



# Horizon scanning and the future

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## **UNDERSTANDING THE FUTURE**

**no very reliable methods**

**too many variables**

**‘reflexivity’ - knowledge influences actions**

**Pandolfo Petrucci, Lord of Siena, to Machiavelli:**

**‘wishing to make as few mistakes as possible I conduct my  
government day by day and arrange my affairs hour by hour;  
because the times are more  
powerful than our brains’**

## **GOVERNMENTS ARE NOT NATURALLY LONG-TERMIST ....**

**Political and economic instability**

**Short tenure in key posts**

**24/7 media pressures**

**Focus on process rather than outcomes**

## **EXEMPLIFIED IN THE UK IN THE MID-90S**

**Sharp cuts in public capital expenditure**

**Short-term (annual) funding cycles which made planning very difficult**

**Low spending on preventive measures in health and crime**

**Little attention to the long-term environmental impacts of consumption patterns**

**Low science investment**

**Few if any long-term plans for the main parts of government**

**Events experienced as shocks (BSE, ERM ...)**

## **A PARTIAL TURNAROUND IN THE 2000S**

**Public capital spending rising 3x as share of GDP**

**Departments given 3 years spending allocations, and in the cases of transport, health and education, 10 year plans to ensure stability**

**Spending on preventive measures (health, crime) sharply increased**

**Science spending up 7% in real terms each year**

**Environmental considerations considered at the heart of government (eg debate over CO2 reductions)**

**New arrangements to insulate decisions from short-term pressures (MPC, FSA)**

**SMALL COUNTRIES APPEAR TO FIND LONG-TERMISM EASIER:  
GREATER REALISM ABOUT THE OPERATING ENVIRONMENT, SMALLER  
NUMBERS ...**

**Singapore... all senior civil service in  
scenario exercises: helped response to  
90s economic crisis**



**Netherlands... used  
scenarios to build  
consensus to change  
direction in late 80s**



**Finland... strategy  
exercises have pushed  
them near top of  
competitiveness league  
tables**

**Switzerland... all senior officials trained  
in a sophisticated set of strategy skills**



## **MACHINERIES FOR HANDLING THE FUTURE**

### **Short-term shocks and threats**

- **Civil contingencies secretariat; horizon scanning group; resilience assessments**

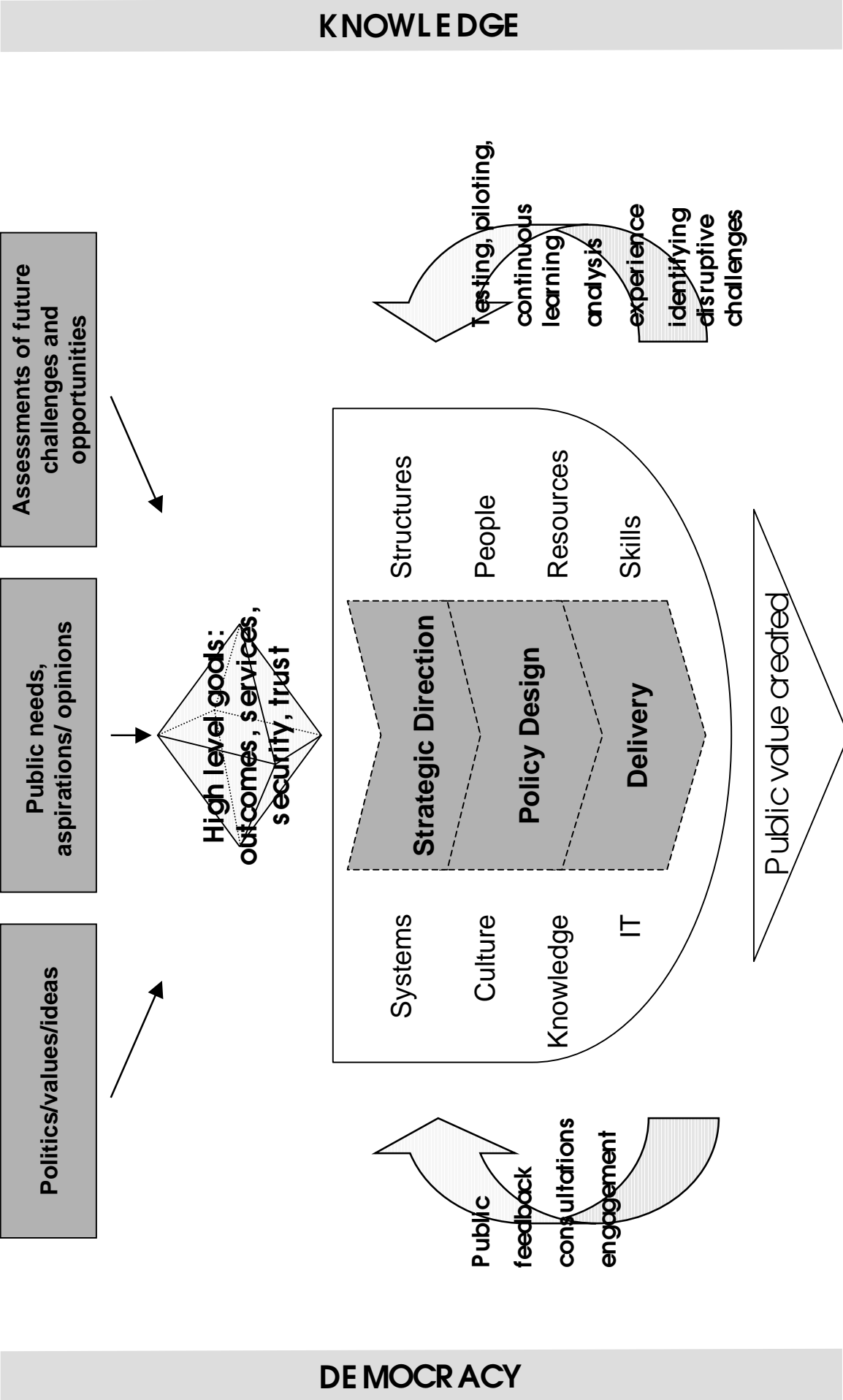
### **Strategy development**

- **SU and parallel units in departments and devolved administrations, along with Foresight, brought together in Strategy Network**

### **Resources and targets**

- **Biannual spending reviews to set targets, allocate resources &c**

# THE CONTEXT FOR STRATEGY AND FUTURES WORK



# METHODS, TOOLS, SKILLS AND EXPERIENCE

## Good strategy work...

Is based on evidence and sound analysis

Is holistic

Is sophisticated about complexity

Is creative and innovative

Is grounded in an understanding of how the world works

Is robust over long time periods

Is communicated compellingly

Is sophisticated about managing risk

Takes into account organisational capacity and rates of behavioural change

Takes into account deliverability

Includes all key decision makers, including ministers

## This requires...

Appreciation of key analytical approaches, including basic economics, statistics, business modelling etc

