Final Project Report

CRISP, Grant Agreement No 265310

By
Walter Wehrmeyer

Centre for Environmental Strategy, University of Surrey

April 2014

Table of Contents

1 Executive Summary.

The past has often been used as a way to figure out what the future may hold, however, this is by and large inappropriate for today: Many factors, such as technology, societal changes, geopolitical changes, profoundly unsustainable resource consumption and environmental problems such as biodiversity loss, climate change, water scarcity and many more; must lead to the conclusion that the past is not only unlikely to be a guide, the future should also be very different from the past. In other words, the most accurate prediction about the future is that it will look nothing like today, and the past should really not be used as a guide towards more sustainable lifestyles or futures. If so, how can we figure out a sustainable, low-carbon future, and how are we going to get there?

The CRISP project –'CReating Innovative Sustainability Pathways' – is an EU funded collaborative research project (Grant Agreement No 265310), undertaken between 2011-2014. The project team comprises seven different organisations from six European countries with a strong and representative mixture across the EU. The relevant EU research Call (ENV.2010.4.2.3-1) asked specifically for these pathways and for bottom-up approaches addressing the question of how to overcome the gap between awareness of the issues at stake and the concrete engagement in sustainability-driven action, as individuals and as a society. This has been the focus for CRISP.

After a detailed policy review and a critical assessment of how existing projects that have the potential to be mainstreamed are functioning and what their core factors of success were, several visioning workshops were held across all partner countries with pupils – typically in their last year before leaving potentially for University – to investigate their visions of low-carbon, sustainable futures by 2030. Pupils were chosen as they are the actors who will (have to) live in the futures the scenario development movement is currently developing. This created over 1500 individual ideas and about 46 visions, many of which overlapped. The visions, and their underpinning ideas were then concatenated towards three overarching "endvisions", called *One Ethical World, Local Community* and *i-Tech,* presenting very briefly these broad characteristics:

- *One Ethical World:* is a vision in which globalised supply chains are realised, global values are locally interpreted, and global healthcare, and governance are foreseen. Fair trade displaces free trade and social equity is diffused within societies.
- *Local Community*: is a vision of strong regional identity, where local production and consumption are well established, decentralisation is achieved, and vegetarianism, social cohesion, individual responsibility and collaborative consumption become the main characteristics of a sustainable community.
- *I-Tech*: is a vision in which technology and innovation become the main drivers. The world becomes a highly competitive place where risk is replaced by intelligent machinery. Functional food, renewable energy and efficient high-tech mobility dominate.

It later emerged that these three visions can also be seen to represent as archetypes the influences of governance, community and technology. In addition, CRISP makes no case that these visions are likely, desirable, sustainable or one being preferable over another. They are visions representing pupils' visions from across Europe.

These visions were then seen as the endpoints of a backcasting and transition pathway development process – again with pupils but also with technical experts and consultants. To provide more specific details on the transition pathways, one of three sectors were chosen for the participants to focus on in their work towards the transition pathways, namely mobility, household energy and food. These 9 permutations were then compared across workshops and participant groups and concatenated into final pathways. These final pathways were then contrasted with other such pathways (including the Europe 2050 pathways) explored in their viability, feasibility, desirability and internal logic using expert interviews as well as questionnaires amongst different publics across the EU.

Amongst many things, the project showed that laypeople are able to develop meaningful visions and corresponding pathways for "their" futures. It also developed a process by which this can be done. In addition, viable transition pathways can be implemented better with support from political spheres (especially Local Authorities), and it appears that a dual approach (supporting bottom-up initiatives with top-down governance and regulatory support) seems to be working well. The pathways and the project analyses also highlighted that multi-stakeholder initiatives with visionary leaders as well as a consensus amongst stakeholders about the need for change and the desirability of the vision (transition platform) also seem essential component, highlighting the need for visions that were developed with much greater social inclusion, including young people.

2 Summary description of the project context and main objectives.

2.1 Aims and Objectives:

Given the text in the Call, the project aims at outlining "bottom-up approaches which address the question of how to overcome the gap between awareness of the issues at stake and the concrete engagement in sustainability driven action, as individuals and as a society". It developed visions of a low-carbon, sustainable life in 2030 and provide transition pathways towards post-carbon societies. To realise these overall aims the project planned to address each of the following sub-objectives, which are directly related to the Work package (WP) structure of the project:

1. To provide a state-of-the-art review of barriers, drivers and synergies towards sustainable development from a policy and conceptual perspective.
2. To develop a suitable assessment methodology to review the efficacy and success of practical initiatives towards sustainable development
3. To review specific initiatives towards sustainable development at different levels, with a diversity of policy contexts, actors, agents and interests.
4. To develop a set of policy- and practice-relevant lessons that can be learnt from the conceptual and practice reviews.
5. To develop end-vision scenarios towards sustainable development.
6. To backcast these scenarios to develop meaningful trajectories for stakeholders.
7. To evaluate and compare the trajectories for the various scenarios.
8. To provide clear and effective guidelines on how different future scenarios can be attained.

2.2 Project Context:

The processes of developing a better understanding and conceptualisation of the future are, by necessity and design, inclusive as well as social processes, which depart from traditional forecasting processes in a fundamental way, as forecasting processes are evidently unreliable in fast-changing societal contexts, and inappropriate if a continuation of the past is to be avoided. This has been recognised by many inclusive processes that have taken place over the years, such as national foresighting exercises undertaken in South Africa, the UK, Germany, the Netherlands, Jamaica, Mozambique and the Seychelles. In addition, the EU roadmap demands such inclusive processes to be applied for future visions, and the transition pathways towards these visions, to be conceived and promoted in that manner (European Commission, 2011). It had been claimed, starting at the Earth Summit at 1992 and still ongoing and in progress (Sondeijker, 2009), that conventional scenario cannot live up to the challenge of visualizing, informing and anticipating the dynamic processes of transformative change. As a transition is complex and needs a system approach for defining paths for a sustainable Europe.

Currently, the most endorsed and perhaps most suitable process to enact the development of future visions and their transition pathways is a combination of Backcasting and Transition Management. The rationale behind transition scenarios is that we are facing persistent social problems of high complexity and uncertainty. For anticipating these developments and influencing future sustainability, we have to be aware of the need for a more radical type of change process that differs significantly from the trend-based ones envisioned in the more conventional scenario approaches. This is because sustainability suggests that prospects for disruption, discontinuities, surprises and shocks are increasingly in evidence. Subsequently, the claim is made that new and better scenario approaches need to be developed that can merge in with this new perspective on foresight.

The processes of developing a better understanding and conceptualisation of the future are, by necessity and design inclusive, social processes which depart from traditional forecasting techniques in a fundamental way. As argued earlier, forecasting is unreliable in fast-changing societal contexts and inappropriate where a break with the past is desired. This has been recognised by many inclusive processes that have taken place over the years, such as national foresighting exercises conducted in

South Africa, the UK, Germany, the Netherlands, Jamaica, Mozambique and the Seychelles. In addition, the EU roadmap demands such inclusive processes are applied in the development of future visions and related transition pathways (EU Commission 2011).

Currently, the most endorsed and perhaps, most suitable process to encourage the development of future visions and associated pathways is a combination of backcasting and transition management approaches. Backcasting methodology involves first creating a desirable vision, and then identifying strategic actions in reverse order from the future vision to the present of how this might be achieved (Quist and Vergragt, 2006). This methodology has been described and demonstrated by many, and a number of steps have been proposed (Quist, 2006; Robinsons, 1982; Quist and Vergragt, 2006; Mander et al., 2008; Kok et al. 2011; Carlsson-Kanyama et al., 2008). Quist et al. (2006) described the process in a generic though, holistic way through a number of steps. These steps are outlined as:

1. Strategic problem orientation,
2. Construction of sustainable future visions or scenarios,
3. Backcasting,
4. Elaboration, analysis and defining follow up and action agenda,
5. Embedding results and generating follow up and implementation.

These generic steps reflect those followed in transition and transition management approaches as well (Quist, 2006). What is different about transition management is that it is specifically focused on the governance aspects of attempting to actively manage societal transitions from one set of system dynamics to another, based on three inter locking and interactive features (Figure 1) (Foxon et al 2009).

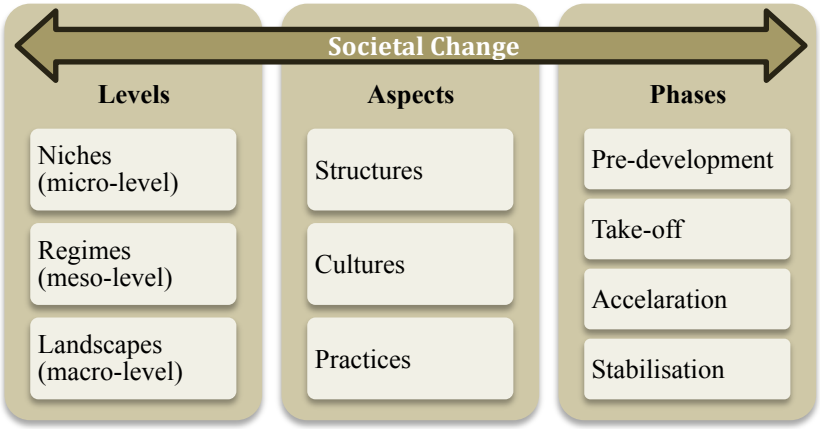


Figure 1: 3 interactive dimensions of societal change

Societal change happens at different levels, namely *niches*, *regimes* and *landscapes*, including the dynamic interactions between and across these levels (Rip et al 1998, Geels, 2002, 2005). It also happens at three different aspects of socio-economic systems (Sondeijker 2009; Martens et al 2002; Geels, 2005) including *structures* that focus on policy frameworks and governance policies, *cultures* that involve personal ethics, as well as local and global cultures, and *practices* or technologies that affect lifestyle patterns and habits (Figure 1) (Sondeijker 2009; Martens et al 2002; Geels, 2005). Due to the complexity of this process, transition is unlikely to be directly realised but a period of time will be required for changes to be embedded in current structures, cultures and practices and be stabilised for the societal transformation to be achieved (Geels 2005, Sondeijker 2009). As such, a number of phases are distinguished in the picture of transitioning societies (Figure 1).

It should be noted, however, that this picture of transitioning societies is not without conflict and disagreement, as structural, cultural and practical actions that drive changes at the different levels are in a continual encounter with actions that resist change. As a result, the success of the "take-off" and "acceleration" stages often depends on the relative success of the structural, cultural and practical actions to cross or bridge levels and to overcome or incorporate resistance. It is then when niche activities are mainstreamed and further actions are initiated, triggering further changes and introducing a certain irreversibility of the induced change (van den Bosch et al, 2005; Foxon 2010; Geels 2005; Sondeijker, 2009).

The multi-level perspective recognises the importance of a diverse and dynamic set of stakeholders and their specific overlapping networks, and is hence recognised as a vital element of the emerging transition management. However, what is not yet clear is whether this element is rooted in the participatory dimension of the backcasting methodology, or constitutes part of the transition theory on

how societal systems should change. As such, and taking into account the fundamental nature of this element, it is not sensible to attribute it to the one or the other. As a result, the linking of backcasting and transition management yields a complex picture of the dynamics of societal change at different levels, with bespoke aspects and transitioning through a broadly defined set of stages. In this, Backcasting is embedded into a wider (Transition Management) process, and contributes by developing a social understanding of the need for change, and developing (in participatory processes) the visions (or scenarios in the earlier backcasting projects) towards which change is to happen.

2.3 The importance of scenario planning

For as long as humankind tried to plan, figuring out of what the future will hold has been a key endeavour to be prepared for the future. Since the Second World War, forecasting has been the dominant tool to do this, where a selection of current parameters are used to predict future events - assumed to vary by certain, assumed amounts. Growth forecasts are thus variations of past patterns, sometimes with upper and lower estimates that come from varying some of the parameters, and we have become increasingly sophisticated in this practice. However, forecasts require stability of the system that is to be forecast, picking the right parameters, an absence of system-changing disruption, acknowledgement that factors shaping the parameters are not changing in the long-run and that change itself is gradual and, effectively, foreseeable. The less the future is different from today, and the closer the future is, the better they work. However, none of these assumptions hold, nor, more importantly, should we wish to have the future to be a continuation of the deeply unsustainable past. It is the need for discontinuous change that requires not only a different understanding of the future, but calls for a different methodology to derive such futures.

Scenarios are broadly defined as consistent narrative about possible futures. They have become popular in stakeholder discussions and the exploration of alternative possibilities in wider policy and engagement processes.

Methodologically and morphologically, there are at least three generations of scenario types that can be identified (Sondeijker, 2009).

1st Ranges of Forecast: Here, forecasts were opened up towards a greater range of possible futures by changing system parameters, typically growth rates of the system under scrutiny of subsystems that are part of it. The Club of Rome forecast on the “Limits to Growth” from 1972 is perhaps the most famous example of it, which also showed some of the criticism towards this early generation, as it ironically showed supreme faith in the technical predictability of social systems yet underestimated fatally the role of technological change.

2nd The second generation of scenarios was improving on the earlier scenarios by essentially improving the modelling component, with greater emphasis on the inclusion of uncertainties, and their somewhat different treatment within the model; as well as the consideration of longer-term trends. In sort, the models were still by and large based on a perpetuation of the past and its trends, but in a more sophisticated as well as careful manner.

3rd Generation models are by nature and design more transitional and aspirational as many of these depart from the past or present as starting points, but begin by envisioning futures. As a result, they are by nature substantially more participatory, and have, arguably, adopted a different stance with regard to the starting point of scenarios. By starting in the future, many of these are much more designed to explore the implications and the dynamics of change, evaluating what could happen much more than figuring out what will happen.

Alongside these differences over time affecting the methodology of these scenario development approaches, their purpose has also changed: Where early scenarios tried to offer greater accuracy by identifying a rage of possible forecasts, the 3rd generation scenarios are now not so much a tool to predict futures by a tool to discuss futures. They have become tools to engage with relevant stakeholders the implications and impacts of plausible narratives of futures, and tare thus substantially more inclusive, deliberative and dialogue-driven. In this sense, the dialogue over scenarios has become a process that is often valued higher than the outcome of a particular scenario description. Likewise, the process has become an output in its own right.

For a discussion of futures that ought to be different from the present, which by design should include discontinuity from the past, 3rd generation scenarios are very suitable. Like with earlier generations, their main strength does not lie so much in the evaluation of possibilities and likelihoods, but in the analysis of assumptions, interdependencies, bottlenecks, obstacles and overlaps. Many 3rd generation scenarios are therefore deliberately vague in their initial description, and the implicit assumption of such scenarios is that, when it comes to strategic planning for the future, two scenario outcomes probably matter more than the actual content of an individual scenario: Firstly, understanding assumptions and interdependencies allows a better indication of likelihoods than traditional forecasts as it opens up a range in a decision-making space that is wider (as opposed to a

range of forecasts that still imply every assumption remains unchanged and affect the overall outcome in a predictable and stable manner). Secondly, the most likely future is often a blending and overlapping of the diversity of futures explored. As a result, the dialogue-driven 3rd generation scenario approach has been adopted here the precise methodology by which they were generated is described in the following section.

