

## **The Shell Global Scenarios to 2025**

**The future business environment:  
trends, trade-offs and choices**

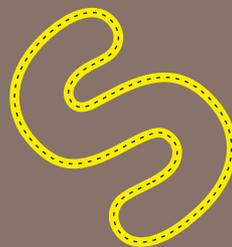
© Shell International Limited (SIL), 2005. Permission should be sought from SIL before any part of this publication is reproduced, stored in a retrieval system or transmitted by any other means. Agreement will normally be given, provided that the source is acknowledged.

The companies in which Royal Dutch Petroleum Company and The "Shell" Transport and Trading Company, p.l.c. directly or indirectly own investments are separate and distinct entities. The expressions "Royal Dutch/Shell Group" and "Group" are used to refer to the companies of the Royal Dutch/Shell Group as a whole. The words "Shell", "we", "us" and "our" are used in some places to refer to the Group and in others to an individual Shell company or companies where no particular purpose is served by identifying the specific company or companies.

The information contained in this publication is, to the best of our knowledge, true and accurate although the forward looking statements herein are by their nature subject to risk factors which may affect the outcome of the matters covered. Opinions from independent experts are presented as their own views in separate inserts with their approval. None of Shell International Limited, its affiliates and their respective officers, employees and agents represents the accuracy or completeness of the information set forth herein and none of the foregoing shall be liable for any loss, cost, expense or damage (whether arising from negligence or otherwise) relating to the use of such information.



## Introducing our Global Business Environment



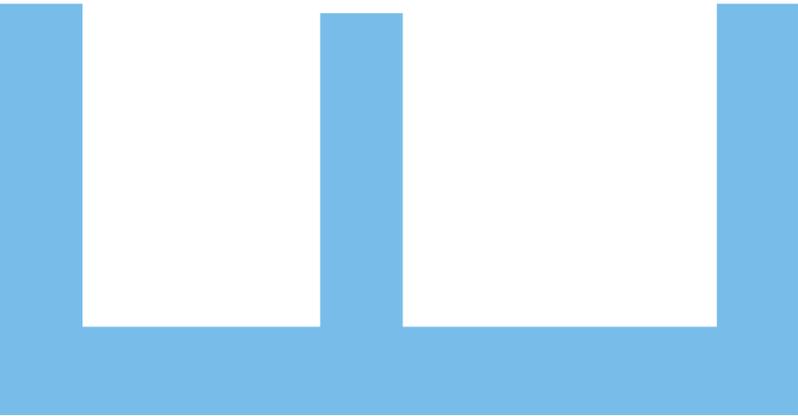
● To use the metaphor of air navigation, the work of the Shell Scenarios team is designed to help charter routes across three interrelated levels: the *Jet Stream* level of long-term predetermined trends,

uncertainties, and forces; the *Weather Systems* that reflect specific features of key regions as influenced by the *Jet Stream* context; and market-level trends and turbulences. This report presents

*Jet Stream* contexts that will impact the Royal Dutch/Shell Group as a whole, through predetermined trends and through long-term equilibria captured in *Global Scenarios to 2025*.

The analytical framework developed for this report can also shed light on *Weather Systems* and market-level risks and opportunities, something done separately in customised **Navigation** applications.

STREAM



Building, creatively, on 30 years of Shell Global Scenarios

● A new approach to scenarios emphasising continuity and flexibility for strategy work.

Over the last three decades, Shell has developed *Global Scenarios* to cast light on the context in which the Group operates, to identify emerging challenges and to foster adaptability to change. These scenarios are used to help review and assess strategy.

The *Global Scenarios to 2025* released in 2005 build on this foundation to develop an enhanced, robust methodology that addresses a broader range of strategic and planning needs across the whole spectrum of relevant time horizons and contexts.

Hence the transition that has occurred from a three-year scenario cycle to an annual one. This will provide greater continuity while also enabling flexible contributions to Group processes for identifying critical risks and opportunities.

**Continuity** is based on a map, the *Trilemma Triangle*, which embodies both an analysis of key forces and a methodology to monitor the implications of these forces year after year.

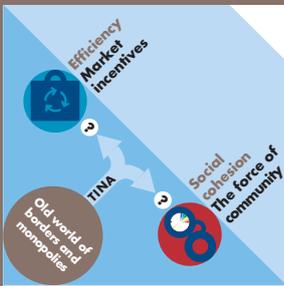
**Flexibility** is based on the fact that this map is not limited to the three *Global Scenarios* themselves, but encompasses a far broader set of possible futures. This will lead to customised applications and to quicker updates. It will also help Shell make significant contributions to important debates in the world at large.

