FUTURE SCENARIOS FOR THE UK FOOD & DRINK INDUSTRY

FUTURE SCENARIOS
FOR THE UK FOOD & DRINK INDUSTRY

Authors
Finbarr Livesey
Ilaria Frau
Dominic Oughton
Charles Featherston

This report was commissioned by the Food and Drink Federation (FDF) from the Institute for Manufacturing (IfM), University of Cambridge.

FUTURE SCENARIOS
FOR THE UK FOOD INDUSTRY

Authors
Finbarr Livesey
Ilaria Frau
Dominic Oughton
Charles Featherston

EXECUTIVE SUMMARY

This report provides a set of possible scenarios for the future of the food and drink industry in the UK in 2025. These are based on a series of interviews and two workshops with food manufacturers, policymakers, civil society representatives, farmers and retailers. The aim is to provide senior decision makers in industry and government with a common basis for discussion on the issues surrounding food production and what can be done to achieve positive outcomes for the industry and the country.

The scenarios bring together self consistent pictures of possible futures based around two axes –

- Whether the impetus for change is coming from government (top-down) or from a mixture of the market and individual action (bottom up)
- Whether we have sufficient or insufficient resources to maintain and improve our standard of living

This leads to four scenarios depending on whether each axis is at one extreme or the other (see figure 1).

Figure 1 – Four scenario quadrants based on impetus for change and resource availability

In **Vision Failure** we see a future characterised by a severe supply-demand gap, resulting in shortages and increasing energy and food poverty, as a polarised society struggles with social unrest and tension. Progress towards this future is driven by both a lack of social engagement and by government's inability to propose a clear vision combined with its reactive short-term response to crisis. As confidence collapses and the economy falls deeper into recession, politicians' ability and scope of action wane. Eventually, forced by the crises they are facing, individuals lobby for greater efficiency and sustainability in the sourcing and use of resources, but with minimal impact.

UNIVERSITY OF CAMBRIDGE

Sustainable Champagne describes a future where there is a sustainable balance between supply and demand for raw materials, food and energy. This has been made possible by changes in people's attitudes and behaviour, which has reduced consumption and has led to pressure on industry for more efficient and sustainable products and services. This change is based on greater awareness and understanding of environmental issues and limits, and a reduction in the role of central government as there has been an increase in localism and community initiatives.

Demand continues to exceed supply in **Good Intentions**, as society, the economy and the environment are affected by the unintended consequences and failures in the strategies chosen by the government. Here government action is the main driver for change, however the difficulties in forming a working and stable coalition, the inability to act rapidly and the limited involvement of industry in the development of strategies contribute to their inability to offer successful and long term responses to the emerging crises. The issues are well understood but government is not making good choices.

The future described in the **Command & Control** scenario is one where government-led interventions and well aimed regulation successfully achieve a balance between supply and demand. On the back of a strong mandate from the voters, the government is able to carry through long term strategies and obtain acceptance for controversial solutions to pressing issues such as energy and food security, including the increased use of nuclear power and the adoption of GMOs. There is increasing regulation, due to the inability or unwillingness of industry to deliver the required changes and targets through self-regulation, and greater control and presence of the state in everyday life.

The most desirable future for contributors to the workshops was Sustainable Champagne, although an almost equal emphasis was placed on the Command & Control by the stakeholders represented, especially the food manufacturers and retailers. In order to achieve either of these outcomes there is a need for a shared vision for the future of the food industry in the UK based on strong evidence, consistent regulation and consumer engagement. Without such a vision, in a business as usual approach, there is a concern that both Good Intentions and Vision Failure are real possibilities.

The following points form a common agenda across the industry to reduce the likelihood that the UK food and drink industry finds itself in either of the more negative scenarios –

- The development of a clear and shared vision across stakeholders

- Deeper and more open consultation between industry, government and society at large

- Stronger evidence for the measures that are required to achieve the goals we set

- Consistent and coherent regulation from government

- Changing consumer expectations to reduce unrealistic expectations for food availability

- Increased skills across the food industry to be able to produce in innovative ways

- Linking innovation with clear sustainability targets in all aspects of food production

- An openness to change for all stakeholders

IfM | Centre for Industry and Government

ACKNOWLEDGEMENTS

IfM | Centre for Industry and Government

CONTENTS

IfM | Centre for
Industry and Government

1.0 INTRODUCTION

Food is a constant backdrop to our lives. However, for many people food is taken for granted, not realising that the food industry has gone through significant changes over the past twenty years and continues to change in fundamental ways. The interaction of global economic and social trends with internal industry pressures for manufacturers, retailers and consumers is changing the types of food available, how food is manufactured and where in the value chain power and influence lie.

This report, commissioned by the Food and Drink Federation (FDF) and written based on work carried out by the Institute for Manufacturing, University of Cambridge, is an attempt to bring together the various stakeholder perspectives and key trends to develop plausible alternative futures for the food industry in the UK. The impetus for the report comes from the lack of truly multi-stakeholder pieces on the future of the food industry, with notable exceptions such as the Food 2030 report[1]. By bringing together representatives from agriculture, manufacturing, retailing and civil society this report starts an important conversation that recognises differences in needs and goals, and it is hoped that it will act as a catalyst for debate on how government, consumers and the industry can find common ground to achieve their varied and sometimes conflicting goals.

1.1 AIMS OF THIS REPORT

This report presents four possible scenarios for the future of the UK food industry to 2025. The aim is to provide a set of plausible descriptions of how the context for food manufacturers may evolve and to discuss how both industry and government might avoid the more negative scenarios and preference the positive outcomes.

The scenarios presented here are not intended to be exhaustive or to claim to represent accurate predictions. They are a blend of expert opinion, stakeholder perspectives and data from a variety of published sources. Their main use is in providing a better understanding of the issues across the food industry and in promoting a common dialogue on the future of food manufacturing in the UK and to assist senior decision-makers in developing their strategies.

[1] http://www.defra.gov.uk/foodfarm/food/pdf/food2030strategy.pdf.

UNIVERSITY OF CAMBRIDGE

1.2 APPROACH

The development of scenarios for an industry can be both time consuming and costly. This project's aims were to produce timely and relevant scenarios for the food industry in the UK and therefore the approach taken was to build on existing scenario work and to use workshops to gather detailed input from multiple stakeholders in as time and cost effective a manner as possible.

Figure 2 – Outline of approach for scenario development
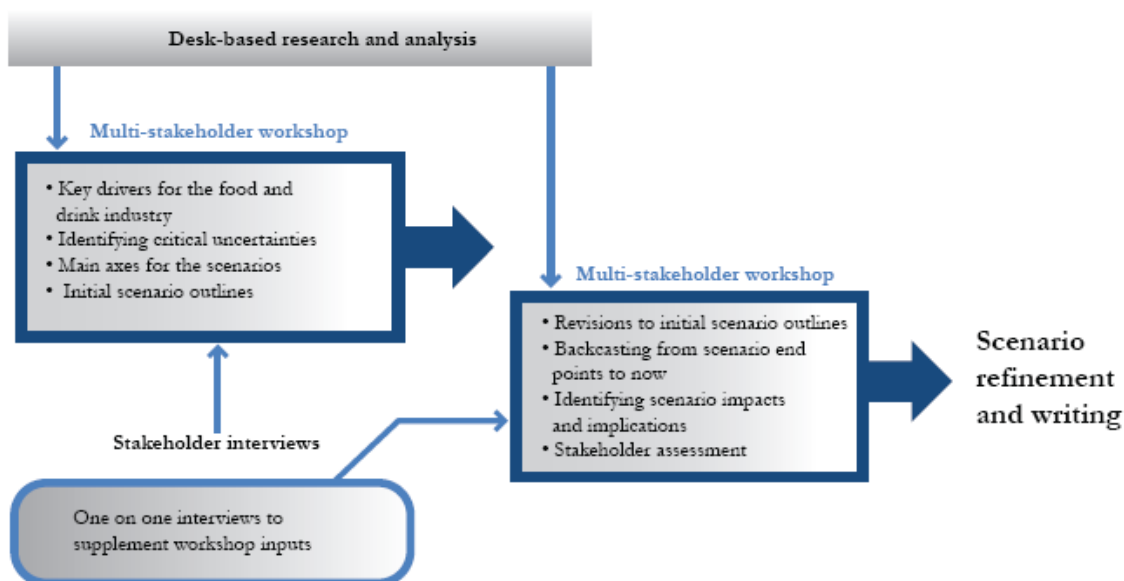
As figure 2 shows, the first workshop worked from an understanding of the key drivers for the industry to develop dominant axes to define the foundations for the scenarios. The second workshop took the initial scenario outlines and reviewed them and developed stakeholder assessments of the impact of each scenario. The outputs of both workshops, along with input from one on one interviews, was then brought together to refine and complete the scenario descriptions that form the majority of this report.

IfM | Centre for Industry and Government

2.0 DEVELOPING THE SCENARIO FRAMEWORK

In order to have a framework on which the scenarios could be developed a set of axes which describe the key uncertainties need to be defined. This was done by identifying the critical uncertainties for the UK food industry and then, by voting and discussion, choosing combinations of one or more of the critical uncertainties to represent the major axes for the scenarios. The following sections detail the critical uncertainties, the axes chosen for the scenarios and the initial titles for the scenario options.

2.1 CRITICAL UNCERTAINTIES FOR THE FOOD AND DRINK INDUSTRY

The first task of the first workshop explored the key drivers as the participants saw them for the food and drink industry. Each participant was asked to give their top five drivers in terms of impact on the industry. The long list of drivers generated was then scored by participants for their potential impact and the uncertainty in the drivers' evolution.

