Horizon scanning and the future

Geoff Mulgan

Director

Prime Minister's Strategy Unit

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

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 CO_2 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

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

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

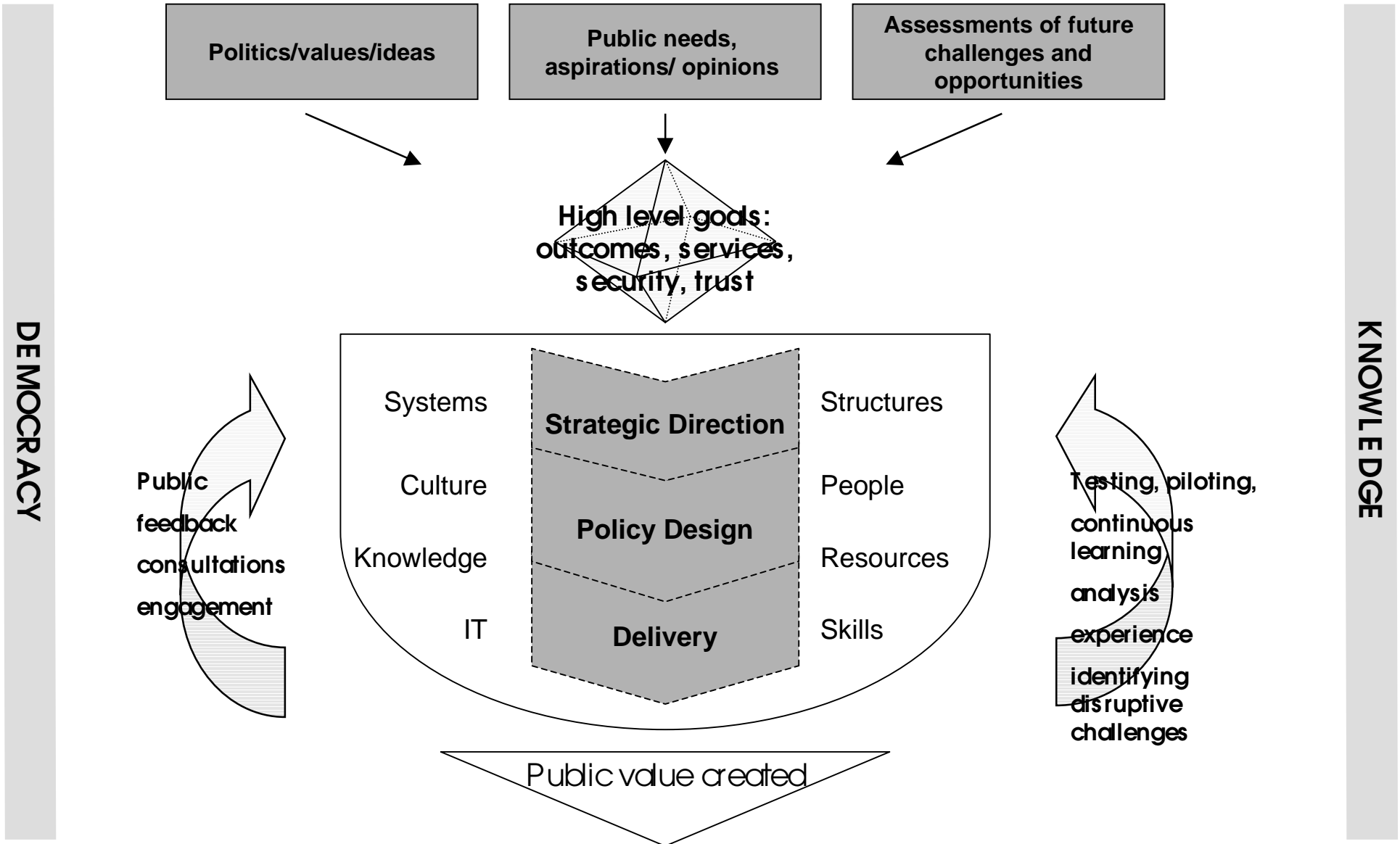## MACHINERIES FOR HANDLING THE FUTURE

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

DEMOCRACY

KNOWLEDGE

Politics/values/ideas

Public needs, aspirations/ opinions

Assessments of future challenges and opportunities

High level goals: outcomes, services, security, trust

Public feedback consultations engagement

Systems

Culture

Knowledge

IT

Strategic Direction

Policy Design

Delivery

Structures

People

Resources

Skills

Testing, piloting, continuous learning analysis experience identifying disruptive challenges