In conclusion, the context of CRISP has these dimensions:

Politically and socio-economically, in the transition towards a more sustainable future, Europe has to develop visions and implement corresponding pathways towards more sustainable lifestyles and markets as well as technologies that support these. This has to be in line with the need to develop successful strategies to ensure Europe remains globally competitive, and addresses deeply-vexing structural ills, such as an ageing society, (youth) unemployment, structural and social imbalances as well as seemingly growing unease towards Europe itself as a vision of unity and integration.

Ethically and democratically, individuals or stakeholders who are affected by a decision should have a say in what that decision should be. This is the basis of all land-use and geographical planning processes in Europe, this is enshrined in the democratic process, and yet when it comes to the development of alternative futures, those who live in these futures are typically not involved (or actively ignored) in the decision-making process. Therefore, if visions should be carried by the people of Europe, they should have a say in this – as the precursor to any "bottom-up" approaches the FP7 call is asking for, but also as a way to ensure that implementing such visions becomes easier if people have had a say in what these visions should be.

Methodologically, the practices of backcasting, scenario development and transition pathways have gelled over time into a cogent and coherent aet of actions and agendas that are strongly supportive of developing such visions. CRISP has been instrumental in demonstrating that the development of such visions and pathways can be made using lay-people.

3 Main S & T results/foregrounds

To realise the CRISP project objectives, each of the following sub-objectives were directly linked to the Work package (WP) structure of the project:

WP1: To provide a state-of-the-art review of barriers, drivers and synergies towards sustainable development from a policy and conceptual perspective.

WP2: To develop a suitable assessment methodology to review the efficacy and success of practical initiatives towards sustainable development

WP3: To review specific initiatives towards sustainable development at different levels, with a diversity of policy contexts, actors, agents and interests.

WP4: To develop a set of policy- and practice-relevant lessons that can be learnt from the conceptual and practice reviews.

WP5: To develop end-vision scenarios towards sustainable development.

WP6: To backcast these scenarios to develop meaningful trajectories for stakeholders.

WP7: To evaluate and compare the trajectories for the various scenarios.

WP8: To provide clear and effective guidelines on how different future scenarios can be attained.

WP9: To Disseminate the project and its results widely

WP10: To manage the project well, and to disseminate widely its results.

Each aim consists of a specific Work Package, outlined in detail below:

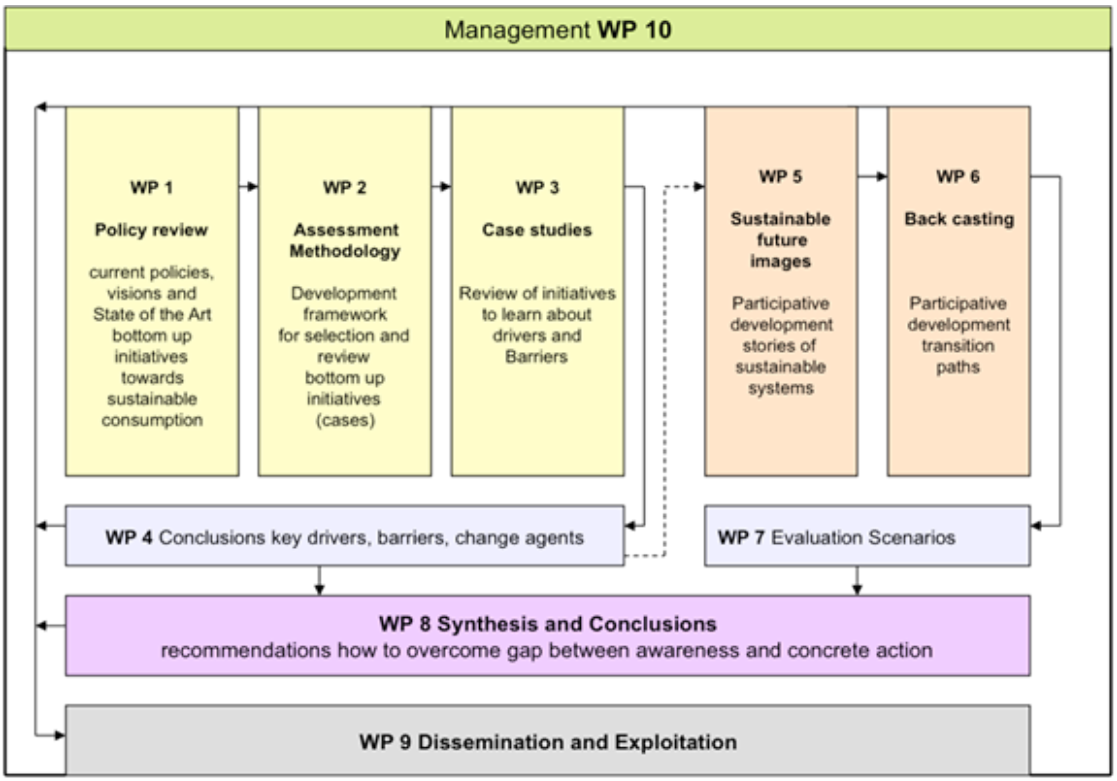


Figure 1: Work packages and their objectives in the project

Phase 1 (Describing the current situation, WP1, 2, 3 and 4) provided the policy and conceptual basis with Phase 2 being the core of the empirical components of CRISP. With the exception of WP9 and WP10, all work packages were broadly sequential in that after a Policy review of existing scenarios, visions and their associated policies, such as the EU2020 and 2050 visions (WP1), a number of practical case studies of successful initiatives were selected and examined that are as yet niches but could be up scaled successfully towards the transition to low-carbon, sustainable lifestyles in the three sectors of food, household mobility and household energy (WP2 and 3). Common themes amongst these and the policy context for successful transitions were then evaluated in the concluding part of the first phase (WP4).

The second, more empirical, phase of CRISP (WP5-7) started by developing initially approximately 45 envisions, which led to the synthesis of three overall visions of low-carbon sustainable lifestyles with

the enthusiastic participation of young people (WP5). These were thereafter explored through backcasting, and trajectories (pathways) towards them were developed in WP6, which is the focus of this report. Following this, the results of WP5 (and to some extent WP6) were evaluated in WP7, with policy conclusions and recommendations to be made in WP8.

As a result, the main findings from CRISP arise from WP 4, 5, 6 and 8. There have been several very significant findings in other RTG WPs, but since they have fed into these WPs, they are not being reported here separately.

3.1 WP4:

Foreground of WP4:

Contemporary social and environmental problems call for systemic, structural changes toward global sustainability in different sectors, particularly in energy, transport\mobility and the food sector (Elzen et al., 2004; Van den Bergh and Bruinsma, 2008; Grin et al., 2010). As problems in these domains are highly complex and uncertain, we need complex and long-term processes of transition in order to sustain the way we fulfil societal needs (Raskin et al 2002). Such transitions require changes at different levels and also need to incorporate the involvement of multiple stakeholders.

Transitions are defined as complex, non-linear, long-term processes involving the structural transformation of societal systems (Grin et al. 2010, de Haan and Rotmans 2011, Geels and Schot 2007, Loorbach 2007) “when the interaction between societal subsystems influences the dynamics of the individual subsystems, leading to irreversible patterns of change” (Grin et al 2010, p. 4). Transitions toward sustainability refer to a “radical transformation towards a sustainable society as a response to a number of persistent problems confronting contemporary modern societies” (Grin et al. 2010:1). These persistent problems – such as the energy problem and climate change – are signs of unsustainable societies, they are complex (as they are deeply rooted in our societal system and are related to system failures which create lock-in and path-dependencies), uncertain and difficult to manage. They emerge as a result of applying simple, single-perspective and linear solutions to systemic processes of socio-ecological change.

In transition management research, the multi-level perspective (MLP), originally developed by Rip and Kemp (1998) and further elaborated by Geels, Grin, Kemp, Rotmans and others (Kemp et al. 2011; Grin et al., 2010; Verbong & Geels, 2007; Geels, 2005; Smith et al., 2005; Rotmans et al., 2001), analyses transition dynamics by distinguishing three levels within the societal system: the *landscape*, representing macro level trends, barriers, and drivers, the *regime*, which represents dominant institutions and technologies and *niches*, in which radical innovations emerge or have the potential to emerge (Geels & Schot 2007, Grin et al. 2010, De Haan and Rotmans 2011) providing seeds for change.

The aim of transition management – as a new mode and way of thinking about the role of governance – is to find solutions for persistent problems based on the identification of transition dynamics and processes that “tries to utilize the opportunities for transformation that are present in an existing system” by “joining in with ongoing dynamics rather than forcing changes” (Rotmans et al. 2001). According to Geels and Schot “The MLP does away with linear causality. There is no simple cause or driver in transitions. Instead, there is co-evolution within and between the levels, i.e. processes at multiple dimensions and levels simultaneously. Transitions come about when these processes link up and reinforce each other. This deviates from technology-push approaches, which can be found in punctuated equilibrium frameworks...” (Geels and Schot, 2009, p. 22).

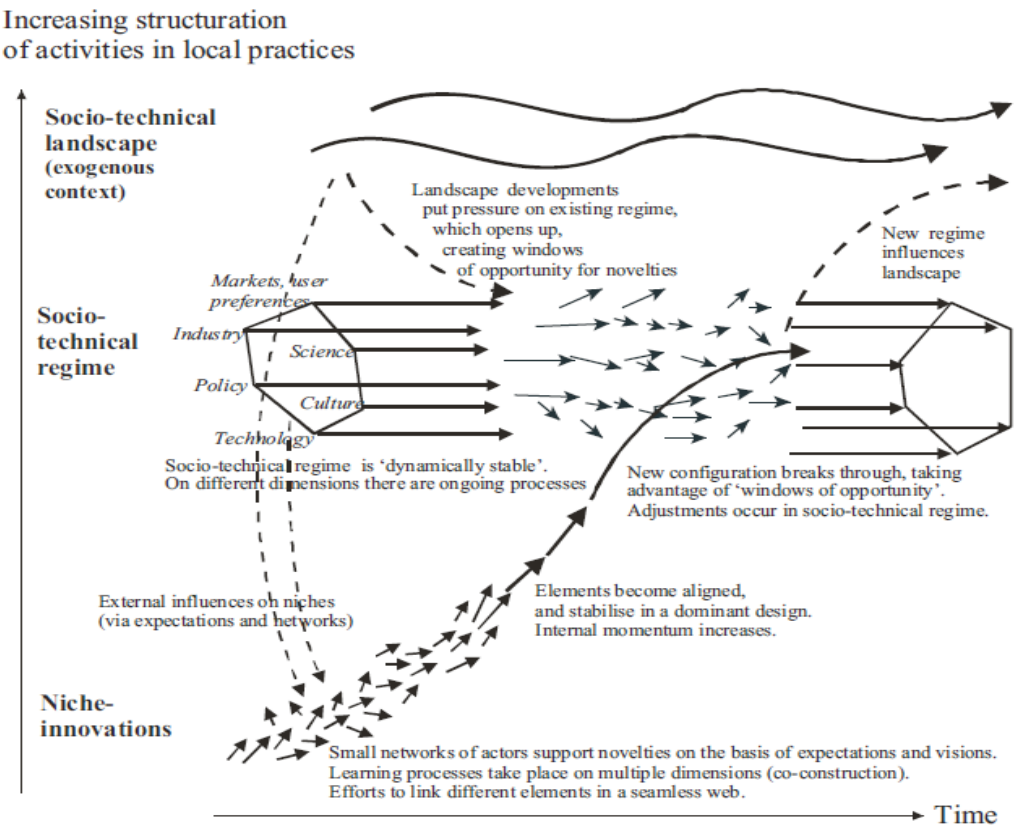


Figure 2: Multilevel perspective on transitions (Geels, 2011)

One of the key observations made in transition management theory, is that the existing regime is stabilized through lock-ins, resulting in path-dependencies. Transitions occur if there is a shift from one regime to another, therefore the regime level is of key interest. It is defined as the dominant structure, culture and practices in a societal system (Rotmans, 2005) or dominant rules, practices and shared assumptions (Rotmans et al. 2001). According to Geels (2004), we can distinguish seven interacting dimensions of sociotechnical regimes: technology, user practices and application domains (markets), symbolic meaning of technology, infrastructure, industry structure, policy and techno-scientific knowledge.

According the principles of transition management, the niche level (micro level), is an important incubating space through which radical innovations – ones which deviate from the existing regime – might emerge, with the aim of solving or addressing persistent, societal problems. This is felt to be an important catalyst for transitions to occur, with actors typically less constrained by the dominant institutions. At this level, there is a greater willingness and able to experiment with radical alternatives, with less pressure exerted from the macro level. Ideally, these innovations should be socially desirable and they should be radical, to the extent that they "have to fight against existing systems and often face a mismatch with regard to existing infrastructure, user practices, regulations, etc." (Schot & Geels 2008, 2).

The landscape (macro) level – which is the most difficult of the three levels to change in any significant way – refers to macro-level trends, barriers and drivers to change. As illustrated in Figure 1, typically the following processes occur at the different levels where (ibid):

- niche innovations build up internal momentum
- landscape changes create pressure on the regime and finally
- the destabilisation of the regime creates windows of opportunity for niche innovations to be scaled up to a greater degree.

Given that CRISP is looking at three specific sectors – food, individual mobility and household energy, it is necessary to provide a brief synopsis of the main results into analysing the key sustainability challenges for these sectors. They will then have to be evaluated and integrated with the visions (WP5) and the transition pathways (WP6).

1.1. Food

There have been considerable changes in food consumption – such as eating habits, dietary changes, and the nature and quantity of food – over the last few decades, mainly due to an increase in agricultural productivity, greater diversity and range of food choices, and less seasonal dependency. Through falling food prices and rising incomes, food has become more affordable in many parts of the world. Yet, while there have been significant improvements in addressing undernourishment globally (Alexandratos, 2006), there are still countries where calorific intake has declined. Due to the food price spike in 2008/2009 the share of people suffering from hunger and malnutrition has grown. Due to the financial crisis, in many European countries the use of public food banks increased considerably (European countries in 2011 faced a 20% growth in use of food banks, UNECE 2012) while half of edible and healthy food is wasted in households and supermarkets (in the EU-27 89 tonnes a year, 179kg per person yearly). Therefore the European Parliament adopted a non-legislative resolution that calls for urgent action to halve food waste by 2025 by introducing better food education in schools, promotion of awareness campaigns introduction of dual-date labelling with sell-by date and use-by date.

According to FAO (Alexandratos, 2006), food production has to increase by up to 70% in order to feed the growing population projected to be around 9 billion people by 2050, with the biggest increase needed in low-income countries (Africa for instance is projected to double its population by 2050). Other important future challenges for food production and consumption are: nutrition transition; diet related health problems; food related uncertainty and distrust (e.g. pesticides, hormones, antibiotics, additives or GMO) or threats to human and animal health; rising level of urbanisation; spread of fast food culture; environmental impacts and (future) governance of the food system (Reisch et al., 2010).

Rapid urbanisation has noticeable effects on food consumption patterns. In a comparison of rural and urban diets, for instance, urban populations show a higher intake of calories, fat, animal protein, sugar and prepared food (Popkin, 2004); a trend which is mainly due to an increase in convenience food and out-of-home consumption (The Government Office for Science, 2011a). A related challenge is nutrition transition, which means changes in diet which are characterized by higher consumption of meat, sugar, saturated fat, salt and low consumption of vegetables and fruits, lower levels of physical activities and related health problems. The trend towards higher consumption of fish and meat is expected to continue; for meat, estimates are rising from 37 kg to 52 kg per person per year by 2050 (Alexandratos, 2006).