Figure 3 – Mapping of key drivers by uncertainty and impact resource availability

1. Increase efficiency via technology
2. Impact of climate change
3. Increasing regulation
4. Water stress and management
5. Price of raw materials
6. Ethics and behaviour (moral/ethical consumption, resistance to techs)
7. Government policy coherence
8. Health concerns and issues
9. Skill availability
10. Population growth
11. Cost of energy
12. Skills and education
13. Acceptibility of technologies
14. Waste reduction
15. Funding for research and innovation
16. Energy availability
17. Information (increased access and availability, speed of communication)
18. Efficient use of raw materials
19. Food safety (demand, perceived v. actual)
20. Availability of finance for investment

From this mapping, those drivers which scored highly on both axes were chosen as the critical uncertainties. Uncertainty relates to the possibility of an event occurring where there is no evidence for judging its likelihood. This will be where -

- the order or nature of things is unknown,
- the consequences, extent, or magnitude of circumstances, conditions, or events is unpredictable, and
- credible probabilities to possible outcomes cannot be assigned.

UNIVERSITY OF CAMBRIDGE

Critical uncertainties are those drivers whose uncertainty is high and whose evolution has a high impact, and thus play a central role in shaping the future. It should be noted that there will be drivers for the industry that do not appear as critical uncertainties for this report even though they will for some parts of the industry have a very significant impact. This is not to say they are unimportant, rather it is the difference between drivers that participants felt were predictable in some sense versus those that had high uncertainty. Participants took these and developed extremes for each, based on plausible end points that would describe the potential span of outcomes for each driver.

Table 1 – Critical uncertainties and their proposed endpoints

Uncertainty	Extreme A	Extreme B
Efficiency improvements through technology	Slow/low improvements in production efficiency	Rapid improvements in production efficiency
Water stress	Water stress made manageable	High water stress due to lack of action
Regulation (level and coherency)	Appropriate and timely regulation of industry	Incoherent policy and regulation across governments
Energy security (availability, mix)	Energy reliably available	Unreliable energy supply and constrained mix
Raw materials cost and availability	Raw materials scarce, availability volatile, costs increase	Raw materials are easily available at low cost
Consumer ethics and behaviour	Consumers embrace new technology, informed choices	Consumers lack trust in technology and are confused
Funding for research and innovation	Public research funding declines, inefficiently applied	Funding leveraged through effective use and co-operation
Health concerns and issues	Food is the enemy, blame the food industry	Food can make you better, customers in control
Availability of skills	Absence of skilled people, unattractive career	Attractive industry/career, successful re-skilling of workforce
Impact of climate change	Strong adaptation to climate change	Failure to adapt to climate change
Cost of energy	High cost, unaffordable energy	Cost neutral energy, fossil fuel substitution
Citizens' attitudes	Individualistic behaviour, disengaged	Engaged, collective attitude and approach

2.2 SCENARIO AXES

Based on the critical uncertainties identified, participants were asked to choose pairs or sets of those critical uncertainties which they felt were most important and were orthogonal (i.e. as unrelated as possible). The following axes were chosen through a voting process and plenary discussion.

Axis One - Resources: Sufficient vs Insufficient

On this axis the availability and accessibility of the world's resources for the UK range from sufficient to insufficient. The resources were defined to include energy, land, agricultural products, water, minerals and labour. In the sufficient 'extreme' the UK's resources are sufficient to meet demand. The insufficient 'extreme' describes situations where the UK's resources fail to meet UK demand.

Whether a situation is sufficient or insufficient depends on three factors; abundance, efficiency and demand. Abundance is the pure availability of resources. Efficiency is the rate at which the resources are used or needed per output. Demand is the rate at which they are consumed. Each scenario is driven by a combination of these where either one or two are dominant or all draw the world and the UK to a particular level of resource availability.

IfM | Centre for Industry and Government

Axis Two - Origin of Control: Top-down vs Bottom-up

This axis defines the underlying driver of action and change within a scenario. In the bottom-up 'extreme' the action is driven by a mixture of individuals and the market. The people have the power and can use their decisions to make a difference. However, this 'voting with the feet' idea can be manipulated by marketing and it depends on the underlying factors in the scenario as to which behaviour is dominant (if either is). In the bottom-up scenarios the government takes a 'hands off' approach.

In the top-down 'extreme' the government drives all change. This does not imply the government has a consistent and focused agenda of regulation as the amount or level of success of any regulation is not defined by the axis.

These two axes were then used to develop four alternative scenarios that considered possible combinations of the end points of the axes as shown in figure 4.

Figure 4 – The four scenarios based on the chosen axes

The following sections provide the detail for each of these scenarios using a narrative to describe the end state and a brief description of how we might get there. Section seven brings together the potential impacts for each scenario highlighting the high level changes for each stakeholder.

UNIVERSITY OF CAMBRIDGE

3.0 SCENARIO ONE – VISION FAILURE

The first scenario is one where there are insufficient resources to meet our needs and the impetus for change is coming from individuals rather than government, due to a lack of agreement in government on the scale of the challenges we face and an inability to carry out the actions needed to achieve sustained growth.

Table 2 – settings for critical uncertainties in Vision Failure

Endpoint A	1	2	3	4	5	Endpoint B
Slow/low improvements in production efficiency			▇			Rapid improvements in production efficiency
Water stress made manageable					▇	High water stress due to lack of action
Appropriate and timely regulation of industry					▇	Incoherent policy and regulation across gov'ts
Energy reliably available					▇	Unreliable energy supply and constrained mix
Raw materials scarce, availability volatile	▇					Raw materials are easily available at low cost
Consumers embrace new technology				▇		Consumers lack trust in technology
Public research funding declines		▇				Funding: effective use + cooperation
Food is the enemy, blame food industry			▇			Food makes you better, customers in control
Absence of skilled people		▇		▇		Attractive industry/career, successful re-skilling
Strong adaptation to climate change				▇		Failure to adapt to climate change
High cost, unaffordable energy		▇				Cost neutral energy, fossil fuel substitution
Individualistic behaviour, disengaged				▇		Engaged, collective attitude and approach

3.1 DESCRIPTION OF 2025 UNDER VISION FAILURE

It is difficult today to think of a time when volatility was not the prevalent state of the markets – financial, commodities, products, even skills. The draining of capital, industrial activity and brains towards more stable countries and regions has been a constant over the past decade, and shortages in resources like those experienced in 2007/08 and in 2012/13 are now the norm. The ensuing inflation has had consequences in all sectors of the economy, exacerbated by energy scarcity that has affected the UK since the peak of oil production in 2015. We are all affected, across society and throughout the supply chain.

The UK is lagging behind in the technology race, leading to a further fall in competitiveness. Incremental technology progress has led to small efficiency gains, and an increasing part of society is spending more and more on food. Food poverty is now a reality for 15% of the UK, and the limitations and resources of the regional health systems – who find themselves battling both obesity and malnutrition – mean that life expectancy in the UK is now less than it was at the turn of the century. Energy poverty is also on the rise for the 7th consecutive year, and even those who could in theory afford their energy are experiencing brownouts. It is not surprising that the financial sector has all but deserted the UK, and what remains of manufacturing is struggling, leaving the UK 11th in the league table of nations in terms of GDP.

It is difficult to trace the situation we are facing today back to one single event, one single decision. It is the sum of many small, seemingly irrelevant choices and decisions, or the lack of them, and has painted us into a corner.

In fairness, we seem to have finally moved on from the unconcerned consumption and carefree, short term attitudes and behaviours of the last decade. Those who can afford it are attempting to reverse these trends, putting pressure on government and business for a more sustainable and efficient use of resources. Nevertheless the results are limited, and it is unclear whether there will be a recovery or not in the longer term.

IfM | Centre for Industry and Government

3.2 FROM HERE TO VISION FAILURE

The '10s started with a couple of squeezes – difficult to call them crises– that showed the cracks in the world's ability to respond coherently to threats. A series of recurrent droughts in several world regions in 2012 and 2013 led to a global harvest failure with severe and widespread consequences, causing a sharp contraction in the supply of raw materials to the UK. The price for fossil fuels kept rising, well past $180 per barrel as peak oil approached, increasing costs and further slowing the recovery from the 2008 recession. Protectionist measures emerged worldwide as countries tried to secure access to raw materials and international relations became less and less co-operative, a major consequence of which was the ignoring of international agreements on climate change.

Through this period the UK had a succession of hung parliaments, with an increasing lack of consensus on major initiatives and policies, in sharp contrast to the coherence of the coalition government of 2010 – 2012. Politicians remained concerned with the next election and were reluctant to propose unpopular measures that could compromise their prospects. Following the 2008 recession and the various deficit reduction packages, public budgets were extremely tight. This constrained the government's ability and its willingness to undertake any drastic measures, leading to short term, palliative and remedial measures. This continued to weaken people's confidence and trust in the government.

The gradual nature of the crisis allowed each stakeholder to stick with their own vision, unconcerned whether it was compatible with other actors, and whether their aggregate would be sustainable in the short or long term.

In the second half of the '10s, however, the squeeze became more dramatic as the impacts of climate change, energy scarcity and growing population grew. Despite advances in drilling and extraction technologies, peak oil had been reached by 2015. The lack of proper funding for research into and infrastructure for alternatives to fossil fuels, worldwide but especially in the UK, meant that the energy mix was still relatively constrained. This resulted in an unreliable energy supply, while prices soared. Water stress, expanding desertification and floods put further stress on the supply of raw materials, for which the UK found itself vying with growing economic powers such as China and India.

2016 and 2017 saw a collapse of bee pollination, particularly in England and Wales, due to series of droughts and floods and of the changes in temperature, affecting approximately £100 million of crops. The lack of investment and protection of other ecosystem services led to greater water stress. At the same time, domestic demand continued to increase as population expanded – particularly following the influx of climate refugees from other countries hit by drought and famine. The movement of people was increased again as resource wars exploded in areas such as in Northern and Central Africa and in the Middle East, where oil reserves were dwindling and no alternative economy had been created.

Towards 2020, food and energy poverty became the government's pre-eminent concern and a growing element of the public budget. Since prices kept increasing, more and more people turned to cheaper foods. For some this led to a shift towards eating more fruit and vegetables, as a relatively cheap food source. But the majority are resistant to changes in their diet leading to dependence on cheaper foods with lower health benefits.