Cooperation with centres of excellence and contributions by eminent experts in the course of developing these scenarios reflect strong teamwork, within and beyond corporate boundaries.

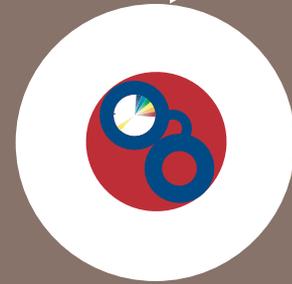
# 1990s

TINA

The iconic worlds of the 2001 *Business Class* and *Prism* scenarios



Previously, *Global Scenarios* explored the challenges of a globalising, deregulated, market-centric world...



During the 1990s, as market liberalisation accelerated, the *Shell Global Scenarios* explored the concept of “TINA” – There Is No Alternative—to increasing globalisation, the onrush of new technology and market liberalisation. The pairs of scenarios put forward in 1992, 1995 and 1998 all featured a market-centric world (*New Frontiers*, *Just Do It!* and *People Power*) as well as an alternative world giving more room to social and community aspirations.

This dilemma between efficiency on the one hand and values and social cohesion on the other still shaped the focal question behind the pair of 2001 *Global Scenarios*: “will the resolution to dilemmas arising from globalisation be dominated by global elites or by the people of the heartlands?”

The 2001 *Global Scenarios* – *Business Class* and *Prism*—drew striking and comprehensive implications of this analysis of globalisation, in an almost iconic manner:

*Business Class* offered a vision of “connected freedom” and greater economic integration. This was a world of efficiency, opportunities and high rewards for those who could compete and innovate successfully. Established authorities would be continually challenged and the power of nation states greatly reduced.

*Prism* highlighted the “connections that matter” and “multiple modernities” reflecting the influence of “heartlands” as opposed to “connected elites”. The power of cultural values and belonging was stressed.

The tensions captured in 2001 remain valid, but societies also face more complex choices on the nature of regulation, the framework for corporate governance and welfare reforms. Conflicts over religion and values, shades of patriotic, populist and nationalist policies, and tensions between nations—including across the Atlantic—reflect greater divisiveness in the world.

2001



2002



2005

The dual crisis of security and market trust

● **Disruption of both international security and trust in the marketplace highlight the importance of the role of the state.**

**Two crises—in short, 9.11 and Enron—have unfolded since 2001, affecting national security and trust in the marketplace. Both have highlighted the vulnerability of our globalised world.**

**Western societies now expect the state to lead the restoration of physical security and market integrity. Middle Eastern, Asian, African and Latin American societies have heightened expectations of peaceful solutions to wars and to persisting poverty.**

In addition to market incentives and community aspirations, this dual crisis brings into sharper focus a third force, namely the power of the state to regulate and to coerce.

This role involves both direct intervention—fighting terrorism and policing the market—and a more general emphasis on transparency, disclosure and good governance.

Society's heightened expectations accelerate the transformation of the state's agenda and methods. Because the new type of state acts in much closer synergy with the market (maximising opportunities for companies, individuals and civil society rather than welfare in general), this greater role of the state reinforces investors' power over value creation.

As a result, the *Global Scenarios to 2025* emphasise the importance of security concerns, legal and capital market cultures, and regulation.

• **Part 1** presents the *Trilemma Triangle*, the analytical framework developed to map relations between market participants, civil society and states.

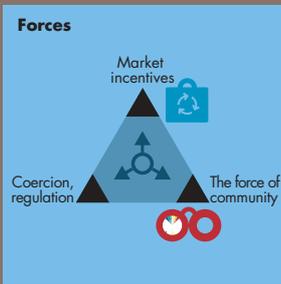
• **Part 2** presents the *Global Scenarios to 2025* themselves. A selection of 'Trilemmas' then summarises implications of the *Global Scenarios* for key aspects of our global business environment.

• **Part 3** analyses critical trends common to all scenarios, first on the international scene (emphasising the US, China, the EU, India and Africa), then in matters of demography, and patterns of economic growth. It concludes by focusing on energy security and the move towards an "energy-and-carbon" industry.

### the Trilemma Triangle

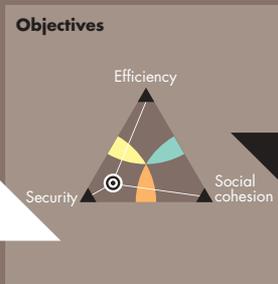
# 2025

The three forces ... the Trilemma Triangle ... the “two wins—one loss” areas



Points on the map show complex trade-offs...

