

Global Leadership & Technology Exchange



Osvald Bjelland of Xyntéo

Inspired by GLTE Washington DC
9-11 November 2009



On 9-10 June 2010, the Global Leadership & Technology Exchange will convene in Stavanger, Norway. As we gear up for the meeting, it is worth taking stock of the discussions that took place at our last exchange, just outside of Washington DC at the historic Gadsby's Tavern in Old Town Alexandria. There, our task was to tackle three of the most demanding challenges facing efforts to decarbonise the global economy.

- How can production and consumption patterns be unpicked and reworked to enable low-carbon growth?
- How can the global energy mix be reconfigured and shifted away from carbon-intensive sources?
- How can multilateral institutions be reformed and strengthened to help deliver and safeguard a lower-carbon world?

The three notes that follow do not venture to summarise the scope and detail of the discussions in Alexandria. Instead they revisit the above themes after the UN summit in Copenhagen and in the run-up to Stavanger, picking up on some of the comments made by speakers and participants. Most of the presentations are available for download at www.xynteo.com/glte/washingtondc

The Global Leadership & Technology Exchange was founded by international strategic advisory firm Xyntéo. Xyntéo runs the exchange programme and facilitates low-carbon collaborations among the partners. Xyntéo alone is responsible for this document and any errors it contains.

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Registered in England number: 5314641. VAT registration number: 857 5824 79

Designed and typeset by Soapbox, www.soapbox.co.uk

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At the Washington DC exchange we were very pleased to announce Peter Darbee's co-chairmanship of the Xyntéo-GLTE Low-Carbon Leadership Board. Peter Darbee is Chairman, CEO and President of PG&E Corporation, one of the US's largest utilities. Since becoming CEO in 2005, Mr Darbee has become one of the energy industry's most active leaders on climate change issues.

On his appointment, Mr Darbee said, "In this new role, I look forward to helping to shape GLTE's ongoing efforts to drive collaboration among members as we move to a low-carbon economy, especially as it relates to addressing cross-border opportunities and challenges."

We are delighted that Statoil will be our host at the Stavanger exchange, which will continue to explore how GLTE partners can collaborate to transform thinking about the climate challenge into low-carbon innovation and growth.

A handwritten signature in blue ink that reads "Dr. John N. R." The signature is written in a cursive, flowing style.

About the Global Leadership & Technology Exchange

The Global Leadership & Technology Exchange (GLTE), founded by international strategic advisory firm Xyntéo, aims to provide senior business leaders with the knowledge, networks and tools they need to exploit the opportunities generated by the shift to a low-carbon economy.

At the heart of GLTE is a belief in the unique power of collaboration – across value chains, across borders – to equip business leaders to achieve low-carbon growth. For many companies, carbon is “elsewhere” – that is, it originates not from within their own four walls but from somewhere else along the value chain. Only collaboration can root out these inefficiencies to capture value.

Also, carbon is so tightly wound into economic and commercial activity that extricating it calls for the pooling of resources and ingenuity on a massive scale. Our partners work together strategically and practically to develop innovative collaborative solutions that are beyond the scope, scale or capabilities of any one organisation.

GLTE partners span three continents and a range of sectors and industries, from oil and gas, energy and utilities to transportation, finance, risk management, consumer goods and information technology. Current GLTE partners are: Det Norske Veritas, Deutsche Bank, Electric Power Research Institute, Ericsson, Gazprom, Hess Corporation, PG&E Corporation, Siemens, Shell, Statoil, Subsea 7, Tata Consultancy Services, Tata Sons, Unilever and Wilh. Wilhelmsen.

About the London exchange

Twice a year the companies that make up the Global Leadership & Technology Exchange meet to share knowledge of low-carbon innovation and explore collaborative opportunities to pursue low-carbon growth. On 6-7 April 2011, senior representatives of GLTE partners and other leading businesses, scientists and regulators convened in London. Tata Consultancy Services served as the exchange’s host.

Taking its cue from the Industrial Revolution, the London programme deliberated the next great turning-point for humanity – the transition to the low-carbon economy. In the opening session, we sought to build clarity around our common destination by asking ourselves what it would actually be like to live and do business in the low-carbon economy. The working sessions that followed evaluated some of the main bridges we need to cross in order to create a new kind of economic growth. What new systems, behaviours and technologies need to be developed across energy, infrastructure, mobility and production and consumption? How could “enablers” like ICT, finance and regulation accelerate these changes? And what about leadership? How do leaders from business and politics need to change in order to mobilise progress?

Global Leadership & Technology Exchange

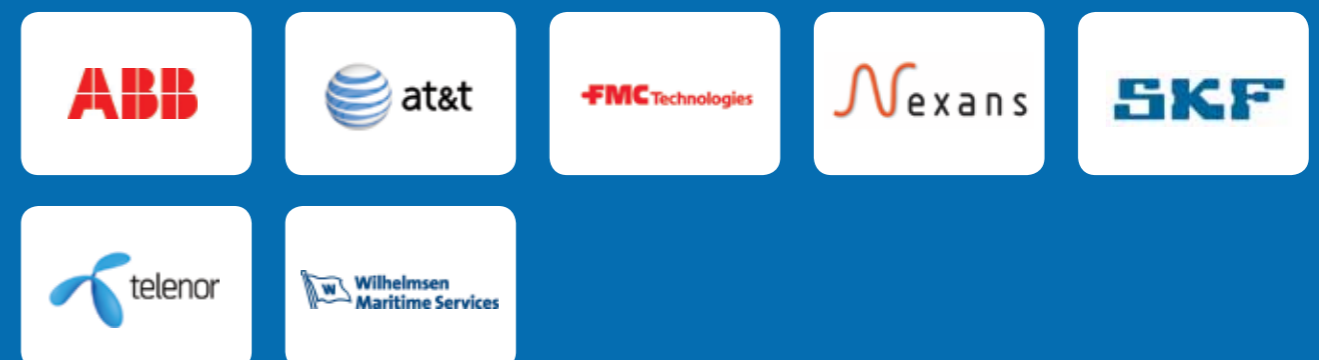
The GLTE partnership

GLTE partners span three continents and a range of sectors and industries, from oil and gas, energy and utilities to transportation, finance, risk management, consumer goods and information technology.



Collaborating under the GLTE umbrella

GLTE partners conduct low-carbon collaborations both with each other and with other organisations. At present ABB, AT&T, FMC Technologies, Nexans, SKF, Telenor and Wilhelmsen Maritime Services are all involved in collaborative projects under the wider GLTE umbrella.





