



Telling Stories

**Report of the scenario workshop
18 February 2009**

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1 Introduction

Foresight's Land Use Futures (LUF) project is exploring how land use in the UK could change over the next 50 years. The project is taking an overarching view of the future of land use across the urban and rural domains, and is creating an evidence-based analysis to help policy-makers gain a better understanding of whether existing land use patterns, practices and governance structures are fit for the future. Foresight's analysis will illuminate key short-term choices and identify potential responses which encourage valued and sustainable land use practices, and which span the environmental, economic and social sectors.

The futures element of the project has four components:

- **State of Science Reviews** designed to gather evidence of current conditions and trends
- **Systems Mapping** to identify key components, actors, and variables critical to understanding land use and mapping their interactions
- **Scenario Building** to extrapolate potential alternative future conditions and changes that would significantly affect patterns of land use and land use systems
- **Diagnostic Analysis** to explore how the land system, and systems of land use, would change under the conditions specified by the different scenarios, and to explore their implications for land use policies and programmes in the UK

This report documents the outputs from the first scenario workshop, held at the Hesperia London Hotel in February 2009.

The purpose of the LUF scenarios is to explore how key issues emerging from the project might develop in the future and, in doing so, to:

- illustrate how the issues might play out in the future and what the consequences for land use might be
- reveal specific, perhaps difficult, policy choices, and potential short-term responses, that government and other actors need to make
- help stakeholders imagine the consequences and outcomes of certain actions or inactions

The scenarios are designed to help stakeholders acknowledge future challenges and to provide a framework in which they can explore what they might do, not what they will do. Ultimately, these discussions should aid decision-making. They should also help government explore the appropriate balance between policies that anticipate and lead the UK through change and those that respond to it.



2 Workshop process

2.1 Working with uncertainty

Given that an important purpose of the LUF scenarios is to communicate the key issues emerging from the project, participants in this workshop were not asked to identify trends, drivers or future uncertainties affecting land use. Instead they were asked to work with a range of issues drawn from the project's systems work, the state of science reviews and the project scoping phase. These included potential tipping points, friction points and overall themes.

The full list of issues discussed is presented in Appendix 1.

2.2 Structure

Participants worked throughout the day in four breakout groups, Blue, Red, Green and Yellow, each of which followed the same four-step process:

- **mapping the emerging themes:** sorting issues into thematic groups (set out in Section 3)
- **identifying critical uncertainties for the future of land use:** highlighting the most important and uncertain issues (Section 4)
- **exploring dimensions of uncertainty:** examining the forces shaping future uncertainties and how they might play out (Section 5)
- **developing stories of the future:** describing what the world might be like in 2060 (Section 6)

3 Mapping the issues

3.1 Introduction

Each group was given a range of issues and asked to cluster them according to theme. Each group's clusters are presented in Sections 3.2–3.5.

3.2 Blue Group clusters

Ecosystem supporting services

- Applying science to maintain beneficial ecosystem functions
- The UK's ability to properly manage and derive benefit from the soil system
- Preventing irreversible change to the land system
- The structure and function of ecosystems are changing
- Capacity of soil to provide ecosystem services
- Soil health

Energy

- Applying science to increase carbon sequestration
- Environmental impact of renewable energy production
- Renewable energy infrastructure
- Price of energy
- Managing land use to minimise its contribution to greenhouse gas emissions

Settlement systems

- Resilience of dispersed settlements
- Dispersion or concentration of the population
- Availability of social housing
- Housing demand
- Percentage of land that is green space (it was 90 per cent in 2008)

Governance

- Degree of multifunctionality at local and regional level
- The role of the public and civil society in influencing land use decisions
- Local governance strengths and weaknesses in land use policy
- The impact of fragmentation of the UK on the sovereign use of land
- Percentage of UK land in UK ownership
- Future designations and protected areas
- Balance between ecology, environment and the economy

Cultural and social: how land affects us

- The aesthetic value of land in a time of change
- Valuing commercial and non-commercial uses of land
- Recreational use of land
- Value of the greenbelt
- Spatial planning and physical health and wellbeing

Farming and food

- Proportion of food produced in the UK for the home market
- Growing food and energy crops in urban settings
- Balance between intensification and extensification of agriculture
- Impact of land use changes on distribution and spread of plant disease
- Impact of CAP and WTO on land prices and uses
- Commodity prices

(What in us changes our) attitudes to land

- Motivation for owning land
- Public attitudes and willingness to change



- Individuals' sense of security

Wild card

- Impact of land use changes on transport of human pathogens

3.3 Red Group clusters

Impacts of demand for land use: the current and future resilience of ecosystem services

- Stability of water demand
- The UK's ability to properly manage and derive benefit from the soil system
- The UK's long-term strategy for water
- Habitat fragmentation
- Environmental impact of renewable energy production
- Impact of land use planning on biodiversity
- The land system's ability to adapt
- The structure and function of ecosystems are changing

Land, identity and social cohesion

- The planning system's role in making places that are valued and have identity
- The connection between landscape and identity in a multicultural global society
- Social cohesion

...As an outcome from decisions about development

- Immigration and population pressures
- Household distribution
- Housing demand
- Increasing social density to support better services and build social cohesion
- Future patterns of demand for housing and services
- Extent of developed land

Governance and the shifting balance of power

- Balancing competing demands
- Public good in a global environment
- National policy-making in the face of perceived global crises
- Locus of power for land allocation decisions
- Balance between governance at regional, national and international level
- The impact of fragmentation of the UK on the sovereign use of land
- Spatial planning and physical health and wellbeing
- Managing land use to minimise its contribution to greenhouse gas emissions

Perception and values

- Landowners' incentive to care for the environment
- Public attitudes and willingness to change
- Balance between production, conservation and development
- Society's attitudes to technology
- Land prices

Global trade relations

- Biotechnology's role in the future of agriculture
- Role of agricultural technology in enhancing productivity and production
- Proportion of food produced in the UK for the home market
- Emergence of more eco-business services
- Global trade
- Performance of the international food trading system

3.4 Green Group clusters

Governance

- International trade agreements
- Performance of the international food trading system
- Capacity for institutional change
- Balance between governance at regional, national and international level
- Inertia in the political and social system
- Locus of power for land allocation decisions

Technology

- Proportion of energy produced in the UK for the home market
- Role of agricultural technology in enhancing productivity and production
- Attitudes to cloned or synthetic food
- Handling and recycling of waste
- Subsurface storage of carbon dioxide, waste and energy

Ecosystems

- The planning system's role in managing the competing uses for land
- Impact of land use changes on distribution and spread of animal disease
- How land is used to deliver multiple benefits
- Impact of land use planning on biodiversity

Happiness

- Mental wellbeing and land use
- Cultural impact of land ownership
- People's perceptions of landscape and the value they attach to it
- Individuals' willingness to change their behaviours in order to reverse anthropogenic impacts on the environment

Sustainability

- Sustainability of rural livelihoods
- Role of biodiversity in sustaining life
- Adapting to climate change

Water security

- Capacity of soil to provide food and water security in the UK
- Seasonal water availability
- Distribution of water-related changes to land use
- The UK's long-term strategy for water

Planning

- Location of economic activity in the UK
- Distribution of eco-cities and eco-homes
- Land take for renewables
- Development pressures
- Stock of redevelopable sites
- Household size and geographic distribution

Valuation

- The aesthetic value of land in a time of change
- How different communities value land and the natural environment
- Carbon prices
- Land prices
- New intangibles which need to be factored into land valuation
- Valuation of ecosystem services

3.5 Yellow Group clusters

Exclusion

- Level of rural unemployment
- Direction and impact of social inequality

Planning

- Land take for renewables
- Local governance strengths and weaknesses in land use policy
- Increasing significance of the EU in determining UK land use policy
- Balance between public and private ownership of rural land
- The planning system's role in managing competing uses for land

Distribution and decentralisation

- Balance between centralised and decentralised agricultural production
- Balance between public and private ownership of urban land
- Patterns of food consumption
- Amount of land used for energy production
- Perceived health risks of imported food

Adaptation

- Impact of land use changes on distribution and spread of animal disease
- Species shift due to climate change
- State of the coastal zone
- Growing food and energy crops in urban settings
- Capacity of soil to provide ecosystem services
- Distribution of water-related changes to land use
- Degree of multifunctionality at local and regional level

Regulation

- Regulation of biodiversity
- Environmental limits to growth
- Designations and protected areas
- Integration of approaches to land management
- Regulatory approach to carbon neutrality
- Mitigating climate change

Energy

- Subsurface storage of carbon dioxide, waste and energy
- Handling and recycling of waste
- Proportion of energy produced in the UK for the home market
- Percentage of land that is green space (90 per cent in 2008)
- How technologies shape agricultural land use

Values

- The aesthetic value of land in a time of change
- The role of the public and civil society in influencing land use decisions
- New intangibles which need to be factored into land valuation
- Desire to be self-sufficient
- Cultural impact of land ownership

Wild cards

- Balance between ecology, environment and the economy
- Speed of change in land use patterns

4 Critical uncertainties

4.1 Introduction

Within each cluster, participants identified one (sometimes two) critical uncertainties, issues that are particularly important for – or will have a high impact on – land use in the future, but which have an uncertain outcome. A total of 47 critical uncertainties were identified and are listed in Section 4.2.

