

# Smarter Energy for a Sustainable Future

Report based on proceedings at the IBM Summit at Start



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When one tugs at a single thing  
in nature, he finds it attached  
to the rest of the world.

*John Muir, author and naturalist, founder of The Sierra Club*

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## Executive summary

Only the most hardened climate deniers and sustainability sceptics now argue that we can continue indefinitely to live and to consume as we do now. We are heading for deep trouble and possibly for disaster, driven by our historic disregard for the scarcity of resources and the collateral damage our progress has created. The evidence is increasingly stark and the range of issues is broadening across all social, natural and economic systems. The problems are both massive and systemic; our response must be worthy of that challenge.

More than 120 business, government, community leaders and commentators attended the Smarter Energy for a Sustainable Future day (Day 2) at the Summit. They concluded we need to act faster and work together across industry and country boundaries; they left determined to make change happen. Their debates and comments are covered in this report - below are some of the key points that were made:

- The UK faces imminent energy shortages, with 2016 being the key year. Nine fossil fuel stations and four nuclear plants are scheduled to close by then, driven by greater safety regulations and binding emissions targets, which means a 10% loss in generating capacity
- A key element in heading off imminent energy shortages is to reduce our consumption. Energy efficiency measures are therefore critical to any strategy for the UK

- The application of smart technology and behavioural change may allow us reduce some of the demand, closing at least part of the looming energy gap
- Behavioural change is required in energy users. People don't know how much energy they are using or how changing day-to-day behaviour or investing in efficiency measures could help. Given that 5-15% savings can be achieved when direct feedback is provided to the consumer, it is clear that changing behaviour could at least influence some significant savings in domestic homes
- Governments are likely to continue to fail to come to even simple agreements through the IPCC, let alone agreeing how to re-engineer the whole system
- Representatives from generation, transmission, distribution, retail, and large energy users were all in accord on the need for better collaboration through information sharing, standards, and common platforms
- Smart Grids are the prize for the future. Smarter demand management is one of the keys to smoothing out energy supply requirements, and the ability to balance variable supply and demand makes a higher level of renewable generation possible
- Policy stability is important. The threat to the very large and long-term investments required to re-create the national energy infrastructure is not the level of taxation or regulation, it is instability.

## Smarter Energy for a Sustainable Future

### Outline of the day's agenda

#### KEYNOTES:

Government vision:	Charles Hendry, Minister of State for Energy & Climate Change
Shell energy scenarios:	Dr Peter Snowdon, Head of Downstream Comms, Shell
Sustainable energy & water:	John Granger, GM, GBS, NE IOT, IBM

#### DEBATES:

Policy and economics	Building the new energy system
Collective action versus market forces	Driven by demand — managing the new infrastructure
Driving social change	New business models for energy in new economies



## What is sustainability?

Sustainability: most people think it's a good idea, some people are passionate about it, some are truly ambivalent or even hostile to the notion, but everybody has a different definition. It is therefore important that we establish a definition to use as a baseline for this report. Sustainability, simply put, is **the capacity to endure**<sup>1</sup>.

At a global level: we live on a planet that is a complex inter-dependent set of eco-systems, and increasingly, socio-technical systems; sustainable behaviour is therefore that which ensures the **environmental** balance is maintained, allowing human civilisation to continue to survive.

At a regional/national level: we must maintain the **economic** structure of our society – markets, businesses, profits, infrastructure and jobs; societal stability in turn ensures the long-term demand for, and the sustainable growth of, products and services. Along with progressive **social** policies on equality and well-being, sustainable markets, businesses and societies aim to create long-term opportunity for all.

These three elements – economic, social, and environmental (also referred to as profit, people, and planet) – form the basis for the Triple-Bottom Line (TBL, figure 1), a simple description of the elements involved. The problem is that for many – particularly those of us charged with delivering hard, short-term results – the social and environmental appear to **detract** from the economic; they are seen as blockers.

It is this central dichotomy that is often cited as the reason for sustainability being a hard sell in business. But it shouldn't be; organisations and those leading them want to survive and prosper as much as they ever did. The only issue is to illustrate both the urgency of taking action and the importance of **all three factors** in ensuring their organisational and individual survival.

We find ourselves at a unique point in our history. Unlike previous generations, we know that we are causing irreparable damage to the planet and that, regardless of arguments about the causes, significant changes in how we live must be achieved.

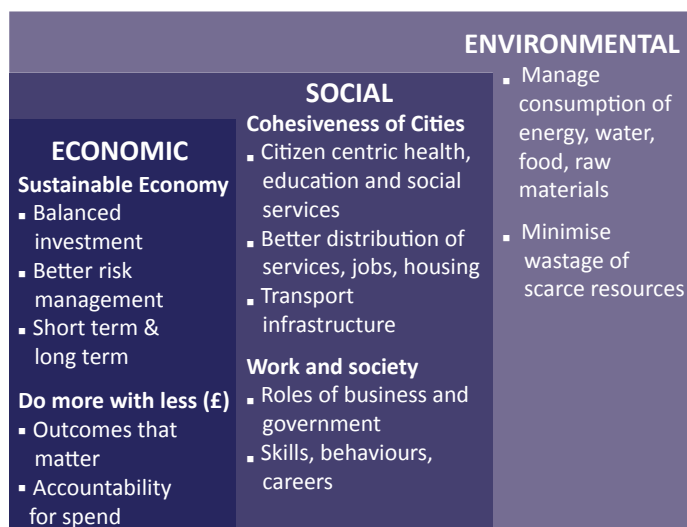


Figure 1. One representation of the triple bottom line

We must discover how to deal with the biggest impacts humans make on this planet, including:

