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# Our Future World

## An analysis of global trends, shocks and scenarios

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## Five megatrends and eight megashocks that will redefine how the world's people live.

1. **More from less.** This relates to the world's depleting natural resources and increasing demand for those resources through economic and population growth. Coming decades will see a focus on resource use efficiency.
2. **A personal touch.** Growth of the services sector of western economies is being followed by a second wave of innovation aimed at tailoring and targeting services.
3. **Divergent demographics.** The populations of OECD countries are ageing and experiencing lifestyle and diet related health problems. At the same time there are high fertility rates and problems of not enough food for millions in poor countries.
4. **On the move.** People are changing jobs and careers more often, moving house more often, commuting further to work and travelling around the world more often.
5. **i World.** Everything in the natural world will have a digital counterpart. Computing power and memory storage are improving rapidly. Many more devices are getting connected to the internet.

## More from less: supporting trends

- **Scarcity of fresh water resources relative to demand.** According to the United Nations by 2025 1.8 billion of the world's people will be living in countries or regions with "absolute water scarcity" and two-thirds of the world population will be experiencing "stress conditions" .
- **Less minerals, more demand.** There is a gradual and permanent decline in mineral ore grades worldwide. At the same time rapid economic growth in India and China is leading to increased demand.
- **Less fish, more demand.** According to the Food Agriculture Organisation global fish stocks are 52% fully exploited. This means fish are being harvested at full biological productive capacity and further exploitation would create dangerous risks for the fishery. In 2030 the world demand for seafood will be 183 million tonnes/yr; 95 million tonnes/yr above 1995 levels.
- **Growth in the global carbon market.** In 2008 the global carbon market transacted 463 MtCO<sub>2</sub>e worth US\$7.21 billion with an average price of US\$15.57 per tonne. One forecast by the World Bank predicts that, for international offsets, by the year 2020 the trade could grow to 3.1 GtCO<sub>2</sub>e worth US\$150 billion at a price of US\$50 per tonne.
- **Growth in biodiversity markets.** At a global scale biodiversity markets are large with global conservation organisations such as The Nature Conservancy spending US\$731 million in fiscal 2007/08 protecting biodiversity.
- **More energy for less money.** Throughout the world energy demand is forecast to rise for coming decades. However, there has been a long term decline in the ratio of energy use to economic growth. This is partly due to improved efficiency through new energy technologies. Projections have been made in the United States which show that energy intensity will decline from 8.8 thousand Btu per dollar of GDP in 2007 to 5.6 in 2030.

- **Less agricultural land, more people to feed.** It is estimated by International Fund for Agricultural Development that about 12 million hectares of productive agricultural land are lost each year to land degradation and this will displace some 50 million people over the next 10 years.
- **Less oil, higher prices.** During fiscal year 2008/09 oil prices fluctuated from US\$35 to US\$135 per barrel. The US Department of Energy has a reference, low and high price scenario for the year 2030 of US\$130, US\$50 and US\$200 per barrel.
- **Loss of biological diversity.** 52% of species are threatened with extinction. It has been argued that the fate of the world's biodiversity over the next 10 million years depends on what happens in the next 50-100 years.
- **Resource conflicts.** As resources become scarce they may be linked to armed conflict and geopolitical instability. This is especially true for stressed river systems. Research has shown that countries which share rivers have a statistically higher probability of military disputes and that dry countries have more conflict. Future decades may see increased risk of resource related conflicts.
- **Willingness to incur higher exploration and extraction cost.** As resources become scarce and prices rise mining companies, and other primary industries, are willing spend more for their discovery and extraction. Environmental and social conflicts may arise as mining companies search further and deeper for resources.

## A personal touch: supporting trends

- **New capabilities for personalisation.** The vast increases in computing power, manufacturing robotics, and the rise of the internet over recent decades have now given marketers the power to customise offerings to ever more demanding customers, in ways they could not before. Those companies that are able to personalise services are likely to gain more loyal customers. Loyalty has been a highly sought after objective by marketers over the past few decades.

- **Privacy and confidentiality concerns.** Modern information technology is allowing governments and companies to capture and store vast amounts of information on people. This is creating a strong demand for systems to protect information from improper use.
- **Personalised health products.** As consumers become more health aware there is a growing demand for personalised health services which meet the unique needs of an individual. For example an IBM scenario says “In the next five years, your doctor will provide you with a genetic map that tells you what health risks you might face in your lifetime and the specific things you can do to prevent them based on your specific DNA.
- **Demand for information management.** There will be a strong demand for technologies that help people deal with information overload. For example, memory tools are on IBM’s list of the top five technology trends over the next five years. Memory tools help people deal with the overwhelming amount of data (e.g. phone numbers, passwords, addresses) they need to remember.

## Divergent demographics: supporting trends

- **Rising rates of obese and overweight people.** In the UK it is estimated that in 2007, 60.8% of adults and 31.1% of children were overweight or obese, of these, 24% of adults and 16.8% of children were obese and that as many as 30,000 people die prematurely every year from obesity-related conditions. By 2050, there will be a 23% rise in the prevalence of obesity-related stroke, a 34% rise in obesity-related high blood pressure, a 44% rise in obesity-related coronary heart disease and a 98% rise in obesity-related diabetes.
- **Food security threats for poorer countries.** Whilst some of the world’s population is dealing with too much food others are dealing with too little. The number of undernourished people in the world increased from 848 million to 963 million between 2003–05 and 2008. World food demand will be 75% greater by 2050.

