and soft drinks.

26. STATEMENT: In 2050 the majority of European businesses selling consumer goods (clothing, home appliances) gain significant proportion of their revenue from maintenance, repair, re-use, alterations and upgrading.

27. STATEMENT: In 2050 90 % of cars in Europe are owned by mobility service companies or co-operatives.

28. STATEMENT: In 2050 a typical visitor of health care services (both public and private) is not ill but looking for preventive services.

2nd Round of the Delphi survey

A) CONSUMPTION PATTERNS
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

1. STATEMENT: In 2050 3D printing has expanded enormously self-expressionist capacity of people compared to current mass consumption.

2. STATEMENT: In 2050 people buy most of the goods and services needed in daily life from their peers within the same recognised group.

3. STATEMENT: In 2050 people use over 25% of their time awake collaborating with their neighbours and peers in order to provide food and other basic goods needed.

4. STATEMENT: In 2050 majority of tools and services that are today understood as privately owned property are in shared use within the community.

5. STATEMENT: In 2050 most of the people build their personal status through consumption choices and therefore sacrifice lots of personal resources in order to make qualified decisions.

6. STATEMENT: In 2050 individuals consumption choices are based on resource budget cards. These cards are shopping lists that you use to plan and allocate your personal natural resource budget.

7. STATEMENT: In 2050 most of the things that would've been bought as products in 2012 are bought as services. Today consumption choices cause stress to many people because of information overflow and complexity of alternatives.

8. STATEMENT: In 2050 consumer cultures are extremely local and thus different pending where you are in the world.

B) ECONOMIC STRUCTURES
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

1. STATEMENT: In 2050 majority of people have multiple skills they use as a source of income and they trade services based on their skills with their peers.

2. STATEMENT: In 2050 there two levels of transaction systems: global one operating with global currency and many local ones that are non-monetery by nature. Majority of people take part in both of these systems but it is possible to live only as part of local economy.

3. STATEMENT : In 2050 global resource scarcity and instability of financial systems have forced governments to forfeit economic growth as an indicator of development for the society.
In the first round of SPREAD 2050 Delphi survey 92% of the respondents evaluated the desirability of a situation where by 2050 GDP has been replaced by other indicators with numbers 5 or 6 (in a scale of 1-6).

4. STATEMENT: In 2050 technology has developed in a way that basic necessities for everyone are provided through local production without imports.

5. STATEMENT: By 2050 many traditional and resource intensive, but technologically and ecologically outdated production processes have disappeared through cutting subsidies and internalizing ecological costs in prices.

6. STATEMENT: In 2050 the most valuable and highly sought after resources are in what now understood as waste. Eg. global companies compete in who can clear the Great Pacific Garbage Patch first and make best use of it.

7. STATEMENT: In 2050 local economies are hyper effective in terms of use of natural and human resources because of locally adapted technologies and smart division of labor between different expertises.

C) SOCIAL BONDS
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

1. STATEMENT : In 2050 societies are hyper-balkanized. This means that most of people interact very little with people outside their own social bubble. These bubbles are formed of same consumption patterns, areas of living, work places and hobbies.

2. STATEMENT: In 2050 local production of energy and food have driven people to collaborate with their neighbours on daily basis.

3. STATEMENT: I n 2050 the extreme scarcity of resources has driven people to maintain and build trust and reputation with their most immediate social group.

4. STATEMENT: In 2050 most adults have a personal teacher or mentor they meet at least once a week. These teachers help people to maintain their physical, psychological and professional competitive edge.

5. STATEMENT : In 2050 people form guilds with their professional peers. Guilds are highly important in maintaining professional skills, providing social security and improving individual lifestyles.

D) POLITICAL DECISION MAKING
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

1. STATEMENT: In 2050 parliaments and other representative structures of democracy exist but issue based interest groups have replaced political parties as main political actors.

2. STATEMENT: In 2050 there's a global research and knowledge bank that forms standards for all national and local level political decision making. It guarantees scientific basis for all government action and can be used to veto any decision that is economically, ecologically or socially irresponsible.

3. STATEMENT: In 2050 people in elections vote first on the specific agenda at hand for the coming term and then elect the representatives to put that agenda and goals forward.

4. STATEMENT: In 2050 national decision making doesn't exist any more. It has been replaced by town based councils that have agreed to meet certain global standards.

5. STATEMENT: In 2050 technology has made all information accessible. This has lead people to think transparency as a norm in all walks of life, including politics, business as well as personal life.

6. STATEMENT: In 2050 China has acquired control of most of the found strategic natural resources. This has lead to situation where European countries have to regulate resource streams and use. Heavy taxation is used to control private use.

7. STATEMENT: In 2050 politics is expert driven. Expert groups define guidelines and boundary conditions locally for such issues as natural resource usage and health than are based on evidence.