...as competing forces pull toward the three triangle apexes



One of the three “two wins—one loss” areas

#### The *Global Scenarios to 2025* explore the three forces of market incentives, communities, and coercion or regulation by the state.

The three forces drive towards different objectives: efficiency, social cohesion and justice, and security. While societies often aspire to all three objectives, the forces display elements of mutual exclusiveness—one cannot be at the same time freer, more conformant to one’s group or faith, and more coerced.

We explore the three dilemmas—a *Trilemma*—involved in the pursuit of these objectives. Hence the use of the *Trilemma Triangle* to map the interplay between market incentives, the force of community (aspirations to conform and

be listened to) and forces of regulation and coercion.

#### Trade-offs rather than utopias

The three corners, or apexes, would be tempting starting points for scenarios, as they would pit a market-centric world against society-centric and state-centric ones. In democratic market economies, however, such worlds are what Thomas Moore in 1516 called “utopias”, worlds that can inspire but cannot exist.

We develop the new scenarios not at the apexes but in the areas of the *Trilemma Triangle* that capture the most plausible trade-offs between these diverse, complex objectives, namely the “two wins—one loss” areas in which forces combine to achieve more of two objectives. Each of

these areas embodies trade-offs acceptable to broader coalitions of actors than in the utopian worlds at the apexes.

Putting business relevance first leads to more complex, sometimes quite technical analyses of our business environment, as trade-offs reflect investor and customer expectations, corporate governance, legal cultures, regulatory integration or conflicts, policies and strategic choices. Yet this complexity is a source of critical strategic challenges, and the three scenarios capture plausible, coherent ways in which essential trade-offs will be arrived at.

Our framework also highlights transformations that will influence how various actors—whether

governments, NGOs or investors—can “play their cards” in pursuit of their objectives.

#### Limits and future developments

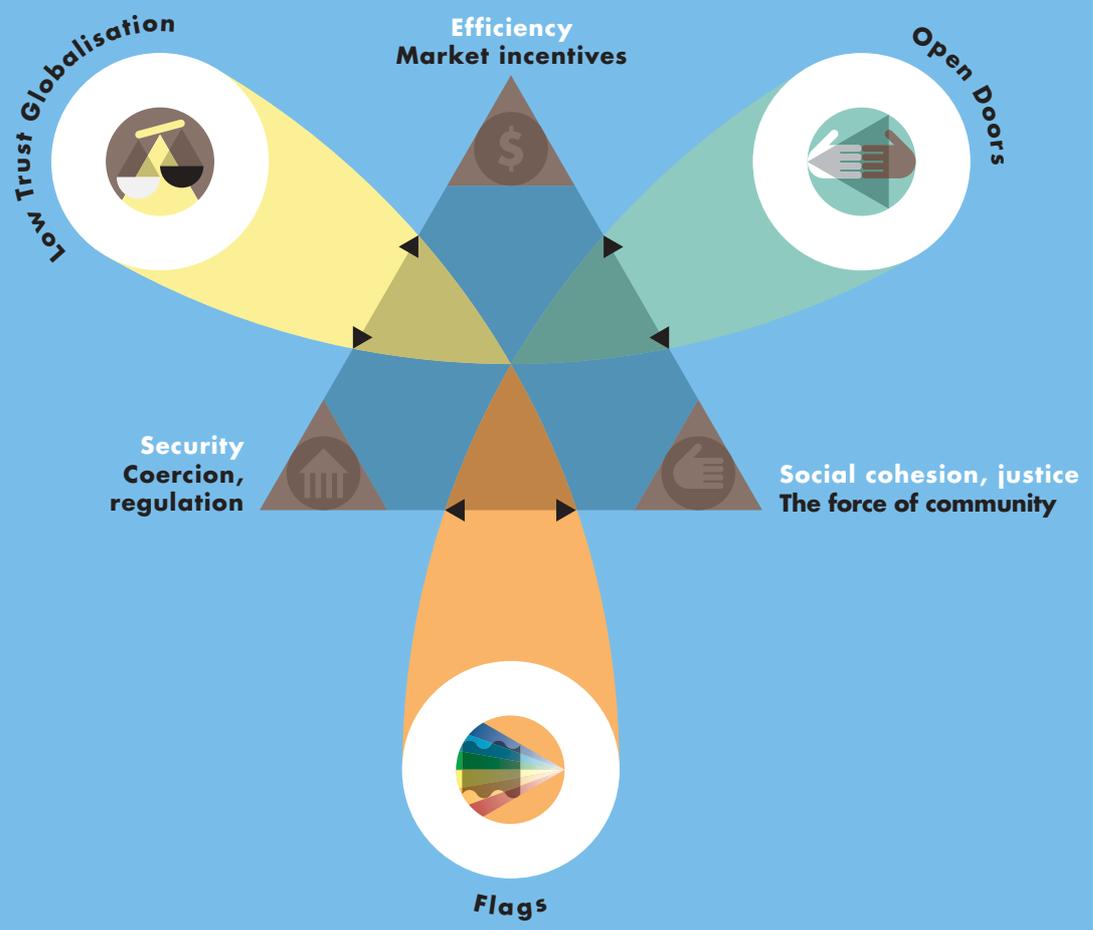
This *Jet Stream* report does not seek to provide answers to all questions that may affect the Group, and even less to list all events that could introduce change. Nonetheless, it is a cornerstone in a more comprehensive risk-assessment effort.