- **Increases in the costs of plant nutrients for food production.** Food and fibre productivity needs to be sustained or increased (at least 2% a year) but the cost and supply of nutrients will be a significant challenge. Some have suggested that the world has reached "peak phosphorus" and major fields have declined. Nitrogen fertiliser production is energy intensive and the price will rise.
- **Worldwide shift towards non-communicable diseases and accidents as the leading cause of death.** The World Health Organisation says "There is a striking shift in distribution of death and disease from younger to older ages and from infectious, perinatal and maternal causes to non-communicable diseases. Traffic accident rates will increase; tobacco-related deaths will overtake HIV/AIDS related deaths. Even in Africa, where the population remains younger, smoking, elevated blood pressure and cholesterol are among the top 10 risk factors in terms of overall disease burden".
- **A new middle class.** In other parts of the world, notably India and China we are seeing another form of "divergent demographics". In these countries we are seeing enormous growth in the number of people in the middle class and able to buy new luxuries. In India the middle class share of the population was 5% in the year 2005 and is forecast to be 20% by the year 2015 and 40% by the year 2025. As another example, car ownership in India is currently 14 per 1000 people and is expected grow significantly with new low cost cars coming onto the market. Australia and the US have car ownership rates of around 500 per 1000 people and India is projected to be the third largest automobile market in the world by 2030.
- **Citizens of the developing world are demanding more protein.** Throughout some parts of the developing world the emerging middle class is demanding food products with greater protein such as milk, eggs and meat. According to the FAO meat consumption in developing countries has been growing at over 5% per year over the last few decades with an expectation of continued future growth.
- **Increasing rates of health literacy.** Health literacy is the ability to access and use health related information relating to food and pharmaceutical products.

## On the move: supporting trends

- **Rapid urbanisation** in South America, Africa, Asia and the Middle East. Shenzhen in China is an example of a city receiving a huge inflow of people from rural areas. A farming region only two decades ago today Shenzhen has a population of in excess of 8 million. Based on projections of urban population growth China will need to build an additional 2 new cities the size of Shenzhen, or over 3 cities the size of Sydney, every year until 2030.
- **International jet travel.** According to Boeing jet aircraft passengers worldwide travelled 4,621 billion kilometres in 2008 and this is forecast to rise to 12,090 billion by 2028. This represents growth of around 5% per year. The sectors with the greatest annual growth out to 2028 include Africa to South East Asia (9.2%), within China (8.6%), within South West Asia (8.7%) and within South East Asia (8.1%). This increase in jet travel will be accompanied by a more interlinked world with a flow of people, ideas and cultures between regions and countries.
- **People are changing jobs more often.** One in three workers in the UK remains in a job for less than two years. Younger workers are more likely to have had several employers over the past five years. The trend looks set to continue, with one in five of the 2,000 workers thinking about changing jobs over the next year. Based on these trends mobility of the workforce is likely to increase in coming years.
- **Increased work commuting time and distance.** Over the past 20 years, more and more UK commuters have experienced a longer and more demanding commute. The average commuter is spending more than 139 hours per year commuting, increasing substantially for Londoners who spend the equivalent of one whole month per year travelling to and from work. Despite remote and flexible working, this trend will continue.

## i World: supporting trends

- **Exhaustion of internet addresses.** Every device or website connected to the internet needs a unique IP address. After 40 years of existence the internet, due to rapid growth, has consumed 90% of just over four billion IP addresses available on the current system known as IPv4. A conversion is planned to move to IPv6 which can accommodate  $3.4 \times 10^{38}$  unique addresses. This trend is evidence of the growth and increased information content and functionality of the internet.
- **Growth in e-commerce.** According to market research firm Forrester, online retail sales in the United States alone reached US\$185 billion in 2009 and are forecast to almost double to US\$335 billion by 2012.
- **Growth in social networking.** The popular social networking site, Facebook, was founded in 2004 and now claims to have 300 million active users with 50% logging into their accounts daily. They say the fastest growing demographic is people aged 35 years and above. Twitter is another social networking tool with rapid and recent growth.
- **Remote sensing.** There have been vast improvements in the geographic range, resolution and accessibility of remotely sensed data over recent decades. Tools such as "Google Earth" are making satellite information, linked to company data, widely available to the general public.
- **Improvements in computing hardware.** The improvement in computing hardware is keeping pace with Moore's law. This trend may continue into coming decades. This is improving digital devices in many ways such as improved memory, processing speed and sensory devices.
- **Cloud computing.** This involves the provision of virtualised resources over the internet to supply integrated services to customers. There is a growing trend for software firms to use cloud computing solutions to avoid high capital costs of developing all required functionality on a single system

## Megashocks identified by the World Economic Forum

### Economic

- Food price volatility
- Oil and gas price spike
- Major fall in US\$
- Slowing Chinese economy (6%)
- Fiscal crises
- Asset price collapse
- Retrenchment from globalization (developed)
- Retrenchment from globalization (emerging)
- Regulation cost
- Underinvestment in infrastructure

### Geopolitical

- International terrorism
- Collapse of the Nuclear Non-proliferation treaty
- US/Iran conflict
- US/ Democratic Republic of Korea conflict
- Afghanistan instability
- Transnational crime and corruption
- Israel-Palestine conflict
- Violence in Iraq
- Global governance gaps

### Environmental

- Extreme climate change related weather
- Droughts and desertification
- Loss of freshwater
- Cyclone
- Earthquake
- Inland flooding
- Coastal flooding
- Air pollution
- Biodiversity loss

### **Societal**

- Pandemic
- Infectious disease
- Chronic disease
- Liability regimes
- Migration

### **Technological**

- Critical information infrastructure breakdown
  - Emergence of nanotechnology risks
  - Data fraud/loss
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