- Population growth.** Population growth is at the core of the sustainability challenge. There were 1.75 billion people on the planet in 1910; today there are 7 billion, and by 2050, the UN estimates that the global population will peak at around 9 billion.
- Resource depletion.** The development of the 'Western' lifestyle over the past 60 years has greatly exacerbated the population problem – a lifestyle based on quantity rather than quality, and on consumption as a validation of our national and individual success. Powered by cheap energy and mechanisation, it's been easy and we could afford it. But we have taken little notice of the 'collateral damage', and as a result we are using up the planet's resources and damaging ecosystems at an alarming rate.
- Unaccountable growth and consumption.** The hidden costs (or 'externalities') of some of our activities are now recognised – not least the estimates of the cost of climate change brought about by GHG emissions from fossil fuel use over the past century. Lord Stern's estimate of 2% of GDP (£28bn annually in the UK alone) to counter climate change is dwarfed by estimates of the economic damage in prospect (for example the figure of \$20tn annually by 2100 by the German Institute for Economic Research (DIW)).

<sup>1</sup> The Bathwick Group's definition, which separates the capacity to endure (surviving) from sustainable development (thriving), which is growth that has at most a neutral social and environmental impact.



## Common themes from the Summit

### Collaboration is key to progress

There are few challenges within organisations that can be solved by an individual employee or a single department, and few challenges in sustainability that can be addressed by a single organisation operating in isolation. ‘We need to collaborate more’ was a key conclusion of every day of the Summit at Start; collaboration is the key to unlocking creativity, finding new ways of approaching familiar problems, and generating widely-accepted solutions. We know however that few organisations collaborate well, internally or externally. Over the past five years The Bathwick Group has analysed how and why this is so. Individual and corporate insecurities, unhelpful reward systems and competitive sensitivities are among the issues that combine to inhibit openness and sharing of data and ideas.

Collaboration is about changing the way individuals think and organisations respond, finding more effective business process alignment, and encouraging trust and positive behaviours. Achieving such change is at the heart of finding the efficiencies, technologies, and market models that will define a more sustainable future.

### Complexity requires systems thinking

The complexities of organisations and markets are a barrier to understanding and change. The developed world today is a network of inter-dependent socio-technical systems, in which changes of any type have systemic impacts that are hard to foresee in the normal scope of an individual’s role. Few people ever experience more than a small part of the picture, and the decisions they take will only be appropriate within the context of their understanding.

Creating predictive frameworks and more holistic decision support models requires systems thinking – the process of understanding how things influence one another within the whole – which is an unusual set of skills. Few organisations employ such skills, except perhaps in strategy or technical design roles, but in an increasingly connected world systems thinking is becoming important. We would do well to recognise, nurture and value the appropriate skills, as second- and third-level impacts are increasingly

coming to define the effectiveness, and therefore the success, of most organisations.

### Data and metrics are the basis for finding solutions

We generate enormous quantities of data within our organisations, much of which languishes in silos, unused for lack of capacity, the right tools or skills to process and analyse its meaning. The amount of data, and the number of sources from which it comes, is spiralling upwards every day; we can’t hope to understand either the scale of the challenge we face or the best routes to a solution unless we learn what we know, and how to gain valuable insights from it.

Peter Drucker famously said “If it can’t be measured, it can’t be managed”. In a sustainability context, if you don’t have information on the impact of your operations and your activity, you won’t be able to manage that impact down. Worse, you can’t enumerate and report success.

### Solutions require atypical personal and corporate behaviour

Of all the challenges we face in becoming more sustainable, individual and organisational behaviour will perhaps be the hardest to address. Personal and corporate insecurities, consumption-oriented lifestyles, unhelpful corporate cultures, a focus on the short term, and a lack of awareness (or unwillingness to understand) inhibit our ability to effect change. They make us believe that what we do individually makes little difference, and help us to hide behind competitive sensitivities to justify inaction. Will it be more carrot or a bigger stick that will produce the changes we need? Probably both, and applied without fear or favour, according to delegates at the Summit.

Scottish philosopher David Hume wrote “All plans of government, which suppose great reformation in the manners of mankind, are plainly imaginary”. In other words, good luck with changing human behaviour. In the 250 years since that was written, have we learned enough, and are we optimistic enough, to prove him wrong?



## Summary of proceedings

### A crisis is imminent



**The Electricity Market Reform package we are consulting on in the autumn will be one of the most important things we do in this parliament. If we get it wrong, prices will rise or lights will go out, or both.**

Charles Hendry, Minister of State for Energy and Climate Change

Our economic prosperity is based on energy, yet we face imminent shortages, with 2016 being the key year. Nine fossil fuel stations and four nuclear plants are scheduled to close by then, driven by greater safety regulations and binding emissions targets, which means a 10% loss in generating capacity, even taking into account planned and new power generating facilities coming on line. The earliest that other new plants could come online is 2018, which leaves the UK a window of at least 2-3 years in which power blackouts will be unavoidable unless we find ways of lowering consumption or find ways to defray loads on the National Grid (for example through micro-generation).

As Shell's Global Scenarios work points out, there are three hard truths about energy usage around the world:

- World population growth combined with economic development is driving a surge in energy demand (doubling over the next 20 years at current rates).
- Supply will struggle to keep pace; all sources of energy compete for skills, base resources, and investment, and new sources and technologies take a long time to develop.
- Environmental stresses are increasing (which require a halving of CO2 emissions by 2030).