UNIVERSITY OF CAMBRIDGE

The failures of vision and the weaknesses of the current system became apparent as key public services approached collapse. The NHS was essentially dismantled, replaced by a Regional Health Service with a more limited mandate. The near collapse of the pension service was another blow to people's confidence, as people saw their expected post-retirement income more than halved. People felt betrayed by the state and increasingly disengaged from society.

Across industries there was a drive for improvements in production efficiency due to the high cost of raw materials. However financing was limited, with little funding for R&D. Consumers were still untrusting of new technologies, an attitude reinforced by limited transparency from companies. Due to high costs and uncertain uptake nanotechnology based trials in several key industries, including food, were abandoned. Progressively, R&D and innovation coalesced in international centres outside of the UK, such as the US and China.

Manufacturers increasingly relocated facilities in an attempt to mitigate costs and to have greater stability in access to resources, including energy and people. This led to a loss of around 200,000 jobs – and the effects on the UK economy and morale were deeply felt. As unemployment increased, so did social unrest and crime.

A significant social change in this period was the increase in shared accommodation, with more generations sharing a house or flat since fewer people could afford to buy property. This effect was strengthened as smaller pensions and reduced welfare meant that families had to look after older members. This also encouraged other behaviour such as less eating out and self-reliance measures such as vegetable gardens and allotments to supplement food availability.

By 2020 people, unable to rely on the state for solutions and not trusting the business sector to deliver solutions, began trying a more collective approach. Groups of consumers attempted to 'vote with their wallets' to drive changes in business products and practices, effectively boycotting those companies and brands that appeared unsustainable. At the same time opinion on new technology became less rigid, as the public accepted more technological advances, even in the food industry. One of the last points of resistance – the use of GM – was removed in 2021, as cheaper GM cereals and produce from the Americas reached the UK market.

People also tried to pressure governments and NGOs into increasing information and awareness of resource consumption, encouraging and promoting reduced consumption, reducing the strain on the supply of key raw materials and energy.

4. SCENARIO TWO – SUSTAINABLE CHAMPAGNE

The second scenario is structured around a world where there are sufficient resources, due to changes in demand and technology advances. The dominant force is not government, rather change has been led by individual and collective action in society.

Table 3 – settings for critical uncertainties in Sustainable Champagne

Extreme A	1	2	3	4	5	Extreme B
Slow/low improvements in production efficiency					▉	Rapid improvements in production efficiency
Water stress made manageable	▉					High water stress due to lack of action
Appropriate and timely regulation of industry			▉			Incoherent policy and regulation across gov'ts
Energy reliably available	▉					Unreliable energy supply and constrained mix
Raw materials scarce, availability volatile		▉				Raw materials are easily available at low cost
Consumers embrace new technology	▉					Consumers lack trust in technology
Public research funding declines					▉	Funding: effective use + cooperation
Food is the enemy, blame food industry					▉	Food makes you better, customers in control
Absence of skilled people				▉		Attractive industry/career, successful re-skilling
Strong adaptation to climate change	▉					Failure to adapt to climate change
High cost, unaffordable energy				▉		Cost neutral energy, fossil fuel substitution
Individualistic behaviour, disengaged				▉		Engaged, collective attitude and approach

4.1 DESCRIPTION OF 2025 UNDER SUSTAINABLE CHAMPAGNE

Compared to previous generations, UK consumers in 2025 have something to be smug about - they are responsibly enjoying significant resource security, if not abundance. Individuals have played a central role in balancing the demand and supply of key inputs such as food and energy – whose security was anything but certain 15 years ago.

The main changes that have allowed the country to reach this position have been driven by individuals who have engaged in response to the pressures and crises of the early 2010s. This engagement has used market mechanisms to affect change, rather than working through large organised groups. In response to distributed consumer pressure industry self-regulation has gradually increased, providing a foundation for coherent regulation by government as it imports these industry-led standards into official regulations.

Self-regulation is also evident in people's behaviour and results in considerate, responsible consumption: serving strawberries in December is an unforgiveable faux-pas, as is leaving the lights on. We boast about how little electricity we use, and compare the size of our carbon footprints. Global demand and sustainability requirements mean that the years of 'cheap' food are over; but we have a better understanding of the hidden costs that we – and the planet – were actually paying, and we have come to accept these higher prices.

This change in attitudes has not heralded a return to the past or a flight from technology, as some feared - we are fully leveraging the benefits of science, and consumers are willing to accept and embrace new technologies and the efficiency improvements they offer. We use social networks to get information on companies and their corporate social responsibility (CSR) ratings, to review product performance and carbon content and to swap tips on sustainability.

It would appear we have done the best we could with the cards we were dealt 15 years ago – but it is unclear whether this position is sustainable in the long term.

UNIVERSITY OF CAMBRIDGE

4.2 FROM HERE TO SUSTAINABLE CHAMPAGNE

A series of negative events (severe water shortages, significant rises in oil prices, and electricity brownouts) brought the gravity of the global and national situation into focus for the wider public. Each event alone could not break the system, but as they built one on top of the other their impact magnified and made the situation undeniable.

A number of NGOs distributed information on the core issues, based on high scientific standards but crucially translated for a general audience. Rather than leading to a panic, this delivery of complex information in an engaging and accessible manner provoked wide ranging debate, leading to calls for long-term solutions from government and industry.

However there was a general perception that the government – still recovering from the significant burden of the recession and deficit reduction – could not provide solutions. However, limited public finances and the reduction in the size of the public sector had encouraged and facilitated the push for decentralisation and localism. This attitude of greater independence encouraged a small number of county councils and small cities, with the support of the vast majority of their residents, to reduce car usage, support renewable energy implementation, and strictly limit water usage.

It has been argued that the limited size of such regions made it easier to reach consensus, and that many had still strong links to the surrounding countryside giving them a better understanding and perception of the 'natural' cycle ("system thinking on your doorstep", someone called it). Also as people in such communities were less likely to move, they had a longer term commitment to their immediate environment.

Whatever the reasons for their success, these local efforts began to have an impact and became headline news. More importantly, their examples began to be used as guides for what could be done in other small and not so small cities. Clearly the initiatives available to a village or even a small city are not necessarily available to a big city or a metropolis. However rather than focusing on the 'why it can't work here', cities began looking at how the concept could be adapted and what alternatives could be implemented. In some of the larger cities, such as Manchester, Birmingham and London, the initiative was picked up by individual boroughs – often those with the highest levels of problems and poverty – and despite some hiccups and failures, the results were generally positive. Successful projects included the reclaiming of derelict areas and buildings for food production, with some councils able to secure the use of high-tech machinery and tools through agreements with research centres and technology institutes. More low-tech initiatives included food grown on top of buildings to feed their inhabitants, or the more widespread use of green walls for thermal insulation of buildings, water capturing systems and solar panels. Such solutions soon became popular even in better-off areas, and quickly became must-haves.

Critics argued that these individual initiatives were insufficient on their own to solve the problems they tried to address. For example, summing all the extra food that could be potentially produced through allotments, re-converted gardens and spaces, would not have been enough to satisfy the growth in demand. Nevertheless, such initiatives succeeded in two ways.

IfM | Centre for Industry and Government

First, during the second half of the '10s they moderated the pressures on the country in key areas such as energy and food, preventing the UK from falling into a downward spiral of economic contraction which allowed time for new technologies (such as the hydrogen cell and intensive sustainable farming) to be further developed and social acceptance for these technologies to develop. Secondly, they promoted a progressive change in the dominant culture and the emergence of a different set of values which translated into a growing demand for products and services offering sustainability, efficiency, and health.

Greater consciousness of the trade-offs and environmental limits in food production and beyond led to what is now known as '3S consumption': Sustainable, Self-limited, and Selective. Adherents of 3S consumption aim to be sustainable in their use of resources, self-limiting in the amounts they use and selective in the types of resources they depend on. The reduction in household energy consumption brought by this new attitude (amplified by high energy prices) and the increased share of energy from renewables and from waste (helped by greater discipline concerning recycling) ensured that energy demand and supply were becoming sustainable.

Indeed, people's willingness to self-impose limitations on their consumption and to accept marginally higher prices that sustainability and quality could involve, has been one of the great changes over the past 10 years – and one that took many by surprise.

Some businesses looked at this as just the latest fad. But others paid closer attention, and saw the potential beginning of an important shift in behaviours and, consequently, in consumption. In response top manufacturers and retailers started adding 3S information on packaging such as air and food miles and carbon footprint. It took some time to agree on the measures and on consistent formats for displaying such information, but by 2017 it was standard – and its absence on any tag, box, can or packet was very obvious. Food chain institutes, such as IGD, and the 3S Initiative, an independent body established in 2017 funded jointly by the government and by the main food and drink companies, were instrumental in the creation and promotion of the measures and standards for the food industry – and in carrying out oversight that ensured consumers' confidence. Providing the information was clearly not enough – food and drink companies and their supply chain had to deliver fast improvements in the efficiency of food production if they were to remain in business, which meant they had to invest significantly in R&D.

By late 2017 however the supply of basic resources hit a plateau; it became clear that the efficiency gains from improvements in mainstream technologies and from improved processes and behaviours would not be sufficient to satisfy growing global demand. Food shortages began to appear in emerging economies, while energy security was once more a pressing issue in the UK. The winter of 2018-19 was particularly harsh, and cases of food and energy poverty in Britain began to be reported once again. Eventually people's fear of a repeat of the 2013-14 crises overcame their reluctance and hostility towards more controversial technology, such as nuclear power and GM crops.

The quest for efficiency and the focus on technology saw a continuing change in the type of skills required and workforce employed in the food and drink industry, with even more automation and a shift from manual/production tasks towards positions with greater technological/scientific content (R&D, technicians etc). The industry was attracting more talent thanks to a stronger image (many still remember the 'work in food, work in life' campaign of 2016) and career prospects were strong. However flaky CSR and dubious sustainability credentials made it difficult for laggard companies to hire the bright young things coming out of UK universities who had clear ideas of what would look good on their CVs.

