



The Future Report 2012

A Steria Report

# 'the future'



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# Introduction



The drivers of change make up a complex, interwoven web that can be challenging to navigate. As leaders we ask: 'How should we address the key transformation issues that affect our businesses? What do we need to do as a result of what we see happening in the world around us?' As the trusted transformation partner for clients around the world, Steria is concerned with charting the future landscape and helping organisations navigate through this changing world.

The Future Report is our map of the landmarks and signposts of the future, an invaluable tool to help you and us maximise opportunities in the complex world ahead and proactively address the key transformation themes. Our belief in the Power of Sharing means we are driven to share our findings, forging progress through collaboration. We are, of course, rooted in reality, not speculative futurism. So we have published this report as an open enquiry on the major issues and trends ahead. In the back of this report you will find very real perspectives on the effect of these changing demographics on some of our clients businesses. What's your view?

Join us in exploring the future – and embracing it.  
We are with you all the way.

François Enaud | CEO | Group Steria



# Foreword

Over the past few years we have seen a revolution in the globalisation of economies and the resulting complexity of interconnectedness. What happens in Beijing, Shanghai, Mumbai and Moscow now matters almost as much as what's happening locally in Paris, Rome, Berlin and London and in some markets, more so. The global credit crisis, which arose from the reselling of worthless mortgage bundles, transformed into a Sovereign debt crisis as governments sought to prop up their overexposed banking systems.

The resulting recession, the 'Great Recession', isn't even over now as we double dip in our journey to full recovery. Finance led recessions have traditionally taken seven years to fully work through before we again reach the pre-recession levels of productivity and performance. It looks like we are on a trajectory to maintain this tradition.

This crisis has in itself generated a rift within the member states of the Euro economy where high performance economies are being increasingly asked to 'prop up' overextended nations. The currency of conversation is all about fairness, but everyone has a different perspective of what this means. To some to retire at 60 years of age is fair but others will have to wait until nearly 70 before they get a state pension. Others say that some states' workers take too much time for holidays and employ too many public workers. Balancing a common and accepted new level playing ground for the Eurozone will take time and require an aggressive public administration transformation agenda.

Governments will need to agree how far they can and are prepared to go to converge their domestic and foreign policies, certainly their budgets. How much sovereignty will the current 27 member states of the European Union be prepared to surrender to create a more synchronous Europe is anyone's guess but it will be a cause of instability until it is 'resolved' whatever that ends up looking like.

Change drives transformation for new markets, products, services and economies to emerge. In the past 100 years of recessions, depressions and panics, as they were once called, many of the largest corporations we know today, were incubated and launched. Change is uncomfortable, but good for innovation and accelerated growth. It's also dangerous for leading players in their fields, as upstart, new entrants, take market share. Key drivers of change and their potential consequences are laid bare in this report for you to consider and respond to.



David A. Smith | Chief Executive Officer | Global Futures and Foresight



# Executive summary

Increasingly we are becoming aware that there is more change happening in the world, society, across industry sectors and in many disciplines of science than ever before and that the change is happening at an increasing pace. In this report we've assembled a wide selection of the most influential drivers of change that will shape our markets and businesses in the coming years. We've raised issues that, in the main, demand a response from us now, not in five or ten years' time. In order to guide you, the report is divided into themes and is fully referenced. There are over 180 links to the sources that have informed our thinking and they are listed in the endnotes. The timeline that we've drawn up serves to illustrate the volume of change but also that change happens in parallel across all fields and geographies at the same time. Those changes have a tendency to conspire together to create compelling change scenarios. It is often at these inflection points that new business models form. This means new sub-sectors or solutions are created, displacing existing products, services and even providers.

## Populations

We are confronted by the evidence of our rapidly changing world every day and are contributing to its change each in our own way. In the past 50 years, we've doubled the number of people alive on our planet, reaching seven billion people at the end of last year. In the next 40 years we are expecting over two billion more people to be alive than today.

## Economies

At the same time, and as a direct consequence of this population growth, we are forecasting that our global economy will triple in size by 2050<sup>1</sup> and is set to have doubled to over \$130 trillion in just 20 years' time, in 2030<sup>2</sup>. Much of this growth is amongst the emerging economies (E7) of the world, including China, Brazil, India, Mexico and Russia. As a consequence, by 2019 the E7, emerging seven major

economies, will be a larger economic bloc than the G7 countries who have led the world economically and to a great extent, politically for the past 60 years. By 2050 China will have the largest economy with a GDP of over \$24 trillion whilst the United States' economy is expected to reach £22 trillion and India the third largest economy at \$8 trillion.

## Political authority

Apart from the economic influence that will shift from the US and Europe to Asia, the political authority will move to these fast growing emergent nations. Turkey and Indonesia are included in the E7 and have populations that are mainly Muslim. Equally, China and India are predominantly atheist and Hindu respectively. As political and economic power shift away from the mainly Judeo-Christian populated countries of North America and Europe towards Asia, new governance, based on different values and beliefs, will begin to impact how business and the world are run.



### Middle class

These shifts in populations, economies and politics are driving an expansion of the middle class. There's more economic activity in more countries than ever before, using increasingly scarce resources, creating wealth for the first time for billions of people. Over 70 million people are entering the middle class every year and most of them are from emerging economies.

### Cities

As a consequence 20 of the world largest 50 cities will be in Asia by 2025, up from only eight in 2007. In 2010 the urbanisation of the world reached 50 percent and it is expected that by 2030, six out of ten people will be city dwellers, which is double the number back in 1950. By 2050 it's forecast that 70 percent, of the then nine billion people, will live in cities.

### Infrastructure

All this concentration into our cities comes at a high price in terms of the infrastructure and resources that are required to sustain their populations. Over \$40 trillion is required to be spent in the next 40 years to provide the infrastructure to support our choices to live in cities. We will need to develop new, innovative measures to provide food, water, waste management and all the other materials and services required by an increasingly wealthy and demanding city dwelling population.

### Resources

China is expected to consume a third of all global energy used by 2035, much of which will need to be provided by renewable energy sources if we are to avoid the worst affects of global climate change. Already we've locked in a 1.4 degree temperature increase and can do nothing but mitigate its impact as the causes of that increase are already present. What we can do, and must do, is become dramatically more effective in managing how we use energy, recycle our waste and materials and

how we consume. Many cities will experience a boom in cleantech services as part of the rapidly expanding response to this problem.

### Food

The population of nine billion by 2050 will eat increasingly well and consume at the base calorific rate equal to 13 billion people today. We will therefore need to analyse our consumption of meat very carefully. 70 percent of the increase in our populations will be born in Muslim countries. Consequently we will increasingly have to consider how food, meat in particular, and other goods and services meet emerging Halal standards, ensuring that they will be acceptable to, what will be a third of the population by 2050.

### Technology

Technology has powered much of the convergence in the world's economies and provided the know-how. It has provided access to global markets for those moving from feudal and agricultural economies to the more valuable industrial, service and intellectual property economies. The internet has expanded to reach 2.1 billion people today and is expected to reach five billion people across the planet by 2020. The raw materials of today's technology are not inexhaustible and indium, used in liquid-crystal displays, and hafnium, a critical element for next-generation semiconductors, could be exhausted by 2017.

Technology is driving the conception of new business models and is set to continue its disruptive and enabling role in the coming decades. When once employees had access to the best technology at work, today it's more likely that their technology at home or in their hand is superior to their employers. Increasingly, companies are looking to 'outsource' personal technologies to their employees enabling them to use their own mobile technologies at work.



## Executive summary

### Control

To enable this, firms will need to start to let go of control across their networks and allow their staff to access their preferred communication tools. Most of these are hosted in the 'Cloud' over the internet. Renouncing control of content that travels across the company's intranet can lead to more satisfied, engaged and happier staff, as they stay in touch with friends and work colleagues alike, across their favourite social networks. Studies are showing that these same staff are then proving to be more productive than those prevented from accessing them. Recent Australian research showed employees to be nine percent more productive when allowed to access Facebook. Securing the company's data should be the objective, not preventing modern day communications.

### Collaboration

Social media has equipped every individual with the power to collaborate across the globe in the same way as the richest corporation. Companies are increasingly becoming networks of collaborating firms and individuals operating across national boundaries. Where once vertical integration, enabled by technology, allowed us to gain economies of scale to make us competitive, today we retain, at the core, only what is necessary, outsourcing and partnering with others to gain their capacity and capabilities for our organisations. Agility, creativity, innovation and collaboration are the watchwords for the successful company in the coming decades – which is no surprise given the amount of change we are being confronted by.

### Outsourcing

As we gain in confidence in being able to collaborate effectively with outside firms and individuals, we are letting go of functions and processes that were once considered essential to retain in-house, increasingly outsourcing them to others to manage for us. Innovation and creativity are two areas where we will invite others to help us more and more, through means such as Engineering R&D outsourcing or through crowdsourcing, where we invite many people to help us discover our next product or service offering.

### Online

The expansion of our online world means that much of the focus of the next decade will be on making sense of the mass of information and the social networks that it relates to.

The internet is estimated to have grown by 1.2 zettabytes last year. That's 1.2 million petabytes, and if that still doesn't make sense, that's more content than existed in every book in the world just ten years ago.

Peerindex and Klout are the latest online tools that are profiling individuals and organisations and scoring their authority, reach and following. We are seeing the emergence of online tools that seek to illuminate those that have real insight and knowledge that could be of use to us, maybe as contractors, employees, advisers or distributors. As a consequence, our messaging, its content, frequency and audience will become increasingly important to us, individually and as companies.





The amount the internet had grown last year



Increase in international assignments by 2020



Amount of basic public services that EU citizens can access via the 'Cloud'

## Workforce

The millennial generation believes that international assignments are important to their career development – employers agree. It's predicted that there will be an increase of 50 percent in international assignments by 2020. But, as we seek to align our company's behaviours with our Corporate Social Responsibility initiatives and climate change legislation, travel may be a frequent casualty. Increasingly we will use video, avatars and immersive technology to supplement our need to travel. As the working population across the European Union is set to fall by 68 million in the next 40 years we will have to be clear about what's automated, what functions require human interaction and how we facilitate those interactions.

## Work

Work itself is changing, with new jobs coming on-stream that didn't exist ten years ago, as a direct consequence of urbanisation, increasing life expectancy, new technologies, globalisation and climate change. To maintain our workforce we will increasingly hire women, the aged and disabled people and probably have three generations of employees in our firms for the first time in any numbers. The diversity of our workforce and the roles we will ask them to perform, in massively changing circumstances, will put even greater stress on them than they experience today. The direct costs related to stress at work are now estimated to be as high as four percent of EU GDP.

## Government

Due to massive public debt governments are recognising that they can no longer afford generous pensions and the European Union Commission has said that the average retirement age across the 27 member countries needs to rise from 60 today to 70 by 2060. Governments are rapidly turning to the 'Cloud' to service the needs of their citizens and today EU citizens can access 82 percent of basic public services online.

The working population will start shrinking from 2012 and unless a dramatic change in migration policy is forthcoming, companies will have to deal with the consequences of older workers and fewer workers in the labour pool in the EU. The EU is setting policies towards car-free cities in Europe by 2050. This could be a boom or bust strategy. On the one-hand it may lead to innovation and the rise of cleantech and on the other it may put off investment and inward migration of companies. We will see.

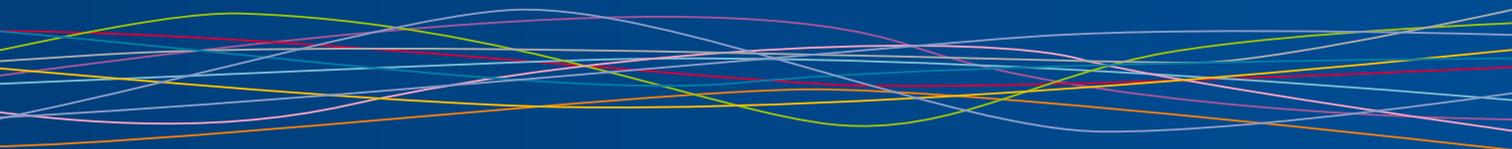
## Response

Drivers for transformation are legion. The game at hand is to understand what's happening and determine if it offers an opportunity worth embracing, or if it's a threat that needs mitigating. At all great points of change, whether it is economic, technological, global, environmental or population change; new markets, industry sectors and players emerge. This is not a time for the faint-hearted. There is very little opportunity or value in standing still and doing nothing. It is a time to engage with the change we will be encountering and ask for yourself, your family and friends and for your organisation – how can I best embrace it?





# Globalisation



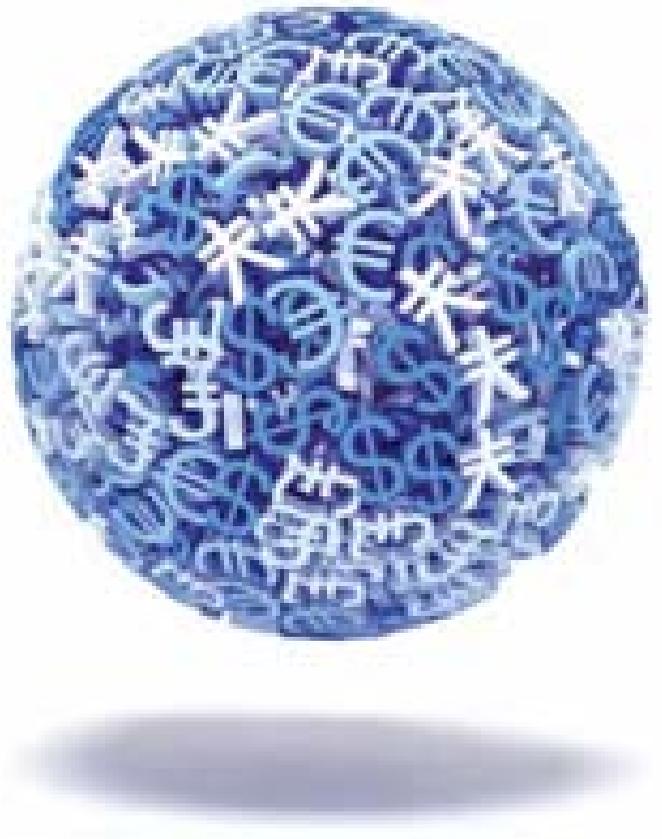
## Globalisation

'World economic output will triple by 2050. China at \$24.6 trillion and the US at \$22.3 trillion will dominate the global economy, with India at \$8.2 trillion far behind in third slot.'  
HSBC in January 2011<sup>3</sup>

'Convergent incomes and divergent growth – that is the economic story of our times. In short, today's divergent rates of growth between successful emerging economies and the high-income economies reflects the speed of the convergence of incomes between them<sup>4</sup>.'

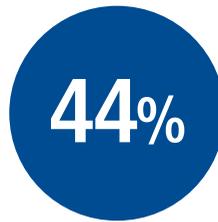
Martin Wolf, writing in the Financial Times, January 2011

The world economy grew threefold, to reach \$62 trillion today, in just 20 years<sup>5</sup>. It is forecast that it will triple again by 2050<sup>6</sup>, indeed it will have doubled to over \$130 trillion in just 20 years' time<sup>7</sup>.

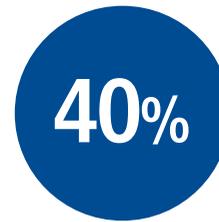




China's economic output by 2050



Projected E7 GDP growth by 2030



Percentage of the world's population achieving middle-class by the end of the decade

### The Emerging Seven economies overtake the Global Seven economies

The rapid convergence between the E7 (emerging seven economies of China, India, Brazil, Mexico, Indonesia, Russia and Turkey) and the G7 (global seven economies of United States, United Kingdom, France, Germany, Japan, Canada and Italy) has been accelerated by the global financial crisis. In 2007, total G7 gross domestic product (GDP, a country's total economic output) at Purchasing Power Parity (PPP, the purchasing value in the local economy) was still around 60 percent larger than total E7 GDP<sup>8</sup>, yet by the end of 2010, PriceWaterhouseCoopers (PWC, a global consulting firm) estimates the gap had shrunk to around only 35 percent. The catch-up process is set to continue over the next decade: by 2020 total E7 GDP could already be higher than total G7 GDP.

In the following decade, from 2020 to 2030, the process of overtaking is likely to be reinforced, with total E7 GDP projected to be around 44 percent higher by 2030. The gap would widen further beyond that, with the E7 almost twice as large as the G7 by 2050. The speed of convergence is important in more ways than one for the future of globalisation, and its speed is quite remarkable considering how long the initial divergence in the 19th century took between the 'West' and today's emerging economies. Issues of trade, protectionism, international governance and geo-politics, not to mention global culture will all be impacted by the rate of convergence.

World economic output will double by 2030 and triple by 2050.

E7 almost twice as large as the G7 by 2050.

### A new middle-class emerges

Technology has helped lower the boundaries and reduce isolationism, helping to democratise knowledge – a necessary precursor for convergence. As such, the comparative advantage of many western world countries has been reduced, whilst the emerging economies, with their generally higher populations, seek to benefit from the inflow of ideas and capital. McKinsey (a global management consulting firm) notes that 'more than 70 million people are crossing the threshold to the middle class each year, virtually all in emerging economies. By the end of the decade, roughly 40 percent of the world's population will have achieved middle-class status by global standards, up from less than 20 percent today<sup>9</sup>.'

### Economic power moves east

This not only augers well for fast moving consumer goods (FMCG, products that are sold quickly and at relatively low cost) majors in the western world, as Kraft, Nestlé and Procter and Gamble can testify, but also suggests we are at the beginning of a new shift in globalisation. Economic power is moving east, yet many of the world's major companies have remained headquartered in the U.S and other western nations.

In a January 2011 report, The Boston Consulting Group (BCG, a global management consulting firm) identifies 100 emerging global challengers, about half of which could qualify for inclusion in the Fortune Global 500 within the next five years<sup>10</sup>. Overall, the global challengers generated revenues of \$1.3 trillion in 2009. If these new challengers 'continue on their current growth path, they could collectively generate \$8 trillion in revenues by 2020 – an amount roughly equivalent to what the S&P 500 (Standard and Poors 500, a list of the leading 500 US companies by market capitalisation) companies generate today.'



## Globalisation

Intense competition seems likely, yet the potential for partnering and trade is also great – for example: in exchange for established market access, reverse innovation (where products and services tailor-made for emerging markets find a niche in western economies) could be generated.

The global challengers generated revenues of \$1.3 trillion in 2009... they could collectively generate \$8 trillion in revenues by 2020.

Unsurprisingly, China is the greatest contributor to the list of 100 global challengers, with 33 organisations, whilst India adds another 20. Whilst their contribution may be great, focusing solely on the Asian giants neglects other emerging world beating companies. Mexico with eight, has more than BRIC

member Russia (six), whilst South Africa, Thailand, Indonesia, the UAE, Chile and Turkey have a combined total equivalent to India, despite having around a third of the population. The greater story is that globalisation is undergoing a change in its nature and its speed, and opportunities are opening beyond the not inconsiderable headlines.

### Getting easier to do business with

That is not to say that there are some considerable obstacles to further global integration. Leaving aside political considerations that should continue to restrict freedom of movement (in a working sense globally), issues remain with governance. However, the World Bank's report 'Doing Business 2012,' found that governments of the 183 economies it surveyed had carried out 1 750 improvements since 2004 'making it easier to start and operate a business, strengthening transparency and property rights and improving the efficiency of commercial dispute resolution and bankruptcy procedures.' Against the backdrop of the global financial and economic crisis, policy makers around the world continue to reform business regulation at the level of the firm, in some areas at an even faster

pace than before. This general move towards easing regulation should help globalisation. The World Bank notes that one of the most striking trends was governments' increasing use of the Internet to reduce paperwork, a development that makes life easier for start-ups and helps governments capture taxes more efficiently. In Singapore, for example, almost everything

More than 20 of the world's top 50 cities ranked by GDP will be located in Asia by the year 2025, up from eight in 2007.

is online, while Mexico has made great strides in helping small businesses use software to file taxes with minimum hassle<sup>11</sup>. The UK ranks 7th globally in its ease of 'doing business,' with Germany 19th, France 29th, Spain 44th and India 132nd. As India and other economies witness a gradual lessening of red tape, their economies will become more competitive and

their companies ever more expansive. The northern European nations of Norway and Denmark outperform the rest of the European Union countries positioned at 5th and 6th rank for 'ease of doing business.'

### Top cities of the world

The location for this latest round of globalisation, although potentially benefitting London, Paris and other global centres, will take place primarily in Asian cities. More than 20 of the world's top 50 cities ranked by GDP will be located in Asia by the year 2025, up from eight in 2007. During that same time period, our research suggests, more than half of Europe's top 50 cities will drop off the list, as will three in North America. In this new landscape of urban economic power, Shanghai and Beijing will outrank Los Angeles and London, while Mumbai and Doha will surpass Munich and Denver<sup>12</sup>.





## IMPLICATIONS

- Economic opportunity is already shifting eastwards.
- Asian cities are set to be both consumer pacesetters and innovative hubs.
- Emerging 100 companies are set to drive major change in the commercial economic power map of the world.
- Significant business model changes may be needed to adapt to the new realities of globalisation.



# Economies



## Economies



Gross external debt (as percent of GDP)  
owed by Ireland



Gross external debt (as percent of GDP)  
owed by the United States



Amount of investment in emerging economies  
that is needed to tackle their infrastructure

Divergent economic growth rates amongst global economies, combined with high public debt in many western economies, are the

Slower growth seems almost inevitable for the heavily indebted nations.

major drivers shaping the future of global markets. Overleveraged consumers and firms struggled to survive their debts, while indebted governments enacted austerity measures and sought the aid of international organisations for bailouts in the face of sovereign defaults.

Deficit spending, government debt and private sector borrowing are the norm in most Western countries, but some nations are in considerably worse debt positions than others.

One way to get the big picture of the level of borrowing is through external debt. External debt is a measure of a total debt in a country that is owed to creditors outside that country; foreign liabilities, capital plus interest that the government, institutions and people within a nation's borders must eventually pay. In short, this number extends beyond simply government debt, but also debt owed by corporations and individuals. The table of most indebted countries, on this basis, is led by Ireland at a gross external debt (as percent of GDP) of 1 239 percent and external debt of \$478 087 for every citizen. Second is the UK at 451 percent of GDP, followed by Switzerland at 391 percent, the Netherlands at 367 percent, Belgium at 353 percent, Denmark at 383 percent, Hong Kong at 265 percent, Sweden 262 percent, France 254 percent, Norway 246 percent, Finland 244 percent, Austria 241 percent, Portugal 207 percent, Germany 183 percent, Greece 178 percent, Spain 169 percent, Australia 139 percent, Italy 136 percent, Hungary 110 percent and the United States in 20th position at 99 percent of their gross domestic product of \$15 trillion as external debt<sup>13</sup>. When viewed on this basis it is easy to see how hard it will be to clear the debt sufficiently at government, company and individual level to start to invest to create growth and prosperity for the future, let alone save for the economic rigours imposed by ageing populations and underfunded pension schemes.

## Debt

Whether or not economies can bear this debt burden will be key to their future standing. India is only predicted to have public debt equivalent to 52 percent of GDP in 2020. By 2016 the French public debt could have increased from 85.4 percent to 95.7 percent, Germany's remain steady at 81 percent and Italy's even fallen back from a massive 120 percent of GDP today to 113 percent, whilst Greece is expected to have continued to rise to 169 percent from 166 percent today<sup>14</sup>. The plan for Greece's public debt is to see it fall from 160 percent of GDP to 120 percent by 2020 which will require strong political will and the support of a frustrated and militant citizenship. All will nervously be watching Japan, where the figure could reach 246 percent by 2020 as a test of market patience.

Slower growth seems almost inevitable for the heavily indebted nations. Indeed, the OECD forecasts for European Union growth, issued in May 2012, for 2012 and 2013, predicts GDP growth of just 0.1 percent and 0.9 percent respectively. By comparison, the United States economy is expected to grow 2.4 percent in 2012 and 2.6 percent in 2013, a full six percent of growth ahead of the EU region in just two years. Even the floundering economy of Japan is expected to grow faster than the EU at two percent and 1.5 percent for the same period<sup>15</sup>. In a March 2012 financial forecast, Brazil's largest private bank foresaw the EU economy growing at just 1.1 percent through to 2020<sup>16</sup>. Much of their gloom centres on the region's persistent Eurozone difficulties but they also highlight the region's ageing population and issues relating to migration as a break on productivity, performance and growth. Essentially this forecast sees the EU falling behind the top two world economies of the United States and that of China at an alarming rate unless there is a change of policy.

## Investment

The United Nations Conference on Trade and Development (UNCTAD, 2012)<sup>17</sup> notes that the effects of the recession are receding in so far as companies are now planning to boost international investment, focusing on emerging economies in particular. Global FDI inflows rose in 2011 by 17 percent compared with 2010, despite the economic and financial crisis. Looking forward, UNCTAD estimates that FDI flows will rise moderately in 2012, to around US\$1.6 trillion. However, the downward quarterly trend in FDI projects over the final quarter of 2011 indicates that the risks and uncertainties for further FDI growth in 2012 remain in place.