Multi-disciplinary teams

Understanding of complex systems and their dynamics

Range of experience and processes for creativity

A wide experience base

Futures methods

Storytelling and logical storyboarding skills

Robust risk management approaches

Understanding of organisational capacity issues

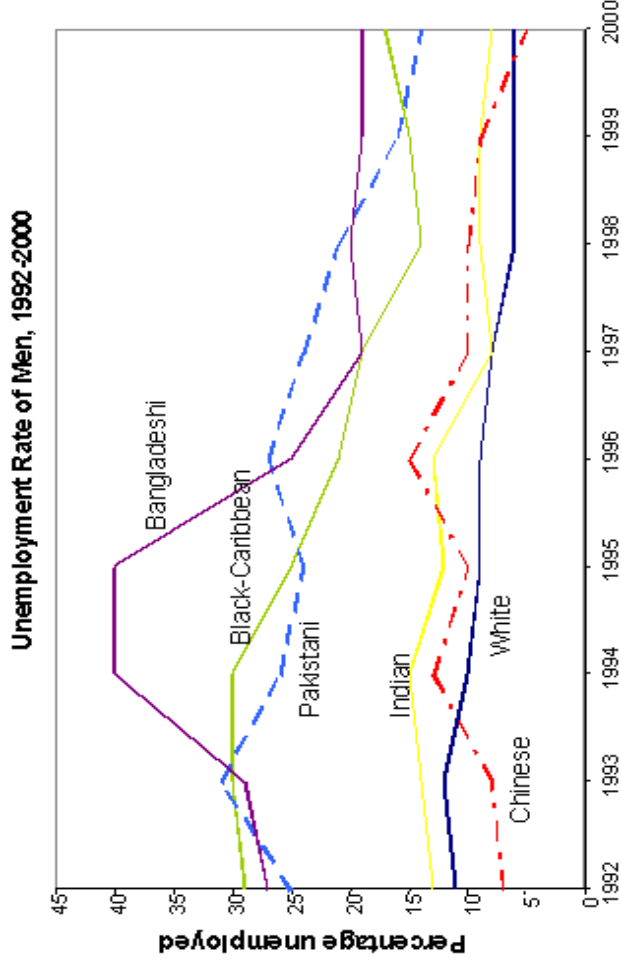
Delivery skills

Careful management of process and stakeholders

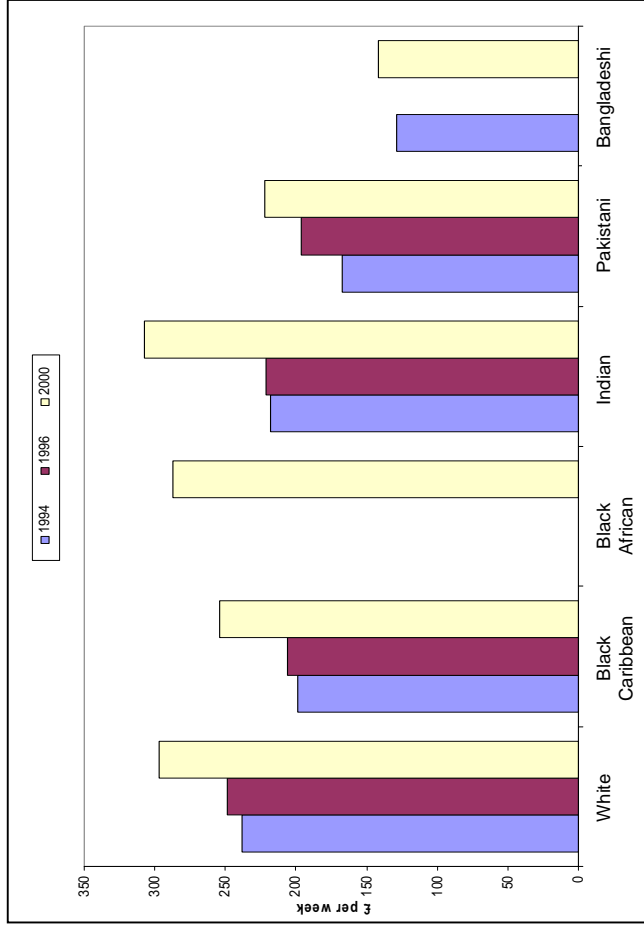
## **ANALYTIC METHODS TO ENSURE A RICHER UNDERSTANDING OF THE FUTURE INCLUDE:**

- **trends analysis**
- **benchmarking**
- **logic trees**
- **market analysis**
- **evidence reviews**
- **modelling**
- **forecasting**
- **simulations**
- **scenarios**

# STATISTICAL ANALYSIS TO IDENTIFY KEY TRENDS – SU ETHNIC MINORITIES 2002 WORK ON EMPLOYMENT AND PAY



Ethnic minority pay trends



Note: Sample sizes for Black African (1994, 1996) and Bangladeshi (1996) average net weekly pay are too small to be included;  
Source: LFS, weighted data

