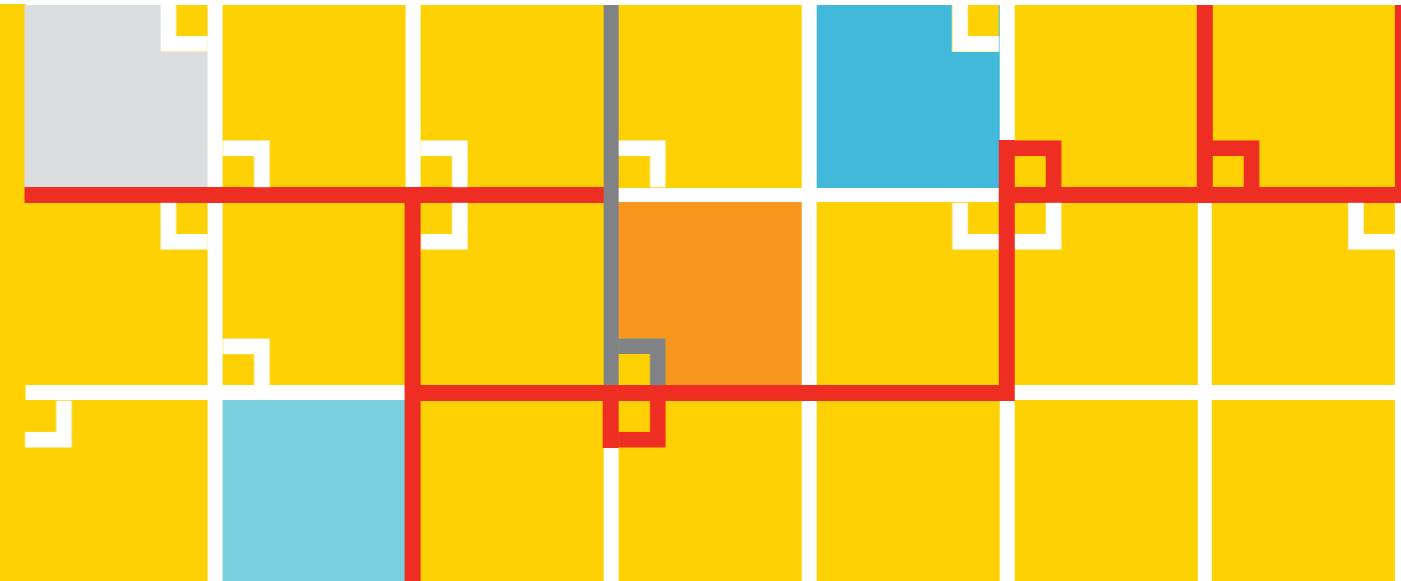
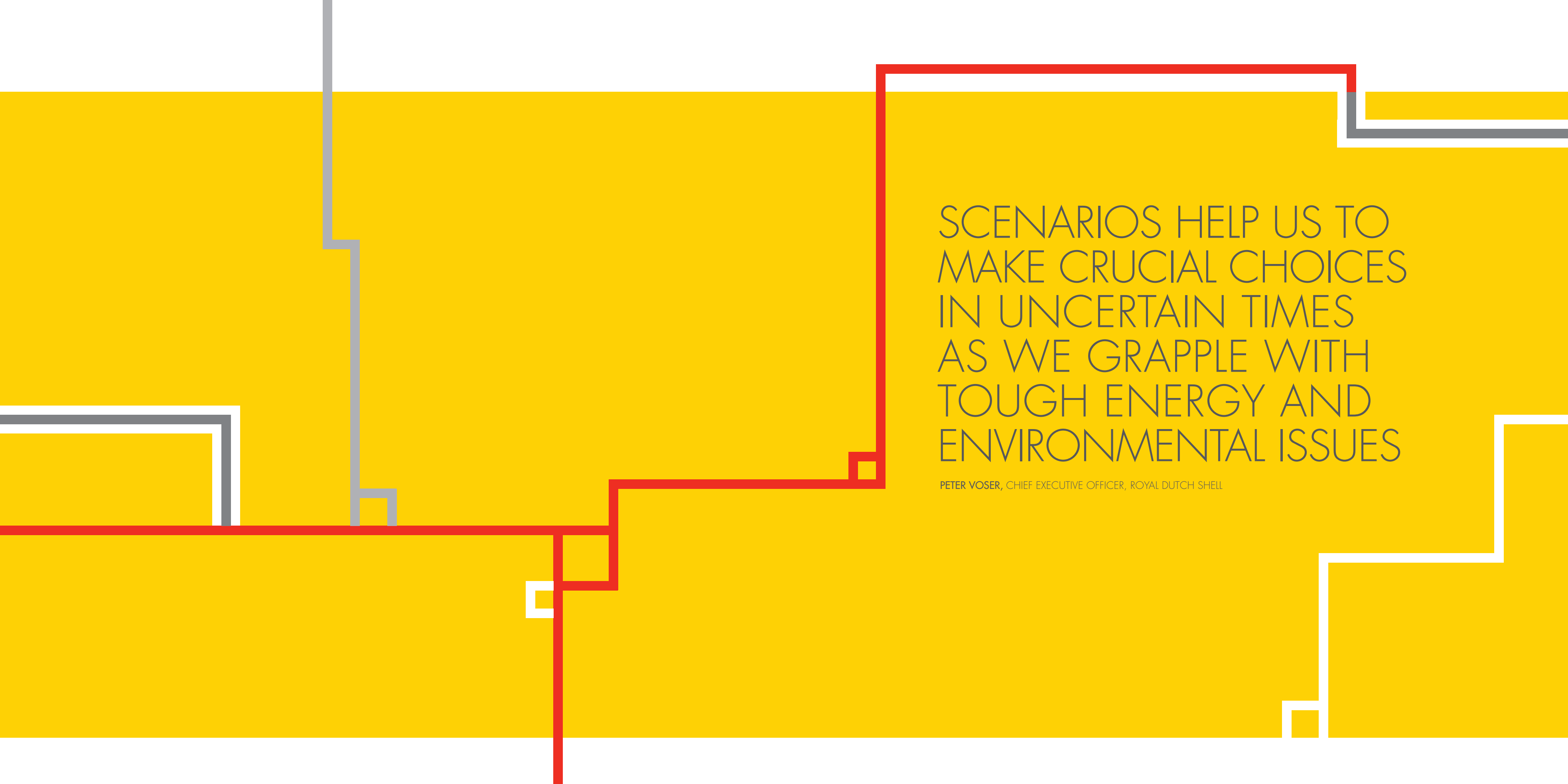




40 YEARS OF SHELL SCENARIOS

40
YEARS
1972-2012





SCENARIOS HELP US TO
MAKE CRUCIAL CHOICES
IN UNCERTAIN TIMES
AS WE GRAPPLE WITH
TOUGH ENERGY AND
ENVIRONMENTAL ISSUES

PETER VOSER, CHIEF EXECUTIVE OFFICER, ROYAL DUTCH SHELL

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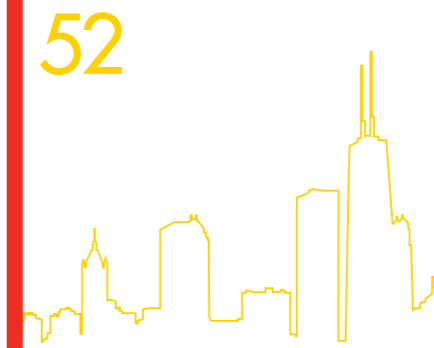
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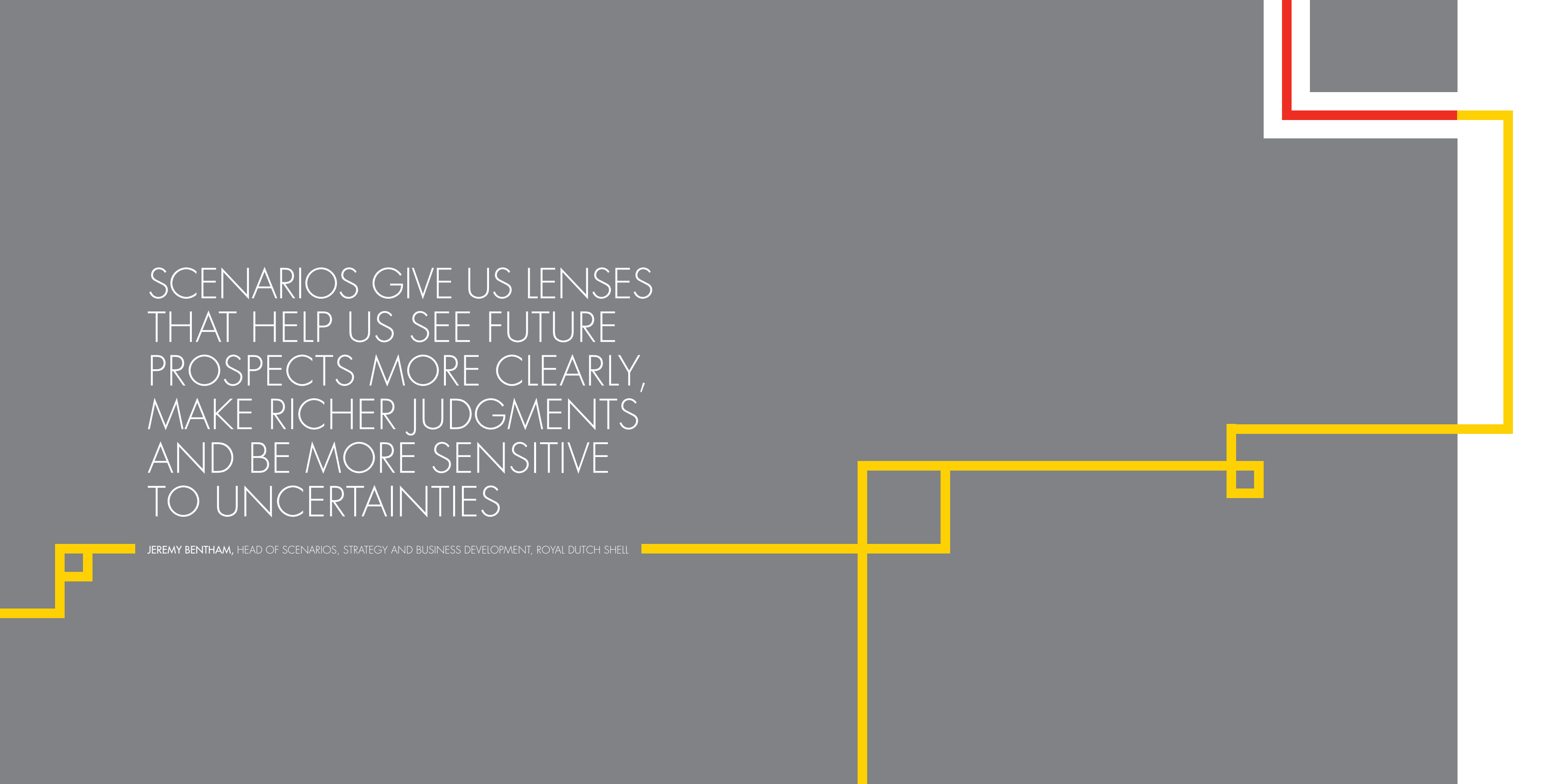
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SCENARIOS GIVE US LENSES
THAT HELP US SEE FUTURE
PROSPECTS MORE CLEARLY,
MAKE RICHER JUDGMENTS
AND BE MORE SENSITIVE
TO UNCERTAINTIES

JEREMY BENTHAM, HEAD OF SCENARIOS, STRATEGY AND BUSINESS DEVELOPMENT, ROYAL DUTCH SHELL

SCENARIOS ARE GROUNDED IN AN UNDERSTANDING THAT CHOICES SHAPE ALTERNATIVE FUTURE PATHWAYS JUST AS MUCH AS THE UNCERTAINTIES IN ECONOMIC, POLITICAL AND SOCIAL SYSTEMS DRIVE CHANGE

JEREMY BENTHAM

HEAD OF SCENARIOS, STRATEGY AND BUSINESS DEVELOPMENT, ROYAL DUTCH SHELL



It is a huge privilege to introduce this celebration of scenario planning in Shell. Each new piece of work has built on past insights and experience – ensuring that the practice has learned from the past and evolved even as the times have changed. I thank everyone who has been part of this 40-year journey and offer best wishes to those who will take the project forward.

The purpose of scenarios is to help people make better strategic choices. In this process, there needs to be a special relationship between decision-makers and scenario developers.

Discussions about alternative scenarios for the future are one of the ways decision-makers are exposed to different possibilities, helping them to move the furniture around mentally. They relax prejudices and advocacy, embracing ambiguity to form practical and pragmatic insights. It can be a subtle, even quiet and stealthy process, over a long period. It depends on a climate of open-mindedness and trust.