8. STATEMENT: In 2050 cities have invested heavily in the past 30 years to safeguard guaranteed energy and food production and resource-efficient infrastructure regarding eg. mobility and housing. In the previous round of the SPREAD 2050 Delphi, two thirds of the answers highlighted the importance and probability of more public investments in enabling sustainable lifestyles.

9. STATEMENT: In 2050 World Parliament controls policies on natural resources. Environmental taxation and market mechanisms are defined globally.

E) ENVIRONMENTS OF LIVING AND ENABLING INFRASTRUCTURES
Please assess the probability, importance and desirability of the following statements and offer arguments supporting your views.

1. STATEMENT: In 2050 majority of investments previously made to improve physical infrastructure in cities are now made within virtual realm.

2. STATEMENT: In 2050 traditional urban planning offers merely infrastructure framework for inhabitants to shape their surroundings through collective action.

3. STATEMENT: In 2050 most of the recreational and household activities are performed in the public and shared spaces instead of private ones.

4. STATEMENT: In 2050 people appreciate flexibility and functionality of homes over large living spaces.

5. STATEMENT: In 2050 smart technologies (mobility, energy usage, recycling and other logistics interconnected through highly centralized control) help people to adopt sustainable lifestyle patterns without extra effort.

6. STATEMENT: In 2050 practically all of the unbuilt space in cities is in farming use.

7. STATEMENT: In 2050 in many European cities, people who belong to professional guilds live in the same neighbourhoods.

8. STATEMENT: In 2050 the emergence of adaptive, digitalized and local service economy has decreased the need for mobility.

Annex B:

SPREAD Sustainable Lifestyles 2050 Counting Backwards Workshop

(Tuusula, Finland 23–25 November 2011)

Victoria W. Thoresen	PERL, Hedmark University College
Shawn Westcott	SSD Advisers
Isabel Wetzel	LSE
Venla Virkamäki	Finnish Association for Nature Conservation

List of Invited experts

Yasmine Abbas	
Olubamidele Adeyemo	Pidgin Perfect
Nik Baerten	Pantopicon
Merve Bedir	Delft University of Technology
Gunilla Blomqvist	Swedish Ministry of the Environment
Naomi Raja Boean	ModelMinds/Youthfoodmovement/Knowmads
Lena Brandt	Lena Brandt Produkt/Marke/Kommunikation
Clare Brass	Royal College of Art and SEED Foundation
Janis Brizga	Green Liberty/Latvia and ANPED
John Chang	Skype
Anna Hult	KTH & CITIES
Mikel Insausti	Arteaga Foundation (Kutxa Ekogunea)
Jule Jenckel	358
François Jégou	Strategic Design Scenarios
Liisa Karttunen	Bonnier
Johannes Koponen	Forum Virium Helsinki
Juha Koponen	Netcycler Oy
Kai Kuikkaniemi	HIIT
Tobias Leenaerts	EVA vzw
Michael Lettenmeier	D-mat
John Manoochehri	Resource Vision
Paul Metz	Platform Sustainable & Solidary Economy
Veera Mustonen	SkillsHelsinki oy
Mariaana Nelimarkka	Freelance journalist
Jussi Nikula	WWF Finland
Nikos Palavitsinis	Agro-Know Technologies
Sini Puntanen	Finnish Transport Agency
Florence Rizzo	CIDEL
Arto Sivonen	Måndag
Dragana Stojkovic	Independent researcher
Sebastian Straube	Instytut Odpowiedzialnego Biznes

List of participating SPREAD Project partners and advisors

Ana Alcantud	Ecoinstitut Barcelona
Ines Biedermann	Henkel AG & Co KGaA
Nora Brüggemann	CSCP
Cristina Chiotan	EuroHealthNet
Marta Corubolo	POLIMI
Éva Csobod	REC
Engin Guvenc	BCSD Turkey
Elina Heikinheimo	Demos Helsinki
Cheryl Hicks	CSCP
Sini Hirvonen	Demos Helsinki
Tuuli Kaskinen	Demos Helsinki
Tommi Kauppinen	Demos Helsinki
Outi Kuittinen	Demos Helsinki
Kaisa Kärki	Demos Helsinki
Juha Leppänen	Demos Helsinki
Satu Lähteenoja	Demos Helsinki
Anna Meroni	POLIMI
Roope Mokka	Demos Helsinki
Oksana Mont	ULUND
Aleksi Neuvonen	Demos Helsinki
Harri Paloheimo	Nokia
Mia Paukovic	ECN
Kurt Peleman	Ashoka
Leida Rijnhout	ANPED
Maria Ritola	Demos Helsinki
Kim-Patrick Sabla	University of Vechta
Bettina Schaefer	Ecoinstitut Barcelona
Koen Straver	ECN
Ottó Szabó	REC
Péter Szuppinger	REC
Simo Vassinen	Demos Helsinki

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