*Jet Stream* forces establish contexts, and our framework helps us to analyse in other work how such contexts can be modified by external shocks such as major wars, regional crises, radical climate change or major pandemics like AIDS.



# Coherent, contrasted business environments

Key to these *Global Scenarios* are the legal environment, the market culture, the global forces of integration and fragmentation and—more generally—the complex interplay between the three forces. These factors shape how different societies, and the global community, strive towards all three objectives of efficiency, social justice and security.



# Executive Summary

## Part 2 the Three Global Scenarios to 2025

### Chapter 5

#### Flags



### a dogmatic, “follow me” world

Zero-sum games, dogmatic approaches, regulatory fragmentation, and national preferences, conflicts over values and religion give insiders an advantage and put a brake on globalisation. Gated communities, patronage and national standards exacerbate fragmentation, and call for careful country-risk management.

### Chapter 4

#### Open Doors



### a pragmatic, “know me” world

“Built-in” security and compliance certification, regulatory harmonisation, mutual recognition, independent media, voluntary best-practice codes, and close links between investors and civil society encourage cross-border integration and virtual value chains. Networking skills and superior reputation management are essential.

### Chapter 3

#### Low Trust Globalisation



### a legalistic, “prove it to me” world

The absence of market solutions to the crisis of security and trust, rapid regulatory change, overlapping jurisdictions and conflicting laws lead to intrusive checks and controls, encouraging short-term portfolio optimisation and vertical integration. Institutional discontinuities limit cross-border economic integration. Complying with fast-evolving rules and managing complex risks are key challenges.

capturing  
key  
dimensions

Our global business environment

... customers and investors ... brands ... compliance ... transparency and disclosure ... transaction costs and vertical integration ...



Scenario	Security	Trust
	Checks and Controls	Rules-based
	Precautionary Principle	Voluntary codes
	Gated communities	Community-based loyalty

Trilemma 1: Resolution of the dual crisis

Scenario	Drivers	Disclosure	Business Impact
	Investors	Financial	"Bolt-on"
	Investors and civil society	Financial and global value reporting	"Built-in"
	National stakeholders	Financial and impact on local communities	Hybrid

Trilemma 5: Transparency and disclosure process

Differences between the three scenarios are captured in Trilemmas which compare specific features of our business environment.

In this report, we share a select number of the implications we have derived from the *Trilemma Triangle* framework regarding our global business environment. Such analysis starts with the contrasted resolutions of the dual crisis of security and trust, a foundation for many other developments.

Investors' attitudes

Differences in investors' attitudes can be captured in the contrasts between "Exit", "Voice" and "Loyalty" (a trilogy of conflict-resolution behaviours that we describe): while investors in *Low Trust Globalisation* will "vote with their feet", they will be more inclined to voice their concerns in *Open Doors*. As transparency and alternatives are limited, *Flags* is a world of "home bias" and of high, even if constrained, loyalty.

The twin logic of compliance and reputation

The strategy and behaviour of companies are influenced by complex combinations of **regulations, compliance** mechanisms (whether through courts, arbitration or bargaining), and of **transparency** and **disclosure** requirements either through the law or through voluntary codes. For instance, the extent to which disclosure will have to cover non-financial performance differs significantly across scenarios: while the "triple bottom line" approach—financial, social and environmental—prevails in *Open Doors*, where civil society groups work closely with investors, measures of non-financial performance focus on local issues in *Flags* (air and water pollution, impact on jobs...).