4.2 The critical uncertainties

Governance

- Public good in a global environment
- Balance between governance at regional, national and international level
- Locus of power for land allocation decisions
- The role of the public and civil society in influencing land use decisions
- Managing land use to minimise its contribution to greenhouse gas emissions
- Capacity for institutional change

Regulation

- Environmental limits to growth
- Integration of approaches to land management
- Mitigating climate change

Planning

- Local governance strengths and weaknesses in land use policy
- The planning system's role in managing competing uses for land
- Location of economic activity in the UK

Resilience of ecosystem services

- The land system's ability to adapt
- The structure and function of ecosystems are changing

Ecosystem supporting services

- Applying science to maintain beneficial ecosystem functions
- Preventing irreversible change in the land system

Ecosystems

- Impact of land use changes on distribution and spread of animal disease

Adaptation

- Adapting to climate change
- State of the coastal zone
- Capacity of soil to provide ecosystem services
- Distribution of water-related changes in land use

Technology

- Proportion of energy produced in the UK for the home market
- Subsurface storage of carbon dioxide, waste and energy
- Individuals' willingness to change their behaviours to reverse anthropogenic impacts on the environment
- Biotechnology's role in the future of agriculture

Energy

- Renewable energy infrastructure
- Handling and recycling of waste
- Proportion of energy produced in the UK for the home market
- Percentage of land that is green space (90 per cent in 2008)

Valuation

- How different communities value land and the natural environment
- Valuation of ecosystem services



Global trade relations

- Global trade

Values

- New intangibles which need to be factored into land valuation
- Cultural impact of land ownership

Land, identity and social cohesion

- The connection between landscape and identity in a multicultural global society

Cultural and social: how land affects us

- Valuing commercial and non-commercial uses of land

Happiness

- People's perceptions of landscape and the value they attach to it

Exclusion

- Direction and impact of social inequality

Farming and food

- Impact of the Common Agricultural Policy (CAP) and World Trade Organization (WTO) on land prices and uses
- Commodity prices
- Public attitudes and willingness to change

Settlement systems

- Dispersion or concentration of the population
- Housing demand

Distribution and decentralisation

- Patterns of food consumption
- Amount of land used for energy production

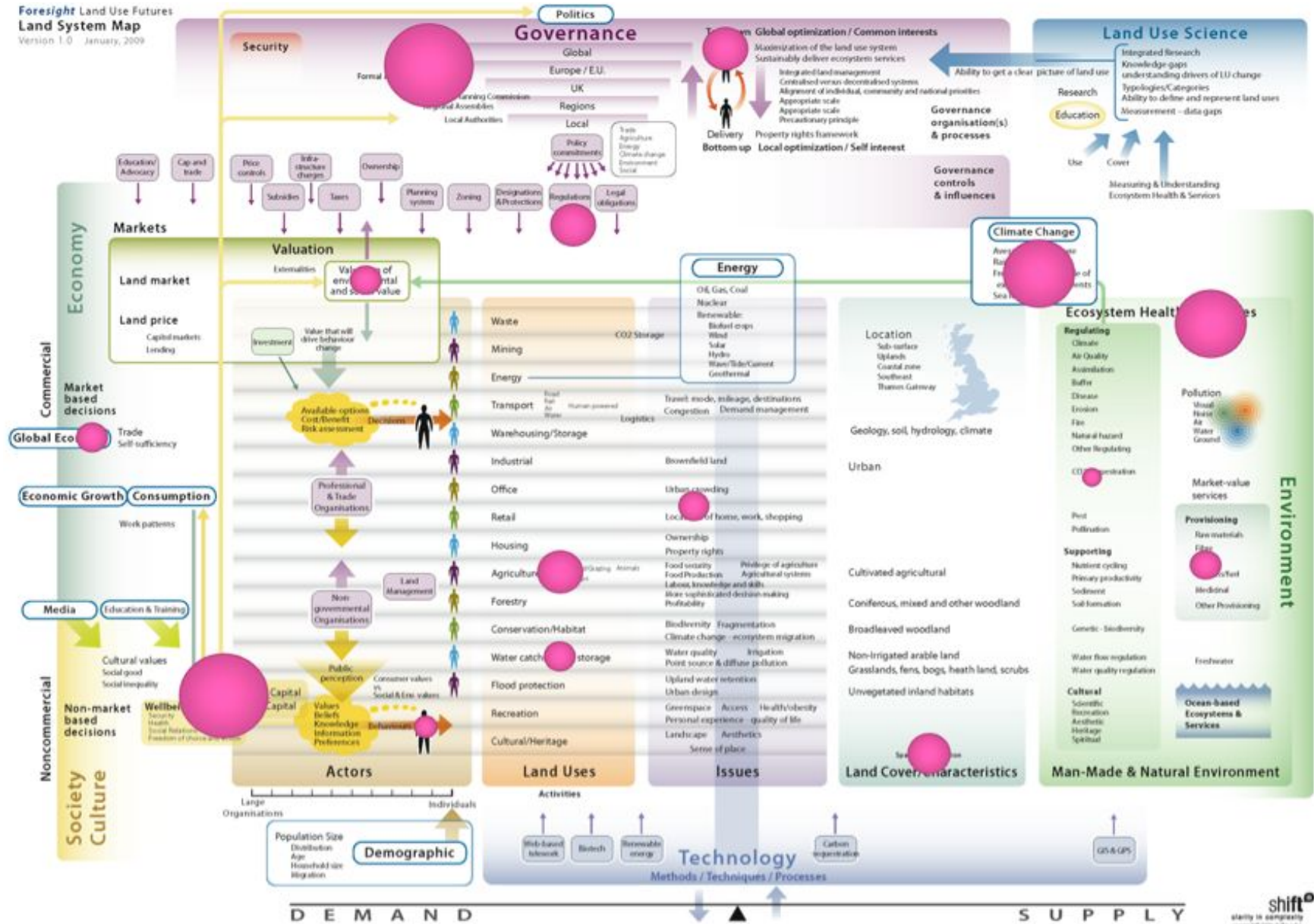


Water security

- Capacity of soil to provide food and water security in the UK
- Land take for renewables

4.3 Mapping uncertainties on the conceptual diagram

The uncertainties are shown on the following page, mapped onto the conceptual diagram produced by ShiftN as part of the systems mapping work. This is an approximation designed to indicate how the uncertainties are distributed around the land uses system. The size of a dot provides an indication of the number of uncertainties mapping to that area of the diagram. Four areas – governance, wellbeing, climate change, and ecosystem health and services – have a high concentration of uncertainty.



5 Considering uncertainty

5.1 Introduction

In this phase of the workshop, participants explored the dimensions of uncertainty in detail. In each case, they built up a picture of the dynamics of change by considering:

- what the principal axis of uncertainty is
- trends and forces that might push the land system to one end of the axis or the other
- the events that might occur as these trends and forces act on the dimension
- which stakeholders will value the move towards one or other end of the axis, and why
- the policy challenges and choices resulting from the move towards one end of the axis or the other

The outcome of these discussions is presented in Sections 5.2–5.12.¹

¹ Sections 5.2–5.12 (and Section 6 of this report) document workshop discussions. They therefore represent views and opinions that were expressed in a workshop setting, not statements of fact or desired outcomes from policy.



5.2 Governance

The balance between governance at regional, national and international level and the locus of power for land allocation decisions

The principal axis of uncertainty:

Local ↔ National

The dynamics of change

The issues affecting future land use cut across all levels of governance and the response to them is likely to require coordination between local, regional, national and international bodies. This need to coordinate responses comes at a time when debate about the appropriate balance between localism and globalism is continuing.

It remains to be seen whether the trend towards localism is the appropriate response to the strategic global challenges we are currently facing and whether the benefits – lower food miles, stronger communities and a greater sense of self-determination – outweigh the risks – loss of the benefits of scale, and of the capacity to tackle problems that demand a supraregional or supranational coordinated response and access to an equitable share of national resources.

In times of economic prosperity, national governments are sometimes able to deploy policy instruments to level uneven playing fields. In more constrained times, there may be less opportunity to do so, perhaps resulting in unfair distribution of wealth and opportunity.

As we move forward towards an uncertain future, localism could even become a divisive trend, pursued strongly by regions that perceive that they own and can control valued resources.

Policy challenges associated with this axis of uncertainty

The main political challenge is around the appropriate role for national government and whether it should take on increased responsibility to protect regions within the UK – as well as the UK itself – to minimise their vulnerability to external events.