UNIVERSITY OF CAMBRIDGE

5.0 SCENARIO THREE – COMMAND & CONTROL

This third scenario is a future in which there are sufficient resources to meet the demands of the country, with the vision and the impetus for change coming from government. This is a world where public leaders had clarity of vision and the will to enforce that vision on the industry and the country.

Table 4 – settings for critical uncertainties in Command & Control

Extreme A	1	2	3	4	5	Extreme B
Slow/low improvements in production efficiency					■	Rapid improvements in production efficiency
Water stress made manageable	■					High water stress due to lack of action
Appropriate and timely regulation of industry	■					Incoherent policy and regulation across gov'ts
Energy reliably available			■			Unreliable energy supply and constrained mix
Raw materials scarce, availability volatile			■			Raw materials are easily available at low cost
Consumers embrace new technology	■					Consumers lack trust in technology
Public research funding declines					■	Funding: effective use + cooperation
Food is the enemy, blame food industry			■			Food makes you better, customers in control
Absence of skilled people				■		Attractive industry/career, successful re-skilling
Strong adaptation to climate change		■				Failure to adapt to climate change
High cost, unaffordable energy		■				Cost neutral energy, fossil fuel substitution
Individualistic behaviour, disengaged		■				Engaged, collective attitude and approach

5.1 DESCRIPTION OF 2025 UNDER COMMAND & CONTROL

The outlook in 2025 is a relatively positive one, characterised by greater resource sufficiency and security than at the beginning of the new millennium. The main driver for change has been government policies, regulations and initiatives. Over the past decade people have been more accepting – even welcoming – of a state that is more present and active, from a regulatory point of view. Governments since 2010 have repaid and strengthened the trust that we have placed in them through a more consistent approach to policymaking and improved enforceability, both at the UK and at the international level.

In industry there has been a rapid improvement in production efficiency over the past 10-15 years - most significantly in food production. Food security has been a key objective for government and public support has been based on providing more focused R&D funding. Another key factor has been the greater understanding and acceptance – by the government as well as by the wider public – of the importance and role of technology in key sectors such as energy and food production. The positive results achieved, and the monetary returns, have ensured ongoing (and increasing) R&D investment in the sector.

Policies have placed great emphasis on total or correct pricing, so that goods and service better reflect the cost of environmental and social externalities. This has meant that while resources are available, prices have increased. As prices of raw materials and products have risen there has been a constant focus on reduction in waste throughout supply chains as well as by consumers.

Increasing levels of industrial policy have brought about a greater (and rising) share of renewables in our energy mix, making it easy for the UK to meet EU targets for sustainable energy production. At the same time we are seeing increasing crop yields as government has strongly supported the introduction of technologies (including and beyond GMOs).

People are healthier, taking greater responsibility for their own physical wellbeing, encouraged by strong government incentives, and we have seen a reverse in the increase of lifestyle-related diseases such as type 2 diabetes.

IfM | Centre for Industry and Government

Over the past couple of years some dissenting voices have emerged as some people start to feel stifled and other blame the loss of innovation and initiative in UK industry on excessive regulation and on overbearing presence of government in the formulation of research agendas.

5.2 FROM HERE TO COMMAND & CONTROL

As many economies began to emerge from the deep recession of 2008-11 we found ourselves facing a number of crises on a global scale. Many of these were made more acute by the upturn in the global economy which, together with the increase in world population, caused demand to rapidly increase for key resources. Supply, however, had not been able to keep up and during 2012-13 events such as peak oil, reduced crop yields (due to adverse climate conditions) and greater insecurity (caused by resource conflicts linked to water stress) came together to create a perfect storm of limited resources, high prices, and uncertain availability.

During the summer of 2012 the surge in energy demand due to a 2-week heat wave caused extensive power failures in the UK, with brownouts across the country; this was followed by a very cold winter, when prices reached record levels and availability was patchy. The population was hit by both high heating bills and high transportation costs, which compounded the higher food prices. There was also the threat of severe shortages, which in a few cases turned into reality. A 'winter of discontent' turned into a winter of fear, as a sense of panic and helplessness started to emerge and quickly spread to financial markets.

Following the 2010 election the scale of government was radically cut back, in response to the state of the public finances and pressure from the private sector. However, as crisis after crisis hit, it became clear that the market would not and could not provide solutions on this scale. Increasingly people turned to politicians and called for concerted action from government.

The hung parliament of 2015 was dissolved by the Queen shortly before her abdication. The new election resulted in a landslide victory for a new and charismatic leader supported by a new generation of politicians. The new PM took to heart Emanuel Rahm's quote "you never want a serious crisis go to waste", and moved quickly to identify key interventions, leveraging the sense of urgency to build consensus and support for relatively harsh measures.

Clear communication was essential for acceptance of this "New Social Contract", which clarified the problems and challenges being faced, the rationale for the strategies and measures undertaken, and the targets and objectives of the government. There was a clear long-term perspective in the strategies and policies proposed: "Would you settle for a band-aid", one of the key slogans was, "if what you need is open heart surgery?" A willingness emerged, across most of the EU and the US, to give up some level of freedom in order to enable the government to pursue the necessary steps and actions to avoid the worst of the coming storm.

Agreements with energy-rich countries such as Russia offered relief from the most painful peaks of energy scarcity for the UK. With that temporary solution in place, the government focused significant R&D funding on the development and deployment of renewable and low-carbon energy alternatives, while firmly pushing ahead with nuclear. Demand was managed through the establishment and widespread use of smart grids, demand pricing, and incentives for insulation, as well as through the successful introduction and enforcement of carbon taxes. In parallel publicly funded R&D for the development of more efficient, less resource-intensive industrial processes was increased, and more consistent and stable regulation was introduced which encouraged industry and communities to move towards self-generation.

UNIVERSITY OF CAMBRIDGE

Control of scarce resources, such as water, were managed through changes in pricing, whereby usage was incrementally taxed. This enabled better water management and led to significant reduction in water stress across the country.

In the food sector this approach led to taxes on foods with high levels of sugars and fats, particularly fast food. This was unimaginatively dubbed as a 'fat tax' by the tabloids, as they portrayed this targeting snacks and confectionery. The government engaged directly with retailers and manufacturers to try and change consumer behaviour towards healthier and more sustainable consumption, while also increasing the amount of regulation addressing the health effects of food, including limits on the amount of salt in packaged food and a complete ban on trans fats. A greater awareness of the social costs of diet-related illnesses, at a time of very limited public resources, won the public argument, impacting positively on health outcomes and on the public purse.

Meanwhile 2012 climate change targets had not been achieved, possibly because for most UK companies 'going green' had mostly been a PR exercise with limited practical consequences. In response, the government introduces a new set of fines for below standard performance as well as strong incentives for significant reductions in emissions.

In parallel to its strategy of focused R&D, the government carried out a relatively deep reform of the education system, aiming for more standardised schooling, updated and strengthened science curriculum, the hiring of more physics and math teachers, improved links between vocational courses and apprenticeship opportunities (which were strongly incentivised) and performance assessments of institutions and teaching personnel.

By 2016 the government's strategies began to show results, with a stabilisation of resource availability and prices, a levelling off of diet-related conditions such as obesity and diabetes and an overall stabilisation of energy demand.

The strength and depth of the civil service, most with further degrees in public administration and similar professional preparation, ensured greater continuity and alignment across governments. This was also helped by the creation of multi-party commissions around issues of particular importance. In particular, the UK placed particular emphasis and was at the forefront in the research and endorsement of measures aimed at the valuing and pricing of ecosystem services and externalities, and at their potential use as a tool to level the international playing field while promoting sustainability.

Together with energy security, food security and safety remained at the forefront of the public agenda. However, despite the various achievements, the milestones set out in the government's food strategy were not effectively delivered by industry, prompting the government to increase regulation to ensure key deliverables were achieved.

The failure of key crops in the UK and abroad due to droughts in 2017, and the ensuing human emergencies in several world regions, acted as catalyst for a significant effort towards the development and acceptance of GM crops with greater drought tolerance. The absence of alternatives to GM crops at this time tilted the balance in favour of GMO. In the UK, the government widely publicised further research and trials to confirm the safety of GMOs (beyond controls already in place at the EU level) and undertook a careful communication campaign to bring the public with them. The confidence and trust of NGOs and leading public figures were fundamental in the eventual positive reception by the wider population.

IfM | Centre for Industry and Government

In 2019 a biosecurity scare concerning the import of meat from abroad and a potential pandemic threat caused the EU to promote union-wide policies focused on traceability, safety, and sustainability. This levelled the playing field for UK companies, who could take advantage of their good positioning, thanks to existing regulations and standards.

Having failed to meet the GHG reduction contained in the first two carbon budgets, the government introduced a law establishing an individual carbon allowance, and resorted to measures aimed at informing and influencing behaviours, such as the issue of carbon credit cards to population. Maintaining within the assigned budget ensured fiscal incentives and other benefits, thus encouraging consumers to ask for and use carbon labels across products and services, giving preference to those with lower carbon footprints and so providing an incentive for business to reduce carbon emission. Similar attempts were done, on smaller scales, to promote understanding and awareness of ecosystem services and their costs, although results were mixed.

Meanwhile sociologists recorded a further growth in social networking in parallel to an increase in individualism and a reduction in the influence of NGOs and other entities for organised action. The confirmation of this phenomenon was when the government bypassed NGOs and resorted to twitter feed consultations ahead of the 2021 budget.

The first years of the 2020s have seen a powerful government enjoying stable support from the population, on the right path to sort out any remaining deficit issues and ready to set a new economic direction for the second quarter of the century. Following the beginning of operation of the new nuclear plants in 2018 (one year later than planned, but the extra time was necessary to ensure proper communication to the population) and thanks to greater efficiency, 40% of energy demand is now covered by non-fossil fuels. A new government food strategy has been launched, and it appears that the strategy's targets will be met two years early. The economy has benefited from the greater stability and resource security, from a focused research investment driven by government-set priorities, and from a consistent and coherent regulatory framework, while the skill gap, which was widening just 15 years ago, has essentially been closed. There are some concerns, however, regarding the slowing rate of innovation and the decreasing level of initiative and entrepreneurship displayed by national companies. This may be behind the slowing of our economic growth.