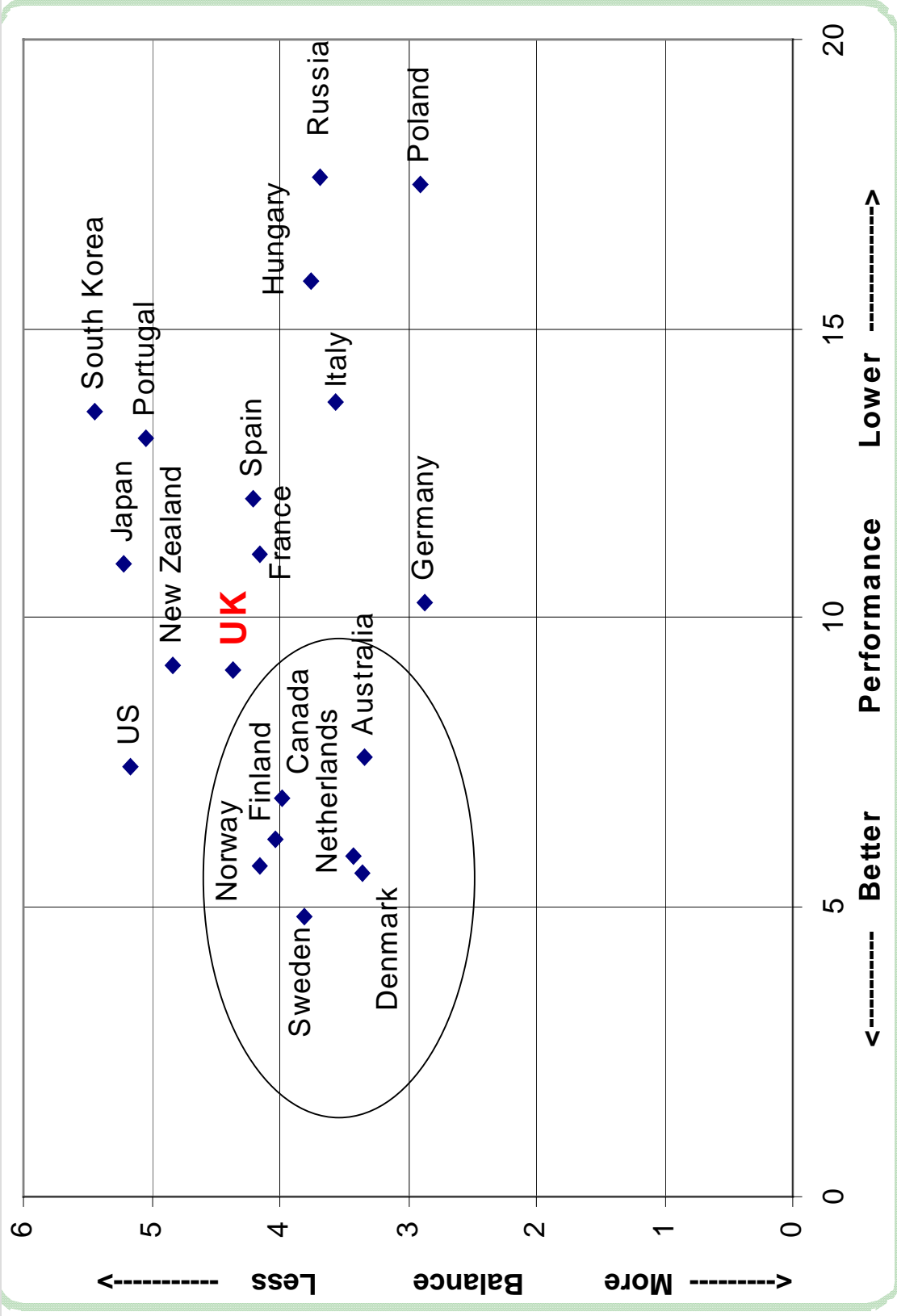
# BENCHMARKING TO IDENTIFY BEST PRACTICE AND MAP TRACTABILITY OF PROBLEMS

	GP rank	HDR rank	Economic Freedom rank	Globalization rank	Commitment to development rank	Growth Competitiveness Index rank	Environment Sustainability Index rank	Life satisfaction rank	Healthy Life Expectancy rank	Trust rank	Employment rank	Economic Growth Rank	Corruption rank	Inequality rank	Defence expenditure rank	Maths PISA score rank	Gender empowerment rank	Networked readiness index	Total	No of categories	Mean rank	Standard Deviation
Sweden	10	2	10	1	7	3	3	4	2	2	3	14	4	1	6	10	2	3	87	18	4.8	3.8
Denmark	4	11	8	3	2	7	9	3	11	1	2	10	2	5	5	9	3	6	101	18	5.6	3.4
Norway	2	1	14	9	8	6	2	5	7	3	1	9	9	2	2	11	1	11	103	18	5.7	4.2
Netherlands	7	6	5	2	1	12	11	1	12	4	4	5	5	4	8		5	8	100	17	5.9	3.4
Finland	9	8	7	6	12	2	1		10	5	12	7	1	3	13	4	4	1	105	17	6.2	4.0
Canada	3	3	4	4	13	5	4	2	13		8	11	6	11	14	6	6	4	117	17	6.9	4.0
US	1	4	1	7	15	1	13	7	15	9	5	6	10	15	1	12	10	2	134	18	7.4	5.2
Australia	6	5	6	14	14	4	6	6	3	6	9	4	8	12	10	5	9	10	137	18	7.6	3.3
<b>UK</b>	<b>13</b>	<b>10</b>	<b>2</b>	<b>5</b>	<b>9</b>	<b>8</b>	<b>19</b>	<b>8</b>	<b>14</b>	<b>13</b>	<b>7</b>	<b>8</b>	<b>7</b>	<b>14</b>	<b>3</b>	<b>7</b>	<b>12</b>	<b>5</b>	<b>164</b>	<b>18</b>	<b>9.1</b>	<b>4.4</b>
New Zealand	14	13	3	11	4	11	7	9	8		6	17	3		17	3	7	14	147	16	9.2	4.8
Germany	8	12	9	12	5	10	14	11	9	10	13	16	11	6	11	13	8	7	185	18	10.3	2.9
Japan	5	7	12	19	16	9	16	14	1	8	10	15	12		12	1	16	13	186	17	10.9	5.2
France	11	9	17	8	10	17	10	15	4	15	15	12	15	7	4	8		12	189	17	11.1	4.2
Spain	15	15	11	13	6	14	12	16	6	7	16	3	13	10	18	16	11	15	217	18	12.1	4.2
Portugal	17	17	13	10	3	15	8	12	17	18	11	2	14		16	19	13	18	223	17	13.1	5.0
South Korea	16	16	16	17		13	20	13	16	12	14	1	18		15	2	19	9	217	16	13.6	5.4
Italy	12	14	15	16	11	18	17	10	5	11	18	13	16	13	9	18	15	16	247	18	13.7	3.6
Hungary	18	18	18	15		16	5	18	19	16	17		17	9	19	14	17	17	253	16	15.8	3.8
Poland	19	19	19	18		19	18	17	18	17	19		19	8	20	17	14	19	280	16	17.5	2.9
Russia	20	20	20	20		20	15	19	20	14			20	16	7	15	18	20	264	15	17.6	3.7

Scandinavian

Anglo-Saxon

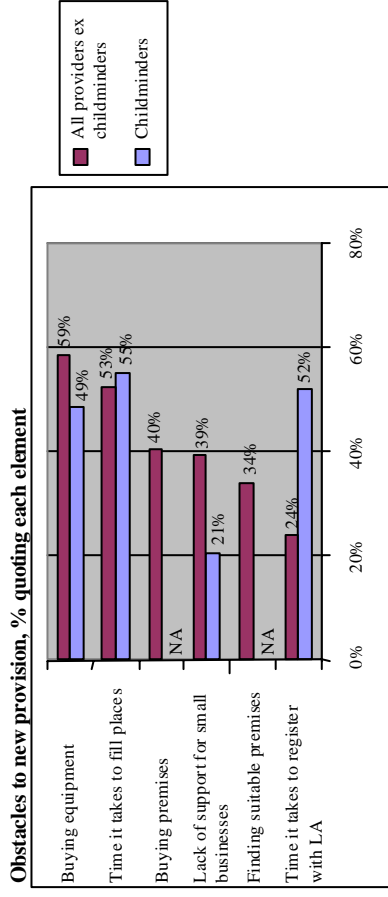
# THE UK IS CURRENTLY OUTSIDE THE CLUSTER OF HIGH PERFORMERS