Generations of leaders in Shell have been prepared to invest in this process and they too deserve thanks for helping to sustain the environment in which scenario planning has flourished.

Looking ahead, we are experiencing turbulent times. The choices we make today have consequences and some will have a deep impact over many years.

Scenarios are grounded in an understanding that choices shape our pathways to the future just as much as the uncertainties in economic, political and social systems drive change.

Scenarios give us lenses that help us see future prospects more clearly, make richer judgments and be more sensitive to uncertainties. We continue to challenge ourselves by developing new scenarios that will help Shell to focus on key features in the landscape of the future from fresh angles.

We look forward to sharing our work with you and – in a spirit of enquiry, collaboration and enthusiasm – to taking our scenario conversations into the next decade.



OVERVIEW

SHELL SCENARIOS SOWED SEEDS FOR STRATEGIC SUCCESS

TODAY'S SCENARIOS TEAM CONFRONTS
NEW CHALLENGES IN A WORLD SHAKEN BY
FRESH ECONOMIC AND POLITICAL TURMOIL



1960s

A PIONEERING TEAM OF
ECONOMISTS, ENGINEERS
AND SCIENTISTS HAD
STARTED WORK ON SHELL'S
FIRST SCENARIOS

1972/3

THE TEAM HAD SHARED
THESE EARLY SCENARIOS
WITH SHELL'S MANAGEMENT,
DARING THEM TO THINK THE
UNTHINKABLE: WHAT IF THE
WORLD FACED AN OIL CRISIS?

2013+

THE NEW LENS SCENARIOS
FOCUS ON AREAS THAT
WILL BE SIGNIFICANT IN THE
DEVELOPMENT OF ENERGY
AND ENVIRONMENTAL
SYSTEMS IN THE 21ST CENTURY

IN 1973, THE GLOBAL ECONOMY WAS SHOCKED BY A MAJOR OIL CRISIS. **SHELL WASN'T.**

In the 1960s a pioneering team of economists, engineers and scientists had started work on Shell's first scenarios. They looked at how the future might unfold and the impact this could have on the company. By 1973 they had shared these early scenarios with Shell's management, daring them to think the unthinkable: What if the world faced an oil crisis?

When the Yom Kippur War broke out in October of that year, the West's support for Israel angered oil-rich Arab states, triggering an oil embargo. Fuel shortages sparked a global recession and a massive stock market crash. The world reeled. But Shell's decision makers were mentally prepared for the worst because they had already imagined it.

These disciplined imaginings of the early Scenarios Team included choices Shell could make to cushion the blow from an oil crisis. Pierre Wack, often dubbed the 'Father of Shell Scenarios', led these early developments and challenged traditional management thinking. He urged executives to abandon their assumptions, including the overriding global belief that oil supply was infinite.

Four decades on, a new generation of scenario planners is still looking to the future and identifying uncertainties, challenges and opportunities. Like their predecessors, they work to ensure that Shell is not surprised by events as the future unfolds. They engage regularly with decision-making executives to review vital intelligence and insights to help the company survive and thrive in times both volatile and stable.

The 1973 scenarios first established Shell's reputation for using this hitherto academic approach to inform strategic business planning. They helped Shell weather the volatility of the 1970s, bringing financial gains running into the billions of dollars thanks to the sale of refineries and installations or decisions not to replace them. Shell has spent four decades since then producing and using many types of scenarios to anticipate global economic, social and political changes and their likely impact on business. Summaries of some of these have been regularly shared outside Shell, contributing to important public debates.

Today's Scenarios Team confronts new challenges in a world shaken by fresh economic and political turmoil. As we move deeper into the 21st century, the world's population is booming and demand for sustainable energy, water, land and food is growing, fuelling tensions over scarce resources.

Building on the success of the past, today's team is approaching the development of upcoming scenarios in a fresh way, recognising that all outlooks in this complex world will be messy. The new approach will provide clarity and insights by zooming in on specific details and then zooming out to a broader panorama.

The new scenarios, which will be ready in 2013, will focus on areas that are significant in the development of energy and environmental systems in the 21st century. These include, for example, the connection between energy, water and food systems and the impact of the world's accelerated urbanisation.

SCENARIOS AND THOUGHT LEADERSHIP.

Shell has shared at least half a dozen far-reaching global scenarios with the wider world since the 1990s, probing the impact of profound developments like the fall of the Iron Curtain and the war in Iraq, as well as the evolution of alternative energy resources like biofuels, shale gas and renewable energy resources like wind and solar power.

In 2008, Shell's *Energy Scenarios to 2050, Blueprints and Scramble*, emphasised how crucial it was for the world to realise three hard truths: that global energy demand is surging, that supply will struggle to keep up and that climate change is a pressing reality.

Although it shares its scenarios, Shell almost always refrains from commenting on what it believes would be a better future for the world. But in 2008, it publicly supported the basic outcomes of *Blueprints* – an energy future in which emerging coalitions of interests eventually accelerate regulatory developments and the implementation of lower-carbon energy and technology.

The alternative scenario, *Scramble*, portrayed a future based on governments focusing narrowly on their own energy interests, neglecting demand-side management and leaving them unprepared for broader supply stresses until it is too late.

Shell's CEO and leadership took the view that the *Blueprints* vision would provide a more sustainable future, not just for business itself but for the wider world.

THE 3 HARD TRUTHS

SHELL'S CEO AND LEADERSHIP TOOK THE VIEW THAT THE *BLUEPRINTS* VISION WOULD PROVIDE A MORE SUSTAINABLE FUTURE, NOT JUST FOR BUSINESS ITSELF BUT FOR THE WIDER WORLD

GLOBAL ENERGY DEMAND IS SURGING

SUPPLY WILL STRUGGLE TO KEEP UP

CLIMATE CHANGE IS A PRESSING REALITY



THE SUCCESS OF THE SCENARIOS LIES NOT JUST IN THEIR ABILITY TO PROVIDE STRATEGIC INSIGHTS BUT ALSO IN THEIR APPROACH TO DEVELOPING AND SHARING THESE INSIGHTS



THE SECRET OF SUCCESS.

Although most companies monitor changes in their business environment, Shell is one of the few that routinely employs these alternative outlooks as core strategic tools. The success of the scenarios lies not just in their ability to provide strategic insights but also in their approach to developing and sharing these insights.

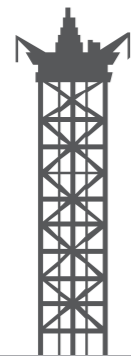
The early scenario developers embraced intuition, uncertainty and engagement. They did not shy away from talking about what could be considered 'unimaginable'.

"While we can't predict the future, science-based creative thinking can give us some clues," says Dr Angela Wilkinson, from the Smith School of Enterprise and the Environment at Oxford University.

Today's scenario builders use complex econometric models and sophisticated methodologies. The scenarios development process now includes a multitude of short, medium and long-term portraits of global energy developments, but also individual country analyses and consideration of major trends, like AIDS and urbanisation.

As always, drawing on the knowledge and imagination of a network of gifted people – both within and outside Shell – is vital to the success of scenario building. And effective modes of engaging decision-making executives remain vital to their impact.

SCENARIOS – WHICH STRIVE TO EXPLORE AND ACCURATELY ASSESS EQUALLY PLAUSIBLE FUTURES – HAVE HELPED SHELL MAKE BETTER LONG-TERM INVESTMENT DECISIONS



1970s

ANOTHER OIL SHOCK



1980s

THE DECLINE AND
EVENTUAL COLLAPSE
OF THE SOVIET UNION

1990s

THE RISE OF
ENVIRONMENTAL
CONCERNS LINKED TO CO₂

2000s

THE DYNAMICS
OF RECESSION
AND RECOVERY



SCENARIO FINGERPRINTS.

Neither rigid predictions nor wild fantasies, building scenarios is a craft that holds real commercial value for Shell.

The process of developing scenarios enables the company's decision-makers to think about the possible wider and longer-reaching implications of unfolding trends and potential discontinuities. They can help to deliver better long-term prospects for Shell, the industry and society.

For an industry investing billion-dollar sums in infrastructure which can operate for decades, a robust outlook is important. Today scenarios continue to influence thinking from the Board and Executive Committee right across the business.

Many important strategic decisions taken by Shell over the last four decades have the fingerprints of the Scenarios Team on them. Of course, all major choices involve multiple inputs from many people, but scenarios have explicitly highlighted specific threats and opportunities or, more frequently, implicitly informed the fundamental mindsets underpinning the decision.

Following the success of the 1973 scenarios, further scenario planning prepared Shell for subsequent global shifts.

Shell's Scenarios helped the company to anticipate, adapt and respond to another oil shock in 1979, as well as the decline and eventual collapse of the Soviet Union in the 1980s. While they were never absolute predictions or forecasts, scenarios helped to prepare the company for the rise of environmental concerns linked to CO₂ in the 1990s and to explore the dynamics of recession and recovery in the 2000s. In the past two decades, scenarios prepared the company for the impact of technology, terrorism and globalisation in a rapidly changing world.

Long before the Berlin Wall dividing West and East Germany came down in 1989, scenarios workshops had imagined potential new opportunities in markets opening up – not only in the Soviet Union but across Eastern Europe. Shell not only opened refineries in Eastern Europe, it closed down or sold some in Western Europe.

In the 1990s, growing social and environmental stresses were highlighted, helping Shell develop a constructive, proactive attitude to the threat of climate change.

In 2005, they also raised the probability of a looming gap between the world's surging demand for energy and global supplies and reinforced the significance of natural gas in the company's energy mix.

A few years later they highlighted a mix of circumstances that made sustainable biofuels look like an attractive business opportunity. In 2011, Shell moved into the production of low-carbon bio-ethanol from Brazilian sugar cane.

In Shell's *Signals & Signposts* scenarios review, one of the key factors raised was the impact of heightened political tension in the developing world. In early 2011, the Arab Spring took the world by surprise, with popular revolts toppling rulers in Egypt and Tunisia and sowing the seeds for reform throughout the Middle East.

While scenarios couldn't, of course, predict the exact date of the uprising in the Middle East and North Africa, they had highlighted conditions that would make the rebellions increasingly likely: growing resentment, youthful populations with little opportunity for employment, economic volatility, rising unemployment and inflation.

Signals & Signposts was published in late 2010 as a commentary and update to *Scramble and Blueprints* – Shell's *Energy Scenarios to 2050*, which remain credible visions as the world grapples with the challenges posed by the hard truths of the global energy system. A new scenarios publication will be launched in 2013.

I LIKE TO ASK HOW MANY
DECISIONS HAVE SCENARIOS
FINGERPRINTS ON THEM

JEREMY BENTHAM, HEAD OF SCENARIOS, STRATEGY AND BUSINESS DEVELOPMENT, ROYAL DUTCH SHELL

CASE STUDIES

SCENARIOS

THEIR ROOTS AND DEVELOPMENT

SCENARIOS ALSO AFFECT THE WAY PEOPLE PERCEIVE THE WORLD AROUND THEM, BRINGING INVALUABLE INSIGHT AND INFLUENCING CHOICES. AT SHELL, SCENARIOS PLAY A ROLE IN MOST STRATEGIC COMPANY DECISIONS

NEITHER WISHFUL FANTASIES NOR RIGID FORECASTS...

... scenarios and their development enable us to think through possible wider and longer-reaching implications of unfolding trends and potential discontinuities. In this way we can avoid being caught by surprise and are instead empowered to adapt more speedily to change.

Scenarios hold real commercial and strategic value. Many governments, institutes and leading organisations now maintain their own scenario divisions. All ask themselves the same question: "What if?" Considering the future enables us to test our strategies, weighing the strengths and identifying potential challenges.

The United States Air Force initiated the first scenarios after WWII in order to anticipate surprise nuclear attacks by considering alternative strategies. Herman Kahn was one of the scenario planners and strategists at that time and rewrote these scenarios for businesses.

Scenarios also affect the way people perceive the world around them, bringing invaluable insight and influencing choices. At Shell, scenarios play a role in most strategic company decisions.

The scenarios analysis focuses on four key areas – economics, energy and the environment, (geo)politics and

socio-cultural issues – to understand how consumers, governments, energy producers and regulators are likely to behave and respond to change in the decades ahead.

THE UNITED STATES AIR FORCE INITIATED THE FIRST SCENARIOS AFTER WWII IN ORDER TO ANTICIPATE SURPRISE NUCLEAR ATTACKS BY CONSIDERING ALTERNATIVE STRATEGIES

Scenarios can take a global view or focus on specific countries such as Libya or Iraq, or specific sectors such as gas or manufacturing. They typically look decades ahead, but can often have a shorter-term focus, as with the Eurozone financial crisis. The ultimate goal of scenarios is to encourage and equip Shell's decision-makers to consider factors that shape their choices right now. ■

THE 'FATHER OF SCENARIOS' WHO SHAPED SHELL'S FUTURE.

He was inspired by an Armenian-born mystic and spiritual teacher. He burnt incense sticks in his London office in the 1970s and paid lengthy visits to a guru in India.