Along with obesity, malnutrition – referring to both under- and over-nourishment – is a growing concern in the highest socioeconomic status categories in low-income countries and in the socially and economically disadvantaged groups of society (SES) in industrialised countries (Popkin, 2002) especially of the urban population. Mainly affected groups are the elderly, children, poor and sick people. Malnutrition occurs predominantly in so-called “food deserts”: areas of relative exclusion where people experience physical and economic barriers to accessing healthy foods (Reising & Hobbiss, 2000, p.138).

Another challenge to tackle in the food domain is that consumers are increasingly uncertain and distrustful of food suppliers (Reisch, 2011). This is mainly due to recent and reoccurring food scares (i.e. health scares) in Europe and the growing distance between consumers and producers. Substantial changes and market concentration processes are observable in the governance of the food system at both national and international levels.

Emerging environmental problems such as climate change, land degradation, loss of biodiversity, accelerating global energy and water demand are closely linked to food production, consumption and distribution. According to the European Environment Agency (2012) “Global food, energy and water systems appear to be more vulnerable and fragile than was thought a few years ago, due to increased demand for food, and a decreased and unstable supply, according to an EEA analysis”. Major contributors to environmental problems are water used for production, use of fertilizers (with impacts on groundwater, soil and air), intensification of production (and hence loss of agro-biodiversity), increasing food miles and food waste. To date, it is unclear how markets will be able to meet the growing food demand without unduly compromising environmental quality.

1.2. Mobility

Passenger transport and demand for mobility services has increased considerably, by 1.4% yearly between 2000 and 2009 with a decline of 1% - along with a decrease in GHG emissions – in 2009 most probable due to the economic crisis and the reduced purchase of new cars (European Commission, 2011). Air travel increased by 48% between 1997 and 2007 (EEA, 2010) while the use of trains and buses shows more moderate growth. At the same time, the distance travelled and time spent on travel has been increasing significantly as well; people travel more often than in the past.

The growth in demand is due to changes in household structure, growing population and longer life expectancy, increase in income and car ownership, speed and convenience, and growing distances between work places, homes and leisure time programs, (Skinner et al. 2004, Gerkeen et al. 2009). Today, people spend 5% of their time on average on travel every day.

Among social and health aspects, the transport sector has a significant impact, namely as exposure to noise (especially in urban environment), physical inactivity and its contribution to obesity, or high death rates associated with transport accidents. Next to health aspects, congestion represents social challenges as well in the form of misuse of time as opposed to time spent on recreation or other activities (Rubik et al., 2012).

The difficulties of instigating change in mobility relate to the fact that it is one of the most important sectors of the European economy, employing 4.5% of people (about 10 million) in the EU and contributing 4.6% of the GDP. Households spend around 13% of their yearly budget on transport in the EU.

1.3. Energy and housing

According to a report by the European Environment Agency (EEA), households account for 25% of EU GHG emissions and contributed 9% to reductions in 2009 compared to 2005 levels (EEA, 2011). In order to decrease the environmental impact of energy production, the production and use of renewable energy sources, especially hydro, wind and solar energy has increased considerably in recent years (Eurostat, 2012f). However, this trend varies between different countries and amongst different energy regimes.

At the same time, the improvement of the energy performance of new buildings and the existing building stock and of electric appliances used in households, have substantial potential to reduce the energy consumption of households. In regions where this has been most effective, this has resulted in improvement of energy security, mitigating climate change and creating job opportunities.

Developing more widespread sustainable housing programmes poses significant challenges and tries to address a complex set of issues, namely:

- Economic aspects: construction and investment in houses and in renewable energy requires substantial financial resources
- Social aspects: quality and the social capital in the neighbourhoods, crime and safety, poverty and social housing
- Environmental aspects: referring to both spatial and urban planning and landscape use, choice of materials and resources for construction, energy use with a special focus on heating and cooling of houses, use of appliances and renewable energy sources.

In 2009, the residential sector used approximately 27% of the total energy supply (industry accounting for 24.2% and transport for 33%, (Eurostat, 2012b). In the last two decades while energy use by industry decreased by 20%, it has grown by 30% in transport (Eurostat, 2012c) and by 40% in the residential sector with substantial difference between Member States (Eurostat, 2012d) - despite numerous energy efficiency policies and programmes, both by the EU and at national level (Bertoldi and Atanasiu, 2009).

EU countries are heavily and increasingly dependent on energy imports, where more than half of the energy consumed by the member states is imported (Eurostat, 2011b). The most significant dependency is oil (84%) and natural gas (64%). The latter is marked by an excessive growth of use by 50% and more than 30% of gas is imported from Russia. The trend of the last two decades is very promising in regards to the development of a more sustainable energy infrastructure as the use of renewable energy sources increased by almost 150% (Eurostat, 2012e), mainly biomass, waste and significant increase of wind and solar energy.

According to EU housing statistics, when assessing the quality of housing 17.7% of the population lived in overcrowded dwellings in 2009, 12.1% spent more than 40% of their income on housing and 6% experienced severe housing deprivation such as noise (22.2%), pollution or other environmental problems (16.5%). Families with children and households at risk of poverty are more likely to be affected (Eurostat, 2011b, c).

WP3 found that in the housing sector, the link between individual practices and the system level is especially strong mainly due to influence of technology development, political regulation and spatial planning. On the other hand, political regulation and technological path dependency is especially strong in this domain leaving less room for consumer choices. When studying the policy framework on

the European and national level, we cannot find a coherent strategy towards sustainable housing or a commonly agreed definition of it.

Analytical framework – grassroots initiatives and policy development

In this part of CRISP, the following question have been addressed:

- What factors influence the success of initiatives? What are the key characteristics of these initiatives?
- What shape the development of the initiatives and what relationship exists between policy development and the cases?
- What are the main barriers, drivers and change agents?

While the countries studied have similarities in the direction of their economic development, we can find significant differences on the level of their economic stability and in their future trajectories; influenced by a large number of factors such as history, natural and environmental constraints, policy changes and culture, etc. All these factors and especially their combination as a response to various challenges will result in different pathways followed by different countries, regions, cities or communities. Social innovations will differ in their approaches, to different extents, and with different outcomes reflecting both global and country specific barriers and drivers.

When analysing the policy framework both on the EU and national level, we also recognise that a strong focus of policies on technology, industry and the commercial sector, has often been to the detriment of important areas such as social innovation and social entrepreneurship. The European Commission itself has launched a new program to research and support social innovation across Europe as there is no information and analysis about instruments and support for this kind of innovation in the different countries. Therefore, it is apparent that there is a need for both Member States and the EU to develop a policy toolbox of support for social innovation projects.

As this report has pointed out, niches and initiatives have to overcome various barriers when trying to mainstream niche ideas: up-scaling towards broader application, replicating and transferring to other contexts and translating when practices get mainstream (Seyfang, 2010). These three elements have been explored in depth in the first phase of CRISP as well. When looking at these different processes therefore, we have identified the following barriers and drivers at the various levels:

- Up-scaling,
- Transfer and replication,
- Translation.

It is apparent that innovations emerge in specific local contexts therefore, if they are to be applied in a wider context or replicated elsewhere, they need to be adapted and contextualised to local circumstances. As argued earlier, a crucial factor is the mobilisation and involvement of various actors and stakeholders from the beginning of project design through to implementation of the projects. The use of social media can easily help to connect people involved and interested in the respective niche area. *Organisational factors* are important to both up-scaling and the transfer and replication of initiatives. Questions asked here might be: to what extent are the organisations or cases able to growth? Do they have the capacity and resources to grow? Are they able to address and reach a large share of consumers and get to the mainstream? Social innovation projects also face the challenge to loose the strength of their guiding principles and sustainability vision when attracting the mainstream as initiatives have to adapt to the current regime whilst they are in opposition to the established culture, practices and interests. *Public institutions, resources and policies* have been necessary in all areas and cases as they can help initiatives to grow and to scale-up since (especially radical cases) are in opposition of the incumbent regime. Here, *cultural-normative factors* are important as well, such as in case of reducing needs and wants in the mobility field or reducing meat consumption in the food domain – issues which pose significant challenges for scaling up.

As concluded in WP3, there is a tension between local and global solutions. For instance, on the one hand a global organic industry developed from the original organic movement (Smith 2007), supported by research and policies contributing to the development of an established niche. On the other hand, the original idea of the organic movement did not diffuse and transformed the food regime, rather elements of the organic niche were adapted in the food regime (Smith 2007) that did not replace the incumbent regime. A *stable policy framework* in the Netherlands, characterized by a *more holistic view towards the sustainability of the food system,* and stronger emphasis on behaviour change in the UK, have both contributed to a long-term dynamic growth on the organic market. In the Netherlands, next to regulatory, market-based instruments and the voluntary steps taken by public authorities, the government placed a strong emphasis on the improvement of communication and the

promotion of first-order learning among all stakeholders both in conventional and organic food production. The introduction of a neutral chain manager could increase trust among the actors. In the UK, the Soil Association helped to translate niche practices to the regime as well, by applying new influences (such as GM food, distrust of consumers in food safety) on the mainstream regime. Another important contributor to success has been the level and depth of cooperation on various levels and between various actors; such as public-private partnerships or the cooperation between the business sector and civil society organisations. The first can be important in providing financial support while the latter has worked to encourage increased trust among the public.

As the incumbent regime includes elements of niche initiatives, actors associated with the original ideas of organic production, through localism for instance, can demonstrate the revival of a new organic niche with the emergence of community based food initiatives – challenging the current form of global food supply (Smith 2007). This is clearly observable in the countries studied, but with differing approaches, eg. local produce box schemes, community supported agriculture or farmers' markets. This approach is very strong in Hungary and Lithuania for example. Regulatory instruments help this process by softening the regulation of public procurement for local products and the promotion of these products between producers and public institutions (e.g. schools). In local based initiatives, volunteers have a significant role that will often result in first-order learning in order to mainstream practices. These are often in opposition to the incumbent regime, therefore gaining political or financial support is often problematic. Here, idealists and enthusiastic persons have a significant role to play in driving the agenda. Next to financial support for the development of the initiatives, support is crucial to bring prices closer to conventional products on the market, to initiate and promote cooperation among various stakeholders, and provide financial help to boost market development for sustainable alternatives and mobilise a larger share of consumers.

Another important challenge is *nutrition transition* and directing consumers into more sustainable dietary alternatives. In Hungary, *regulatory* (ban on junk food and soft drinks at schools) and *market-based* (fat tax or junk food tax) instruments are applied, while in Lithuania education and information-based instruments are the main focus. Clearly, a combination of a wide policy mix and the combination of different policy tools would increase the effects of this approach considerably.

In case of culturally and normatively sensitive approaches, such as reducing meat consumption, reduction of car use and needs and wants in mobility and energy consumption, educational and information-based policies combined with examples provided by public institutions and the business sector (e.g. tasty and nutritious meals offered regularly) are necessary. Offering other forms of mobility services corresponding to trends and needs of commuters and travellers and altering current spatial planning are also examples that can help to transform the current regime and to respond effectively to persistent challenges.

Increasing cooperation on different levels and between actors, awareness raising and knowledge dissemination is key factor in areas such as food waste, reducing meat consumption and guiding consumers towards a healthier diet, but structural and cultural barriers have to be overcome as well. Here, availability, accessibility and affordability are necessary too.

In some cases, especially regarding eco-housing and mobility, we could not see a strong consumer demand for greening volume house building or shifting modes in mobility. In recent years, especially due to rising energy prices and peak oil concerns, next to regulation for greener housing and technological development in the mobility domain, stricter regulations are needed as well as the consideration of widening sustainability aspects (e.g. water consumption).

Findings from WP4:

The prevalence and tendency towards pursuing economic growth first is present in all country reports on the national level, as well as at the European level (WP1 report). In the main, this agenda does not consider the failure of the current development path of focusing on economic growth and does not take into account its social and environmental impacts.

The CRISP project has identified a variety of cases, which promise social innovation across Europe. Moreover, many of these cases show the potential to offer answers to persistent problems in the domains of food, mobility and housing. In some cases, niche innovations seem to remain marginal and unable to offer a stable alternative to the regime, especially in case when general trends are in contradiction with their particular agenda. In all cases, organisational and economic factors are essential for the success of initiatives and the public sector plays a key role as well.

In case of food and energy, sustainability garners significant attention from both policy makers and the business sector, with various responses. At the same time, a holistic approach is missing in all of the domains. Agency is of key importance at each stage of the development of innovations. By the

term agency, we mean enthusiastic persons and leaders play a significant role in the success of niche innovations as they mobilise people, build trust, with professional expertise increase credibility, develop visions and provide leadership. Enthusiastic persons also help to build networks that seem to be crucial for up-scaling and mainstreaming system innovation. At its most effective, this network is able to destabilise or influence the incumbent regime and use landscape pressure more effectively. So-called shadow networks (Olsson et al. 2004) work within and outside the system to create new opportunities and replace the current regime. Enthusiastic persons contribute to a successful start of the initiatives (e.g. Edible Rotterdam (NL), Ethical Vegetarian Alternative (BE), Don't buy bottled water (LT), The market –Our treasure' citizens group (HU)), on the other hand relying only on volunteer work without a strong organisational development innovation projects face the challenge to become vulnerable on the long-run.

Mobilisation of the public and increasing public participation can push landscape pressure further and motivate larger-scale experimentation with new alternatives. Cooperation on the levels of regime and niches might be beneficial in many cases as niches offer alternatives and solutions to persistent problems, while the regime has access to the resources to mobilise larger numbers of actors and the public. Actors from different levels also help to transfer and spread knowledge and enhance learning (a good example can be found in the Dutch sustainable food case).

However, in case of mobility, sustainability is rather peripheral to regime interests but it has been attracting growing attention among policy makers as well. Barriers of a psychological and cultural nature pose significant challenges in the transition towards sustainable mobility (e.g. car ownership and driving as status symbol and sign of freedom) or in food consumption (e.g. lowering meat consumption) as well as infrastructural ones, requiring longer time to respond.

Many of the initiatives (Transition Towns, Freiburg, Weissenburg, SZOVET, Samso, Edible Rotterdam, etc.) aim to organise economic activities and system of provision in a different way, strengthen communities with a focus on local and regional actions responding to different needs and values, offering the possibility to get up-scaled and adopted to the different circumstances. Local and bottom-up initiatives and experiments offer the possibility to find solutions to local problems and to more easily overcome cultural, psychological barriers. Lessons of local initiatives can be incorporated in national policies if governance is flexible to adopt these results. When looking at the different levels of initiatives and barriers they face we can observe the need for collaboration of bottom-up and top-down strategies and to find where these different levels meet. Contextualisation, social processes and guiding principles are also crucial if we analyse the transferability and up-scaling potential of initiatives. Social transfers impose a greater challenge than on the geographical level. As practices are rooted in specific, local contexts, these need to be adjusted to national and local settings (emphasized in a few of the initiatives, for example the Climate Road from Norway), where the active role and cooperation of different actors is essential requiring organisational and financial resources.