China, India and Brazil top the list of target countries for foreign direct investment (FDI) until the end of 2012. The highest total on record was \$2.1 trillion in 2007, but this fell 16 percent in 2008, then a further 37 percent to \$1.11 trillion in 2009 as the crisis left companies slashing spending.

Given the crucial need for infrastructure investment in India (between \$1.5 and \$2 trillion<sup>18</sup>) and other emerging economies, they would appear better placed than the US to absorb high level flows of international capital, although housing bubbles and other afflictions that affected the US and thus global economy, cannot be ruled out. The need for capital does not necessarily ensure its correct and productive allocation. Indeed whilst there are many barriers to India's growth, the twin dynamics of an ageing population and heavy public indebtedness ensure many western nations do not have the potential to rival the long term growth that is being, and should continue to be, seen in India.

## Technology and outsourcing

One of the key drivers in the global adjustment that we are witnessing is the spread of technology. In an open global system, barriers for education and technology are considerably lower, thereby reducing the previous comparative advantage held by Europe and the U.S. Economic isolationism is now pretty much confined to a few small outposts around

One of the key drivers in the global adjustment that we are witnessing is the spread of technology.

the world. Outsourcing of manufacturing has been facilitated by global links and diffusion of technology, and there would appear to be very little, perhaps even fewer barriers than for manufacturing, stopping the gradual but inexorable outsourcing of increasing numbers of knowledge-based jobs.

However, to describe this process of technological transfer as zero-sum is to miss the dual edged nature of technological advancement, as industries with the potential to revitalise economies appear.



## Economies

### Biotechnology

Industrial biotechnology, worth some \$170 billion in 2010 is set to grow to \$660 billion by 2020<sup>19</sup>. The biopharmaceutical market could also be worth \$392 billion by 2020, up from less than \$100 billion today. Another biotechnology industry, agricultural biotechnology which deals with genetically modified (GM) crops amongst other things, is expected to grow from around \$8 billion in 2010 to \$50 billion by 2025<sup>20</sup>.

Various forms of biotechnology could form a trillion dollar market by 2020.

Advancements in nanotechnology have to date, often proved to materialise at a slower rate than the often unrealised stellar pronouncements of market growth. Nevertheless, with nano-featured products filtering through to the consumer and governments investing significant amounts in R&D, predictions of a trillion plus dollar market (up to \$2.4 trillion) by 2015 appear to have more credence than those made in the late 90's<sup>21</sup>.

### Europe 2020

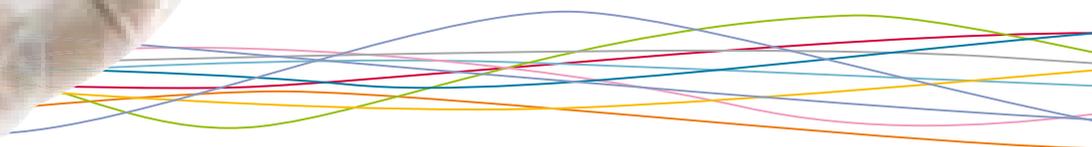
Investment in research, development, education and skills is one of the European Union's central policy areas. These key areas are essential to economic growth and to the development of the knowledge-based economy. The Europe 2020 strategy sets out a vision of Europe's social market economy for the 21st century. It aims to turn the EU into a smart, sustainable and inclusive economy that delivers high levels of employment, productivity and social cohesion. Innovation is a motor for economic progress: it is therefore a key element of Europe 2020.

Europe 2020 puts forward three priorities that go together and reinforce each other:

- Smart growth: developing an economy based on knowledge and innovation;
- Sustainable growth: promoting a more resource efficient, greener and more competitive economy;
- Inclusive growth: fostering a high-employment economy, delivering social and geographical cohesion<sup>22</sup>.

### Smart cities

The Smart City Market, comprised of Smart Grids, Green Buildings (low energy consumption and high recycling of waste) and integrated low carbon transportation options is also forecast to quadruple in size by 2020 to become a \$2.1 trillion market<sup>23</sup>, whilst green environmental products and services is projected to hit \$2.74 trillion according to the UN<sup>24</sup>.



### Emerging high growth industries

Healthcare accompanied by welfare services and care technology, financial services, leisure, media and entertainment including the merging of TV, Film, Video, gaming and communications, energy generation, management and reduction will be another core field of growth along with biotechnology and other life sciences including the need to encourage the take-up of genetically modified crops for a variety of uses across the globe. Also set to grow once we achieve a semblance of order in our economies will be the service sectors of IT, law and accounting. The UK Commission for Employment and Skills (UKCES), for example, predicts an 883 percent rise in business services jobs to 2017, representing 33 percent of all new jobs created in the UK over this time period. Of course highly automated and skilled industrial manufacturing will also take a key place in the successful economies across Europe in the coming years.

Green environmental products and services are projected to hit \$2.74 trillion.

### Cleantech

An unmistakable trend is the developing interest from industrial investors in the Nordic countries, Germany, Austria, Japan and the United States, which in 2010 accounted for four out of five investments.

On the acquisition side, the trend is even more obvious. Large industrial companies from major foreign markets are now the typical buyer of Nordic cleantech companies. It is clear that Nordic companies are seen as valuable assets to increase the value of their cleantech offer<sup>25</sup>.

The German environmental industry has easily surpassed all growth forecasts. By 2020, it will be the country's foremost industry, accounting for 14 percent of GDP.

German specialisations are already developing around some advanced technologies. Germany's Federal Ministry of the Environment<sup>26</sup> notes that 'the German environmental industry has easily surpassed all growth forecasts. By 2020, it will be the country's foremost industry, accounting for 14 percent of GDP.' German players are already positioned among the world's technological front-runners, for example with regards to photovoltaics (light source direct energy generation). Revenues from environmental industries will more than double from the 2009 figure to €3 100 billion by 2020. →



## Economies

### Chemicals

The global chemicals market is set to reach a size of \$5.3 trillion by 2020<sup>27</sup>, yet KPMG (A global management services firm) (2010) notes that 'new global capacity being developed in the coming years will render 14 of 43 chemical crackers in Europe uneconomic by 2015.' The closure of these plants would correspond to the loss of 26 percent of total cracker capacity in Europe. At the same time, Middle Eastern chemical producers continue to seek expansion along the value chain into higher value-add solutions. Their Chinese counterparts are attempting to fulfil a government directive to make the country self-sufficient in chemicals. These Middle Eastern and Chinese entities are often cash-rich and backed by government support. High-tech opportunities for European organisations lay in the Far East, particularly in China, as this recent article in the ChinaDaily Europe illustrates. French companies are being encouraged to invest in China's high-end manufacturing industry, high-technology companies and the modern service sector as the nation pursues a more innovative, energy-efficient economic model. France should 'try to expand exports of energy-conservation and environmental protection products, as well as aviation and aerospace technology,' Bai Lichen, vice-chairman of the National Committee of the Chinese People's Political Consultative Conference, said in a keynote speech at the 18th China-France Economic Forum in Beijing in March 2012. Under its 12th Five-Year Plan (2011-15), China aims to be more environmentally friendly by developing the renewable energy and new energy industries. New guidelines encourage foreign companies to invest in high-end manufacturing, new energy, the service sector and strategic emerging industries.

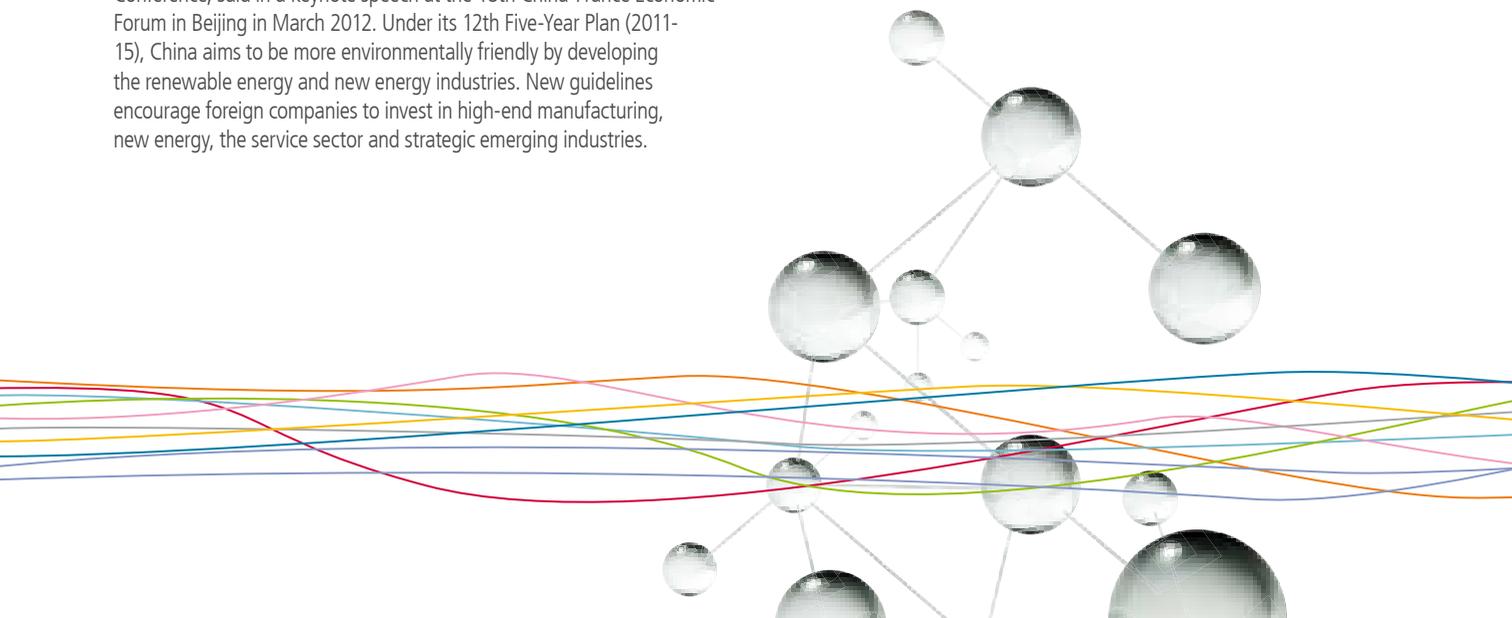
Despite rapid economic growth, China faces energy-related problems, including 'comparatively low energy reserves per capita worldwide, environmental pollution and energy safety, so the nation intends to upgrade its energy technology and industry,' said Feng Fei, Director of the industry department at the State Council's Development Research Centre.

'China's policy on saving energy and the environment translates into huge benefits for French companies,' Feng said<sup>28</sup>.

From 2011 to 2015, China's spending on energy conservation and environmental protection will reach an estimated 3 trillion yuan (\$475.8 billion). The nation will also 'top the world' in spending on renewable energy development, reported Bai.

'These numbers mean profits for the world, including France,' said Bai.

Clearly this is only one example of the exhortations of China for high tech firms from the developed nations to visit. They need the developed nations' expertise and capabilities to help them meet their goals, the door is open and we need to be bold and take our opportunities.





## IMPLICATIONS

- Foreign direct investment is starting to flow again – but to China, India and Brazil, rather than to the traditional destination of the USA.
- Debt issues in the ‘west’ will suppress consumer and government spending.
- New industries will grow around the environmental, bio, nano, and other technologies and will become fundamental to growth in the European Union.
- The ‘production with services’ business model is better suited to the high cost economies of the EU.



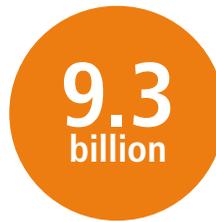
# Population



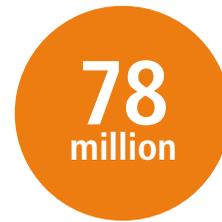
## Population



Global population  
in 1960



Global population  
by 2050



On average, the amount of people added  
to the global population every year

In late 2011, according to the United Nations (U.N.) Population Reference Bureau, humanity reached a new demographic milestone with the birth of the 7th billion living person<sup>29</sup>. The global population is set to continue to grow and reach 9.3 billion people by 2050<sup>30</sup>. In 1960 the global population stood at three billion. This equates to the addition, on average, of 78 million people per year between 1960 and 2011 – in effect adding the modern day population of Turkey to the planet, every year.

A new demographic milestone with the birth of the 7th billion living person. In 1960 the global population stood at three billion.

### Population growth and decline in Europe

The picture on a regional level is somewhat more nuanced. On 1 January 2011, the population of the European Union's 27 member states (EU27) was estimated at 502.5 million, compared with 501.1 million a year earlier<sup>31</sup>.

The UK population is projected to grow at its fastest rate since the post-war 'baby-boom', increasing from 61.4 million now to 70.6 million in 2030.

Even within Europe there are countries with outright declines in overall population, such as Germany, which declined slightly from 81.8 million people in 2010 to 81.75 million in 2011, offset by countries experiencing higher relative growth such as the UK. The population of the United Kingdom grew by 400 000 people from 2010 to 2011 reaching 62.4 million, with

45 percent of year on year growth between 2008 and 2009 coming from migration. The UK population is projected to grow at its fastest rate since the post-war 'baby-boom', increasing to 70.6 million in 2030 and projected to grow by 1 100 people a day over the next decade (2010 to 2020)<sup>32</sup>. According to the projections, growth will be driven in part through natural change – more people being born than dying – and also through net inward migration – more people arriving in the UK than leaving<sup>33</sup>.

Much of the UK's population growth has occurred in its cities. The urban population of the UK rose from 50.3 million in 1990 to 53.5 million in 2005. This figure is expected to increase over every five-year period up until 2030, at which point it is expected to reach 59.6 million<sup>34</sup>.

The population of Spain grew by just 0.4 percent to 47.15 million people between 2009 and 2010 and grew by only 22 497 inhabitants in 2011. The population of France grew by just 305 000 between 2009 and 2010 taking their total population to 65 million people. Much of this growth comes from net migration, even though immigration is slowing rapidly and longer lifespans for their citizens. In recent decades Europeans have generally been having fewer children, and this can partly explain the slowdown in the EU27's population growth. A total fertility rate of around 2.1 live births per woman is considered to be the replacement level, in other words, the average number of live births per woman required to keep the population size constant if there were no inward or outward migration is 2.1.

The total fertility rate in the EU27 declined to a level well below this replacement level in recent decades. The lowest total fertility rate of 1.45 live births per woman was registered in the EU27 in 2002. A slight recovery in the fertility rate was subsequently observed in most of the Member States, such that the EU27 average had increased to 1.59 live births per woman by 2009.

The slight increase in the total fertility rate observed in recent years may, in part, be attributed to a catching-up process following a general pattern of postponing the decision to have children. When women give birth later in life, the total fertility rate tends to decrease at first, before a subsequent recovery<sup>35</sup>.

### Ageing populations

The impact of demographic ageing within the EU is likely to be of major significance in the coming decades. Consistently low birth rates and higher life expectancy will transform the shape of the EU27's age pyramid, probably the most important change will be the marked transition towards a much older population structure and this is already becoming apparent in several Member States. As a result, the proportion of people of working age in the EU27 is shrinking while the relative number of those retired is increasing. The share of older people in the total population will increase significantly in the coming decades, as a greater proportion of the post-war baby-boom generation reaches retirement. This will, in turn, lead to an increased burden on those of working age to support the social expenditure required by the ageing population for a range of related services<sup>36</sup>.

Profound in its implications for pension schemes, taxation, business talent, economic competitiveness not to mention health and service provision, ageing will affect almost every global economy in the coming years.

According to the convergence scenario of EUROPOP2010, the EU27's population is projected to increase to 525 million by 2035, peaking at 526 million around 2040, and thereafter gradually declining to 517 million by 2060. During the same period, the median age of the EU27's population is projected to rise to 47.6 years. The population of working age is expected to decline steadily, while older persons will account for an increasing share of the total population – those aged 65 years or over will account for 29.5 percent of the EU27's population by 2060 (17.4 percent in 2010).

Another aspect of population ageing is the progressive ageing of the older population itself, as the relative importance of the oldest people is growing at a faster pace than any other age segment of the EU's population. The share of those aged 80 years or above in the EU27's population is projected to almost triple between 2010 and 2060<sup>37</sup>.

The over 65 years of age population in France has increased 3.5 percent in just 20 years and is set to increase. In the UK the ONS suggests the oldest age group is likely to grow the most quickly with the number of Britons over 85 set to more than double over the next 25 years from 1.3 million in 2008 to 3.3 million by 2033. The numbers of centenarians is set to rise from 11 000 to 80 000 by 2033<sup>38</sup>.

Ageing is also far from being confined to the eldest of age groups. As of 2010 there were 10 million people in the UK over 65 years old. The latest projections are for 5.5 million more elderly people in 20 years' time and the number will have nearly doubled to around 19 million by 2050<sup>39</sup>. However, the UK looks set for somewhat of a demographic dividend compared to some of its European neighbours. →



## Population

### Implications of ageing European populations

Due to ageing and low fertility, by 2050, in the unlikely absence of immigration, and at constant labour force participation, the European Union (EU) labour force would decline by around 68 million workers<sup>40</sup>.

By 2050, the European Union labour force would decline by around 68 million workers.

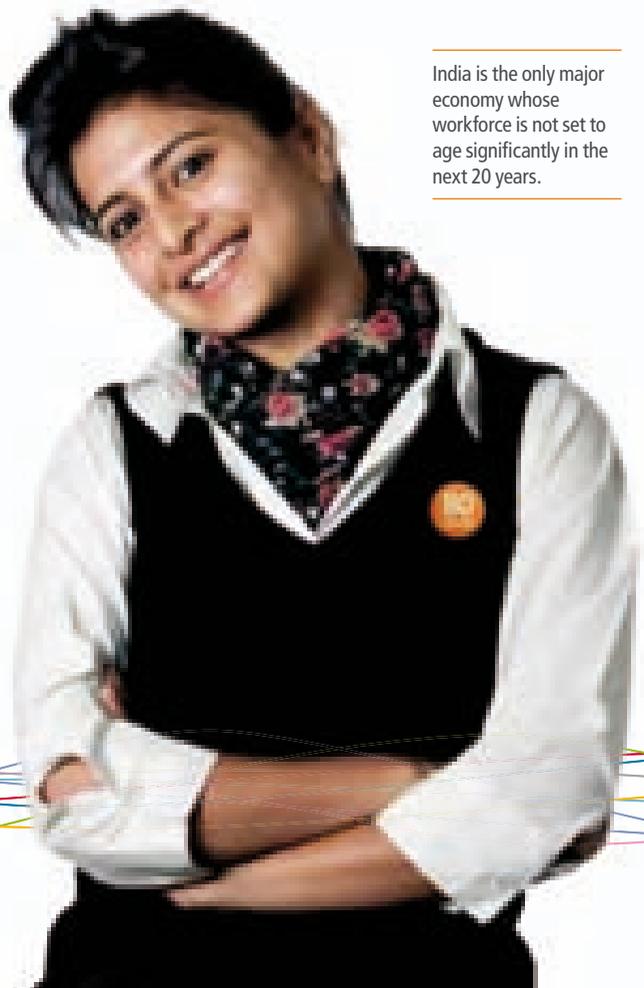
'The fiscal impact of ageing is projected to be substantial in almost all member states,' says an EC report. It predicts that spending on pensions, healthcare and long-term care will increase by 4.75 percent of GDP by 2060 in the EU as a whole and by five percent in the Eurozone (the 17 EU member states who

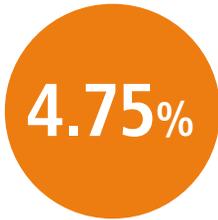
share a common currency in the euro). The European Commission predicts that 'annual GDP growth rate' will 'decline significantly in the future,' with a smaller working age population acting as a 'drag on growth and on per capita income'<sup>41</sup>. The nature of European ageing will ensure an unprecedented rise in diseases of old age, such as dementia – which is set to increase considerably in incidence from about 10 million today to about 14 million people in 2030. The forecasted cost for the EU of such a process is over €250 billion<sup>42</sup>. The World Economic Forum has noted that when populations fall, 'productivity must increase to balance the equation'<sup>43</sup>.

### Youthful India

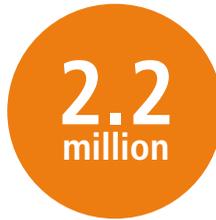
India, meanwhile, is the only major economy whose workforce is not set to age significantly in the next twenty years. That is to say, that given the extremely youthful population, 'India finds itself with a potentially higher share of workers as compared with dependents. If working-age people can be productively employed, India's economic growth stands to accelerate'<sup>44</sup>.

India is the only major economy whose workforce is not set to age significantly in the next 20 years.





Increase in spending for pensions, healthcare and long-term care by 2060



Amount of people predicted to migrate annually from developing to developed countries



France's average life expectancy by 2055

### Migration

Whilst population growth is more smoothly forecast than say economic growth, being as it is slower to respond to external events, there are a couple of wild cards that could affect future population growth. One concerns political decisions regarding the flow of people. The other, sometimes related factor, is that of migration. In 2005 the UN predicted that over 2.2 million people will migrate annually from developing to developed countries over the next 45 years<sup>45</sup>. Although large, this figure is dwarfed by the potential impact of climate change. A number of non-governmental organisations (NGOs) have predicted as many as one billion people could have been forced to relocate by 2050 due to the effects of climate change, although numerous studies suggest local migration a more likely response than international movement as a result<sup>46</sup>.

The foreign born population of OECD countries in 2009 accounted for 14 percent of the total population. This is a 13 percent increase relative to 2006 and a 37 percent increase over the past decade. In 20 out of 34 OECD countries, immigrants exceeded ten percent of total population. Countries with historically high immigration, such as Germany and the Netherlands (with immigrant populations of 13 percent and 11 percent respectively), were overtaken by the new migration countries of Ireland and Spain. Since that time the economic crisis has caused a number of migrants to return home and countries have raised immigration barriers to reduce the inflow of migrants to their countries<sup>47</sup>.

According to the United Nations' projections, the French population will total the same as Germany's by 2055. This is based on the assumption of a continuing rise in fertility rates in France and Germany (reaching in 2055 an average 1.92 children per woman in Germany and 2.06 children per woman in France), that life expectancy will continue to rise (to reach 85.5 years in Germany, and 86.5 years in France) and that immigration will represent a net influx of 1 in 1 000 people<sup>48</sup>.

The European Union produces more science PhDs per capita than the US, but it ends up with fewer researchers. The EU trains more scientists, but does not keep them. For the EU to achieve its target of three percent of GDP to be invested in research, it would need some 700 000 extra researchers. But, in reality, the EU suffers a net loss of graduates to the rest of the world. It loses some of its brightest to the US and the return rates are actually falling<sup>49</sup>.

The EU's Reflection Group, noting the potential loss of 68 million workers in the coming decades suggests that 'since not all immigrants become economically active, a net gain of some 100 million people would eventually be needed to fill the gap. Realistically such a large net intake over the next 40 years is neither likely nor necessary.'



## Population

### Purchasing power

The economic driver, a strong factor no doubt in much migration, will undergo drastic change in the period to 2020. From 2011 to 2020, per capita GDP growth in the EU region will average around one percent, whilst Indian growth per head will average 5.8 percent (despite an even higher rate of GDP growth). On an individual level this still leaves a sizeable gap in earning power, even at purchasing power parity levels. Indeed at purchasing power parity levels (US=100) the UK was 81 percent in 2009, whilst India equated to a score of seven percent. Despite economic growth lifting India past Britain, Indian purchasing power will remain low, at 15 percent.