Pierre Wack embraced unconventional ideas, challenged managerial assumptions and pioneered new strategic thinking. The Frenchman went on to become one of the world's most influential management thinkers and was dubbed the 'Father of Shell Scenarios'.

As Head of Shell's Group Planning Division, Wack helped the company in the early 1970s to anticipate the possibility of a sharp rise in oil prices ahead of the 1973 oil crisis. As a result, he laid the foundations for four decades of scenario planning.

Wack fostered the belief that a business that imagines multiple ways the future may unfold is better prepared to overcome challenges and seize opportunities.

Wack was inspired by Georges Gurdjieff, a Greco-Armenian guru who believed that most human beings who are awake act

as if they are asleep. The mystic argued that people had to work hard to reach greater levels of awareness and insight.

Inspired by these ideas, Wack encouraged Shell's managers to challenge conventional business thinking. He opted for a confrontational approach, breaking down their assumptions. The aim was to view the world from new perspectives and to open different windows on the world.

He believed that companies spent too much time thinking about demand and supply trends, price changes, new technologies, competition and economic fluctuation, but not enough time using their intelligence and intuition to sharpen their understanding of a complex world.

"Deep in our hearts, we would all choose a scenario with no surprises," said Wack.

Shell's early scenarios in 1971-73 proved the value of Wack's approach. They helped Shell to anticipate the impact of the crisis in the Middle East in 1973, sparked by an Arab oil embargo imposed in response to Western support for Israel in the Yom Kippur War. By 1972 Shell Scenarios were warning of a sharp rise in prices "resulting from increasing oil scarcity, which may take place at any moment in the next few years."

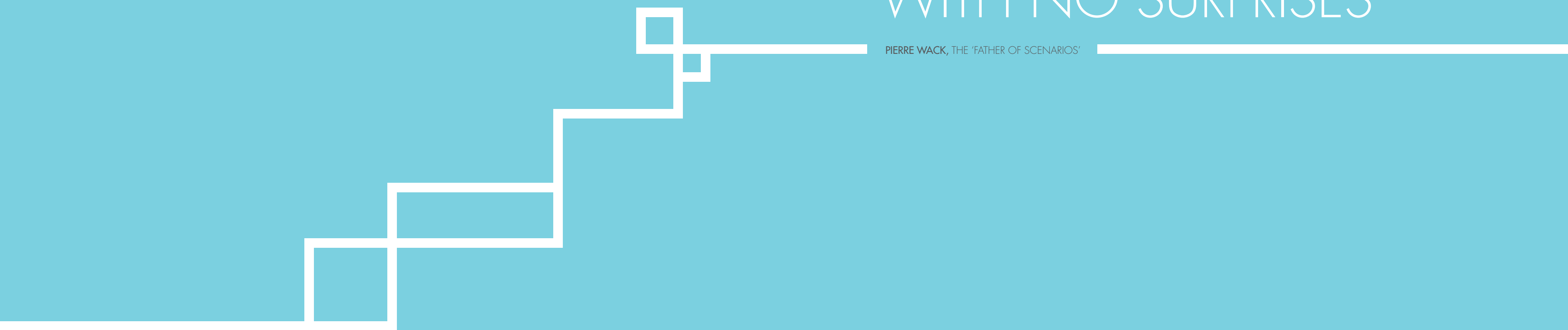
Wack died in 1997 aged 70 and spent his final years in France living in a 14th century chateau in the Dordogne. While he saw out his life in an historic setting, his legacy was that of a moderniser. He spent his life with his gaze firmly fixed on the horizon. ■



WACK HELPED THE COMPANY IN THE EARLY 1970s TO ANTICIPATE THE POSSIBILITY OF A SHARP RISE IN OIL PRICES AHEAD OF THE 1973 OIL CRISIS

WACK FOSTERED THE BELIEF THAT A BUSINESS THAT IMAGINES MULTIPLE WAYS THE FUTURE MAY UNFOLD IS BETTER PREPARED TO OVERCOME CHALLENGES AND SEIZE OPPORTUNITIES

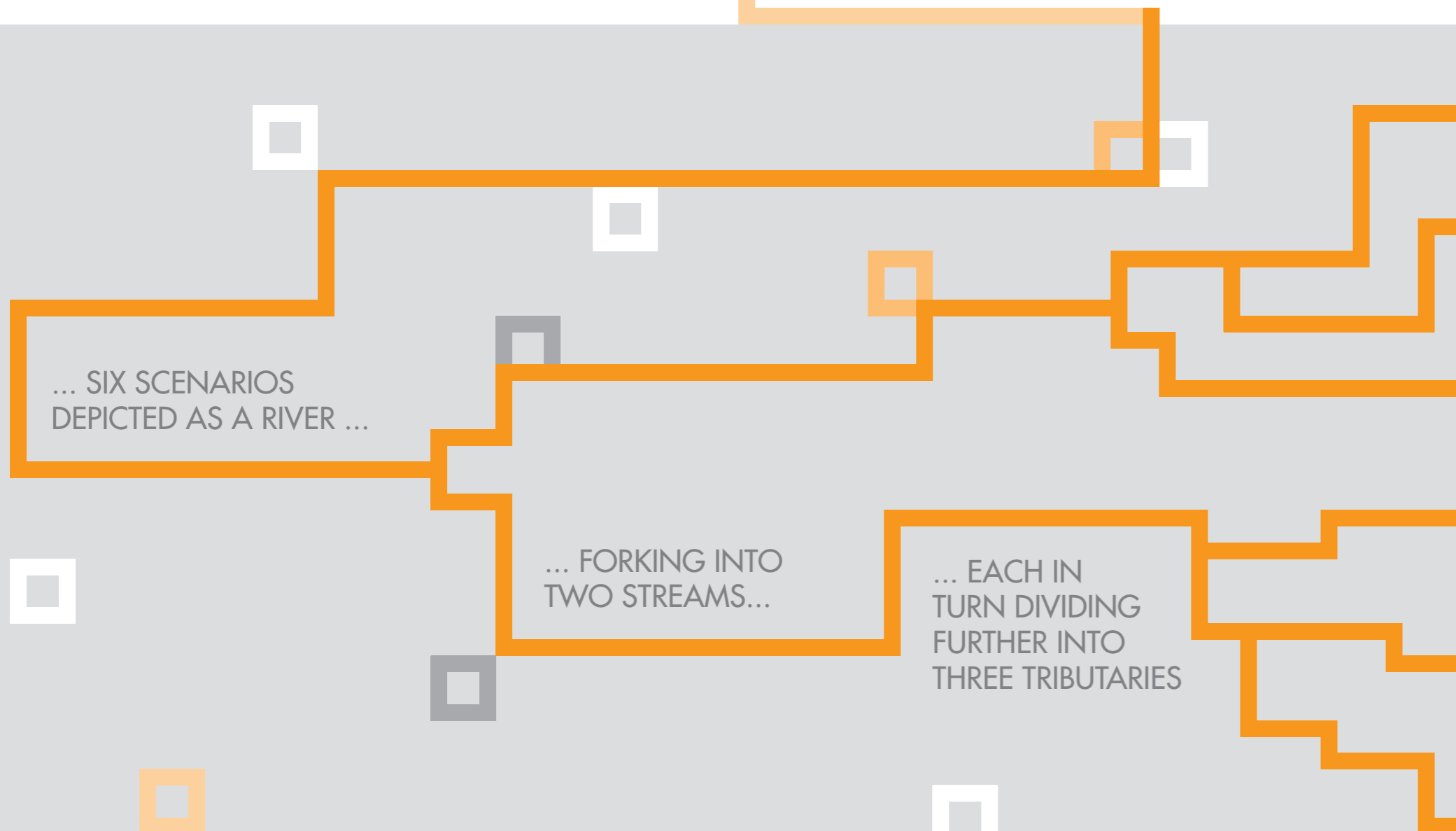
CHALLENGE
CONVENTIONAL
BUSINESS
THINKING



DEEP IN OUR HEARTS,
WE WOULD ALL
CHOOSE A SCENARIO
WITH NO SURPRISES

PIERRE WACK, THE 'FATHER OF SCENARIOS'

IN SEPTEMBER 1972, HEAD OF SCENARIOS, PIERRE WACK, GAVE WHAT IS RECALLED BY THOSE WHO ATTENDED AS AN 'ENTHRALLING THREE-HOUR PERFORMANCE' IN WHICH HE OUTLINED...



SHELL'S 1973 OIL SHOCK SCENARIO SUCCESS.

Shell sowed the seeds for scenario planning in a fertile decade of experimentation: the 1960s. By the early 1970s, scenarios had not only taken root, they had borne fruit.

The '1973 Scenarios', as they became known, allowed Shell to foresee the possibility of a Middle East oil shock and to respond more swiftly than its competitors when a crisis struck in 1973.

The '1973 Scenarios' created a legacy of credible, critical and cutting-edge strategic planning at Shell. They sounded an alarm bell about the potential for a sharp rise in energy prices months before the 1973 oil crisis shook the global economy. They also created a new approach to business planning that survives today. They underlined the importance of imagining how future events might plausibly shape the world rather than attempting to forecast probable or preferable visions of tomorrow.

The pieces of the jigsaw which were to form this body of work started falling into place as early as 1970. Bit by bit the picture began to take shape.

By September 1972, Head of Scenarios, Pierre Wack, gave what is recalled by those who attended as an 'enthral-

ling three-hour performance' in which he outlined six scenarios depicted as a river forking into two streams, each in turn dividing further into three tributaries.

These scenarios not only suggested a shift in attitudes of producer governments, but also highlighted the growing power of OPEC and a possible Middle East oil crisis and price hike.

In October 1973, the oil crisis struck. Arab producers imposed an oil embargo on Western governments in response to their support for Israel in the Yom Kippur War. It triggered petrol pump queues, a stock market slump, rising unemployment and soaring inflation. The price of crude oil soared from around \$2.50 to \$11 in a matter of weeks.

Word of Shell's approach spread far and wide. From 1973 to 1974, Wack presented the scenarios to Shell operating companies in Europe and Asia, as well as to the UK's Prime Minister Edward Heath and the U.S. State Department. In later decades,

Shell Scenarios would be followed with similar interest by the wider world, becoming a brand in their own right.

The 1973 oil crisis put an end to 25 golden years for the oil industry in the wake of World War Two, rattled the world's seven big oil companies and sparked a global economic shock. But the crisis also proved an invaluable lesson for Shell: grappling with uncertainty using scenario planning was critical to Shell's future success. Indeed, while scenarios are primarily aimed at enabling richer strategic conversations about the future, their success in anticipating the crisis helped embed the approach in the company's strategic DNA. ■



ONE OF THE KEY INSIGHTS OF THE EARLY YEARS OF SHELL SCENARIOS WAS THAT IN ORDER TO SURVIVE AND EVEN THRIVE UNDER CONDITIONS OF UNCERTAINTY, IT WAS IMPORTANT TO HARNESS INTUITION, ENGAGE WITH UNCERTAINTY AS MORE THAN A LACK OF KNOWLEDGE, AND ATTEND TO THE QUALITY OF 'STRATEGIC CONVERSATION' RATHER THAN JUST THE QUALITY OF STRATEGIC ANALYSIS

ANGELA WILKINSON, PROGRAMME DIRECTOR OF THE FUTURES DIRECTORATE
AT THE SMITH SCHOOL OF ENTERPRISE AND THE ENVIRONMENT

ENERGY SCENARIOS TO 2050 AND THE THREE HARD TRUTHS.

Scarce resources, surging demand and the impact of climate change make energy choices critical to the planet's future.

Shell's *Energy Scenarios to 2050* gained international renown for their unflinching acceptance of the harsh realities facing the world and the company's decision to support a future that embraced more sustainable energies and technology.

The scenarios, named *Blueprints* and *Scramble*, were published in 2008 and marked a watershed in Shell's scenario development for a number of reasons. First, the team invested in the development of a highly detailed (in-house) World Energy Model to quantify the scenario outcomes in a coherent granular form;



THE WORLD
NEEDS TO REDUCE
CARBON EMISSIONS
TO COMBAT
CLIMATE CHANGE

THE THREE HARD TRUTHS

- 01** The world's population and prosperity is growing rapidly and with it an insatiable demand for energy.
- 02** The conventional resources to meet that demand are finite, and alternative sources of energy are vital and will struggle to keep pace with demand growth.
- 03** The world needs to reduce carbon emissions to combat climate change.

then it considered behavioural choices made by human beings, from decision-makers in government to wider society and consumers; and finally it accepted certain incontrovertible truths about the world's energy system.

Although created for Shell's businesses, the relevance and immediacy of *Energy Scenarios to 2050* also made an impact on policymakers in the European Union and elsewhere.