Better educated and with the right tools and products made available thanks to government intervention, consumers find it easier to look after their diet, so that there is a reversal in the trends of food-related diseases. Nevertheless there are increasing signs of individuals' disengagement from politics and issues of common interest, as they seem happy to delegate decisions – and responsibility – to the government and the public sector.

UNIVERSITY OF CAMBRIDGE

6.0 SCENARIO FOUR – GOOD INTENTIONS

The final scenario shows a future where even with the best of intentions our problems are not solved. Government recognises the issues that face the industry and attempts to take the lead. However, a lack of coordination between government departments and a lack of communication between industry and government have left us with insufficient resources and a weak industry.

6.1 DESCRIPTION OF 2025 UNDER GOOD INTENTIONS

The increase in the world's population has put a great strain on the planet's resources – energy, water and food – affecting every aspect of the global economy. Over the past decade, governments across the globe have taken the lead in attempting to deal with resource shortages, promoting innovation to improve efficiency while also attempting to curb consumption. Top-down driven collaborative action is the dominant societal force, although the results have fallen short of our hopes and expectations.

In the UK there have been some improvements in production efficiency across industry. However, as government regulation and policies have not been coherent and consistent and public funding for R&D has been limited, the outcomes of these improvements have proven insufficient to compensate for the reduction in supply. Demand continues to exceed supply in vital areas such as energy, raw materials, and food – a situation which we share with several other countries worldwide. Consumers don't fully trust technology, which they feel has failed them. This is not helped by the daily overload of information from the government, from the media, from companies which leads to confusion.

Table 5 – settings for critical uncertainties in Good Intentions

Extreme A	1	2	3	4	5	Extreme B
Slow/low improvements in production efficiency				■		Rapid improvements in production efficiency
Water stress made manageable				■		High water stress due to lack of action
Appropriate and timely regulation of industry					■	Incoherent policy and regulation across gov'ts
Energy reliably available			■			Unreliable energy supply and constrained mix
Raw materials scarce, availability volatile		■				Raw materials are easily available at low cost
Consumers embrace new technology					■	Consumers lack trust in technology
Public research funding declines			■			Funding: effective use + cooperation
Food is the enemy, blame food industry	■					Food makes you better, customers in control
Absence of skilled people				■		Attractive industry/career, successful re-skilling
Strong adaptation to climate change				■		Failure to adapt to climate change
High cost, unaffordable energy		■				Cost neutral energy, fossil fuel substitution
Individualistic behaviour, disengaged		■				Engaged, collective attitude and approach

Our energy supply is unreliable, and unsuccessful energy strategies mean our reliance on fossil fuels remains very high. Energy prices are at record levels, and more and more people are in energy poverty. Raw materials are scarce, and their availability is volatile and irregular. Food prices have continued to increase, and there are periodical shortages. Due to the government's aim to contain demand, rationing is back – both for food and energy. Many have started questioning the effectiveness of such measures.

On the positive side, there has been a reverse in the trend of obesity and other lifestyle related illnesses: as we eat less and walk and cycle more, it would appear we have never been (physically) better.

Confidence in the government's ability to get us out of trouble has collapsed – public interventions and policies have had mixed success, but together they have not been enough to solve such large scale problems. People feel their trust has been betrayed, but don't know who to turn to. Individuals have become more disengaged and don't seem to be able to find the courage to take back control.

IfM | Centre for Industry and Government

6.2 FROM HERE TO GOOD INTENTIONS

Concerns that our consumption of natural resources was unsustainable had emerged by the end of the 20th century, with experts openly discussing peak oil and a no return moment for carbon emissions. However these conversations never managed to become part of the mainstream. The wider public in developed and emerging countries assumed that these were passing glitches that could be safely ignored.

Population growth and increasing affluence in emerging economies such as India and China put further strain on the planet's resources in the first two decades of the new century. The food shortages of 2012-13 and the constant increase in oil prices as peak oil approached caused wider ripples than the previous contraction of 2007-08. The threat of global recession became a real issue.

The food crisis originated from a series of devastating floods in India and South East Asia followed by severe droughts. This caused huge disruption to cultivation and a sharp drop in the production and availability of key foodstuffs such as rice. At the same time the increase in oil prices changed the economics of farming and led to a significant portion of crops being grown for energy generation rather than food production.

Industry-led innovation during the first half of the '10s was focused on increasing production efficiency and the yield from resources. However, it lacked scope and co-ordination, and its impact was marginal as new production processes tended to provide small incremental improvements rather than a great leap forward.

A period of insecurity followed, fuelled by growing international tension and the fear of resource wars. People turned to their governments for protection and solutions. In 2015, a new set of politicians came to power in the UK, untainted by previous scandals or by the mishaps of the financial collapse. Their political mandate was reinforced by the crisis, and they moved quickly to put a radical programme in place.

Starting from 2016, the UK saw a new wave of industrial policy as the government decided to concentrate its investments in specific industries and technologies. There was a period of strong debate on which sectors and technologies would be targeted, and how. Industry was not a major part of these discussions, due to lobbying scandals and a general perception that business could not be trusted to look beyond their own short term interests. As a result, there was limited communication and information flow between government and industry, which was reflected in subsequent regulation, which tended to be extensive and frequently inconsistent across government departments.

While several authoritative voices highlighted the importance of addressing climate change, in the UK and other developed countries the confusion and contradictions around global warming and its potential impacts led to climate change denial. The lack of international coordination and the fact that governments' attention was focused on more pressing domestic issues meant that the 2015 peak emission deadline came and went without any real comment.

The absence of a clear supranational strategy and the reluctance for each country to penalise its citizens at a time of crisis also prevented any international agreement on organic farming and efficient global agricultural and energy policies. There was a marked return to protectionism, particularly for strategic sectors such as energy, food, and pharmaceuticals in the UK, which blocked several acquisition attempts from multinationals in the US, India and China.

UNIVERSITY OF CAMBRIDGE

In the time it took for the government's interventions to produce results the scarcity of resources became harsher. High prices for food and energy eroded disposable income, a situation made worse by inflation which, for a period, was over 10%. Reduced consumer spending caused a contraction in the rest of the economy and several industries experienced significant downsizing and a number of long established British brands went bankrupt.

Following a series of shortages, there were a number of 'runs' on supermarkets and on petrol stations, as public fear increased. The government attempted to ensure adequate access for all and to contain the alarm by introducing rationing in 2018 for both food and energy. After some resistance the public took to the cause, harking back to Churchill and the war effort – t-shirts with his quotes, such as "Never, never, never, never give up" and "If you are going through hell, keep going" became the height of fashion. The spirit of New Millennium Austerity brought back war-time practices of vegetable gardens, thrift and self-provisioning – much more than in the half-hearted attempts during the 2008-10 recession.

By 2020, the effects of the government's actions began to appear. This eased the immediate pressure on demand and started increasing supply, but there were some unintended consequences. The push for biofuels tailed off, after significant amounts had been spent on tests, because priority was given to crops for human consumption. Another blow came from the failure of GM initiatives, due to inconclusive GM trials and a decline in people's confidence. This led to GM technology being shelved indefinitely as a real element of food production.

While the government's strategy of targeted industrial policy had some success it became clear that this approach was not sufficient. The improvements in production efficiency and the reductions in emissions were too small to lead to a sustainable economy. The government decided to abandon the breadth of its investments and focused on a single technology platform, risking all on one technology approach. Several industries tried to exert pressure through lobbying, but this resulted in the government becoming more rigid and mistrusting in its dealing with businesses who, it was perceived, had to be kept in check through further regulation and controls.

The results of the various government-led strategies and interventions have barely kept the economy running in the UK. Several signs now point to another global recession and there are doubts that the UK can withstand its repercussions and recover. The government and the public fear that the UK could fall out of the top 10 nations in the world and could struggle to meet its obligations to Europe.

7.0 IMPLICATIONS FOR EACH SCENARIO

This section brings together the potential implications for each scenario for each of the main stakeholders represented in the scenario process. The food and drink industry can be broken into suppliers (agricultural and other), food manufacturers, and retailers (see figure 5).

Figure 5 – stakeholders in the food and drink scenarios
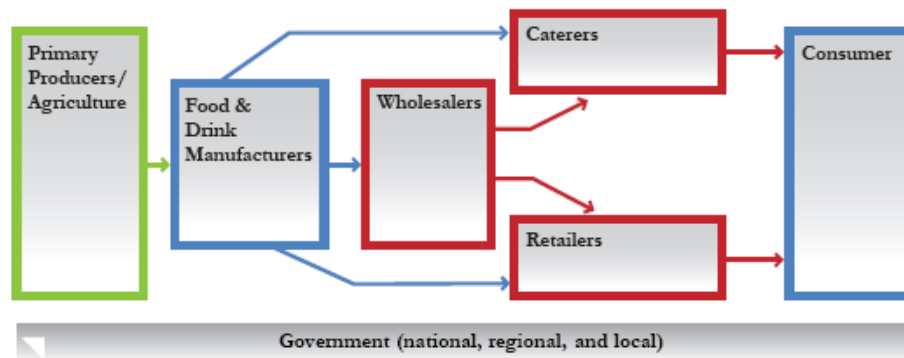
Beyond the industry itself, consumers (and society broadly) and the government are clearly important stakeholders. This is especially true for the government, at all levels, as setter of the environment for the industry through regulation and legislation and as the core body setting a vision for the country.