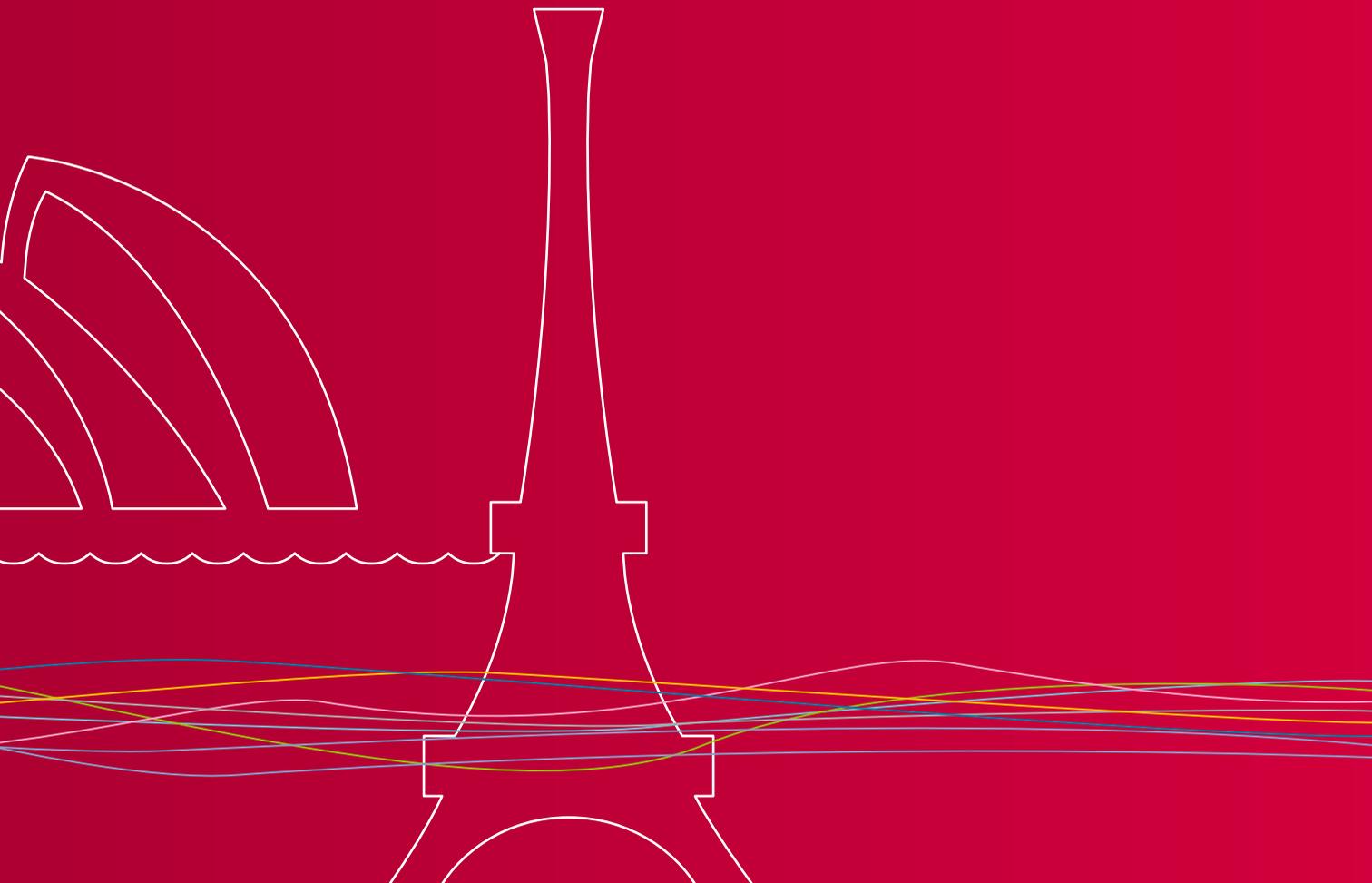
## IMPLICATIONS

- Mass economic and climate related migration can be expected.
- Consumers and employees are becoming older and more ethnically diverse in many European markets.
- Increasing productivity in ageing markets is essential if their economies are to avoid protracted difficulties.
- Losing the smartest talent to more attractive economies will hamper R&D and innovation.





# Urbanisation



## Urbanisation

Half of the world's total population already lives in urban areas. By 2030, 80 percent of Europeans are expected to live in cities. This is why sustainable urban development is acquiring a crucial dimension in the debate over future European policies.

'Historically cities have always been innovation centres, but it is especially from the typical medium-sized European city that innovation starts. Now even the Chinese have discovered that small is beautiful, or better, middle-sized is beautiful. They have found that cities of 500 000 to 600 000 residents are much more sustainable, and they are building medium-sized urban areas to avoid their cities turning into megalopoli,' says President of the Committee of Regions Mercedes Bresso at the 5th European Summit of Regions and Cities, in Copenhagen in March 2012. Beautiful, green, smart and inclusive, colourful cities, where people want to live, and can thrive. That is the objective<sup>50</sup>.

London is Europe's largest city and its Mayor Boris Johnson says: 'The future of the world lies in cities. Cities are where people live longer, have better education outcomes, are more productive,' adding that cities are also where people emit less polluting carbon dioxide per person<sup>51</sup>.

### Infrastructure

Globally, by 2030, six out of ten people will live in cities. This will result in a greater demand for power, water and transportation services<sup>52</sup>.

The extent of which is quite staggering; the Organisation for Economic Co-operation and Development (OECD) estimates that more than \$40 trillion could be spent worldwide on infrastructure projects before 2030<sup>53</sup>. Europe, largely in the form of renovation, stands to invest some \$9.5 trillion with Asia set to invest a collective \$15.89 trillion<sup>54</sup>.

### Urbanisation

In 1900, around 14 percent of the world's population lived in cities, by 1950 this had risen to 30 percent and today is 50 percent. Currently, there are more than 400 cities with a population over a million, 19 of which have over ten million inhabitants<sup>55</sup>. This remarkable growth has created vast infrastructure investment needs and this seems set to continue as experts predict that 70 percent of global populations will be urban by 2050.

Despite seeming continuity of the trend, the drivers underpinning it reveal a sea of change underway. The rise of urbanism will continue to have profound impacts on business, national economies and the environment, but the location of such urbanism is decidedly shifting. Emerging economies are set for the largest urban growth, both in terms of population and GDP. India and China will account for more than 62 percent of Asian urban population growth and 40 percent of global urban population growth from 2005 to 2025<sup>56</sup>. India alone is set to add 215 million people to its cities, whose populations will account for 38 percent of the Asian urban total of 2.5 billion in 2025. It took nearly 40 years (from 1971 to 2008) for India's urban population to rise by nearly 230 million; it will take only half that time to add the next 250 million. The speed of urbanisation is troubling in terms of town planning yet confers massive economic potential – McKinsey explains that a \$1.1 trillion capital investment in India's cities is necessary to meet projected demand for urban services. To put that figure into context, the Australian economy, largely unaffected by the global recession had an estimated GDP of \$1.5 trillion in 2011.

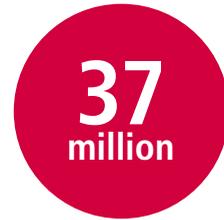




Percentage of people living in cities in 1900



Percentage of people expected to be living in cities by 2050



Tokyo's population by 2020

The potential for business goes far beyond infrastructure investment however. In India, urban per capita GDP is projected to grow at a rate of six percent a year from 2005 to 2025, while China will see growth of 7.3 percent. In an April 2012 report published by Credit Suisse they state that typically, as the share of a country's urban population rises by five percentage points, there is an associated gain in per capita economic activity of ten percent<sup>57</sup>.

The number of urban households with true discretionary-spending power in India could increase sevenfold, to 89 million households, by 2025.

The number of urban households with true discretionary-spending power in India could increase sevenfold, to 89 million households, by 2025<sup>58</sup>. The pace

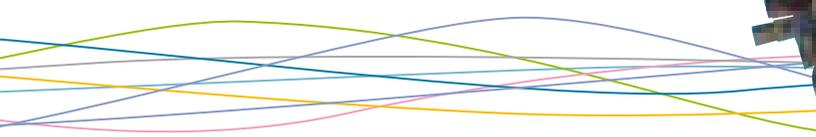
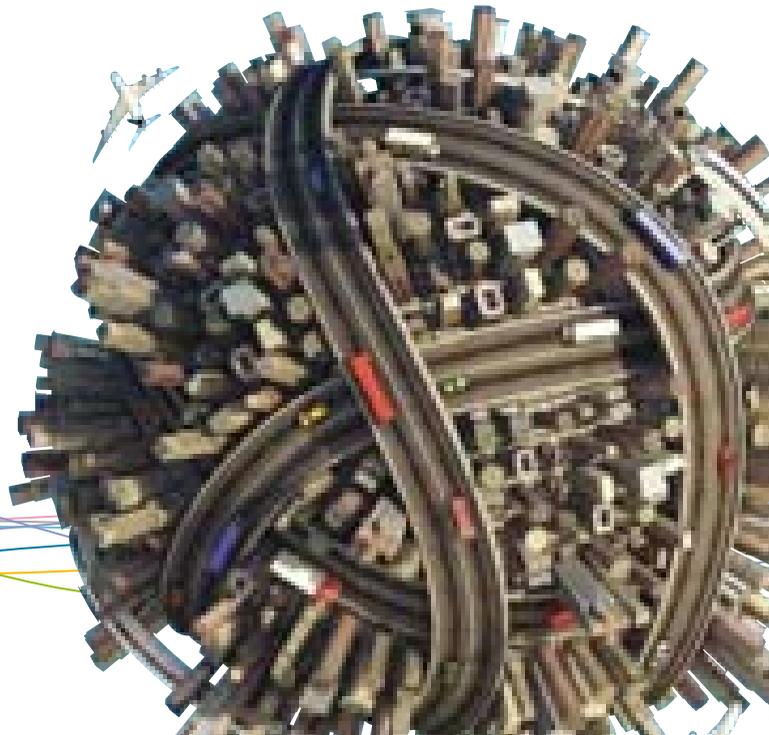
of such urbanisation in China and India, combined with the rate of GDP increase in the world's two most populous nations has never been seen before and will certainly reshape and give rise to new forms of business, innovation as well as global power structures.

Consider for example, that in 2007, half of global GDP came from 380 cities in developed regions, with more than 20 percent of global GDP coming from 190 North American cities alone. The 220 largest cities in developing regions contributed another ten percent<sup>59</sup>. By 2025, one-third of these developed market cities will no longer make the top 600 cities; indeed, 136 new cities are expected to enter the top 600, all of them from the developing world and overwhelmingly — 100 new cities — from China. Not a single one of the forecast 25 fastest growing cities in the world, by population, are in developed countries. Kinshasa, the capital of the Democratic Republic of Congo, is set to grow the fastest from 2015 to 2020 at an additional 424 000 people per annum<sup>60</sup>.

Amongst the top two hundred cities in the world, Shanghai is the fastest-growing and Athens, Lisbon, and Dublin, the capitals of the three most endangered nations in Europe's sovereign debt crisis, made up the bottom three<sup>61</sup>.

In terms of total population, the largest city by 2020 is likely to be Tokyo with 37 million people, followed by New Delhi with 26 million then Mumbai, 24 million followed by Shanghai with 19 million and Karachi with 17 million. In the face of climate change, Asia-Pacific nations will need to move to greener, more resilient, lower-emission options that not only sustain the environment but also offer opportunities to the poor. Asia's fast-growing cities must lead the climate change battle as 40 percent of people live there<sup>62</sup>.

Cities are also likely to be worst affected by climate change, as witnessed during the devastating 2005 floods in Mumbai, Jakarta (2007), Brisbane (2010-11) and Bangkok (2011).



## Urbanisation

### European urbanisation

Europe is the only continent with cities growing at less than one percent annually, which in turn raises questions about the future of economic growth in the continent. Without the prospect of suddenly leaping fertility rates, the prospects for further large scale urbanisation in Europe look slim.

The announcement of a shift to car-free urban living and majorly reduced CO<sub>2</sub> emissions in 500 EU cities could be a move towards a new economy

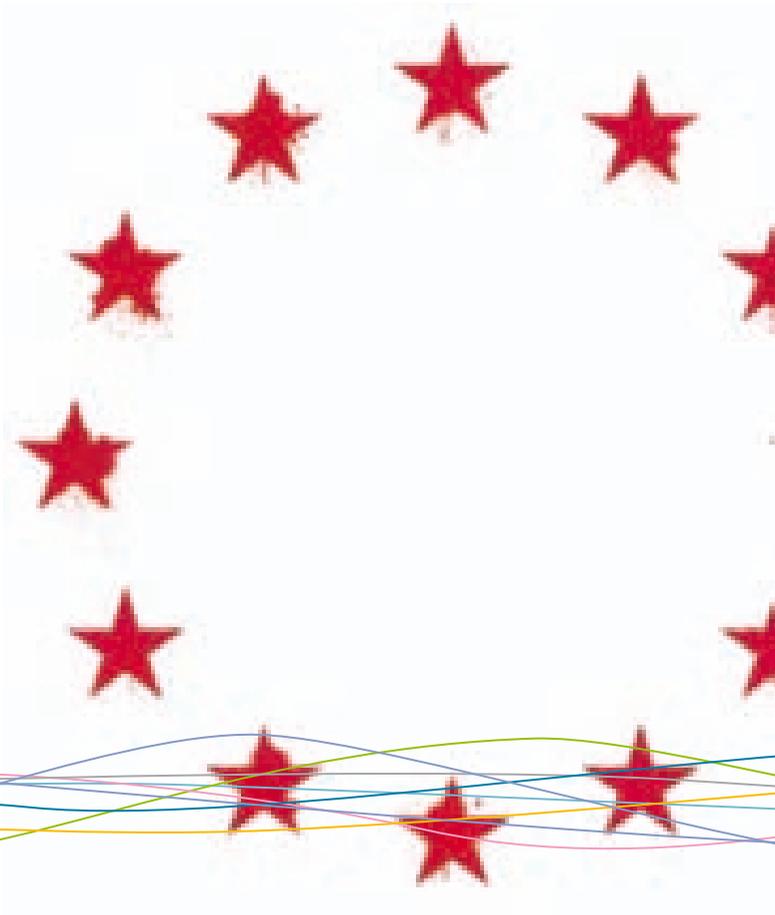
As of 2010 London was the only European city among the world's largest 20 metropolitan areas.

not dependent on fossil fuels, but might also be interpreted as a growth inhibiting policy further complicating economic growth. However, fDi Magazine, in its Cities of the Future 2011 report for Europe notes that London and Paris are first and second place with regards to future outlook

(comprising business friendliness, human resources, economic potential, infrastructure and a number of other criteria). There are also four German cities in the top 20.

Urbanisation in Europe cannot and will not, match the rate and rapidity of emerging economies. The urban population of the UK rose from 50.3 million in 1990 to 53.5 million in 2005. This figure is expected to increase over every five-year period up until 2030 at which point it is expected to reach 59.6 million<sup>63</sup>. Whilst the UK population is forecast to grow by 1 100 people a day over the next decade (to 2020)<sup>64</sup>, it will not be enough to maintain London's position amongst the top 20 global cities in population terms.

As of 2010, London was the only European city among the world's largest 20 metropolitan areas<sup>65</sup>. Paris is 22nd. Among the top 25 cities, they are two of the three slowest-growing areas. Europe's main metropolitan areas grew just 28 percent between 1965 and 2010, a period during which the global growth average in urban areas has been 135 percent.



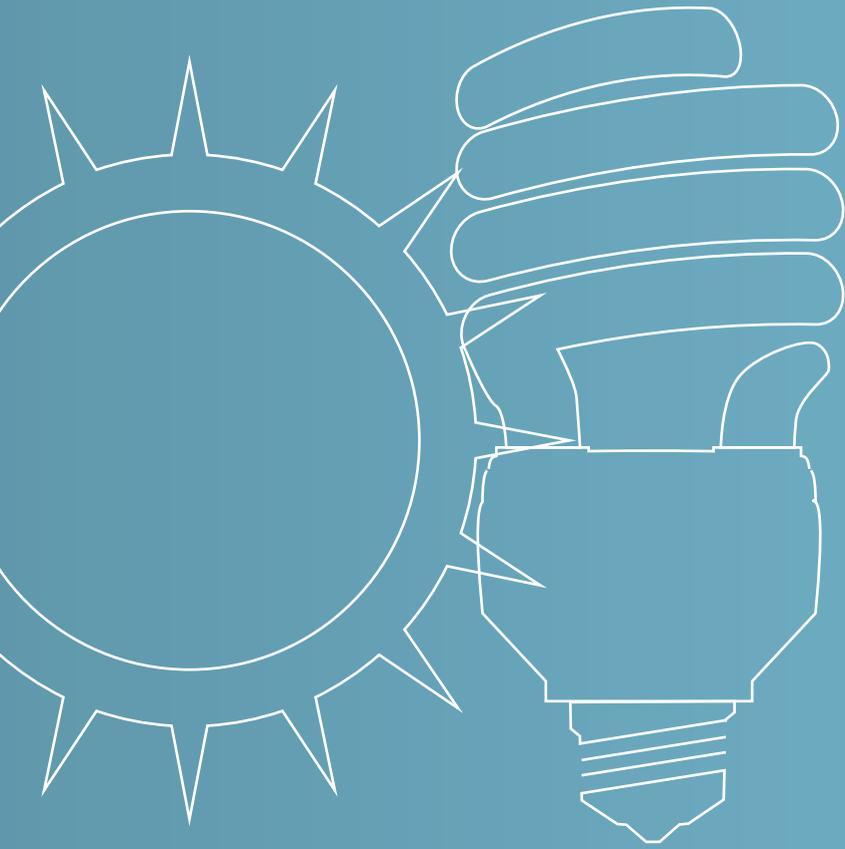


## IMPLICATIONS

- Huge infrastructure investment is needed, but governments may struggle to fund them. As a result new business and funding models will emerge.
- The future of the global economy lies in Asian cities. European city growth is forecast to be low.
- CO<sub>2</sub> emission reduction policies could be an inhibitor to European cities' economic growth.
- Cities have more in common with each other across the world than they have with other towns and villages in their own countries.



# Energy



## Energy

Global economic growth, prosperity and rising populations will push up energy needs over the coming decades and as a consequence, governments are introducing measures to drive investment in efficient and low-carbon technologies. The Fukushima nuclear accident, turmoil in parts of the Middle East and North Africa and a sharp rebound in energy demand in 2010 which pushed CO<sub>2</sub> emissions to a record high, highlight the urgency and the scale of the challenge.

The International Energy Agency's (IEA) 'World Energy Outlook', published in November 2011, indicates that primary energy demand will increase by one-third between 2010 and 2035, with 90 percent of the growth in non-OECD economies, according to their central New Policies Scenario.

### China and India energy

China has consolidated its position as the world's largest energy consumer, consuming nearly 70 percent more energy than the United States by 2035, even though, by then, per capita demand in China is still less than half the level in the United States.

Two nations that were among the least affected by the global recession were China and India, and they continue to lead the world's economic growth and energy demand growth. Since 1990, energy consumption as a share of total world energy use has increased significantly in both countries, and together they accounted for about ten percent of the world's total energy consumption in 1990 and 20 percent in 2007.

Strong economic growth in both countries continues over the next 20 years, with their combined energy use more than doubling and accounting for 30 percent of total world energy consumption in 2035.

China and India will consume a third of global energy by 2035.

Everywhere, we see energy being used more efficiently and energy supplies continuing to diversify as new technologies and sources emerge. Key findings of the 2012 Exxonmobil Energy Outlook include:

- Global energy demand will be about 30 percent higher in 2040 compared to 2010.
- Energy demand growth will slow as economies mature, efficiency gains accelerate and population growth moderates.
- In the countries belonging to the Organisation for Economic Cooperation and Development (OECD) we see energy use remaining essentially flat. Non OECD energy demand will grow by close to 60 percent.
- By 2040, electricity generation will account for more than 40 percent of global energy consumption.
- In 2040 oil will remain the most widely used fuel, but natural gas will grow fast enough to overtake coal for the number-two position.
- For both oil and natural gas, an increasing share of global supply will come from unconventional sources, such as those from shale formations. Demand for natural gas will rise by more than 60 percent through to 2040.
- Demand for coal will peak and begin a gradual decline.
- Gains in efficiency through energy-saving practices and technologies will temper demand growth and curb emissions.
- Global energy-related carbon dioxide (CO<sub>2</sub>) emissions will grow slowly, then level off around 2030<sup>66</sup>.



### Access to energy

Somewhat paradoxically a large minority of the global population still doesn't have access to electricity. It would cost a comparatively small \$36 billion per year to enable the world's one billion energy-starved people to access energy supplies at home by 2030, notes IEA. Some 1.2 billion people, equivalent to China's population, will still not have electricity by 2030 if global governments made no change to existing policies, down from 1.4 billion currently.

1.2 billion people, equivalent to China's population, will still not have electricity by 2030.

### Fossil vs renewable energy

The share of fossil fuels in global primary energy consumption will fall from around 81 percent today to 75 percent in 2035. Renewables increase from 13 percent of the mix of fuels today to 18 percent in 2035. The growth in renewables is underpinned by subsidies that will rise from \$66 billion in 2010 to \$250 billion in 2035, support that in some cases cannot be taken for granted in this age of fiscal austerity. By contrast, subsidies for fossil fuels amounted to \$409 billion in 2010<sup>67</sup>.

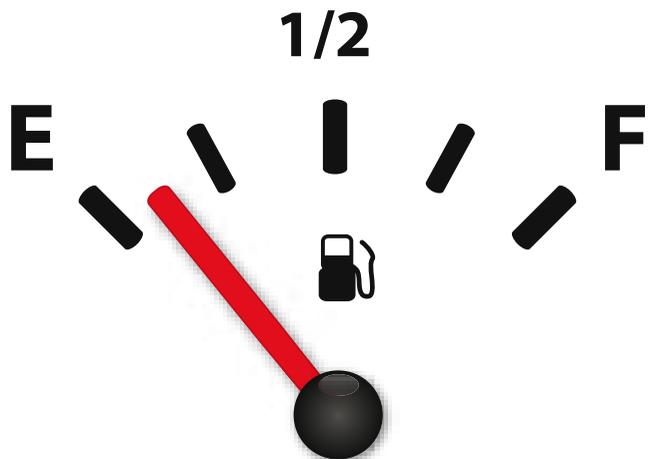
Short-term pressures on oil markets are easing with the economic slowdown and the expected return of Libyan supply. But the average oil price remains high, approaching \$120/barrel (in year-2010 dollars) in 2035. Reliance grows on a small number of producers: the increase in output from Middle East and North Africa (MENA) is over 90 percent of the required growth in world oil output to 2035. If, between 2011 and 2015, investment in the MENA region runs one-third lower than the \$100 billion per year required, consumers could face a near-term rise in the oil price to \$150/barrel.

Oil demand will rise from 87 million barrels per day (mb/d) in 2010 to 99 mb/d in 2035, with all the net growth coming from the transport sector in emerging economies. The passenger vehicle fleet will double to almost 1.7 billion in 2035. Alternative technologies, such as hybrid and electric vehicles that use oil more efficiently or not at all, will continue to advance but they take time to penetrate markets.

Fossil fuels will account for over 50% of the increase in total primary energy demand, whilst modern renewable energy will triple between 2008 and 2035.

Alternative technologies, such as hybrid and electric vehicles that use oil more efficiently or not at all, will continue to advance but they take time to penetrate markets.

The use of coal – which met almost half of the increase in global energy demand over the last decade – will rise 65 percent by 2035. Prospects for coal are especially sensitive to energy policies – notably in China, which today accounts for almost half of global demand. More efficient power plants and carbon capture and storage (CCS) technology could boost prospects for coal, but the latter still faces significant regulatory, policy and technical barriers that make its deployment uncertain.



## Energy

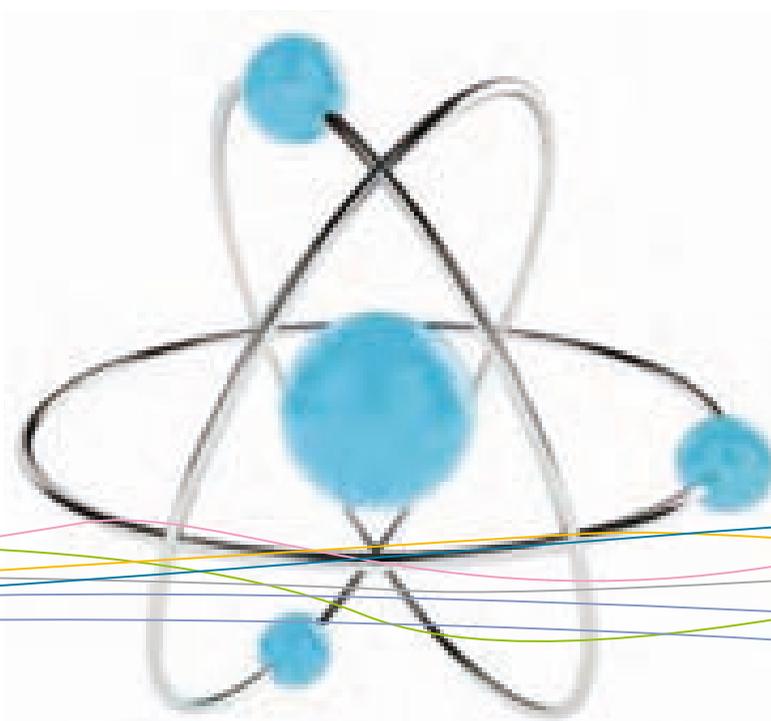
### Nuclear energy

Fukushima Daiichi has raised questions about the future role of nuclear power. In the IEA's New Policies Scenario, nuclear output rises by over 70 percent by 2035, only slightly less than projected last year, as most countries with nuclear programmes have reaffirmed their commitment to them. But given the increased uncertainty, that could change, according to the IEA.

Unterweser nuclear power plant in Esenshamm, Germany will be shut down along with 16 other nuclear plants by 2022. Angela Merkel, Chancellor of Germany, has committed to shutting all of the country's nuclear reactors by 2022, a task said by one minister to be 'as mammoth as the project to reunite East and West Germany in 1990.' This decision will make Germany the first major industrialised nation to go nuclear-free in decades. It gives the country just over ten years to find alternative sources for 23 percent of its energy<sup>68</sup>.