Other important factors when measuring the successful of niches are the extent of their institutional embedding and of their influence in enabling changes in cognitive frames and assumptions (second-order learning), the size of a supportive network, growth potential and the possibility and flexibility to link with the regime. In short, niche developers need to build up a public and political case for support and to exploit tensions in the regime. An important barrier or prerequisite for the above is the availability of funding and financial resources. When looking at the initiatives, we can conclude that financial barriers are significant when looking at their ability to get up-scaled and transferred. Values and objectives and their ability to connect to policy agendas and interests influence the growth and success of niches substantially as well, many projects (especially bottom-up, grassroots initiatives) grow out of different social movements (e.g. SZOVET, The Market our Treasure, Critical Mass) with different aims, motivation and ideologies.

The initiatives – such as organic farming in the food sector, eco-housing in the housing sector or modal shift and reducing needs and wants – can be seen as radical since they try to reframe the guiding principles in the different domain. Increased use of ICT, applications and the social media can be of help to connect like-minded people and speed up social mobilisation when crisis (such as the oil crisis, the food crisis or the economic crisis) open up new windows of opportunities.

For example, the Soil Association and SZOVET were able to connect to a range of different social and economic policy fields (unemployment, community development, health, education, landscape management etc) that contributed to their success for up-scaling and influencing the regime. In the UK, the Big Society agenda or in Hungary the current focus of the government of national values and cultural heritage have offered windows of opportunity for the initiatives mentioned above. An important landscape pressure for all innovations offer the current financial crises calling for new ways of provision, solution and even values, behaviour and lifestyles.

3.2 WP5 Findings and Conclusions

There are a number of methods and techniques that can be used in an envisioning workshop depending on the scope, issue and outcome pursued. The CRISP envisioning process need to satisfy a number of requirements:

- Compatibility with low carbon futures in the context of sustainable development;
- Created by participants between the ages of fourteen and eighteen years of age;
- Consistent with transition scenarios so that they can be used in the backcasting exercises.
- Cover the thematic areas of food, household energy and mobility.

Based on the requirements, a four (4) step method was designed to set up and to carry out envisioning workshops:

- Step 1: **Setting the stage** –information is gathered to prepare the facilitator for the workshop; participants are selected and sent relevant background information prior to the workshop;
- Step 2: **Envisioning the future** – participants are introduced to the problem area and asked to envision their desired future; techniques enabling creative thinking are employed; facilitation of the process with multi-media recordings.
- Step 3: **Narrating the future**– narrations of the futures are guided by a set structure to enable predefined elements to be included.
- Step 4: **Wrap up and follow up** – the workshops are concluded and participants are informed of future steps and continued involvement with the project.

The workshops were tasked to brainstorm with youngster on "ideas or any aspects of a sustainable and desirable future", with an emphasis on three specific sectors (mobility, household energy and food) and each workshop tried then to develop a set of intrinsically consistent scenarios based on a group clustering technique. Different to other workshops, no voting on the individual ideas took place.

Following this stage, all ideas and workshop scenarios were then put together, to develop three overarching e*nd-visions*:

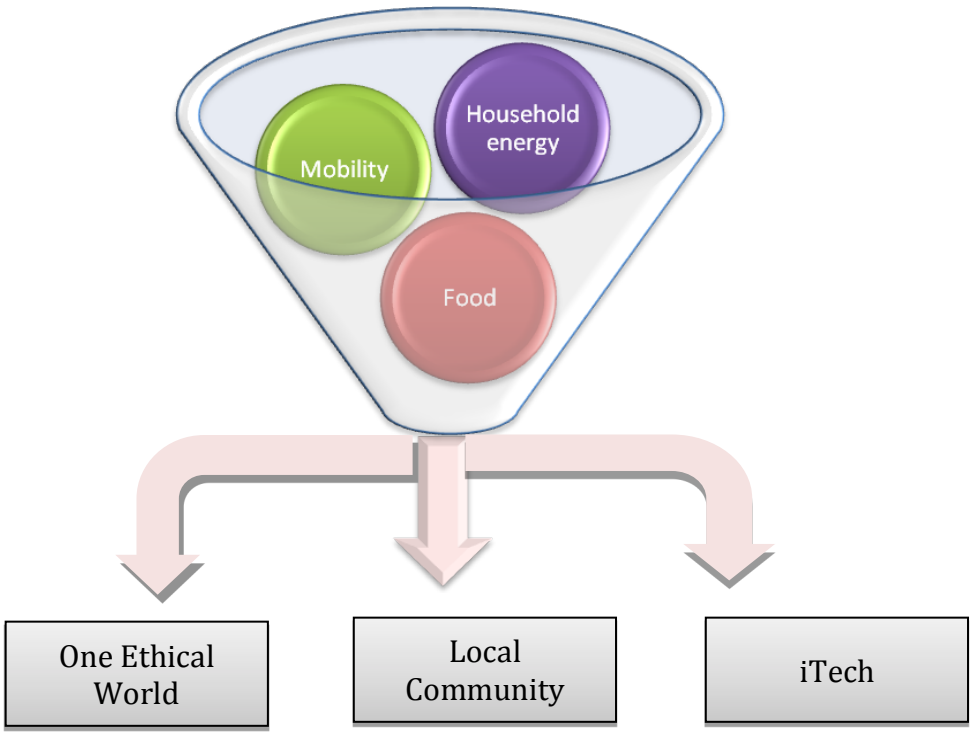


Figure 3: The end visions developed through the consideration of the three sectors

It has to be noted that for the workshops a parental, as well as, full school consent were given in writing form, beforehand. The development of transition pathways is subject to subsequent steps that are not included nor discussed herein.

For the most part of the workshops completed in all 6 countries, the pupils have shown no particular difficulties in engaging with the task at hand and were very enthusiastic about the idea of generating the visions of their own future. They were competent and exhibited critical thinking, as well as, willingness to not only envision but also engage with *their* future.

The narrative of the three end visions developed are presented in Boxes 1-3, and includes a short focusing on the three sectors, namely, mobility, household energy and food. The three end-visions were converted into three shot animation videos, following the idea of van de Kerkhof and Wieczorek (2005) outlining the need for visualisation in participatory processes and the recognition that young people may not read the transition management visions, but may find their animation on more accessible (van de Kerkhof and Wieczorek, 2005). These videos can be found on the CRISP webpage.

ONE "ETHICAL" WORLD VISION

This vision is that of a fairer, more equitable world. The great divisions between rich and poor and developed and developing countries are dramatically reduced. A growing ethical movement and influence from civil society and citizens in response to global economic, societal, and ecological trends are reinforced by a global vision of global justice. This vision is shaped by ethics with mutual correspondence of both ethically informed behaviour and political leadership. The public demands a responsible, transparent government and political process. Adaptive and reflexive instruments initiate dialogue and greater interaction between the macro-, meso- and micro-levels. There are recognised global laws giving rights to everyone and greater standards of equity. People co-operate with *their* government, acting in a collective rather than self-centred efforts.

Global production is based on Fair Trade, because with global allocation/distribution of renewable energy comes global co-ordination and governance. There is equity in the allocation and distribution of resources within the different regions that are either providing or receiving, according to their spatial characteristics, capabilities and needs. This global distribution has allowed an optimization of life-cycle impacts that would be impossible locally or regionally. Greater ecological stability, a reduction in excessive pollution, and greater care for endangered species, forms the basis of a more sustainable society. The greater the economic and political cooperation between countries, the more the aid that citizens will get, especially those who need it more.

Accommodating a growing global population is a central political concern of both developed and developing countries which look on meeting people's needs and developing a decent standard of living for all. Communication between countries is to become easier and languages are more recognised and taught. A global strategic land use plan and resources allocation system will identify specific areas appropriate for organic food production, and others appropriate for energy production and heavy industrial activity. The EU is integral part of the world network of material, information and energy flows, but it has developed a strong reputation for being a leader in behaviour (as opposed to technology) driven change. Social innovation is largely superseded by technological innovation. Responsibility for the societal, economic, and ecological well-being is shared globally rather than regionally. Global sports events help foster a sense of global unity and cooperation.

Unsustainable behaviour is frowned upon with regulation/taxation supporting such social values. For example, individual transport is seen as a selfish action, especially when most commuters spend hours daily on public transport for commuting or prefer to exercise by cycling or running to their workplace. There are also fairer career salaries and a chance for everyone to earn a better wage for their work. Less social discrimination means a more optimistic population keen to work and earn their own money. A strong welfare system underpins these aims with better income distribution and a more efficient and fairer benefits system to support those unable to work. A global health care system, and a cure for all illnesses, such as AIDS, a very low global crime rates and all nuclear weapons are destroyed, promoting global peace.

Of course, **mobility** is important globally and within regions as it helps to develop links between countries based on trade, politics and education. Cheaper tourism to increase income in destination countries also leaves more people satisfied while enjoying and learning about different cultures. People use more sustainable forms of transport w,. In addition, connecting via communication technology rather than travelling is encouraged.

Some types of **food** will be more expensive than others, as for instance meat and fish. This is because other food than meat and fish, is produced ethically in areas with location advantages. There is to be more home cooking and less use of 'fast food' restaurants thus, encouraging family interaction through cooking and avoiding food produced through intensive farming or which embeds more food miles.

Consumers are encouraged to reduce **household energy** use, both via information and education and through policy measures to discourage inefficient domestic energy consumption. In addition consumers are encouraged to decrease the use of non-renewable energies and increase the use of renewable energy sources, especially the energy alternatives to fuels such as, petrol. Energy is to be generated globally according to the spatial characteristics of each area and will be distributed to wherever is needed.

Overall, greater understanding of the human effects of unsustainable development on the natural world exists, and people's energy choices are influenced by this higher awareness.

LOCAL COMMUNITY VISION

The year 2030 is characterised by living in dense communities, organised into regions and clusters. Social cohesion in these clustered communities be they urban or rural, is strong with an emphasis on local cultural identity, local use of resources and family. Social responsibility for ensuring a sustainable living and healthy lifestyle by consuming less food, less household energy, and pursuing more exercise as part of their mobility needs, is enshrined by all citizens. Communities are largely self-sufficient in terms of products and services, effective in the reservation and management of resources, and ungrudging in sharing products and services (e.g. cooperatives) within and between other communities. The shift of monetary transactions to collaborative consumption is promoted and the society is seen as a communal pool of assets to be drawn upon. This collaborative consumption in the form of sharing, exchange or lending is frequent with many products traded directly within the community. The trade for essentials that cannot be supplied locally is limited only to the bare necessitates. All services are facilitated by ICT and regulations. Education constitutes a vital beam of this collaborative community as it promotes a self-reliant society and encourages people to engage in life-long learning, improve their professional and individual skills, fulfil their dreams and aspirations and look for a meaningful and balanced life.

Such societies are communal and frugal, with fully engaged and environmentally-literate citizens who understand the human impacts on the environment and society.

With regard to **food**, local food and decreasing food-miles is a central feature. This is achieved through corner shops, farmers' markets, but also a strong preference for vegetarian food. Locally produced insects are a popular source of protein supplementing the seasonal varieties of food after most meat and fish consumption was scaled down due to animal welfare concerns. A large part of food production is subsistence (garden, roof and wall gardens, community gardens). Different to the past, production here is not for an anonymous market, but production is for a purpose. Food is a communal focus point, and its consumption takes place in communities and communal spaces that have replaced earlier fast food restaurants.

From a **technology** perspective, environmental progress has taken priority over economic progress, but instead of having significant rates of technological progress, communities should rely on existing technology, using it more efficiently, and more tailored to local conditions and needs.

Mobility needs are much reduced and moved away from individual motorised modes. People prefer to work closer to the place they live, products and services are based locally, and for the mobility needs that remain, subsidised public transport in combination with cycling and walking are gaining popularity. Car use is limited to emergencies and far-away places that are otherwise difficult to reach, although car sharing is popular on these routes.

Household energy is locally produced, but energy demand is also reduced through more efficient energy use, warmer clothing and improved insulation. Urban planning based on the ideas of sustainable development has supported this, with extensive waste avoidance and re-use, as well as re-use of grey and rain water and a proliferation of green spaces in towns.

i-TECH VISION

By 2030 technology is recognised as the dominant driver of lifestyle changes as there is an increased reliance on technology for social, political, personal and technical solutions, and on the continuous development of new gizmos, gadgets and gear that have reached every part of everybody's life. The transformative nature of technology is acknowledged, and its strong focus on solutions rather than on process improvements is recognised especially with regards to sustainable solutions. Education is perceived as the mean through which well-educated and highly skilled individuals will be shaped, and new business models and other innovative concepts will be emerged.

With regards to **mobility**, regions and economies benefit from the migration of the information intelligentsia to these areas. Public transport is considerably cheaper, more reliable, affordable available and faster. Innovative technologies are promoted to achieve higher efficiency in order to minimize associated environmental impact and reach more social attraction, whereas individual transport by car is becoming more expensive. World trade agreements on patenting and technology development and transfer have become dominant policy issues between countries and regions. Technology, is facilitating communication between individuals living in distant places either for work or personal related purposes, and is enabling the speaking of different languages by automatically translating into the desired language, while also providing the opportunity to communicate face to face through3D holograms.

With regards to **food**, technology is transforming the production and consumption of food radically. High energy food and drinks of low calorie now dominate the market, while new and novel tastes are continuously developed and jostle for market shares. This cheap and readily available food is accessible to everybody, whereas cooked food is considered a luxury. However, technological improvements and innovations that would turn kitchens into modern and smart spaces, with self-cleaning equipment, multiple functions and high energy efficiency that will help to keep the space organised space and would monitor the food consumed and the food status (near to expiration) will also help individuals to maintain a healthy diet, and waste less food while also preventing them from buying more than they need. Food pills, high tech food production, extensive use of high-tech to maintain appropriate conditions in greenhouses where food is produced, or on roofs and in gardens for local food production is also foreseen. Use of i-technology is also to be employed to make food last longer, thus reducing waste and increasing access to it by more people.

With regards to **household energy**, houses are to be intelligent and smart. They will follow global standards with all kinds of digital and holographic devices and services making everyday life easier and cleaner (clean, cook, organize everything), while also, giving advice on and monitoring the use of water and energy consumed. Almost all accommodation is to be "energy plus", due to a mixture of improved insulation, domestic energy production and reduced energy consumption. PV and solar panels are to be integrated in the material and construction of houses, respectively, while geothermal energy and small wind turbines are to be used for the production and consumption of energy on the community level. At the same time the planning on a global scale has indicated locations for large scale RES projects to provide cheap and clean energy to everyone. Water is to be transported through energy efficient networks from areas that have water surplus to other arid areas of Europe. Also, water needs will be covered by purifying grey and rain water for secondary uses.

Typical technologies include:

- Renewables (solar, wave, tidal water, wind, hydro-, bio-and geo-energy), recyclables and extraction of materials from waste, production of algae for biofuels, renewing water by using toilet-filters.
- High tech substitutes (energy pills, food pills, personal holographic presentation in relation to distant working, open –person solar vehicles, artificial muscle mass as a substitute for meat, hi-tech solutions that experiences the tastes of the past, magnet trains, submarine tunnels, jet packs, nano-, and GMO technologies, solar, floating houses.

Non-invented technologies: one person cabin that can use GPS without rails and can mix pedestrians with cyclists, nano-sized solar cells, voice-activated cooking systems, underwater cars, flying cars, mopeds and horses, cars with muscles, holiday simulators, raw materials from other planets, changing CO_2into energy, amphibious vehicles. Insulation materials on roofs and terraces which change colour according to the weather conditions thus, reducing the need for heating and cooling. Energy production embedded in materials.