*For the past 30 years, Shell has conducted scenario planning exercises as an input to long-term strategic planning. The scenarios describe two models: Scramble and Blueprints.*

*Scramble describes a world where short-term thinking is the norm, and we are scrambling to keep the lights on. Characterised by an increasingly nationalistic viewpoint in which issues like environment are recognised as important but there is a belief that someone else will sort them out. People look at the hard truths and find them overwhelming. The government focuses on increasing supply to satisfy growing demand. But by around 2020 supply hits the buffers and governments realise they need to intervene on the demand side – limiting usage of electricity, transport, etc. It's a very volatile time economically and politically, where events outpace actions and environmental challenges only start being properly addressed by 2030.*

*Blueprints is more ordered; effective CO2 pricing stimulates technology development, and efficiency and innovation in transport. There is a broader anticipation of the challenges and early actions are taken, including aggressive efficiency measures and standards, a shift to electrification, a new infrastructure carrying more renewable energy sources, and CCS emerging after 2020.*

The task, and the investment required, is huge



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**Ed Miliband referred to the ‘holy trinity’ of renewable, nuclear, CCS – we need the ‘holy grail’ – clarity of policy from government, energy efficiency from business, and consumer cooperation.**

Sara Vaughan, Director of Regulation and Energy Policy, E.ON UK

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Rebuilding our energy infrastructure will require enormous investment, at a time when we can least afford it. The scale of investment is daunting – £200bn or more will be needed over 10 years to remake the UK’s energy infrastructure<sup>2</sup>. The conundrum is how we will pay for it; consumers will end up shouldering the bill in some form, but how painful that becomes will depend on how we approach the task. It may be a combination of increased energy costs, smart new models of long-term amortisation of the investment, and increased public funding through the tax system.

In any case, we will also need a virtuous circle of stable policy to provide a basis for long-term investment by private companies, collaboration across the industry to both lower costs and provide the right conditions to implement a Smart Grid, and consumer awareness and energy efficiency. Of course, the application of smart technology and behavioural change may allow us reduce some of the demand, closing at least part of the looming energy gap.

The era of cheap energy is over



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**We are paying for years of cheap energy now. We have to be honest about the costs for the future – for every energy source. For nuclear, it’s paying for waste, for hydrocarbons its carbon, and so on.**

Ian Smale, Group Head of Strategy and Policy, BP plc

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2 Source: Ofgem: Project Discovery

However we achieve infrastructure redevelopment, the era of cheap energy – from whatever source – is over. Perhaps more accurately, we are coming to recognise that the cheap energy we have enjoyed for the past few decades was effectively subsidised to a significant extent – the cost of fossil fuel-based products has always failed to take into account the costs associated with pollution externalities. This is usually seen as carbon emissions that create climate change, but should also include other gases (Nitrogen and Sulphur Oxides, Methane, etc.) and particulates that impair air quality. In the same way, the price we paid for nuclear-generated energy did not include decommissioning costs, which we are paying now as a huge and unavoidable capital expense – more than 70% of the budget of the Department of Energy and Climate Change today is absorbed in decommissioning.



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**The first and foremost issue is to price energy properly; we should have a proper carbon price.**

Ian Smale, Group Head of Strategy and Policy, BP plc

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Whatever we do in the future, and however our energy is generated, we must create a real cost for the energy we consume. The price of carbon – currently only around €16 per tonne, needs to rise significantly if action is to be taken. Energy needs to be more realistically priced, and long-term investments require the certainty that new supplies, from wind to nuclear, will be financially viable. Creating a realistic price for the energy we consume would be politically difficult, but is necessary.

We are scrambling at the moment



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**Even in a scenario in which you’ve pulled all the efficiency levers, enabled new technologies to develop and be deployed rapidly, it still isn’t getting us to where we want to be in climate terms.**

Dr. Peter Snowdon, Head of Downstream Communications, Shell

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Shell's Scramble vs Blueprints scenarios outline two potential scenarios for how we tackle the energy challenge. Today, we seem to conform more to the 'Scramble' scenario than to 'Blueprints'.

The primary reason that the 'Blueprints' scenario seems unlikely is that it requires a global carbon price – and we've seen governments fail to come to even simple agreements through the IPCC, let alone agreeing how to re-engineer the whole system.

The bad news is that the Massachusetts Institute of Technology (MIT) worked on models to understand the likely carbon concentrations from each scenario; the 'Scramble' scenario showed a figure of 1,000ppm by 2100 – far above the 450ppm required to limit climate warming to 2 degrees centigrade<sup>3</sup>.

On a positive note, we seem to be recognising the need for energy efficiency, which is the only way to limit spiralling demand, and we are finding ways to empower people to make changes and find solutions at a local level.

There is no silver bullet, no single technology



**There are no silver bullets; we don't see any technologies that will change the game.**

Dr. Peter Snowdon, Head of Downstream Communications, Shell

There is no single technology available today which will enable us to change the course of events over the next 40 years. Gas, which is relatively cheap and relatively clean, has a key role to play as a bridging fuel and as an alternative to the irregular provision of renewables.

<sup>3</sup> Limiting global warming to 2°C is widely seen as relatively 'safe', and the minimum we are likely to achieve even with significant early action. The IPCC estimates that 1000 ppm CO<sub>2</sub>-eq would see a global temperature rise 5.5°C, which would equate to 8°C or more over large landmasses, and result in extensive desertification and mass extinctions. As a comparison, 5.5°C is roughly the same temperature difference between now and the end of the previous ice age.