Towards a Sustainable Energy Mix

The Interplay between Business and Government

The case for a radical policy shift

Around 66% of global greenhouse gas emissions originate from the production, delivery and use of energy.¹ Making a reality of the low-carbon economy depends fundamentally on our ability to reengineer the global energy mix, shifting it away – permanently – from carbon-intensive fuels.

In its most recent annual energy forecast, the International Energy Agency (IEA) predicts that, without a major policy shift:²

- World primary energy demand, driven mainly by developing Asian economies, will increase by 40% between 2007 and 2030.
- Fossil fuels will account for more than three-quarters of the 2007-2030 increase in energy use.
- In 2030 fossil fuels will continue to dominate the primary energy mix, with oil occupying a 30% share.

Energy-related CO₂ emissions have dipped slightly as a result of the financial crisis and economic contraction, but can be expected to rebound as the world economy recovers its footing and energy demand picks up. Should the energy system be left to evolve unchecked, says the IEA, the rate of growth of fossil fuel consumption could be so forceful as to push global greenhouse gas concentrations over 1,000 parts per million (ppm) of CO₂-equivalent gas – enough to cause an average global temperature hike of up to 6°C.³

The end-goal: what is a sustainable energy mix?

Achieving the right energy mix is not only a matter of adjusting ratios between different sources of primary energy: building a sustainable energy mix will demand the wholesale overhaul of the entire energy value chain –

“The financial crisis has been but a shower. If we do nothing about climate change, we will be swept away in a deluge.”

Dr Jamshed Irani
Tata Sons



David Rodgers
US Department of Energy

¹ See World Resources Institute emissions flow chart, “World Greenhouse Gas Emissions: 2005”: www.wri.org/chart/world-greenhouse-gas-emissions-2005

² World Energy Outlook 2009, Executive Summary, International Energy Agency, p.4: www.worldenergyoutlook.org/docs/weo2009/WEO2009_es_english.pdf

³ WEO 2009 Executive Summary, p.6

from the processes and technologies employed to extract the energy, right through to the way in which the consumer makes use of it.

All of these variables, combined with lingering scientific disagreement over the scale of physical change implied by higher greenhouse gas concentrations, mean that there is no hard-and-fast definition of what a sustainable energy mix would look like. The IEA has adopted as its reference point the prevailing view that atmospheric greenhouse gas concentrations need to stabilise at around 450ppm, which would give a 50% chance of keeping global warming to 2°C.

In the IEA “450 Scenario”, “radical and coordinated policy action” changes the business-as-usual evolution of the energy system, pulling it off its high-carbon trajectory and putting it on a 450ppm path with these characteristics:⁴

- Global energy-related CO2 emissions peak at 30.9 gigatonnes just before 2020 before declining to 26.4 gigatonnes in 2030.
- Though fossil fuels remain the dominant energy source in 2030, the share of non-fossil fuels in the primary energy mix grows to 32% – up from 19% in 2007.
- Between 2007 and 2030 primary energy demand increases by 20% instead of 40%, slowed by increased energy efficiency in transport, buildings and industry.
- Coal-based power generation is halved, as compared with the business-as-usual projection.
- In 2030 CO2 emissions per unit of GDP are less than half 2007 levels.

Recent analysis by Mark Jacobson and Mark Delucchi (of Stanford University and the University of California, Davis respectively) suggests that the world’s energy systems could in principle go carbon-free as early as 2030. In a paper published in November 2009 in Scientific American⁵ the pair explain how wind, water and solar resources could supply 100% of the world’s energy, for all purposes. Fifty-one percent of their envisioned energy mix comes from wind; 40% from solar; and 9% from water resources.

This roadmap is ambitious – the plan calls for the construction of 3.8 million wind turbines – but it is not entirely fanciful: 73 million cars and light trucks are manufactured each year and, during World War II, the US was able to retool automobile factories to produce 300,000 aircraft for the Allied efforts. The wildcard is not practical capacity or know-how but rather our collective will. The scale of the challenge calls for a war-time mobilisation.

“Technology is the easy part. It’s the policy bit that’s hard.”

David Rodgers
US Department of Energy

“There are 50 different regulatory regimes in the US. This needs rationalisation if the US is to decouple energy from economics and change current business models.”

Helen Burt
Pacific Gas & Electric Company



Helen Burt
Pacific Gas & Electric Company

The policy options: tools for creating A low-carbon energy mix

Cheap and abundant supplies of fossil fuels form the bedrock for today’s modern economies. This foundation needs now to be unpacked and rebuilt. Change of this scale will require ambitious, courageous policy, capable of pursuing several goals simultaneously. This policy will need not only to remodel the energy mix to favour lower-carbon energy sources and lower-carbon means of extraction, delivery and use. It will also need to safeguard energy security, guarantee relative affordability, and accommodate the expansion of the world’s population to 9 billion over the next 40 years.

Current policies have us travelling along the wrong trajectory. Without any major changes, energy-related CO2 emissions will grow in tandem with growth in demand for fossil energy – which is projected to increase at a rate of 1.5% per annum between 2007 and 2030.⁶

Governments can make use of a range of policy instruments to put the world on a pathway to clean, affordable and secure energy:⁷

- Carbon pricing, whether directly through taxation or indirectly through a cap-and-trade scheme, has the advantage of keeping government out of business decision-making.
- Subsidies can help immature technologies by providing financing which may not otherwise have been available.
- Regulation and standards are particularly valuable in contexts where the market is not functioning properly.

Successful policy will entail a judicious combination of these instruments. Dimitry Zenghelis, Chief Economist for Climate Change at Cisco, estimates that a carbon price of \$40 now, rising to \$80 in 2050, coupled with standards and research and development, is what it will take to hit the 450ppm target.⁸

Governments have a transformative role to play in marshalling energy investment – which nose-dived as a result of the financial and economic crisis. From 2008 to 2009 global upstream oil and gas budgets contracted by 19%. Had it not been for the “green” provisions of fiscal stimulus packages, renewable investment would have fallen by 30%; in the event, estimates the IEA, it probably dropped by close to a fifth.⁹

The IEA estimates that a sustainable energy mix would entail \$36.5 trillion in investment in energy infrastructure and energy-related capital stock through to 2030.¹⁰ This sum is significantly offset by economic, health and energy-security benefits, but governments have to make a compelling case to electorates if these



Dr Bryan Hannegan
EPRI

“Half the battle is behavioural change. A possible precedent is World War II, where a common threat marshalled the energy and focus necessary for success. With climate change, we just don’t get it.”

