

ecosperity 2014

TOWARDS **SUSTAINABLE GROWTH**
IN THE NATURAL RESOURCES INDUSTRIES



Organized by

TEMASEK

In partnership with

**Goldman
Sachs**



NUS
BUSINESS
SCHOOL

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TEMASEK

2014 marked Temasek's 40th anniversary. As we reflect on the past and look to the future, we realise we are at the beginning of a long journey. But it is not one which we make alone.

Over the past decades we have focused our investment activity towards transforming economies and growing middle income populations. As world economies develop and a significant portion of the global population transitions into the middle class, global prosperity needs to be achieved in an environmentally sustainable way.

As societies become more prosperous and aspirational, businesses need to find ways to enable and manage both consumption and conservation. So not necessarily "less", but "better"; better in dealing with our physical and social environments, and the impact of economic growth on communities.

The first Ecosperity conference was a successful start, thanks to the efforts of the panellists, moderators and all those involved in the event. We aspire to build a platform for leaders to share their thoughts on sustainable practices and prosperity in business.

The theme for this year was "Towards Sustainable Growth in the Natural Resources Industries" with a focus on global energy, mining, and agriculture – industries which are at the core of Asia's economic growth.

We thank our partners Goldman Sachs and NUS Business School, and our speakers, for supporting the Ecosperity conference. The issues that were discussed will benefit this generation and future generations to come.

CHENG WAI KEUNG
Deputy Chairman, Temasek



Goldman Sachs is proud to have partnered with Temasek in hosting the inaugural Ecosperity conference in conjunction with Temasek's 40th anniversary celebration.

Sustainable use of the world's resources is an essential component of continued global economic growth. As populations grow and more people move to cities and urban centers, an emerging middle class is increasingly putting a strain on food supplies, energy and natural resources.

Goldman Sachs is committed to helping catalyze market-based solutions to the environmental challenges we face today, and Ecosperity was an opportunity to convene leaders to continue an important dialogue on this subject. While there are no easy solutions, sustained engagement by all stakeholders is necessary to address these and other issues that play such an important role in the greater Asia Pacific economy.

We would like to thank all of the conference's excellent speakers for sharing their insights and making the event a success.

We also thank our other co-host, the National University of Singapore Business School, for their partnership and for the opportunity to engage and educate our next generation of leaders through the Ecosperity Young Leaders Dialogue.

Finally, we look forward to continuing this important dialogue with all of you at future Ecosperity forums.

GARY COHN
President and COO, Goldman Sachs





NUS Business School is pleased to have had the opportunity to collaborate with Temasek and Goldman Sachs on the inaugural Ecosperity conference, especially in the organisation of the Ecosperity Young Leader's Dialogue.

The conference generated many ideas and raised greater awareness on the importance of sustainable practices. In tandem, the Young Leader's Dialogue underscores our vision to nurture a new generation of business graduates imbued with a deep sense of corporate social responsibility.

Companies in Asia are gradually aligning business goals to the global blueprint for sustainable growth. However, more can be done to achieve even greater sustainability. A recent study by NUS Business School and the Singapore Compact for Corporate Social Responsibility revealed that the bulk of mainboard listed companies here lack transparency in disclosing information on sustainability practices, while others do not place corporate sustainability as a top priority. The fact that several local organisations are still struggling to adopt relevant sustainable practices points to a call for action.

On a larger scale, Asia's phenomenal economic growth - made possible by global energy, mining, and agriculture industries - has created wealth and raised millions out of poverty. The prosperity generated has to be channelled in an environmentally sustainable manner.

Thus, convening the Ecosperity conference at this point is timely. Ecosperity champions the robust exchange of information, innovative ideas and sustainability best practices among global CEOs, top public officials and thought leaders, with the objective of balancing environmental sustainability with economic development in this region. This is much needed for the economic and ethical survival of Asian businesses.

As future leaders, our graduates play a critical role in taking Singapore and Asia forward on the sustainability journey. Their commitment to greater corporate social responsibility - and the vital role they play in putting more companies on the sustainability roadmap - would pave the way to a brighter future for Asia.