# ANALYSIS OF MARKET DYNAMICS IN PUBLIC AND PRIVATE FIELDS

## SU CHILDCARE REVIEW 2002

### BARRIERS TO NEW PROVISION ARE SIGNIFICANT; SUPPLY MAY NOT REACT EFFECTIVELY TO DEMAND

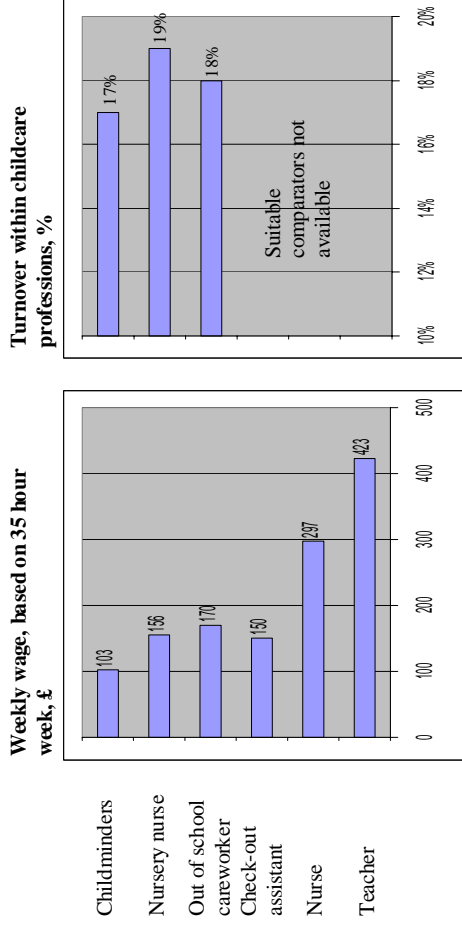


Buying equipment, the time it takes to fill places, and buying childcare premises ranked as the major obstacles to entry for non-childminder provision

The time it takes to fill places and to register with local authorities were the major concern of childminders

Source: Callender C., The Barriers to Childcare Provision, 2000, DFEER2.31

### TURNOVER IN CHILDCARE PROFESSIONS IS HIGH; WAGES ARE LOW



Source: DfES, childcare workforce survey; DfES stats; BBC website

# EVIDENCE REVIEWS TO MAP WHAT WORKS AND LIKELY IMPACTS – SU CHILDCARE REVIEW 2002

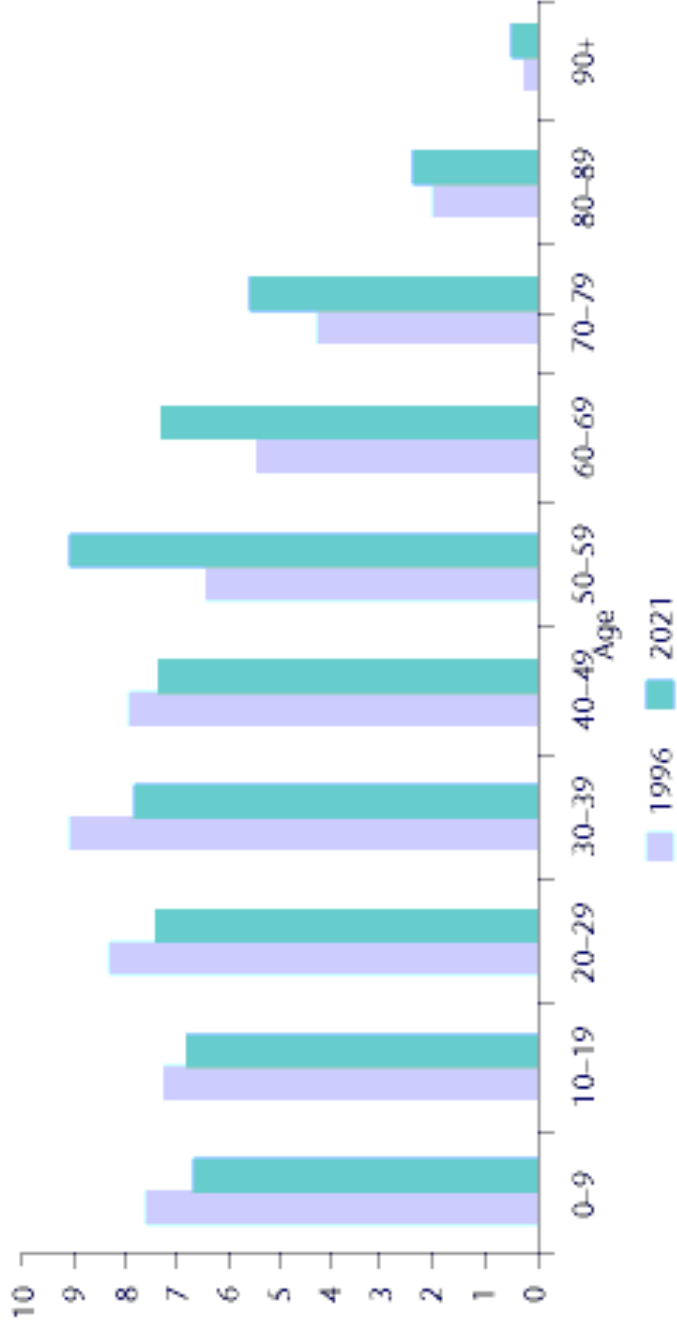
Name of project/scheme	Internal - Child		Int - Parent		External benefits																			
	Country	Targeted at low SES children	Age of child at last follow up	increased IQ to age 11	improved behaviour	increased school attainment to 11	increased school attainment to 18	increased family income	reduced special educational needs	improved emotional/psych. at age 18	improved parenting indicators	increased maternal employment	increased educational attainment	improved mental health	reduced crime rates - child	reduced crime rates - mother	reduced welfare recipients - child	reduced welfare recipients - mother	improved health - child	improved employment - child	improved employment - mother	reduced child abuse	reduced teen pregnancy - child	
<b>Early Childhood Interventions.</b>																								
Early Training Project (reported)	US	Y	20	Y	Y	Y	Y	Y	?	?	?	?	?											?
Perry pre-school	US	Y	27	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y							M	?			?
Chicago CPC	US	Y	14	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
Project Care	US	Y	5	Y																				
Syracuse Univ. Family	US	Y	21	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
Carolina Abecedarian	US	Y	8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
IHDP - full sample	UK	M	n/a	Y	Y	Y	Y	?																
EEC 2000	UK	M	n/a	Y	Y	Y	Y	?																
EEC 2001	UK	M	n/a	Y	Y	Y	Y	?																
Head Start - Westinghouse Report	US	Y	7	Y	M																			
Head Start - Currie&Thomas	US	Y			Y																			
<b>Childcare</b>																								
Cost, Quality and Child Outcomes	US	N	8		Y	Y																		
Effects of Public Daycare	Sw	N	13		Y	Y																		
NICHD data - Belsky	US	N			N																			
NICHD - cognitive and language	US	N	3	Y																				
NICHD - quality	US	N	6		Y	Y																		
NICHD - behaviour	US	N	3																					
NICHD - attachment	US	N	1.5																					
Vandell & Henderson	US	N	8		Y	Y																		
EPPE	UK	N	7	Y	Y																			
EPPNI	NI	N	6																					
Osborn and Millbank	UK	N	10	M	M	Y																		
The Impact of Study Support	UK	N	16		Y	Y																		