### Natural gas

The future for natural gas is more certain. Its share in the energy mix will rise and gas use will almost catch up with coal consumption, underscoring key findings from a recent WEO Special Report which examined whether the world is entering a 'Golden Age of Gas.' One country set to benefit from increased demand for gas is Russia. Key challenges for Russia are to finance a new generation of higher-cost oil and gas fields and to improve its energy efficiency. While Russia remains an important supplier to its traditional markets in Europe, a shift in its fossil fuel exports towards China and the Asia-Pacific gathers momentum. If Russia improved its energy efficiency to the levels of comparable OECD countries, it could reduce its primary energy use by almost one-third, an amount similar to the consumption of the United Kingdom. Potential savings of natural gas alone, at 180 bcm, are close to Russia's net exports in 2010.



70%

Nuclear output to rise to this  
by 2035

2.8  
billion

Amount of households in the world by 2040.  
A 50 percent rise from 2010

30%

Growth of industrial demand for energy  
from 2010 to 2040

## Energy demand

As societies advance, they will continue to need energy to power homes, businesses, industry, transportation, electricity generation and other vital services. The Outlook examines each of those demand sectors in detail.

- Residential/commercial

Homes and businesses represent a significant portion of global energy demand, especially when electricity usage is considered. Through to 2040, economic expansion, rising prosperity and a continued rise in the number of households globally will cause demand to grow by 25 percent in the residential/commercial sector. Virtually all of this increase will come from non-OECD countries, and almost all of it will be met by two forms of energy: electricity and natural gas.

By 2040, there will be 2.8 billion households in the world, an increase of nearly 50 percent from 2010. These households will need energy for lighting, heating, cooking, hot water and refrigeration, as well as electricity to run everything from computers to air conditioners.

- Transportation

One of the most profound shifts in energy usage through to 2040 will come from the transportation sector. The proliferation of hybrid and other advanced vehicles – along with improvements to conventional-vehicle efficiency – will result in flattening demand for personal transportation, even as the number of personal vehicles in the world doubles. In contrast, demand for fuel for commercial transportation – trucks, airplanes, trains and ships – will continue to rise sharply.

From 2010 to 2040, demand for energy for commercial transportation will rise by more than 70 percent. Most of this growth will come from heavy duty vehicles, which include freight trucks of all sizes, as well as buses, emergency vehicles and work trucks. Global economic growth will drive a steep increase in demand for energy for commercial transportation, as business activity and rising incomes enable increased movement of goods—both within and between nations.

- Industrial

Globally, industrial demand for energy is expected to grow by about 30 percent from 2010 to 2040 and will continue to come from non-OECD countries. However, by extending The Outlook for Energy to 2040 this year, we can spot some important trends emerging within the non-OECD: a flattening of industrial demand in China, and a pick up in growth in places like India and Africa. →

## Energy

### Electricity generation

The electricity generation sector is essential to meeting modern energy needs. Utilities and other electricity producers transform different types of primary energy – everything from natural gas to coal to wind and hydroelectric power – into electricity to be used in homes and businesses. Through to 2040, global demand for electricity will continue to rise steeply, as the fuels used for electricity generation continue to shift to lower-carbon sources, such as natural gas, nuclear and renewable<sup>69</sup>.



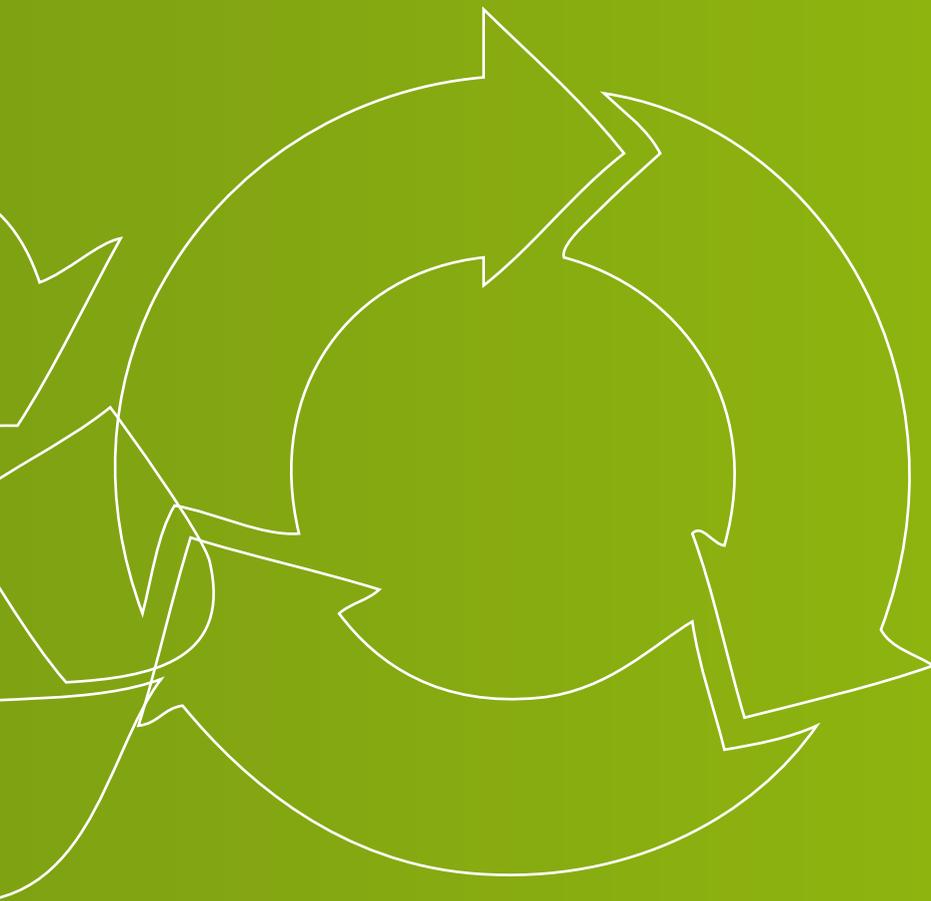


## IMPLICATIONS

- Over one billion of the world's population has no access to electricity. Changing this will have huge impacts on many markets.
- Energy efficiencies will drive building and transportation design and regulation for many years to come.
- Pressure for low carbon energy generation and consumption will impact business models, investment and even consumer behaviour.
- Nearly all increase in oil demand is for transportation. We will see many strategies to reduce transportation energy use and the development of alternative means to transport materials and people.



# Environment



## Environment

60%

Amount of energy consumption for heating buildings that needs to be cut

215  
million

Urban population growth in India by 2025

€4  
trillion

Amount that could be saved annually under a low carbon future

## Cost

To stabilise the amount of carbon dioxide in the atmosphere at 450 parts per million (ppm), which was the target set by the United Nations' Intergovernmental Panel on Climate Change (IPCC), will cost \$542 billion per year, every year till 2030, according to the World Energy Outlook (WEO).

The EU estimates it at about half that cost, or about \$224 billion per year. A research group called New Energy Finance sides with the WEO, putting the price tag at \$515 billion dollars a year. However, it is widely forecast that even if all anthropogenic greenhouse gas emissions were to be halted immediately, the past rate of emission production and the delayed impact of such, has already locked the planet into a 1.4 degrees Celsius rise, which suggests that it would be wiser to proportion some capital to mitigating the effects of climate change in addition to fighting to halt even higher average temperature rises.

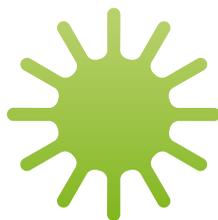
Differently envisaged futures are possible. In a 2011 report, the World Wildlife Fund (WWF) and energy consultancy Ecofys<sup>70</sup> notes that 'total energy demand could be 15 percent lower than in 2005 due to ambitious energy saving measures even though population, industrial output, freight and travel will increase.' It estimates that 95 percent of global energy demand could be met by renewables by 2050 if a number of steps are taken in conjunction with investment.

95 percent of global energy demand could be met by renewables by 2050.

The energy consumed in the heating of buildings needs to be cut by at least 60 percent through energy efficiency, the use of solar power and geothermal heat. Electricity grids need to be upgraded, smart grids installed and electric transport introduced on a large scale globally. Energy consumed in agriculture can be reduced through the consumption of meat being halved per person by 2050 in industrialised countries. Meat requires more base food calories – grains – to generate a calorie for human consumption than a vegetarian diet. As rising global populations become wealthier they are consuming more meat. Four trillion Euros (\$5 588 billion) could be saved annually under a low carbon future but the price of this investment appears high – growing to 3.5 trillion Euros a year over the next 25 years from one trillion Euros today.

Europe will need to spend 2.9 trillion Euros or 25 percent of the bloc's annual gross domestic product over the next ten years to satisfy demand for low-carbon technologies, a report by Accenture and Barclays Capital (2011) notes. It is unlikely, according to The Pew Charitable Trusts that this figure will appear for Europe alone. It notes that private investments in G-20 (global top twenty economies) clean power projects could total \$2.3 trillion by the end of the decade, with demand and policies being driven by investment in Asia, led by China and India<sup>71</sup>.

In the IEA's New Policies Scenario, cumulative CO<sub>2</sub> emissions over the next 25 years amount to three-quarters of the total from the past 110 years, leading to a long-term average temperature rise of 3.5°C. China's per-capita emissions match the OECD average in 2035. Were the new policies not implemented, we are on an even more dangerous track, to an increase of 6°C in global temperature.



### Cleantech

If the avowed goal of climate change aversion, or at least mitigation, is to be achieved, signs of this level of investment in the years to 2020 are critical. As the IEA (2010)<sup>72</sup> report notes, the clean technology revolution will require an additional \$46 trillion investment (beyond energy infrastructure investment) if we intend to halve carbon emissions by 2050 (from 2005 levels).

In a 2009 Cleantech report, commissioned by the World Wildlife Fund Netherlands (WWF-NL), Roland Berger estimated the size of the global Clean Energy Technology market in 2008 at €104 billion with an annual growth rate forecasted at 12 percent, or €131 billion by 2010. In reality, the demand for Clean Energy Technology grew by a spectacular 31 percent per annum. At €179 billion in 2010, the global market exceeded the forecast by more than a third their 2011 updated report revealed. They went on to identify that the expected size of the global cleantech market by 2015 to be in the order of €290 to €360 billion<sup>73</sup>.

### Wind energy

With a share of 30 percent in the total cleantech market, wind energy is the most important technology, not to mention one of the most cost effective sources of renewable electricity. Demand for wind turbines is spread across the globe and there are many companies active in this segment, such as Vestas, GE, Dongfang and Suzlon, in Europe, the United States, China and India. Its total market share has grown by 27 percent per year and has reached a size of €50 billion<sup>74</sup>.

### Solar power

Solar PV is the fastest growing cleantech segment, growing at nearly 100 percent a year. With a share of 24 percent (€45 billion), it has now become a major contender in the cleantech market. Chinese companies like Yingli, LDK Solar and Suntech Power have shown high growth in the past two years. This growth is matched by the increase in sales numbers at companies like Applied Materials, Roth and Rau and Centrotherm, providing Asian companies with the necessary manufacturing equipment to produce solar cells and panels.

In Germany Angela Merkel's government slashed the guarantees it offered industrial solar energy producers, such as Solarhybrid and tens of thousands of homeowners, in an attempt to dramatically reduce growth in the solar energy capacity in the German energy market. When it embarked on its cleantech policy, it recognised the need to incentivise investment for the infrastructure to be developed. Today, over 7 500 megawatts or 100 percent more capacity has been developed than was forecasted, the equivalent of 15 nuclear energy plants. This is all good news except that accompanying this expansion is a solar energy surcharge that the customer is required to pay. This has led to a situation today where German energy has one of the highest energy costs in Europe.

Renewable energy resources, according to the European Wind Energy Association (EWEA), are poised to meet over half of EU's electricity demand by 2030. In a statement released in mid-January 2012, Justin Wilkes, EWEA's Director of Policy, said that the EU had already achieved the 21 percent target set in a 2001 directive for the end of 2010 by generating somewhere between 665-673 TWh from renewable resources, or 21 percent of total EU consumption of 3 115-3 175 TWh in 2010. →

## Environment

That is an impressive feat. But even more impressive is what Mr. Wilkes says can be achieved by 2020 and 2030 if EU merely stays the course. If renewable electricity production in the EU continues to grow at the same rate as it did from 2005 to 2010, it would reach 36.4 percent and an amazing 51.6 percent of electricity consumption within EU block by 2020 and 2030, respectively.

### Bio-capacity and waste

Regardless of direct climate change impacts, there remains a serious environmental challenge. An estimated 60 percent of the Earth's ecosystems have been degraded in the past 50 years and natural resource consumption is expected to rise to 170 percent of the Earth's bio-capacity by 2040 according to the World Business Council for Sustainable

Natural resource consumption is expected to rise to 170 percent of the Earth's bio-capacity by 2040.

Development<sup>75</sup>. Part of the reason is that global waste production has increased 50 percent in 20 years<sup>76</sup> and is predicted to double again by 2030. Increasing urbanisation, rising per capita incomes and a booming global population together suggests more waste. Professor Ian Williams of the University of Southampton

suggests this will lead to a doubling of global waste generation. He states that each European produces over 500kg of domestic waste per year, whilst industrial waste disposal in developed countries totals some \$150 billion a year<sup>77</sup>. Despite improvements and scientific potential, much of the coming population growth in cities worldwide is to occur in the developing world, which is still short of such widely applicable solutions.

The UN, in February 2010, stated that global e-waste is set to increase by 40 million tonnes per year<sup>78</sup>. It should also be noted that at present however, only ten percent of all total global waste products are recycled in the world<sup>79</sup>.

### Recycling

It is estimated that roughly 15 percent of Indian consumers recycle<sup>80</sup> whilst the Department for Environment, Food and Rural Affairs (Defra) in the UK, notes that more than 40 percent of England's household waste was recycled, reused or composted in 2010<sup>81</sup>.

The EU is targeting 50 percent by 2020; whilst a Friends of the Earth study (2011) claims that a 70 percent goal could lead to the creation of at least

500 000 new jobs<sup>82</sup>. The group also suggests that 'by recycling materials the EU currently buries or burns, the equivalent of 148 million tonnes of climate changing emissions would be saved: comparable to taking almost 50 million cars off the road.'

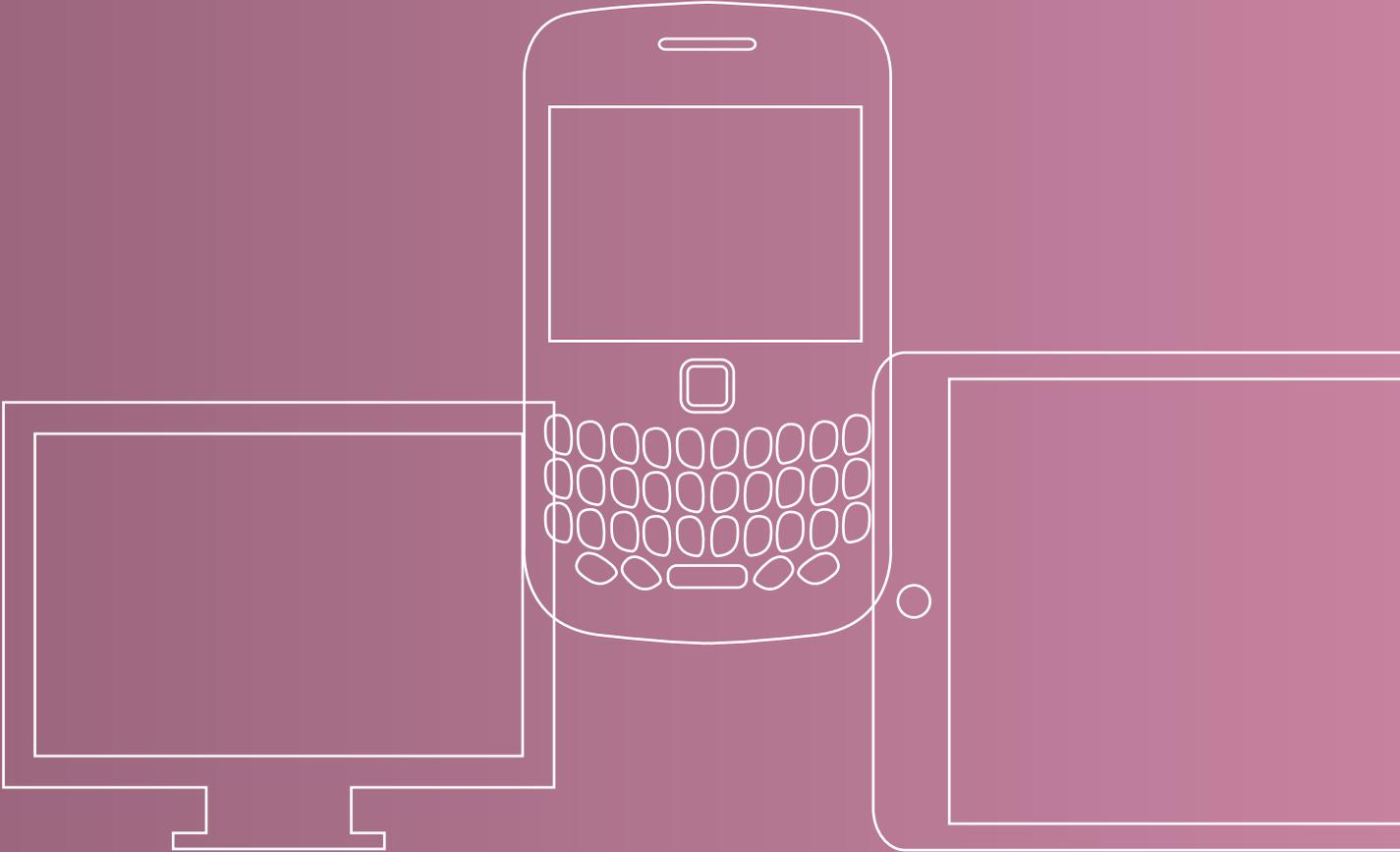
The latest figures from Eurostat, based on 2010, indicates a wide variety in performance of recycling across EU states. From an estimated 45 percent in Germany to just one percent in Romania, with an average across all 27 EU states of 24 percent. Clearly, there are many factors involved with a state's capacity, willingness and ability to recycle its waste, but the necessity of doing this is being spelled out to us daily, in terms of reduced access to resources and spiralling costs of acquiring them<sup>83</sup>.





## IMPLICATIONS

- Overuse of the Earth's resources will force change on us. We are already locked into 1.4 degrees of increased global temperature whatever we do.
- Energy generation, access, cost and usage will become critical points of focus and increasingly commercial issues.
- Waste and recycling will become critical issues as we move to 70% of the world's population living in cities.
- Meat consumption, at present levels, in developed countries will become increasingly hard to sustain.



# Business models



## Business models

25%

Percentage of 'non-routine' activities (such as innovation, leadership and sales) in 2010

40%

Percentage of 'non-routine' activities in 2015

50%+

Adoption of smartphone and tablet use by the end of 2012

A lot has happened in the past few years to shake-up the historical assumptions that underpin companies and their business models. The global economic meltdown and lingering sovereign debt crisis are

Chief Executives (CEOs) have seized upon creativity as the necessary life raft for their organisations.

foremost amongst these changes, which have combined with issues surrounding global climate change, the price of oil, energy and food and longer and more complex supply chains, even access to talent during the downturn<sup>84</sup>. The result, in short, has

been a sea change, against which Chief Executives (CEOs) have seized upon creativity as the necessary life raft for their organisations.

### Creativity and innovation

According to a 2011 survey of 1 500 chief executives conducted by IBM's Institute for Business Value, CEOs identify 'creativity' as the

CEOs who select creativity as a leading competency are far more likely to pursue innovation through business model change.

most important leadership competency for the successful enterprise of the future. The study also states that 'CEOs who select creativity as a leading competency are far more likely to pursue innovation through business model change. In keeping with their view of accelerating complexity, they

are breaking with traditional strategy-planning cycles in favour of continuous, rapid-fire shifts and adjustments to their business models.'

### Collaborative work and social networking

Although business models differ greatly from industry to industry, there are some commonalities underpinning emerging success. Financial outperformers are 57 percent more likely than underperformers to use collaborative and social networking tools to enable global teams to work more effectively together<sup>85</sup>. Indeed the notion of dispersed teams looks set to rise, with important implications for business models. Gartner (global technology analysts) suggests that 'non-routine' activities that

Financial outperformers are 57 percent more likely than underperformers to use collaborative and social networking tools.

cannot be automated, such as innovation, leadership and sales, will dominate employment, and that by 2015, 40 percent or more of an organisation's work will be 'non-routine', up from 25 percent in 2010. This suggests ample room for more outsourcing. Gartner also suggests that ad-hoc groups or 'work swarms', with no previous experience of working with each other, will become a commonplace team structure. Groups of individuals, often but not necessarily geographically distant, will come together to form temporary or recurring project teams under this potential new model<sup>86</sup>.

2011 saw a huge rise in social media, taking it from a sideline activity to the centre of the web universe. In the coming year social media will grow exponentially and become one of the central activities in human affairs on many different levels. Companies have all but fully embraced social media in their business plans already, but the integration in 2012 will become all-encompassing, with social media dwarfing other marketing activities. The increase will become so pervasive that it will become a given and a business necessity to have brand monitoring software to track engagement and measure return on investment (ROI).

Companies will also move away from having a marketing department that also handles social media. The new necessity to survive the competition will be a director of social media, and possibly a staff that does nothing but. This is because social sites will become the new customer service centres of corporations, tailoring their practices to fit into the customers' paradigm.

Marketing will finally find the ultimate sweet spot in social media, where well-planned campaigns become almost effortless and extremely more effective due to fitting in the target market's activities rather than becoming an extra activity. Businesses that can see the future and prepare properly will thrive. Those who do not will sink and we are likely to see a shake-up and shake-out of businesses in the coming year as this heats up.

### Mobile social activities

With the smartphone and tablet markets already in full gear, this will be the year that they rise toward the saturation point. These markets have been sitting in the 20-35 percent adoption range for a couple of years, but the latter half of 2011 saw them inching higher each month. In 2012 this market will break 50 percent and beyond, and in doing so, social media activities will follow and become much more mobile than they are tethered to a laptop or desktop. Social gaming will continue to grow at astronomical rates, incorporating more and more advertising as well as real-world activities that tie in<sup>87</sup>.



### Resistance to the networked company

Management orthodoxies still prevent most companies from leveraging talent beyond full-time employees who are tied to existing organisational structures, which limits the organisations' ability to tackle increasingly complex challenges.

Pilot programs that connect individuals across organisational boundaries are a good way to experiment with new models.

Pilot programs that connect individuals across organisational boundaries are a good way to experiment with new models, but incentive structures must be overhauled and role models established to make these programs succeed.

### Engaging outside knowledge and know-how

In the longer term, networked organisations will focus on the orchestration of tasks rather than the 'ownership' of workers. Open innovation is one such example, with P&G's Connect and Develop programme proving their world-class open innovation capability. P&G have more PhD qualified personnel than most, yet are not afraid to partner externally where beneficial. For example:

Networked organisations will focus on the orchestration of tasks rather than the 'ownership' of workers.

P&G is working in partnership with Brazilian company, Braskem SA, to use a renewable, sustainable, sugarcane-derived plastic for packaging, citing deficiencies in their own expertise in this area<sup>88</sup>.



## Business models

### Unsourcing

'Unsourcing', as the new trend has been dubbed, involves companies setting up online communities to enable peer-to-peer support among users. Instead of speaking with a faceless person thousands of miles away, customers' problems are answered by unpaid individuals in the same country who have bought and used the same products. This is done either in discussion forums set up on the company's own website or on social networks like Facebook and Twitter, says The Economist in June 2012<sup>89</sup>.

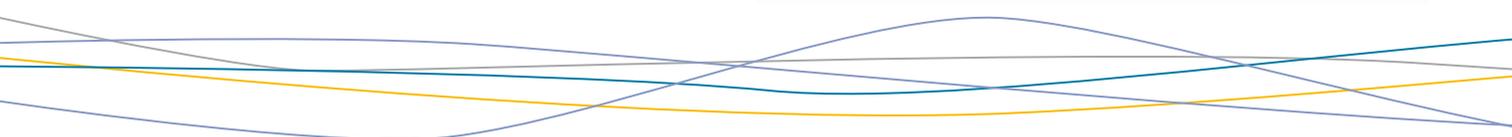
### Near-shoring

Near-shoring presents an advantage to fringe economies – those outside the European Union may hold a particular advantage here. According to the 2010 Global Services 100<sup>90</sup> list, 'Ukraine is 11th and Belarus is 13th among the top twenty leading countries in the area of IT Outsourcing and Hi-Tech services with Ukraine representing the region's biggest IT outsourcing professionals market with 11 000 professionals involved.'

Eastern Europe has emerged as a strong competitor to low cost destinations like India and Philippines, with its ability to offer niche capabilities and when it comes to high-end, sophisticated application development and IT projects, Europe is still seen as the best bet. The advantage here is not much in terms of cost but in the innovation and quality of services that is brought to the table.

### Near-shoring opportunity

Over the last few years, there has been a visible shortage of skills in Western Europe, while Eastern Europe has witnessed a significant growth in its talent pool even through the recession. For instance, according to service provider, luxoft, Romania has seen a 12 percent growth in the experienced IT professionals employed at companies offering IT outsourcing services. This justifies why services and facilities are increasingly moving towards the East. Moreover European enterprises are preferring to keep work closer to home rather than sending it to far-off destinations. Cultural compatibility and similar time zones make nearshoring to Eastern Europe a convenient option<sup>91</sup>.