Key land policy challenges relate to land allocation decisions and how to balance local and national interest.

Pushing in this direction

- Democracy at the local (district) level
- Poorer local mobility
- Local and dispersed energy generation

Events that could result from a push in this direction

- Collapse of strategic transport infrastructure
- Duplication – fewer economies of scale
- Less trade, more autonomy

Those who will value a move in this direction

- Local communities
- Farmers (perhaps)

Pushing in this direction

- National politics and global bodies such as the Intergovernmental Panel on Climate Change (IPCC)
- Desire for greater mobility
- Centralised energy production and distribution

Events that could result from a push in this direction

- Regional economic specialisation
- Economies of scale from big projects
- Centralised systems
- Local unrest
- More interdisciplinarity

Those who will value a move in this direction

- Developers
- Multinational businesses



The role of the public and civil society in influencing land use decisions

The principal axis of uncertainty:

Private choice ↔ Public choice/action/
participation

The dynamics of change

This is the world of big state versus little state, and what role we want the state to have. There is a growing sense that market solutions – private choices and minimal state involvement – may not be the best path for ensuring that land use continues to support human and other life and delivers wellbeing. Central to this is the question of whether a new economic and business paradigm – in which environmental sustainability and economic growth are compatible – will emerge.

Allowing free markets in land and environmental services seems likely to increase individualism and short-termism, at a time when the collective good and a long-term approach seem important.

The UK is closer to the private choice end of the axis. This raises a number of questions about whether it needs to move more towards the right end of the axis and, if so, how far and how quickly. Failure to move – or at least to take a longer-term view – could lead to economic and social fragmentation if natural resources are not seen as national strategic assets and if regions therefore choose to keep those assets to themselves ('Welsh water for the Welsh' for example).

It seems inevitable that fragmentation can only be avoided through strong governance to ensure sharing of resources.

It also seems inevitable that this issue will play out at national, supranational and global levels.

Policy challenges associated with this axis of uncertainty

If government needs to intervene to strengthen governance and create a longer-term approach, the key policy challenges will be timing (knowing when to intervene and how to balance anticipative versus reactive policies), scale (knowing how far to move the land use system towards the right of the axis) and partnership (negotiating and securing agreement on the approach).

Pushing in this direction

- Return of the boom years driven by the market imperative
- Ideology of neoliberalism

Events that could result from a push in this direction

- Fiscal measures
- Private ownership leading to further enclosures
- Privatisation and commoditisation of land services
- Emphasis on private consumption
- Championing of the freehold-as-tenure aimed at ownership entitlement

Those who will value a move in this direction

- Existing landowners and vested interests
- Those aspiring to acquire land
- Farmers with land or a strong tenancy

Pushing in this direction

- Insecurity
- Limits on growth
- Evidence of how and why market failures occur

Events that could result from a push in this direction

- Regulatory measures
- Compensation and settlement
- Nationalisation of land
- Compulsory purchasing

Those who will value a move in this direction

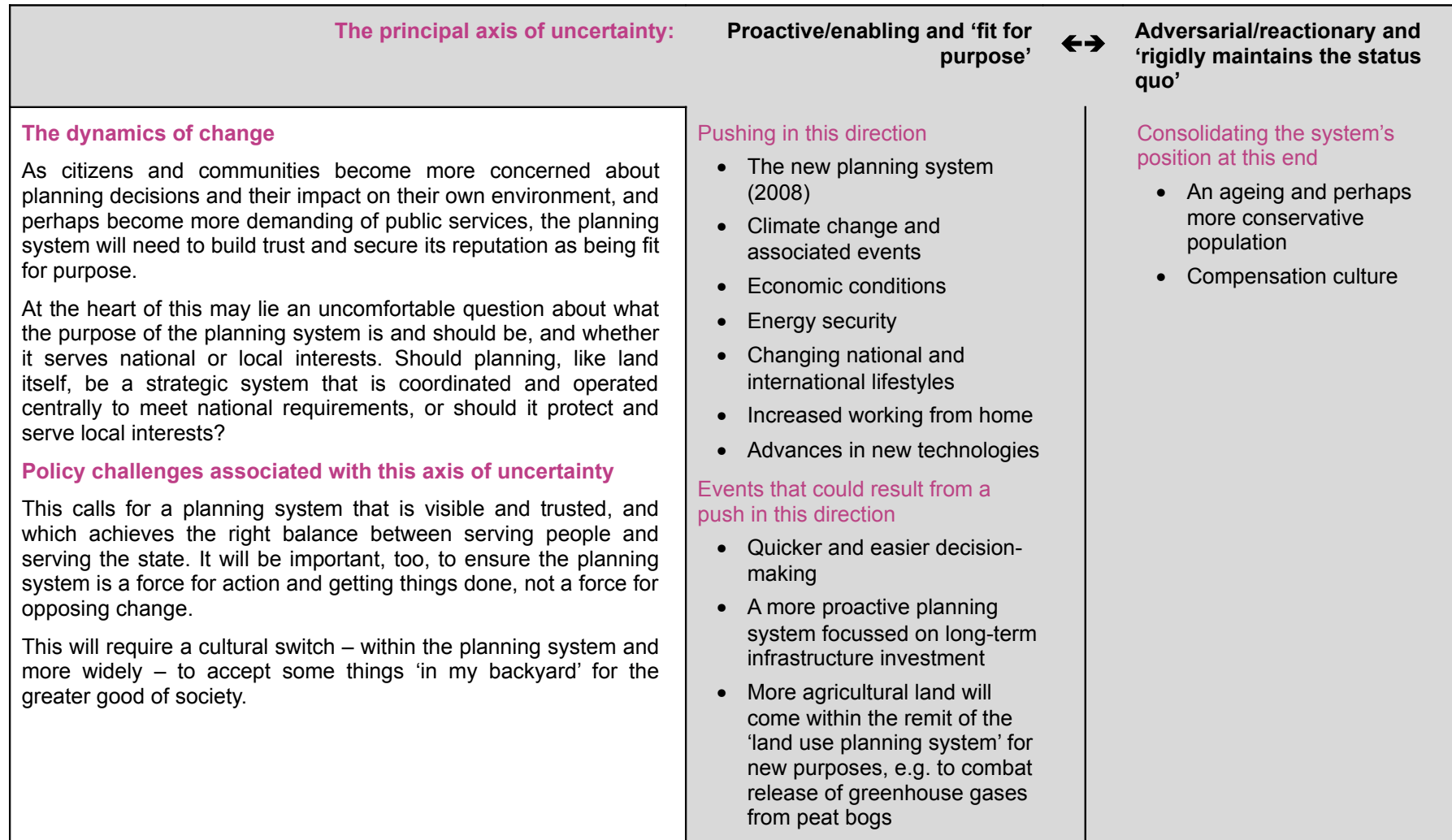
- The dispossessed
- The socially conscious and environmentally responsible

Capacity for institutional change

The principal axis of uncertainty:		Very rigid ↔ Open, flexible and responsive
<p>The dynamics of change</p> <p>One of the important factors that will determine whether – or how effectively – the UK achieves effective and meaningful local governance will be the capacity of local and national bodies to work together.</p> <p>Achieving effective working relationships in land use, planning and other policy areas will require more than legislative change. It will also demand a significant cultural change and a redefinition of the relationships between regions and the centre.</p> <p>At the local level, this may challenge institutional accountability, risk-taking and capacity to respond to changing circumstances. It will probably require stronger horizontal relationships with other regions rather than strong vertical relationships with the centre. At the national level, institutions will need to balance the line between national coordination, and driving forward in the national interest.</p> <p>Ultimately, national institutions may need to take more of a back seat and local institutions may need to take greater charge. Achieving this within a policy framework that utilises land assets in a national interest while maintaining and optimising local benefits may be demanding.</p> <p>Policy challenges associated with this axis of uncertainty</p> <p>Accommodating the interests of a diverse range of stakeholders will challenge institutions at both local and national levels, and in different ways. Balancing autonomy and control will be a significant challenge that may require local bodies to accommodate increasing numbers of directives and legislative frameworks. The demands of those directives may not always be aligned with the interests of local stakeholders.</p>	<p>Trends and forces</p> <ul style="list-style-type: none"> Opposing legislative frameworks Complexity of the land planning system Everything grinds to a halt Why does everything get so complicated? Complexity creates inertia <p>Possible events</p> <ul style="list-style-type: none"> Economic boom or crisis Change of government Government initiatives to speed up the pace of change Vested interests will increase Local versus national tensions <p>Stakeholders</p> <ul style="list-style-type: none"> All stakeholders want timely national decisions to enable action from well-informed, skilled practitioners Community at large will favour no change 	