Recognising that Shell was considered knowledgeable about energy matters (but not given the same recognition externally for environmental issues), the Scenarios Team – led by Jeremy Bentham, Head of Scenarios, Strategy and Business Development – involved environmental specialists at MIT, knowing this would add significant credibility to the scenarios.

"MIT ran our numbers through their climate system," said Martin Haigh, Senior Energy Adviser. "This was not an easy process. But it gave us credibility on the environment story and we wanted these scenarios to have a global impact."

CONTINUED →

SHELL'S *ENERGY SCENARIOS TO 2050* GAINED INTERNATIONAL RENOWN FOR THEIR UNFLINCHING ACCEPTANCE OF THE HARSH REALITIES FACING THE WORLD AND THE COMPANY'S DECISION TO SUPPORT A FUTURE THAT EMBRACED MORE SUSTAINABLE ENERGIES AND TECHNOLOGY



MIT RAN OUR NUMBERS THROUGH THEIR CLIMATE SYSTEM. THIS WAS NOT AN EASY PROCESS. BUT IT GAVE US CREDIBILITY ON THE ENVIRONMENT STORY AND WE WANTED THESE SCENARIOS TO HAVE A GLOBAL IMPACT.

TAKING A STAND

In signalling a preference for the basic outcomes of the *Blueprints* scenario, Shell continued to signal its public belief that efforts to address greenhouse gas emissions and other environmental pressures from rising energy demand were crucial. *Blueprints* imagines an energy future driven by a patchwork of emerging coalitions and interests that results in policies to manage energy demand, cross-border alignment to create incentives for the development of low-carbon energy resources, and the deployment of technologies which would moderate emissions.

The alternative, *Scramble*, portrayed a future based on states prioritising their own energy security over all other considerations.

SCRAMBLE SCENARIO

In the *Scramble* scenario, immediate pressures to achieve energy security trump policies to manage demand. National governments focus on securing sufficient energy supplies, resulting in a resource scramble among nations. Governments neglect action to address climate change until major events like floods and severe storms prompt response.

Action to tackle energy demand and promote efficiency comes only when supplies become tight. Continued economic growth can only be achieved with better management of resources. The energy system in *Scramble* is disjointed, as the world is continually trying to catch up with energy demand by pursuing the easiest energy available.

There were those within the Scenarios Team and Shell who believed the company should remain neutral when it came to the scenarios. And, indeed, the company aims to be successful no matter how the future unfolds. But, given the significance of the hard truths confronting the world's energy system, Shell's former CEO, Jeroen van der Veer, announced that the outcomes imagined in the *Blueprints* scenario would produce a more sustainable future.

"Backing *Blueprints* was controversial," said Jeremy Bentham. "But Shell is part of the world and ultimately a more sustainable world is a better place to do business." ■

BLUEPRINTS SCENARIO

In the *Blueprints* scenario, action to manage energy use is driven by concerns about the available supply of resources, but also by environmental concerns and the commercial opportunities presented by a transformation of the world's energy system.

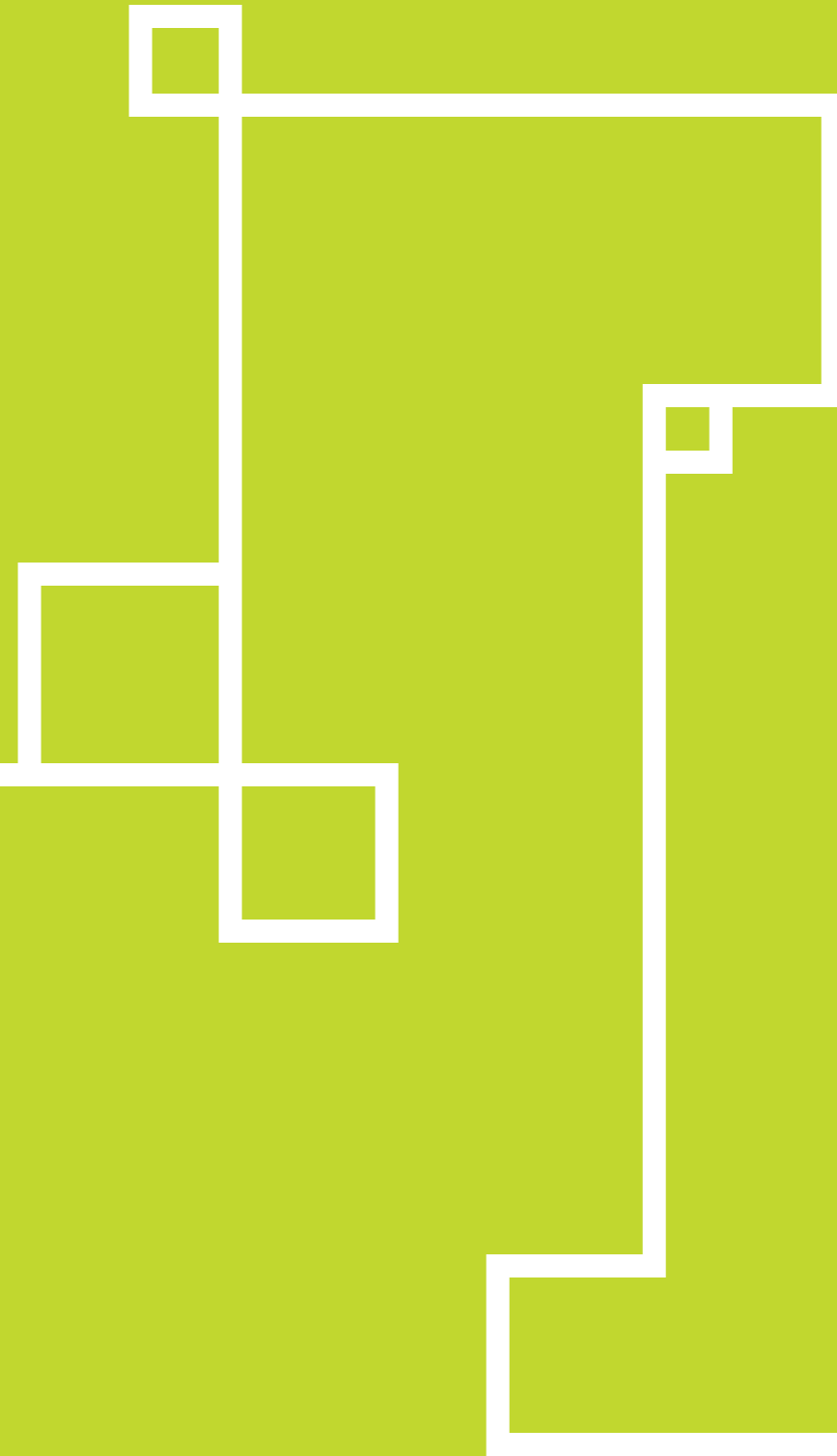
Groups with intertwined interests increasingly join together to drive better economic and lifestyle possibilities. After being adopted at a local level, these become part of the mainstream wherever interests coincide.

A patchwork of policies drives businesses to lobby for clear regulations and encourages early adoption of new technologies and innovation.

BACKING *BLUEPRINTS* WAS CONTROVERSIAL. BUT SHELL IS PART OF THE WORLD AND ULTIMATELY A MORE SUSTAINABLE WORLD IS A BETTER PLACE TO DO BUSINESS

THE REQUIRED COMBINATION OF
ANALYTICAL CAPACITY AND POWERS
OF IMAGINATION IS A CHALLENGE IN
ITSELF, BOTH FOR THE ORGANISATION
AND FOR THE PEOPLE INVOLVED

EWALD BREUNESSE, FORMER SCENARIOS TEAM MEMBER



SCENARIOS INSPIRED NEW VISIONS FOR POST-APARTHEID SOUTH AFRICA.

When the world recalls South Africa's transition to majority rule in the 1990s after decades of apartheid, they picture Nelson Mandela leaving Robben Island prison and voters queuing to cast the ballots that would usher in the country's first multi-racial government.

Few picture a serene resort in a wine-growing region near Cape Town where South African leaders met over six months in 1991-92 to create four scenarios used by a nation at a crossroads to create a new future.

Shell's scenarios practice was the inspiration for that series of meetings where 22 politicians, business leaders, trade unionists, academics and community activists from across the political

spectrum convened. The leaders were black and white, from the left and right, members of the opposition and the apartheid-era establishment.

Together their compelling storylines mapped the path to a new South Africa at the Mont Fleur Conference Centre, with a helping hand from Adam Kahane, a former member of Shell's Scenarios Team in London.

The meetings were the brainchild of Professor Pieter le Roux, from the opposition-aligned University of the Western Cape. Le Roux wanted to apply Shell's scenario planning methods to create a set of stories about how South Africa might develop as it attempted to throw off the shackles of racism, inequality, hatred and mistrust fostered by the adoption of apartheid in 1948.

Le Roux turned to Adam Kahane to lead the meetings in what has become known as the *Mont Fleur Scenarios Exercise*.

The meetings took place against a backdrop of hope and fear. In 1990, South Africa had lifted its ban on the African National Congress (ANC), releasing Mandela after 27 years in prison. A year later President F.W. de Klerk repealed the last

CONTINUED →

THE MEETINGS TOOK PLACE AGAINST A BACKDROP OF HOPE AND FEAR



FEW PICTURE A SERENE RESORT IN A WINE-GROWING REGION NEAR CAPE TOWN WHERE SOUTH AFRICAN LEADERS MET OVER SIX MONTHS IN 1991-92 TO CREATE FOUR SCENARIOS USED BY A NATION AT A CROSSROADS TO CREATE A NEW FUTURE

1992-2002

THE FOUR MONT FLEUR SCENARIOS IMAGINED HOW EVENTS MIGHT UNFOLD IN THE DECADE 1992-2002. THEY WERE CALLED: *OSTRICH*, *LAME DUCK*, *ICARUS* AND *FLIGHT OF THE FLAMINGOS*.

LE ROUX WANTED TO APPLY SHELL'S SCENARIO PLANNING METHODS TO CREATE A SET OF STORIES ABOUT HOW SOUTH AFRICA MIGHT DEVELOP AS IT ATTEMPTED TO THROW OFF THE SHACKLES OF RACISM, INEQUALITY, HATRED AND MISTRUST FOSTERED BY THE ADOPTION OF APARTHEID IN 1948

remaining apartheid laws, multi-party talks commenced and international sanctions were lifted.

But the country's future was precariously poised. Fighting raged between the ANC and the Zulu Inkatha movement and the country remained gripped by demonstrations and police crackdowns.

The first three storylines were prophetic warnings about what could happen in South Africa if the wrong decisions were taken, whilst the fourth was a vision for a better future.

Ostrich was a future where a white-minority government disregards the crisis and refuses to negotiate. *Lame Duck*, where negotiations limit the government's powers, preventing it from dealing with the country's problems. *Icarus* painted the picture of a new democratic government which ignores prudent financial management and crashes the economy. *Flight of the Flamingos* was the story of South Africa building foundations carefully to develop incrementally, together.

The 16-page summary of the work appeared in the country's newspapers and the Mont Fleur scenarios not only shifted people's thinking but also their actions.

Trevor Manuel, who took part as an ANC representative in the Mont Fleur meetings and went on to serve as Minister of Finance, acknowledged that the scenarios played a significant role in the country's economic and political transition. The economic discipline of the new government enabled the annual real rate of growth of the South African economy to jump from 1% in 1984–1994 to 3% in 1994–2004.

"It's not a straight line from Mont Fleur to our current policy," he said in 2000. "It meanders through, but there's a fair amount in all that going back to Mont Fleur. I could close my eyes now and give you those scenarios just like this. I've internalised them, and if you have internalised something then you probably carry it for life."