**Just in the US, the total CO<sub>2</sub> capture volume would be equivalent to the whole volume of oil and gas extracted around the world. How could you deal with it? We would have to re-engineer the whole oil industry backwards.**

Ian Smale, Group Head of Strategy and Policy, BP plc

Carbon Capture and Storage (CCS) is not necessarily the answer – it reduces the efficiency of generation (by as much as 30% in coal-fired stations), and in any case there is too much CO<sub>2</sub> produced from the burning of hydrocarbons to deal with.

Of course, looking at how technology has developed over the past 40 years shows how difficult such predictions are. New technologies, or developments of existing technologies, may well produce step changes we cannot foresee today, but we cannot rely or plan on such an outcome. We will need to plan for the deployment of all the economically viable generation options known to us today – all renewable types, and nuclear. Economic viability depends to a great extent on volume, and on the carbon price, both of which will be determined by government policy.

Energy efficiency is vital and needed immediately



**Energy efficiency is critical – the most efficient and carbon-free megawatt is the one we don't need to generate.**

Summit delegate

Given the earlier findings, a key element in heading off imminent energy shortages is to reduce our consumption. Energy efficiency measures are therefore critical to any strategy for the UK. There are four key elements of addressing demand-side efficiency:

- Reducing (eliminating!) unnecessary usage in all its forms
- Avoiding inefficient use by changing our behaviours
- Smoothing demand variations by scheduling usage more effectively
- Applying new technologies, such as smart grids

Any efficiency measures will need to address the largest consumers of energy – buildings and transport. Given that nearly 90% of buildings that will be in the UK in 2050 are already built<sup>4</sup>, measures to retro-fit energy efficiency solutions are critical. The last government introduced the Carbon Reduction Commitment (CRC) legislation for the top 5,000 energy consumers in the UK, and the new coalition is just now consulting on a range of legislation including the ‘Green Deal’ aimed, amongst other things, at making small businesses and existing housing stock more energy-efficient.

But efficiency measures must go further than incentives; we should be educating every organisation, however small, and consumers about the realities, and providing tools and techniques to downsize consumption. In the short term, the low-hanging fruit includes highly inefficient electrical equipment and house insulation for example. In the longer term, perhaps the best way of achieving real efficiencies lies in the creation of smarter ways to manage demand, through Smart Grids.

Supply-side efficiencies are also important, including more efficient generation and distribution technologies.

### Changing consumer behaviour is important in reducing consumption

Consumers are relatively disinterested in changing how and when they use energy. As long as the price differentials are not too great, we will continue to use as much energy as we want, when we want it. As long as the provision of energy is simple and invisible (and without penalty for inefficient use), consumers and business customers are likely to carry on regardless.

As an Environmental Change Institute paper<sup>5</sup> noted in 2006, “Most domestic energy use, most of the time, is

<sup>4</sup> Source: University of Oxford

<sup>5</sup> ‘The effectiveness of feedback on energy consumption’, Environmental Change Institute, University of Oxford, 2006

invisible to the user. Most people have only a vague idea of how much energy they are using for different purposes and what sort of difference they could make by changing day-to-day behaviour or investing in efficiency measures.” Given that the paper notes that savings from direct feedback (immediate, from the meter or an associated display monitor) typically range from 5-15%, it is clear that changing behaviour could at least influence some significant savings in domestic homes.

In the view of Summit attendees however, changing consumer behaviour is likely to require sticks as well as carrots, such as council tax additions, stamp duty variance, and significantly variable pricing. Joined-up thinking in local and central government could provide greater incentives also, by integrating planning policy with council tax for example, or rewarding community efforts to lower consumption or to implement local micro-generation grids.



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**We have to find ways to make wasting energy socially unacceptable.**

Summit delegate

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To make such behavioural changes endure, and applying equally to any aspect of sustainability, many delegates talked about the advantages of making waste of any type socially unacceptable. Introducing penalties for poor behaviour and (later) incentives for good behaviour could nudge people in the right direction.

### Smart Grids are the prize



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**In the past, the challenges we faced was to find new sources of oil, gas, or coal. Now, the solution is as much about technology as it is new sources of new fuel.**

Charles Hendry, Minister of State for Energy and Climate Change

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The United States Department of Energy's Modern Grid Initiative report contains a neat description of the characteristics of a Smart Grid. The report says that a Smart Grid must:

- Be able to heal itself
- Motivate consumers to actively participate in operations of the grid
- Resist attack
- Provide higher quality power that will save money wasted from outages
- Accommodate all generation and storage options
- Enable electricity markets to flourish
- Run more efficiently
- Enable higher penetration of intermittent power generation sources

Oddly, one of the most important features of the smart grid is not included in the definition — the ability to balance variable supply and demand, and to smooth out demand peaks and troughs.

In terms of balancing variable supply/demand, a Smart Grid would:

- Allow for the connection of intermittent power sources (which many renewable are)
- Allow therefore for the expansion of micro-generation and local grid facilities
- Provide for much better storage facilities; not just major pumped storage hydroelectric facilities like Dinorwig, but using (for example) electric vehicles as distributed batteries
- Enable variable pricing and usage-smoothing plans
- Allow consumers more control over their usage and their bills

Smarter demand management is one of the keys to smoothing out energy supply requirements. Today, demand for electricity drops overnight by about 40% from peak usage during the day. So a large proportion of our generating capacity is only needed for half the day because we all do things at the same time; smoothing demand for non-time critical activity would avoid building new power stations, even if overall demand was not curtailed.

It should be noted that concerns about privacy must be addressed; some people characterise smart grid technology as a 'spy in the home' regardless of the obvious benefits to individual consumers and society in general. In reality, such concerns pale in comparison to other issues we have already accepted – like mobile telephony, Internet banking and online retailing.