Jonathan Charry
ManatJones Global Strategies

“Challenges that threaten wallets are the most compelling.”

Dr Georg Fronja
Siemens Energy

⁴ WEO 2009 Executive Summary, pp.7-8

⁵ Mark Jacobsen and Mark Delucchi, “A Plan for a Sustainable Future: how to get all energy from wind, water and solar power by 2030”, Scientific American, November 2009

⁶ WEO 2009 Executive Summary, p.6

⁷ “Good policy, and bad”, Special report on the carbon economy, The Economist, 5 December 2009

⁸ As above

⁹ WEO 2009 Executive Summary, p.5

¹⁰ As above, p.9



Dr Jamshed Irani
Tata Sons

resources are to be successfully mobilised. This points to perhaps one of the biggest hurdles for policymakers: public opinion. Recent polls suggest that public belief in climate change, and support for action to contain it, is dwindling. It is vital that we all act to reverse this trend; to meet this educational challenge, the discourse of opportunity may be more compelling than that of threat.

Another important role for policymakers is that of technological midwife, of helping game-changing technologies traverse the “Valley of Death” separating them from market. One way governments can do this is by offering loan guarantees or Advanced Market Commitments to drive uptake of infant technologies in areas of high uncertainty and high need. The challenge is to “pick” the right technologies, basing the choice on a considered evaluation of the life-cycle impact of the technology, including its environmental, social and economic ramifications.

“Geothermal doesn’t get the respect it deserves. It’s base load energy. It’s renewable. It’s distributable. We need to evangelise!”

Michael Parrella
GTherm

“With climate change, there is no free lunch. But it is a lunch worth paying for.”

Dr Bryan Hannegan
Electric Power Research Institute

Conclusion

Building a sustainable energy mix will require a low-carbon energy revolution – a transformation of the same magnitude as the Industrial Revolution but accelerated threefold. We are moving too slow, and Copenhagen did little to pick up the pace. Governments need to take action to ensure that businesses across industries have consistent, coherent policy frameworks in which to operate; securing a meaningful global climate deal is an integral part of this. For their part, businesses need to give efforts to develop these frameworks their full-throated support, while engaging creatively with government to support the design of support the most effective low-carbon growth solutions.



The Road to Sustainable Consumption and Production Time to Rethink?

Sustainable consumption and production: a definition of what is not

According to the United Nations Commission on Sustainable Development, sustainable consumption and production is defined as follows:

The use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle so as not to jeopardise the needs of future generations¹¹

Achieving sustainable consumption and production, then, depends ultimately on striking an equilibrium between a good quality of life and the impacts of living that life. At this juncture we are dramatically off balance. It is estimated that the world's natural resource consumption outpaces the earth's carrying capacity by 125%; this mismatch could reach 170% by 2040.¹²

The widening gulf between consumption and carrying capacity means that we are not only ruining our planet's ecosystems; we are also undercutting the resource base upon which the world's industries depend, as well as compromising the well-being of the human societies of both today and tomorrow. The figures are stark:¹³

- 60% of the earth's ecosystems have been degraded over the past 50 years.
- 30% of the planet's terrestrial area has been urbanised or converted to cropland.
- The world has lost almost a third of its plants and animals since 1970.
- Present extinction rates are a hundred times higher than the historical background rate, as indicated by the fossil record.

"We know what to do, but we can't bring ourselves to do it."

Dr Gabrielle Walker
BBC presenter, author
and Senior Advisor to Xyntéo

"We need to reset the system."

David Pumphrey
Center for Strategic &
International Studies



Thor Jørgen Guttormsen, Norwegian Shipowners' Association (L) and Ken Lane, Global Initiatives (R)

¹¹ UN Commission on Sustainable Development, Symposium on Sustainable Consumption, Oslo, 1994
¹² WWF estimate, as reported in "Sustainable Consumption: facts and trends from a business perspective", World Business Council of Sustainable Development, November 2008, p.11: www.wbcsd.org/DocRoot/19Xwhv7X5V8cDIHbHC3G/WBCSD_Sustainable_Consumption_web.pdf
¹³ As above, p.10

Flash-forward to 2050

Global consumption and production is driven by a trinity of factors: population growth, the rise of the affluent and the spread of consumerist behaviour. In other words, the number of people with both a desire for “stuff” and the money and access to acquire it is growing – fast. These spenders are increasingly concentrated in emerging market economies like China and India. How will this cluster of demographic, social and economic trends shape the global landscape over the next few decades?

- In 2050 the global population will have grown to 9 billion people, most of whom will live in developing countries.
- Between 2007 and 2050, global GDP (60% of which today comes from consumer spending) will grow by 325%.
- China’s GDP will overtake the US’s by 2025.
- India’s growth relative to the US will be slower, closing in around 2050.
- By 2050 the GDPs of Mexico, Brazil, Russia and Indonesia will outpace the UK’s.¹⁴

Perhaps the most striking trend is the inexorable ascendancy of the middle-class consumer, a group that is expected to triple by 2030. On current trends, there will be 2 billion new middle-class consumers by 2030, drawing almost 80% of the world’s population into that income bracket. By 2025, China alone will count 220 million of these energetic spenders among its ranks, a fourfold increase since 2004.¹⁵

“We act as though we are in the early stages of a chess game, but the reality is that we’re in the end-game.”

Dr Gabrielle Walker
BBC presenter, author and
Senior Advisor to Xyntéo



David Pumphrey
CSIS

The limits of information

Almost everyone has heard the story. Over the past century the average temperature of the atmosphere near the earth’s surface has increased by 0.74°C.¹⁶ The ten warmest years on global record have occurred since 1997. Since the mid-1970s global surface temperatures have increased by an average of more than 0.15°C a decade.¹⁷

Allowing these trends to continue unchecked could have major consequences – among them more droughts, falling crop yields, more floods, more storms, more intense rainfall, disappearing glaciers, rising sea levels, melting permafrost and a dramatic loss of biodiversity. Scientists believe that, to avert the worst of these consequences, total man-made emissions of carbon cannot exceed 1 trillion tonnes. Yet we are on track to breaching this limit by the 2040s.¹⁸ Unsustainable consumption and production is at the heart of the problem.