11th

Ranking of Ukraine among the top twenty leading countries in the area of IT outsourcing

12%

Amount of growth in experienced IT professionals in Romania

330 000

Amount of recipes submitted for a crowdsourced campaign by McDonalds in 2012

### Crowdsourced innovation

An area of emerging interest is crowdsourcing – outsourcing a project to a group of people. InterContinental Hotels Group (IHG) has a credit card connected to its loyalty program issued by Chase Bank. In the spring of 2009, IHG and Chase planned to relaunch<sup>92</sup> 'the Priority Club' Select Visa and wanted more conversational feedback and insight into new card features than traditional market research could provide. Using 'Communispace', a provider of private online communities, it sourced a pool of 300 then current Priority Club Visa cardholders willing to share their opinions on what card benefits and services were important. After the crowdsourcing project concluded, Chase and IHG promoted the card through multiple channels. The initial email campaign for the new product yielded an 80 percent increase in new accounts when compared to the previous 2010 email campaign for the legacy card product. Chase and IHG also saw a 53 percent lift in the response rates from existing customers opting to upgrade to the new card.

As part of a crowdsourced campaign at McDonald's in Germany, fans voted for the 'Pretzelator' burger with a pretzel bun. McDonald's in Germany invited consumers to create their own sandwich, fans came up with flavours that include pretzel-bun burgers, an Italian-style chicken burger, and a curry and chili-flavoured sandwich with chorizo and jalapenos, all of which will be sold across Germany for a limited time.

Tapping into the popularity of crowdsourced campaigns, the marketing team behind McDonald's in Germany invited fans to submit a recipe for a new burger and consumers to vote on their favourites. Around 330 000 burger recipes were submitted in 2012 and got a total of five million votes. This year, fans chose five winning creations which will be sold in the 1 415 restaurants across Germany. Similar campaigns have been launched in the Netherlands, Spain and Austria<sup>93</sup>.

### Corporate crowdsourcing sources

- Ideas Project – crowdsourcing platform by Nokia
- Fiat Mio – create a car
- Open Innovation Sara Lee – open innovation portal of Sara Lee
- P&G Open Innovation Challenge – external idea sourcing in Britain
- Ideas4Unilever – corporate venturing
- BMW Customer Innovation Lab (German language)
- LeadUsers.nl & Live Simplicity – Philips' crowdsourcing platforms
- Kraft – innovate with Kraft
- InnovationJam\* – IBM's more internally focussed idea generation project
- Dell IdeaStorm – external idea sourcing
- Vocalpoint – P&G's network for women
- Betavine – Vodafone's mobile app community
- My Starbucks Idea – shaping the future of Starbucks<sup>94</sup>



## Business models

### Employee driven technology

The adoption of new technology is a global phenomenon, and the intensity of its usage is particularly impressive in emerging markets where relatively few legacy technologies exist vis-à-vis developed economies' organisations.

Disruptive business models tend to arise when technology combines with extreme market conditions, such as customer demand for very low price points, poor infrastructure, hard-to-access suppliers, and low cost curves for talent.

Disruptive business models tend to arise when technology combines with extreme market conditions, such as customer demand for very low price points, poor infrastructure, hard-to-access suppliers, and low cost curves for talent. Technology use is increasingly employee driven. A joint UK/US study of 2010 revealed that 26 percent of employees admitted to spending more than an hour a day on social networking sites<sup>95</sup>. Harnessed correctly, social networks could empower employees through facilitating

knowledge transfer. White label social networks are regularly appearing within companies as a response to employee use. ABI (industry analysts) forecasts that the market will be worth nearly \$1.3 billion in 2013<sup>96</sup>.

### New entrant competitors

Emerging economy competitors are now appearing en masse, with offerings ranging from a low-cost bespoke tutoring service to the remote monitoring of sophisticated air-conditioning systems around the world. For most global incumbents, these represent a new type of competitor: they are not only challenging the dominant players' growth plans in developing markets but also exporting their extreme models to developed economies. To respond, 'global players must plug into the local networks of entrepreneurs, fast-growing businesses, suppliers, investors, and influencers spawning such disruptions,' suggests McKinsey<sup>97</sup>. Reverse innovation has been one adjustment made by global players, with companies such as General Electric (GE), locating research centres in these cauldrons of creativity to spur their own innovations there. 'Others, such

as Philips and SAP, are now investing in local companies to nurture new, innovative products for export that complement their core businesses<sup>98</sup>.

New York Times columnist Thomas Friedman believes a new generation

If you thought the rate of change was fast thanks to the garage innovators of Silicon Valley, wait until the garages of Delhi, Mumbai and Bangalore get fully up to speed.

of start-ups are poised to disrupt established business models<sup>99</sup>. EKO, the Indian fast-growing financial services company, uses cell-phones, software, and text messaging to allow migrant workers without access to traditional banking to transfer funds and save money – a low-cost answer to an entrenched problem. In just 18 months, the company has 180 000 users doing 7 000

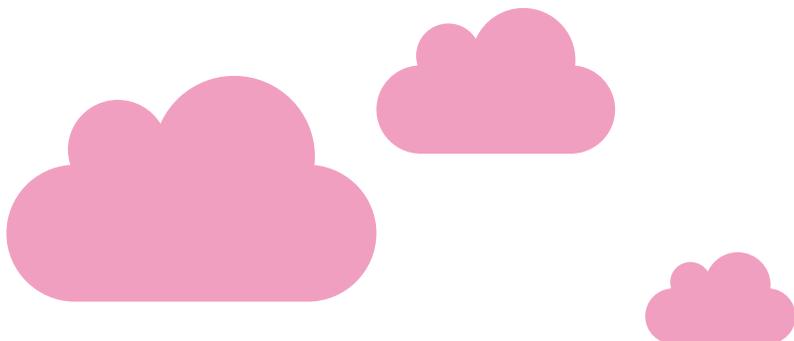
transactions a day and is already turning a profit. 'In the next decade we will see some really disruptive business models coming out of here – to a neighbourhood near you. If you thought the rate of change was fast thanks to the garage innovators of Silicon Valley, wait until the garages of Delhi, Mumbai and Bangalore get fully up to speed<sup>100</sup>.'

### Corporate social responsibility comes as standard

In many cases emerging business models are just as 'modern' as those in the west. Corporate social responsibility, or CSR, is built into

65 percent of the profits of the Tata Group companies go to charities, whilst tech group Infosys has built and staffed entire hospitals in different regions of the country.

the foundations of many emerging market organisations for example. Sixty-five percent of the profits of the Tata Group companies go to charities, whilst tech group Infosys has built and staffed entire hospitals in different regions of the country, rolling out a national curriculum to develop IT skills at the same time. Dr. Reddy's, the Indian £1.5 billion pharmaceutical corporation, provides for the health care needs for 40 000 children<sup>101</sup>. Not only is this smart business sense, given the swathes of Indian poor set to take the road to middle



class status (and consumer spending) in the next decade, but, as Harvard Business Review notes, the creation of a powerful social mission drives employee performance – a key part of organisational success. To an extent the financial and economic meltdown of 2008 has helped solidify already established trends regarding a broken down contract between employee and employer. A business model with wider purpose inbuilt could well be a key differentiator for attracting talent and of ensuring lower staff turnover.

### Cloud and mashups

In addition, the emergence of the cloud and mashups has the potential to further erode traditional barriers delineating one business model form another.

Ettienne Reinecke, Chief Technology Officer at Dimension Data (South

The potential exists for a wave of outsourced business models built on the cloud. Might knowledge work be the next industry to be offshored?

Africa) says cloud computing is 'a total watershed moment' for the IT industry. 'It's very much driven by a utility-based consumption model, it's very attractive from a financial construct perspective, and the simplicity is very advantageous.

To make it simple you have to hide the complexity somewhere. And that complexity is

underestimated today. It's disruptive, it will change business models in the IT sector, and it will change business models across many sectors. To me it's the IT sector for the first time experiencing a disruptive consumption model of technology<sup>102</sup>. In fact cloud computing will have major implications for almost all industries, from issues regarding talent needs to freeing up technology budgets to service true customer interaction. Clearly the potential exists for a wave of outsourced business models built on the cloud. Might knowledge work be the next industry to be offshored?

### Complexity

One of the stated goals is the reduction of complexity in an organisation. Some complexity is beneficial to customers, and ultimately to organisations – for example offering personalisation in financial products. A 2011

Three quarters of respondents said complexity has increased for their organisations over the past two years, and a majority expect things to become even more complicated in the coming two years.

KPMG study found that complexity is global – reaching across both mature and developing markets, as well as across industry sectors. Furthermore, complexity is increasing – three quarters of respondents in the KPMG study said complexity has increased for their organisations over the past two years, and a majority expect things to become even more complicated in the coming two years. To compound the issues, complexity is not static – about half of respondents expect the causes of complexity

to shift over the next two years, and a majority say their companies will need to take different or additional actions to manage complexity<sup>103</sup>. Increased risk is the single greatest problem associated with increasing complexity although complexity is not necessarily bad – AT Kearney notes that 'the focus should be on determining the right level of complexity<sup>104</sup>.' Next generation business models also need to address fluctuating levels of trust amongst the public. →



## Business models

### Consumer power

The internet has enabled consumers to chat, shop, share, pay and consume in ways not possible previously. With the growing influence of the internet, consumers are no longer just passive recipients of marketing messages. They are out there creating messages and content and in-turn influencing other customers. One of the factors that differentiate the internet from other media channel is Interactivity. Using the interactive component of the internet, consumers are gaining control not offered by traditional channels and are able to ignore, resist or even adapt to the smartest marketing campaigns. This consumer power has increased multifold with the dawn of the digital age and is set to increase dramatically as we move from 2.1 billion to five billion people interacting on the internet. We can expect a 300 percent increase in global economic activity in 40 years, much of the increasing economic activity taking place online, or facilitated online and in many cases, through deliberate government policy<sup>105</sup>.

### Trust

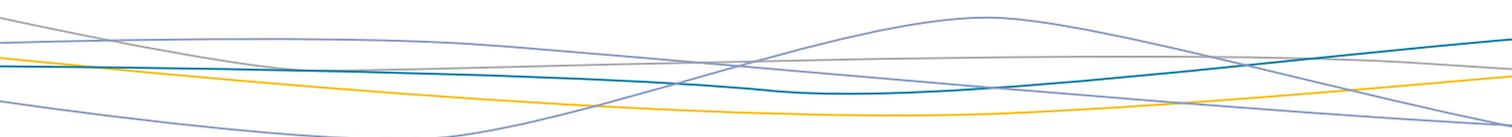
Blame for the financial and political chaos of 2011 landed at the doorstep of government, as trust in that institution fell a record nine points to 43 percent globally, according to the 2012 Edelman Trust Barometer. In 17 of the 25 countries surveyed government is now trusted by less than half to do what is right. It trails business, media, and non-governmental organisations as the least trusted institution.

France, Spain, Brazil, China, Russia, and Japan, as well as six other countries, saw government trust drop by more than ten points. Government officials are now the least credible spokespeople, with only 29 percent considering them credible. Nearly half of the general population – the first time the Barometer looked at this broader group – say they do not trust government leaders to tell the truth. Business is now better placed than government to lead the way out of the trust crisis.

Although business experienced fewer and generally less severe declines in trust, it has its own hurdles to clear. Trust in business fell globally from 56 percent to 53 percent, with countries like France and Germany, in the heart of the Eurozone economic crisis, experiencing double-digit decreases. Lack of confidence in business spread to South Korea, where trust dropped 15 points. China was the only country to see a significant increase in trust in business, rising from 61 to 71 percent.

CEO credibility declined 12 points to 38 percent, its biggest drop in nine years. In South Korea and Japan, it dropped by 34 and 43 points, respectively. In the midst of this systemic decline in trust, commentators who the reader relates to as a peer have re-emerged as one of the most credible spokespeople; with the biggest increase in credibility since 2004, trailing only academics and technical experts. Regular employees jumped from least credible spokesperson to tie for fourth on the list, with a 16-point record rise. Social networking, micro-blogging, and content sharing sites witnessed the most dramatic percentage increase as trusted sources of information about a company, rising by 88, 86, and 75 percent, respectively.

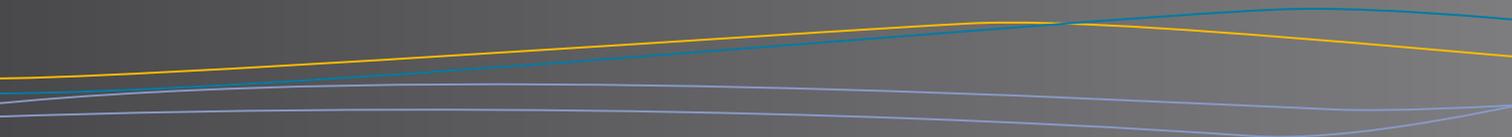
Smart businesses will talk to employees first, because citizens now trust one another more than they do in established institutions. The 2012 Trust Barometer reveals that the factors responsible for shaping current trust levels are less important than those that will build future trust. Consistent financial returns, innovative products and highly regarded senior leadership are the primary factors on which current trust levels lie. However, listening to customer feedback and putting customers ahead of profits are far more vital to building future trust<sup>106</sup>.





## IMPLICATIONS

- Social networks and other new communication mediums are vital in facilitating intra- and inter-business knowledge sharing as organisations engage with more outside firms and individuals.
- Incorporating 'purpose' into the business increases employee engagement and productivity, and trust by increasingly powerful consumers and other stakeholders.
- 'Outsourcing' IT to employees will increasingly benefit organisations, as staff buy and maintain their own technology for work increasing the need to balance trust and security.
- The Cloud offers simplicity to the user and supports new business models but providers will need to hide from view the complexity inherent in offering these services.





## Technology



## Online

By 2020, the number of Internet users will reach almost five billion – equal to the entire world's population circa 1987. This compares with around 2.1 billion users in 2012 and only 360 million in 2000.

Of the 2.1 billion internet users registered worldwide almost half of them live in Asia. About 44 percent of all internet users live in Asia, with China being the global leader with about 485 million internet users. Only 36 percent of the world's most populous country residents have internet access. Europe accounts for about 23 percent of all internet users, 13 percent are from North America and ten percent – from Latin America. Africa, Middle East and Australia account for six, three and one percent respectively. About half of all people online are younger than 25. The Web is made up by more than 555 million websites, with almost 300 million of them appearing last year. There are a total of 3.15 billion registered email accounts, which is 1.5 times more than the total number of users. More than 70 percent of all emails are spam communication<sup>107</sup>.

Vast numbers of people in developing countries will gain access to the web, thanks to a combination of plummeting costs and exponential improvements in technology. This will include laptops, tablets and smartphones that can be bought for only a few tens of dollars, together with explosive growth in the use of mobile broadband. Even some of the most remote populations on Earth will gain access to the Internet<sup>108</sup>.

## Smartphone – gadget

The uptake of the smartphone is one such example of this convergence and the growth of the market has been rapid. In the years since the iPhone launched, the global smartphone market is already larger than the PC market. IDC (information technology analysts)<sup>109</sup> in

February 2011 announced that 101 million smartphones were sold in Q4 2010, versus 92 million PCs. Smartphone shipments, meanwhile, grew 87 percent year over year, while PCs only grew three percent. In May 2012 Gartner reported that Apple sold just over 33.1 million iPhones during the first quarter of 2012 and accounted for 7.9 percent of all mobile phone sales and Gartner also reported that Samsung also sold just under five million more smartphones than Apple making it the number one smartphone vendor with 38 million sales<sup>110</sup>.

By 2014, one in four mobiles globally will be a smartphone.

One of the effects of smartphone use is to place a premium on a business's online offering, as well as testing its bricks and mortar pricing policies. Experian (a financial data provider) stated in 2011 that one in ten shoppers said they use their mobiles in stores to search for better prices online. Only 12 percent of consumers surveyed said they believed a bricks-and-mortar store would offer better value than an online one<sup>111</sup>. Depending on the category of item being purchased, between 80 and 90 percent said the internet has an influence on their purchasing decisions. Smartphone use goes beyond business-to-consumer (b2c) issues though – 48 per cent of UK small and medium sized enterprises (SMEs) are using the devices for email tasks and basic web browsing<sup>112</sup>.



Internet users in 2000



Internet users by 2020



Sales predicted of the Apple iPad by 2015

Smartphone penetration is increasing rapidly in Western Europe. The number of smartphones will overtake that of other handsets by 2014. The mass adoption of smartphones will reinforce two trends that are already at play in the mobile market: the rationalisation of SIMs and the emergence of handset data services as the fastest-growing source of revenue for mobile operators. Smartphones will account for more than half of all handsets in use by 2014, and will have reached 72 percent by 2016<sup>13</sup>.

### Smartphone vs PC

Google's John Herlihy commented in 2010 that: 'In three years' time, desktops will be irrelevant. Today we are well on the road to this being realised. In Japan, most research is done today on smartphones, not PCs. Mobile makes the world's information universally accessible. Because there's more information and because it will be hard to sift through it all, search will become more and more important. This will create new opportunities for new entrepreneurs to create new business models – ubiquity first, revenue later<sup>14</sup>.'

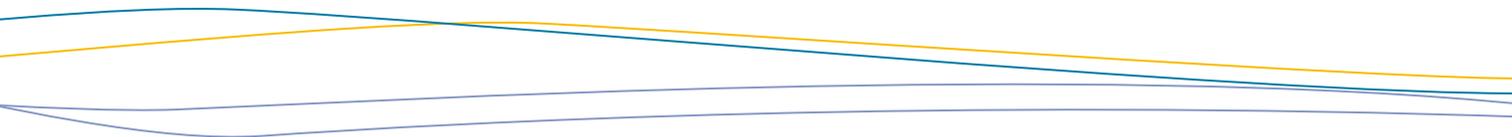
Analysts are upping their predictions for the iPad tablet's market share growth over the course of the year. In a note to investors, Gene Munster of Piper Jaffray says the firm is now forecasting as many as 66 million sales of the new device in 2012, up from the earlier prediction of 60 million. Meanwhile, Shaw Wu of Sterne

Agee is now predicting 60 million, up from 55 million. Regardless of the final outcome, the bottom line impact the device will have on the market was summed up by Munster saying, 'we believe the unprecedented ramp of the iPad over the past year is evidence that the tablet market will be measurably larger than the PC market.' He's also forecasting that Apple will ship 66 million units by year-end and by 2015 that number will reach 176 million.

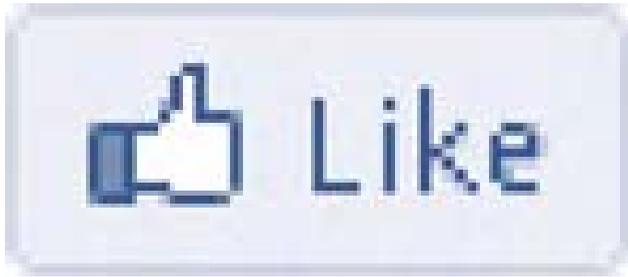
Those figures stack up with other trends in the so-called 'post-PC' era (a misnomer, really – it doesn't mean 'no PC', as many assume). For example, Apple CEO Tim Cook noted during the iPad's launch that Apple sold more iPads in Q4 2011 than any single manufacturer sold PCs. Gartner later released figures showing that PC shipments were on track to grow just 4.4 percent in 2012 to 368 million units, as consumers would prioritise buying smartphones and tablets over desktops and laptops. In addition, IDC also recently raised its tablet shipment estimates for the year, up from 87.7 million to 106.1 million, in advance of the iPad's launch<sup>15</sup>.

### Growth potential in Germany is big

With more than one mobile phone per person in Germany, it is a strong mobile market, but the potential for growth exists. German mobile consumers are connected and getting smarter. Nearly two out of every three (63%) mobile purchases in Germany are smartphones. Today, 30 percent of Germans own a smartphone, compared with 45 percent in the U.K., 40 percent in the U.S., and 36 percent in Russia. →



## Technology



## Go Mo-So-Lo (Go Mobile, Go Social, Go Local)

More than 250 million active users currently access Facebook through their mobile devices and they are twice as active as non-mobile users. In Germany, nearly 50 percent of all smartphone users have used a social networking app in the last 30 days. A mobile and social media strategy must go hand-in-hand (having a Facebook page is not enough). And proximity is influence. Location-based mobile alerts are impacting decisions to buy in a particular store. Creating a successful mobile strategy requires 4Cs:

Content – be engaging.

Conversation – create two-way dialogue.

Community – connect through advocacy programs.

Continuity – think long-term and ongoing<sup>16</sup>.

## Mobile battery life

One of the great barriers to the even faster take-up of mobile devices has been the life of their batteries. For a great many reasons, innovation in battery performance is set to deliver significantly longer life for our computers and gadgets and even for our electric and hybrid vehicles. In the next few years mobile devices will penetrate even deeper into our personal and business lives as their always-on capability is realised through these longer life batteries<sup>17</sup>.

## Mobile storage

It is safe to assume that the exponential trends in capacity and price performance will continue. These trends have been consistent for over half a century. Even if the limits of miniaturisation are reached with current technology, formats will become available that lead to new paradigms and even higher densities. Carbon nanotubes, for example, would enable components to be arranged atom-by-atom.

By 2050 – if trends continue – a device the size of a micro-SD card will have storage equivalent to three times the brain capacity of the entire human race.

The memory capacity of the human brain has been estimated at between one and ten terabytes, with a most likely value of three terabytes. High-end consumer hard drives are already becoming available at this size.

Well before the end of this decade, it is likely that micro-SD cards will exceed the storage capacity of the human brain. By 2030, a micro-SD card (or equivalent device) will have the storage capacity of 20 000 human brains. By 2043, a micro-SD card (or equivalent) will have a storage capacity of more than 500 billion gigabytes – equal to the entire contents of the Internet in 2009. By 2050 – if trends continue – a device the size of a micro-SD card will have storage equivalent to three times the brain capacity of the entire human race<sup>18</sup>.



Current amount of active users accessing Facebook through their mobile devices



Amount of gigabytes storage capacity achievable on a micro-SD card by 2043



Amount of ad revenue from social networks worldwide by 2013

### Social software

Gartner believes that as the business benefits of social software become evident, adoption of these platforms will lead to email being replaced as the primary means of communication by 2014<sup>119</sup>. Increased security levels and so called white label social networks, for use internally, should ensure greater usage. Early evidence again tends to support their theory

70 percent plus of IT-led social media projects will fail.

that financial outperformers are 57 percent more likely than underperformers to use collaborative and social networking tools to enable global teams to work more effectively together<sup>120</sup>. Nevertheless, Gartner adds that

'the rigid distinction between email and social networks will erode as both become more developed. Email will take on many social attributes, such as contact brokering, while social networks will develop richer email capabilities.' However, business may be slower in understanding where the true benefits lie in the social age than placing their bets in a technology that has become its own zeitgeist. To this end it is predicted that 'only 25 percent of businesses will routinely use social network analysis to improve performance and productivity through to 2015.' Furthermore, the Gartner study adds that more than 70 percent of IT-led social media projects will fail as technology departments tend to provide an IT solution rather than a social solution that targets specific business value. The need for an integrated social media strategy aligned to business goals and of a social media literate workforce is essential therefore if ROI is to live up to the hype that surrounds it. Successful commercialisation of social networks may also help business realise its potential<sup>121</sup>.

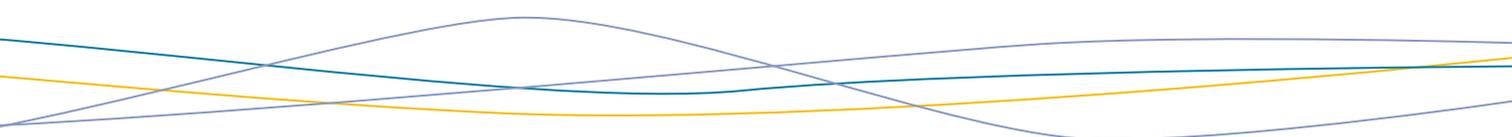
Worldwide revenues from social media sites such as Facebook reached \$10 billion last year. That is up 41 percent from 2010, according to technology research firm Gartner. These figures are set to explode in the next few years, projected to grow by 50 percent next year and nearly triple to \$29 billion by 2015. Advertising revenue is the largest contributor to this overall figure, with social gaming bringing in another significant revenue stream<sup>122</sup>.

An integrated social media strategy aligned to business goals and a social media literate workforce is essential.