In *Low Trust Globalisation*, financial reporting is complex and contentious enough for companies to "stick to the rules" and limit their disclosure to mandatory standards.

What type of regulatory integration?

We explore how regulators would interact across borders, and how this would impact business. We see a strong contrast between regulatory competition in *Low Trust Globalisation*, a clear dominance of national regulation in *Flags*, and regulatory "co-opetition"—a combination of in-depth cooperation and of competition to attract investors and companies—in *Open Doors*.

## Part 2

### Chapter 6

market-level  
tools

legal,  
regulatory  
and market  
environments

... global civil society ... Kyoto ... internet governance ... corporate governance codes ...

Scenario	Instruments	Cross-border dynamics
	'Private attorneys general'	Regulatory competition
	Voluntary best practices	Regulatory co-opetition
	Command and control	Fragmented national regulations

Trilemma 6: Legal and regulatory integration

Scenario	Drivers	Key CG risks	Instruments
	Institutional investors	Legal	Detailed rules
	Investors and stakeholders	Reputational	Comply-or-explain codes
	National champions	Loss of control	Stringent domestic laws

Trilemma 13: Corporate governance (CG) cultures

Trilemmas are building blocks that can be mobilised for market-level applications, such as risk assessment or project evaluation.

Our intention, in this report, is not to be exhaustive but simply to illustrate how the analytical framework behind the *Global Scenarios to 2025* lends itself to in-depth, customised strategic analysis.

#### Competitive assets

Trilemmas are also used to explore key dimensions of corporate competitive strategies, in light notably of the nature and the level of transaction costs to be expected in each scenario. The differing incentives to outsource or to integrate vertically are among the points we discuss.

#### The emerging global civil society

The ways in which a "global civil society" can continue—or fail—to emerge in critical fields are also illustrated.

The Trilemmas that we present focus on relations between NGOs, companies and government, as well as on the ways in which Internet governance is likely to evolve as governments seek to reassert control. Trends in civil society are also relevant the concluding chapter on biodiversity and the post-Kyoto regulatory framework to deal with climate change.

#### Corporate governance

How institutional investors and other actors influence the corporate governance agenda can also be analysed in the framework of the *Trilemma Triangle*. This leads us to contrast, for instance, how three major types of risks that the Boards of global companies have to consider would be prioritised and addressed:

*Low Trust Globalisation* is characterised by a combination of a very strong role for institutional investors and a legalistic approach to rules and compliance. Mandatory standards, systematic rating and disclosure reflect—and further reinforce—the overall climate of distrust. **Legal risk** is very high, and D&O (Directors and

Officers) insurance reaches staggering heights. In *Open Doors*, by contrast, stakeholders have a major voice as well, and often work in cooperation with investors and regulators. The capacity to understand and evaluate different market cultures is high, and trust is reflected in comply-or-explain codes. Board evaluation is emphasised. Legal risk is moderate, but **reputational risk** matters a lot.

*Flags* sees political considerations interfering with a patchwork of stringent national rules, further encouraging the "home bias" in investment portfolios. **Loss of control** risk is very high, as groups with good connections and national champions can weaken the rule of law.

## Chapter 7 changing patterns of globalisation

... the US financial and innovation global hub ... the Chinese manufacturing hub ... Indian democracy ... EU regional clout ...



### ● Part 3 looks at how power affects scenario outcomes and at how critical energy and environment challenges can be met.

#### US leadership

The differential in long-term growth potential between the US on the one hand, and Europe and Japan on the other (approximately 3% against 2% and 1%, respectively), means that trade with, and foreign direct investment into and out of, the US have become central to further integration patterns within the OECD. Global governance meanwhile reflects an overarching US influence.

In addition to its economic, financial and demographic importance, the US is also playing an increasingly central role in legal and regulatory terms. US legal concepts and regulatory standards are adopted or imitated, and US courts are increasingly involved in settling international disputes.

#### European and Japanese "soft power"

European contributions to global governance, like the "mutual recognition" concept, embody a more decentralised view of global integration. Europe has demonstrated very significant "soft power", preempting conflicts over minorities in Central Europe and facilitating political change in Turkey or Ukraine. Yet the role of "soft power" is dependent on the broader global context.

Forums like the International Organisation of Securities Commissions (IOSCO) or the International Accounting Standards Board (IASB) foster convergence among domestic jurisdictions, with the US a key player and the EU quite often able to leapfrog.