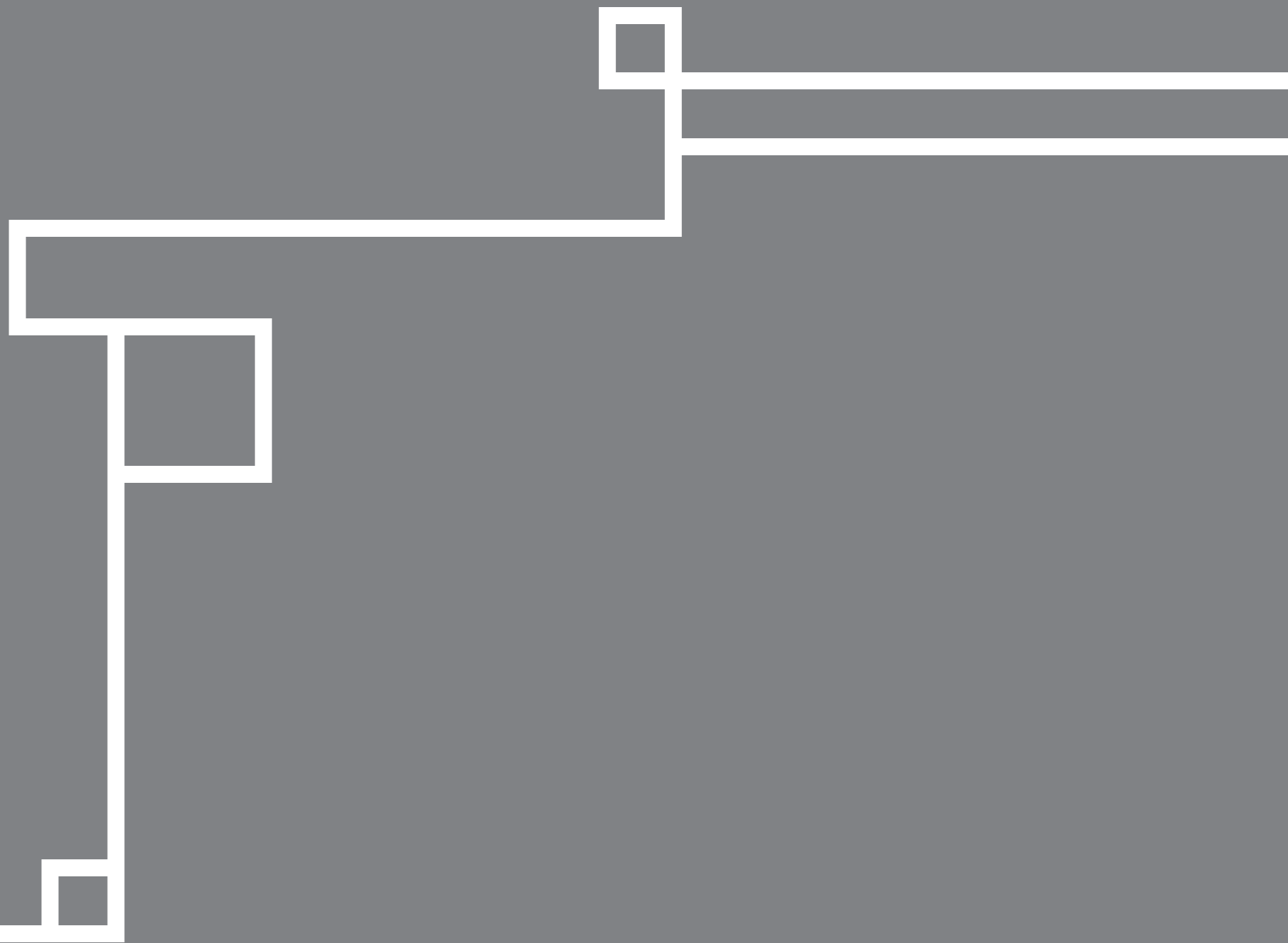
Kahane was not the only Shell expert to play a critical role in creating scenarios for a South Africa in transition. After Pierre Wack retired from Shell in 1980, he started to work as a consultant to Clem Sunter, the head of scenario planning for Anglo American, the largest mining company in South Africa.

In 2010, Sunter observed how influential the Mont Fleur scenarios had been. Reflecting on South Africa's negotiated transition to democracy he said: "...take a bow, all you who were involved in the Mont Fleur initiative. You may have changed our history at a critical juncture." ■

TAKE A BOW, ALL YOU WHO WERE INVOLVED IN THE MONT FLEUR INITIATIVE. YOU MAY HAVE CHANGED OUR HISTORY AT A CRITICAL JUNCTURE

IF MANAGERS OPERATE WITHIN DEFINED
CONFINES, THEY NO LONGER TEND TO SEE
SOLUTIONS OUTSIDE THEIR OWN VIEW OF THE
WORLD. SCENARIOS CAN REMOVE THE BLINKERS
FROM MANAGERS' EYES AND SHOW THEM
ALTERNATIVE WINDOWS ON THE WORLD.

PIERRE WACK, THE 'FATHER OF SCENARIOS'



SCENARIO PLANNING: PART OF SINGAPORE'S DNA FOR TWO DECADES.

The city state of Singapore may be small but it thinks big. Smaller than New York City, it has come a long way in a short time since independence in 1965.

Despite few natural resources, it enjoys one of the highest standards of living in the world. It's also the easiest place on the planet to do business. That may be in no small part due to the country's commitment to planning.

Singapore's government started using scenario planning in 1991, drawing inspiration and support from Shell. Two Singaporean officials spent time with Shell in London studying scenario planning. In 1992, the country produced its first scenarios and in 1995 Singapore set up a Scenario Planning Office. First used in the Ministry of Defence, scenario planning spread across government.

"The scenario planning method used by Shell helped it to deal with the 1973 oil shock," said Peter Ho, retired Head of Singapore's Civil Service and now Senior Advisor to Singapore's Centre for Strategic Futures (CSF), an agency at the heart of government. "Everyone knew

about that, certainly the cognoscenti did. It was the inspiration, if you will, for Singapore to look at scenario planning."

Today scenario planning is part of the DNA of Singapore's government and public service. Planning units in ministries and agencies are familiar with its key vocabulary and concepts. Singapore produces national scenarios every three years, in addition to scenarios on topics ranging from climate change to new media.

"Singapore is probably the only country in which scenario planning is used comprehensively across all levels of government to plan strategically for the future," added Peter Ho.

With a strong economy driven by electronics manufacturing and financial services, this south-east Asian "tiger economy" is no stranger to shocks in a globalised world. It has weathered

the 1997 Asian Financial Crisis, the after-effects of the terrorist attacks on September 11, 2001, the 2003 SARS virus outbreak, and the recent financial and economic downturn.

Singapore appears to have turned awareness about its vulnerability to external events into a competitive advantage.

"We have found that the conversations generated by the scenario planning process are as useful as the output, because they build an anticipatory mindset, challenge prevailing assumptions, and sensitise our people to the larger national challenges and opportunities," said Peter Ho. ■

SINGAPORE IS PROBABLY THE ONLY COUNTRY IN WHICH SCENARIO PLANNING IS USED COMPREHENSIVELY ACROSS ALL LEVELS OF GOVERNMENT TO PLAN STRATEGICALLY FOR THE FUTURE

1973

THE SCENARIO PLANNING METHOD USED BY SHELL HELPED SINGAPORE TO DEAL WITH THE 1973 OIL SHOCK

1991

SINGAPORE'S GOVERNMENT STARTED USING SCENARIO PLANNING IN 1991, DRAWING INSPIRATION AND SUPPORT FROM SHELL

1992

SINGAPORE PRODUCED ITS FIRST SCENARIOS

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SINGAPORE SET UP A SCENARIO PLANNING OFFICE. FIRST USED IN THE MINISTRY OF DEFENCE, SCENARIO PLANNING SPREAD ACROSS GOVERNMENT



SHELL'S TRACK RECORD IN ANTICIPATING
MAJOR STRUCTURAL CHANGES IN THE
GLOBAL ENERGY MARKETS HAS SUBSTANTIALLY
ENHANCED THE CREDIBILITY OF SCENARIO
ANALYSIS WITHIN THE GROUP

PETER CORNELIUS, FORMER SHELL SCENARIOS TEAM MEMBER

SOWING SEEDS FOR THE UNITED NATIONS' LANDMARK AIDS IN AFRICA SCENARIOS.

TIMES AND TRANSITIONS

Imagine Africa in 2025. The continent is losing its fight against HIV/AIDS.

Homes stand empty, poverty is growing, instability is rising and AIDS orphans with little hope and even less to lose are mourning a missing generation of parents. Disunity threatens the continent's economic, social and political fabric.

The 2005 United Nations report *AIDS in Africa: Three Scenarios to 2025* made it clear that there was nothing inevitable about this future.

With Shell's scenario development experience, the UN was able to outline three compelling but contrasting visions for Africa, highlighting the complex and dynamic connection between health, economic development, security, peace and stability.

"The AIDS epidemic acts as an overarching symbol of many problems facing Africa and the world," the report said.

The Joint United Nations Programme on HIV/AIDS (UNAIDS) was able to investigate which response to the crisis would create the best outcome for Africa, Africans and the wider world by 2025.

One scenario, named *Times and Transitions*, outlined a best-case scenario in which the number of people living with HIV and AIDS almost halves between 2003 and 2025 despite a 50% increase in the continent's population. A transformation in how Africa and the world tackle health, development, trade and security makes this possible.

THE 2005 UNITED NATIONS REPORT *AIDS IN AFRICA: THREE SCENARIOS TO 2025* MADE IT CLEAR THAT THERE WAS NOTHING INEVITABLE ABOUT THIS FUTURE

TOUGH CHOICES



THE AIDS EPIDEMIC ACTS AS AN OVERARCHING SYMBOL OF MANY PROBLEMS FACING AFRICA AND THE WORLD

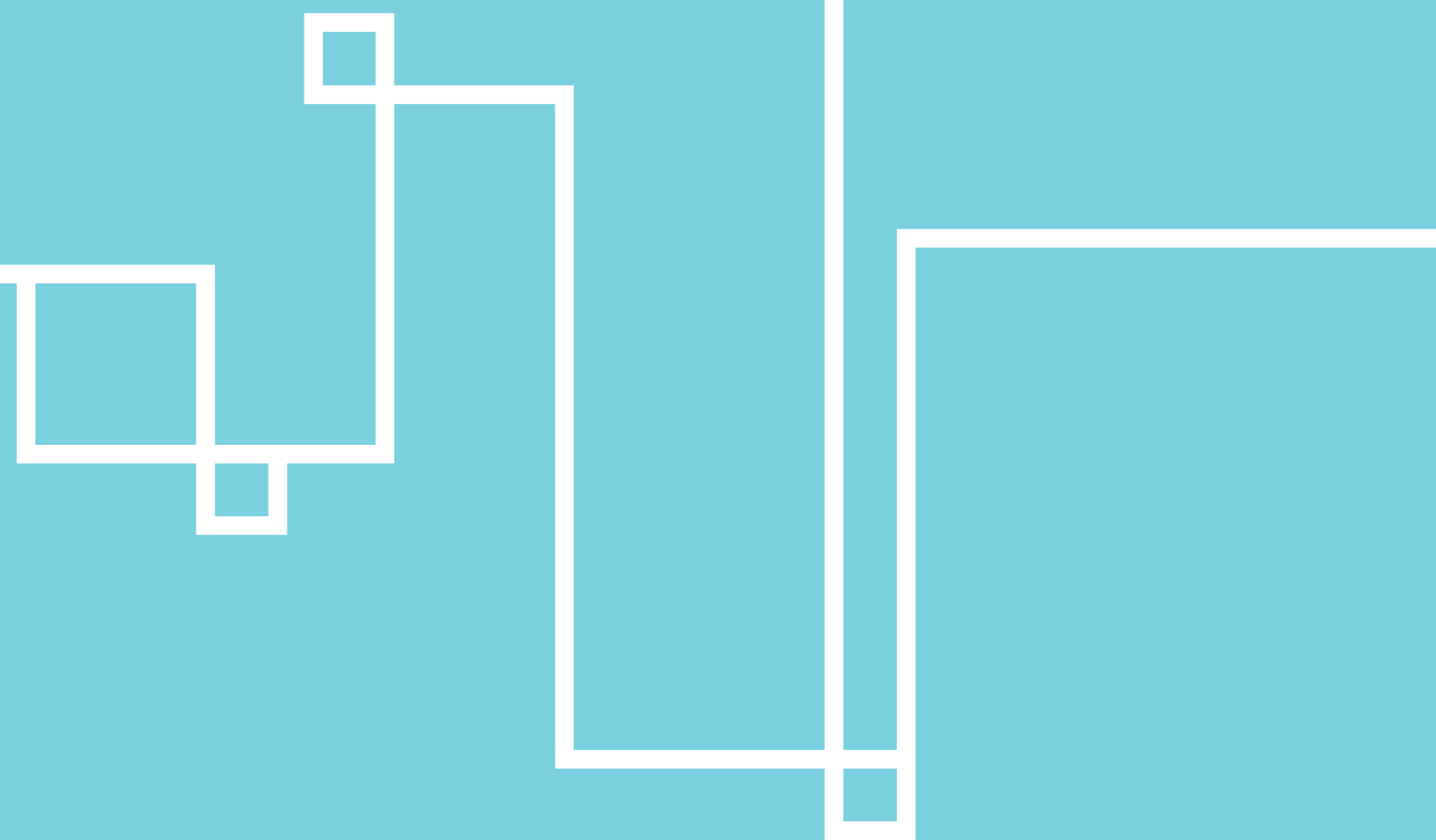
Traps and Legacies is a worst-case scenario in which Africa remains firmly in the grips of HIV and AIDS, facing poverty and instability. Despite the good intentions of African leaders and donors, the response to the crisis is short-term, fractured and fails to deliver a lasting solution. The epidemic continues to cost millions of lives and sparks a rise of more than 50% in the number of people living with HIV and AIDS across the continent.