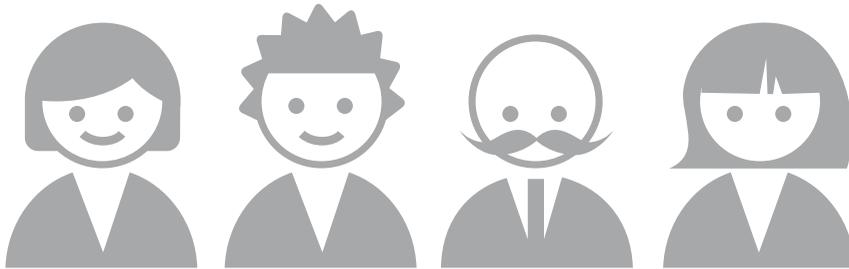
Ad revenue from social networks worldwide is expected to reach \$5.54 billion this year, according to eMarketer estimates, and will double to over \$10 billion by 2013. eMarketer is taking into account a number of popular social networks, including Facebook, Twitter and LinkedIn. Half of this year's ad spend on social networks, \$2.74 billion, is coming from the US market. Unsurprisingly, the majority of this ad revenue is coming from Facebook, which is expected to pull in over \$3.8 billion this year from advertising to its 800 million members<sup>123</sup>.

### Web influencers

Social media analysis sites such as PeerIndex and Klout have emerged, and seek to mine publicly available data from social networks, predominantly Twitter, to identify the Web's new influencers in terms of reach, peer influence, authority and amplification<sup>124</sup>. Seeing as each factor is measured, this could be seen as a first step into the fuller commercialisation of social networks and of individuals and of an organisations' 'worth.' →



## Technology



### Innovation

As open-source innovation and co-creation become familiar means for firms to innovate their products and service offerings the role of social media becomes more critical. Firms that have embraced these collaborative ways of surfacing new ideas understand that the greater the size and diversity of input the higher the likelihood is of imaginative and breakthrough innovation happening. Social networks provide the transport layer on which new ideas can flow into the organisation. Procter and Gamble built a network of over three million contributors to their product innovation process and moved from one of the lowest to one of the highest new product success rates in their industry.

### Virtual communication

There is also the probability that business communication will become increasingly virtual too. Market Media Research<sup>125</sup> predicts that the virtual meetings industry will grow to \$18.6 billion by 2015, a 56 percent annual growth rate from 2010. With the oil price set to remain high over the next decade, air travel is neither economical, nor for many companies, compatible with their corporate social responsibility (CSR) policies. In September 2009, Cisco's Global Sales Experience was virtual – and 19 000 globally dispersed employees attended. The company saved 90 percent of what the conference would have cost if it had been conducted the traditional way with hotel rooms and airline flights. Cisco, the global networking company, also saved its employees a total of 334 000 hours of travel time and kept 84 400 tons of carbon from entering the atmosphere<sup>126</sup>. It is unlikely given the very real need for face to face contact in many instances to replace meetings with virtual meetings, but used as an alternative in some situations and even in conjunction with a main event, virtual meetings look to have established a useful role in the business communication mix.

### Avatars

Scientists from Microsoft Labs have developed a prototype of an Xbox gaming avatar that you can quickly customise to look like you, sound like you, even laugh, sneer or scowl like you. Someday soon you will be able to conjure up a gaming avatar that looks and speaks like you to play Xbox Live games. It's one more small step down the path to immersive virtual-reality experiences<sup>127</sup>.

### Immersive virtual-reality worlds

People will spend a large amount of time in virtual-reality worlds in which they will compete, socialise, relax, be entertained and do business by the year 2020. British Telecom futurologist Ian Pearson says immersive computer-generated environments will give people 'a life-size, 3D image and the links to your nervous system allow you to shake hands, it's like being in the other person's office. It's impossible to believe that won't be the normal way of communicating<sup>128</sup>.'

### Collaboration

It is entirely possible that emerging and future technologies will seek to increase collaboration and facilitate smoother information through-flow by focusing on these three previously mentioned vehicles; social, mobile and virtual. One possible result is the evolution of the avatar/homepage used to represent the social network user. A 'touchable holograph' display has already been developed at the University of Tokyo, that adds tactile feedback to 3D images<sup>129</sup>. The implication of this technology goes far beyond today's social network user as it would completely define the relationship between work and space. It would, in essence, provide the physical touch lacking in distance working and e-learning, ensuring that the technology delivers more of a worker's social needs that flow from their work.

### Augmented reality

Augmented reality refers to software applications that place generated graphical, aural and textual information on top of real-life imagery. At the moment, this is mostly the realm of mobile phones such as the iPhone or Android; however, in years to come many expect that there will be optical versions available that are similar to eye-glasses or even contact lenses<sup>130</sup>.

### Natural User Interfaces (NUI)

The total amount of data now being stored and managed has reached 1 200 petabytes, or 1.2 Zettabytes percent (one petabyte equals one million gigabytes).

'Microsoft is imagining a NUI future,' Steve Ballmer's company describes pretty accurately the way things are going with personal technology right now. 'You don't have to look very far to realise that technology is becoming more natural and intuitive,' it begins. But then he notes, 'in a typical day, many people use touch or speech to interact with technology, on their phones, at the ATM, at the grocery store and in their cars<sup>131</sup>.'

### Data volume

In May 2012 IDC released calculations of the total amount of data now being stored and managed had reached 1 200 petabytes, or 1.2 Zettabytes — enough for a stack of DVDs reaching from the earth to moon and back. By 2020, that stack will reach halfway to Mars.

In 2009 the Digital Universe grew by 62 percent to nearly 800 000 petabytes (one petabyte equals one million gigabytes) and in 2010 the rate of growth is forecast to be almost as high, to 1.2 million petabytes, or 1.2 zettabytes.

Extrapolating this growth means that by 2020, the Digital Universe will be 44 times as large as in 2009, whilst the growth of files will outstrip even that, at a factor of 67. By way of comparison, the number of IT professionals is forecast to grow by a factor of 1.4 whilst storage is forecast to grow by a factor of 30.

Hence, we have a growing gap between the amount of digital content being created and the amount of available digital storage. In 2009, if people had wanted to store every gigabyte of digital content created, they would have had a shortfall of around 35 percent. This gap is expected to grow to more than 60 percent (that is, more than 60 percent of the petabytes created could not be stored) over the next several years<sup>132</sup>.

### Unstructured data

Social media, the cloud and high powered computing, might, between them, be able to deal better with unstructured data. More than 80 percent of all of information could qualify as unstructured data, resulting in partial business intelligence at best<sup>133</sup>. In a sense, unstructured data will need to be dealt with 'virtually' given that the sheer size of data is probably too much for a single organisations system to process. →



## Technology



Percentage of information in the digital universe that could be part of a cloud service by 2020



Amount of devices communicating over the internet by 2020



Sales of professional and personal service robots by 2013

## Data regulation and analytics

IDC have forecast that every 5.5 years we will see a tenfold rise in the amount of data that we will need to store and analyse for our business. It also predicts that as much as 80 percent of this data could be covered by some regulatory compliance obligation. The sort of data that we are collecting is changing rapidly. In the past few decades much of the data we stored and analysed was numbers or letters. Today we record calls in our customer contact centres and are starting to regularly hold video conferencing calls with our clients, suppliers and business partners. This data will be required to be stored and will also be required to be analysed by your business intelligence system. To make sense of this vast amount of data we will need new techniques and tools in place.

## Filtering the noise

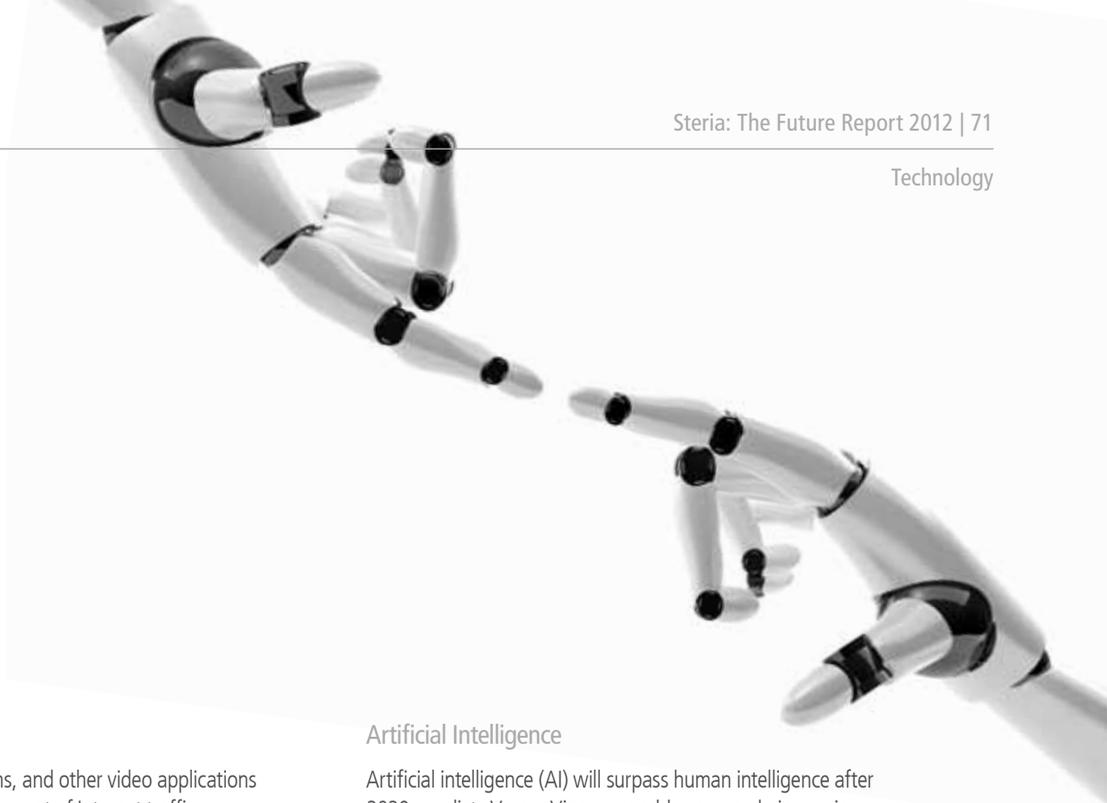
Advances in data storage, transmission and processing have transformed the internet from a geek's paradise to a supporting pillar of 21st century society. But while the last ten years have been about access to information, the next ten will be dominated by how to make sense of it all. Without the means to find what we want in this vast sea of information, we are quite literally drowning in data. And useful as search engines like Google are, they still struggle to separate the meaningful from the meaningless. Over the next decade we will see some significant changes in how we interact with the internet. As devices like phones, cameras, projectors, TV's, computers, cars, shopping trolleys, you name it, become increasingly integrated and connected, be prepared to see rapid and radical changes in how we interface with and make sense of the web<sup>134</sup>.

## Data lifespan

Worries concerning data lifespan continuing to give air to subjects embarrassing to the user long after the fact are also being addressed. An app called TigerText allows text-message senders to set a time limit from one minute to 30 days after which the text disappears from the company's servers on which it is stored and therefore from the senders' and recipients' phones. Jeffrey Rosen, a law professor at George Washington University, writing in the NY Times notes that 'expiration dates could be implemented more broadly in various ways. Researchers are developing a technology called Vanish that makes electronic data 'self-destruct,' after a specified period of time. Instead of relying on Google or any given social network to delete the data that is stored 'in the cloud', Vanish encrypts the data and then 'shatters' the encryption key. To read the data, your computer has to put the pieces of the key back together, but they erode as time passes, and after a certain point the document can no longer be read<sup>135</sup>.'

## In the cloud

Using reasonable forecast assumptions on cloud services, it is possible to conclude that as much as 15 percent of the information in the Digital Universe in 2020 could be part of a cloud service – created in the cloud, delivered to the cloud, stored and manipulated in the cloud, etc. Even more information could 'pass through the cloud', that is, be transported using a cloud services email system or shared community, be stored temporarily on disk drives in the cloud, be secured via a cloud service, etc. By 2020, more than a third of all the information in the Digital Universe will either live in or pass through the cloud.



### Peer-to-peer digital video

TV shows, YouTube clips, animations, and other video applications already account for more than 60 percent of Internet traffic, says CacheLogic, part of the Alcatel-Lucent global networking company. 'I imagine that within two years it will be 98 percent,' adds Hui Zhang, a computer scientist at Carnegie Mellon University. And that will mean slower downloads for everyone.

Zhang believes help could come from an unexpected quarter: peer-to-peer (P2P) file distribution technology. Of course, there's no better playground for piracy, and millions have used P2P networks such as Gnutella, Kazaa, and BitTorrent to help themselves to copyrighted content. But Zhang thinks this black-sheep technology can be reformed and put to work helping legitimate content owners and Internet-backbone operators deliver more video without overloading the network<sup>136</sup>.

### Ambient technology

By 2020 we expect to have over 22 billion devices communicating over the internet. As we will be connected to it through many devices our use of

By 2020 we expect to have over 22 billion devices communicating over the internet.

technology to communicate effectively blends into our surroundings. For example as we walk down a street it's possible for our diary to connect with a bus stop and tell us to stop right there and wait 30 seconds for the right bus to take us where we want to go. We will be able

to connect with our friends, family and business associates in new dynamic and spontaneous ways, increasing our productivity and connectedness. The issue here will be one of privacy versus utility – which is likely to be one of the most discussed and argued over issues of the coming decade.

### Artificial Intelligence

Artificial intelligence (AI) will surpass human intelligence after 2020, predicts Vernor Vinge, a world-renowned pioneer in AI, who has warned about the risks and opportunities that an electronic super-intelligence would offer to mankind.

He says: 'It seems plausible that with technology we can, in the fairly near future, create (or become) creatures who surpass humans in every intellectual and creative dimension. Events beyond such an event – such a singularity – are as unimaginable to us as opera is to a flatworm<sup>137</sup>.'

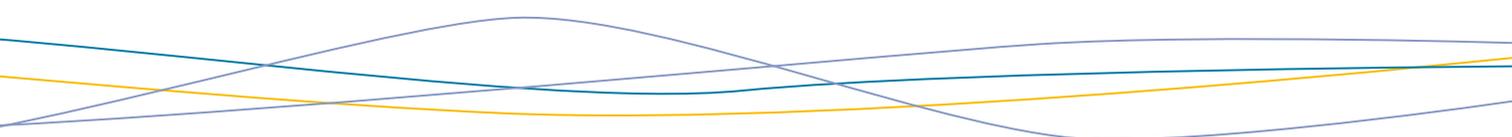
### Robots

Until recently, the idea of robots appearing in peoples' homes was considered science fiction, or something which only the very rich had access to. However, the consumer robotics market is booming at the moment. Thanks to falling costs, they are beginning to enter mainstream society. Sales of professional and personal service robots are expected to grow by 300 percent between 2010 and 2013 to reach 20 million units in 2013. Initially popular in Japan, Korea and the Far East, they are now

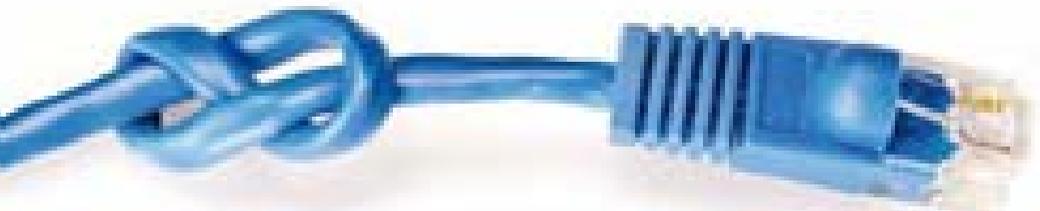
South Korea has a stated goal of 'a robot in every home by 2020.'

spreading to Western homes too. Some robots clean carpets or mow the lawn; others help busy professionals entertain children or pets; other machines feed and bathe the elderly and incapacitated. South Korea has a stated goal of 'a robot in every home by 2020,' and

Samsung has already developed a robot maid that 'recognises people, can turn on microwave ovens, washing machines and toasters, and also pick up sandwiches, cups and whatever else it senses as objects<sup>138</sup>.' →



## Technology



The scarily realistic Geminoid F, made with help from robot maker Kokoro, looks just like a twenty-something Japanese woman. The android sports extremely realistic hair and a set of teeth which apparently enable it to produce the most realistic robot smile yet. The android is operated by remote control and can mimic the exact facial expressions and speech of its operator. All of its electronics are hidden inside the android itself, and it can be charged and powered by a standard household electricity supply.

The Japanese are used to seeing robots being implemented in day to day society; things like roadwork's in Tokyo are often decorated with simple robotic traffic conductors. The Geminoid F, however, will be used in much more complex situations. Its apparently friendly appearance makes it the perfect receptionist, and Ishiguro also believes that it would work well in hospitals, relaxing patients when nurses couldn't be there<sup>139</sup>.

### 3D printing

The ability to take designs and images direct from a computer, transmit them across the world to a printer that will fabricate a perfect replica in 3D in metal, plastic or ceramics is now with us. The latest printers can print an object up to eight square meters in volume, the size of a small car. Expect in the future that bicycles, cars, and anything else around that size will be able to be personalised, designed to fit perfectly and meet our desire for individualism.

### Resource constraints to growth

Nevertheless, the development of future technology is not as assured as the growth of Moore's law would suggest. Armin Reller, a materials chemist at the University of Augsburg in Germany, has predicted that supplies of indium, used in liquid-crystal displays, and of hafnium, a critical element for next-generation semiconductors, could be

exhausted by 2017. The world's zinc will be gone by 2037, he says<sup>140</sup>. With this in mind, innovation in the future may increasingly focus on recovering already utilised resources and pioneering new ways of doing things, rather than purely exploiting new technologies.

### Fast broadband

The European Commission has proposed to spend almost €9.2 billion from 2014 to 2020 on pan-European projects to give EU citizens and businesses access to high-speed broadband networks and the services that run on them. The funding, part of the proposed Connecting Europe Facility (CEF), would take the form of both equity and debt instruments and grants. It would complement private investment and public money at local, regional and national level and EU structural or cohesion funds. At least €7 billion would be available for investment in high-speed broadband infrastructure<sup>141</sup>.

The Netherlands has the fastest internet connections in Europe with more than 68 percent of Dutch broadband lines clocking in at 5Mbit/s or more. That compares to only 30 percent of UK connections at least hitting this high-speed broadband mark, leaving the UK in 15th place in the list of 22 European countries with high-speed broadband connectivity. That's still a 70 percent year-on-year rise for the UK, which is ranked 25th in the world for fast net access. Across Europe, more than half of broadband connections were at speeds of 2Mbit/s or over.

The fastest internet in the world is found in Japan – with 59 Japanese cities filling out the Akamai list of the 100 cities with the fastest broadband. Brno in the Czech Republic has the fastest connection speeds of any city in Europe at an average of 8.3Mbit/s. Everywhere in Europe the speed of broadband is on the rise, with Switzerland, Ireland, Turkey and Spain posting increases in high-speed broadband adoption (5Mbit/s at least) of over 100 percent<sup>142</sup>.



## IMPLICATIONS

- Desktop and mobile computing operating systems vs mobile operating systems – the App world versus the online world – will be one of the most dramatic changes of technology this decade.
- An increasingly mobile, social and virtual era of technology and IT is upon us – requiring us to learn how to use new business models and social and online analytics to stay relevant.
- The coming data flood presents an opportunity for those with clear and effective technological and organisational tools. Third parties will provide the capacity and capability to manage this mass data.
- As artificial intelligence and robotics develop, keeping the less skilled in work will become an increasing challenge and will raise unemployment.
- Resource constraints mean we can't continue to develop and use technologies the way we always have – we will see breakthrough innovation in many areas.



# Work



## Work

25%

Percentage of people aged 55 and over in the EU27 in 1990

40%

Percentage of people expected to be aged 55 and over in the EU27 by 2060

2.8 million

Amount of people expected to be working in renewable energy in the EU by 2020

Professor Lynda Gratton of the London Business School has identified five key forces that shape the world of work<sup>143</sup>. The first is globalisation and the migration to cities. Second, she suggests that technology and the digitalisation of knowledge, alongside our connectivity, will create a global network of micro-entrepreneurs across national boundaries. In the next ten years, five billion people will be connected. Demographic change, 100-year life-spans, ageing societies and the transition to a low carbon economy round out her list of drivers of change.

## Ageing workforce

Ageing is perhaps the biggest long term issue of these, and perhaps the one that the world of work is least prepared to deal with. The proportion of the population in the EU27 who are aged 55 and over rose from 25

The EU labour force will decline by around 68 million workers by mid century if trends persist.

percent in 1990 to 30 percent in 2010, and is estimated to reach around 40 percent by 2060<sup>144</sup>. With an increase of some five percent, the total EU population is to reach 526 million in 2040. Not counted in the statistics are potential further enlargements

to populous countries such as Turkey.

The largest chunk of the population will continue to be the age group 15-64, but it will decrease from 67 percent in 2010 to 56 percent in 2060. Those aged 65 and over will become a much larger share, rising from 17 percent to 30 percent of the population, and those aged 80 and over, rising from five percent to 12 percent, will almost become as numerous as the young population in 2060.

For a large part of the 20th century, Sweden was the country with the highest median age, starting at 36 years, in the mid-nineties Italy took the lead. The next oldest country, Germany, was also almost always in the top ranks and it is expected to be so for the next 30 years. After 2040,

Latvia and then Romania are projected to have the highest median ages, evidencing the eastward shift of the ageing process. The latest projections for the UK are for 5.5 million more elderly people in 20 years' time and the number will have nearly doubled to around 19 million by 2050<sup>145</sup>.

The EU labour force is going to rise slightly until 2020 as more women are joining the workforce, but after that a decline of almost 12 percent will be recorded by 2060<sup>146</sup>. The EU labour force will decline by around 68 million workers by mid century if trends persist<sup>147</sup>. The EU Commission predicts that 'annual GDP growth rate' will 'decline significantly in the future,' with a smaller working age population acting as a 'drag on growth and on per capita income'<sup>148</sup>.

## Environment related jobs

The EU eco-industry directly employs around 3.4 million people, around 1.5 percent of all Europeans in employment, more than in car manufacturing, chemicals or textiles. The number of jobs linked to the environment extends beyond the ecoindustry to sectors that depend on a good quality environment – such as organic agriculture, sustainable forestry and green tourism. These jobs are often less visible than other jobs as they are spread throughout Europe among firms helping to improve environmental performance. Using a narrow definition, around 5.6 million people are directly employed in jobs linked to the environment. There are many other jobs that are also dependent on the environment, though arguably to a lesser degree. Using wider definitions, such as 'all those working in agriculture,' one in ten European jobs depends to some extent on the environment. These jobs support others elsewhere in the economy, for example through demand for components and materials. When these indirect effects are included, it is estimated that around one job in every six is somehow dependent on the environment.

### Renewable energy sector

Policies that support renewable energy sources can give a significant boost to the economy and create new jobs. As part of its action to combat climate change, the EU has committed to increase the share of energy from renewable sources to 20 percent (from around 8.5 percent today) by 2020. It is estimated that meeting this target will provide an additional 410 000 jobs and boost GDP by 0.24 percent. In 2005, around 1.4 million people in the EU worked in renewable energy and generated €58 billion, contributing around 0.6 percent to Europe's GDP. By 2020, employment in the sector could reach 2.8 million people, though jobs would be lost elsewhere in the economy such as in fossil fuel production. Biomass is currently the main source of renewable energy in the EU, but much of the growth is likely to be in solar and wind energy.

To 2030, most large economies will experience stagnation noted Germany's Deputy Environment Minister Astrid Klug, but this number could triple by 2020, and hit 900 000 by 2030<sup>149</sup>. A total of 1.8 million people currently work in environmental protection, accounting for 4.5 percent of Germany's workforce. France seems similarly placed. According to a 2009 report by the Boston Consulting Group<sup>150</sup>, the greening of the environment could create or keep up to 600 000 jobs by 2020.

### Changing workforce

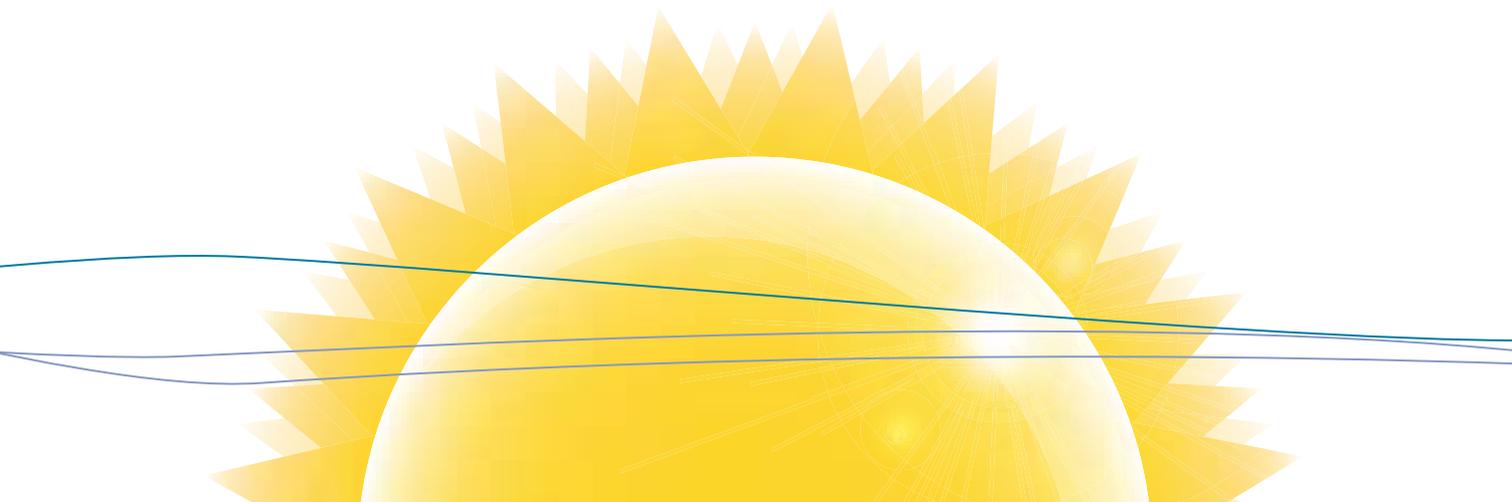
Germany and Italy will experience drops in the size of their workforce of eight percent and five percent whilst the UK will experience a two percent increase. Owing to its young population, India is set to experience a potential dividend in the form of a 45 percent rise in working population. Clearly both rapidly expanding and shrinking working age populations present numerous challenges and opportunities, albeit of a different nature. One common issue revolves around talent, and its shortage.