3.3 WP6 Findings

Using the concepts of backcasting and transition management, the visions that formed the end point for the pathways were examined to identify the milestones, directions and levels of change for different stakeholders. This was done under the prism of current and future global and local change, using 2013 as the base year and 2030 as the projection year. A catalogue of 400 'building blocks' – future activities that should be used to support positively one or several visions or current and persistent activities that should be stopped as they hinder progress towards one or several visions – was used in the backcasting process (Sondeijker 2009).

Each Workshop broadly followed a set pattern:

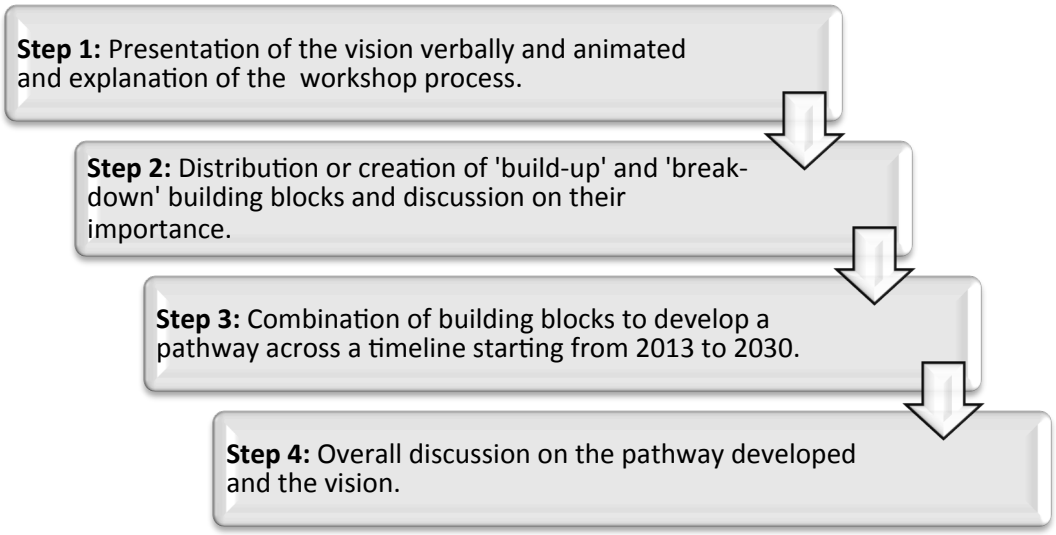


Figure 4: Transition Pathway Development Sequence

In total, 17 Workshops were held in all participating countries focusing on one of the three visions in combination with one of the three sectors namely, Food, Energy and Mobility. The workshops involved either experts or laypeople. The term laypeople refers to ordinary people who according to the dictionary "*do not have specialized or professional knowledge of a subject*" (Collins, 2013). Herein laypeople were in their majority students from secondary and higher education. Students were selected over the general public, because as the argument has it, those affected by a decision, should as well have a say in that decision. As such, the involvement of young people in our workshops was considered as a fundamental aspect for the development of strong pathways, while at the same time it added in our understanding of how young people conceptualize their future.

Each workshop invited only one of the two target groups. The number of participants in each workshop ranged between five and forty-five. The majority of participants were experts. In total, 9 workshops were held with experts and 8 workshops were held with laypeople.

Table1: Backcasting Workshops

	One Ethical World	Local Community	I-Tech
Food	SIFO (Norway) - Expert CEU (Hungary) – Expert CEU (Hungary) – Public	Surrey, (UK) – Expert RUG (Netherlands) – Public	KTU (Lithuania) - Expert
Energy	RUG (Netherlands) – Expert	Surrey, (UK) - Public TNO (Netherlands) - Expert TNO (Netherlands) – Public	SIFO (Norway) – Expert TEI (Greece) - Expert
Mobility	Surrey (UK) – Public	CEU (Hungary) – Expert TEI (Greece) – Public	Surrey, (UK) - Public (x2/parallel sessions)

From the 17 workshops held, 4 workshops were equally taken place in the UK and Netherlands, 3 in Hungary, 2 in Greece and Norway, equally, and 1 in Lithuania. The structure of the methodological approach followed in the workshops was similar in all countries; the vision was initially presented as the basis in which the backcasting process was constructed, followed by the use or not of the building blocks and the development of the pathway.

In the backcasting workshops, the three visions were examined under the prism of current and future global and local change, using 2013 as the base year and 2030 as the projection year, across three sectors namely, food, mobility and household energy (Figure 4-1). The building blocks – or activities identified for the realization of these visions – were reviewed and a re-evaluation of some of the relevant building blocks was undertaken. This was possible as the pathways that were developed from the workshops were based on the chronological attribution of building blocks across 2013-2030. Afterward, the building blocks that made up the pathways were allocated into their dominant vision, and then they were grouped into three dimensions namely Structure, Practices and Culture in order to attain fit and synergistic behaviour towards each future vision (Figure 4-1).

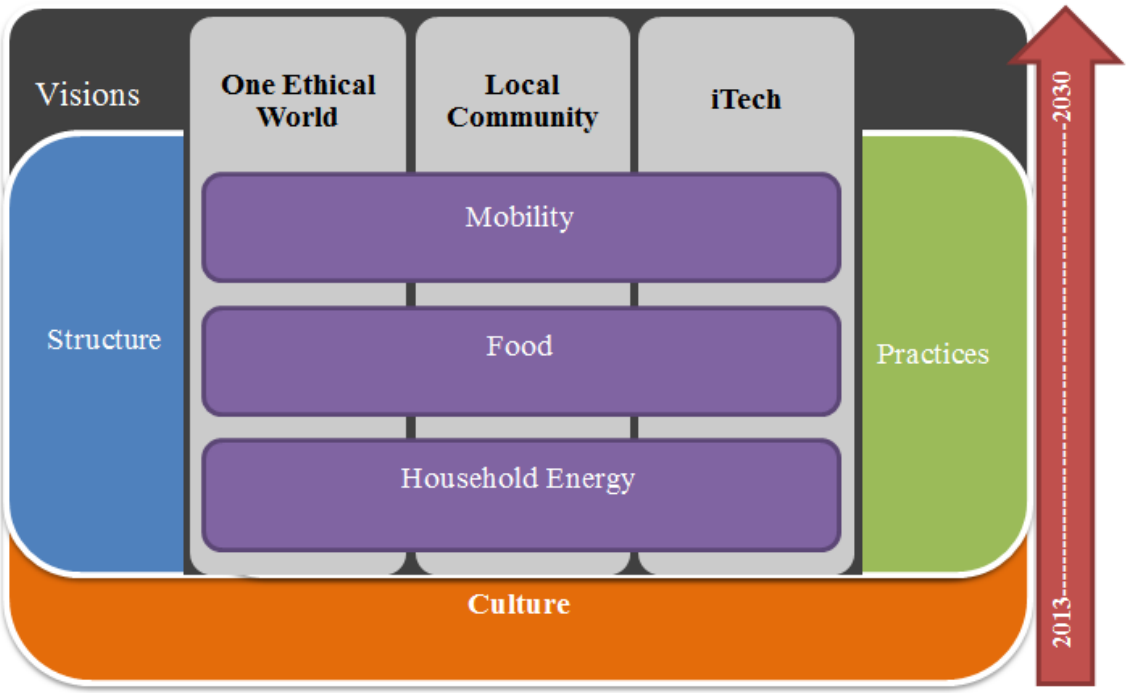


Figure 5: Framework to develop the visions' pathways

The presentation of the pathways based on the three dimensions, allows the comparison and assessment of their individual activities. It also fosters the analysis of convergent and divergent activities between the pathways.

It should be mentioned that Culture is an abstract dimension that affects and is affected by structure and practices. The magnitude and direction of the effect of culture depends on history, spatial characteristics, socio-political situation and economic status and as such, a chronological order cannot define this dimension. For this purpose, no specific actions or concepts have been designated in Culture. Structure and Practices, however, are dimensions that can evolve through time. Structure was set to be a two-fold dimension with 'Governance', and 'Infrastructure' being the backbone of the realisation and organisation of change.

One of the intriguing aspects of the development of pathways during the backcasting workshops was that the activities had to be attributed in a timeline. This timeline had to be retained in the synthesis of the final pathways. Following the Transition Management (TM) this timeline could be distinguished into four phases, each denoting a specific time interval. These four phases were namely the Pre-development, Take-off, Acceleration and Stabilisation. Pre-Development is a three-year time interval, whereas Take-off, Acceleration and Stabilisation, are all four-year time intervals. Year 2013 was the base year and 2030 the projection year.

Table 4-1 presents the pathways developed based on the collation of data derived from the 17 backcasting workshops. The development of these pathways, namely the *One Ethical World*, *Local Community* and *i-Tech*, was based on the allocation of the identified building blocks into the three dimensions and across the four phases established based on the TM theory.

Table 1.3 The pathways developed as based on the workshop results

	ONE ETHICAL WORLD	*LOCAL COMMUNITY*	*ITECH*
PREDEVELOPMENT: 2013-15	▪ Developing global etiquette for business conduct ▪ Fair and equitable trade principles underpin policy ▪ Food prices reflect externalities (meat subsidies removed) ▪ Regulation of industry to encourage incorporation of global, social and environmental responsibility ▪ Re-orienting education to nurture global understanding and cultivate fairness and cooperation ▪ Strengthening of powers and accountability of international institutions to enforce common interests across national	▪ Incorporation of externalities into pricing ▪ Re-orienting education to foster skills for local sustainable living (e.g. food growing) ▪ Strengthening of communities through effective community engagement and devolution of decision-making power to local level ▪ Facilitating decentralisation, individual and community well-being, and local production and consumption become the drivers for policy ▪ Local markets for exchange and barter common	▪ Requires political support, collaboration and will ▪ Policy aims to enable technology, innovation, development and application for sustainable living ▪ Educate builders in installing and maintaining household technologies ▪ Re-orienting education to focus on the understanding, use and development of technology, including through use of social media.
	▪ Creating food systems based on fair trade and food security ▪ New models of business practice (global social aims) ▪ Focus on development of low carbon modes of transport ▪ Mobilisation of young people and consumers ▪ Developing integrated global renewable energy system	▪ Creation of local food systems ▪ New models of business practice (local/community-owned) ▪ More involvement in local activities and clubs (People/networks) ▪ Investment in public transport and support for car sharing ▪ Developing local renewable energy systems	▪ Public private partnerships focus on social responsibility ▪ Stimulating development of fundamental new technologies ▪ Includes disrupting existing high carbon technology ▪ Developing strong partnerships between private and public sectors for technology development ▪ Linking of IT and transport
	▪ Increase in vegetarianism ▪ Awareness raising campaigns (People/networks) ▪ Teleworking and teleconferencing becomes the norm	▪ Products made from energy efficient and ecologically -friendly material ▪ Local initiatives (buying local, tree planting, local 'eBay's', etc.) ▪ Local reuse and recycling of components and materials ▪ More intergenerational interactions and trust in community ▪ Teleworking common when work not close to home ▪ Refurbishment of housing to reduce energy consumption ▪ Homes built to keep heat in when cold and heat out when hot, and include rainwater harvesting systems as standard	▪ Developing and testing of GMO, meat substitute and food pills ▪ Increased awareness of energy and resource use because of monitoring technology leads to energy saving ▪ Teleworking and conferencing becomes the norm
TAKE-OFF AND ACCELERTION: 2016-25	▪ Strict food quality controls ▪ Consolidation of accountable governance for global level ▪ Land reform ▪ Companies required by law to produce in ethical and sustainable way (e.g. application of 'polluter pays') ▪ Green fiscal reform and budgeting at global level	▪ Community planning that integrates local sustainable food, energy/housing and mobility needs (emphasis on cycling and walking) ▪ Making local production and consumption pay (e.g. incentives) ▪ Regulation to facilitate home energy-generation and insulation ▪ Local power company in every municipality (often community owned) and emphasis on household renewable energy generation ▪ Development of green fiscal reform and budgets at local level ▪ Siting of financial resources and management at local level	▪ Developing global standards for food safety ▪ Legislation for technological development (e.g. GMO) ▪ Regulatory provision to encourage households to install the latest energy generating and energy conversion measures ▪ Local and national government support for not only developing technology for sustainable living, but facilitating its use
	▪ Sustainability improvements in food production and storage	▪ Personal carbon allowances (People/networks) ▪ Tariffs based on road use ▪ Development of biofuels and fuel cells for transport ▪ Increasing housing density and rural (small-scale) industry ▪ Development of local smart grids	▪ Discovery and testing of new food proteins ▪ Carbon quotas
	▪ Meat-free days in public sector catering ▪ Household food waste almost zero ▪ Trust in international institutions (Provides mandate) (People/networks) ▪ Gas and coal power stations are closed	▪ Increase in vegetarianism ▪ Home-cooking ▪ Household food growing and mobility by foot, cycle, public transport ▪ ICT facilitates sharing of goods and services locally (Technology/IT) ▪ Collaborative consumption (swap rather than buy new) (People/Networks) ▪ Work, live and shop locally ▪ Holidaying in country ▪ Communalisation' of housing	▪ Cultural acceptance of meat substitutes ▪ Increased demand for food pills ▪ Updating of technological functioning of neighbourhoods ▪ Trust in public-private partnerships ▪ Car servicing and user-based systems ▪ Overcoming aversion to technology through education, awareness-raising and making it accessible to all ▪ Zero-energy housing is standard for all new housing developments
STABILISATION:2026-30	▪ Focus on fair distribution of resources and legislating for any remaining unethical practices in production and provision of goods ▪ Regional specialisation for mutual benefit		
	▪ Internationally integrated low carbon transport system ▪ Development of international integrated smart grid ▪ Clean, energy-efficient public and private transport	▪ Integrating food growing into urban land use and forging city-rural links	▪ Developing integrated public transport system ▪ Sustainable and reliable energy system to power transport
			▪ Sustainability integrated into every aspect of everyday living

Looking closely at the building blocks that made up the pathways we observed that there were many common elements between the pathways at a given time interval, that could fit under the same scope. For instance, while some of the building blocks were aiming at providing political support, others were aiming in reorienting education, developing new products and production reform or initiating changes in food, transport and energy infrastructural systems, among others. This gave rise to the structural framework of pathways, developed based on the clusters formed that contained the homogeneous elements that could fit under the same development and stream of change (Figure 4-2). This structural framework is the same for all three pathways. However, to avoid confusion it must be emphasised that the activities enclosed in each cluster of the structural framework, are different for each of the pathways.

	Governance	Infrastructure	Practices
PRE-DEVELOPMENT	- Political support - Principles of behaviour - Support of industry and innovation - Education - Strengthen local/global community	- Develop and support food infrastructure - Develop and support transport iInfrastructure - Develop and support energy infrastructure	- Initiation of changes in food practices - Initiation of changes in mobility practices - Initiation of changes in energy practices
TAKE-OFF	- Consolidate and relocation of governance - Products and production reform - Supporting innovation	- Food infrastructure - *Roll out* - Transport infrastructure - *Roll out* - Energy infrastructure - *Roll out*	- Food Practices - *Roll Out* - Transport Practices - *Roll Out* - Energy Practices - *Roll Out*
ACCELERATION	- Consolidation and relocation of budgets	- Acceleration of take-off phase	- Acceleration of take-off phase
STABILISATION	- Completion and assessment of distribution effects	- Integration of food, transport and energy infrastructure	- Integration of food, transport and energy practices

Figure 6: Structural framework of all pathways within each phase and across the three dimensions

As, shown in the structural framework of the pathways, Acceleration is basically an extension of the Take-off phase and this is because many of the activities necessary to take-off the pathway towards the future vision cannot be fully attained within a 5-year period – for instance, the development of a suitable electricity grid that inevitably will take longer than 5 years to implement – but will take longer. As such, Take-off and Acceleration will be presented as one phase that expands into a 10-year time, also to avoid any justifiable arguments regarding the duration of the take-off phase.