7.1 VISION FAILURE IMPLICATIONS

As the breadth of food available contracts and government and industry struggle to solve global challenges, consumers realise that the expectations that they have clung to for over a decade are unrealistic. They are facing a future of high prices and limited choice, as the percentage of income spent on food heads towards 15% of disposable income. The public is trying to push for sustainable practices, but price remains the key driver throughout the industry, far beyond any concerns for the environment or health outcomes. Pricing and a lack of awareness is leading to poor diet for the less affluent leading to a rise in malnutrition, while at the same time the well off are seeing continuing rises in obesity. People are buying more own brand or no brand and discount chains are taking more and more market share. They were amongst the first to stock GM products and they are also benefiting from a consumer focus on more basic ready-to-cook meals.

Consumers are slow to respond to the difficulties they face. However, changes such as less eating out and a significant rise in grow-your-own begin to appear in the 2020s. People are becoming better informed about food, scared by the horror stories at both ends of the food spectrum, with their information coming from public sources as the food companies are not trusted.

Across the food industry there is greater consolidation and vertical integration to increase resilience and secure supply of key raw materials. The carbon footprint of the industry decreases as the size of operations in the UK declines and because high transportation costs mean there is an effort to reduce food miles.

UNIVERSITY OF
CAMBRIDGE

Figure 6 – changes in key metrics for Vision Failure
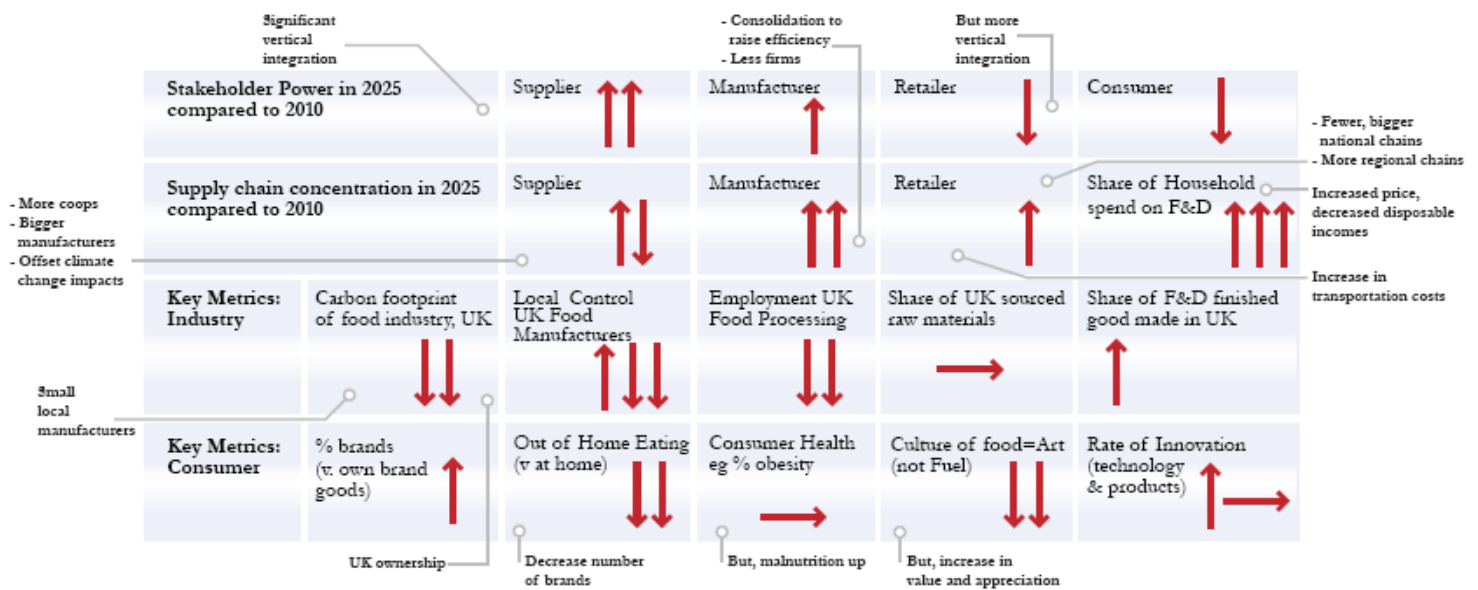
Key: The strength and direction of change is indicated by the up (increasing) and down (decreasing) arrows, with arrows in both directions indicating drivers in both directions.

Across the food industry there is greater consolidation and vertical integration to increase resilience and secure supply of key raw materials. The carbon footprint of the industry decreases as the size of operations in the UK declines and because high transportation costs mean there is an effort to reduce food miles.

Suppliers (primarily farmers) are initially profiting from the situation as high prices drive their profits up, but slow technology advances and increases in transportation costs make them less profitable over time. There is further consolidation in agriculture and other suppliers to the food industry, and continuing constraints on raw materials mean they have greater power than might otherwise be the case.

Consolidation continues amongst manufacturers driven by the need to reduce costs. Only a few UK food manufacturing companies remain, the majority have been acquired by US- and China-based multinationals. All of the industry has been pushing lean manufacturing, by increasing automation rather than more innovative process technologies, so employment decreases. A significant part of operations have been relocated to other countries where lower costs and proximity to raw materials can help with competitiveness.

There has been a rationalisation and reduction in the range of products available, to meet demand for affordable products. This move has meant a trend towards 'basic' and 'essential' and away from luxury high margin products. This has also meant less fresh or chilled food, i.e. more ambient, as energy is an issue both in transportation and retail of food.

There has been a consolidation amongst retailers, and some attempts at vertical integration, with fewer branches competing on the same streets. There is a clear two tier structure for retail, with a small number of bigger national and international chains and at the same time the emergence of regional chains, due to the increase in transport costs and distribution efficiencies.

IfM Centre for Industry and Government
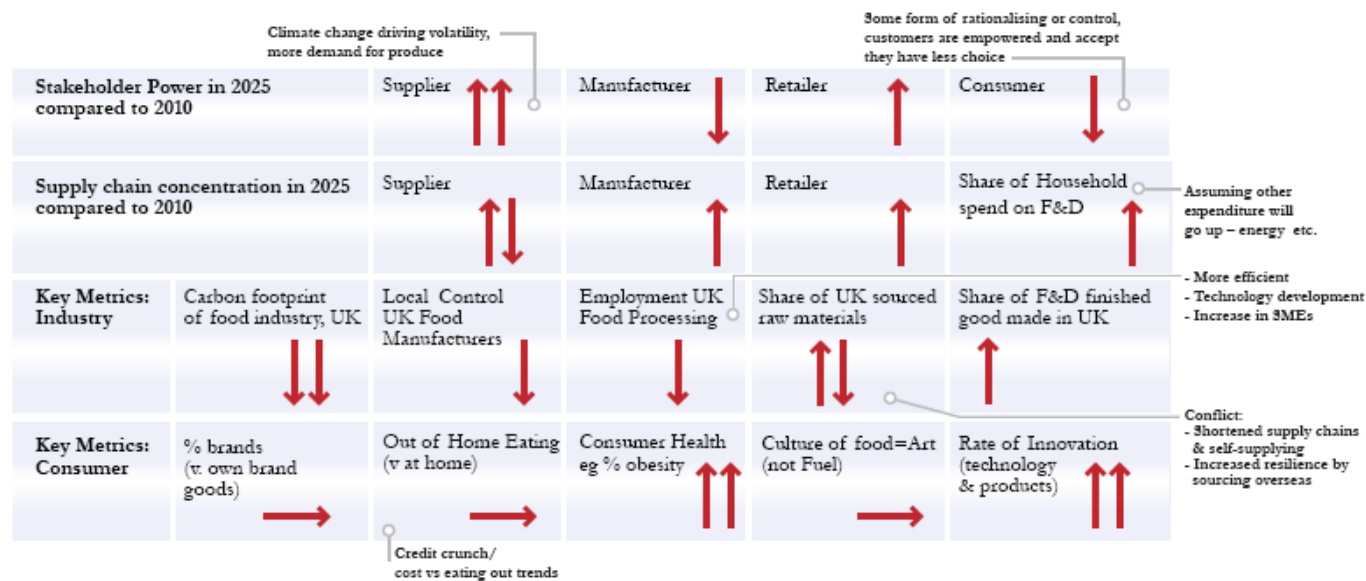
7.2 SUSTAINABLE CHAMPAGNE IMPLICATIONS

In this future, consumers are better educated and better informed although they have less choice in food and prices have increased. Mass markets continue to prevail, but there is rising demand for local products serving local markets. The share of household spending on food and drink has gone up, even though volume of consumption has declined. This is a combination of the desire for better quality food and reductions in household waste. People continue to eat out but in new modes, for example in community kitchens. Food is still perceived as a pleasure and an art, not only a necessity, with an underlying philosophy of responsibility in terms of health and sustainability. As a result, health trends are improving, and after a peak in 2014 the incidence of obesity and other food related diseases is falling.

There has been a general shortening of the supply chain to maximise efficiency and minimise waste. As a result, the carbon footprint of the food industry in the UK has drastically diminished. Suppliers see their profits grow as climate change drives volatility and there is high demand for produce. They are closer to consumers, with greater transparency and information offered. There is a concentration at the top, although there is a proliferation of small, local producers who cater for local communities and for farmers' markets in larger cities. The mix of foods produced in the UK changes due to climate change although manufacturers still need to source abroad some products to ensure resilience of supply. Suppliers and manufacturers work together to win consumer confidence using a 'made in the UK' branding implying local, ethical and safer.

Food manufacturers see their margins squeezed as prices of materials rise and consumers demand greater quality and sustainability, pushing them to invest further in technology and skills. Investment in long-term initiatives is encouraged by stable and coherent regulation. Concentration rises with mergers and acquisitions from abroad, in parallel with an increase in SMEs producing for local demand. There has been investment in capacity for semi-finished products abroad (e.g., cocoa paste) in order to shorten supply chains, improve CSR ratings, and reduce some costs, although overall the share of food and drink finished goods produced in the UK increases marginally (due to automation, product innovation, safety demand and logistics pressures). Competition is based on the ability to meet needs of niche groups of consumers and to provide 'services' connected to the product: information, recycling, education, etc. Brands remain important, as long as they can satisfy consumers of their sustainability, health and ethical credentials.