¹⁴ All projections in this list taken from “Sustainable Consumption: facts and trends from a business perspective”, WBCSD, 2008, p.8

¹⁵ As above

¹⁶ “The greenhouse effect and the carbon cycle”, UNFCCC website: http://unfccc.int/essential_background/feeling_the_heat/items/2903.php

¹⁷ “Climate Change: The Facts”, Met Office, 2009, p.15: www.metoffice.gov.uk/climatechange/guide/downloads/quick_guide.pdf

¹⁸ Myles R. Allen et al, “Warming caused by cumulative carbon emissions towards the trillionth tonne”, Nature, Vol. 458, 30 April 2009, p. 1163. See also “Humanity’s carbon budget set at one trillion tonnes”, New Scientist, 29 April 2009: www.newscientist.com/article/dn17051-humanitys-carbon-budget-set-at-one-trillion-tonnes.html

At odds with the clarity of the evidence and the urgency of the challenge, polls reveal a schizophrenic bent in consumer attitudes towards climate-friendly consumption. A McKinsey survey in Brazil, Canada, China, France, Germany, India, the UK and the US revealed that, while 53% of consumers were concerned about environmental and social issues, they were unwilling to change their purchasing choices to reflect these concerns. Thirteen percent, furthermore, said they were willing to pay more for sustainable products and services – yet they did not currently do so.¹⁹



Dr Gabrielle Walker
BBC presenter, author and Senior Advisor
to Xyntéo

This gap between intention and action points to the limits of information. Decarbonising the world’s consumption -production paradigm not only requires that consumers understand the impact of their actions and how they can mitigate and minimise them; it also requires a titanic shift in behaviour. The dilemma is fundamentally one of attitudes – of psychologies and of values.

Low-carbon hearts and minds

Last year a task force initiated by the American Psychological Association (APA) identified six principal psychological barriers to greener consumption.²⁰ The nature of these obstacles suggests that solutions will need to combine clear, coherent information to underpin consumer choices with effective strategies to change consumer values – that is, for solutions to be effective, they must win both hearts and minds.

The psychological barriers flagged up by the APA task force were as follows:

- **Uncertainty:** Mixed messages about climate change’s causes and effects deter low-carbon behaviour.
- **Mistrust:** Many don’t trust the motives of the scientists and policymakers arguing for climate action.
- **Denial:** A substantial minority flatly reject the scientific argument that human activity can influence the climate.
- **Undervaluation of risks:** Some that accept that climate change will have serious consequences push those consequences so far into the future that the risk becomes distant and the case for action weak.
- **Sense of a lack of control:** Many feel that they are powerless to stop the problem, and so do nothing.
- **Habit:** The compulsion of routine deters people from making necessary changes.

“We can, and should, conceive of manufacturing as industrial ecology, of cities as granite gardens, and of “business as usual” as sustaining a green economy.”

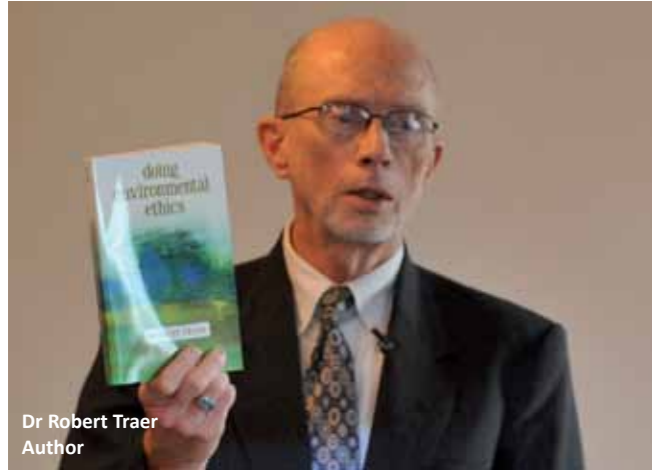
Dr Robert Traer
Author of “Doing Environmental
Ethics”

“Different people need different stories.”

David Pumphrey
Center for Strategic &
International Studies

¹⁹ “Sustainable Consumption: facts and trends from a business perspective”, WBCSD, 2008, p.17

²⁰ “Psychology and Global Climate Change: Addressing a Multifaceted Phenomenon and Set of Challenges”, press release about report, American Psychological Association, 5 August 2009: www.apa.org/news/press/releases/2009/08/climate-change.aspx



Dr Robert Traer
Author

Clearly, another reason for consumer reluctance to pay the real price for goods and services (that is, the price that reflects the full cost of production and consumption, including climate impacts) is rational economic short-term self-interest: it costs too much. Yet another dynamic at play is the “tragedy of the commons”: though many consumers understand that their actions are harming the environment and thus undercutting long-term personal interests, they won’t move until their peers move. (Indeed, peer influence is a very powerful determinant of consumer behaviour.)

Changing hearts and minds is a question of both creating new values and appealing more effectively to

existing ones. Decision-makers and decision-formers, if they are to sway voters and consumers, need to develop story-lines that resonate with the values of different groups. For some, the discourse of ethics may be more compelling than a strictly utilitarian argument. The latter relies on expectations of future consequences to make decisions in the present, while ethics are less time-bound. In the case of climate change, the future consequences are the main source of uncertainty; redirecting the debate towards our moral duty to care for future generations and on the human right of every individual to a safe environment may, for some, be a route around this uncertainty.

For other groups, the narrative of national interest might be most potent. In the US, for example, reducing dependence on oil exporters is high on the political agenda. So the overlap between sustainable consumption-production and energy security could be an important trigger for smarter consumption.

The role of business

A fuller understanding of consumer psychology is vital to recalibrating consumer behaviour. Businesses, in particular consumer goods companies, have a pivotal role to play in sparking this mental revolution. For one, consumer goods companies have unrivalled marketing nous: they are best-placed to get under the skin of the consumer. Second, responsible for an estimated 5 billion tonnes of CO₂ emissions per year, (roughly 10% of the global total) they have a responsibility to contribute to solutions.²¹ Third, it is in their commercial interests to do so: consumer goods companies that fail to respond early could lose competitive advantage as low-carbon regulation is introduced.

The World Business Council on Sustainable Development (WBCSD) sees three core roles for business:²²

- **Sustainable innovation:** Businesses can develop new products and new business models that minimise emissions while also satisfying customer demands for performance and affordability.