Public value created

METHODS, TOOLS, SKILLS AND EXPERIENCE

| Good strategy work...	This requires...
Is based on evidence and sound analysis	Appreciation of key analytical approaches, including basic economics, statistics, business modelling etc
Is holistic	Multi-disciplinary teams
Is sophisticated about complexity	Understanding of complex systems and their dynamics
Is creative and innovative	Range of experience and processes for creativity
Is grounded in an understanding of how the world works	A wide experience base
Is robust over long time periods	Futures methods
Is communicated compellingly	Storytelling and logical storyboarding skills
Is sophisticated about managing risk	Robust risk management approaches
Takes into account organisational capacity and rates of behavioural change	Understanding of organisational capacity issues
Takes into account deliverability	Delivery skills
Includes all key decision makers, including ministers	Careful management of process and stakeholders

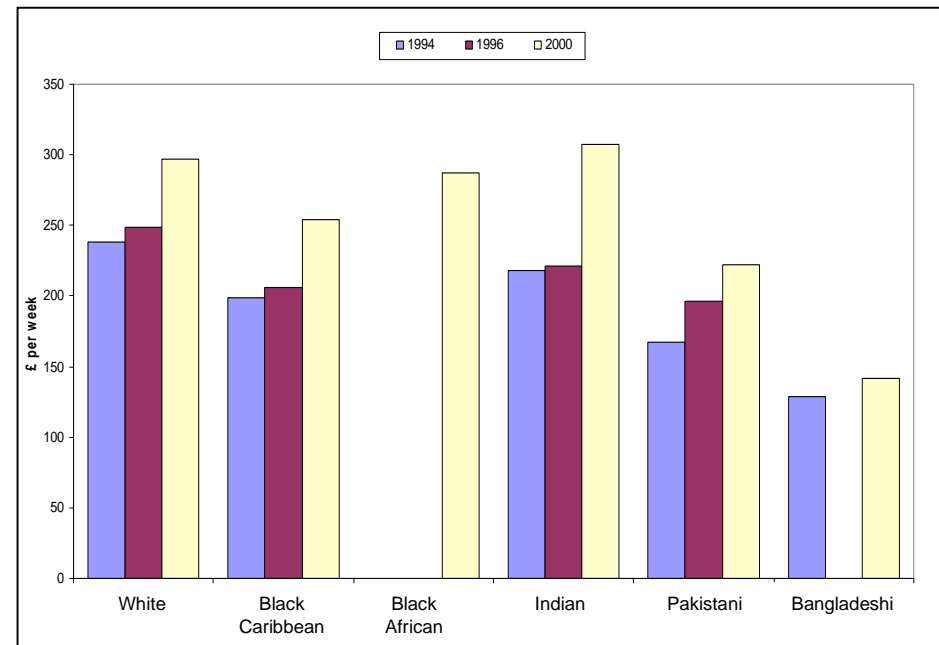## ANALYTIC METHODS TO ENSURE A RICHER UNDERSTANDING OF THE FUTURE INCLUDE:

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

Unemployment Rate of Men, 1992-2000
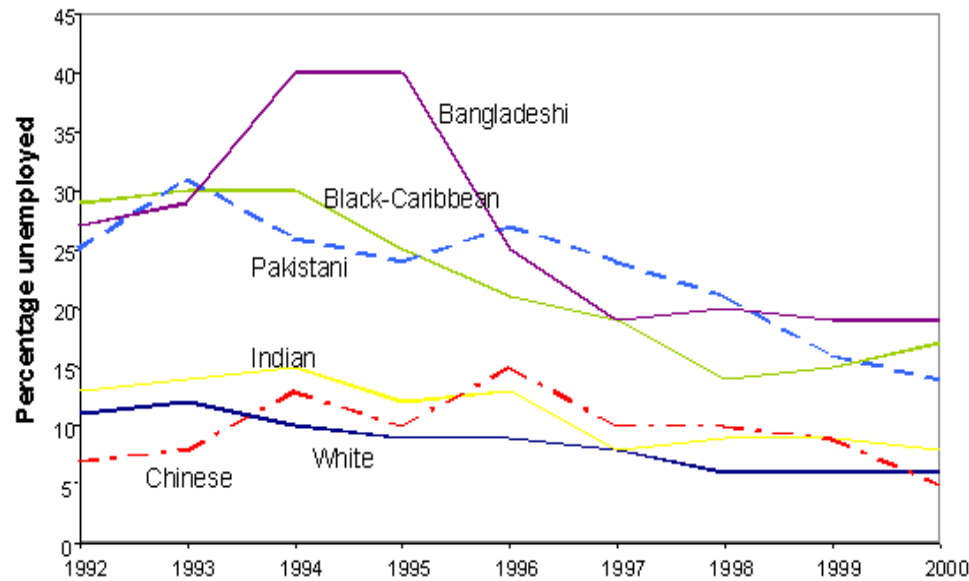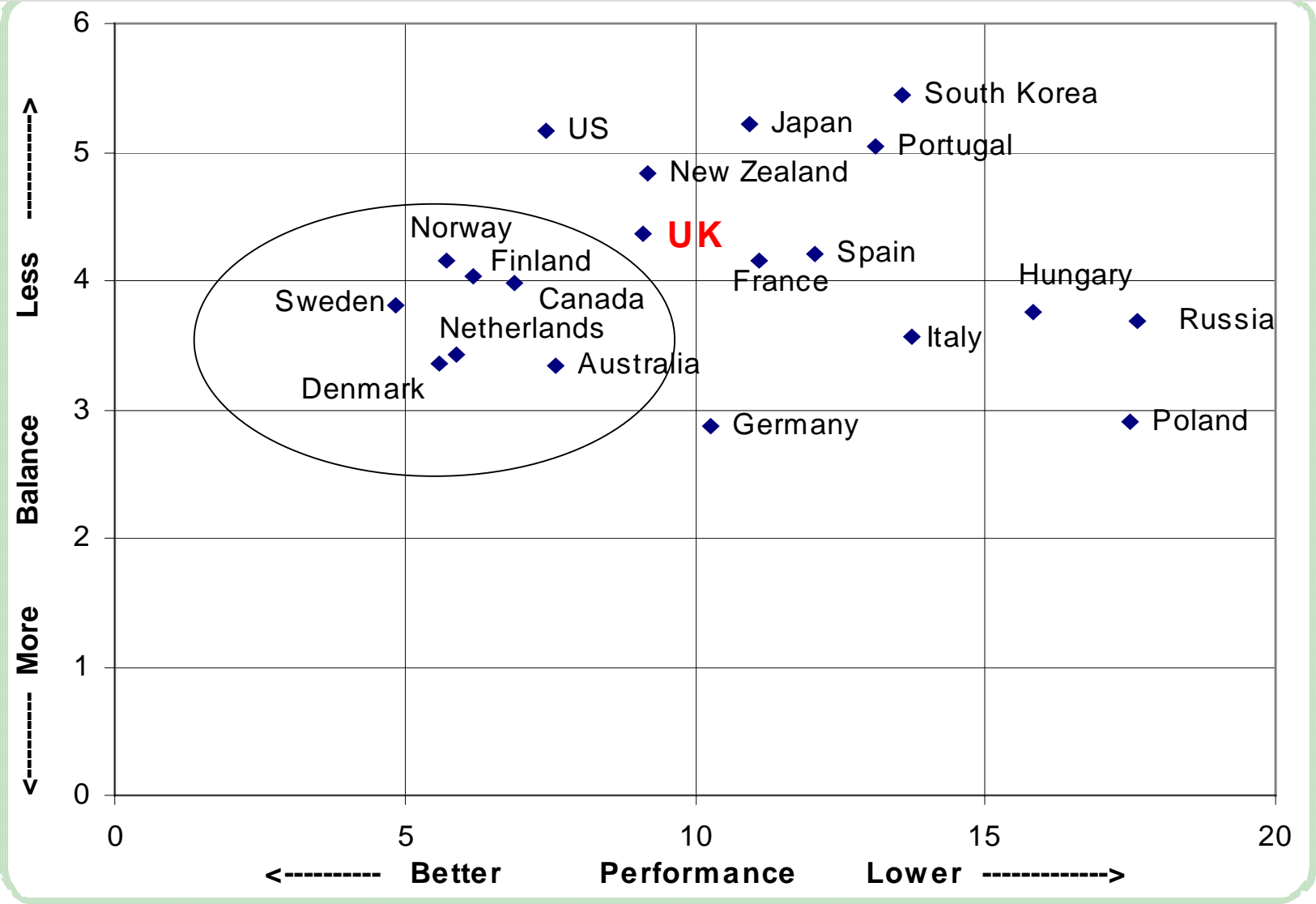
Ethnic minority pay trends

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

	GDP rank	HDR rank	Economic Fredom rank	Globalization rank	Commitment to development rank	Growth Competitveness 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
UK	**13**	**10**	**2**	**5**	**9**	**8**	**19**	**8**	**14**	**13**	**7**	**8**	**7**	**14**	**3**	**7**	**12**	**5**	**164**	**18**	**9.1**	**4.4**
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	16	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 { Sweden, Denmark, Norway, Netherlands, Finland, Canada }