UNIVERSITY OF CAMBRIDGE

Figure 7 – changes in key metrics for Sustainable Champagne

		Supplier	Manufacturer	Retailer	Consumer
Stakeholder Power in 2025 compared to 2010		Supplier ↑↑	Manufacturer ↓	Retailer ↑	Consumer ↓
Supply chain concentration in 2025 compared to 2010		Supplier ↑↓	Manufacturer ↑	Retailer ↑	Share of Household spend on F&D ↑
Key Metrics: Industry	Carbon footprint of food industry, UK ↓↓	Local Control UK Food Manufacturers ↓	Employment UK Food Processing ↓	Share of UK sourced raw materials ↑↓	Share of F&D finished good made in UK ↑
Key Metrics: Consumer	% brands (v. own brand goods) →	Out of Home Eating (v at home) →	Consumer Health eg % obesity ↑↑	Culture of food=Art (not Fuel) →	Rate of Innovation (technology & products) ↑↑

Annotations:
- Climate change driving volatility, more demand for produce
- Some form of rationalising or control, customers are empowered and accept they have less choice
- Assuming other expenditure will go up – energy etc.
- More efficient / Technology development / Increase in SMEs
- Conflict: Shortened supply chains & self-supplying / Increased resilience by sourcing overseas
- Credit crunch/ cost vs eating out trends

Key: The strength and direction of change is indicated by the up (increasing) and down (decreasing) arrows, with arrows in both directions indicating drivers in both directions.

Retailers profit in this scenario, although concentration continues to increase. Modes of shoping have polarised with on the one hand web-based, efficient and automated purchasing, and on the other local markets and an increase in 'green co-ops'. In this scenario, own brands prosper only if they can prove their sustainability credentials.

7.3 COMMAND & CONTROL IMPLICATIONS

Consumers have less choice and less control on the foods they can buy, driven by strong government regulation and by retailers cost cutting through narrowing the ranges they offer. But they have given over their power willingly, understanding the need for large scale coordinated responses to the challenges of food security and climate change.

People's trust in food and drink companies is increasing, as their 'good behaviour' – due to government's directives and instructions – reassures people. There is a greater understanding of and demand for information on provenance, carbon footprint, etc, and an increased appreciation of climate, environmental impact, and their effect on food availability and price. As externalities are better priced, their choices tend to be more linked to full cost. Consumer spending on food and drink has significantly increased (up almost 25%) although this is to some extent compensated by public welfare (better health, education, public services). The level of out-of-home eating has stabilised, balanced by the increased costs for food. There is a balanced view of food as both nourishment and source of (healthy) pleasure, to be consumed in moderation.

The balance of power has shifted away from the consumer as government takes a strong role. The food and drink industry is benefitting from a more coherent and consistent regulatory framework, which shows policymakers have a better overall understanding of the industry. The industry's image is also strong and positive, helped by better food safety and quality and supported by an aggressive PR campaign. A career in food and drink manufacturing, with its improved career paths, salaries and training, is seen as an appealing prospect with recognised value and experience. This has made recruitment easier; and given the successful education policies and investments, its workforce is now an important element in the increased competitiveness of the sector.

IfM Centre for Industry and Government

Following market consolidation, suppliers are more concentrated. There is also greater vertical integration to increase resilience and reduce inefficiencies, while high transport costs and the need to contain carbon emissions has led to a better balance of local supply and central distribution. Domestic food production has increased, thanks to GMOs and to adoption of advanced agricultural technologies. Traceability is very important and is at the core of much of the regulation. Review of incentives and funding aims at greater efficiency and sustainability, requiring farmers to make more informed decisions.

Figure 8 – changes in key metrics for Command & Control
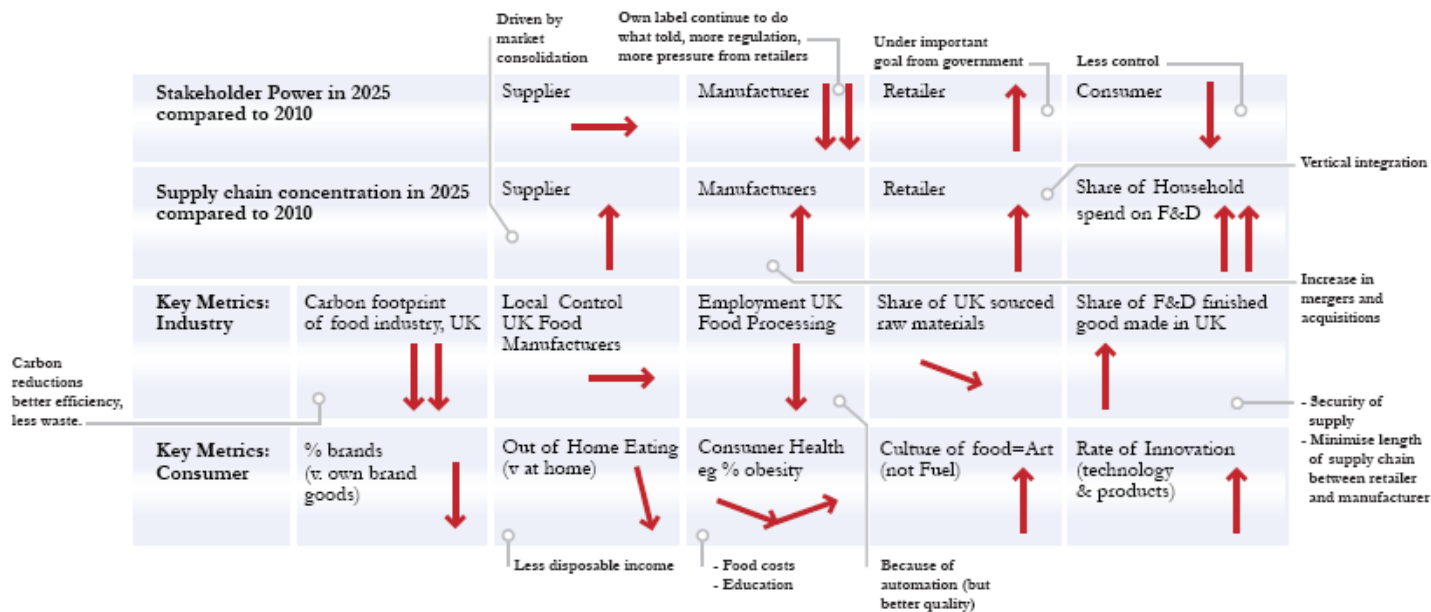
Key: The strength and direction of change is indicated by the up (increasing) and down (decreasing) arrows, with arrows in both directions indicating drivers in both directions.

There are fewer, larger food manufacturers, continuing the trend of acquisition by international groups – although they still have to follow UK regulations for products manufactured or sold in the UK. Their power has decreased, due to increases in regulation and greater pressure from retailers and from own brands. Innovation is driven by the government's objectives and research funding, which has focused on better productivity and efficiency and on waste reduction; however there is less and less innovation initiated by the industry itself. Irradiation has been re-introduced to improve efficiency of distribution and storage, which has also encouraged an increase in the share of ambient food. There is greater automation and thus less employment, although it tends to be more skilled (technicians, scientists, etc) and needs to be rewarded appropriately. Thanks to new growing techniques and trade globalisation there is less reliance on UK suppliers (despite high transport costs), and more raw materials and semi-finished products are sourced outside of the UK. However, there are more EU controls on food imports, and the share of finished goods produced in the UK is increasing due to the desire for safety, security of supply, and minimisation of the length of the supply chain between manufacturers and retailers.

UNIVERSITY OF CAMBRIDGE

Retailers see some consolidation, with the emergence of pan-European retailers, which changes the supply chain dynamics. These retailers have greater power and influence, especially due to the goals and objectives assigned by the government, and drive the push for healthier, more sustainable products and reduced packaging. As online purchasing continues, the value added for customers is seen to be in the experience and service rather than just the food and drink itself.

7.4 GOOD INTENTIONS IMPLICATIONS

The whole supply chain employs less people as companies have invested heavily in automation to contain costs. Although suppliers have benefited to some extent from the high prices brought by resource scarcity and by public funds and support which have focused on intensive farming for both cultures and livestock, they are currently experiencing problems connected to water stress and rationing, high prices for agricultural input such as phosphorous and nitrogen, and various ecosystem failures. This sector has gone through a polarisation of larger firms, which are more efficient and produce high volumes nationally, and smaller players operating locally/regionally, which are less efficient and effective in volume terms. Overall, the share of raw materials sourced in UK has gone up as production volumes have increased and transportation costs remain prohibitively high, as well as because of growing demand and protectionism abroad.