Following the synthesis of the pathways, their narrative could also be developed. These are presented below.

***'One Ethical World'* pathway**

In the pre-development phase the establishment of principles, regulations, and methods of education are highly required for increasing mutual understanding, fairness and cooperation

between countries. In the food, transport and household energy sectors, new models of business practice are promoted and young people and consumers are mobilised. These actions are reinforced by awareness raising campaigns that stimulate incorporation of sustainable practices in modern lifestyles and routines.

In the take-off and acceleration phase, the reformation of governance, industries and companies to conform to the principles and regulations of ethical and sustainable production and consumption is needed. The food, transport and energy infrastructure is congealed with major improvements being revisited, reviewed and remade. Trust upon the international institutions, people and networks are prerequisite of the transition to an improved sustainable infrastructure. The amalgamation and relocation of budgets that will bring economic reform and budgeting at global level is highly required. This will further strengthen the improvements made in food, transport and energy infrastructure. Awareness raising campaigns and stimulus on accepting the changes that are about to come are continued and maximised at this phase.

In the stabilisation phase, the assessment of the fair and ethical distribution of resources, and of the integration of food, transport and energy infrastructure development, performance and utilisation is concluding.

***'Local Community'* pathway**

The pre-development phase requires implementation of policies for local production and consumption, local support and innovation, community engagement in decision-making, and education in fostering skills for local sustainable living. The initiation of food, transport and energy infrastructure is driven by public involvement in local activities and clubs, and by organised groups and networks.

In the take-off and acceleration phase*,* the focus is shifted on reshaping and innovating local governance and businesses, to amplify local production, consumption and development. Food, transport and energy infrastructure development is initiated by assigning the revenue raised by taxes as collateral. Working, living and shopping locally enhances collaborative consumption amongst people and networks, including the wider sharing of goods and services locally. Fiscal reform will bring the consolidation and relocation of budgets as well as economic support for suitable initiative at the local level. This will enable the continuation of the development of local food, transport and energy infrastructure, as well as its embracement and effective operation by the community.

In the stabilisation phase, the assessment of the unintended consequences and distribution effects from the transition, as well as the integration of the local food, transport and energy infrastructure and practices.

***'I-Tech'* pathway**

In the pre-development phase, it is necessary to build on political support, collaboration and support of the industry for pushing innovation, technological development and sustainable living. Education is desired to provide a deep understanding of the use of technology to specialists and the public. The design of suitable systems for of food, transport and household energy requires the creation of public and private partnerships that support social responsibility, new technologies and technological breakthroughs supported by organised groups and networks.

In the take-off and acceleration phase the consolidation of local and national governance, production reform, innovation and research and development (R&D) are all required for the promotion and use of sustainable technology for sustainable living. The food, transport and energy infrastructure development, and changes in current practices, requires increased awareness of the benefits of technological improvements in order to overcome aversion to technology. This will allow and intensify its use for providing increased living standards in a sustainable manner. The adjustment of the public in the increased pace of technological developments and their application in everyday living, as well as the collaboration of all stakeholders are prerequisites in retaining trust in public-private partnerships and succeeding in updating the technological functioning of neighbourhoods, communities and countries.

In the stabilisation phase the penetration and impact of technological solutions is assessed and the integration of food, transport and energy development is enabling sustainability to be integrated in every aspect of everyday living.

WP6 Conclusions

Looking closely the pathways, it was possible to observe many similarities, many of which have been described in Chapter 4, Section 4. These similarities apart from being indicative of the similar dynamics that govern the transition pathways are also indicative of the potential of integrating the pathways into developing a coherent strategy that can take us a bit closer to sustainability.

This strategy will fundamentally look into providing the tools for enabling change that will essentially lead us towards achieving the desired visions. Notwithstanding the usefulness of the strategy in achieving some shared goals, this must not be confused as the solution that will help us attain the future visions, but as the guidance tool that indicates the steps that have to be taken in order to achieve all three visions. Each of these steps includes a number of underlined actions enveloped in each specific pathway, which have to be undertaken in order for the specific goal, represented by each step, to be fulfilled.

By integrating the pathways, the following strategic plan was developed:

STRATEGIC PLAN: SUSTAINABLE, LOW CARBON EUROPE BY 2030

	Phase 1	Phase 2	Phase 3
Governance	➢ To gather political consensus, and for supporting technological development (Transition Arena). ➢ To develop practical principles of behaviour / responsibility for private and public sector locally, nationally and globally. ➢ To encourage the development of a circular economy and of new suitable business plans. ➢ To provide education and training courses to all individuals at all ages to nurture ethical values, fairness, co-operation, social equity, self-resilience and sustainable practices, for overcoming aversion to technology and its proper use. ➢ To enforce common interests across national boundaries, and community engagement / participation in decision-making through the strengthening of accountability of existing organisations.	➢ To consolidate accountable and reliable global governance that promotes the development of appropriate local spatial plans and improves eco-system services, using appropriate technologies. ➢ To ensure that the ethical and sustainable production is controlled through annual assessments, and changes in unsustainable standards of practice. ➢ To support eco-innovation and sustainable development through incentives and investments in research and development. ➢ To consolidate global and local budgeting for securing fiscal reform and development of new technologies for increasing long-term 'profitability'.	➢ To ensure that the codes and standards of ethical practices are endorsed at all levels and scales of practice, and that limitation in current processes are improved by new technological developments.
Infrastructure	➢ To promote the ethical and sustainable production, handling and distribution of food by using technological advances and by sponsoring biotechnology research for the development of new forms of food. ➢ To develop low carbon models of transport that are cost effective, reliable and efficient by making use of advances in transport technology, and securing investments in research and innovation in the transport sector. ➢ To use existing innovative technologies, for initiating changes in energy infrastructure and enhancing renewable energy generation and refurbishment of buildings.	➢ To enhance investments in sustainable food production, logistics and consumption through new technologies and biotechnology breakthroughs. ➢ To publicise low carbon technologies and of public transport with preference in cycling and walking as the new lifestyle, through the use of social media. ➢ To develop reliable smart grids that can be fed by a variety of renewable energy sources and to stimulate the restructuring of the energy system in order to ensure that sustainability is embedded at all scales of the system.	➢ To continuously analyse the interconnections between food, energy and transport systems in order to be aware of potential risks and be able to tackle sustainability challenges.
Practices	➢ To promote food production, handling and storage based on sustainable, innovative technologies, and motivate the shift to seasonal food preference. ➢ To make clean transport technologies established as the modern mobility lifestyle through the use of social media and examples of famous front-runners. ➢ To increase awareness on the importance of energy production and consumption and on existing technologies able to do that, through social media and online educative courses, in order to increase the installation of renewable energy systems in buildings and households.	➢ To stimulate food sharing and food waste prevention; boost installation of modern appliances in households for changes in food practices. ➢ To further promote the use of public transport, and of cycling and walking as a shared, fun and healthy activity of the new sustainable lifestyle, through the use of social media and reward schemes. ➢ To promote renewable energy generation through the use of new technologies and smart grids as the modern way of living in order to enlarge interest and participation in renewable energy schemes.	➢ To integrate food, transport and energy practices in the new modern lifestyle, in which sustainability is integrated in every aspect of everyday living.

It would be wrong – and somewhat pretentious – to assume that the three pathways are the only viable ones to attain a vision of low-carbon, sustainable lifestyles across Europe. There are many other pathways available, covering different sectors, countries, stakeholders and agendas. In fact, it is easy to assume that we are neither short of visions nor of pathways as to how to achieve them. What we are probably short of is the political and economic will to start such pathways and departure from those changes that essentially lead to the perpetuation of the status quo. In fact, political initiatives that currently promote **any agenda substantively different to a perpetuation of the status quo, let alone radical steps towards sustainability,** are only a few**.**

This is likely due to the current economic situation that promotes the short-term, urgent, provision of competitiveness to drive job creation; serious, structural and somewhat systemic indebtedness of key decision-makers (states, local authorities, consumers); lethargy to develop ideas that go beyond, and show benefits, only in the long-term; absence of a critical mass towards change; growing cautiousness amongst politicians to divert from what they assume their voters want; and probably many more. Given the persistence of the need for change, and the growing urgency of doing so, we seem to be in the bizarre and awkward situation that, over the last few years, the need for change seems to grow alongside the inability and perhaps unwillingness for change.

The pathways are neither outlandish nor they require impossible or absent systems, technologies or capabilities. They do rely, however, on a wider willingness to act, on political leadership; on the acceptance that a continuation of the current path is neither viable nor meaningful, but that change requires investment into assets, goodwill and time and that the outcome is neither cheap nor assured. This has nothing to do with the pathways delivered and evaluated here, but with the overall scale and scope of change required. In this, these formidable obstacles are hurdles for change generally and generically not against any specific pathway be that created by CRISP or others.

However, as also outlined in the Introduction of this report, there remains an urgent, persistent and persuasive “Case for Change”. The pathways, and the end-visions they pursue, are instruments informing decision-makers on the need to act upon this Case for Change. They demonstrate the possibility that public involvement in the development of viable strategies is not only evidently possible, but also opportunistically desirable as it makes subsequent implementation easier, and the pathways more popular. They also offer the opportunity of a different set of pathways to be designed, with the public as a way forward to start and liven up a much-needed dialogue about how we, in Europe, address the wicked problems we face, and how we want our life to be in the future.

3.4 WP8 Findings and Conclusions

There is a lot of experience in the EU Member States with regard to the development and implementation of National Sustainability Development Strategies. However, overall can be concluded that the prevalence of pursuing economic growth first is present on national level as well as on the European level. In other words: the current and desired future development path of focusing on economic growth does not into account its social and environmental impacts.

It is then understandable that the gap between a sustainable system with a certain balance between societal, environmental and economic aspects is largely experienced. Moreover, the past, present and nearby future policies, and therefore the ‘regime level’, are underlining this experience. Therefore, small scale niche initiatives are taken to cope with or even to change the policy regimes by by-passing and / or demolishing the regime barriers and by making use of all kind of for example social, economic, technical and institutional drivers.

The CRISP project has identified current barriers and drivers of promising sustainability initiatives across Europe in the domain of food, mobility. Overall it can be concluded that:

- several of the successful measures have chosen the positive elements from - and exploited the strengths of - both bottom up and top down strategies. A success factor has for instance been cooperation between different types of actors (public-private partnership, or business - civil society (NGOs) collaboration) and between different levels (meso - micro). Three key

players in this partnership have been identified: enthusiasts and innovators, public authorities and citizens / consumers

- strong political and economic measures may have significant effect. However, such measures have often seemed difficult to implement because citizens often dislike restrictions or a government that prescribe what to do. In that sense the views of the public are also, in many cases, a barrier and can often slow down the work of sustainability aims and objectives.
- initiatives aimed at consumers and citizens only affect a small proportion of the population – often those who already are engaged and interested in these types of questions.
- economics and finance proved to be a key factor for the success or failure of an initiative. The public sector plays a key role in this because many of the initiatives require significant investments from consumers as well as from producers in the short term.
- some areas of consumption are to a greater extent culturally and normatively influenced than others. For example it may be easier to mobilize the population around the choice of energy carrier (electricity from solar or coal) than energy savings in the house. This is because it plays a minor role to consumers where the energy comes from than how the energy is used inside the house. In the case of food and energy, it can be concluded that sustainability created significant attention by both policy making and the business sector with various responses. On the other hand, conclusions in case of the mobility domain states that sustainability is rather peripheral to regime interests but it has been attracting growing attention among policy making as well. Barriers of a cultural nature pose significant challenges in the mobility (e.g. car ownership and driving as status symbol and sign of freedom) or in food consumption (e.g. meat consumption) as well as infrastructural ones requiring longer time to respond.
- agency is of key importance at each stage of the development of innovations. Enthusiastic persons and leaders play a significant role in the success of niche innovations as they mobilize people, build trust, develop visions and provide leadership. Enthusiastic persons also help to build networks that seem to be crucial for up-scaling and mainstreaming in system innovation.
- contextualization, social processes and guiding principles are crucial for the transferability and up-scaling potential of initiatives. Social transfers impose a greater challenge than on the geographical level. The increased use and the growing possibilities of ICT, applications and the social media can be of help to connect like-minded people and speed up social mobilization.

Findings on scenario and pathways towards a sustainable Europe

From the participative process with a wide range of stakeholders - including teenage pupils, students, scientists, governmental officers, layman and expert practitioners – three types of desirable sustainable low carbon future visions for 2030 were derived:

- Decentralisation, as a solution to seduce individuals to sustainability driven actions within the setting of a local (or virtual) community of people who share something in common, for example same needs or habits or believes or social position or facilities or neighbourhood etc. This is called the ‘Local community’ scenario.
- Globalisation, as opposite to the previous scenario, to use the spirit that all people of the world should benefit from and participate in a sustainable context. Seduce individuals as well as the society to build upon the belief that the EU can only become sustainable if we interact in an ethical way with the world around us. This called the ‘One ethical world’ scenario.
- Rely on sustainable high-tech innovations, as a solution for sustainability issues without necessity of changing own behaviour and routines or suffering from the illusion that a sustainable world can only be realized by restrictions, soberness and uncomfortable lifestyles. This called the ‘I-tech’ scenario.

Regarding the abovementioned scenarios the following conclusions were drawn from the quantitative and qualitative analysis:

- Different opinions of sustainability. The society has become more differentiated, due to trends like individualisation, one have their own opinion what a sustainable future means for them and own motivations how they would like to contribute. For some target groups, sustainability is already a part of their lifestyle. These are often the people who are already actively involved with initiatives. However, most people are only willing to act sustainable if this is linked to their practical routines and own believes
- Differences in desirability. A difference was found in expected human well-being in general and own life satisfaction in specific across the end visions. All visions are seen as a representation of a desirable future, those respondents who evaluated the vision describing a sustainable future based on local organisation expected higher human well-being and personal life satisfaction in the described future than those respondents who evaluated the vision describing a sustainable future based on technological developments. This difference seems to be caused by the expected effects of the different pathways towards the end visions on social bonds: while social bonds are expected to be increased by the pathway towards the Local community vision, they are not by the pathway towards the I-tech vision. The effect a pathway has on social relationships therefore seems to have an important impact on the well-being people expect themselves and other to have in the corresponding vision. In addition, the visions' perceived impact on autonomy is often mentioned as a reason for disliking the visions in the qualitative data; all visions are seen as restricting personal freedom in one way or another. Interestingly, however, this does not seem to impact expected well-being: although all visions are perceived as restricting, people still believe they and others can live satisfying lives in these visions.
- An I-tech Europe is the most feasible Europe. The quantitative data showed that the I-tech vision was not only seen as more feasible than the Local community vision, but even the effect of social bonds on feasibility was the reverse of its effect on desirability: the more social bonds were expected to be increased by the pathway towards it, the less feasible the vision was perceived to be. In contrast, autonomy did seem to have an effect on feasibility: the more autonomous the pathway towards the vision was perceived to be, the more feasible the vision was perceived to be. The qualitative data suggest that people believe all visions are in one way or another too good to be realized. The reason provided for this in the Local community vision often refers to a distrust of human nature: humans are believed to be egoistic and materialistic. It is therefore understandable that restricting individual needs is expected to lead to a lot of resistance – hence the expected positive effect of autonomy on feasibility – and that it is believed to be impossible to form a society in which these egoistic and materialistic goals need to be set aside for collective and sustainable ones – hence the found negative effect of social bonds on feasibility.
- The likely Europe is a combinations of the three scenarios. There is a difference between possible futures and likely futures. As the experience with many other 3rd generation scenarios has shown, the most likely future is probably a combination of different pathways, in as much as the most likely end-state is a combination of different visions. The "Logic of Change" is a persistent element in this. Therefore, the future is likely to see a blending of pathways, which is more significant than the ability of different pathways to shape trajectories towards different futures. Social engagement and contribution is the start and the driver for deep change. The pathways and visions need to be communicated from the start and throughout. Likewise looking at the rapid pace of change, something today seem as unrealistically futuristic may actually be achieved tomorrow. The scope and acceptability of change is often misunderstood and underestimated.