### Complexity and inter-connectedness are major hurdles

The energy sector is incredibly complex and inter-connected, so any change is systemic in nature and tough to implement. It's a little schizophrenic – the engineering is highly complex, but the consumer sees (and expects) simplicity. How, by working together more effectively, could the industry remove some of the complexity and making the engineering simpler, rather than just hiding it?



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**The energy system is big, complex, it's got many parts, and the existing legacy infrastructure doesn't change quickly or easily. The challenge is to make all those parts work together more efficiently.**

Summit delegate

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### Collaboration is at the centre of all solutions

The call for collaboration was clear in every debate within the Energy day at the Summit. We have already covered the hurdles of collaboration earlier in the paper; but what was interesting was that the call for collaboration, and for regulators to remove the artificial barriers to co-working on solutions, came from every part of the industry. Representatives from generation, transmission, distribution, retail, and large energy users were all in accord on the need for better collaboration through information sharing, standards, and common platforms. Delegates all saw major inefficiencies in the way we operate today, and significant challenges to finding the solutions we need to address our immediate problems, let alone long-term sustainability. But there is a high level of ambition to find those solutions, which we should not squander.

### Policy stability is required

There was a clear call to government and regulators from delegates on the day: whatever decisions need to be made about future direction, make them and stick to them (within reason of course – future events may enforce changes, but political changes of wind should not be among them). Like any public policy framework, the threat to organisational action and investment is not the level of taxation or regulation, it is instability – particularly in relation to the very large and long-term investments required to re-create the national energy infrastructure.



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**I would make a plea for stability in policy. Nothing is more damaging to investment than uncertainty.**

Summit delegate

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Despite the international and connected nature of the markets, we cannot afford to wait for international agreements to emerge, whether on carbon pricing, reduction targets, or any other measure. We have to take decisions at a national or regional level, set the framework, and commit to it in the long term. Without that commitment, it is unlikely that the private sector could make the investments required.



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**Do we have a stable policy framework? Does it give a clear signal? The answer is clearly no – there has been no global agreement, and probably never will be.**

Ian Smale, Group Head of Strategy and Policy, BP plc

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### The patchwork of utility regulation must be simplified

Hand in hand with stable policy, regulation needs to be simplified and work towards positive outcomes. We have many areas of regulation today that inhibit innovation in finding solutions to sustainability challenges. The

patchwork of utility legislation and regulation also works against collaboration, just when we need to work together. Could we consider suspending some parts of those regimes to work on projects that would allow cross-industry and cross-functional collaboration?

### Incentives must be clarified and regularised

As well as the sticks and mandates of legislation and regulation, there are structural irregularities in incentive frameworks. The patchwork of responsibilities split across multiple regulators and government departments also results in a lack of consistency with regard to how new technologies and techniques are developed.



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**Policy needs to be joined up. We usually focus on individual generation technologies in isolation, and we end up with different incentives for different sources. We should think of them together.**

Sara Vaughan, Director of Regulation and Energy Policy, E.ON UK

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A more joined-up approach would ensure that individual technologies are not unreasonably promoted (or suppressed) – as we noted earlier, we need every technology that we know about to be investigated and deployed where appropriate to address the challenges. It would also result in fewer reversals of policy, where an individual well-intentioned incentive is seen to distort the market, and is reduced or withdrawn within a year or two of its launch.

### We need a vision for the future



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**Stories capture the essence of what we need to do, and could form the basis of how we communicate with customers.**

Summit delegate

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Parallel with the sticks and carrots of behavioural change, it is important to provide a simple and powerful vision of what the future could look like, and why it would be better. Echoing the original vision behind Start – of providing a positive message about sustainability – delegates were clear about the desirability of a compelling vision of the future, delivered in a way that people can understand

The situation is not all doom and gloom – we are seeing elements of action in many areas of work. Creating a vision is as much about joining up all those pockets of success and collaboration as it is about imagining a better future. It's not just about how we need to start, but where we will end up; it's about giving people an aspiration.

THERE IS AN URGENT NEED FOR...  
**NOVEL NETWORKS**

11,000 MILES OF CHAINING TARGET FOR WIND AND TIDAL TECHNOLOGY  
ALRIGHT GUY!  
DEVELOPMENT OF INDIVIDUAL SKILLS  
UK SHOULD BE LEADING THE WORLD  
WITH THE CONSUMER AT THE WHEEL  
DRIVEN BY EVIDENCE

\$200 BILLION REQUIRED TO REPURPOSE ENERGY INFRASTRUCTURE  
TOO MUCH INVENTION AND NOT ENOUGH INVESTMENT  
WE HAVE TO REINVENT THE ENERGY MARKET

CARBON CAPTURE AND STORAGE

DEMAND ECOSYSTEM

147 NATIONS - HARD TO GET CONSENSUS

LOCAL AGREEMENT MORE POSSIBLE

AGREEMENT

MAKE A NEW START

SMARTER ENERGY FOR A SUSTAINABLE FUTURE

LET'S START ON MONDAY MORNING!

SUPPLY

GREATER COLLABORATION

BUSINESS CUSTOMER

PUT BUSINESS AT CORE OF THE REVOLUTION

BOLD STEPS

INTERCONNECTED: THE INTERNET OF THINGS

SUSTAINABILITY IS AN OPPORTUNITY

CREATE FRAMEWORK OF INCENTIVES FOR EFFICIENCY

PERMISSION TO BREAK REGULATORY RULES FOR THE GREATER GOOD

SMART GRID  
UTILITIES NEED TO ANTICIPATE CUSTOMER NEEDS

JOINED-UP STRATEGY  
WATER ENERGY TELCO  
3, 2, 1, GO

WE NEED PACE - IN THE RIGHT DIRECTION

SOLUTION

WROOOM!  
CAN WE MAKE THE GOVERNMENT A BETTER EXAMPLE OF ENERGY EFFICIENCY?