#### Chinese benchmarks

The combination of currently cheap labour costs, market size and rapid technological modernisation makes China the world's manufacturing hub, redefining the terms of global competition. Having rapidly modernized its regulatory framework by embracing WTO-endorsed rules, China is now facing a broader governance challenge, whether at corporate or at public level, which will condition its further success.

Against this background, global governance will differ widely in our three scenarios, ranging from rejuvenated multilateralism in *Open Doors* to coalitions of the willing in *Low Trust Globalisation* and an inter-national rather than global order in *Flags*.

## Part 3

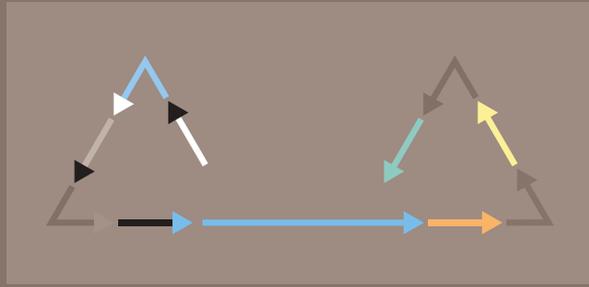
### Our Global

#### Business

#### Environment

## Chapter 8 African futures

... trans-Atlantic relations ... the Middle East peace process ... AIDS ... conditionality and development ...



## ● European integration, the Middle East and the African development challenge.

### The Middle East

*Open Doors* offers hopeful prospects for the Middle East as the Iraqi situation is internationalised and new reforming groups offer alternatives to authoritarianism and fundamentalism. Development fosters security, opening new possibilities of trans-Atlantic cooperation in the region.

In *Low Trust Globalisation*, strong regimes address social needs, helped by high oil prices, but there is little incentive to reform and fundamentalism appeals to disenfranchised groups. The US maintains a regional presence, with a low profile. *Flags* sees a turbulent Middle East, driven by conflict. Low oil prices provide additional incentives to attempt cautious reform, but this is bitterly

contested. Groups unite against common enemies rather than for common objectives.

### India out of China's shadow

Is India set to emulate China's rise to become a global player? India can combine "soft power"—witness Bollywood's global success—with regional "hard power". Yet the IT services sector is not a broad enough base to achieve full-scale modernisation, when agriculture still occupies more than half the working population but accounts for only 22% of GDP. The complexity of Indian democracy—reflecting political coalitions based on ethnicity, caste and language—makes policy reform less strikingly effective than in China, but may well provide a more stable foundation for success.

### African futures

For Africa also, *Open Doors* is more favourable as the international community takes a long-term view on trade, foreign aid and the fight against AIDS. Conditionality is based on fundamental principles (human rights but also Kyoto implementation for EU donors and Christian values for US ones). *Low Trust Globalisation* sees an emphasis on access to resources, the fight against corruption and efforts to deal with failed states on an emergency basis. *Flags* is about "strong men", patronage, national efforts to combat AIDS, war against terror and bilateral deals.

# Chapter 9

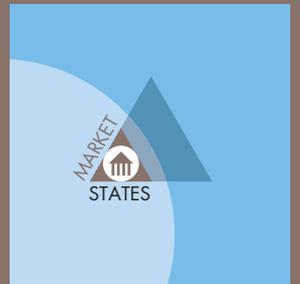
states  
transform

commanding  
heights

... private actors coercing through courts ... states using the market ... investors seeking alignment ...



How the *Trilemma* is resolved influences the strategies open to states, civil society, companies and investors.



## ● How power translates into law, how key actors play their cards, alone or in alliances...

The *Global Scenarios to 2025* are about the dynamics of change as shaped by the three forces, by the actors behind them, and by the objectives they point toward.

In addition to international trends reflecting changes fostered by US power and by the rise of China, each of the three scenarios explores transformations in the set of incentives, constraints and instruments for key actors.

Of particular importance are the globalisation of the legal scene, the gradual transformation of the ways in which states exercise power, and the importance of corporate governance for value creation but also as part of investor efforts to seek greater alignment on the part of their companies.

### Global legal forum shopping

By seeking a judgement against another party, civil society groups or investors can mobilise the coercive power of the courts to redress their losses or advance their interests. Investor activism, "legal forum shopping" and the adoption of new business models by law firms give US courts a global appeal and reach.

### Market States

Contrary to predictions by many "business gurus", the state does not wither away. Rather, the gradual transition from the Nation State to a Market State model implies a redefinition of states' fundamental promises, towards maximisation of opportunities for companies, investors, civil society and citizens rather than of the Nation's welfare.