21 “Moving Fast to a Cleaner Climate, A manager’s guide: how consumer goods companies can tackle climate change”, Coca-Cola and Unilever

22 “Sustainable Consumption: facts and trends from a business perspective”, WBCSD, 2008, p.22

- **Choice influencing:** Businesses can deploy marketing strategies that decouple material consumption from value.
- **Choice editing:** Businesses can eliminate carbon-intensive products or product components from their supply chains, so removing dirty goods from their offerings.

Businesses need to step away from the practice of merely tacking a sustainability strategy onto their organisations. Decarbonisation must become intrinsic to the business; it must pervade the entire value chain. It is not enough to introduce a niche product in an isolated part of the organisation while the rest of it carries on with business as usual.



Ash Gupta
Avantha Holdings

Common but differentiated responsibilities

It is a paradox of the prevailing economic model that higher levels of human development inflict the most damage on the environment. It is estimated that it would take three planets to sustain the world population if everyone adopted the lifestyles of the British, and five to support the North American way of life.²³

Different economies face different challenges. The WBCSD categorises these “sustainability challenges” as follows:²⁴

- **Consumer** (e.g. US, Japan, Western Europe): This group needs to lower resource use while maintaining competitiveness and economic output.
- **Emerging** (e.g. China and South-East Asia): These economies will need to “leapfrog” to sustainable consumption-production structures, jumping over western pathways to industrialisation.
- **Developing** (e.g. Africa): These economies need to develop sustainable solutions to eradicate poverty.

Conclusion

Achieving sustainable consumption and production is a systemic challenge. Overcoming it will entail different actors tackling many problems. Producers need to develop radical new business models that underpinned by a life-cycle perspective of goods and services. Businesses need to collaborate with partners along their value chains to maximise value and minimise externalities. Governments need to find ways of severing development from unsustainable lifestyles – not least to accommodate the forecast growth of emerging economies’ consumer populations. And consumers need to be shown that adopting a low-carbon lifestyle is not about donning a hair shirt; a low-carbon life could be a better one.

23 WWF estimate, as reported in “Sustainable Consumption: facts and trends from a business perspective”, WBCSD, 2008, p.9

24 As above, p.12



Today's Multilateral Institutions Their Role in Building a Low-Carbon World

Today's multilateral institutions: origins and original mandates

Building a low-carbon world is a quintessentially global project: without an international institutional framework to shape regional, national and sub-national carbon reduction efforts, changes made – however bold, however innovative – will never be enough. The challenge is simply too big.

The question is whether today's international institutions are up to the task. The most prominent of them were created for another time, to cope with other, simpler breeds of crisis against different constellations of political and economic power. The United Nations was founded by the victors of World War II to preserve their dominance while preventing the century's third descent into global conflict. The World Bank and the International Monetary Fund, too, have their roots in the post-war preoccupation with either repairing the consequences of Nazi-led aggression or containing future outbreaks. The bank was set up to rebuild Europe's devastated economic infrastructure; the fund to prevent the financial and economic instability that stoked the conflict in the first place.

This mandate is of course now totally obsolete. Germany is a progressive, constructive player in the international system; Europe is rich and at peace. Today the world faces an entirely different set of threats and challenges, unforeseen by the post-war architects of the international system. The delegates who met in 1945 in San Francisco to set up the UN and at Bretton Woods the year before to establish the international financial institutions could not have imagined that the central global concern in 2010 would be this: how can economic growth be divorced from cheap, high-carbon energy, without denying the booming populations of the emerging economies their right to higher standards of living?



Professor Robert Socolow
Princeton University

“The response of multilateral institutions to the financial and economic crisis was formidable. Can they do the same for climate change – an even greater threat?”

Vikram Widge
International Finance Corporation,
World Bank Group



Sven Molllekleiv
DNV (and Norwegian Red Cross President)

The climate architecture we have: signposts for the future

International institutions are not static organisms with fixed mandates; they have become what they are principally through evolution rather than design, through adaptation to disturbances in their environments. The authors of the UN Charter, for example, did not really envision that the UN would intervene *within* states to keep (or in some cases enforce) peace between warring factions – yet the post-war profusion of intra-state warfare has made this one of the world body’s flagship functions.

Climate change, like shifting patterns in conflict, has prompted multilateral institutions across the board to adjust operational remits. The bodies that populate the international system – the alphabet soup of organisations including not only the World Bank, the IMF and the UN’s sprawling family of funds, programmes and agencies, but also the G8, the G20, specialised entities like the International Energy Agency and regional arrangements such as the European Union – collectively carry out a range of climate-related activities. They drum up public awareness around the problem and build government buy-in for solutions. They deliver humanitarian relief to those affected by climate-related disasters and help vulnerable communities build resilience to climate impacts. They mobilise and channel green finance to poorer countries to promote lower-carbon development pathways. They conduct specialised research to improve knowledge of the low-carbon challenge.

Important though these tasks are, their impact is undercut by the absence of a coherent institutional architecture dedicated to putting the world on a low-carbon pathway. The closest we have is the United Nations Framework Convention on Climate Change (UNFCCC): though it has made a number of seminal contributions – most notably by giving rise to the Kyoto Protocol and by formalising annual climate talks among governments – the UNFCCC can move no faster than the political ambitions of its parties. The UNFCCC’s progress has been tied closely to another pivotal climate institution, the Intergovernmental Panel on Climate Change (IPCC). Though it is, as an independent body, free of the politicisation inherent to the UNFCCC, the IPCC has its own challenges to contend with.

The strengths and weaknesses of the UNFCCC, the Kyoto Protocol and the IPCC – the main pillars of the climate architecture we currently have – provide important lessons for efforts to build a more robust multilateral institutional framework for the future. The next two sections discuss the key achievements and limitations of these bodies. Drawing on two papers by Alex Evans and David Steven at the Center on International Cooperation

at New York University²⁵, the final section outlines a) what functions an improved institutional architecture needs to get right and b) what structural reforms might equip it to do so.

The UNFCCC and Kyoto

The objective of the UNFCCC is the “stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”.²⁶ The agreement opened for signature in 1992 and entered into force in 1994. With 194 signatories it enjoys near-universal support.

The convention was envisaged as a work-in-progress – a loose structure to modify and tighten as necessary. Thus, just one year after the UNFCCC came into force, governments began discussions to strengthen it. The Kyoto Protocol – which, though linked to the UNFCCC, in fact stands on its own – was adopted unanimously in 1997, entering into force in 2005. Kyoto’s key feature is that it imposes upon its rich state signatories mandatory greenhouse gas emission cuts, to be met within a five-year “commitment period” that expires in 2012. Developing countries, which bear relatively little responsibility for historical emissions, are exempted .