5.3 Planning

The planning system's role in managing the competing uses for land

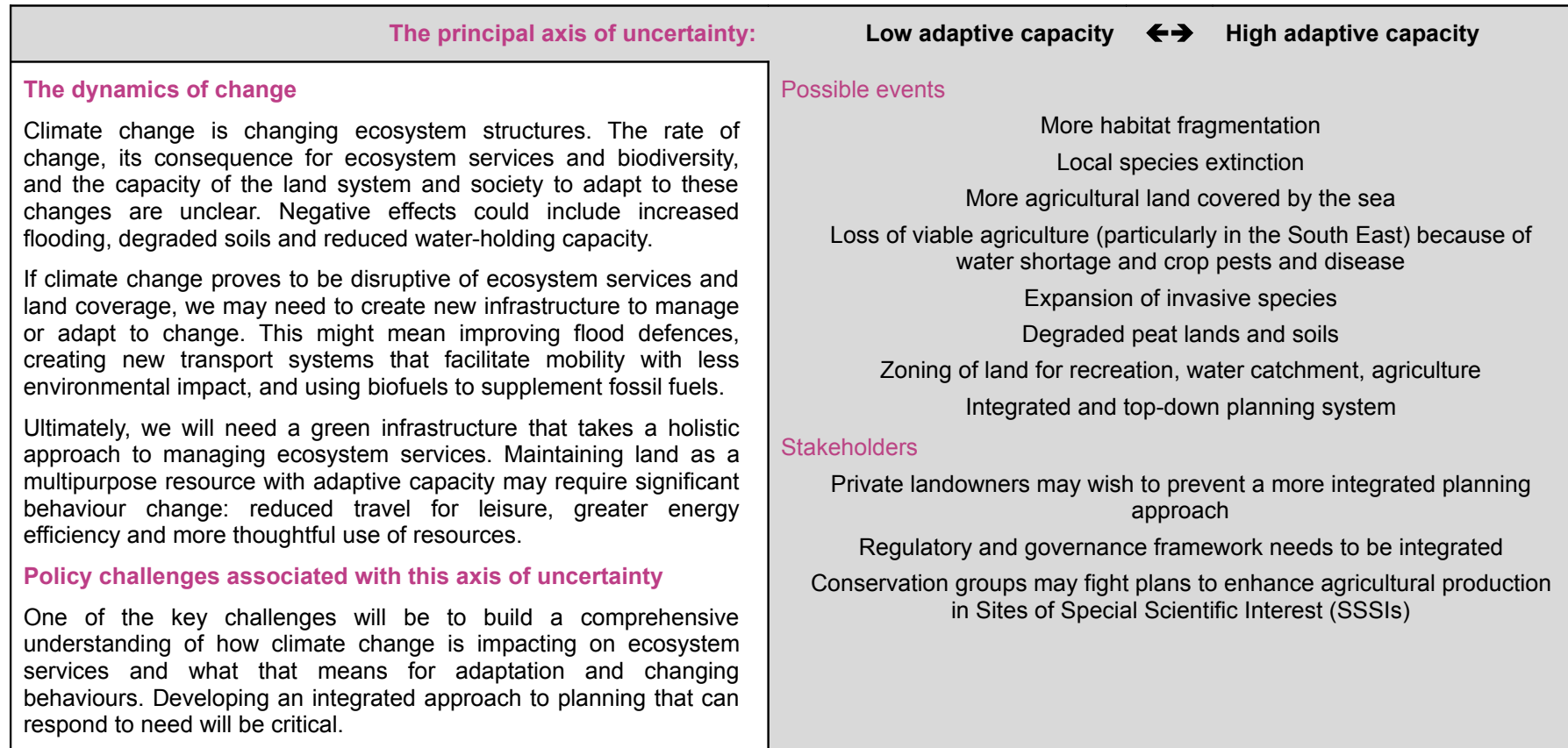


Location of economic activity in the UK

The principal axis of uncertainty:	South East centric	↔ Distributed across the UK
<p>The dynamics of change</p> <p>The South East of England is home to a quarter of the UK population and is the major centre of economic activity in the UK. London, the largest city in Europe, has the largest concentration of visitor attractions in the UK and the largest retail area in the UK. Heathrow airport is the busiest and best-connected in the world.¹</p> <p>The current economic crisis poses some hard questions for London and the UK. If the financial services sector is left significantly weakened by current or future events, London's and the UK's economic prospects might be weakened also. Regional development policy might need to focus on redistributing employment around the UK, particularly if tourism declines because of the credit crunch and carbon rationing.</p> <p>Global warming and rising sea levels might also impact on the sense of security that employers feel in London, perhaps contributing to outward migration.</p> <p>London is both a national and a global city. While its heritage is rooted in the UK, its economic activity and outlook are global. If internal relations fragment or the UK becomes more localised and the South East is unable to meet its resource needs from within the UK, London might seek to become a city state and capitalise on its international connections.</p> <p>Policy challenges associated with this axis of uncertainty</p> <p>The group discussing this uncertainty felt that global driving forces would result in the UK economy remaining dominated by London and the South East. In this outcome, the key policy challenges relate to transport policy and regulation, ensuring that Common Agricultural Policy (CAP) and rural policies sustain rural life, and managing the consequences of increasing fuel duty.</p>	<p>Pushing in this direction</p> <ul style="list-style-type: none"> • Global influences and forces • International trade agreements • Transport infrastructure and costs <p>Those who will value a move in this direction</p> <ul style="list-style-type: none"> • More socially or economically marginal communities • Global businesses 	<p>Pushing in this direction</p> <ul style="list-style-type: none"> • Whitehall promoting the regions • Leisure and tourism moving away from the South East? • Climate change <p>Those who will value a move in this direction</p> <ul style="list-style-type: none"> • Rural landowners and rural communities

5.4 Resilience of ecosystem services

The land system's ability to adapt as the structure and function of ecosystems change





5.5 Adaptation

Distribution of water-related changes to land use

The principal axis of uncertainty: Redistribution of water in UK for quantity & quality reasons ↔ Water remains local

The dynamics of change

Water is mainly produced in places far away from where it is needed. In stable economies, this creates infrastructure and logistics challenges. In unstable societies, it may lead to water being used as a political or economic weapon.

In the UK, drinking water is a publicly-regulated private industry that we mainly take for granted. Security of supply is generally taken as read. However, water is unevenly distributed around the UK and the infrastructure for moving it around is privately owned. While water security may be (broadly) guaranteed in the UK overall, there are significant pressures from dense urban areas (particularly London and the South East) and from agriculture. Resisting these pressures may require changes in practice (more water recycling by industry and homes), in consumption (minimising our water footprint) and in agriculture (using GM foods that require less water).

Coastal flooding and erosion may cause changes to living patterns around Britain. The challenge for local and national government may be to understand the scale and timing of such changes and to choose whether to pursue a policy of controlled land loss or of investment in minimising damage and supporting communities. Similar arguments apply to housing built on floodplains. In extreme circumstances, whole communities or urban areas may be forced to relocate.

Policy challenges associated with this axis of uncertainty

Water management sets significant policy challenges. Large-scale movements of people away from coastal areas and floodplains into existing centres will result in densification, which will bring its own challenges, not least in terms of security of supply. Water will increase as a global issue.

Pushing in this direction

- Government intervention in times of crisis (drought, flooding)
- Water pricing
- Climate change

Events that could result from a push in this direction

- Revenue opportunities for water companies
- Irrigation and improvement in crop productivity
- Water poverty if we have water pricing

Those who will value a move in this direction

- Consumers in water-scarce areas
- Water companies in water-rich areas
- Government – to avoid tensions between areas

Pushing in this direction

- Technological fixes (e.g. drought-resistant crops)
- Technology to treat water quality
- Cultural shift in the value of water

Events that could result from a push in this direction

- Big impact on types of crop grown
- Heatwaves and higher morbidity in summer
- Loss of water quality
- Loss of water availability