### Investors seeking alignment

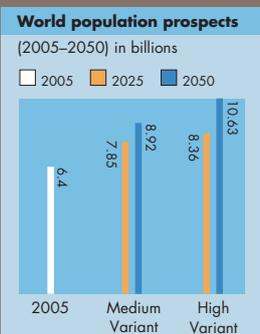
In the wake of the Enron crisis, institutional investors scrutinise how companies create or destroy value. Rating agencies and a whole "trust value-chain", reinforced by NGOs and "ethics watchers", help them align companies with mandatory or "comply-or-explain" standards.

Corporate governance is an essential lever in investors' hands as they seek stronger alignment. It is also critical to a company's capacity to anticipate and address risks, and is increasingly reflected in its market valuation. Convergence towards Anglo-Saxon standards of corporate governance is a key aspect in the further globalisation of capital markets.

### Chapter 11 economic baselines

### Chapter 10 demography and migrations

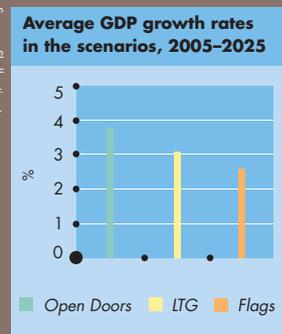
#### ... demographics and migration ... productivity differentials and border discontinuities shaping economic growth ...



Source: UN Population Division



Source: Shell estimates



Source: World Bank (2004), CEF and Shell estimates

● **By 2025, the level of global economic prosperity is 40% higher in Open Doors than in Flags.**

As well as bringing to light qualitative changes in the business environment, the *Global Scenarios to 2025* enable us to identify the quantitative trends ahead. These trends—including economic growth, demand for energy and pace of change—are strongly influenced by demography and migrations.

**International migrations** will be the aspect of demographic change most influenced by the set of incentives and constraints captured in the *Trilemma Triangle*. *Open Doors* differs from the other two by the importance of knowledge sharing and offshoring opportunities that can make up for the “youth and brain drain” prominent in *Flags* and *Low Trust Globalisation*. In the latter, migrations are limited to meet labour market needs.

#### Productivity and growth

Economic growth rates range from 2.6% per annum in *Flags* to 3.8% in *Open Doors*. These growth differentials are largely explained by levels of productivity growth and border discontinuities.

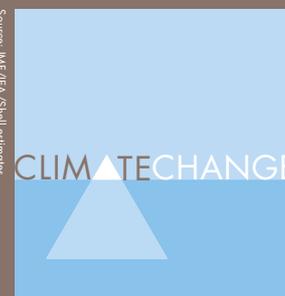
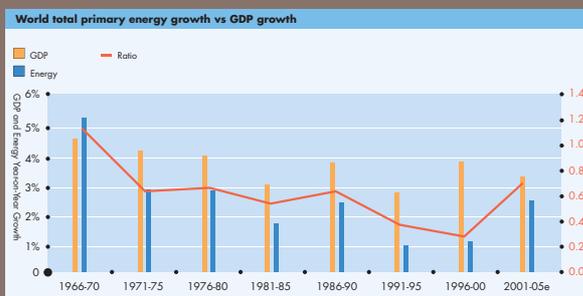
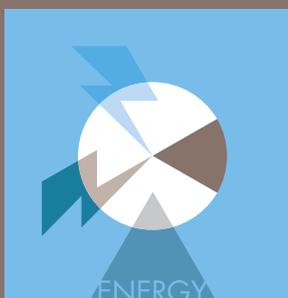
In *Open Doors*, technological progress is rapid thanks to substantial R&D efforts conducted in a cooperative environment within one set of global Intellectual Property (IP) rules. With trade barriers progressively dismantled, and the hurdle of institutional discontinuities diminishing, foreign trade expands rapidly. Financial markets are more integrated, fostering the efficient allocation of capital on a global scale.

In *Low Trust Globalisation*, trade integration also increases, albeit along a flatter path due to security concerns and continuing institutional differences across borders. IP regimes differ, and knowledge dissemination is hampered by legal and security considerations.

A very different pattern develops in *Flags*, where national barriers undermine collaborative research efforts across borders and impede the wider distribution of technological innovations. Markets remain fragmented, and high domestic savings are required in order to finance investments.

# Chapter 12 the energy system of 2025

... demand elasticity ... technology ... investment ... consumer-producer dialogue ...