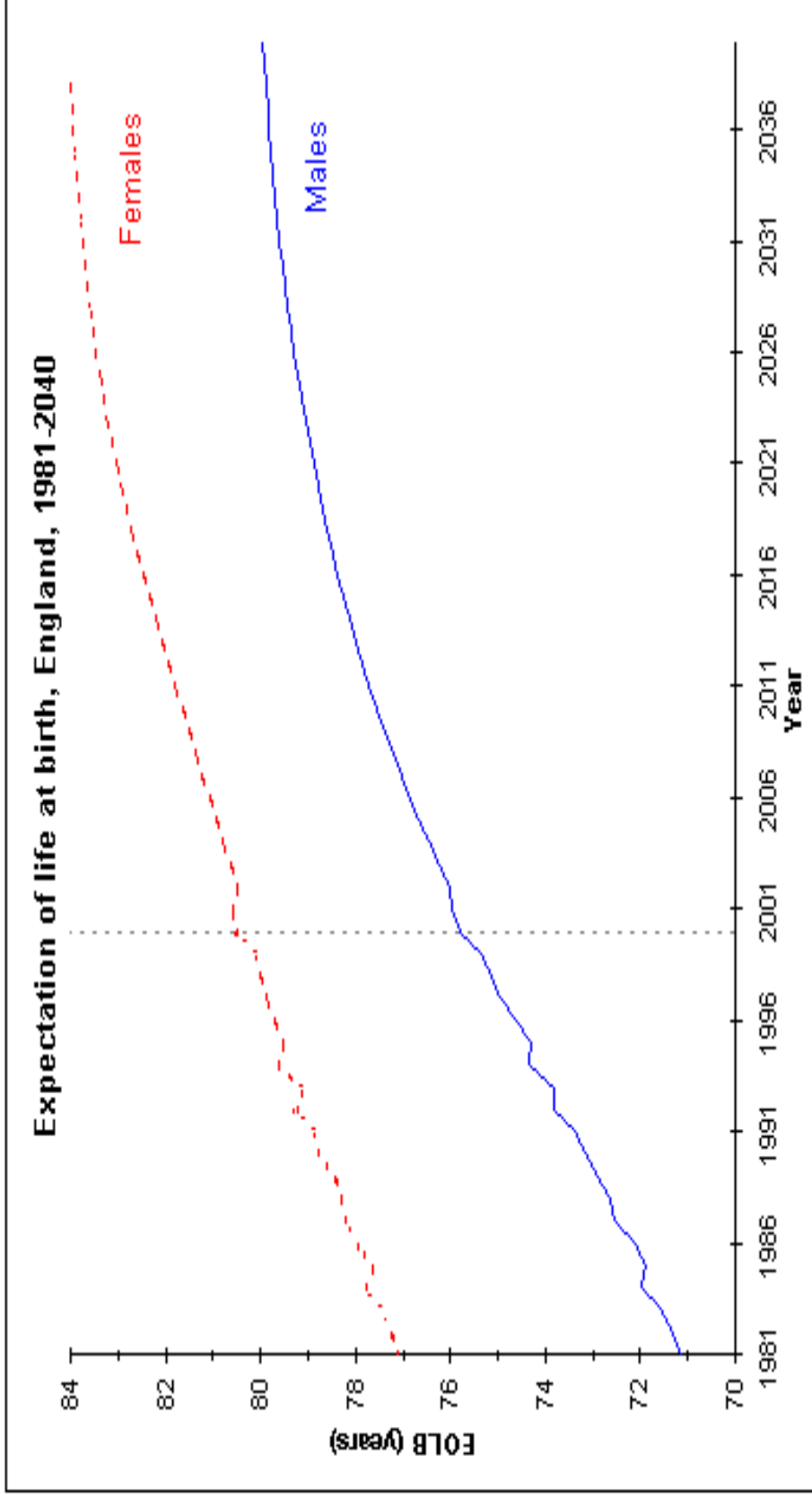
# MODELLING TO ASSESS EFFECTS OF ACTIONS

		At March 31	2001	2002	2003	2004	2005	2006
<b>NET PLACES EXPECTED</b>								
<b>0-4 year places</b>	Children's Centres	New build					1,496	3,490
		Sure Start glue					0	0
		Nursery glue					3,290	7,678
		Total					4,786	11,168
		Govt supported					13,137	13,137
		Unsupported					25,439	27,401
	Nursery conversion					11,218	11,218	
	Childminder 0-4					5,060	5,060	
	<b>Total</b>					59,640	67,983	
<b>5-14 year places</b>	Childminder 5-14						1,117	1,117
	Out of School Clubs				21,221	21,220	21,220	21,220
	<b>Total</b>				21,221	22,337	22,337	22,337
	<b>Total</b>				21,221	81,977	90,320	
<b>CHILDREN HELPED</b>								
		At March 31	2001	2002	2003	2004	2005	2006
<b>0-4 year places</b>	Children's Centres	New build					1,944	4,537
		Sure Start glue					0	0
		Nursery glue					4,278	9,981
		Total					6,222	14,518
		Govt supported					17,078	17,078
		Unsupported					33,071	35,621
	Nursery conversion					14,583	14,583	
	Childminder 0-4					6,578	6,578	
	<b>Total</b>					77,532	88,379	
<b>5-14 year places</b>	Childminder 5-14						1,954	1,954
	Out of School Clubs					37,136	37,135	37,135
	<b>Total</b>					37,136	39,089	39,089
<b>Total additional children helped</b>						37,136	116,622	127,468

# FORECASTING OF BROAD TRENDS – EG AGEING

**Figure 3.10: Projected age structure of the population**  
**Over the next 20 years, the working-age population over 50 will grow by 2 million, and the under-50s will fall by a similar amount**





<http://www.god.gov.uk/Population/Index.aspx?v=Table&pic=2001 England led>

## FORECASTING AS STIMULUS

	USA	EU	CHINA
<b>POPULATION</b>			
2003	278	389	1275
2050	411	370	1700
<b>GDP (share in world)</b>			
2003	29.1	29.3	3.7
2050	27.8	16.5	15.9

# FORESIGHT TO MAP IMPACTS AND CHALLENGES - EG HEALTH

Major Drivers	5 yrs (2007)	10 yrs (2012)	15 yrs (2017)	20 yrs (2022)
Patient Expectations	Consumerism Holistic health & wellbeing		Meeting needs of older people	
Medical Advances	Minimally Invasive Surgery		Pharmacogenomics Major Pharmaceutical Innovation	Widespread Genetic Screening & Therapy Stem Cell Technology
Information & Support Technology	Complete EPR & use of IT networks Home Monitoring Protocol Driven/Expert Systems		Intelligent Devices	Robotics
Demography & Society	Inequalities Smaller households, single parents, living alone	Population growth in 45 - 75 age group		Population growth in in >75 age group
Epidemiology	Focus on managing risk factors	Chronic disease increasing Greater differentiation of diagnosis		
Labour Force	Portfolio careers Lifelong learning	Labour force ageing and participation rates reducing		Increasing informal elderly care demands A end to retirement?