Those who will value a move in this direction

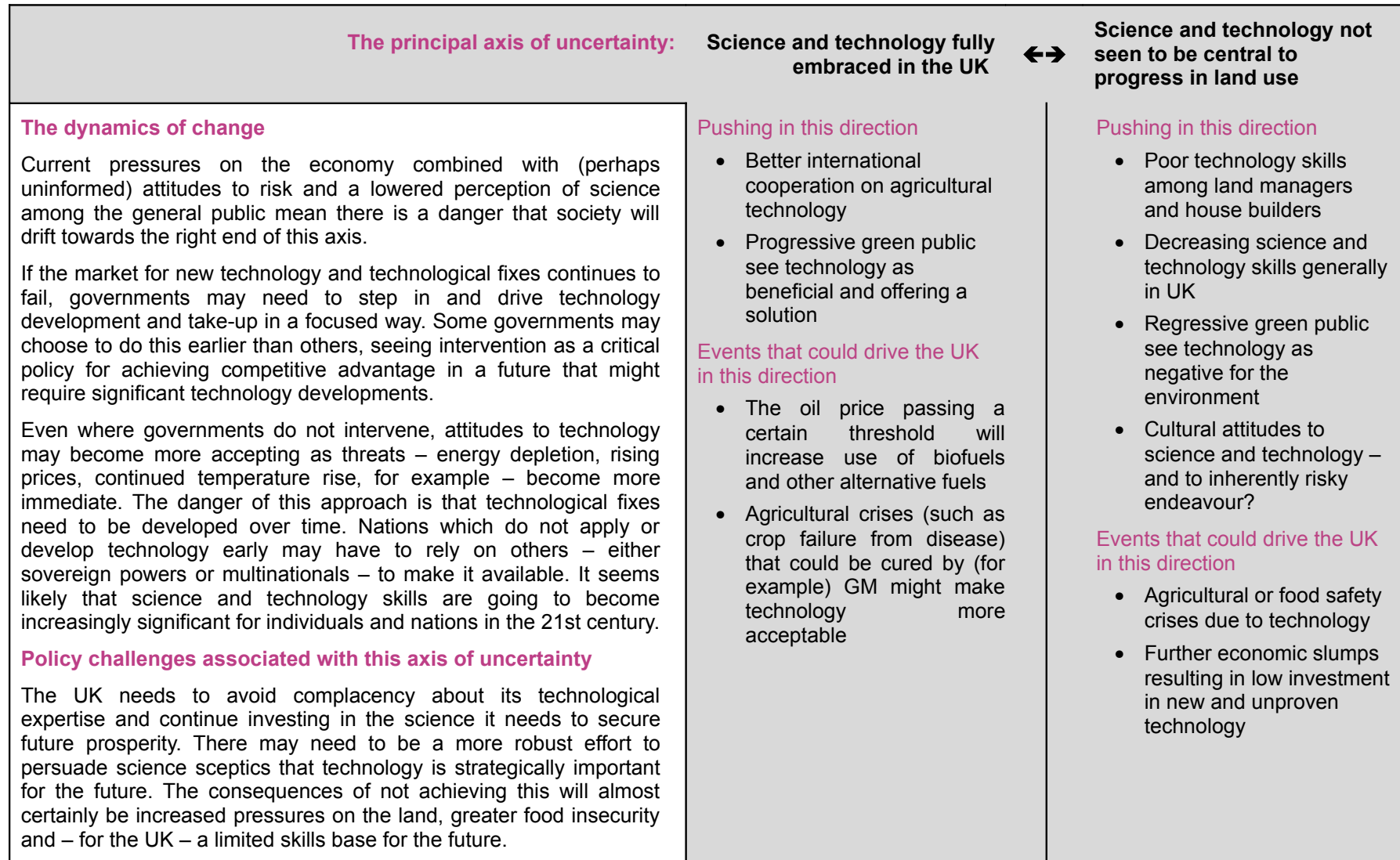
- Biotechnology companies that have invested in drought-resistant crops
- High-volume local water users

Capacity of soil to provide ecosystem services

<p>The principal axis of uncertainty:</p>	<p>Value of soil is low</p>	<p>Value of soil is high</p>
<p>The dynamics of change</p> <p>Soil underpins the provision of ecosystem services. It is the substrate for growing food, it is a carbon store, it is at the heart of ecosystems and it is a core contributor to biodiversity.</p> <p>The resilience of soil is being tested by climate change and by land management practices. There is not sufficient understanding of the different soils within the land system, nor of how soil quality and its capacity to support environmental services might be affected by these changes.</p> <p>Valuing soil and recognising its importance seem to be important preliminary steps in future policy-making. So does building our knowledge of how different soils work and how resilient they will be to changes. Without this understanding, policy decisions on topics such as intensification or selective growing of crops in different parts of the country might have unintended consequences for water quality, air quality, crop production and carbon storage.</p> <p>We rely on soils to provide food and energy, and to act as a carbon store, yet the continued overuse of fertilisers, pesticides and herbicides may ultimately damage this resource. Or it may not – we need to understand soil systems more clearly to ensure that policy choices maintain or increase their capacity to support life.</p> <p>Policy challenges associated with this axis of uncertainty</p> <p>The UK needs to capture and secure the multifunctionality of soil. Accounting for and valuing soil in carbon trading will also be important. Climate change models remain global in nature and there is little knowledge of how climate change will impact at the regional level. Building different soil types into regional models as they are developed will be a significant step forward. Integrated catchment management will improve the UK's ability to protect its soil.</p>	<p>Pushing in this direction</p> <ul style="list-style-type: none"> • Shortage of nutrients • Shortage of carbon <p>Those who will value a move in this direction</p> <ul style="list-style-type: none"> • Farmers • Supermarkets • The organic movement • Carbon pricers and traders • Water companies 	<p>Pushing in this direction</p> <ul style="list-style-type: none"> • Space availability <p>Those who will value a move in this direction</p> <ul style="list-style-type: none"> • Fertiliser and chemical companies • Internal drainage boards

5.6 Technology

Biotechnology's role in the future of agriculture



5.7 Energy

Proportion of energy produced in the UK for the home market

The principal axis of uncertainty:

UK imports energy ↔ UK exports energy

The dynamics of change

Will energy be plentiful and cheap (even free) or will it be precious and expensive?

Maybe the best we can hope is that the answer will be ‘somewhere in the middle’. Our energy future is fraught with challenge. Barring the discovery of a new cheap, zero-carbon or carbon-negative and plentiful energy source – which may happen at some point over the next 50 years but which we should not rely on – it is likely that our energy future will rely on four factors:

- new ways of generating energy
- greater efficiency in the storage and distribution of energy
- more efficient use of energy
- more restrained consumption

It remains to be seen whether people will prefer to change their behaviours (i.e. become more energy efficient) or change their values (e.g. accept nuclear power) – or what the ‘behaviour mix’ will be.

Ultimately, access to energy may become a moral issue. We could see a two-tier system develop, perhaps with distributed energy generation meeting the needs of local communities and national-scale generation projects meeting the needs of major cities.

If the UK chooses, it could become energy secure through a mix of renewables, nuclear, coal and gas, with sufficient surplus to export.

Policy challenges associated with this axis of uncertainty

In the face of difficult and challenging choices about energy, will the government trust citizens to make intelligent and responsible choices about the energy mix, or will it tell us what we need?

Pushing in this direction

- Failure to adopt energy efficient behaviours
- Rejection of nuclear power
- Pinning our hopes on a technical fix

Events that could result from a push in this direction

- Distributed network owners put energy back into the national grid
- Smart grids that can adjust pricing and supply in real time to meet fluctuations in – and manage – demand

Pushing in this direction

- Determination to be energy secure

Events that could result from a push in this direction

- Establishment of a nuclear programme
- Investment in safe renewable energy
- New investment in coal and gas

Renewable energy infrastructure

The principal axis of uncertainty:	
	Low land take (invisible) ↔ Heavy land take (visible)
<p>The dynamics of change</p> <p>This is a significant area of uncertainty. How will climate change affect the resource base – e.g. wind and biofuels – and what will this mean for the location, extent, cost (generation, storage and distribution) and price of renewable energy?</p> <p>In the short term, attitudes to renewable energy are likely to play a major role in the visibility of renewable energy production. NIMBYism may keep production down and continue to push it offshore, increasing the cost of generation and distribution. This may also result in renewable energy feeding into a national grid rather than leading to a distributed and community-based generation programme. This may lead the UK to import more energy.</p> <p>Attitudes may change if energy fixes such as nuclear fission or hydrogen-powered vehicles fail to materialise. This could result in a rapid push from the EU to change planning laws and increase renewable energy production. Agricultural subsidies might disappear, replaced by extensive energy crop production leading to market-driven agriculture. Farmers and landowners would thrive in this scenario.</p> <p>Policy challenges associated with this axis of uncertainty</p> <p>Policy challenges relate to whether the UK can or will meet EU Directives at a politically acceptable cost. An important issue is the existing lack of evidence on the environmental impacts of renewable energy and the need to build the evidence base to support informed decision-making and planning. It will also be important to build a more detailed understanding of the choices and options involved in balancing food and energy supply.</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Pushing in this direction</p> <ul style="list-style-type: none"> • Improved carbon capture and storage • High food prices • Offshoring of renewable generation <p>Events that could result from a push in this direction</p> <ul style="list-style-type: none"> • Britain diverges from the rest of Europe • More imports • Increased investment for new technologies <p>Those who will value a move in this direction</p> <ul style="list-style-type: none"> • Big industry • Energy producers • Civil engineers </div> <div style="width: 45%;"> <p>Pushing in this direction</p> <ul style="list-style-type: none"> • Carbon price increases • Energy price increases <p>Events that could result from a push in this direction</p> <ul style="list-style-type: none"> • Increased microgeneration • Compensation for local residents • More market-driven agriculture <p>Those who will value a move in this direction</p> <ul style="list-style-type: none"> • Farmers • Landowners <p>Those who will resist a move in this direction</p> <ul style="list-style-type: none"> • Poor house owners in fear of being trapped by falling land prices and perceived loss of amenity • Conservation lobbies • Tourist agencies </div> </div>



Integration of approaches to land management

The principal axis of uncertainty:

Single strategy/body



Multiple strategies/bodies

The dynamics of change

Land is a national resource. If external uncertainties increase, which increase the UK's vulnerability, and if the relationship between local and national regions and institutions is not working effectively, it may be necessary to reduce the number of bodies making decisions about land use.