Anglo-Saxon { US, Australia, UK, New Zealand, Germany, Japan }

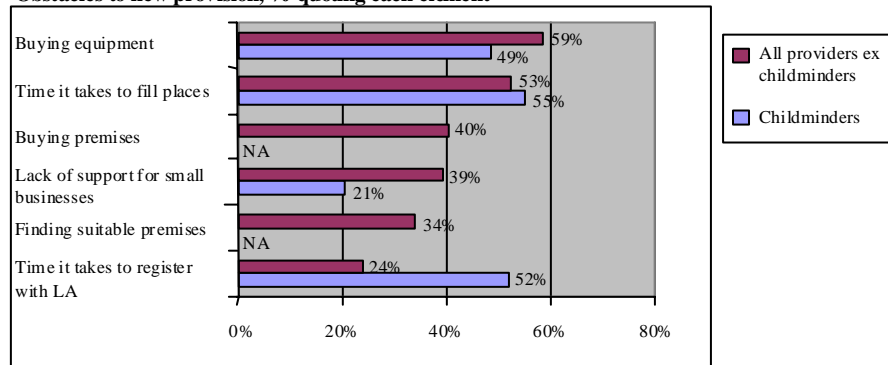# THE UK IS CURRENTLY OUTSIDE THE CLUSTER OF HIGH PERFORMERS

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

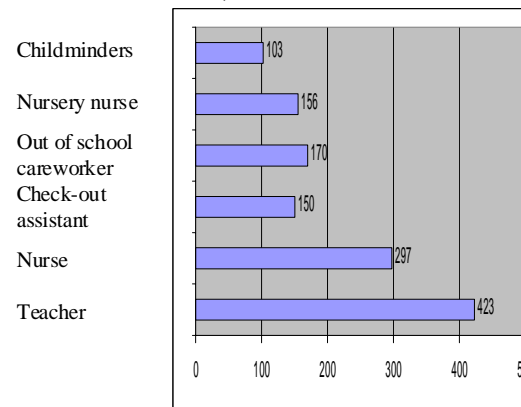Obstacles to new provision, % quoting each element

	All providers ex childminders	Childminders
Buying equipment	59%	49%
Time it takes to fill places	53%	55%
Buying premises	40%	NA
Lack of support for small businesses	39%	21%
Finding suitable premises	34%	NA
Time it takes to register with LA	24%	52%

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 o childminders
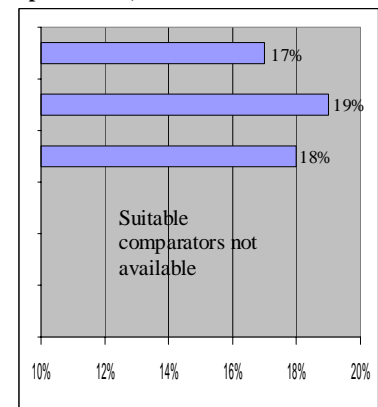
Source: Callender C., The Barriers to Childcare Provision, 2000, DfEE RR231

TURNOVER IN CHILDCARE PROFESSIONS IS HIGH; WAGES ARE LOW

Weekly wage, based on 35 hour week, £

Childminders	103
Nursery nurse	156
Out of school careworker	170
Check-out assistant	150
Nurse	297
Teacher	423

Turnover within childcare professions, %

Childminders	17%
Nursery nurse	19%
Out of school careworker	18%

Suitable comparators not available

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

Name of project/scheme	Country	Targeted at low SES children	Age of child at last follow up	Internal - Child								Int - Parent				External benefits								
				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 qualifications at age 18	improved emotional/psych.	improved parenting indicators	increased maternal employment	increased educational attainment	improved mental health	reduced crime rates - child	reduced crime rates - mother	reduced welfare recipience - child	reduced welfare recipience - mother	improved health - child	improved employment - child	improved employment - mother	reduced child abuse	reduced teen pregnancy - child
Early Childhood Interventions.																								
Early Training Project (reported)	US	Y	20	Y		Y	?		?	?														?
Perry pre-school	US	Y	27	Y		Y	Y	Y	?	Y						Y	Y				M	?		?
Chicago CPC	US	Y	14	?		Y	Y		Y			Y				Y								
Project Care	US	Y	5	Y																				
Syracuse Univ. Family																Y								
Carolina Abecedarian	US	Y	21	Y		Y	Y		Y				Y	Y				Y	Y			Y		
IHDP - full sample	US	Y	8	Y	Y	M						Y	Y											
EEC 2000	UK	M	n/a		Y	Y		?				Y	Y	Y	Y									
EEC 2001	UK	M	n/a	Y	Y	Y		?				Y	Y	Y	Y								Y	
Head Start - Westinghouse Report	US	Y	7			M																		
Head Start - Currie&Thomas	US	Y				Y														Y				
Childcare																								
Cost, Quality and Child Outcomes	US	N	8			Y	Y																	
Effects of Public Daycare	Swe	N	13			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					M													
The Impact of Study Support	UK	N	16			Y		Y			Y													