Tough Choices offered a halfway house between the other two scenarios. It is less bleak than *Traps and Legacies* but less hopeful than *Times and Transitions*. African leaders take tough measures to combat the long-term spread of the disease as part of a long-term development strategy. ■

TRAPS AND LEGACIES

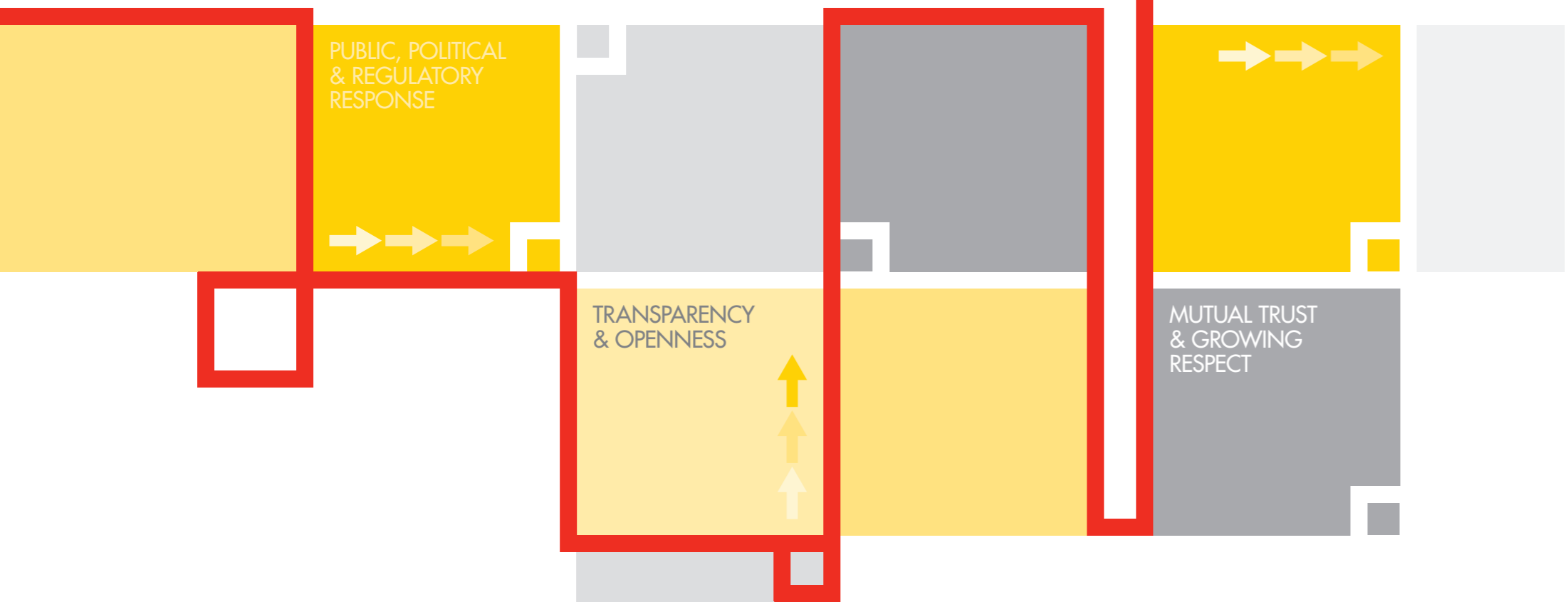
THE OUTLOOKS THE SCENARIOS TEAM
OUTLINE DO NOT NECESSARILY MAKE FOR
COMFORTABLE READING, FORCING SHELL
MANAGERS AND EXTERNAL DECISION-MAKERS
TO CONFRONT DIFFICULT TRUTHS

JEREMY BENTHAM, HEAD OF SCENARIOS, STRATEGY AND BUSINESS DEVELOPMENT, ROYAL DUTCH SHELL



REBUILDING TRUST, AT THE HEART OF MACONDO SCENARIOS 2010.

The catastrophic oil spill at the Macondo BP exploration well in the Gulf of Mexico damaged the oil and gas industry's reputation for safe and reliable operations and compounded a crisis of confidence deeply embedded by the 2008 financial crisis.



In 2005 Shell Scenarios had identified low levels of trust in global business, highlighting the company's existing conviction that transparency and accountability were vital to the industry's future.

The *Signals & Signposts* scenarios update published in 2011 noted the fallout from the Macondo oil spill, drawing on earlier scenarios that explored market concerns about security and trust in the wake of the September 11 attacks and the collapse of US energy giant Enron in 2001.

The earlier scenarios – *Global Scenarios to 2025* – were published in 2005. These provided a natural starting point for the Scenarios Team to frame its discussions about the Gulf oil spill.

“After the spill, we realised the earlier work provided a valuable set of lenses through which we could view the events unfolding in the Gulf, in particular the public, political and regulatory responses in the United States,” said Adam Newton from the Shell Scenarios Team.

The *Open Doors* scenario described how transparency and openness can create a relationship – between industry, regulators, government and the public – built on mutual trust and earned respect.

“The approach contends that if we are transparent as an industry and we welcome attention and scrutiny across our operations and procedures, we

THE GLOBAL SCENARIOS TO 2025 WERE:

LOW TRUST GLOBALISATION
A world marked by rapid regulatory change, overlapping jurisdictions, conflicting laws and intrusive checks and controls.

OPEN DOORS
A world of regulatory harmonisation, voluntary best practice codes and close links between investors and civil society.

FLAGS
A world characterised by regulatory fragmentation, nationalistic preferences and conflict.

can create a new relationship built on trust,” added Newton. “You can draw a line between this approach and Shell’s business response to the Macondo crisis, which was to open our company up for close examination with the aim of demonstrating our credibility.”

The Scenarios Team held internal workshops in The Hague and London before heading to Louisiana and Washington DC to assess local impacts, political reactions and responses to the crisis. In all, more than 200 internal and external stakeholder opinions were sought over a six-week period as oil continued to flow from the stricken deep water well.

“Scenario thinking can bring objectivity to a discussion. It’s about being open, collaborative and helping others to shape

CONTINUED →

AFTER THE SPILL, WE REALISED THE EARLIER WORK PROVIDED A VALUABLE SET OF LENSES THROUGH WHICH WE COULD VIEW THE EVENTS UNFOLDING IN THE GULF, IN PARTICULAR THE PUBLIC, POLITICAL AND REGULATORY RESPONSES IN THE UNITED STATES

THE APPROACH CONTENDS THAT IF WE ARE TRANSPARENT AS AN INDUSTRY AND WE WELCOME ATTENTION AND SCRUTINY ACROSS OUR OPERATIONS AND PROCEDURES, WE CAN CREATE A NEW RELATIONSHIP BUILT ON TRUST

our thinking – it reduces ‘no-go areas’ for discussion and helps to make sure we have a business response based on understanding others and not just a narrow view of the business impact,” said Newton.

In considering the potential long-term impact of the crisis in trust, *Signals & Signposts* outlined two plausible visions of the future.

One was dubbed *High Wire*. It represented the default position for an entire industry judged according to the standards of its worst-performing operators. It pointed to a low trust world with high levels of compliance but little incentive for industry collaboration. It was marked by knee-jerk and politicised responses to safety incidents, with stiff penalties for accidents hitting the entire industry and driving up costs. A low trust

environment was perpetuated, in which there was little motivation for operators to strive to achieve higher than average industry operating standards.

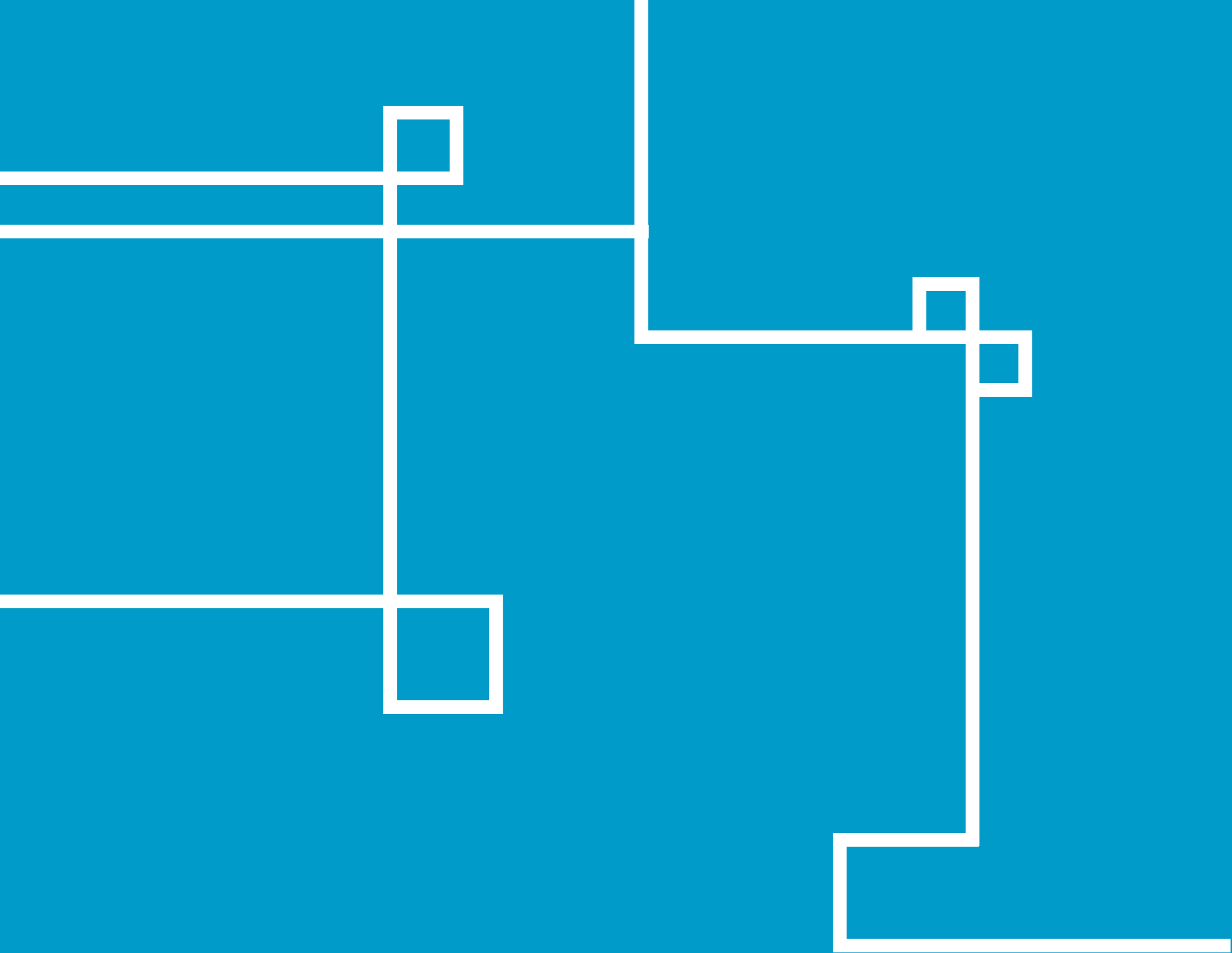
The *Safety Net* scenario, in contrast, pointed to an industry model based on open co-operation and partnership. Trust was earned and sustained by adopting greater openness and transparency across operations and in communications. The principle of transparency underpinned a new approach, bringing together the technical expertise largely developed in the private sector with the regulatory expertise of the public sector.

This underpinned a stronger relationship with government and regulators, as well as increasing social acceptance. Collaboration on standards drove

greater investment in joint industry research and development, improving operations and reliability, and defining more effective responses should an incident occur. Gradually tough self-regulation became the norm and compliance did not depend exclusively on government regulation.

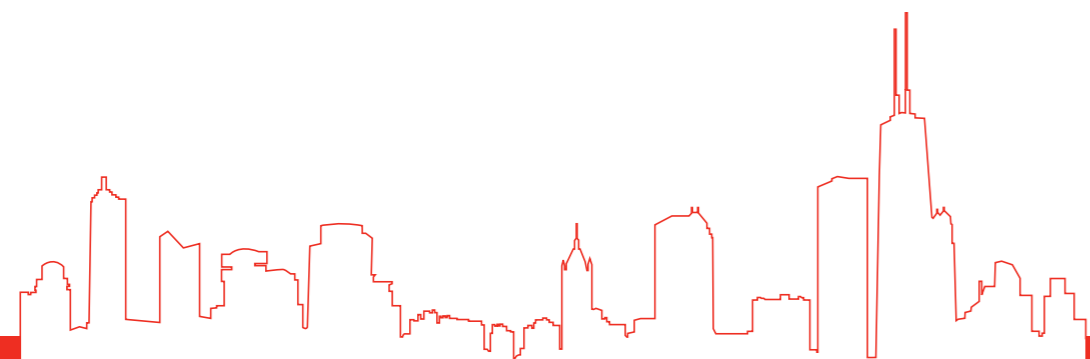
Signals & Signposts not only highlighted significant continuity in the work of the Scenarios Team from one decade to the next, it also reaffirmed the company’s conviction that collaboration between civil society and the public and private sectors was vital to address economic, energy and environmental challenges. ■

SCENARIO THINKING CAN BRING OBJECTIVITY TO A DISCUSSION. IT’S ABOUT BEING OPEN, COLLABORATIVE AND HELPING OTHERS TO SHAPE OUR THINKING.