### Talent acquisition

Having access to the best talent continues to be a challenge for CEOs and business leaders – with 97 percent of CEOs in PwC's annual global CEO survey saying that having the right talent is the most critical factor

for their business growth<sup>151</sup>. In addition, 79 percent of CEOs said they would be changing their strategies for managing talent as a result of the downturn – and 55 percent said

they would look to change their approach to global mobility including international secondments. Work is set to become more international, aided by technological and business model evolution. PwC predict a further 50 percent growth in assignments by 2020. There will be more assignees, more business travel, and more virtual tools.



## Work

### Worker productivity

The mobile platform has become the dominant communications and interaction platform by early-adopting best-practice organisations. The capabilities afforded to users of smartphones and tablet devices grow immensely day by day. Tablets will become the virtual classroom, and an emerging class of tools will let employees manage almost every aspect of their professional life digitally. During the next year, talent management leaders need to invest heavily supporting execution of talent management initiatives across mobile.<sup>152</sup>

### Virtual work

Virtual tools will be central in ushering in a new world of work, and by necessity, the new world promises to be more flexible. Gartner suggests that 'non-routine' activities that cannot be automated, such as innovation, leadership and sales, will dominate employment, and that by 2015, 40 percent or more of an organisation's work will be 'non-routine,' up from 25 percent in 2010. These increasingly non-routine tasks, it suggests, will be outsourced to geographically dispersed ad hoc teams, or 'swarms.' In effect, this is the birth of the contract economy.

PwC suggests that this may mean<sup>153</sup> the boundary between work and home life disappearing as companies assume greater responsibility for the social welfare of their employees.

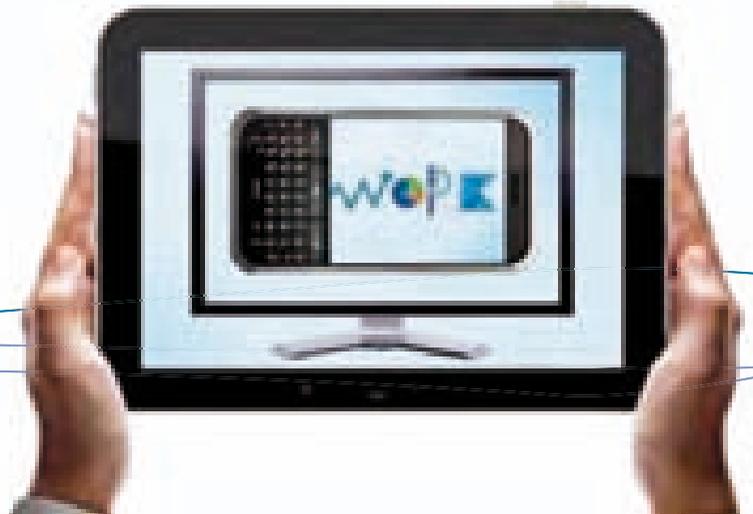
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that 'non-routine' activities that cannot be automated, such as innovation, leadership and sales, will dominate employment, and that by 2015, 40 percent or more of an organisation's work will be 'non-routine,' up from 25 percent in 2010.

### Remote work

Remote work changes everything. The continued growth of technology, social media, and easy communications now makes it possible for most knowledge work and team activities to occur remotely. Allowing top talents to work 'wherever they want to work' improves retention and makes recruiting dramatically easier. Unfortunately, even though it is now possible for as much as 50 percent of a firm's job to be done remotely, manager and HR resistance has limited the trend. Fortunately, managers and talent management leaders have begun to realise that teamwork, learning, development, recruiting, and best-practice sharing can now successfully be accomplished using remote methods. Companies like IBM and Cisco have led the way in reducing and eliminating barriers to remote work<sup>154</sup>.

Any doubt about the headway made by Bring Your Own Device (to work) (BYOD) was dispelled by the study published in 2012 by US-based Absolute Software. Some 300 IT managers and directors in France, Germany, and the UK were quizzed about their acceptance of the BYOD movement. As many as 52 percent said they allowed staff access – albeit not unrestricted access – to the corporate network. There's a good reason for this: half the respondents said they were convinced that people using their own hardware boosted their employer's productivity, as long as these devices were used within a regulated framework<sup>155</sup>.



211%

Increase in UK jobs in the hospitality sector by 2017

214%

Increase in UK jobs in retail distribution by 2017

883%

Increase in UK jobs in accountancy, law, consultancy, advertising and PR by 2017

### Service industries

The Eurozone crisis continues to impact on the growth of the services sector across the EU. German combined manufacturing and services indicators rose, slightly, in May 2012 but the service sectors in France and Spain showed a slight decline as confidence in the economies remains low<sup>156</sup>.

The UK Commission for Employment and Skills (UKCES) report, based on ONS data, suggest that by 2017, the UK will see a 211 percent increase in jobs in the hospitality sector and a 214 percent increase in jobs in retailing distribution. There will be an 883 percent rise in employment for other business services – accountancy, law, consultancy, advertising and public relations – which are expected to account for more than one third of the jobs growth to 2017<sup>157</sup>. Mike Campbell, UKCES director of policy and research, said the research identified continued rapid growth in areas like IT, business services, financial services, care of the elderly and young people, advanced manufacturing and biotechnology.

If the industries are to prosper, they will need to incorporate a number of changes in a small period of time. The ageing population is chief amongst these. Other factors include the desire for flexible working and the expectations of the new millennial generation.

### Internationalisation

According to research by telecommunications staffing provider Glotel, one in six (18 percent) of those polled said they would like to take up an opportunity abroad within the next five years, while just under one in ten (nine percent) said they would do it within ten years. Millennials are more open to overseas assignments than any previous generation and see working overseas as an important part of their own personal development. A significant majority of the millennials PwC surveyed,

some 80 percent, want to work abroad, with 70 percent expecting to

Millennials are more open to overseas assignments than any previous generation and see working overseas as an important part of their own personal development.

use non-native languages in their careers and 94 percent stating they believe they will work across geographic borders more than their parents did. Whether or not this new international set-up will be realised will in part depend on Government's responses to domestic social issues. New UK government rules, for instance, will reduce the number of jobs open to non-European skilled migrants from 500 000

to 230 000 – fewer than one percent of the UK labour force<sup>158</sup>.

### Networked organisation

Low levels of immigration and an ageing workforce in most European nations will place knowledge management front and central in the coming decade and beyond. If indeed the future of the workplace lies in more dispersed, globally diverse teams, then it would stand to reason that knowledge silos could become a thing of the past. This will place the focus on professional networks – and of leveraging the networks of alumni who have since moved on to other projects. Rand<sup>159</sup>, a non-profit global think tank, believes that the general framework for the future includes this networked economy. It also cites three other factors. Slower labour force growth will encourage employers to adopt approaches to facilitate greater labour force participation among women, the elderly, and people with disabilities. Greater emphasis will be placed on retraining and lifelong learning. Lastly, future productivity growth will support rising wages and may affect wage distribution. →

## Work

### Three features of network-oriented organisations

By examining today's most forward-thinking organisations, Cisco can already identify three features of network-oriented businesses. They are increasingly:

**Borderless:** Networked organisations tend to have relatively porous boundaries separating their own departments from their outside partners, customers, press and other key constituencies.

**Collaborative:** Rather than settling for simple market research 'reconnaissance,' these organisations actively seek out ideas from customers and partners, exchange information with them, and involve them in innovation and value creation.

**Pervasively-networked:** All divisions and functions of the organisation are engaging with customer networks, and digital technologies are used to connect across disciplines and departments within the organisation as well<sup>160</sup>.

### New jobs

But what will the networked economy entail? Will a change in how we work be accompanied by what we do? Rohit Talwar in the 'Shape of Jobs

The demographic ageing process could give rise to mass uptake of old age consultants.

to Come report' of 2010<sup>161</sup> notes that several trends point towards the creation of whole new markets. The demographic ageing process could give rise to mass uptake of old age consultants, whilst a revolt against wasteful industrial farming could lead to vast urban 'vertical

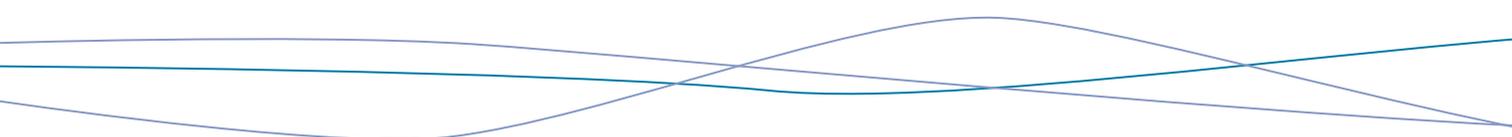
farms,' requiring horticultural and perhaps GM expertise, notes the report. Advancements in social media and healthcare alone promise an array of new jobs and of skill modifications for those already in those industries.

### Green jobs

Over 20 million new jobs could be created in Europe's green economy over the next decade if EU member states adopt Brussels' new jobs package and make low-carbon industries central to their national employment plans. The package has been released in response to spiralling unemployment in the EU27 countries, which hit an all-time high of 10.2 per cent in February 2012. The new proposals, which are designed to help create a more dynamic labour market across the EU, identify the green economy as a means of cushioning the bloc against long-term structural changes that threaten Europe's competitiveness, while also providing an engine for growth alongside health services and ICT.

Welcoming the proposals, climate commissioner Connie Hedegaard wrote on social media site Twitter that energy-efficiency measures could lead to two million jobs by 2020, increased recycling of key materials could create 560 000 new jobs by 2025, and 2.8 million people could work in renewable energy by the end of the decade.

The jobs package also calls for increases in environmental taxes and Hedegaard argued that around 1.5 million jobs could be created by switching taxes from labour to energy and emissions. She also argued that those countries looking to undermine plans to adopt higher energy-efficiency targets as part of the Energy Efficiency Directive would damage Europe's job prospects.



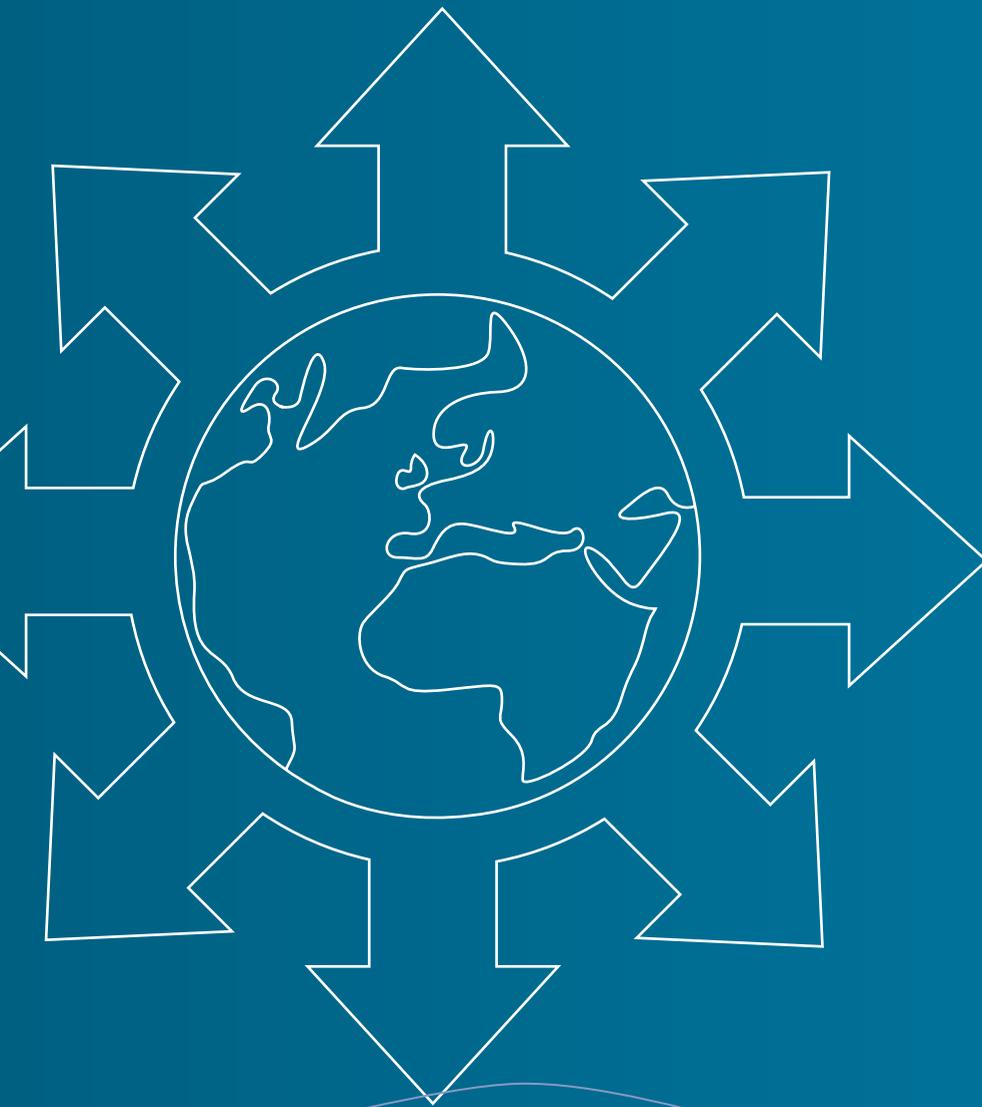


## IMPLICATIONS

- Longer life expectancy will change our attitude to our working lives. We will increasingly live a 'gap' lifestyle – mixing work, leisure, volunteering and care duties.
- Talent recruitment and retention will become increasingly strategic concerns as shortages and up to four generations of workers require more effort to create the right workforce mix, including more women, the aged and the disabled.
- Work-based training will rise in importance as talent mismatches and shortages occur and knowledge transfer from older workers will require conscious effort if it is to take place – at all.
- Strategic foresight and engagement in global talent networks will help identify issues ahead of time.



# Outsourcing



## Outsourcing

The birth of the contract economy, where an agile company core uses outsourcing to reduce costs, increase expertise and allow organisational flexibility is well and truly established today.

### Cost reduction

Outsourcing, in the more narrow and familiar sense that is common in present day business, looks set to strengthen tremendously as a global market. Within the Global Data Centre Outsourcing market, one of the key factors is decreasing cost, thanks to the rise of cloud computing. TechNavio's analysts forecast<sup>162</sup> that the Global Data Centre Outsourcing market will reach \$163 billion in 2014. The cost savings of cloud computing are considerable. With major providers offering desktop deals in the range of \$35–\$75 per head, companies will find their existing deals of \$300–\$1 000 per head difficult to defend, notes Morrison & Foerster<sup>163</sup>.

### Information Technology – Business Process Outsourcing

The National Association of Software & Services Companies (Nasscom), the apex body of India's information technology and business process outsourcing sectors (IT-BPO (Information Technology – Business Process

Changing demographics, increasing affluence and economic growth in Asia/Pacific continues to drive shared services and BPO adoption, especially in Australia, India, Southeast Asia and China.

Pacific continues to drive shared services and BPO adoption, especially in Australia, India, Southeast Asia and China,' T.J. Singh, research director at Gartner, notes<sup>165</sup>. 'There is growing demand for multi-country shared services and BPO services within Asia/Pacific. Buyers continue to invest in services that deliver scalable, high quality and consistent services across their geographical presence.'

Outsourcing)), stated last year that India's share in the global outsourcing market rose to 55 percent in 2010 from 51 percent in 2009<sup>164</sup>. Nasscom said it expects the BPO export market to grow 14 percent to touch \$14.1 billion and is helped by adoption of technology across government, corporate and small and medium businesses.

'Changing demographics, increasing affluence and economic growth in Asia/

The present global services market is characterised by counterbalancing trends. On the one hand, organisations are resorting to offshoring in an effort to cut cost and on the other hand policymakers say that offshoring has led to increased unemployment in their countries and that it has made the economic condition in their countries worse. Even though the effects of slowdown are evident in the global services market, the practice of offshoring is not going to cease.

According to the A T Kearney's Global Services 2011 index, the top three countries are India, China and Malaysia and are ranked 1st, 2nd and 3rd respectively in the index. Their large talent pool and cost advantages are factors in their favour. Asian countries dominate the top ten in the list with Indonesia, Thailand, Vietnam and Philippines securing 5th, 7th, 8th and 9th positions respectively.

The financial crisis in Europe has made the countries outside the euro zone favourable destinations. Countries such as Estonia, Latvia, and Lithuania have become favourite destinations in the domain of Business Process Outsourcing (BPO) and voice support. The UK has improved its ranking and now holds the 16th position and is a major customer outsourcing market. Other major customer markets in the region are Germany and France. The Middle East and North African regions have recently become favourite destinations for companies to outsource their services. Egypt is ranked 4th in the index and first in the region followed by United Arab Emirates with 15th position and 2nd in the region.

The outsourcing industry will face difficulties for a short duration and will enjoy benefits in the long-term as the economy improves.

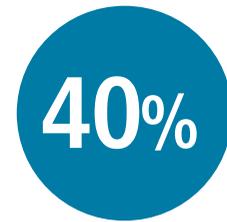
With the trend towards Asian based outsourcing assured. Dr. Ganesh Natarajan, Vice Chairman and Chief Executive of India's Zensar Technologies<sup>166</sup>, forecasts global outsourcing to reach \$1.3 trillion by 2020, with Asia capturing between 80 and 85 percent of the total market by that date.



Amount the Global Data Centre Outsourcing market will be worth in 2014



Predicted worth of global outsourcing by 2020



Amount of revenues that could be captured by India's Engineering R&D providers by 2020

The remaining 15 to 20 percent of the market would be shared by Europe, Latin America and other countries. Interestingly in 2010, Morrison & Foerster note that by one key measure – the volume of outsourcing spending by international firms – Europe is now a bigger outsourcing market than North America. But recovery from recession is predicted to be slower in Europe than elsewhere thanks to structural issues and the ongoing fragility of the euro. This may erode Europe's lead as new outsourcing deal signings are slow to come on-stream.

### Shared services

Businesses and public sector organisations continue to outsource operations, with demand for shared services outstripping traditional outsourcing.

Karl Flinders of Computer Weekly comments in June 2012 on the rise of shared services. According to KPMG research into outsourcing trends 52 percent of organisations in North America, Asia and Europe increased investment in shared services during the last quarter. This compares with 37 percent that have seen increased demand for traditional IT outsourcing, and 27 percent for business process outsourcing (BPO).

The research found that banking and healthcare were the sectors outsourcing the most, with IT, finance and accounting, and HR functions the main candidates. While traditional outsourcing remains a valuable component of business efforts to reduce overheads, relative growth of its use has slowed, KPMG found.

'The relatively weak BPO growth expectations are a reflection of diminished demand for more traditional, generic, transaction-oriented outsourcing arrangements, such as in finance and accounting, in contrast to the greater demand for more specialised BPO,' said Shamus Rae, partner at KPMG's shared services and outsourcing advisory team.

The research also revealed that IT services suppliers are becoming more confident of demand. A significant 68 percent said they were cautiously optimistic about their pipelines growing over the next three months, compared with 61 percent in January<sup>167</sup>.

### Research and Development (R&D)

Perhaps one of the more overlooked drivers in the accentuation of the outsourcing market value by 2020 is that of higher-end work. No longer is outsourcing confined to call centre type work, but as technological advantage converges globally, India and others appear well set to develop high-end research and development (R&D) outsourcing functions. Going forward, India's Engineering Research & Development (ER&D) providers have the potential to capture a 40 percent share of global offshore revenues in 11 key verticals by 2020 according to a 2010 Booz study. 'India is the only country in the world to offer a large third-party engineering vendor base,' according to Sunil Sachan, Principal, Booz & Company (a management consulting firm)<sup>168</sup>.



## Outsourcing

### Strategic partners

Nasscom President Som Mittal notes that, 'due to the growing sophistication of the ER&D services industry, customers have begun to view service providers as strategic partners. India is now an epicentre for global ER&D services with a compelling value proposition.' In this sense outsourcing could well be seen as a strategic industry in the future by economies, and the first step towards the development of strongly aligned vertical industries. Increasing investment in ER&D, has the potential to transform India into an engineering powerhouse over the next decade with the potential to create more than five million jobs.

The Booz study also details anticipated changes in the ER&D landscape in 2020, compared to the current day. Key global drivers of change include a shift in centres of economic activity, notably the emergence of Asia, demographic challenges in mature economies, greater technology convergence and major shifts in industry structures.

Concurrent growth in the Indian domestic market, infrastructure investments by the Indian government, and offset policies are expected to drive growth in the domestic Indian ER&D services outsourcing industry. Indeed domestic demand is expected to contribute between ten and 15 percent of the Indian ER&D market in 2020, with European demand adding another 30 percent. In a sign of changing times, the US market is only expected to provide 45 percent of total ER&D service revenue in 2020, down from 62 percent in 2009. Clearly businesses and policy makers alike will have to contend with an ever more competitive and dynamic global marketplace.

### The future

Businesses have become larger, more global and increasingly virtual and this trend is set to continue, even accelerate. Outsourcing of IT assets and processes and the people who run them is a dying model. Outsourcing customers are looking for more agile, less expensive and lower commitments to vendors and simply want to consume the processing and IT power it needs, when it needs it. They aren't going to be looking to acquire new assets any time soon, they don't want the obligations of ownership and management of IT assets, they simply want to use IT services to prosecute their business plan.

A new market will need to develop where service providers are engaged to meet the needs of the client's business rather than support the IT that meets their needs. It will mean increasingly direct support of a client's business goals, at the point where the activity takes place, rather than underpinning technology that provides a platform for the software to be deployed, that in turn, supports the business. Providers will need to create solutions-in-a-box for their customers to plug into their business model. These solutions will need to be highly adaptable and built as components that can be assembled with other solutions and other providers' solutions for rapid deployment.

New entrants providing innovative back office and vertical solutions are entering the market leaving many traditional outsourcing firms struggling with their less adaptable business model<sup>169</sup>.

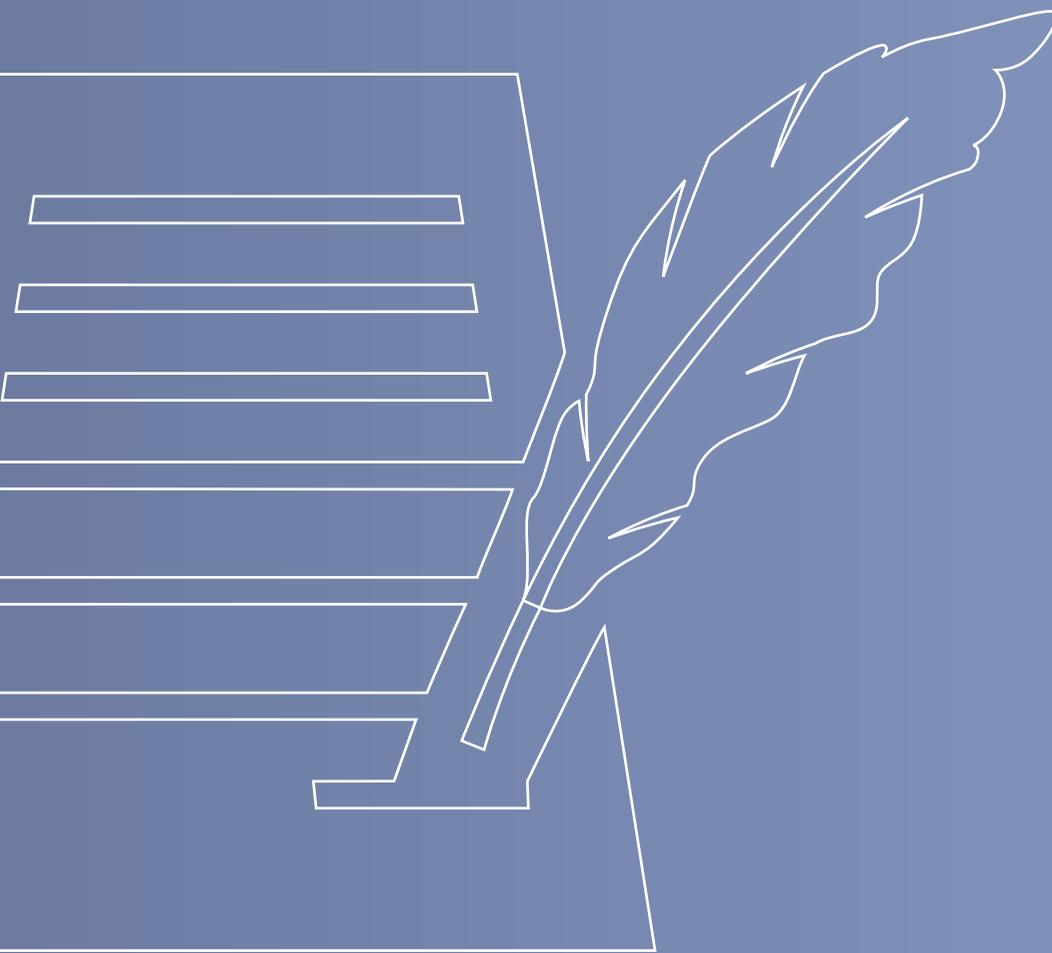


## IMPLICATIONS

- Outsourcing service providers will be required to address highly geographically dispersed and increasingly virtual organisations with adaptable, out-of-the-box solutions.
- Outsourcing of knowledge-based work will increase and the size of the outsourcing service provider will become smaller and more niche, at the same time as global service providers will increase in size.
- Huge potential for growth in the 'Far East' due to vast populations and a commitment to education – but as costs rise expect new 'Next 11' economies to become increasingly important and 'Old World' economies become more competitive.
- As Research and Development is increasingly outsourced – outsourcing firms will be seen as strategic partners.