Today, the Kyoto Protocol is on the receiving end of some damning criticism. Some is deserved. But it is important not to throw the baby out with the bath water: Kyoto was a game-changer. It pioneered the concept that carbon should carry a monetary value and so opened the door for carbon markets – without which the low-carbon economy will never happen. Kyoto also brought governments (traditionally obsessively skittish about encroachments on their sovereignty) around to the idea of subjecting their economies to binding emissions cuts. Through the Clean Development Mechanism, it set up a framework for channelling resources from the rich world to fund low-carbon modernisation pathways in lower-income countries.

That said, Kyoto does have structural shortcomings that need to be acknowledged so that they can be used as lessons for strengthening the climate architecture:²⁷

- Reduction targets need to be formulated to meet scientific necessity rather than what governments considered politically and economically achievable.



Suman Bery
National Council of Applied Economic Research

25 Alex Evans and David Steven, “An Institutional Architecture for Climate Change”, A concept paper commissioned by the UK Department for International Development, Center on International Cooperation, New York University, March 2009: www.cic.nyu.edu/staff/Staff%20Docs/DFID%20final%20version%20CIC.pdf. “Hitting Reboot: what next for climate after Copenhagen?”, Managing Global Insecurity, a joint project by The Brookings Institution, New York University’s Center on International Cooperation and Stanford University’s Center for International Security & Cooperation, December 2009: www.brookings.edu/papers/2009/1221_climate_evans_steven.aspx.

26 Article 2 of the United Nations Framework Convention on Climate Change: available at www.unfccc.int.

27 The list that follows is a summary of chapter three of Evans and Steven, “An Institutional Architecture for Climate Change”, March 2009. See pages 20-22.

“There has to be a separation between climate change mitigation and paying for this mitigation. Otherwise nothing is going to happen on an international scale.”

Suman Bery
Director General, National Council
of Applied Economic Research

- The new agreement needs wider participation: the exemption from Kyoto of non-OECD countries, many of which are fast-growing emitters, means that the proportion of global emissions covered by Kyoto is shrinking. Low participation translates into both higher costs for solutions and lower odds for beating the problem: even if OECD states reduced their emissions to nil, climate stabilisation would remain out of reach without non-OECD engagement.
- The five-year window in which emissions-reduction targets are supposed to be met under Kyoto is too short, dwarfed by the lifetimes of capital stock in the energy sector.
- The new deal needs to avoid carbon leakage. Cuts in consumption of greenhouse gases in one country often reappear as production increases in another.
- We need an effective global system for enforcing progress on emissions reductions. Kyoto parties currently face weak penalties for non-compliance, which encourages them simply to negotiate laxer targets. Non-parties face no penalties for non-participation, which encourages free-riding.

Kyoto’s frailties were laid bare in Copenhagen, where government representatives tried but failed to negotiate a legally binding post-2012 climate deal. Negotiators instead cobbled together a partial agreement – the Copenhagen Accord – that takes a step forward by uniting, for the first time, the US, China and other major polluters in a political pact to stabilise the climate. However, it regresses by dropping most of the numbers needed to focus efforts to deliver this goal. The accord specifies no new cuts, instead inviting participating governments to submit their own targets.²⁸

Talks have now resumed, with a view to upgrading the Copenhagen Accord into a legally binding emissions reduction treaty; the new “deadline” is December 2010, when negotiators will meet at a summit in Mexico – though observers are already looking to the next summit, in South Africa in 2011, as a more realistic target. There is neither time nor appetite for another toothless political declaration. Upon the expiry of Kyoto’s commitment period, an effective global legal agreement needs to be in place – one that spans all big emitters, irons out Kyoto’s misincentives and builds on its achievements.

The IPCC

The Intergovernmental Panel on Climate Change was established by the UN Environment Programme and the World Meteorological Organisation in 1988. It does not undertake its own research, its core mandate being instead to provide regular assessments of existing peer-reviewed literature relevant to understanding the scientific basis of climate change and its potential environmental and socio-economic consequences.

The IPCC published its first assessment report in 1990. The body has released four reports altogether, the most recent in 2007. With each

²⁸ See “Q&A: The Copenhagen climate summit”, BBC News website, 21 December 2009: <http://news.bbc.co.uk/1/hi/8426835.stm>.

publication the IPCC’s conclusions have grown steadily more assertive. Whereas the 2001 report states that there is “new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activity”, the 2007 report is more emphatic, concluding that it is more than 90% likely that human activity causes climate change.²⁹ The IPCC has been the prime mover of climate policy so far.

In the run-up to the Copenhagen summit and in its wake, the panel came under vicious attack by climate change deniers. The stimulus for this particular campaign was the discovery that the IPCC had published an erroneous forecast of glacial melting.³⁰ This is a serious mistake, and steps need to be taken to prevent errors of this sort happening again. But the high-pitched end of the outcry is overblown. The IPCC issues huge amounts of detailed text: it would be remarkable if there were no slips in work of such encyclopaedic proportions.

The furore does, however, remind us of two points, which are crucial to the future evolution of climate institutions. First, the credibility of institutions is a precious asset that must be protected. The IPCC should go out of its way to give airtime to legitimate scientific debate, not least to block detractors off from an easy (but ultimately spurious) line of attack – namely that the IPCC shirks and stymies open scientific inquiry.

Second and related to this, creating an effective institutional framework depends on generating a more sophisticated public debate on the reality of climate risks and the scale of the solutions.³¹ Publics are growing sceptical of claims of a straightforward consensus when disagreement makes the news so regularly. Publics are also tiring of the discrepancy between the purported largeness of the problem and the smallness of the solutions put forward by politicians. One consequence of this fatigue is that belief in climate science is crumbling in some countries: a Pew Center survey in October 2009 found that the percentage of Americans that thought there was solid evidence for climate change had dropped from 71% in April 2008 to 57% in October 2009.³² Polls in other countries have picked up similar patterns.

²⁹ See the IPCC’s Third Assessment Synthesis Report (2001) and the Fourth Assessment Synthesis Report (2007) at www.ipcc.ch/publications_and_data/publications_and_data_reports.htm.