How far governance of the UK land system moves towards the left of this axis will depend on how vulnerable the UK feels and how much multiple bodies are able and willing to collaborate on delivery. If collaboration is high, multiple bodies may be sustainable and they may even be able to define their own strategic framework. If it diminishes, it is likely that the number of bodies with strategies of their own will also reduce.

In extreme circumstances – where vulnerability is high and collaboration is low – central government may need to set a national strategy for land use.

Policy challenges associated with this axis of uncertainty

This is a highly dynamic axis, exploring exogenous forces and the UK's capacity to develop timely, implementable and flexible responses to them. It points to policy challenges which the UK Government needs to tackle in order to achieve flexible, effective strategies. It must acquire the right knowledge of external challenges, develop the right personal and institutional skills to deal with them, and create consensus and consistency among its delivery partners about how to respond.

Pushing in this direction

- Efficiency targets
- Decrease in national targets, increased focus on delivery of public policy goals
- Policy failure
- Postcode lotteries
- Devolution within England

Events that could result from a push in this direction

- More conflict due to external pressures, irrespective of integrated or non-integrated management
- Popular and institutional resistance to single strategy bodies
- More ossified policy structures and higher perceived barriers
- Fear of admitting national failure

Those who will value a move in this direction

- National businesses
- National stakeholders
- National government

Pushing in this direction

- Local stakeholders
- Policy failure
- Devolution within the UK
- Local accountability
- Individualism
- New forms of collectivism (e.g. transition towns)

Events that could result from a push in this direction

- Increased conflict
- Multiple bodies and strategies working against each other
- More flexibility for policy development and remedial action

Those who will value a move in this direction

- Local government
- Smaller businesses
- Landowners

5.8 Valuation

How different communities value land and the natural environment

The principal axis of uncertainty:

Land is valued for now



Land is preserved for the future

The dynamics of change

If current patterns of land use are to change in light of continuing pressures, the process will be more acceptable to communities if they have some ownership of this change. Acquiring that ownership may be relatively straightforward, even for significant changes. As understanding of the need for change increases, attitudes and beliefs are likely to change too.

The important factor may be how quickly people realise that change is necessary. Once they do, it may be that what communities value will change, and with it the way they value land. The value of land as a store of economic wealth, as an amenity and as a source of cultural identity may diminish in the light of food and energy scarcity.

A critical part of this uncertainty is how early people realise that changes are necessary. The transition will be easier if it can be made – and managed – in advance of need. But if there is a lag between what communities value land for and what society needs from it, the transition may be difficult and disruptive.

Policy challenges associated with this axis of uncertainty

The challenge is to engage, inform and empower communities. The UK currently sits at the left end of this axis, with citizens firmly rooted in a short-term mindset.

Raising awareness of environmental challenges, providing compelling evidence about the impact of climate change and offering incentives to support positive behaviour change are all essential, but if they are not sufficient to change attitudes, government may need to take a stronger regulatory approach.

In this future

- Communities are engaged and empowered
- People are environmentally aware
- Practices and behaviours are focused on the needs of future generations as well as the current one
- Regulation has acted as a stimulus to behaviour change, but is not required to keep positive behaviours in place

5.9 Values

Individuals' willingness to change their behaviour in order to reverse anthropogenic impacts on the environment



The dynamics of change

Over the last couple of years, citizens in the developed economies have been taking on board the message that they need to minimise their carbon footprint, to improve energy efficiency, to consume fewer resources and to be less wasteful.

The current financial crisis has turned these priorities on their head. Citizens are encouraged to spend their way out of recession; high-profile decisions seem to take less account of environmental matters; and short-term crisis management means there is little appetite for debating long-term issues.

If it is true – as the then Danish Prime Minister Anders Fogh Rasmussen said at the International Scientific Congress on Climate Change in Copenhagen in March 2009ⁱⁱ – that ‘business as usual is dead and green growth is the answer to both our climate and economic problems’, citizens are baffled and bewildered by the lack of concerted effort to tackle the problem.

This means that individuals are also confused about what actions to take. If evidence continues to emerge that suggests the imperative to act is more urgent than had previously been supposedⁱⁱⁱ, and if that evidence does not lead to action, this confusion will turn to scepticism or fear.

Policy challenges associated with this axis of uncertainty

Citizens need clear messages about the environment and strong leadership about what actions they need to take. Achieving this will need investment in the evidence base and joined-up government – internationally as well as nationally – to lead societal change. Without this coordinated effort, it will be difficult to get agreement on what should be done and to make the best decisions. It will also be difficult to agree on what trade-offs are acceptable.

These communities are

- Diverse
- Fragmented
- Turbulent, and value dynamism
- High-risk and risk-tolerant

Stakeholders who value a move in this direction

- Businesses that can use confused messages to take on the competition
- Media
- Cynics

Stakeholders who will resist a move in this direction

- Environmentalists – particularly the younger generation

These communities are

- Coherent
- Cohesive
- Stable and value stability
- Low-risk and risk-averse

Stakeholders who value a move in this direction

- Concerned consumers
- Farmers
- Governments – clarity makes their lives easier

Future possibilities

We could see a burgeoning of place-based cultures as well as professional cultures and communities of interest



5.10 Land, identity and social cohesion

The connection between landscape and identity in a multicultural global society

The principal axis of uncertainty: The cultural characteristics of landscape are highly contested ↔ Clear consensus about the cultural characteristics of landscape

The dynamics of change

Landscape is much less of a provider of jobs than it was and the land's cultural conditioning – people's stake in the land – has decreased. Moreover, the way we live is changing. The amount of time we spend rushing around means that it is increasingly rare to be part of the landscape (other than when on holiday) and more common to pass quickly through it while travelling from A to B^v.

Mainly for legacy reasons, society's current view of the land system is probably closer to consensus than contest, but that could change markedly towards contested views, depending on

- how changes in the economic climate affect the global land market and the monetary value of land
- whether economic conditions will create more economic nomads, and the extent to which they will link their sense of identity to local landscapes
- the level of migration (real and virtual)
- the extent to which investment in energy infrastructure leads to transformation of the landscape

Another major dynamic that will impact on this uncertainty is class conflict, with the young, the poor and the angry or resentful on one side and wealthy, risk-averse elders on the other. Is it a bourgeois fantasy to maintain the romance of the countryside?

Green organisations are a fulcrum between these two cultural perspectives. They wish to preserve aspects of traditional landscape, but need to create innovative social, political and economic models to achieve this. The land is both culturally and economically mediated. At the regional level, it is all about return on investment, while at the local level, it is more about ecosystem services.

Perhaps the biggest uncertainty is whether our evolving society will accept an existing cultural model that is rooted in an historic and static cultural perspective, or whether the perspective itself will change to reflect changing cultural models. Whatever emerges will determine the extent to which culturally diverse communities of the future can be united by the features of the land they share.

Policy challenges associated with this axis of uncertainty

Managing changes in an increasingly contested point of view of land,

These communities are

- Diverse
- Fragmented
- Turbulent and value dynamism
- High-risk and risk-tolerant

Stakeholders who value a move in this direction

- Entrepreneurs
- Artists
- Young people
- Immigrants
- Government in avant-garde role as change agent
- Leaders

Future possibilities

We could end up with a collection of different ethnic communities that do not come together culturally to build the environment

These communities are

- Coherent
- Cohesive
- Stable, and value stability
- Low-risk and risk-averse

Stakeholders who value a move in this direction

- Institutions
- Seniors
- Landowners
- Traditionalists
- Farmers
- Managers

Future possibilities

We could see a burgeoning of place-based cultures as well as professional cultures and communities of interest



5.11 Farming and food

Commodity prices

The principal axis of uncertainty: Local expertise/
protectionism/self-sufficiency ↔ Global cooperation/broad
price stability

The dynamics of change

Population change, the cost of carbon and climate change will continue to place significant upward pressures on commodity prices. The extent to which the world is able to manage this pressure will depend on how far it can harness – and is willing to share – science and technology solutions to these global challenges. Continued growth in markets and the equitable distribution of commodities and wealth will depend on how strong global relationships are, and whether the owners of technology and owners of land can work together in a mutually beneficial relationship.