MODELLING TO ASSESS EFFECTS OF ACTIONS

NET PLACES EXPECTED

		At March 31	2001	2002	2003	2004	2005	2006
0-4 year places	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
	Nursery new build	Govt supported					13,137	13,137
		Unsupported					25,439	27,401
	Nursery conversion						11,218	11,218
	Childminder 0-4						5,060	5,060
	Total						59,640	67,983
5-14 year places	Childminder 5-14						1,117	1,117
	Out of School Clubs					21,221	21,220	21,220
	Total					21,221	22,337	22,337
Total						21,221	81,977	90,320

0-4 ratio places:children	1.30
5-14 ratio places:children	1.75

CHILDREN HELPED

		At March 31	2001	2002	2003	2004	2005	2006
0-4 year places	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
	Nursery new build	Govt supported					17,078	17,078
		Unsupported					33,071	35,621
	Nursery conversion						14,583	14,583
	Childminder 0-4						6,578	6,578
	Total						77,532	88,379
5-14 year places	Childminder 5-14						1,954	1,954
	Out of School Clubs					37,136	37,135	37,135
	Total					37,136	39,089	39,089
Total additional children helped						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

Expectation of life at birth, England, 1981-2040
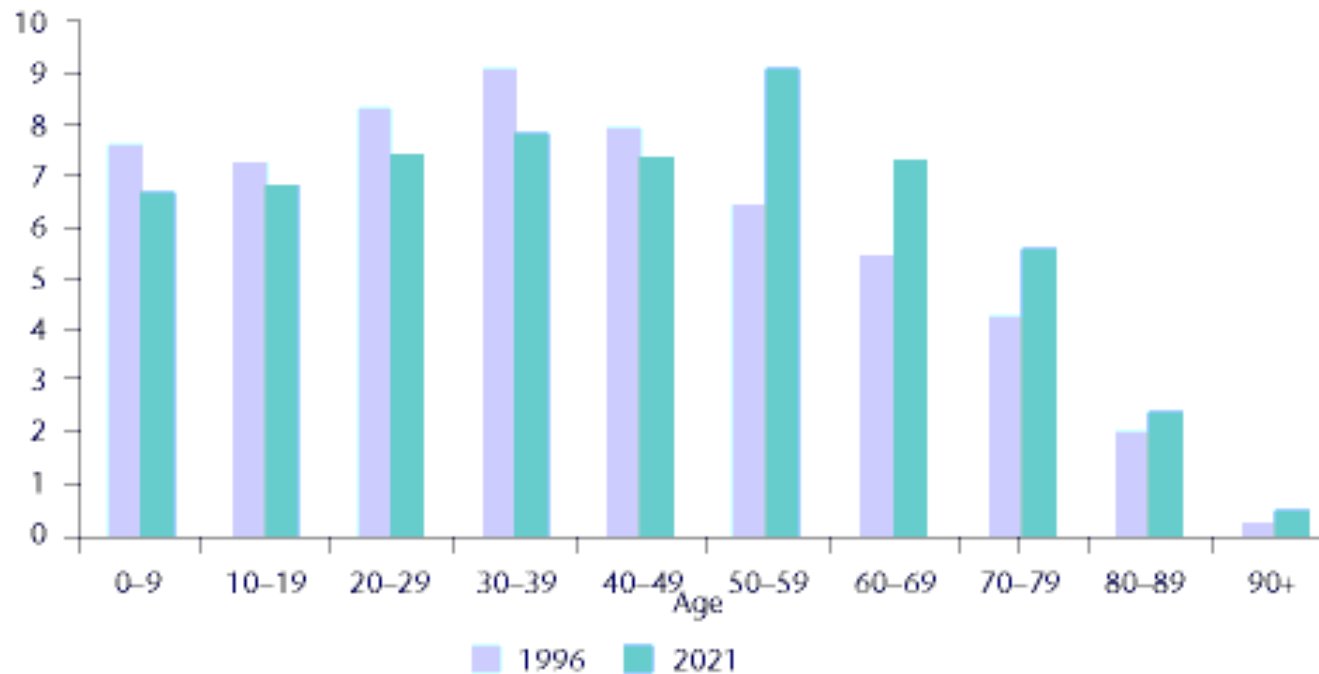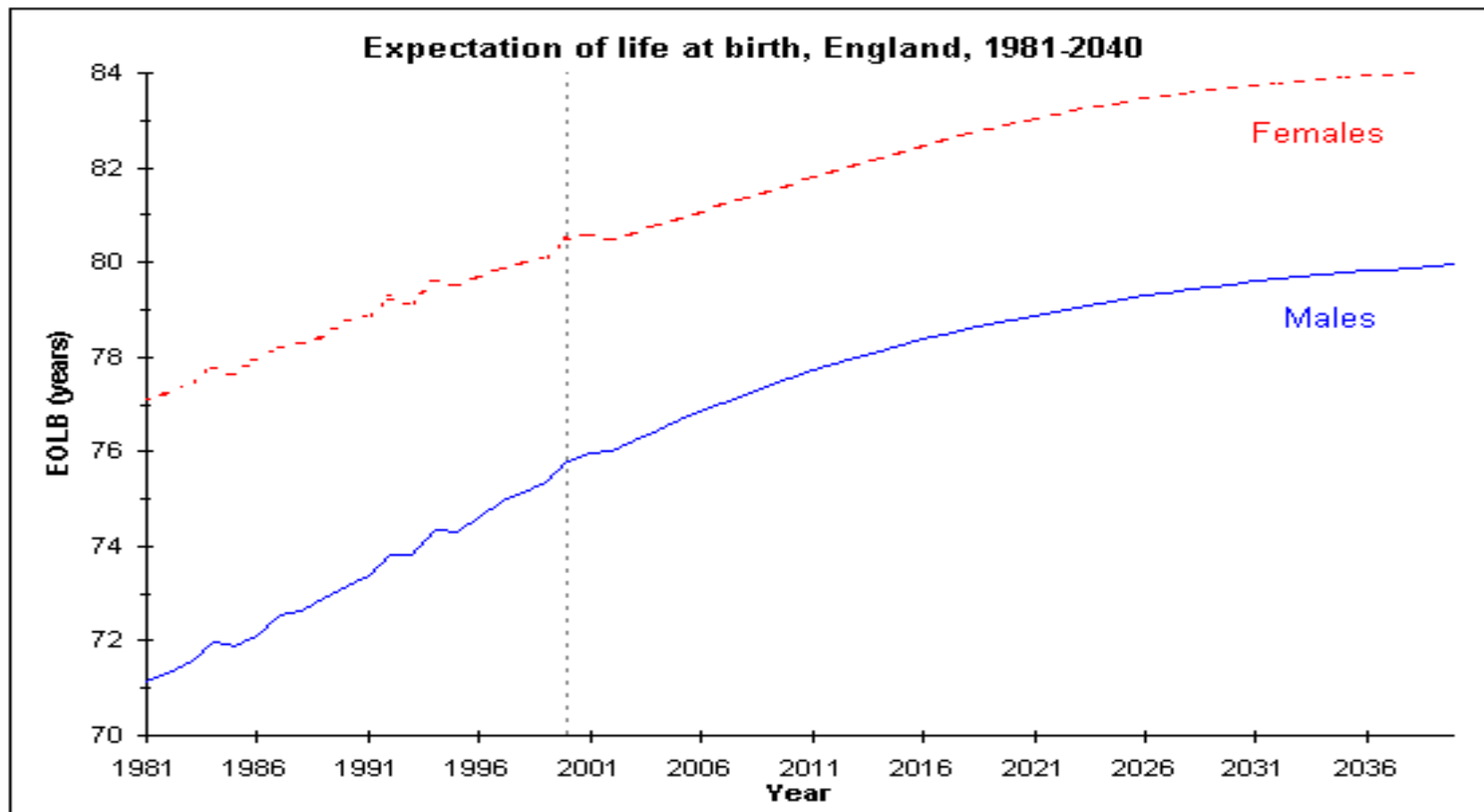
FORECASTING AS STIMULUS