³⁰ See “IPCC’s statement on the melting of Himalayan glaciers”, 20 January 2010: <http://www.ipcc.ch/pdf/presentations/himalaya-statement-20january2010.pdf>.

³¹ Evans and Steven, “Hitting Reboot: what next for climate after Copenhagen?”, December 2009, p.8.

³² “Fewer Americans see solid evidence of global warming”, Overview of survey report by the Pew Research Center for People and the Press, 22 October 2009: <http://people-press.org/report/556/global-warming>.



Johan Nic. Vold
Xyntéo

“We have to move beyond arguments for per capita emissions to a discussion of how to allow each country to have a discrete carbon price. This will then drive the emissions of the future rich to equal those of the existing poor.”

Professor Robert Socolow
Co-Director, Carbon Mitigation
Initiative
Princeton University



Tomorrow's multilateral institutions: functions and form

For simplicity, the above discussion has equated international institutions with international organisations. But in reality institutions extend beyond these bodies to encompass the interplay between formal international organisations, rules and norms, domestic politics and government decision-making. So creating a multilateral institutional framework capable of delivering a low-carbon world is not just about strengthening existing climate bodies and setting up new ones: it is about engineering the rules of the game to shape decision-making by a whole raft of players, including governments, businesses and individuals.

This is a colossal task requiring, according to Evans and Steven, a “radically different concept for multilateralism”. This multilateralism needs to be equipped to discharge these functions:³³

1. **It must reduce emissions**, efficiently and in line with a full-term, science-backed stabilisation target that replaces the short-termism of Kyoto. As this quantified, binding target is pursued, “quick wins” should be pursued to make immediate headway on carbon reductions. Combating deforestation and forest degradation, for example, offers a cost-effective way of reducing emissions – and its specificity might make it a better bet for effective cooperation between rich and poor countries.
2. **It must create the right incentives**. Otherwise, the deal will never garner sufficient buy-in from the different parties. A possible model could be the bargain that underpins the Nuclear Non-Proliferation Treaty, in which countries agree to forego nuclear weapons development in exchange for access to civil nuclear energy. In the climate context the arrangement would go like this: rich countries secure the full participation of developing countries in an emissions reduction deal, in exchange for compensatory resource flows from rich countries to support emissions performance and adaptation in developing countries.
3. **It must enforce emissions cuts**. The climate is a public good; efforts to protect it are therefore vulnerable to free-riding. An enforceable framework will need to feature common standards and data sources, mechanisms to militate against crime and fraud, an investigation and verification system, and strong disincentives to non-participation. “Carbon default” needs to become as grave a transgression as non-compliance with a Security Council resolution.

³³ Evans and Steven, “An Institutional Architecture for Climate Change”, April 2009: pp.25-34. The three points that follow summarise and build on analysis and recommendations in chapter four of the Evans-Steven paper. See pages 25-30.

Evans and Stevens also put forward suggestions for improving this new multilateralism's form. Here are three of their recommendations:³⁴

- **Strengthen the IPCC**. It should be mandated to report more regularly, to keep up with new scientific findings. In addition, an independent audit of its procedures should be conducted in order to preserve the panel's integrity.
- **Break down the silos between international bodies working in areas related to climate**. Food and energy markets, for instance, are increasingly interlinked. Both are highly susceptible to climate impacts; both offer huge carbon reduction possibilities. Policy-makers should therefore start thinking in terms of a “single scarcity challenge” and promote collaboration across the international organisations engaged in scarcity issues. Also, by mainstreaming climate resilience into development strategies, this approach would yield dividends for those countries most vulnerable to the effects of climate change.
- **Use the G20 to coordinate low-carbon strategies within fiscal tightening measures**. As governments switch from stimulus to fiscal tightening, there will be a window for inserting low-carbon incentives – for example by increasing taxation on carbon and by further cutting spending on fossil fuel subsidies.



Conclusion

The climate institutions in place today are too fragmented to shape the massive changes in behaviour needed to pull the world off its current course and put it on a low-carbon path. The obstacles to upgrading the institutional architecture are primarily political. A central hurdle is the deadlock between emerging economies and the advanced industrialised countries. Overcoming this will require an updated understanding of the international system, one that appreciates that the easy division of the world into developing and developed blocs is growing more and more irrelevant in climate politics. Both politicians and campaigners alike need to absorb this reality if progress is to be made.

Meanwhile, the letdown of Copenhagen leaves the world on track to pass 3°C and businesses remain in limbo, waiting for the price signals they need to change investment patterns and business models.

³⁴ This list combines a selection of recommendations made by Evans and Steven in “An Institutional Architecture for Climate Change” (April 2009) and “Hitting Reboot” (December 2009).



GLTE Showcase

Low-Carbon Collaboration in Practice

The Global Leadership & Technology Exchange is an international consortium of some of the world's leading businesses from a range of industries working together to transform thinking about the climate challenge into low-carbon innovation and growth.

GLTE has three main objectives. It seeks to provide its partners with new knowledge of the challenges and opportunities thrown up by efforts to build a low-carbon economy. It aims to foster new networks of senior executives engaged in the pursuit of low-carbon growth. And it endeavours to open up new business opportunities via low-carbon collaboration projects among partners.

One session at the Washington meeting was dedicated to sharing progress made on ongoing GLTE projects. Brief descriptions of each of the showcased projects are included below.

Thor Jørgen Guttormsen **President, Norwegian Shipowners' Association**

Getting shipping ready for the low-carbon economy

Mr Guttormsen presented the preliminary findings of a joint report by the NSA and Xyntéo. "Leadership Through Rough Seas: piloting shipping to low-carbon growth" argues that shipping leaders that respond early to the challenges of climate change will be better placed to gain competitive advantage in the transition to a low-carbon economy. The report is now complete and available here:

www.xynteo.com/LeadershipThroughRoughSeas.html





Stephen Cadden
Group Vice President, Logistics,
Wilh. Wilhelmsen

Optimising supply chains

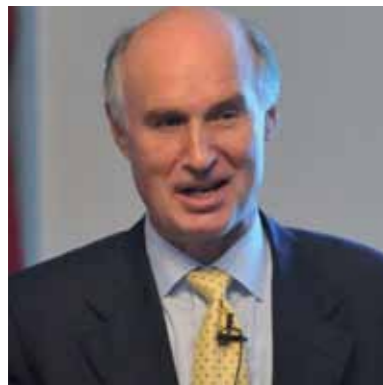
Mr Cadden told the group about Wilh. Wilhelmsen's collaboration with Tata Motors. In early 2009, Wallenius Wilhelmsen Logistics (WWL), Wilh. Wilhelmsen's logistics arm, and the Indian car giant conducted a joint analysis to identify potential short-, medium- and long-term carbon savings along the post-manufacturing value chain of Tata passenger cars, from the factory in Pune, India to the dealer network in South Africa. Xyntéo facilitated the project.