# Regulation and legislation



## Regulation and legislation



Average retirement age in the EU in 2012



Average retirement age in the EU by 2060



The cost of stress in France every year

Ageing and environmental laws are likely to shape much future regulation and legislation at least within the European Union.

## Retirement

The European Commission has stated the average retirement age in the 27-nation bloc would have to increase from the current age of 60 to 70 by 2060 if workers are to continue supporting retirees at current rates. EU Employment Commissioner Laszlo Andor believes it is urgent for Europe to act now because its working age population will start to shrink from 2012.

Swedish Prime Minister Fredrik Reinfeldt recently said Swedes may have to stretch their working life from 65 to 75 years in order to keep the same standard of living. In France, the major reform featured an increase of the legal retirement age from 60 to 62 years from 2017 onwards. In order to receive full pension payments, French will have to work until the age of 67 in the future. François Hollande, now the 24th President of France, would like to undo some parts of the reform. According to him, people having started to work early would be able to retire at the age of 60 (instead of 62), as was the case before former French President Nicolas Sarkozy's reform. The sole condition is that they must have paid their contributions for a period of about 42 years.

In Germany the highly controversial pension reform became effective on 1 January 2012. The retirement age to obtain a full pension is to gradually rise from 65 to 67 by 2031. In May 2011 Angela Merkel blasted the heavily indebted southern European countries, saying they needed to raise retirement ages and reduce vacation days. 'It is also important that people in countries like Greece, Spain and Portugal are not able to retire earlier than in Germany – that everyone exerts themselves more or less equally. That is important,' Merkel stated. She added: 'We can't have a common currency where some get lots of vacation time and others very little. That won't work in the long term.' In Greece, retirement before the age of 65 is a fading dream for those still in work.

In the Czech Republic, pension reform is one of the main issues of the current Czech government. Its final form was approved in September 2011 and the reform should come into force in January 2013. According to the reform, people currently in their 50's will be able to claim pension at 63, people presently around 20 will retire at 69, and children born this year will retire at 73.

In Slovakia, the retirement age was set at 62 years, both for men and women. Before the fall of the government in October 2011, there was a plan to link the life expectancy among the elderly and the retirement age from January 2016. According to experts the current system is unsustainable and the retirement age will have to go up.

In Poland, Prime Minister Donald Tusk and his ruling liberal Civic Platform (PO) have proposed raising the retirement age for women from 60 to 67 and for men from 65 to 67. This should happen gradually, starting from 2013.

The phasing out of the compulsory retirement age in the UK commenced in April 2011<sup>70</sup>. If an employer seeks to retire an employee who only reaches retirement age after 30 September 2011, they risk a claim of age discrimination unless they can provide objective justification for retirement at that age.

Average retirement age in the 27-nation bloc (EU) would have to increase from the current age of 60 to 70 by 2060.

Under the current timetable, the state pension age will rise to 66 by 2026, 67 by 2036 and 68 by 2046<sup>71</sup>. Overall these moves should have a net benefit for organisations in the form of retention of tacit knowledge and willing and able workers. Whether or not this will be able to make up for a predicted shortfall in skilled migrants is difficult to say. New UK government rules will halve the number of jobs open to non-European skilled migrants. Given the role of networks and of open innovation crossing borders, this may not be a critical issue, but one that no doubt, will impact different industries in different ways.

### Stress at work

The European Commission (2011)<sup>72</sup> has published an evaluation of the agreement to ensure a minimum level of protection against stress at work, concluding that it has had positive effects where implemented.

In France the cost of stress has been reported to reach at least €2 to €3 billion each year.

'Over the last ten years, work-related stress has increased in nine Member States and has only fallen in Sweden. Studies suggest that between 50 percent and 60 percent of all lost working days are related to stress. In France for example, the cost of stress has been reported to reach

at least €2 to €3 billion each year. In the UK it's estimated that ten million working days are lost due to anxiety, stress and depression linked to work. The direct costs related to stress at work are now estimated to be as high as four percent of EU GDP.' A deepening of this law may be possible. →



## Environment

Absent a trade war or implosion of the European project, the other major issue that looks set to drive regulation is that of climate change and the environment. Potential EU legislation centred on the construction of new buildings and allowance of carbon emissions per member state has become major issues<sup>173</sup>. New energy standards for example that require all new buildings constructed in Europe after 2020 to be nearly carbon-neutral<sup>174</sup>, whilst a gradual move to car-free (petroleum using vehicles) cities in 2050 has been targeted<sup>175</sup>. Critics have pointed out that the cost of implementing these targets, together with any ensuing loss of competitiveness will ultimately damage the economy; whilst proponents point to the potentially huge markets that the EU could possibly lead in, such as the green buildings market which is expected to be worth \$606.8 billion globally by 2015<sup>176</sup>.

With its distinct demographic advantage and (currently) low carbon footprint, especially on a per capita basis, impactful Indian legislation is likely in other areas. Capital market regulator the Securities and Exchange Board of India (Sebi) plans to regulate outsourcing by market intermediaries to prevent systemic risk and protect investor interest.

## Operational, reputational, legal and systemic risk

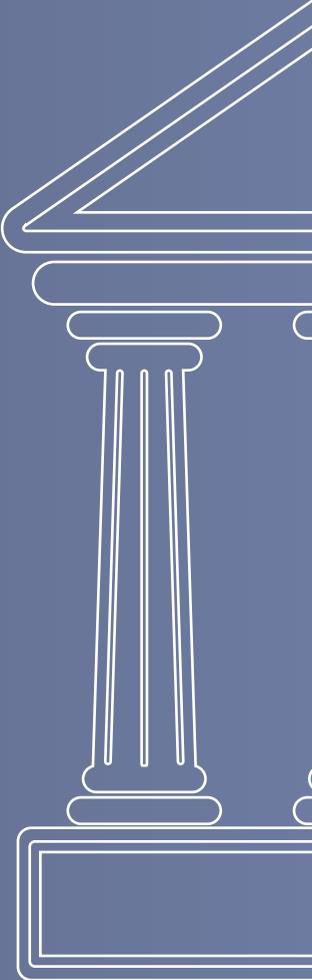
'Outsourcing raises a variety of concerns both for the regulator and the outsourcing intermediary. There are several risks associated with outsourcing such as operational, reputational and legal risks. There is also concentration and systemic risk, if a large number of market intermediaries rely upon one, or a few, third parties for the same activity,' the regulator noted in 2011.





## IMPLICATIONS

- Climate change legislation will impact all businesses, particularly those in Europe.
- Energy and debt will remain important influencers of government policy for the coming decade.
- With less new foreign talent and more older workers, retraining and continuous learning will be at a premium and retirement policy will change dynamically.
- Regulation will seek to reduce risk in outsourcing being concentrated in too few organisations.



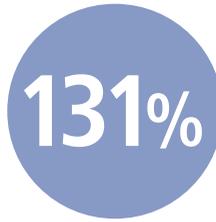
# Government



## Government



Public debt (Percentage of GDP) of Greece in 2011



Public debt (Percentage of GDP) predicted for Italy by 2020



Public debt (Percentage of GDP) predicted for Germany by 2020

Driven by EC directives, budgetary constraints, globalisation, European integration, technological progress, the increasing needs of ageing populations and higher expectations of citizens and businesses, governments are transforming their public administration to be fit for the future. During these current economically difficult times, additional pressures are playing their role, as governments seek to contain civil unrest as unemployment remains stubbornly high and sluggish economies prove difficult to stimulate into growth. Much of this public transformation requires organisational, operational and attitudinal change alongside the adoption of new processes and practices and the engagement of non-traditional outside players to help design and deliver the resulting services.

### Public debt

Nenad Pacek, an economist regarded as one of the world's leading authorities on emerging markets, believes that countries with public debt of 60 percent or more of GDP are inevitably forced into 'deleveraging,'

Countries with public debt of 60 percent or more of GDP are inevitably forced into 'deleveraging,' by raising taxes and cutting government spending.

by raising taxes and cutting government spending<sup>177</sup>. The combination ultimately depresses economic activity. Greece is currently experiencing economic and social turmoil and had a public debt of 165 percent of GDP last year, a wholly unsustainable position. Public debt by 2020 is expected to hit 131 percent in Italy, 124 percent in the UK, 114 percent in France and 97 percent in Germany<sup>178</sup>. Policy makers in

these countries face an uncomfortable decision – dealing with these debts at once risks social unrest and a sharp economic contraction, whilst leaving it be places a structural constraint on future growth. Higher debt and taxation together with reduced welfare and overall governmental spending seems a given, with differences between countries probably only in the specific details. The question all are facing is how to do more with less.

### Balancing the books

Defence is one area struggling to balance its international commitment with domestic funding, as shown in the Libyan intervention. Total worldwide military spending in 2010 was \$1 630 billion, an increase of 1.3 percent in real terms, estimates the Stockholm International Peace Research Institute<sup>179</sup>. This was the slowest rate of growth in ten years. In 2010, the UK and Germany cut spending by one percent in 2010, while France slashed its budget by eight percent. With little prospect of a quick solution to Europe's debt problems, the likelihood of further cuts or spending freezes seems likely. Aside from possible job cuts and their knock-on effects in the defence sector, it remains unclear as to the effect this will have on business.

### eServicing

As a result of the need to provide good service with a limited budget, governments increasingly intend to use online and self service capabilities to service and meet the needs of their citizens. Whatever the reason

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or benefit being sought by government, it is clear that governments are changing how they engage with their citizens. It will require back-end processes, the functions that operate away from the front-line service and point of citizen contact, to be changed, new processes developed and old ones streamlined and automated if the benefits are to be realised.

Although internet users get increasingly involved in shaping and customising the services they want, the involvement of citizens and businesses in collaborative production and design of eGovernment services is still a relatively unexplored topic. The reason for this is that most European governments still seem cautious to engage third parties to deploy collaborative approaches.

The impact of sharing the production of services with others will lead to the creation of more innovative, flexible and personalised services. This will increase the overall effectiveness of eGovernment services and maximise public value.

### Simplify to automate

In Belgium the modernisation and automation of public service administration is being led by the twin goals of simplification and automation. The simplification of regulation such that it can be automated thus removing the need for citizens to be in contact with civil servants at all. This requires back office collaboration with other government departments and middle-ware. A service that makes accessing complex information simpler and helps citizens search for the services they need.

### eDemocracy

The Belgians believe in eDemocracy, which they define as interacting with people, although they are less enthusiastic about eParticipation, which they define as allowing the public to work with politicians to make decisions. They exemplify their commitment to eDemocracy in providing election results the same day as the election in time for any discrepancies to be 'spotted' and investigated before the results are called at 5pm and by midnight the results are final. This form of crowd control helps test the accuracy of information.

### eParticipation

The provision of eGovernment or eServices does not equate to eParticipation, however. The German Ministry of the Interior set out in 2008 to capture the state of eParticipation in German states and cities<sup>180</sup>. A rundown of results for each of the 50 cities shows that citizens overall remain in the role of passive information receiver in urban planning processes. 58 percent of the cities offer citizens the possibility to comment on drafts and concepts but only six percent have virtual polls on urban planning projects. Nevertheless, other areas fared better – some 60 percent of German cities were found to try and include their constituents in the early phase of budgetary planning by offering them the chance to submit ideas – mostly through online forms and in 20 percent of the cases through a participatory budgeting platform. The City of Essen's participatory budgeting effort to generate savings of €381 million, gained a lot of attention, with a total of 3 776 registered users participating; leaving over 2 700 suggestions and 113 000 comments/evaluations. The city is still analysing the data. Besides the use of a forum and polls, citizens could follow the discussion via Twitter which offered additional feedback opportunity. Notably in the spring of 2010, Germany launched a drive for a national eGovernment strategy to commence in 2015<sup>181</sup>.

As of February 2011 Europeans, on average, could access 82 percent of basic public services, such as job searches and benefit guides, online from just 69 percent the year before, according to Europe's 9th eGovernment Benchmark report<sup>182</sup>. On eProcurement, Scotland was the only country that actually has monitored the benefits it has achieved from adopting eProcurement services. In the 2006-2010 period, the Scottish Government has reported almost £800 million in audited savings from eProcurement. →



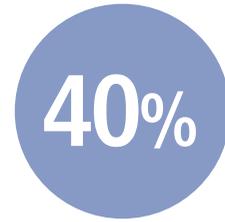
## Government



Amount spent on 'invest-to-save' initiatives by the Welsh Assembly



Amount that will be saved in the long-term by the Welsh Assembly 'invest-to-save' initiatives



Amount pension affordability has fallen by since 2005

### eCare services

In another example, the Welsh Assembly Government has announced additional investment in telemedicine and telecare services. The government has committed £7.3 million to be spent on 'invest-to-save' initiatives including telecare and online booking for ambulances. Another £350 000 will be spent on telemedicine equipment to enable hospital clinicians to make a diagnosis of stroke remotely. The assembly government believes the investment will cut costs by £14 million a year and save £64 million over the long-term.

### Volunteering

Not only is the modus operandi of European governments changing, but so too is its role. Enforced fiscal retrenchment is forcing government to turn to the voluntary sector in some instances. Whether financially or ideologically motivated, the Big Society fits with what Visions of Britain was calling for in 2010, namely 'a move towards local government and local volunteering (that) offers a chance for communities to benefit from the skills and energies of (mostly) older people<sup>183</sup>.'

The 'golden age' of pension income wealth is fading although half the people currently aged between 55 and 64 are planning to retire early. As a result, local activism, volunteering and representation is likely to be biased towards more senior members of the community, particularly when you consider that the 60+ population will rise rapidly over the coming decades.

### Pensions

According to the report 'European Pension Observatory 2012,' published by consultancy Debory-Eres, the replacement rate in several European countries is set to drop significantly due to increasing demographic pressures. The report cited Italy and Poland, which will see replacement rates drop respectively from 68 percent and 56 percent in 2007 to 47 percent and 26 percent in 2060. Jérôme Dedeyan, president at Debory-Eres, said: 'The European pension shortfall is estimated at between 100 percent and 200 percent of the EU's GDP, and the current financial crisis is aggravating those issues. Governments will, therefore, have no other choice than to increase the number of years spent at work, encourage part-time work in retirement and review pension contributions.'

Meanwhile, statistics published recently by the European Commission have shown that one-third of Europe's current workforce would like to continue working even after reaching legal retirement age. Lázló Andor,

Pension affordability has fallen by almost 40 percent since the end of 2005.

commissioner for employment, social affairs and inclusion, said: 'The Eurobarometer survey shows people are ready to remain active as they grow older. I am confident the European year [of active ageing] will act as a catalyst to mobilise citizens, stakeholders and decision-makers to take action to promote active ageing and to tackle the challenges of ageing in a positive way.'

'Despite the lack of data, we can estimate the current capitalised pension's savings in Europe at between 25 percent and 150 percent of countries' GDP,' it said in its report. 'The demographic pressure means this amount is insufficient. The EU should accumulate up to four times its GDP in capitalised pension's savings to compensate the fall of the first pillar<sup>184</sup>.'

The impact of pensions on government goes beyond those in the public sector, however. 2011 research from AXA shows that UK savers could face a shortfall in their pension funds unless they are able to work into their 70's<sup>185</sup>. Pension affordability has fallen by almost 40 percent since the end of 2005 and the average male saver who chooses to go ahead and retire today would face a pension of just over half what he could have obtained five years ago. The female pension affordability age now stands at 71.3 years, meaning women who wish to retire on a similar pension income to what could have been achieved five years ago face staying in work for an additional six years and four months.

### Healthcare

European healthcare is barely managing to cover its costs, according to the Economist Intelligence Unit's 2011 report on European Healthcare. The means of raising the necessary funds is inadequate to cover its costs and those costs themselves are soaring. According to World Bank figures, public expenditure on healthcare in the EU could jump from eight percent of GDP in 2000 to 14 percent in 2030 and continue to grow beyond that date. The overriding concern of Europe's healthcare sector is to find ways to balance budgets and restrain spending. Unless that is done, the funds to pay for healthcare will soon fall short of demand.

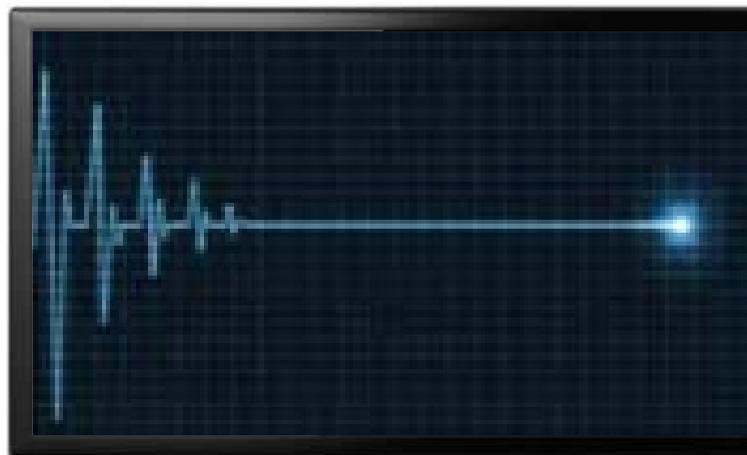
Public expenditure on healthcare in the EU could jump from eight percent of GDP in 2000 to 14 percent in 2030.

Two interconnected trends: the ageing of the population and the parallel rise in chronic disease are fuelling this meltdown scenario. Those financial burdens are being exacerbated by the rising cost base of medical technologies. On the positive side, the prospects for eliminating many diseases are improving rapidly with the mapping of the genetic make-up of people who develop cancer, diabetes and heart disease. This is good news

but is accelerating our life expectancy and increasing the burden of care for elderly citizens on our smaller workforce and on government services<sup>186</sup>.

Insurance companies and other healthcare service providers hold data on the efficacy of the treatments they fund and deploy. Governments and healthcare service providers will need to become more adept at utilising this information to maximise the effectiveness of the available remedies.

So, governments are setting in train a number of measures that have, amongst their goals, the desire to make engagement with their citizens more interactive, higher value, faster, more accurate and more relevant all at a lower cost than at present. All these are worthwhile and in many cases, will need changes to legislation and regulation, attitude and process and organisational and technological infrastructures. It will require that the business of public administration be simplified. →





## IMPLICATIONS

- Internet based and cloud services will be increasingly used by governments to service their citizens' needs.
- Partnership with government will be key in order to shape the workforce of the future, to address society's needs and be provided at lower cost than has been traditional.
- Volunteering will increasingly be integrated into governments' service provisioning, particularly in their old age care services.
- Healthcare will need to use information more effectively to ensure that the most effective remedies and interventions are used.

# About the author

David A. Smith | Chief Executive Officer | Global Futures and Foresight

David is the chief executive of Global Futures and Foresight (GFF). In his 30-year business career he has held senior management positions in both large and small organisations and has gained real insight over that time on how visions of the future, if properly engaged, can help organisations achieve significant change and growth. He has been involved in public sector, commercial and financial markets and has held sales, marketing and general management positions in companies such as the UK-based DRG group and Unisys corporation, the global US IT services business. Whilst at Unisys he held the position of Strategic Marketing Director for their \$2 billion global financial services business.

He co-founded The Global Future Forum in 2000, the Unisys global think-tank and since then established Global Futures and Foresight as a futures research business, helping business and government better prepare for the future. He has worked with many leading organisations around the world including: NATO, Microsoft, INTEL, Siemens, Unisys, Cisco, CSC, Royal Mail, HSBC, RBS, LloydsTSB, Lloyd's, RSA, More Than, DHL, ACORD, Reed Exhibitions, Mace, Mars, SPAR, Kraft, Heinz and many other household names across a diverse set of industries. He regularly works with academic institutions such as the Henley Business School and Tampere University in Finland and industry associations such as the Chartered Institutes for IT(BCS), Marketing (CIM), Purchasing (CIPS) and Directors (IoD).

As a regular international conference speaker and writer he has become recognised as one of the most influential future thinkers in our nation. He is a passionate believer that we are not victims of what the future might hold if we prepare ourselves in advance.

He has appeared on many TV and radio programmes including the UK ITN News, UK BBC, Middle East and Malaysian TV and on UK, Australian, German and South African radio. His experience has shown him the powerful impact that glimpses of the future can have on business and government alike if they embrace the drivers of change and are prepared to adapt.

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# Glossary of terms

A8 accession countries	The eight countries that joined the EU in 2004.	Eurozone	The 17 EU member states that share the euro as a common currency.
Android	Open source software stack (Operating system, middleware and apps) that runs on mobile handsets.	FDI	Foreign Direct Investment.
Apple	Computer and more recently mobile technology manufacturer.	FMCG	Fast Moving Consumer Goods.
B2C	Business to Customer – online interaction.	Fortune Global 500	The world's top 500 corporations ranked by revenue.
BPO	Business Process Outsourcing.	G7	Global seven economies. The 'developed' economies.
BRIC	Brazil, Russia, India and China fast growth economies.	Gigabyte	One thousand megabytes.
Cisco	Computer networks company.	Global Service 100 list	100 global outsourcing firms.
Cloud	Applications, data and processing that is provided by service companies over the internet.	GM crops	Genetically Modified crops. The DNA has been altered.
CO <sub>2</sub>	Carbon Dioxide.	Google	US based, global internet search, cloud computing and advertising technology firm.
Crowdsourcing	Outsourcing tasks to a large, undefined group of people.	Halal	Permissible under Islamic law.
CSR	Corporate Social Responsibility.	IEA	International Energy Agency.
Dementia	Loss of cognitive ability.	iPad	Tablet computer from Apple.
E7	Top seven emerging economies. Countries include People's Republic of China, India, Brazil, Mexico, Russia, Indonesia and Turkey.	IPCC	Intergovernmental Panel on Climate Change.
EBPO	Engineering Business Process Outsourcing.	iphone	Mobile smartphone from Apple.
eCare services	Care services provided over the internet.	IT-BPO	Information Technology – Business Process Outsourcing.
Emerging markets	Relatively recent high growth economies.	Klout	Social Media Analytics firm. Measure social value.
eParticipation	Engagement with government and its services over the internet.	Mashup	Bringing together of two digital components to form a new product or service offering.
ER&D	Engineering Research and Development.	Megabyte	A million bytes of data. A byte is a character such as an 'A.'
eServicing	Providing services over the internet.	Micro-SD card	Small memory card used in mobile devices and digital cameras.
EU	European Union (27 member states as at 2012).	Microsoft	US based computer software company with a wide range of products.
European Commission	The executive body of the EU.		

Millennials	Age cohort born somewhere between mid 1970's to the turn of the millennium in 2000.
NGO	Non Governmental Organisation.
OECD	Organisation for Economic Co-operation and Development.
ONS	Office for National Statistics.
Peerindex	Social Media Analytics firm. Measure social value.
Petabyte	One thousand terabytes.
PPP	Purchasing Power Parity.
R&D	Research and Development.
Reverse innovation	Innovations designed for emerging markets that are re-imported to developed economies.
RICS	Royal Institute of Chartered Surveyors.
Sebi (India)	The Securities and Exchange Board of India.
Smartphones	Mobile phones that have computer-like capabilities.
Standard and Poors 500	500 large US companies that are traded on either of the two US stock markets.
Terabyte	One thousand gigabytes.
Twitter	The short-form online blogging service. Each message is limited to 140 characters.
UKCES	UK Commission for Employment and Skills.
UN	United Nations.
UNCTAD	United Nations Conference on Trade and Development.
WEO	World Energy Outlook.
World Economic Forum	Forum held at Davos where world business leaders meet to discuss major issues each year.
WWF	World Wildlife Fund.
Zettabyte	One billion terabytes.

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