OUR GOAL IS NOT TO PREDICT THE FUTURE BUT TO ENABLE POLICYMAKERS TO MAKE RICHER AND BETTER DECISIONS INVOLVING THE FUTURE, AS A RESULT OF HAVING A DEEPER GRASP OF KEY DRIVERS AND KEY UNCERTAINTIES

JEREMY BENTHAM, HEAD OF SCENARIOS, STRATEGY AND BUSINESS DEVELOPMENT, ROYAL DUTCH SHELL



LAGOS BANGALORE RIO DE JANEIRO
 BUENOS AIRES SHANGHAI TAIPEI CHENNAI
 JAKARTA SÃO PAULO NAIROBI
 HO CHI MINH CITY JOHANNESBURG DELHI

AN URBAN PLANET IN SEARCH OF ENERGY, WATER AND FOOD SECURITY.

We are living in an urban age. With millions leaving the countryside for the bright lights of cities like Shanghai, Rio, Lagos and Delhi, rising demand for energy, water and food is set to be most acute among our skyscrapers and slums. The city is also where the brightest ideas may emerge about investing, innovating and regulating for a sustainable future.

In 2011, Shell embarked on a project to explore innovative ways to ensure greater water, food and energy security.

Understanding the complex connections between energy, water and food – the so-called “stress nexus” – is crucial to making the most of the globe’s finite resources. It is also critical to avoiding drought, food shortages and a decline in our quality of life in the decades ahead. At the same time, understanding the complex connection would deepen Shell’s understanding of potential commercial risks and opportunities.

With 75% of the world’s population set to live in cities by 2050 – up from around 50% today – rising prosperity is expected to drive demand for energy, goods and services, particularly in urban areas.

“Our cities are likely to be the crucibles of the biggest challenges and opportunities created by our need to innovate, invest and regulate for a sustainable future,” says Jeremy Bentham, VP Global Business Environment.

Shell’s Scenarios were the starting point for the initiative to explore the stress

nexus. The 2011 *Signals & Signposts* publication included an examination of wider pressures on the planet’s resources.

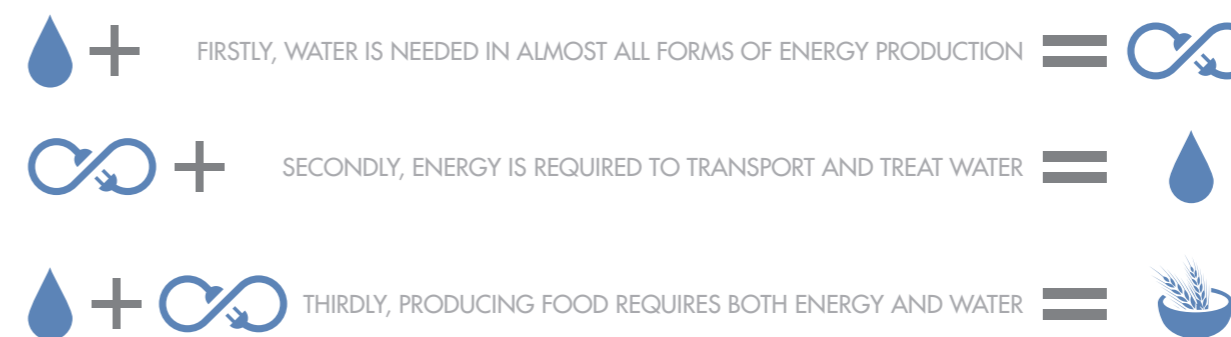
The relationship between energy, water and food appears simple on the surface. Water is needed in almost all forms of energy production. Energy is required to transport and treat water. Producing food requires both energy and water. But in reality, the relationship is far more complex.

To help unwrap this complexity, in 2011 Shell brought together academics and experts from industry, government and

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WITH 75% OF THE WORLD’S POPULATION SET TO LIVE IN CITIES BY 2050 – UP FROM AROUND 50% TODAY – RISING PROSPERITY IS EXPECTED TO DRIVE DEMAND FOR ENERGY, GOODS AND SERVICES, PARTICULARLY IN URBAN AREAS

THE RELATIONSHIP BETWEEN ENERGY, WATER AND FOOD APPEARS SIMPLE ON THE SURFACE:



IN REALITY, THE RELATIONSHIP IS FAR MORE COMPLEX.

SHELL'S SCENARIOS INDICATE THAT LATENT ENERGY DEMAND COULD ALMOST TRIPLE IN THE FIRST HALF OF THIS CENTURY, WHILE 'BUSINESS AS USUAL' PRODUCTION WOULD ONLY GROW BY 50%

non-governmental organisations to examine interconnections between energy, food and water systems and to find ways to reduce stresses in the decades ahead. The aim was to identify areas where targeted investment, planning and creative solutions would have the most impact.

Shell turned to Eric Berlow, an expert in mapping complex natural ecosystems from the University of California at Berkeley, to help spearhead analysis of the relationship between rising demand for energy, water and food.

Using network analysis, the relationship was mapped in a nexus revealing thousands of potential linking features. "Participants in the exercise emerged from three days locked in a small windowless room where the nexus mapping took place in a state of existential despair," said Adam Newton, Project Manager for the Scenarios Team and the leader of the stress nexus working group.

Approximately 20 core issues ultimately emerged as central and influential factors in the nexus. These were split into six categories: Smart & Sustainable Design; Technology Innovation; Policy & Pricing; Natural Resource Nationalism; Other Constraints; and Growth in Population & Prosperity.

Two of the biggest policy levers in the nexus appear to be smart and sustainable urban design and emissions regulation.

"With cities producing up to 80% of CO₂ emissions it's clear that smarter urban development is required to give the world more compact, connected, efficient cities with secure access to water and food, integrated mobility and effective management and reuse of waste streams," Adam Newton commented.

Between 2000 and 2040 it is estimated that over \$300 trillion of investment will be required for city infrastructure according

SYSTEMS THINKING

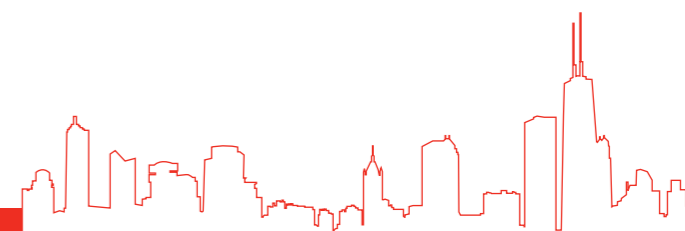


ZONE OF UNCERTAINTY



STRESS NEXUS

WITH CITIES PRODUCING UP TO 80% OF CO₂ EMISSIONS IT'S CLEAR THAT SMARTER URBAN DEVELOPMENT IS REQUIRED TO GIVE THE WORLD MORE COMPACT, CONNECTED, EFFICIENT CITIES...

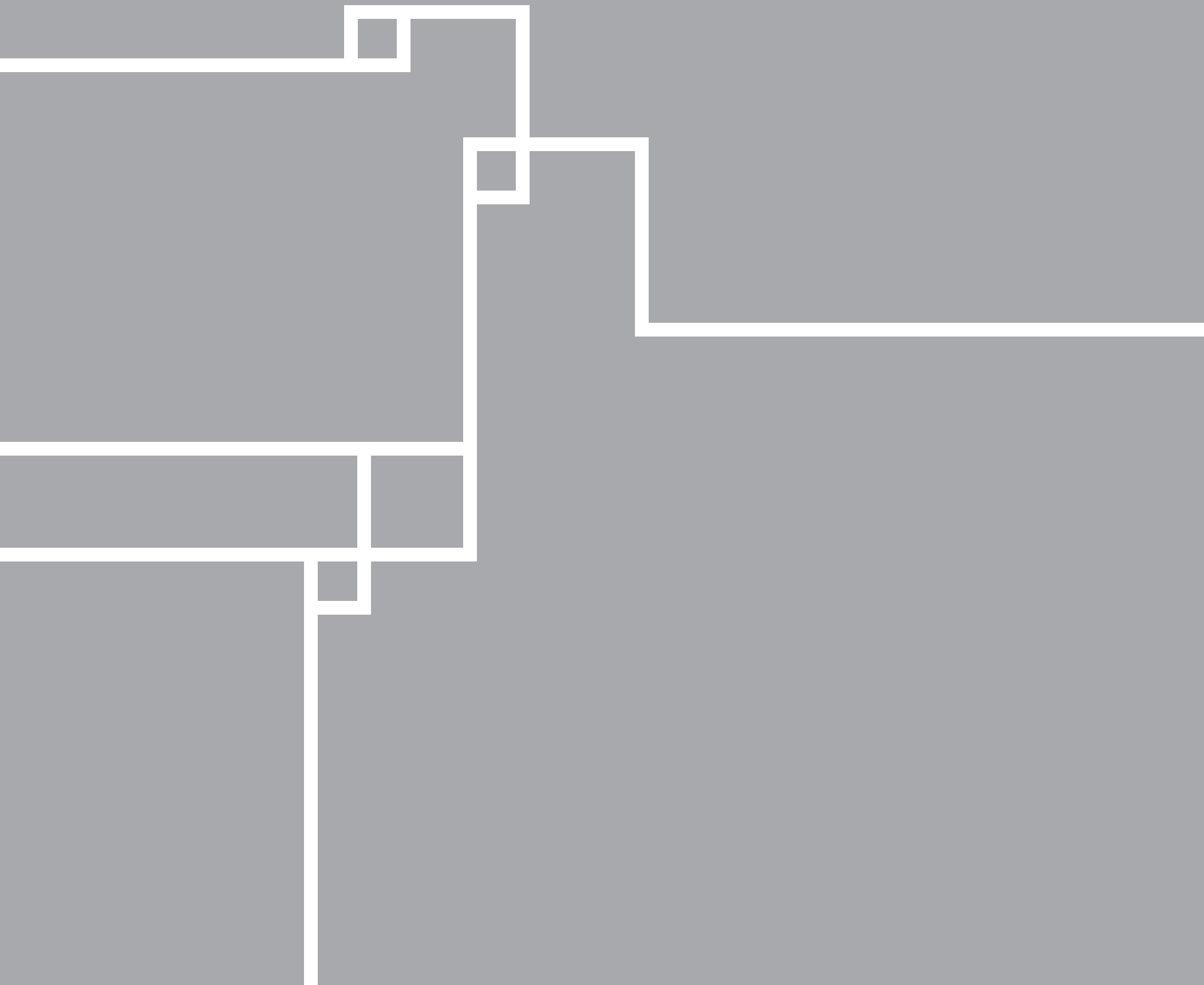


to a 2010 report for the WWF. That will accompany phenomenal growth in cities in China, India, the US, Nigeria, Bangladesh and Brazil.

Indeed, with the world's population set to grow from around 7 billion in 2011 to 9 billion in 2050, the equivalent of adding another China and another India to the world, it will be challenging to meet basic needs for water, food and energy.

If current water consumption trends continue, the world could face a 40% shortfall between global freshwater demand and supply by 2030. At the same time, there will be 50% growth in food needs. Oxfam estimates that stresses on the planet could lead to a doubling in food prices by 2030.

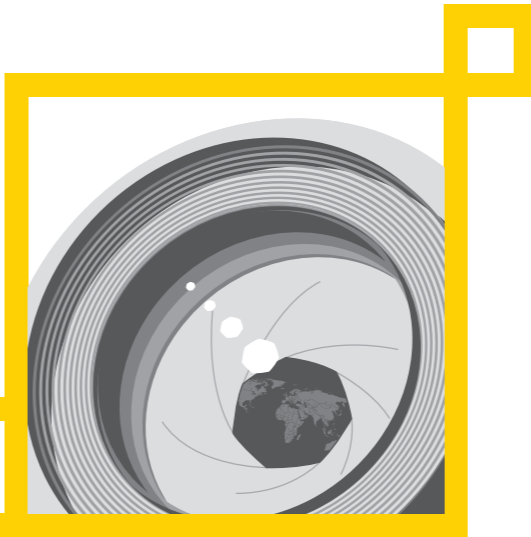
Shell's Scenarios indicate that latent energy demand could almost triple in the first half of this century, while "business as usual" production would only grow by 50%. This large potential gap will need to be closed by some combination of extraordinary supply growth or demand moderation. Shell refers to this gap as a "zone of uncertainty". As it applies to energy, so too could the dynamics of water and food resources behave according to the same model as the planet's population balloons. ■



PEOPLE ACROSS THE ENERGY INDUSTRY
AND BEYOND HAVE FOLLOWED SHELL'S
EXAMPLE TO MODEL WHAT MIGHT BE
PLAUSIBLE IN THE FUTURE

SIR DAVID KING, DIRECTOR OF THE SMITH SCHOOL OF ENTERPRISE AND THE ENVIRONMENT AT THE UNIVERSITY OF OXFORD

LEADERSHIP PARADOX



AS OUR PLANET GROWS MORE PROSPEROUS, URBAN AND CONNECTED, THIS PRESSURE ON RESOURCES IS CHALLENGING US ALL TO FIND NEW WAYS TO MEET HUMANITY'S RISING ASPIRATIONS IN A SUSTAINABLE FASHION

ERA OF VOLATILE TRANSITION DEMANDS NEW APPROACH.