Time when we **predict** that a major change may be seen in this dimension

Source DH

# **SIMULATIONS TO ASSESS DYNAMICS - SYSTEM FEATURES, BEHAVIOURS, EMOTIONS**

**Examples include:**

- **contingency exercises for  
CBRN**
- **simulation of NHS internal  
market in early 1990s**



# SCENARIOS TO TEST ROBUSTNESS - 'WHAT IF ...' SU ENERGY REVIEW 2002

Figure 5.1 Locating the five scenarios on the grid of governance and social values

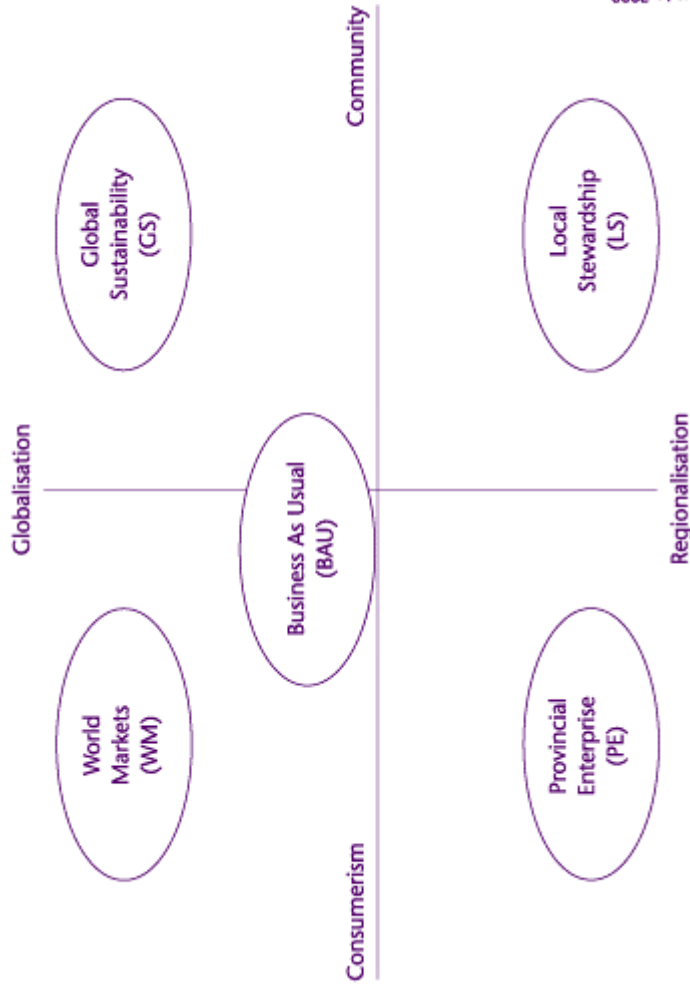
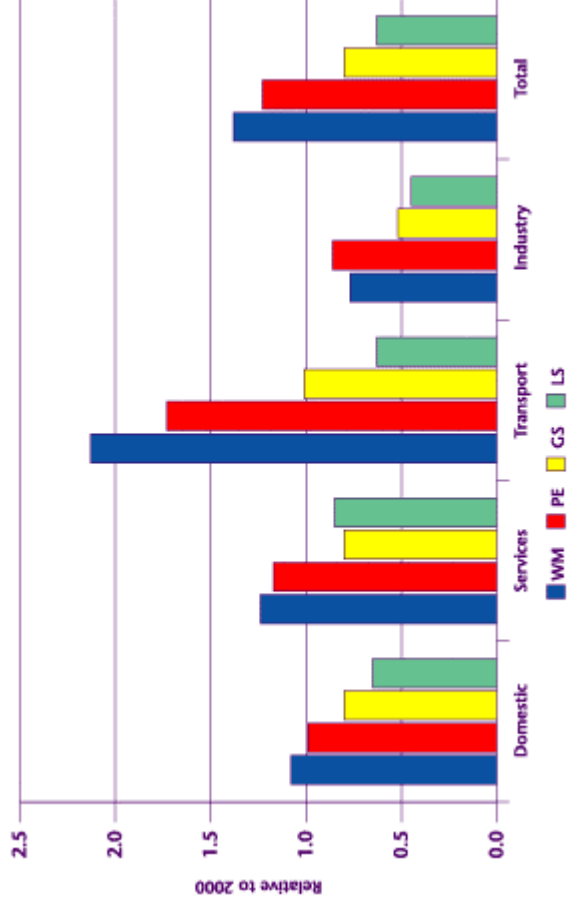
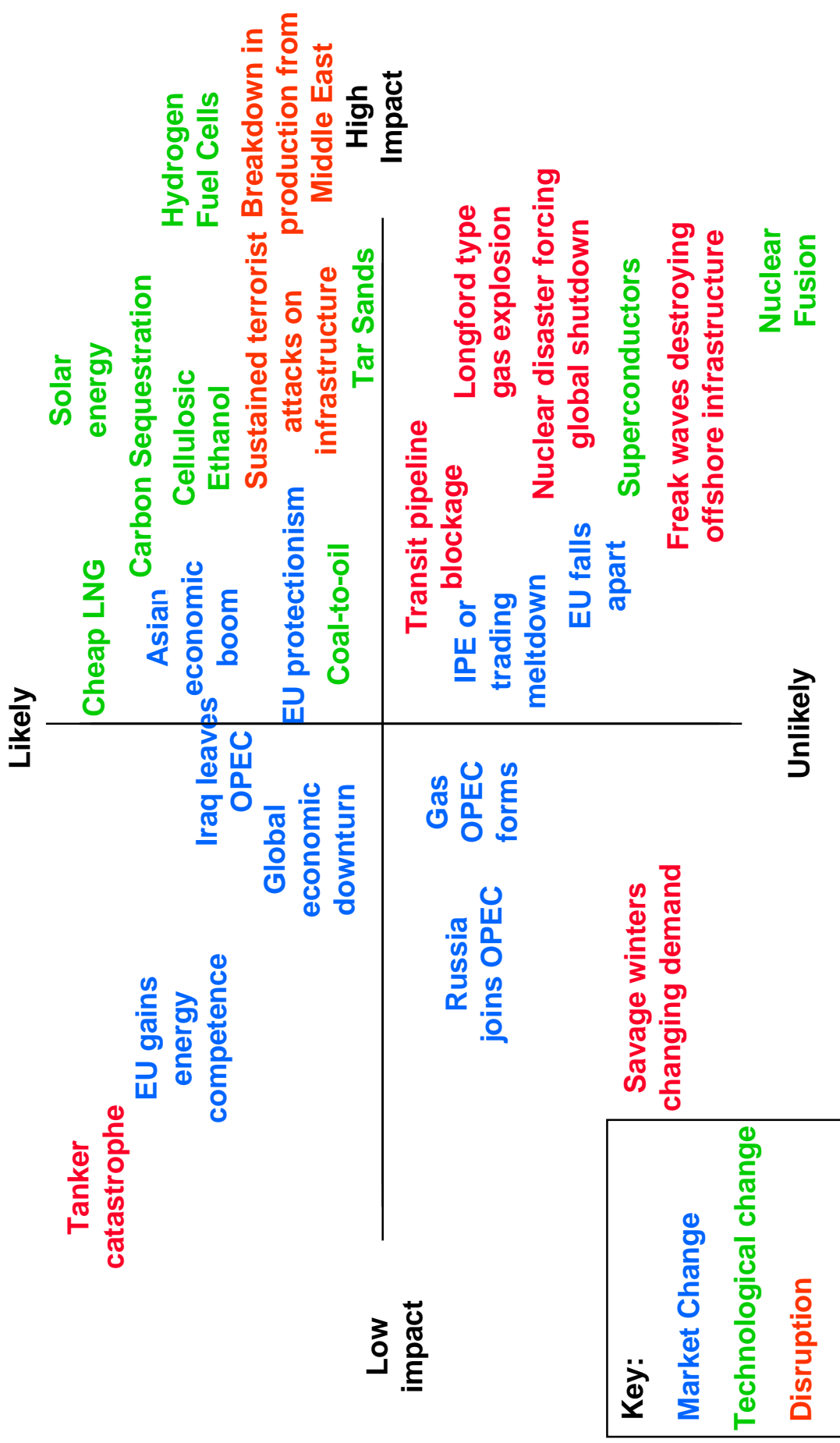