	USA	EU	CHINA
POPULATION			
2003	278	389	1275
2050	411	370	1700
GDP (share in world)			
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	Intelligent Devices Protocol Driven/Expert Systems	Robotics	
Demography & Society	Inequalities	Population growth in 45 - 75 age group Smaller households, single parents, living alone		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**
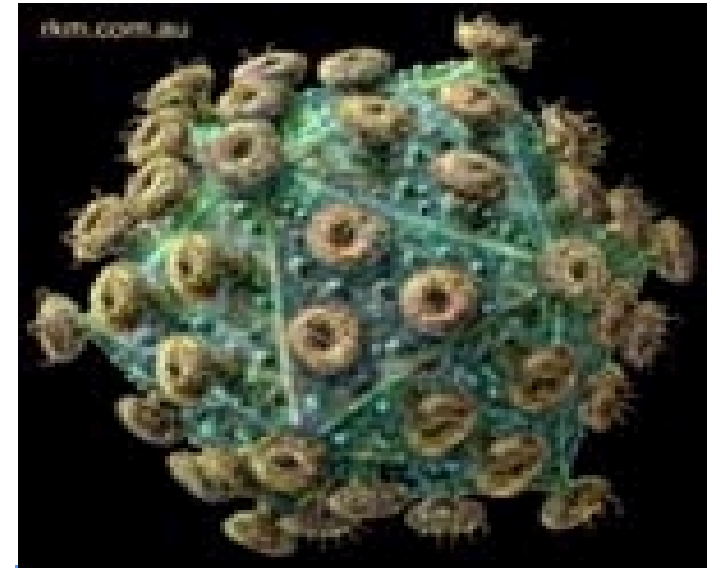
Figure 5.1 Locating the five scenarios on the grid of governance and social values
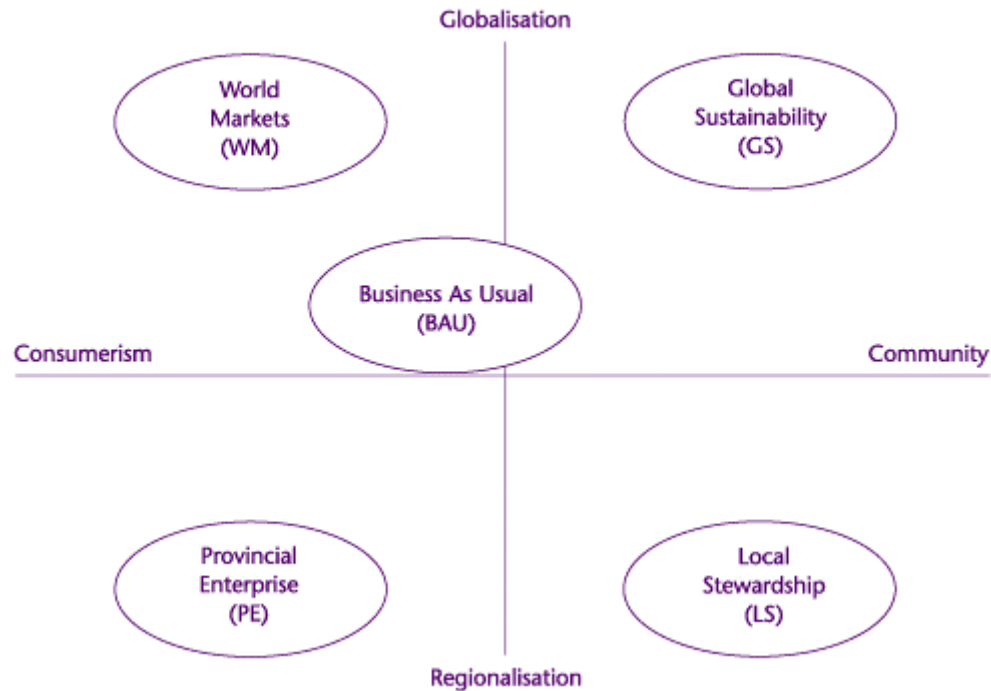
Figure 5.2: Energy demand by scenario in 2050
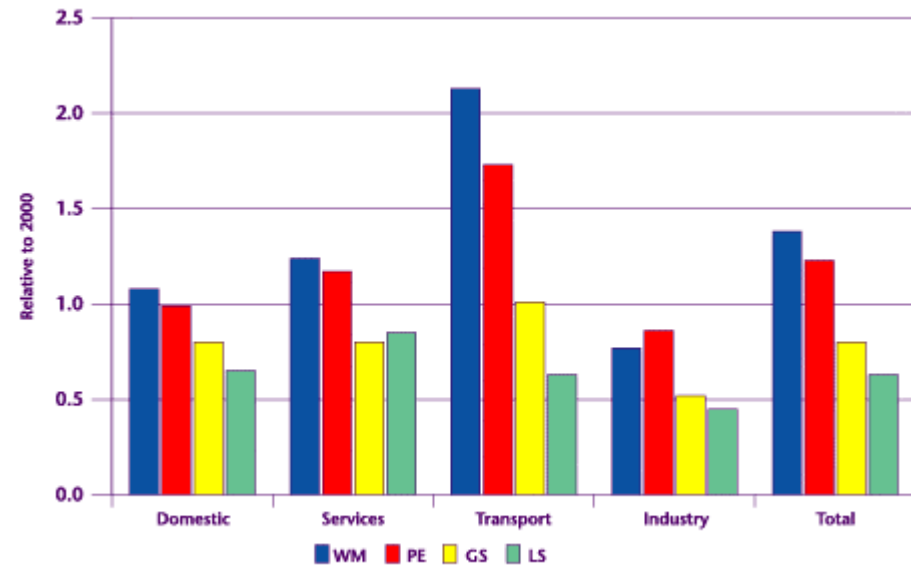
ENERGY SCENARIOS TO 2020: IMPACT/LIKELIHOOD ANALYSIS