CAN WE MAKE THE GOVERNMENT A BETTER EXAMPLE OF ENERGY EFFICIENCY?

WILL EVERYONE CHANGE THEIR E.V. AT THE SAME TIME CAUSING A REACTIVE COLLAPSE ON THE GRID?

SUSTAINABLE SECURE AFFORDABLE  
BETTER SOLUTION

An Era of Revolutionary Change!

THE UK ENERGY MARKET, REGULATION, TRANSMISSION AND DISTRIBUTION ARE FRAGMENTED

SCRAMBLE BLUEPRINT  
SUPPLY DEMAND CO2  
THERE IS NO SILVER BULLET  
LET'S KEEP THE LIGHTS ON  
THIS IS A GREAT OPPORTUNITY

THE NEXT 5 YEARS ARE CRITICAL

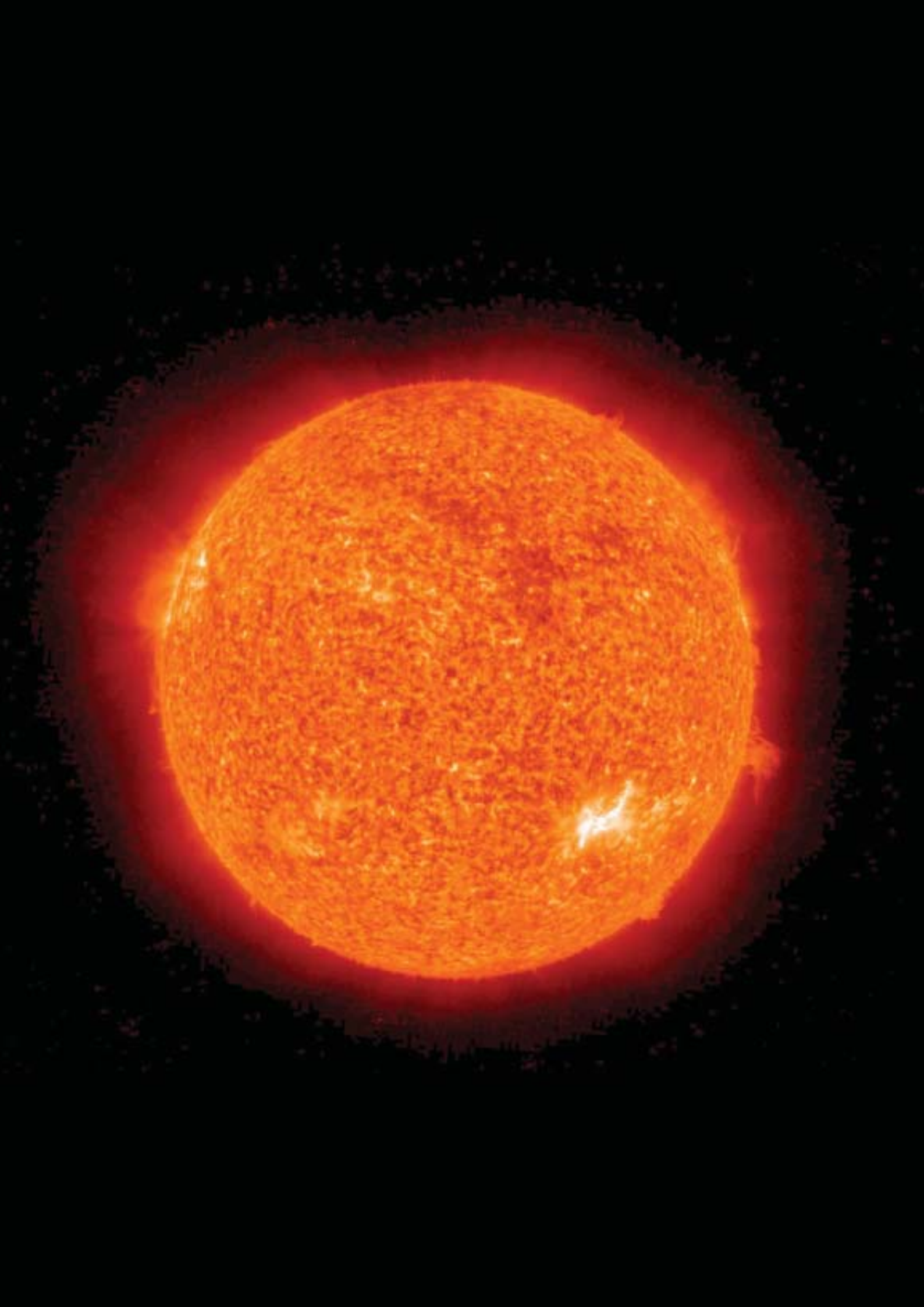
WE NEED HOME ANALYTICS AND SMART APPLIANCES

SHOULD WE FOCUS BEHAVIOUR CHANGE ON YOUNGER GENERATION?