N. Chandrasekaran
CEO, Tata Consultancy Services

Unleashing IT's potential to unlock low-carbon growth

It is estimated that IT could shave up to 15% off business-as-usual global emissions in 2020. Working with Xyntéo, TCS is looking at finding new ways to help its customers increase productivity while reducing CO₂ emissions within their companies and along their value chains – right through to the final consumer. Mr Chandrasekaran outlined the TCS-Xyntéo project.



Bjørn Myklatun
Chairman of the Board, Acergy Norway

Value-chain decision-making "nodes": where cost, time and quality intersect with emissions

As Mr Myklatun explained at the exchange, the overall goal of this collaborative GLTE project between Acergy, Statoil and Xyntéo is to explore how key partners in the oil and gas industry can collaborate to optimise value chains. Drawing on the Tyrihans oil and gas field, the project will try to adopt a new point of view: it will seek to identify key decision-making "nodes" along the whole value chain and map how cost, time, quality and greenhouse gas emissions interact with each other.



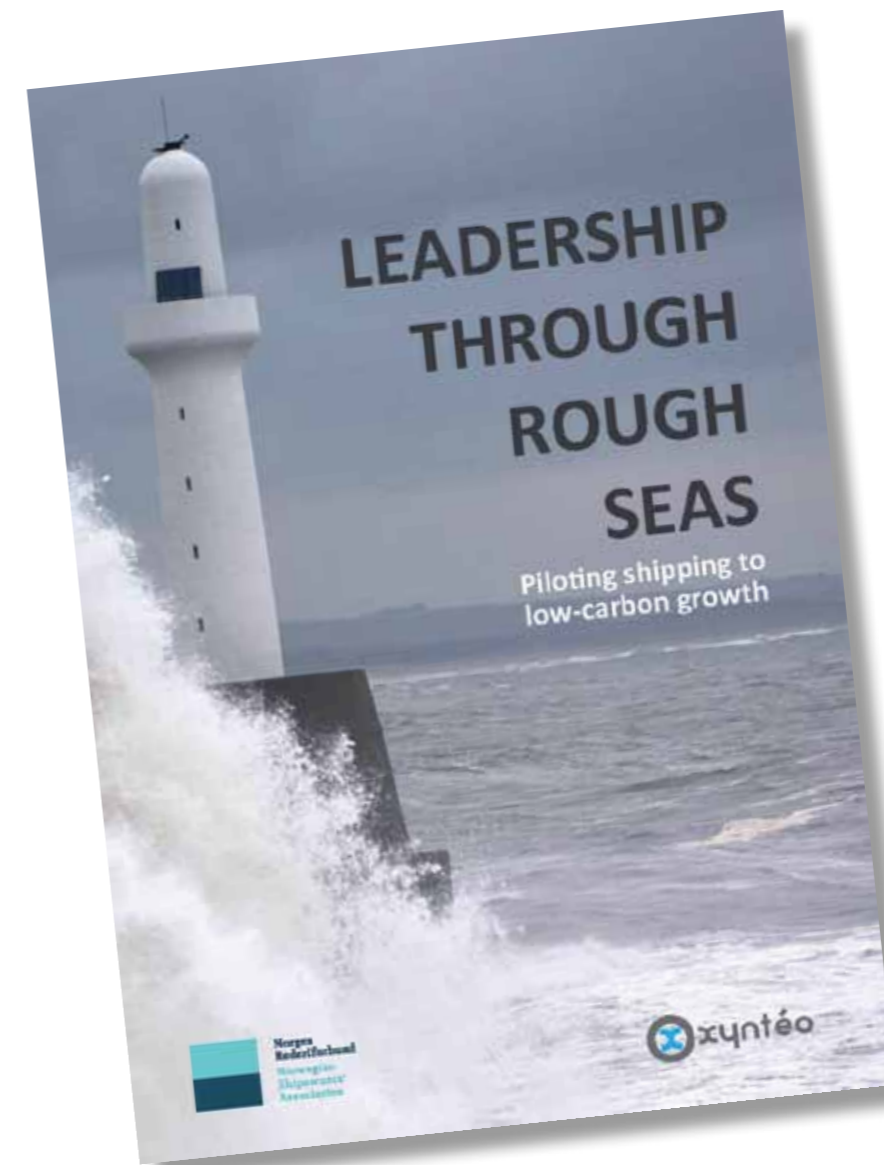
Dr Georg Fronja
Head of Strategy, Energy Sector, Siemens

A pre-competitive alliance to redesign the North Sea energy supply

Dr Fronja noted that a lower-carbon North Sea energy supply would confer a bundle of important benefits, both for industry and for society as a whole: not only a healthier climate, but also greater security of energy supply in Northern Europe along with lower energy costs. This project, which currently involves Siemens and Xyntéo, aims to shed light on the extent of the value that could be captured by energy stakeholders. Starting with a feasibility study engaging all key industrial players, the initiative will then conduct a second, wider scoping exercise bringing in other parts of the value chain. This could pave the way for viable investment projects.

Dr Alexander Medvedev
Deputy Chairman, Gazprom and
Director General, Gazprom Export
Natural gas's central role as a bridge to the low-carbon economy

Dr Medvedev highlighted how important natural gas was to the bid to lower the global carbon footprint. Natural gas is abundant and affordable; and it burns relatively cleanly. It has an important role, therefore, in progressively removing coal and oil from the global energy mix. This project – which is currently being scoped by Gazprom and Xyntéo – would aim to support the scaling-up of natural gas by addressing knowledge gaps and identifying new solutions to improve natural gas technology; strengthen natural gas collaboration; create new business models for the industry; and develop more progressive regulation. A group of partners has been identified.



"This report by Xyntéo makes a constructive contribution to the debate about the future of shipping in the low-carbon economy. It also supports the NSA's view that securing this future will demand bold regulatory solutions and leaps in innovation and knowledge."

Elisabeth Grieg
 Former President of the Norwegian Shipowners' Association

Leadership Through Rough Seas is available at: www.xynteo.com