Re-linking, energy security, carbon

### The triple discontinuity

The energy scene is being transformed under the impact of a triple discontinuity reflecting qualitative changes in the three forces at the apexes of the *Trilemma Triangle*. On the market side, three decades of 'delinking' of economic growth and energy consumption are giving way to strong 'relinking' as the largest share of new demand comes from developing economies. Forces of coercion and regulation, meanwhile, reflect a new awareness that energy supply will come from unconventional energy sources and from more challenging regions. Growing concerns over detrimental climate change make carbon management a pillar of the emerging energy-and-carbon industry.

### Relinking

Already in 2001–2004 China accounted for 40% of new oil demand. With a car fleet expected to grow from 20 million cars in 2005 to 150–180 million in 20 years, and with massive increases in power generation, the Chinese energy mix—with coal in any case still the dominant source—and the policies China may adopt to achieve energy efficiency will have major impacts on global demand patterns.

### Energy security

With investment needs assessed at USD 16 trillion over three decades, critical uncertainties are not only about the regions in which energy companies will be able to invest; they also cover which types of technology will be developed, either as a result of market forces or in conjunction

with ambitious national or international technology programmes like fuel cell cars or new types of nuclear power plants.

Encouraging such investments will be part of the determined, and possibly anxious, search for energy security. However, such security can be sought through bilateral deals, point-to-point pipelines and allocating priority to indigenous sources—as in *Flags*—or through international cooperation as in *Open Doors*. In the latter, we see the IEA, China, India and OPEC engaged in a policy dialogue that would cover the development and use of strategic reserves as well as of spare production capacities.

Some of the same ingredients would also be present in *Low Trust Globalisation*, but with strategic

reserves and spare capacities used in a much more divisive context, and with investment encouraged within narrower bilateral or regional preferential agreements.

### The energy-and-carbon industry

The third discontinuity, relating to carbon emissions, is both less visible as the full impact of carbon emissions will only be felt in several decades, and more radical because the CO<sub>2</sub> concentration in the atmosphere is already half as high as it would be if our planet had continued on the natural cooling trend that began 10,000 years ago. Scientific evidence is still debated, but the US National Academy of Sciences and the IPCC concur that man is now co-responsible for the state of the planet, irrespective of current political doctrines.

## Jet Stream

Low Trust Globalisation

Open Doors

Trilemmas

Flags

#### Climate change

While people are more inclined to address climate change issues in *Open Doors*, this is also the scenario in which CO<sub>2</sub> emissions increase most rapidly as a result of higher economic growth and of the absence of security-driven investment in indigenous renewable energy sources. The long-term trajectory leading to a stabilisation of CO<sub>2</sub> at 550 ppm is crossed towards the end of the next decade—except if carbon sequestration is pursued very actively, which would be the case if worrisome signals of detrimental change or scientific certainty also crossed a major threshold.

*Low Trust Globalisation*, paradoxically, could see faster progress towards carbon efficiency as a result of a different

set of policies aimed at energy efficiency, conservation and development of renewables, notably wind. Major nuclear power generation programmes are also conceivable. Where the scenario differs from *Open Doors* is in the more hesitant development of emission trading schemes as called for under the Kyoto Protocol. While the EU would try to incentivise developing countries to join, the US would stay outside, even if states like California took far-reaching measures of their own.

*Flags* would see a patchwork of national approaches, a number of which would place a high value on environmental and climate objectives. Here also the search for energy self-reliance would have positive implications in terms of carbon efficiency.

#### The Kyoto Protocol

In all scenarios, the implementation of the Kyoto Protocol in February 2005 will have taken users and producers through a 'cognitive threshold': who emits what, and what rights and risks are being created, becomes explicit knowledge.

Whether this awareness leads to action will vary widely across the policies and corporate scenarios. But carbon atoms now carry a price tag. The 'invisible' has become 'visible' and the price mechanism is at work, with major developments conceivable. Our scenario period is indeed the time when the energy-and-carbon industry comes of age.

#### Biodiversity

Environmental issues are, of course, not limited to climate

change. Biodiversity is an issue for which the energy-and-carbon industry will be expected to play a prominent role, for the sake of the communities in which it operates. Building on work by the IUCN and other organisations, we identify different types of policies that would be pursued in each scenario.

Of special interest is the shift from the still relatively abstract notion of "biodiversity" to the concept of "ecosystem services" that could be expected in *Open Doors*: providing specific resources such as fresh water, protecting natural barriers e.g. against floods, and providing cultural and aesthetic benefits could indeed be among the "win-wins" that would put market forces more effectively at the service of human development and aspirations.