This type of approach would change the nature of global markets, perhaps irreversibly, and increase the developed nations' dependence on developing economies. The scale of this transition could require a revolutionary change in attitude which may only come through increasing pressures, but it is not easy to be confident about which direction the world will take. Resource wars, famine and increasing ill-health may force nations to cooperate, especially if they affect the rich world. Public opinion may demand an end to inequality and call for fairer chances across the globe; bioterrorism and suspicion of others may make it harder to keep trade flows open; the owners of technological solutions to major world problems may not want to share them for public good.

Policy challenges associated with this axis of uncertainty

If nations cannot agree on a cooperative approach, a drift towards protectionism and localism may result. Although it is unlikely that any one nation state alone can determine the direction of travel, the impact of policy choices and actions in the major countries will be influential.

Localism may be a good option in the short term for nations which have the resources to make it work. But food and energy security may mean little without political security and peace.

In this future

- There will be a move towards greater organic production, and investment in less damaging fertilisers
- Producers have to forego short-term economic benefits and productivity gains from intensive farming in favour of sustainable practices. Sustainability standards will be certified
- 2nd and 3rd generation biofuels will be used extensively
- Water scarcity within and between nations will be problematic. Individuals may need to restrict their 'water footprint'
- Better land use planning rules will optimise efficiency
- Import restrictions and high prices will protect against 'damaging' goods

Stakeholders who will resist a move in this direction

- The NFU

In this future

- The developing world will manage supply and demand of staples
- Developing nations will grow the world's food
- Changed subsidy systems will make it easier for nations to agree optimal locations for growing crops
- Food and energy security concerns will cause economic and political differences to be put aside

Stakeholders who will resist a move in this direction

- The chemical industry



5.12 Settlement systems

Dispersion and concentration of the population

The principal axis of uncertainty:

Multifunctional areas



Patchwork Britain

The dynamics of change

The future settlement pattern of the UK will depend on many factors, but perhaps the greatest disruptive potential will be from localism. A shift towards regional self-determination as a means of securing economic advantage from natural resources could have significant implications for the distribution of wealth and employment in the UK, perhaps inverting the current north–south divide.

Whether regions seek self-determination will depend on many factors, including the level of security that comes through scale. In certain global circumstances, localism will create comparative disadvantage. Increasing population and dwindling resources suggest that the production and distribution of environmental services may require a more efficient approach

The multifunctional approach may be the most appropriate, but the spatial scale of multifunctionality may need to become considerably smaller than at present. This would mean changes of land use in both urban and rural settings. Alternatively, zoning land use according to its most efficient use in a particular place may achieve greater efficiencies.

Left to the market, Britain – already on the left half of this axis – might move even further towards multifunctionality. As long as this is the best option for the UK, government may wish to leave the market to set the right level of population dispersal. But if the better option is to create production zones, it is likely that government will need to develop them through regional policy and infrastructure development. This might cause land values to move significantly over a short period of time, and lead to short-term economic and social instability.

Both cases are likely to affect settlement. The multifunctional approach will lead to greater dispersion of population around areas of production, while the zoned approach will lead to greater concentration and require higher levels of infrastructure investment.

Policy challenges associated with this axis of uncertainty

If we choose the multifunctional route, we have to define the space where we have the freedom to be multifunctional. Multifunctional nodes will need to be linked by infrastructure.

If we choose to zone the UK, we will need to identify which areas are

Pushing in this direction

- Public awareness and local produce
- Economic crises
- Risk – not putting all eggs in one basket
- Oil prices, transport costs

Events that could result from a push in this direction

- Evening out of the differential in housing markets, leading to greater equality between regions
- Food being supplied
- Better quality of social cohesion

Pushing in this direction

- Economies of scale and achieving comparative advantage
- NIMBYism – especially around wind turbines

Events that could result from a push in this direction

- Local water shortages
- Much more sophisticated infrastructure – every zone needs to be linked to every other one

Housing demand

The principal axis of uncertainty:		
	Housing is an asset	Housing is a service
<p>The dynamics of change</p> <p>A major future uncertainty is likely to be the freedom of choice that individuals have concerning housing. Constraints on mobility, possible changes to urban structures, or resettlement patterns around zones of production might all have an impact on the demand for and choice of housing.</p> <p>In extreme circumstances, it is possible to imagine that large houses could be deemed an unsustainable use of land unless they house multiple generations, minimising the housing footprint of the individual.</p> <p>A significant shift towards local production and low-carbon consumption, coupled with carbon reduction policies, might lead to some evening out of land prices between urban centres, peri-urban fringes and market towns. If areas need to become more self-sufficient, population may flow rapidly outwards from urban centres. Under certain conditions, this might require governments to support commercial and non-commercial landowners trapped in the wrong place.</p>	<p>In this future</p> <ul style="list-style-type: none"> • The house is mine • People can live a long way from work • There is a high need for infrastructure • Capacity to change capital programmes in advance of changing need is important • Local and national governments have to work together to maintain flexibility of supply 	<p>In this future</p> <ul style="list-style-type: none"> • Housing is a space for living in • People are constrained to live near where they work • Planning practice may zone housing to meet the needs of skilled workers

6 Telling stories

6.1 Introduction

At the end of their discussion of the dimensions of uncertainty, the four groups each had the opportunity to write stories about the future that describes how that dimension might play out by 2060. Because each of the groups developed more than one dimension of uncertainty, they had the capacity to produce more than one story. Each group therefore worked in syndicates during this stage of the workshop. In particular, groups considered:

- patterns of land use change
- winners and losers in the land system
- the role that science and technology plays or has played in land management
- how land is governed

Not all groups managed to get to this stage. Some groups took their stories away from the workshop and developed them further. The final outputs are presented in this section.

Adapting to change

Looking back to 2009, the services provided by land are far less vulnerable to change than they used to be.

Through the development of technological innovations (e.g. the now widespread acceptance of GM crops), we have managed to maintain and increase agricultural production. Diffuse water pollution is now a thing of the past, and fears that it could be exacerbated by climate change were not realised thanks to the effectiveness of measures such as Nitrate Vulnerable Zones and River Basin Management Plans.

Although we have seen a contraction in the area of productive agricultural land and settlement in low-lying coastal areas, coastal re-alignment has allowed us to save our most important fens, grazing marsh

and other coastal habitats. Although the economic impacts of coastal flooding have been severe, some of the worst effects have been mitigated by a more coordinated, top-down approach to rural planning. This has included the creation of upstream bluespace to take flood water, and land use policies designed to reduce peak flows. These have included floodplain afforestation and the restoration of degraded catchments, for example by blocking drainage ditches in upland catchments.

Our current approach to rural planning coordinates previously fractured policy on agricultural incentives, the designation of protected areas for conservation and River Basin Management Plans. For many years now, land use zoning has enabled us to protect and enhance key ecosystem services, through a combination of top-down coordination of strategic

priorities at regional scales and bottom-up negotiation with stakeholders at the catchment scale.

Under this system, ecosystem services are mapped and valued, identifying areas that can most efficiently provide key ecosystem services. So, for example, the provision of drinking water is prioritised in some areas (usually uplands), and there is a presumption against any land use that may compromise water quality and supply, such as intensive livestock production and frequent managed burning. In other areas, food supply is the priority, to meet Government targets on self-sufficiency, given our increasingly uncertain global food market.

By optimising ecosystem services at a landscape scale, it has been possible to maintain a diverse mosaic of land uses, which has enabled us to adapt to a range of threats and opportunities including climate change adaptation and mitigation, habitat fragmentation, invasive species, and the requirements of local communities.

The new approach to spatial planning has also blurred the distinction between rural and urban land use. Urban areas have increasingly been allowed to expand into the greenbelt, creating urban areas with extensive green space that are more pleasant to live in, especially now the summers are so much hotter than they used to be. This policy has reduced the pressure on cities, creating breathing space for wildlife and enabling people to access green space.

The winners in this new approach have been the general public, who rely on ecosystem services for their survival and wellbeing.

Although there have been both winners and losers, most landowners opposed the changes, as control has shifted towards Government and the interests of the wider stakeholder community. Some landowners fared worst than others. On productive agricultural land, there is now less red tape and more incentives than there have ever been.

While some land that was previously considered marginal has been brought into production to meet food demands, some less productive agricultural land is now zoned for other priorities. So, for example, we've seen a significant contraction of upland sheep farming and grouse moors. Of course many grouse

moors have been unviable for many years due to the successive outbreaks of bird flu that closed the countryside during the 2020s and 30s.

Conservationists have also been both winners and losers. Some Sites of Special Scientific Interest have had to be abandoned in order to make way for other priorities. The viability of many of these had of course been called into question long ago due to the effects of climate change. On the other hand, some of our most valued habitats and species have adapted to change, or their conservation priorities have been maintained.

Overall, most would agree that there have been more winners than losers despite the many shocks the land use system has seen over the past 50 years.