Likely

Tanker catastrophe

EU gains energy competence

Iraq leaves OPEC

Global economic downturn

Cheap LNG

Solar energy

Carbon Sequestration

Asian economic boom

Cellulosic Ethanol

Hydrogen Fuel Cells

Sustained terrorist attacks on infrastructure

Breakdown in production from Middle East

EU protectionism

Coal-to-oil

Tar Sands

High Impact

Low impact

Transit pipeline blockage

Russia joins OPEC

Gas OPEC forms

IPE or trading meltdown

Longford type gas explosion

Nuclear disaster forcing global shutdown

EU falls apart

Superconductors

Savage winters changing demand

Freak waves destroying offshore infrastructure

Nuclear Fusion

Key:

Market Change

Technological change

Disruption

Unlikely

- 23 -

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
Quantitative Trend analyses Time-series, extra-polations, 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.	- Objective method - Valid and logical - Easy to communicate - Economical and easy to handle.	- Not as neutral as may appear - Accepted as a kind of truth about the future - Narrow and isolated - Extrapolation of the past.
Qualitative Trend analyses 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.	- Early warning tool - Outlining possibilities and risks - Starting point for formulating scenarios - Gives an overview of the system and inspiration.	- Relies strongly on the observer - Difficult to distinguish fads from long-term trends, trends from counter trends - Megatrends can often be too general.
Wild Cards Shocks	All areas and settings.	- Works with the possible futures - As early warning exercise.	- No explicit method - Rests heavily on the observer.

'FUTURIST'S TOOLBOX' 2

Method	Application	Advantages	Disadvantages
Delphi survey Multi-round anonymous expert evaluation techniques	Any subject, but especially within technological fore-casting and often combined with other methods.	- Produces more reliable forecasts than those of an individual expert - Quite fast and economical with the use of IT - Is often considered "scientific".	- To some it is considered a "method of last resort" – when there is no other way to base a forecast - Difficult to define who is qualified as an "expert"
Scenario Methods Normative scenarios, Explorative scenarios, Strategy scenarios	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.	- Scenarios can be used as: • early warning • a tool for creating a common frame of reference • a strategic tool • an evaluation tool - Gives the decision-maker a choice of futures.	- Difficult to transform into decisions / actions - A qualitative method applied to a world used to quantification - Gives the decision-makers a choice of futures.
Future workshops Visioning, backcasting, brainstorming, brainwriting, group idea generation techniques	Originally a method for mobilising the "silent majority". Today used by wide range of institutions e.g. companies, ministries, political parties, trade unions.	- Founded on participation and potentially leading to empowerment - Defining the preferred future as an alternative to probable futures.	- Can be seen as too "soft" or emotional - Must be followed by implementation in line with the conclusions - The risk of projecting people's fears and hopes of the past.

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

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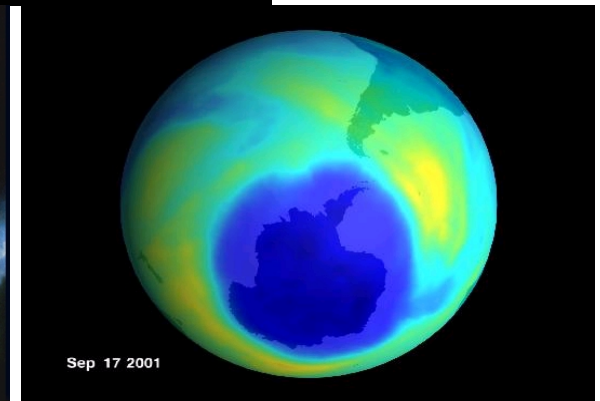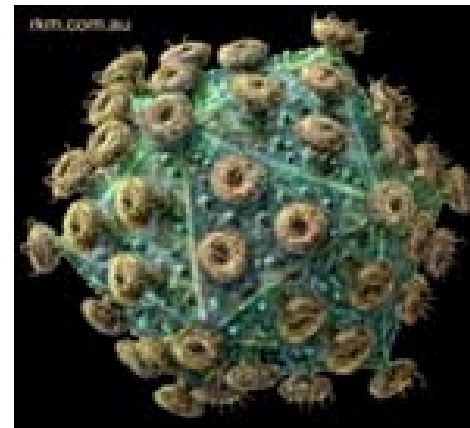
… with direct links to decision-making processes (budgets, legislation &c)

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.

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

File   Edit   View   Favorites   Tools   Help

Back   Forward   Stop   Refresh   Home   Search   Favorites   History   Mail   Print

Address http://www.strategy.gov.uk/   Go   Links   Customize Links   Free Hotmail   Windows

CabinetOffice   ■ **Introduction**   ■ **Management Units**   ■ **Organisation Chart**

□ Site Index
□ Search
□ Feedback

strategy unit

- What's new
- About
- Projects
- Reports
- Consultation documents
- Alumni network
- Site index

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

► Strategic Futures

► Working in the SU

► Contact us

© Crown copyright

Internet