Figure 9 – changes in key metrics for Good Intentions
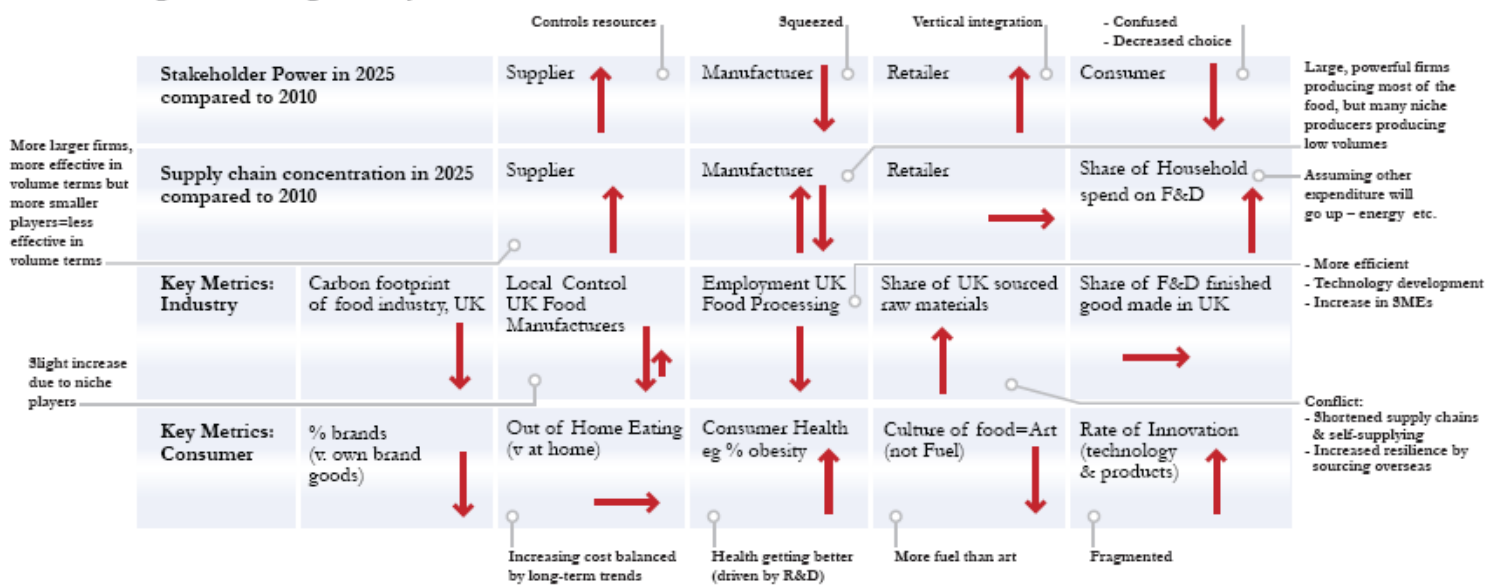
Key: The strength and direction of change is indicated by the up (increasing) and down (decreasing) arrows, with arrows in both directions indicating drivers in both directions.

The increase in energy and raw material costs has reduced margins for food manufacturers, and consolidation resulted in the emergence of fewer, larger processors (although the inclusion of the sector in the list of critical, 'fenced' industries has protected the majority from outside acquisitions) alongside a significant number of small, niche operators who produce low volumes inefficiently but still benefit from government funding, often selling directly to the public. In order to improve resource access and reduce costs some facilities have been moved abroad and some manufacturers have attempted to integrate vertically for critical supplies. Innovation has focused on process efficiency and waste reduction rather than on products. Product ranges are more specialised.

IfM | Centre for Industry and Government

Retailers enjoy greater trust from consumer; they have benefited from an increase in the share of own brands and no-brands versus branded products, and several have opted to integrate vertically to secure sourcing. There has been no major consolidation, but rather a rationalisation of distribution networks and practices. Consumers are facing a reality of rationing, reduced choice, and higher prices that have caused a rise in the share of income spent on food. As a consequence more people are eating at home and only a few can afford to eat in restaurants, although some out-of-home eating remains for practical reasons. People perceive food as fuel, and are very careful about waste. They have only limited trust in big companies and brands, and find the amount of information excessive and confusing, but they trust the government's directives and guidelines.

UNIVERSITY OF
CAMBRIDGE

8.0 CREATING A DESIRED FUTURE

The scenarios presented in this report are one set of possible futures for the food industry in the UK. As they are based on critical uncertainties, we cannot say that one is more likely than another. However, it is clear which futures are more desirable to each stakeholder group. Using the opinions of the various stakeholders represented we can see whether there is alignment on where the food industry needs to go and what actions each stakeholder might undertake to achieve a common positive scenario.

8.1 WHICH SCENARIO IS MOST DESIRED?

Attendees were divided into groups representing the main stakeholders as follows – food manufacturers, suppliers, retailers, society and government. Each group was asked to discuss and vote on the most desired future, using seven votes in each group.

Table 6 – stakeholder group voting on the most desired future

	Command & Control	Good Intentions	Vision Failure	Sustainable Champagne
Food manufacturers	4	0	0	3
Suppliers	0	4	0	3
Retailers	4	1	0	2
Society	3	0	0	4
Government	3	0	0	4
Totals	**14**	**5**	**0**	**16**

As table 6 shows, the scenario that attracted the most votes was Sustainable Champagne, but the Command & Control scenario was a very close second overall and was the lead within more groups (manufacturers, suppliers and retailers). It is obvious from the table that no stakeholder wishes to be in the Vision Failure future, while Good Intentions, due to its specific advantages for suppliers, attracted a small number of votes. Overall, while stakeholders agree on the need for sustainable resources there is a split on whether the impetus for change should come from government or from society. There appears to be a strong desire from industry for government leadership through coherent and appropriate regulation and legislation, while the public wish to maintain some control in the face of the pressures facing the country and the food industry in particular. There was also clear agreement on what would be most likely to happen in a business as usual approach to the future – with some luck the outcome would resemble Good Intentions, but without it was most likely that our future would lead to Vision Failure.

IfM | Centre for Industry and Government

8.2 ACHIEVING A POSITIVE FUTURE

The scenario exercise and the discussions on desired futures have highlighted a number of potential actions for each stakeholder group in order to achieve a positive future for the UK food industry. Some of these apply in a government led approach, some apply in a more consumer or individually driven approach. Taken together they represent an agenda for change that can bring together the competing needs of the various stakeholders and increase the likelihood of a positive outcome for the food industry in the long term.

There is a need for a clear and shared vision across stakeholders

One of the strongest points from this exercise is that there needs to be a shared vision for the food industry across all of the stakeholders. This does not mean perfect agreement, but that there is consent to a common view on how the industry should evolve and the actions that should be taken at the highest level. This is a clear recognition that expecting interests to align across the stakeholder groups naturally is unrealistic and that without some form of cooperation the outcomes will be worse for all groups.

Deeper and more open consultation

In support of the shared vision, there needs to be more open consultation between consumers, suppliers, manufacturers, retailers and government. The key here will be transparency of consultation and the ability for all groups to participate equally.

Stronger evidence for the measures that are required to achieve the goals we set

The significant changes that will be asked of the industry and consumers will need to be based on the strongest evidence available. To that end, where there are areas of disagreement or confusion joint government-industry research projects should be launched in order to provide all stakeholders with the evidence they require to make further decisions. Such projects should be run jointly between government and industry in order to strengthen the common vision that is required to increase the likelihood of positive outcomes for the consumer, the industry and the country.

Consistent and coherent regulation

A key point for the industry to be able to plan and invest is to have confidence in the regulatory and legislative structure that will be in place both nationally and internationally. Without clarity and consistency, the industry's ability to invest in new machinery, skills and innovation will be hampered, as constant change and contradictory laws will impose too high a burden on companies.

Changing consumer expectations

As the industry changes and adapts, so must consumers. The demands of the consumer will be pivotal in achieving positive and sustainable outcomes for the food industry. If consumers demand the widest availability of food across seasons there will be little pressure on companies to change their sourcing and production strategies. Government has a strong role to play through providing education on food related matters, while the industry needs to make explicit the true costs of producing and sourcing food.

UNIVERSITY OF CAMBRIDGE

Increase the skills base of the food industry

The demands of sustainability and increased productivity across the food industry will demand higher skills across a broad range of roles. There is a responsibility on the industry, suppliers, manufacturers and retailers, to increase the skills levels of employees through continuous and targeted training in order to be able to produce and deliver food to consumers in innovative and sustainable ways.

Continue to focus on innovation with clear sustainability targets

The food industry will feel the impact of rising oil prices and any emissions regulations for transport and production quite quickly. For both social reasons, in terms of sustainable outcomes, and for competitive reasons, to reduce the costs of production, the industry needs to have a very aggressive focus on innovation in the use of energy in production and transportation of food.

Embrace change

The one common factor for all stakeholders will be a need to accept rather than resist change. For consumers this will mean changing their demand patterns, so that there is less pressure to have all foods available in all seasons, as well as a greater acceptance of necessary technologies for food production. Food manufacturers, suppliers and retailers may see a higher level of government intervention, with the expectation that new regulation will be more coherent across government departments and stable over time. The parallel of this will be for government to regulate once, rather than continually tinkering with the system and adapting to individual demands rather than thinking of the industry as a whole.

8.3 CONCLUSION

The scenarios presented in this report provide a platform for a multi-stakeholder discussion on the future of the food and drink industry in the UK. They have been developed with the assistance of representatives of the industry and government and so have a number of perspectives built into their structure.

As we have emphasised above, this process is not predictive. These scenarios represent plausible futures based on the critical uncertainties that the industry faces. Over time the level of uncertainty associated with the drivers of the industry should reduce, and it will become clearer which scenarios are still possible end points in 2025.

There was agreement across the workshop attendees that the most likely scenario under current approaches is Good Intentions, with a low risk of this becoming Vision Failure. However, these are the scenarios which have the worst outcomes across all stakeholders and so there is a clear call for a clear and collective vision for the industry that spans industry and government. This report is a first step in this direction and we hope it can be built on by industry groups, companies and the relevant government departments.

IfM | Centre for Industry and Government

In order to raise the likelihood of positive outcomes for the industry and for UK consumers there is a need for -

- Leadership, from within the industry and from government
- Clarity and cooperation both within the industry and between industry and government
- An expectation of more from less in all aspects of production and consumption
- An acceleration of changes that have already begun in order to achieve the scale of impact required
- Openness between all the stakeholders through continued dialogue

Finally, the food and drink industry should and could set an example through coherent self regulation. This would show the willingness of the industry to change and could lead to coherent and positive formal regulation from government. The inclusion of industry approaches in government regulation should be positive for the industry and could increase the level of mutual trust between industry, government and consumers.

Overall this process has shown that there is a willingness and an awareness across the industry and government that business as usual will not be sufficient for the food and drink industry. Only through positive cooperation can the industry prosper and overcome the challenges it faces in the coming ten to twenty years.

UNIVERSITY OF CAMBRIDGE

FUTURE SCENARIOS
FOR THE UK FOOD & DRINK INDUSTRY