Global cooperation

Today we have a system of global cooperation which means that the developed world shares R&D and technology with the developing world in more sustainable ways, and we buy goods from these developing countries.

The developing countries use the profits to invest in their own sustainable communities and infrastructure. At home, we are still producing some food of our own, we are using renewable energy, and we are encouraging the recovery of damaged ecosystems.

Those countries which are less well governed, have fewer natural resources, or which have been damaged by climate change, are doing less well.

The developed nations are also paying a premium rate to developing nations that are safeguarding ecosystems such as rainforests that help to mitigate climate change. These particular environmental services are beyond price.

The world has incredible technology transfer and we have developed new crops, new methodologies and new techniques, which are transparent and trusted. We now look back on older, less trustworthy technologies such as genetically modified organisms as stop gaps and they are no longer used. Knowledge sharing is managed through strong regulated global agreements.

We have made good progress, but land tenure in the developing countries still needs reform to ensure that local people receive the full benefits due to them.

Power to the people

Nobody cares about food and energy issues - so as long as they are both available, there is little interest in what it takes to keep the supply going.

The nuclear lobby won long ago and fusion reactors have come on line. These are clean and secure technologies and the waste problem has been solved. The UK's energy mix is boosted by a strong marine renewables sector.

In fact, the North Sea is now a major energy centre. It is used for energy production and distribution, while carbon capture and storage technology means that carbon dioxide is safely stored below the sea bed in decommissioned oil fields.

The UK is helping the rest of the world catch up with our success.

People power

We live in a pragmatic age. People have long accepted that one of the best ways to preserve the landscape is to preserve the climate that shaped it - and they also recognise that it's only possible to enjoy a walk in the country if you can get there.

Productive land is farmed for energy and biomass. GM biomass has replaced cows, of which herds have been severely reduced due to high carbon charging. Wind farms have sprung up in areas such as East Anglia and Scotland where conditions are right.

Protected sites still exist and have been expanded to include historic agricultural landscapes. Society is happy to enjoy them as long as they are not required for production. Self-sufficiency is the watchword.

The age of getting smarter

Over the past 30 years, climate change has accelerated and put nuclear power totally out of the picture as preferred sites were flooded by sea level rise. Old plants were decommissioned, and the nuclear waste and detritus was sold to China. They are rapidly turning the depleted uranium into bullets and ammunition to defend against the War of Northern Aggression which started two years ago as the Russians swept across the border from Siberia. This geopolitical brouhaha has also put natural gas out of the picture, as Russia is now hoarding its supply, and we've run through our own reserves.

The silver lining is that energy self-sufficiency has become the UK's new economic dynamo: in fact, it's our global economic comparative advantage. We've

deployed so many solar-powered CO₂-methane converters across the UK that we can practically run our national grid off the carbon we're wringing out of the atmosphere.

This focus on self-sufficiency has meant a slow, effective, but sometimes painful transformation of social scale. The densities of human habitation across the UK now vary widely.

A diverse array of new settlement patterns emerged as we built new low-carbon-footprint towns and retrofitted old cities to enhance their self-sufficiency. Promoting a sense of belonging, of local identity and social cohesion has proven a design challenge for both the new towns and the old, as people move around even more than they did 50 years ago. Live here five years, people say, and you're British! The unit of identity is really less national and more local and regional.

This makes maintaining unique and vibrant local landscapes more important than ever.

Who wins? The energy-rich and young ecotech entrepreneurs; also landowners, as we'll need their land for food self-sufficiency. It's a win for the Department of Energy, as it will be coordinating the marshalling of critical and scarce resources, as well as investing in alternatives

Who loses? possibly Defra, at least in its environmental watchdog role.

Government's role is to achieve consensus. It must help bridge different points of view of the land in order to make this difficult transition to self-sufficiency.

Science, technology and innovation will be critical to accelerate the transition to a hydrogen economy

This transition will be very capital-intensive: where will the financing come from to convert the infrastructure? Will it mean a large role for government in steering and regulating the new hydrogen infrastructure?

Ironic - this scenario started out with government supporting 'a thousand flowers blooming', encouraging ecotech entrepreneurialism to kick-start the design and innovation creativity necessary for a transition to self-sufficiency. But it will end by swinging back to regulation and a focus on building greater social consensus and cohesion.

21 August 2060

These days, the uplands are seen as soil and water protection zones. Economic modelling - very different from the old days - takes account of the value of soils and other natural resources.

Farmers are regarded as soil managers, stewarding the resource and looking after it so that it can sustain future generations.

Some areas have been abandoned because of poor soil quality, but new ecosystems have emerged. Biodiversity flourishes in low-fertility soils.

Multifunctional marvel

Britain has been reorganised to overcome the weaknesses it faced 50 years ago. Back then, intermittent and poorly managed water supplies, ageing infrastructure and unsustainable levels of densification meant the UK was terribly inefficient.

Agglomeration has brought little benefit, and land use planning is now based on more local distribution of resources and decision-making. London has been divided up and parts of the population have dispersed to other parts of the country.

Different parts of the country specialise in different economic activities. Settlements are encouraged to be as self-sufficient as possible. Some smaller settlements achieve both self-sufficiency and carbon neutral

living. Larger centres usually have small food production cooperatives within the city boundaries. Green spaces - whether for recreation, water capture or air quality control - are commonplace. Full-scale agricultural production takes place in satellite zones. The UK is productive and efficient and there are strong trading links between different nodes.

The transition has been as painful as it was necessary, but unrestricted movement means that settlements have - broadly - reached social equilibrium. Families tend to live close together in areas where they have skills. Worries about segregation remain, but there is no evidence of it yet.

Aligning governance structures with administrative and functional boundaries continues to be a challenge, but partners are committed to making it work.

Local decision-making on land use

Communities and regions now have local decision-making power - which is great - but we are rather inclined to resist change.

As a consequence, the patterns of land use today vary little from those of 2009.

While this suits many local people, they tend to be the ones with a vested interest in maintaining the status quo - local landowners, the better-off, and local businesses. Overall, it is hard to avoid the uncomfortable fact that the choices we are making now are damaging mobility and consequently long-term national prosperity. More immediately, they seem to be having a negative effect on those - the bulk of the population - who are unable to travel significant distances.

There are some limited opportunities for local-scale energy generation. But perversely perhaps, the focus on local decision-making has created a culture of entrepreneurialism and innovation at the local level and some areas make quite forward-looking planning decisions. The problem is that they are fragmented, so that across the UK as a whole, good decisions are diluted out.

National land use planning

Now that decision-making power rests in the hands of those who know how to use it, the UK enjoys a more integrated infrastructure. Regions specialise within a coordinated national framework - some in nuclear power, some in grain production, some in amenity and landscape preservation, some as mega-cities.

This approach works particularly well for large businesses and for the long-term interests of the economy. The people who lose out are those living in areas where national decisions create disadvantage, perhaps because they lead to significant land use changes. There are plenty of opportunities for science and technology, especially in nuclear power and big science projects designed to overcome global challenges.

less biodiversity.

Out of practice

The take-up of science and technology is limited and it has not been strongly adopted in land use practice.

Agriculture has been largely unchanged over the past few decades. There is not enough land for the UK to rely on for food and energy. Farmers are losing the battle against the new diseases and pests which have emerged over the past 60 years and which continue to adapt. Those who extol the virtues of indigenous and historical technologies still appear on the media regularly to remind us of the benefits, but they are beginning to sound less confident.

Reduced soil fertility has had a particularly damaging impact on livestock and the landscape. There are fewer animals and

7 Next steps

This document is an important resource for the scenario development process, providing the context for the scenarios and suggesting key themes for them.

Water is very scarce and the lack of alternative fuel technologies means that mobility has decreased. These two factors have combined to increase the population in cities.

Although the cities are benefiting from the increased supply of labour, decades of poor-quality building mean that the physical infrastructure is declining. Household bills are high, driven by poor energy efficiency in cold winters and hot summers.

It isn't easy to see how to get out of this slump. We have lost our own skills base in technology, and have no option other than to buy it in. But the shopping list - for food, energy and other resources - keeps getting longer and longer.



The next steps in the scenario building process are:

- Theme development: prioritising and developing the themes emerging from this workshop, and from the systems work and the state of science reviews
- Synopsis development: developing a set of storylines that cover a number of key issues and themes
- Focus groups: taking the synopses to focus groups to test and develop storylines
- Writing first draft scenarios
- Validating and refining the scenarios through workshop discussions



Endnotes

- i See information and indicators on London at <http://www.lda.gov.uk/>
- ii <http://en.cop15.dk/news/view+news?newsid=875>
- iii See, for example, <http://news.bbc.co.uk/1/hi/sci/tech/7940532.stm>
- iv <http://www.newscientist.com/article/mg20126965.900-heritage-is-not-what-it-used-to-be.html>