With growth in the world's population, rapid urbanisation and rising prosperity exerting more pressure on the world's energy, food and water resources, we have entered a new era of rising anxiety and dissatisfaction.

As our planet grows more prosperous, urban and connected, this pressure on resources is challenging us all to find new ways to meet humanity's rising aspirations in a sustainable fashion.

These 21st century economic, social, political and environmental pressures are the focus of Shell's latest scenarios work, to be released publicly in 2013.

In 2011, Shell published *Signals & Signposts*, a companion piece to the 2008 *Energy Scenarios to 2050*. *Signals & Signposts* was the starting point for Shell to examine different ways to tackle these stresses in the global system. *Signals & Signposts* suggested that these

pressures made industrial and social transformation inevitable.

Signals & Signposts not only reflected the impact of the global economic and financial crisis but also included an examination of the wider pressures on the planet's resources. It made clear that we have entered an "era of volatile transitions", with very different possible pathways ahead.

PATHWAY LENSES

Signals & Signposts was the genesis of the new lens scenarios. Pathway Lenses, for example, explore what happens when gaps emerge between what people want and what they have. Closing that

CONNECTIVITY PARADOX

PROSPERITY PARADOX

gap could require economic, social, environmental or political reform to curb financial turbulence, growing social inequality and social tension.

A widening gap fuels anxiety and dissatisfaction. This in turn creates opportunities for change, for new ways of doing things to close that gap.

Closing the gap can be hampered or encouraged by what we call inhibitors and facilitators. Ignorance, interests and ideology, as Nobel-prize winning economist Paul Krugman points out, can prevent transitions towards a more sustainable future.

We see two archetypal pathways in the face of these challenges: Room for Manoeuvre and Trapped Transitions. These give us new lenses on the dynamics of multiple transitions.

Not only are we living in times of volatility and transition. We are also living in times of paradox.

PARADOX LENSES

Aspirations have grown in line with rising prosperity as millions emerge from poverty around the world. But institutional inadequacy, inequality and insecurity are throwing up challenges which must be overcome to maintain and extend public well-being. For example, rising prosperity in developing countries coupled with stagnation for many in developed countries is fuelling tension between the most advantaged and the wider population. It is also creating resource stresses that threaten to undermine some of the very benefits of prosperity. We call this the Prosperity Paradox.

The scale of global challenges also creates a Leadership Paradox, as widespread stresses require coordination between many different groups to achieve progress, but those same groups have different vested interests which may block the pace of reform and progress.

We also face a Connectivity Paradox. Technology is unleashing greater connectivity and individual creativity while also encouraging more herd behaviour and putting intellectual property at risk.

These new lenses suggest that addressing the challenges of the 21st century will be challenging and often uncomfortable. It may require many people and organisations to reconsider their own vested interests, to forge innovative partnerships and to move towards more effectively accommodating the best interests of others as a necessary component of their own flourishing. ■



TEAM PROFILES

PETER SCHWARTZ

FORMER HEAD OF SCENARIOS,
STRATEGY AND BUSINESS DEVELOPMENT

Peter Schwartz has become one of the world's most renowned futurists, business strategists and scenario planners. A prolific author and lecturer, the *Financial Times* described him as a "gem, an original, a fizzing stream of ideas and anecdotes."

His first book, *The Art of the Long View*, published in 1991, is considered a seminal work on scenario planning. His other books include *When Good Companies Do Bad Things*, an examination of corporate social responsibility and *China's Future*, which describes different scenarios for Asia's biggest economy. In addition to writing seminal books on the future, he has served as a script consultant to Hollywood films including *Minority Report*, *Deep Impact* and *War Games*.

Before joining Shell, he directed the Strategic Environment Centre at SRI International, an independent, non-profit research institute conducting client-sponsored research and development for government agencies, commercial businesses, foundations and other organisations.

After his career at Shell, he co-founded the Global Business Network (GBN), a leading organisation focused on scenario thinking and planning. He has led programmes for corporations, governments and non-profit institutions. His research and scenarios work spans energy, environment, technology, telecommunications, media, entertainment, aerospace and national security. He has a B.S. in aeronautical engineering and astronautics and an honorary doctorate from Rensselaer Polytechnic Institute.

JOOP DE VRIES

FORMER HEAD OF SCENARIOS,
STRATEGY AND BUSINESS DEVELOPMENT

After Shell Joop de Vries went on to become an expert in qualitative aspects of scenario planning and cultural research, working in Paris, Heidelberg and Maastricht.

During his time at Shell he held management positions at Shell Centre in London in supply, oil trading, competitive positioning and marketing. Introduced to Shell scenarios early in his career, he worked with Pierre Wack and later succeeded Peter Schwartz as head of the Scenarios Team. After working with the Scenarios Team he became marketing director in the Netherlands and coordinator of Shell's activities in Central America, leaving Shell in 1996.

He joined two Paris-based cultural research institutes, the International Research Institute on Social Change and Cofremca Sociovision, providing research in marketing and for scenarios development. He later moved to Heidelberg in Germany to work on futures projects for Sinus Sociovision in consumer electronics, human resources, sustainability, media, housing, health care, politics and lifestyles. He moved to Maastricht and published a book in 2006, *Whose Europe Wins*, looking at values and aspirations in European society.

He studied chemistry in Nijmegen, worked at Rutgers University (N.J.) and obtained his doctorate in 1974 with a dissertation on physical chemistry.

KEES VAN DER HEIJDEN

FORMER HEAD OF SCENARIOS,
STRATEGY AND BUSINESS DEVELOPMENT

Kees van der Heijden went on to write seminal scenarios and become an associate fellow at Oxford's Said Business School after a long and distinguished international career at Shell.

After joining Shell in 1957 he spent many years abroad in operating companies in Manila, Singapore and Curaçao, mostly in activities concerned with commercial planning, economics, and corporate planning and strategy. He also headed Shell's internal strategic consultancy group, assisting management teams in strategy development and implementation.

He is the author of the seminal *Scenarios: The Art of Strategic Conversation* and co-author of *The Sixth Sense: Accelerating Organizational Learning with Scenarios*. He became Professor Emeritus of Strategic Management at the Graduate Business School of Strathclyde University, Glasgow and a leading expert on the emergence of institutional strategic thinking and learning.

JOSEPH JAWORSKI

FORMER HEAD OF SCENARIOS,
STRATEGY AND BUSINESS DEVELOPMENT

Joseph Jaworski went on to become a leading expert on transformation leadership after leaving Shell. He started his career as a lawyer at a large US law firm, where he was a senior partner and member of the executive committee.

A co-founder of the Global Leadership Initiative, he worked for many years on the transformation of large-scale organisations. He wrote critically acclaimed books on transformational leadership, including *Synchronicity*.

In 1980, Jaworski founded the American Leadership Forum, which focused on promoting civic leadership in the United States. In 1990 he joined Shell in London to head their team of scenario planners. At Shell he radically altered the way the company looked at scenarios, focusing not only on predicting futures but on creating better ones. After leaving Shell he returned to the United States to join the Board of Governors at the MIT Center for Organizational Learning and co-founded the Society for Organizational Learning.

ROGER RAINBOWFORMER HEAD OF SCENARIOS,
STRATEGY AND BUSINESS DEVELOPMENT

Roger Rainbow went on to become a leading consultant on scenario planning and strategy after leaving Shell. He specialised in how to help leaders gain deeper understanding of the relationship between strategy and the world around them.

After retiring from Shell in 1999, he consulted with a number of leading companies around the world. His worked as Strategic Planning Advisor to Control Risks Group, a leading business risk consultancy, as well as on the International Advisory Board of Energy Intelligence Group. He also served as a Fellow of the Windsor Leadership Trust, a UK-based charity that aims to develop leadership skills at all levels of society.

Rainbow joined Shell in 1970 after attending business school and teaching for four years in Tanzania. He worked for Shell in the Philippines, Brunei, Turkey, Venezuela, and Australia as well as in London. He joined the Scenario Planning Team as Head of Energy before taking over as the head of the team in 1993.

He gained a BA in Physics from Oxford University, a teaching diploma from Makerere College, Uganda and an MBA from London Business School.

GED DAVISFORMER HEAD OF SCENARIOS,
STRATEGY AND BUSINESS DEVELOPMENT

Ged Davis led a large number of scenarios projects during his long career and tackled issues including AIDS, sustainable development and climate change.

He was the director of the UNAIDS 'AIDS in Africa' scenario project from 2002 to 2003 and was involved in scenarios on the future of sustainability for the World Business Council for Sustainable Development. He was also a facilitator of an emissions scenario for the UN's Intergovernmental Panel on Climate Change (IPCC).

After leaving Shell he served as managing director of the World Economic Forum. He was responsible for global research, scenario projects and the design of the annual Forum meeting at Davos, which brings together corporate, government and non-profit leaders to shape the global agenda.

He served as a member of the InterAcademy Council Panel on Transitions to Sustainable Energy, a director of Low Carbon Accelerator Limited, a governor of the International Development Research Centre in Ottawa and a member of the INDEX Design Awards Jury.

He joined Shell in 1972, spending 30 years at the company. He graduated with a degree in Mining Engineering from Imperial College, London and was awarded postgraduate degrees in Economics and Engineering from the London School of Economics and Stanford University.

ALBERT BRESSANDFORMER HEAD OF SCENARIOS,
STRATEGY AND BUSINESS DEVELOPMENT

Albert Bressand, who led Shell's Global Business Environment (GBE) department from 2003–2006, was responsible for designing a new generation of Shell Global Scenarios around an enhanced, original methodology for risk and opportunity assessment. During his career he also worked as a key adviser to the EU and the French government.

He was Special Adviser to the EU Commissioner in charge of energy in Brussels and served as Economic Advisor to the Minister of Foreign Affairs of France. He also held key positions with the French Institute for International Relations and the World Bank.

As a member of the faculty of the World Economic Forum, he chaired a number of sessions at the Davos Annual Meetings. He contributed to several major Cambridge Energy Research Associates (CERA) studies on world energy, notably the CERA Dawn of a New Age scenarios and the Securing the Future study on EU-Russia gas relations. His work has appeared in *Foreign Affairs*, *International Affairs* and *Le Monde*, among other publications.

He gained advanced degrees in both mathematics and engineering at École Polytechnique in Paris, École Nationale des Ponts et Chaussées and Paris-Sorbonne, and an MPA and a PhD in Political Economy at the Kennedy School of Government at Harvard University.

JEREMY BENTHAMCURRENT HEAD OF SCENARIOS,
STRATEGY AND BUSINESS DEVELOPMENT

Jeremy Bentham, the head of the Shell Scenario Team since 2006, has 30 years of experience in the energy industry and has worked in most of Shell's main business sectors. An Oxford University physics graduate, he joined Shell in 1980 following postgraduate experience at the California Institute of Technology. He also holds a Masters' degree in management from the Massachusetts Institute of Technology (MIT), where he was a Sloan Fellow from 1990 to 1991.

Following experience in both research and technology process design, Jeremy worked in the areas of manufacturing economics, industry analysis and commercial information technology. He then held line management positions coordinating commercial and production activities at a number of refinery facilities. Subsequently he became manager of corporate strategy analysis within the Corporate Centre of the Shell Group, and then led a strategic project for Shell's Exploration and Production Business.

Jeremy joined the leadership team of Shell's global commercial technology company, Shell Global Solutions, in 1999, with specific responsibility for commercial and strategic developments including new business. He was subsequently appointed as chief executive of Shell Hydrogen. Since January 2006 he has been responsible for Shell's Global Business Environment team, which is best known for developing forward-looking scenarios to support strategic thinking and direction-setting.



ACKNOWLEDGEMENT

TO ALL OUR COLLEAGUES, PAST AND PRESENT, WHO HAVE WORKED ON THE DEVELOPMENT OF SHELL SCENARIOS, **WE THANK YOU FOR YOUR MANY CONTRIBUTIONS.** IT IS YOUR CREATIVITY AND INSIGHT THAT MAKE OUR SCENARIOS CREDIBLE AND ENGAGING.

IT IS YOUR COURAGE TO THINK BEYOND COMFORTABLE BOUNDARIES THAT ENSURES SCENARIOS HAVE BEEN – AND WILL CONTINUE TO BE – USEFUL STRATEGIC TOOLS WITH WHICH TO FACE THE FUTURE.