Figure 5.2: Energy demand by scenario in 2050



# ENERGY SCENARIOS TO 2020: IMPACT/LIKELIHOOD ANALYSIS



# THE “WANLESS HEALTH SCENARIOS” FOR 2022 - IMPACT OF PUBLIC BEHAVIOUR CHANGE

	Slow Uptake	Solid Progress	Fully Engaged
Health Promotion (smoking, exercise, diet etc)	No Change	Meet current public health targets	Go beyond current public health targets
Acute ill health among the elderly	Increase + 10%	Decrease - 5%	Decrease -10%
Long term ill health among the elderly	Increase	No change	Decrease
Life Expectancy at birth	Men: 78.7 Women: 83.0	Men: 80.0 Women: 83.8	Men: 81.6 Women: 85.5

# 'FUTURIST'S TOOLBOX' 1

Method	Application	Advantages	Disadvantages
<b>Quantitative Trend analyses</b> Time-series, extrapolations, S-curve, envelope curve, cycles and long-waves analyses, neural networks	Typically used in areas such as demographics, economics, and technology, i.e. areas where solid and long data series exist. Ought not to stand alone.	<ul style="list-style-type: none"> <li>- Objective method</li> <li>- Valid and logical</li> <li>- Easy to communicate</li> <li>- Economical and easy to handle.</li> </ul>	<ul style="list-style-type: none"> <li>- Not as neutral as may appear</li> <li>- Accepted as a kind of truth about the future</li> <li>- Narrow and isolated</li> <li>- Extrapolation of the past.</li> </ul>
<b>Qualitative Trend analyses</b> Trend spotting, megatrend analyses, cross-impact, scanning, environmental scanning, relevance trees	All areas. Though typically social, institutional, commercial and political topics. Often focusing on change and areas in change. By definition, megatrends are relevant to all areas.	<ul style="list-style-type: none"> <li>- Early warning tool</li> <li>- Outlining possibilities and risks</li> <li>- Starting point for formulating scenarios</li> <li>- Gives an overview of the system and inspiration.</li> </ul>	<ul style="list-style-type: none"> <li>- Relies strongly on the observer</li> <li>- Difficult to distinguish fads from long-term trends, trends from counter trends</li> <li>- Megatrends can often be too general.</li> </ul>
<b>Wild Cards</b> Shocks	All areas and settings.	<ul style="list-style-type: none"> <li>- Works with the possible futures</li> <li>- As early warning exercise.</li> </ul>	<ul style="list-style-type: none"> <li>- No explicit method</li> <li>- Rests heavily on the observer.</li> </ul>

## ‘FUTURIST’S TOOLBOX’ 2

Method	Application	Advantages	Disadvantages
<p><b>Delphi survey</b></p> <p>Multi-round anonymous expert evaluation techniques</p>	<p>Any subject, but especially within technological forecasting and often combined with other methods.</p>	<ul style="list-style-type: none"> <li>- Produces more reliable forecasts than those of an individual expert</li> <li>- Quite fast and economical with the use of IT</li> <li>- Is often considered “scientific”.</li> </ul>	<ul style="list-style-type: none"> <li>- To some it is considered a “method of last resort” – when there is no other way to base a forecast</li> <li>- Difficult to define who is qualified as an “expert”</li> </ul>
<p><b>Scenario Methods</b></p> <p>Normative scenarios, Explorative scenarios, Strategy scenarios</p>	<p>Unstable systems or changing environments can also be used for exploring possibilities of change. In line with the assumption that the future is uncertain the method is becoming widely used.</p>	<ul style="list-style-type: none"> <li>- Scenarios can be used as:                             <ul style="list-style-type: none"> <li>• early warning</li> <li>• a tool for creating a common frame of reference</li> <li>• a strategic tool</li> <li>• an evaluation tool</li> </ul> </li> <li>- Gives the decision-maker a choice of futures.</li> </ul>	<ul style="list-style-type: none"> <li>- Difficult to transform into decisions / actions</li> <li>- A qualitative method applied to a world used to quantification</li> <li>- Gives the decision-makers a choice of futures.</li> </ul>
<p><b>Future workshops</b></p> <p>Visioning, backcasting, brainstorming, brainwriting, group idea generation techniques</p>	<p>Originally a method for mobilising the “silent majority”. Today used by wide range of institutions e.g. companies, ministries, political parties, trade unions.</p>	<ul style="list-style-type: none"> <li>- Founded on participation and potentially leading to empowerment</li> <li>- Defining the preferred future as an alternative to probable futures.</li> </ul>	<ul style="list-style-type: none"> <li>- Can be seen as too “soft” or emotional</li> <li>- Must be followed by implementation in line with the conclusions</li> <li>- The risk of projecting people’s fears and hopes of the past.</li> </ul>

## FISHING AS AN EXAMPLE

### Biological research

- **Short term:** selective breeding and genetic modification of farmed species to improve the feed conversion and disease resistance. Challenge public and industry views on safety and ethics?
- **Better understanding** of fish biology and development to extend aquaculture to new species.
- **Medium term:** Wild fish (chaotic system) ecosystem modelling
- **Medium / long term:** genetic modification of cereals and soya. 6 kg of industrial fish species produces 1 kg of salmon. Replacing fishmeal with cereals in farmed fish diet could dramatically reduce price of fish and improve sustainability of aquaculture.