WE NEED A BIG PICTURE OF BEHAVIOUR

WE NEED A BIG PICTURE OF BEHAVIOUR

BEHAVIOUR



## Next steps: developing the themes

### Harnessing the momentum of the Summit

There are a number of proposed collaborative projects that were suggested at the Summit, which are outlined here. Many delegates at the Summit committed to working together to find solutions. What is happening now with that mandate? A number of projects have already been identified and are underway; over time, the continuing conversations will no doubt spawn others. Among the projects already identified are:

#### A WORKING PARTY ON PLATFORM SHARING OPERATIONAL EVENT INFORMATION/GOVERNANCE

Set up a working party to take a stronger position on industry/government collaboration, to lead on policy and deploy programme management skills to correlate existing and future work. Many leading players in the industry are working with academia and partners in the supply chain, but such efforts must be coordinated to create real change. The industry can take the lead by setting up an open 'smart energy' forum to share information and innovation.

#### DESIGN AUTHORITY

Create a workshop series to discuss a new network code set to identify events across all sectors and the supply chain, to improve energy network governance. The objective will be to create a design authority that would integrate the components of policy, code, and design.

#### BUILD A COMMON POLICY/STRATEGY ACROSS CARBON, WATER, ENERGY

Create workshops to consider and make recommendations on policy and regulatory frameworks – for example to consider creating a single body from the existing Ofgem and Ofwat regulators.

#### PRICING AND INCENTIVES PROJECT

The change in consumer attitudes needs to be abrupt; the pricing and incentives project will consider issues such as the introduction of a 'real' price of energy, or a variable pricing model which would charge on a sliding scale for consumers over- or under-shooting a normal usage profile.

It will also consider a range of other incentives that would speed up the introduction of new technologies such as smart meters.

#### GOVERNMENT CITIZEN AWARENESS CAMPAIGN

There needs to be strong central communications around the energy challenges that the UK is facing. In the past, the government has deployed hard-hitting advertising on HIV awareness, anti-smoking and drink driving campaigns, so theoretically it could do the same in relation to some of the serious sustainability problems we face. The project will make recommendations about effecting behavioural change through advertising, social media and other potential communication methods.

#### EXPORTING UK LEADERSHIP

A project to identify areas in which the UK can take a leadership position through the experience in the UK economy, and export best practice to evolving and developing economies around the world.

#### ENERGY AID

Work with a range of participants from industry and academia to outline a plan for creating a new energy-focused charity along the lines of Water Aid.

## THE START INNOVATION JAM

The IBM Summit at Start was *“one of the most significant events of its kind that has ever taken place in this country”* according to Charles Hendry, the Minister of State for Energy & Climate Change. The Summit brought together key stakeholders from many communities, and created a momentum amongst attendees to do something to make a difference. The journey towards a sustainable economy will be a long one, and the Summit was always intended to be the start of a process rather than a single, albeit impressive, event. As a continuation of that process, IBM has announced that it will be hosting a ‘Start Innovation Jam’ in April of 2011.

An Innovation Jam is an online text-based discussion forum for conducting a large-scale brainstorming event. Diverse groups of individuals are connected via a web browser to discuss and develop actionable ideas for business-critical or urgent societal issues. The key word is ‘actionable’. The purpose of this Jam is to take what was learned from the Summit, and turn it into a bank of actionable ideas. This is about how – the Summit identified a number of urgent needs to which we need to find solutions: we need to encourage collaboration between differing constituencies, but how do we make it happen? How do we start to change individual and corporate behaviours? How do we engage with younger people and how do we act NOW to make a difference? The Jam aims to answer these questions and in doing so kick off hundreds of projects that will generate real solutions and provide inspiration for a thousand more.

The Jam will be facilitated by IBM in conjunction with the Start organisation and many of the other Start partners. They will be inviting everyone who attended the 2010 Summit, their partners and clients, and many others who wish to join them on the journey.

## The IBM Summit at Start

Start is an initiative established by HRH The Prince of Wales, that aims to create a vision of a more sustainable future, and seeks to promote sustainability through simple, positive and aspirational messages.

IBM is one of the founding partners, and is the exclusive partner for Business to Business engagement. In September 2010 IBM led a Business Summit – nine invitation-only days that covered key topics on the sustainability agenda for business. Its starting point was simple: “ask not what you can do for sustainability – ask what sustainability can do for you”.

Business engagement in the broad sustainability agenda is crucial if we are to make progress. Business led the industrial revolution, it led the digital revolution and all the signs are that it will drive the sustainability revolution too. Each day of the summit saw senior business leaders, public sector officials, NGOs, academics and commentators come together in London’s Lancaster House to make a difference to how sustainability is perceived and positioned in the

UK. Over 1,000 of the UK’s most influential people joined forces with some of IBM’s global experts to create a new constituency around economic, social and environmental sustainability.

Charles Hendry, the UK Minister of State for Energy and Climate Change said that the IBM Summit at Start was “one of the most significant events of its kind that has ever taken place in this country”; this document, written by The Bathwick Group, reports the output from the summit, with a specific focus on Day 2, ‘Smarter Energy for a Sustainable Future’.





## About The Bathwick Group

The Bathwick Group is a research-based consulting company that helps clients address their most pressing needs in strategic planning and go-to-market execution.