3.5 References:

Alexandratos, N., 2006. World Agriculture: towards 2030/50, interim report. An FAO perspective. Rome: FAO.

Bertoldi and Atanasiu 2009, Electricity Consumption and Efficiency Trends in European Union - Status Report 2009. European Commission, Joint Research Centre, Institute for Energy. Available at: http://iet.jrc.ec.europa.eu/sites/default/files/documents/scientific_publications/2009/eneff_report_2009.pdf.

European Commission, 2011a. Market Observatory for Energy, Key Figures, June 2011. Available at: http://ec.europa.eu/energy/observatory/eu_27_info/doc/key_figures.pdf.

European Environment Agency, 2011. End-user GHG emissions from energy: Reallocation of emissions from energy industries to end users 2005–2009. EEA Technical Report, 19, 1-12. Available at: http://www.eea.europa.eu/publications/end-use-energy-emissions).

Geels, FW (2002): "Technological Transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study" in: Research Policy; Vol 31; pp; 1257-1274

Geels, FW (2005): "Technological Transitions and System Innovations: A Co-evolutionary and Socio-Technical Analysis", Edward Elgar, Cheltenham

Quist, J; Vergragt, P. (2006): "Past and future of Backcasting: the shift to stakeholder participation and a proposal for a methodological framework"; in: Futures, Vol 38, pp 1027-1045

Popkin, B.M., 2002. An Overview on the Nutrition Transition and its Health Implications: The Bellagio Meeting. Public Health Nutrition, 5(1A), pp.93–103.

Reisch, L., Scholl, G. & Eberle, U., 2010. CORPUS Discussion Paper 1 on Sustainable Food Consumption. CBS & IOEW. Available at: www.scp-knowledge.eu

Smith, A., 2007. Translating Sustainabilities between Green Niches and Socio-Technical Regimes. Technology Analysis and Strategic Management, 19(4), pp. 427-450.

Sondeijker, S: "Imagining Sustainability: Methodological Building Blocks for Transition Scenarios", Rotterdam

Van De Kerkhof, M. & Wieczorek, A. 2005. Learning and stakeholder participation in transition processes towards sustainability: Methodological considerations. *Technological Forecasting and Social Change,* 72**,** 733-747.

van den Bosch, S; Brezet, H; Vergragt, P (2005): "Rotterdam Case Study of the Transition to a fuel cell transport system"; in: Fuel Cells Bulletin, June 2005; pp. 10-16

4 Potential impact

The potential impact of CRISP is far-reaching – asked to analyse and develop ways to support "bottom-up" approaches as well as to produce visions and viable pathways, it has delivered, but in a way that asks profound questions. Different to more theoretical projects, CRISP has shown that is is possible to involve laypersons in the deliberation about their futures. This is arguably a far-reaching way to develop bottom-up approaches in a way that is more democratic and more accountable than many of the other visioning and transition processes.
The visions were plausible and intrinsically meaningful, the pathways showed many elements common to pathways produced by technical experts. Therefore, CRISP has demonstrated:
- there is no prima facie argument against the development of laypersons in scenario development, backcasting or transition pathway design.
- the role of technical experts in the design of such visions etc must therefore be questions in its current monopoly, both on grounds of ethical accountability as well as the high cost it carries in terms of greater implementation difficulties in later stages. In addition, CRISP is asking perhaps awkward questions regarding the role of technical experts in social deliberation, the existence of the Deficit Model in preventing laypersons and bottom-up approaches access to the "wider discussion".
- if Europe is to become a *Europe of its Citizens*, efforts to include citizens in the design of this endeavour is both necessary and, given CRISP's demonstration character, possible. If European governance is uneasy about anti-European sentiment, developing a truly grassroots process towards Europe's sustainability pathways is logically a way that should be considered.
In addition, CRISP has been active in the development of several pioneering methodological innovation: The visioning process and the pathway development process both are evidently innovative, effective and robust towards cultural differences and different levels of expertise, knowledge and engagement amongst the participants. It is also cost-effective in terms of the operating costs of the workshop, but also, arguably more importantly, in terms of reduced implementation costs. (the latter point is based on the assertion that initiatives that have broad stakeholder support usually find implementation easier and faster. Engagement is one way to engender such support as well as to provide greater liklelihoods that the pathway is actually socially acceptable in the first place).

One of the most important and relevant conclusions of the analysis is that all visions are seen as sustainable. To a large extent this is due the huge differentiation of lifestyles, opinions, perspectives, etc. in our present society caused by major largely intertwined autonomous trends like individualisation, globalization, informatization, etc. This is the reason that we face an enormous variety in initiatives, all related to different 'target groups' often expressing their dissatisfaction with the present regime and policies. It can be derived from this that firstly the initiatives are very much related to the major autonomous trends, secondly the initiatives themselves will never scale up to mainstream because there is no one single mainstream and thirdly the present regime is organized and acting in a way (pillar wise) that does not take the societal differentiation into account. From the aforementioned the following policy recommendations can be drawn.

Forget collective awareness

The call text suggested people to have a certain awareness of environmental issues. We argue whether this is true. The awareness of environmental and social issues is often on a general level, but lacks a sense of urgency. Concrete engagement in sustainability driven actions, requires *collective responsibility* for sustainability behaviour instead of *awareness* of the issues at stake. Therefore the policy focus should lie on collective responsibility

Link responsibility to daily routines, structures and believes

It is possible to create some kind of collective responsibility on sustainability, but only if this is linked to different kind of lifestyles and their connected daily routines, structures and believes. Therefore policymakers should focus of facilitating initiatives according to the versatility of our society where possible, but strong directive measures where needed.

Stimulate alternative sustainable opportunities and linked technology

In the context of aiming a low carbon sustainable EU is 2030, it is important that consumers can choose from various sustainable options. In other a sustainable policy should facilitate and stimulate a great variety of products and services. In this case a lot is expected from for example 3D-printing

Use the possibilities of social media and big data for sustainable solutions

The local community end vision can gain from integrating social media to expand the outreach of this end vision. Where the end vision mainly focuses on a geographical vicinity many possibilities come to fore when integrating social media to link communities with common interests on a more broader scale. Increased use of ICT, applications and the social media can be of help to connect like-minded people and speed up social mobilisation when crisis (such as the oil crisis, the food crisis or the economic crisis) open up new windows of opportunities. Sharing products, sharing knowledge on sustainable and appealing solutions, creating new solutions and creating social relationships can be facilitated by smart integration of social media for sustainable solutions. Social media and big data solutions will in the future be able to offer global solutions on a local scale.

Allow and facilitate entrepreneurship

Policies and initiatives on sustainable behavior often comes along with restrictions (like leaving your car at home in favor of public transportation, eating less meat), or asks for more money to spend. Starting up initiatives that have this focus turns out to be difficult. A focus on the possibilities of sustainable solutions seems to have better chance of success. For entrepreneurs this means that sustainable solutions can offer the possibility to make them less dependent on (scares) resources and offer new ways to interact with clients by new business models that are based on using products instead of possessing them. This that policy should also focus on opportunities to fulfil needs instead of solving problems and let entrepreneurs earn their money

An holistic vision based on the three scenario's is needed

From the policy analysis we learned that the present regime is lacking a holistic vision, which has resulted in an policy emphasis on economic growth. On the long run (probably even on the short run) this will lead to an Europe that is far from sustainable. We learned from the scenario findings that a combination of the three scenarios is a most likely scenario for a European sustainable future and that in a way all three scenarios are seen as sustainable.
It therefore is highly recommended to develop an holistic vision as a starting point towards a sustainable Europe. The holistic vision should be based on the three scenarios and the concept of change in culture, structure and daily practices:

1. The One Ethical World scenario should be seen as the overall guiding principle towards the change in culture and perspectives.
2. The Local Community Scenario is forming the basis for the structural aspects of a sustainable Europe. Local can be "geographical" and / or it refers to bind people with the same interests, feelings, etc.

3. The I-Tech world is seen as supporting our daily routines in the new structure. Here, ICT with its new and fast growing possibilities and applications, will play a major role.

The policy transition is most urgent

To allow the above to happen new vision and action is needed from the government in a way that companies and citizens can take new initiatives towards a low carbon society. The government should transform itself from steering into steering and facilitating co-creation, sharing of knowledge, stimulating a multidisciplinary approach, guidance and financing good ideas, all from an holistic view. This cannot be accomplished by the present structure, culture and practices of our government. One of major things that should happen is to change the present rigid pillar structure into a far more flexible project and program organization. This should be combined with large training programs on linked fields like interdisciplinary working, second and third order learning, working in different roles (compelling, facilitating, knowledge broker and linking pin between all kind of actors), etc.

4.1 Dissemination:

CRISP's dissemination plan and communication strategy had a two–fold challenge to face, which was to disseminate the project itself as well as its results; and to disseminate and listen to the ideas behind the project that are to build a low carbon future. The main objectives that were covered by CRISP's dissemination process plan were to:

- Inform interested bodies and the wider audience about the scope and the visions' of CRISP
- Raise awareness in the research communities and beyond about the project outputs; facilitate the cooperation between key stakeholders
- Develop an exploitation matrix for individual (member level) and collective (consortium level) exploitation of the project results, and if possible quantify the impact of the dissemination activities by special indices
- Encourage all involved parties, micro- (individuals), meso- (organisations), and macro-level (countries) to act as change agents towards that transition
- Manage the Advisory Board.

Means of Dissemination:

A CRISP **website** was created, given high priority from the very beginning. Its main objectives, in the general way were to:

- Serve as image – communication interface of the project
- Offer a common point of reference for the project
- Aid dissemination of written material
- Provide a "web identity" for CRISP
- Collate other internet-based sources, including YouTube films, RSS feeds and such
- Offer interested parties (both of internal and external) access to news and new developments.

Through the CRISP website, the public documents produced within the project were made accessible. In due course, feedback was collected and recorded through the use of vision- related questions in the dedicated online space. The CRISP website design principles followed the "EU Project Websites – Best Practice Guidelines", EC Research Directorate – Environment, March 2010 in order to achieve contextual and structural robustness with a harmonized visual identity.

The design adopted a standard approach for better quality and user-friendliness for the project. To increase popularity, the website was been designed with the ability to assign and engage different users to different groups. The user-friendly structure with the bi-accessible menu (horizontal quick access bar and vertical dropdown menu) facilitates easy engagement for all types of visitors, both beginners and expert internet users, depending on the level of information that one seeks to get. CRISP website services are easily operated and their usage is comprehensible to all partners and guest visitors.

In the following graphs CRISP website footprint and engagement is presented as the number of people that have visited the website in respect to their country and /or city of origin, representing the CRISP website "trans-national identity".

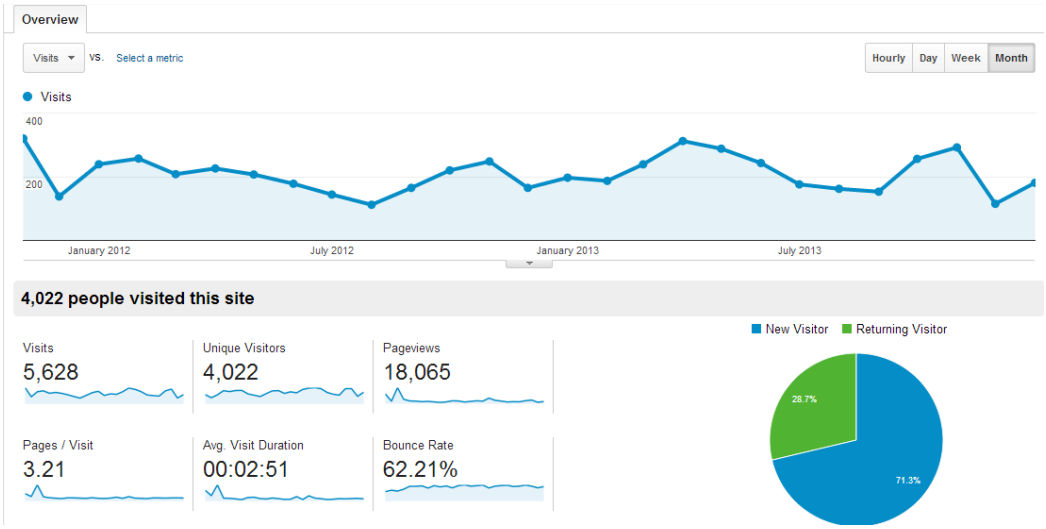


Figure 3.1 CRISP's website visits from the first launched of the official project page

Country / Territory	Acquisition			Behavior		
	Visits ↓	% New Visits	New Visits	Bounce Rate	Pages / Visit	Avg. Visit Duration
	5,628 % of Total: 100.00% (5,628)	71.29% Site Avg: 71.23% (0.07%)	4,012 % of Total: 100.07% (4,009)	62.21% Site Avg: 62.21% (0.00%)	3.21 Site Avg: 3.21 (0.00%)	00:02:51 Site Avg: 00:02:51 (0.00%)
1. United Kingdom	1,338	80.19%	1,073	65.32%	2.38	00:01:45
2. Greece	1,246	32.91%	410	47.67%	6.44	00:07:28
3. Lithuania	365	58.08%	212	54.79%	2.82	00:01:53
4. Netherlands	362	73.48%	266	55.52%	2.98	00:02:21
5. United States	250	96.80%	242	74.80%	1.74	00:00:51
6. Hungary	247	70.04%	173	62.75%	2.62	00:01:34
7. Germany	220	90.00%	198	72.73%	2.24	00:01:24
8. France	158	90.51%	143	82.28%	1.42	00:00:12
9. India	139	96.40%	134	71.22%	1.83	00:01:06
10. Belgium	99	85.86%	85	61.62%	2.69	00:02:20

In order to maximise the impact of the project, the CRISP consortium was present at main sustainability events and conferences, taking place in Europe during the course of the project. Considering the need to reach local governments representatives, the following events have been identified as critical ones to be attended and followed by the assorted publications:

Table 3.1 Participation in target events /conferences

No.	Type of activity	Contributors	Title	Conference	Place	Date	URL
1	Presentation/ article	Wehrmeyer, W., Fudge, S., Stasiškienė, Z., van de Lindt, M., Emmert, S., Kondili, E., Papathanasopoulou, E.	Designing Effective Visioning Workshops	European Round Table on Sustainable Consumption and Production (ERSCP)	Bregenz	2-4 May 2012	http://www.erscp2012.eu/
2		Borch, A., Vittersø G., Stø, E.	Overcoming Barriers to Sustainable Change: A Practice Perspective Lessons Learnt from 35 Environmental Initiatives within Housing Energy, Transport and Food	NCCR conference "Making Sense of Consumption", School of Economics, Business and Law	Gothenburg	30 May - 1 June 2012	http://www.nccrconference.com.my/fwbPagePublic.jsp?fwbPageId=pIndex
3		Wehrmeyer, W., Iacovidou, E., Coke, A.	Transition Pathways Towards a Sustainable, Low Carbon Europe Developed by Pupils and Professionals Across 6 EU Countries	InContext Scientific Conference on Pathways, Scenarios and Backcasting for Sustainable and Low Carbon Lifestyles: Comparing Methods, Cases and Results	Rotterdam	7-8 Oct 2013	http://registration.ecologic-events.eu/incontext-scientific-workshop
4		Wehrmeyer, W, Fudge, S. Stasiskiene, Z., Emmert, S., Farsang, A., Kondili, E., Venhoeven, L., Vitterso, G.	The Future is not what it used to be: School Pupils' visions and Transition Pathways across 6 EU countries	IST 2013: International Conference on Sustainability Transitions	Zurich	19-21 June 2013	http://www.ist13.ch/index_EN

No.	Contributors	Title	Conference	Place	Date	URL
5	Stasiskiene Z., Hopeniene R., Staskevicius A., Veliute A., Wehrmeyer W., Fudge S., Watt A., Farsang A., Steg L., Venhoeven L., Perlaviciute G.	Paper: Getting to radical sustainability: are we radical enough for changes?	IAPS International Network Symposium 2013	A Coruña, Spain	June 25-28, 2013	http://www.iaps2013symposium.org/
6	Farsang, A., Watt, A., Wehrmeyer, W., Fudge, S., Stasiskiene, Z., Vitterso, V., Kondili, E., Venhoeven, L.	Paper: Identifying key drivers, barriers and change agents: policy and practice-relevant lessons from six countries across the EU	IAPS International Network Symposium 2013	A Coruña, Spain	June 25-28, 2013	http://www.iaps2013symposium.org/
7	Wehrmeyer, W., Emmert, S., Farsang, A., Kondili, E., Stasiskiene, Z., Venhoeven, L., Vittersø, G.	Paper: New Futures and New Ways to get there: Examining School Pupils' and Experts' Transition Pathways across 6 EU countries	IAPS International Network Symposium 2013	A Coruña, Spain	June 25-28, 2013	http://www.iaps2013symposium.org/

8	Farsang, A. Vittersø, G., Borch, A., Stø, E., Watt, A. Pinter, L., Wehrmeyer, W.	Paper: Pathways to sustainable and ethical food consumption. Results from backcasting workshops in Hungary and Norway	11th ESA conference "Crisis, Critique and Change"	University of Turin	August 28th-31st, 2013	http://www.esa11thconference.eu/the-conference
9	Venhoeven, L. Bolderdijk, J.W., Steg, L.	Paper: Explaining the relationship between pro-environmental behavior and well-being	10th Biennial Conference on Environmental Psychology	Magdeburg, Germany	22-25 September 2013	http://www.envpsycon.ovgu.de/
10	Venhoeven, L. Bolderdijk, J.W., Keizer, K., Steg, L.	Paper: A bright view on sustainability	30th International Congress of Psychology	Cape Town, South Africa	22-27 July 2012	http://www.icp2012.com/ICP/
11	Venhoeven, L. Bolderdijk, J.W. Steg, L.	Paper: Pro-environmental behavior as a self-signal: How seeing yourself as a "good" person may increase well-being	28th International Congress of Applied Psychology	Paris, France	8-13 July 2014	http://www.icap2014.com/
12	Venhoeven, L. Bolderdijk, J.W. Steg, L.	Poster: What is feasible does not necessarily bring satisfaction: Expected life satisfaction in and feasibility of different sustainable future scenarios	Heymans Institute (HI) symposium	Groningen, The Netherlands	April 3**rd 2014**	http://www.rug.nl/research/heymans-institute/organization/symposiumcolloquia/2014-heymans-symposium
13	Venhoeven, L. Bolderdijk, J.W. Steg, L.	Poster: Pro-environmental behavior: How a meaningful contribution can help increase well-being	Kurt Lewin Institute Conference	Zeist, The Netherlands	22-23 May 2014	http://www.kurtlewininstitute.nl/kli/kli-conference/general-info/

Along CRISP's presence at conferences and other open-type events, one key channel for dissemination and peer-review of scientific achievements of the project is the publication of peer-reviewed papers and/or journals. A list of publications and papers produced by the CRISP consortium is found below:

Wehrmeyer, W., Fudge, S., Stasiškienė, Z., van de Lindt, M., Emmert, S., Kondili, E., Papathanasopoulou, E. (2012) "**Designing Effective Visioning Workshops**". Paper presented at the European Round Table on Sustainable Consumption and Production (ERSCP) Conference, Bregenz, 2-4 May 2012.

Borch, A., Vittersø G., Stø, E. (2012) "**Overcoming Barriers to Sustainable Change: A Practice Perspective. Lessons Learnt from 35 Environmental Initiatives within Housing Energy, Transport and Food**". Paper presented at the NCCR conference "Making Sense of Consumption", School of Economics, Business and Law, Gothenburg, 30 May - 1 June 2012

Wehrmeyer, W., Iacovidou, E., Coke, A. (2013), "**Transition Pathways Towards a Sustainable, Low Carbon Europe Developed by Pupils and Professionals Across 6 EU Countries**". Paper for the InContext Scientific Conference on Pathways, Scenarios and Backcasting for Sustainable and Low Carbon Lifestyles: Comparing Methods, Cases and Results", Rotterdam, 7-8 Oct 2013

Wehrmeyer, W, Fudge, S. Stasiskiene, Z., Emmert, S., Farsang, A., Kondili, E., Venhoeven, L., Vitterso, G. (2013), "**The Future is not what it used to be: School Pupils' visions and Transition Pathways across 6 EU countries**". Paper presented at IST 2013: International Conference on Sustainability Transitions 2013; Zurich, 19-21 June 2013

Stasiskiene Z., Hopeniene R., Staskevicius A., Veliute A., Wehrmeyer W., Fudge S., Watt A.,

Farsang A., Steg L., Venhoeven L., Perlaviciute G. (2013), "**Getting to radical sustainability: are we radical enough for changes?**"; Paper presented at IAPS International Network Symposium 2013, A Coruña, Spain, June 25-28, 2013

Farsang, A., Watt, A., Wehrmeyer, W., Fudge, S., Stasiskiene, Z., Vitterso, V., Kondili, E., Venhoeven, L. (2013) "**Identifying key drivers, barriers and change agents: policy and practice-relevant lessons from six countries across the EU**". Paper presented at IAPS International Network Symposium 2013, A Coruña, Spain, June 25-28, 2013

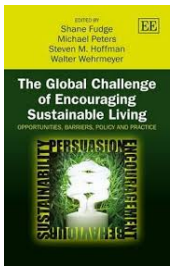
Wehrmeyer, W., Emmert, S., Farsang, A., Kondili, E., Stasiskiene, Z., Venhoeven, L., Vittersø, G. (2013) "**New Futures and New Ways to get there: Examining School Pupils' and Experts' Transition Pathways across 6 EU countries**". Paper presented at IAPS International Network Symposium 2013, A Coruña, Spain, June 25-28, 2013

Farsang, A. Vittersø, G., Borch, A., Stø, E., Watt, A. Pinter, L., Wehrmeyer, W. (2013) "**Pathways to sustainable and ethical food consumption. Results from backcasting workshops in Hungary and Norway**". Paper presented at the 11th ESA conference "Crisis, Critique and Change", University of Turin, August 28th-31st, 2013

Venhoeven, L., Bolderdijk, J.W., Steg, L. (2013) "**Explaining the Paradox: How Pro-Environmental Behaviour can both Thwart and Foster Well-Being**". Sustainability, 5, 1372-1386.

Venhoeven, L., Bolderdijk, J.W., Steg, L. Keizer, K. (revise and resubmit) "**The association between environmentally-friendly behavior and positive emotions**". Nature Climate Change

CRISP consortium also produced / published a book under the topic of sustainable "The Global Challenge of Encouraging Sustainable Living. Opportunities, Barriers, Policy and Practice".



Fudge , S. ,Peters , M., Steven M. Hoffman , S.M., Wehrmeyer, W. (2013) "The Global Challenge of Encouraging Sustainable Living. Opportunities, Barriers, Policy and Practice" Book published by Edward Elgar Publishing Ltd, ISBN:9781781003749, eISBN:9781781003756, DOI:10.4337/9781781003756, Pages:288

CRISP videos

Special dissemination pattern in CRISP project was the visualization of the developed visions intro three thematic videos available to public via YouTube. With this communication tool the results of the project were made understandable to the wider public offering concise and memorably visual understanding of the significance of the research in practice. Furthermore,

videos mobilised people to think about their daily routines and change their desirable future and gain a wider understanding of research and innovation of CRISP.

Videos permanent links maybe found below:

i-Tech vision

http://www.youtube.com/watch?v=JgcEVQkPb1o

Local Community vision

http://www.youtube.com/watch?v=y51hJZOq9k4

Ethical World vision

http://www.youtube.com/watch?v=pTzrssJcd64

Blogs, Youtube and Wikipedia

The CRISP project produced a blog accessible also from the public area of the website (http://blogs.crisp-futures.eu/). CRISP blog through article publishing was meant to be the sound–voice of the project, aiding both beginners and expert internet users to engage with CRISP's concepts.

CRISP's critical success factor is the transferability of the ideas and recommendations to the target groups. CRISP also elicits views and comments on the work packages' outputs from the general public, which, as stated in the original proposal, is to be made via video versions of scenarios. Therefore, it was necessary for the videos to be published into social networking and video sharing sites, including YouTube, so to push in the most effective and immediate way CRISP scenarios to the wider public. This activity was made under the provisions of ethical consideration of the project.

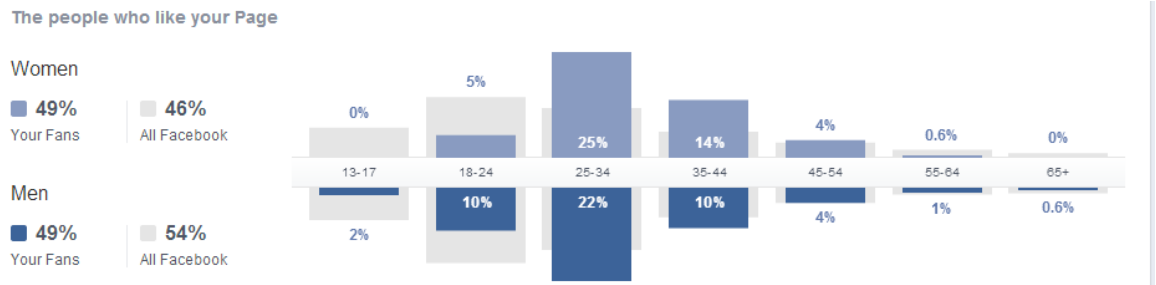
CRISP videos were also published and available from each country-project partner so as to be accessible in the native language of the each participant's population. Furthermore, they were embedded in the online questionnaires circulated in the backcasting phase. Statistics considering views and interaction since they were country specific and integrated in the questionnaire – online form do not follow the original population that has accessed them.

Wikipedia is written collaboratively by largely anonymous Internet volunteers who write without pay. Anyone with Internet access can write and make changes to Wikipedia articles, except in limited cases where editing is restricted to prevent disruption or vandalism. Users can contribute anonymously, under a pseudonym, or, if they choose to, with their real identity. Considering the very active role of Wikipedia as a first level of educational and public knowledge, CRISP was cited through an article according to the rules of electronic encyclopedia, in the official European communication language (English-UK). To that end, CRISP uploaded an article under the tile "Transition Scenario" which has been established as an online encyclopedic term, (http://en.wikipedia.org/wiki/Transition_scenario) and has been linked with other terms, such as "Backcasting" and "Sustainable City", aiming at engaging relative "Think Tanks" in the future.

Facebook is an online social networking service. Its name comes from a colloquialism for the directory given to students at some American universities.

Considering the importance of the social networking sites, and their accesses to the youngsters especially community, a Facebook Page for CRISP was developed (https://www.facebook.com/CRISP2030). It served as a vivid dashboard for announcing ideas and events and for acquiring knowledge and optioning for multiple issues by polling. It also served as the main communication tool for CRISP videos and ideas. CRISP Facebook identity presented in brief below:

- Launched Facebook page on 12 June 2012
- Main activity started at September 2012
- Used "Internet Memes" to engage youth
- Approximately 140 posts from 9/2012 to present



Country	Your Fans	City	Your Fans	Language	Your Fans
Greece	66	Athens, Attiki, Greece	43	English (US)	55
Hungary	24	Budapest, Hungary	7	English (UK)	40
United Kingdom	16	Csabdi, Fejer, Hungary	6	Greek	32
Netherlands	14	London, England, United ...	5	Hungarian	13
Lithuania	9	Thessaloníki, Thessaloni...	5	Dutch	11

Twitter is an online social networking and micro-blogging service that enables users to send and read "tweets", which are text messages limited to 140 characters. Registered users can read and post tweets, but unregistered users can only read them. A twitter page was produced (https://twitter.com/CrispFutures) connected to the CRISP Facebook Portal to enhance the project's presence. The Twitter page mainly focused on broadcasting news, links and other time sensitive information about the project.

LinkedIn is a social networking website for people in professional occupations. Founded in December 2002 and launched on May 5, 2003, it is mainly used for professional networking. In 2006, LinkedIn increased to 20 million viewers. CRISP in respect to the communication and engagement strategy developed a LinkedIn social network (http://www.linkedin.com/company/creating-innovative-sustainability-pathways) so as to inform practitioners, business oriented audiences as well as research fellows about CRISP existence, news and events.

CONCLUSIONS

The aim of the dissemination WP is an explicit dissemination report of the CRISP project. The report describes how all the media channels can serve to raise awareness around the project and facilitate the dissemination of the message of the sustainable transition towards a low carbon Europe. The project results were presented in target – oriented audiences i.e. municipalities, NGOs, research and educational institutes, European bodies, schools, urban designers and of course in the general public. For all these, special dissemination actions as well as communication material were considered.

Additionally, exploitation activities were also addressed in detail, being structured along several dimensions, i.e. internal – external, project results and project ideas, the actor- audience (i.e., pupils, general public, policy makers), and the type (events, publications, internet and media presence) guidelines), and the audience (internally to the consortium and or externally to a wider community), reinsuring the success of the communication strategy of CRISP.

Finally, the impact of the produced visions into videos and the transferability of the ideas and feelings to the wider public turned to be the key dissemination and engagement tool of the CRISP project.