### Information and measurement technology

- **Short term:** Electronic log books and electronic markets. Provide catchers, fishery managers and the supply chain a shared information base. Improves traceability of fish stock, provides catchers higher prices, and improves sustainability of resources.
- **Medium term:** Use of pressure sensors on nets, and flow meters linked to real time tamper proof GPS to enhance the enforcement of fish catching.
- **Optical, physical and chemical sensors at sea combined with satellite monitoring to monitor and predict the growth rate and location of fish stocks and accurately assess the health of fish eco-systems**
- **Database integration:** network computers to manage the GIS data on fishing activity and environmental / resource quality to predict and manage stocks

## VITAL TO CHALLENGE CONVENTIONAL OPINION

In 1990 who predicted:



**Elected east European ex-communists leading their countries into the EU**

**A European civil war with 200,000 dead and ethnic cleansing**

**Mapping of genome completed**

**The US economy rebounded**

**Japan in a 12 year slump**

**Half a billion Internet users**

**Terror attacks in US**

**France, Russia and China allies against US**

**?**

## SOURCES OF INSIGHT

**importance of tracking the margins - complementary medicine, Internet, gun culture, rise of BNP, text messaging, Big Brother - not likely to be spotted by over-established institutions**

**multiple sources - analysis, open source, media, leading indicators, gossip**

**processes of distillation and judgement (JIC model)**

## Strategic Futures

This programme of work was set up to improve the ability of government to think about, react to and potentially shape the future. A further aim is to identify medium and long-term challenges for government across all policy areas. The following is the formal remit for the programme:

*To make policy making more forward thinking and outward looking and to identify strategic challenges and opportunities for government*

There are several main areas of work carried out under the Strategic Futures banner. These are summarised in the following list, followed by detailed outputs.

- **SEMINARS:** a series of seminars on strategic issues designed to spread best practice and innovative thinking. Delegates are drawn from government, academia and industry. Ministers/Permanent Secretaries chair or speak as appropriate.
- **RESEARCH:** research is carried out internally or via contractors to review some of the key issues for futures work in government.
- **NETWORKS:** under the Strategic Futures banner a network of strategic thinkers was formed in 2000. This comprises strategy heads (or their equivalents) from all major government departments, the EC and the devolved administrations.

## **IN CONCLUSION**

**Horizon scanning and futures methods should be part of the mainstream toolkit of any major institution - firm, government, university**

**They are not foolproof - but often bring implicit assumptions to the fore, and clarify choices**

**To be useful they need to be designed to help decision-makers make better decisions**

**the best models use mixed teams integrating analysts and practitioners, different sectors, work best and are most likely to spot complex patterns**

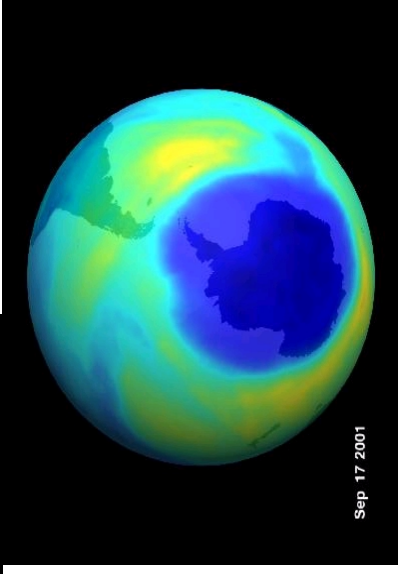
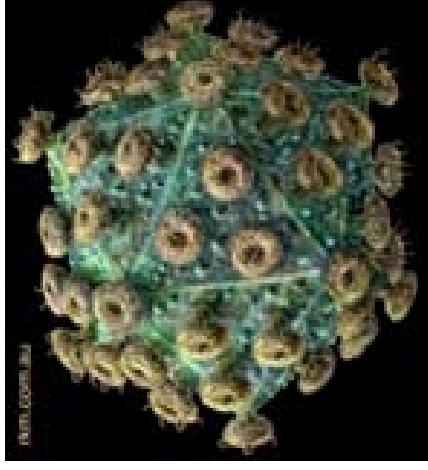
**... with direct links to decision-making processes (budgets, legislation &c)**

**horizon scanning for shocks to anticipate, mitigate, and prevent; but speed of response is often the key**

**WHAT COUNTS AS SUCCESS?  
PREDICTABILITY WILL ALWAYS BE ELUSIVE. THE BUSINESS OF  
GOVERNMENT IS INHERENTLY UNPREDICTABLE, MESSY AND  
SHAPED BY EVENTS.**



# BETTER PREPARED FOR LOW PROBABILITY HIGH IMPACT EVENTS

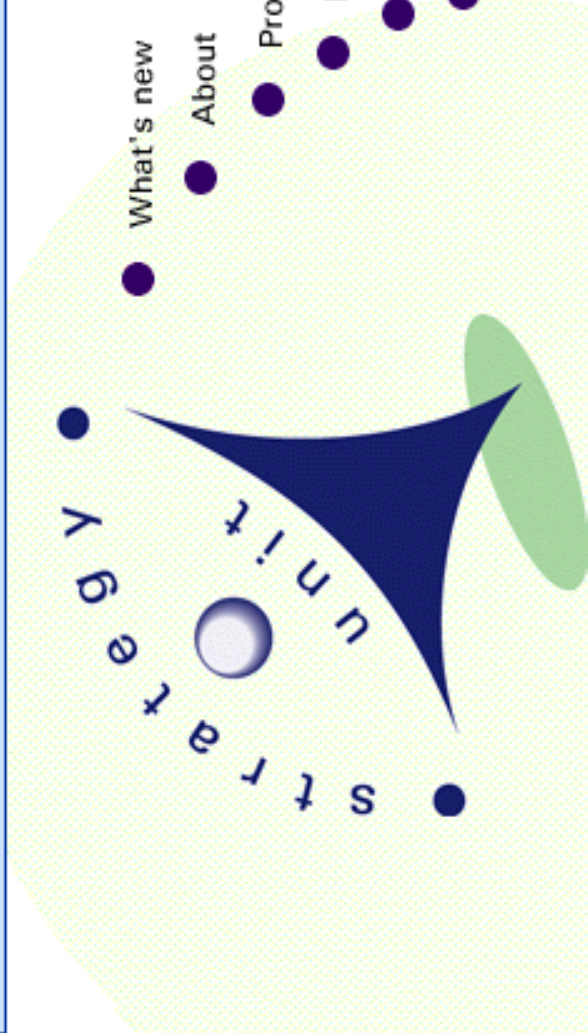


**LESS DRIVEN BY EVENTS, MORE DRIVEN BY GOALS**



**'whatever I have done in science has solely been by long  
pondering, patience and industry'**

**Charles Darwin**



"...providing the Prime Minister and Government departments with a capacity to analyse major policy issues and design strategic solutions..."

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