### **Sustainability & the future economy:**

Defining the future – risks and opportunities; strategic modelling and benchmarking, future-proofing to mitigate strategic risks, and identification of new market opportunities

### **The future of business & organisational performance:**

Focused on collaboration and disruptive platforms; solving client challenges rapidly by combining external experts and IP protection mechanisms to expedite solutions to important challenges

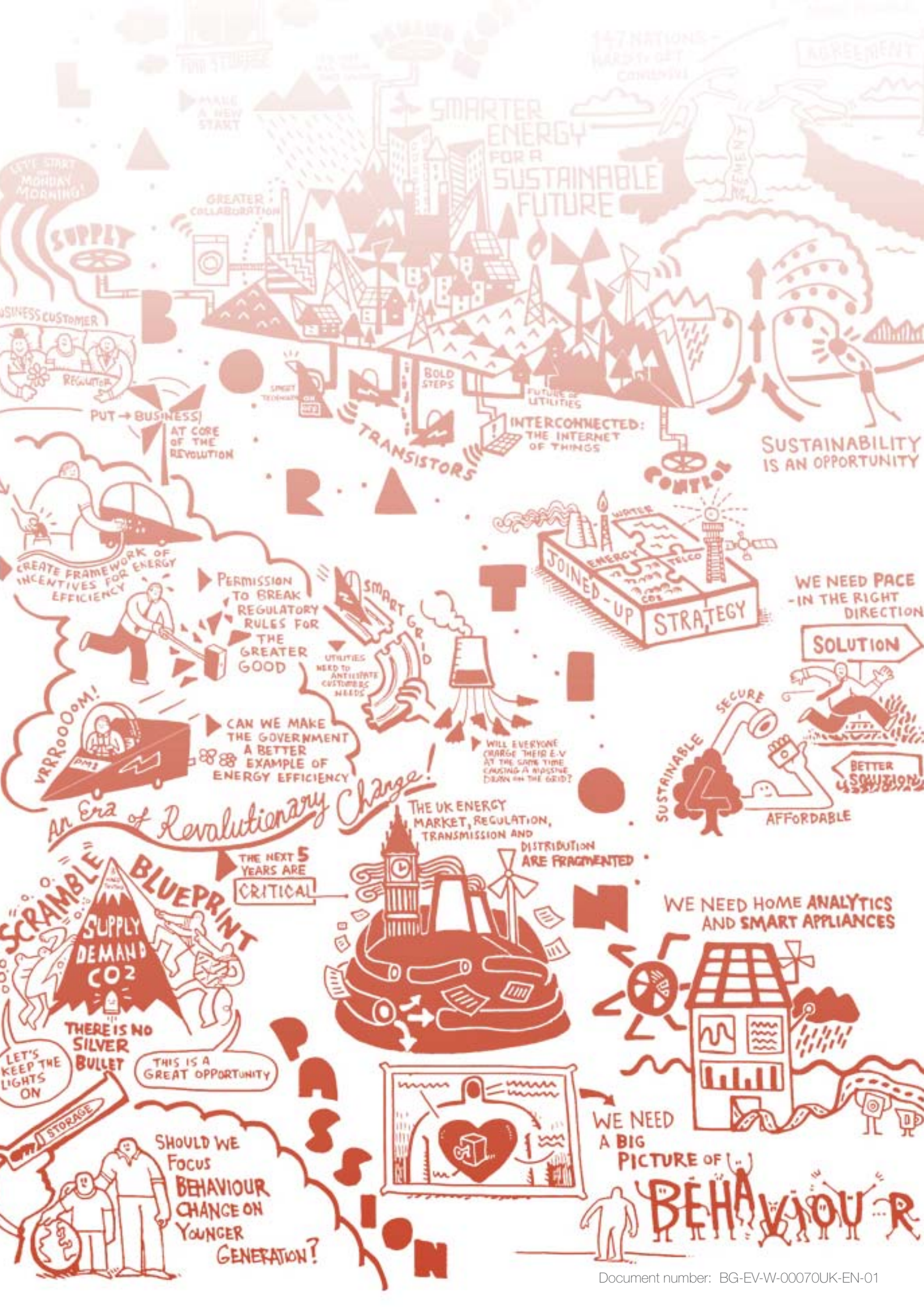
### **The application and future of information technologies:**

Focused on infrastructure (futures and cloud computing) and interaction (including social media) in business. Future-proofing strategy and effectiveness audits for enterprise IT leaders, cloud assessments, data audits, and benchmarking

### **IT industry futures:**

Marketing strategy, customer analysis and deep research, sales acceleration and business partner enablement solutions

[www.bathwickgroup.com](http://www.bathwickgroup.com)



SMARTER ENERGY FOR A SUSTAINABLE FUTURE

SUSTAINABILITY IS AN OPPORTUNITY

SUPPLY

BUSINESS CUSTOMER

PUT → BUSINESS) AT CORE OF THE REVOLUTION

TRANSISTORS

INTERCONNECTED: THE INTERNET OF THINGS

CREATE FRAMEWORK OF INCENTIVES FOR ENERGY EFFICIENCY

PERMISSION TO BREAK REGULATORY RULES FOR THE GREATER GOOD

SMART GRID

JOINED-UP STRATEGY

WE NEED PACE - IN THE RIGHT DIRECTION

SOLUTION

VRRROOOOM!

CAN WE MAKE THE GOVERNMENT A BETTER EXAMPLE OF ENERGY EFFICIENCY

WILL EVERYONE CHARGE THEIR E.V AT THE SAME TIME CAUSING A MASSIVE DRAM ON THE GRID?

SUSTAINABLE SECURE AFFORDABLE

BETTER SOLUTIONS

An Era of Revolutionary Change!

THE UK ENERGY MARKET, REGULATION, TRANSMISSION AND DISTRIBUTION ARE FRAGMENTED

THE NEXT 5 YEARS ARE CRITICAL

WE NEED HOME ANALYTICS AND SMART APPLIANCES

SCRAMBLE BLUEPRINT

SUPPLY DEMAND CO2

THERE IS NO SILVER BULLET

THIS IS A GREAT OPPORTUNITY

LET'S KEEP THE LIGHTS ON STORAGE

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BEHAVIOUR

PASSION