PROFESSOR BERNARD YEUNG
Dean and Stephen Riady Distinguished
Professor, NUS Business School



ABOUT ECOSPERITY 2014

The inaugural Ecosperity conference was hosted by Temasek in conjunction with Temasek's 40th anniversary and in partnership with Goldman Sachs and NUS Business School. Ecosperity brings together global CEOs, top public officials and thought leaders to explore cutting edge issues on sustainable growth.

As world economies develop and a significant portion of the global population transitions into the middle class, global prosperity needs to be achieved in an environmentally sustainable way. Ecosperity enables an intimate and robust exchange of information, best practices and ideas on how we can achieve this goal.

The theme for Ecosperity 2014 was "Towards Sustainable Growth in the Natural Resources Industries" with a focus on global energy, mining, and agriculture – industries which are at the core of Asia's economic growth. Ecosperity fosters the exchange of ideas and best practices on balancing environmental sustainability with economic development objectives across these industries in both established and frontier regions.





MORNING FIRESIDE

Geopolitical trends driving sustainable development

Moderator:



Nik Gowing
International Broadcast Journalist

The world is facing a transformational moment in energy history. New technologies are unlocking vast resources, and strategic relations continue to influence energy flows.

Panelists:



Dr. Steven Chu
12th U.S. Secretary of Energy,
Nobel Laureate

Amidst such economic and geopolitical trends, countries are striving for sustainable development, which opens up new opportunities for greater global collaboration.



Dr. Chen Deming
President, Association for Relations
Across the Taiwan Straits; Standing
Committee Member, National
Committee of the Chinese People's
Political Consultative Conference

This session discussed how we can navigate the trade-offs between economic realities, security requirements, and environmental necessities while seeking potential synergies.

A call for a sustainable growth model

- A more in-depth understanding of the tension between consumerism and sustainability is needed. Businesses depend on consumers increasing consumption of goods and services to generate profits, while sustainability requires efficient use of goods and services and conservation of energy.
- Countries are compelled to develop a sustainable growth model to maintain economic growth. Sustainability and efficiency should be considered as finite resources and decelerating population growth can pose constraints on long term economic growth.
- The definition of consumerism needs to be modified to accommodate a more sustainable growth model, where people consume without lowering the standard of living of future generations.
- The unsustainable growth model which started during the industrial revolution tends to be repeated by developing nations. Focus should be on a growth model that places more emphasis on long term sustainability.

Geopolitical trends in relation to energy and sustainability

- Regional economic cooperation has improved since the financial crisis, but geopolitical tension poses a material risk to globalisation.
- Russian sanctions have put pressure on EU member countries to seek new sources of energy supply, while encouraging Russia to build closer relationships with new customers such as China.
- The US shale revolution has sent reverberations around the globe. In the current highly integrated global environment, a more energy self-sufficient US is leading to shifts in trade patterns, world oil price declines and changing competitive landscapes.

Even more important than what is said and agreed during global conferences is what is done afterwards.

Dr. Chen Deming





Exploring alternative energy resources

- Developing countries undergoing rapid growth such as China and India simultaneously face energy shortages and pressure to improve air quality. These countries have a strong incentive to secure energy supplies that help to meet both of these objectives.
- Carbon Capture and Storage holds potential for application to coal fired power, however this process is energy-intensive and currently still uneconomic.
- China is rich in shale gas but faces big challenges in extraction and transportation. LNG and piped imports of natural gas will continue to form an essential part of China's energy supply.
- Nuclear power can play an important role as an alternative energy resource and facilitate the transition to a less carbon-intensive energy mix.

Looking to the future

- Renewable resources are generally intermittent, making storage of electricity one of the foremost issues. Technological breakthroughs in battery technology signal a promising future for battery performance and storage of electricity.
- Consumers should strive toward more energy-efficient behaviours. Governments have a key role to play in order to promote sustainability and implement policies that provide guidance.
- Cross-border cooperation will facilitate global sustainable growth through knowledge sharing. Developing countries should continue to get more actively involved in the global discussion on climate change, environmental protection and energy consumption.



“ Developed countries should make available those technologies that can help developing countries grow in the most effective way. ”
Dr. Steven Chu



ENERGY PANEL

Realizing environmentally sustainable growth in the energy industry

Moderator:



Richard Manley
Co-head of Asia Pacific Equity Research, Goldman Sachs

Panelists:



Antonio Brufau
Chairman, Repsol



Dr. Jin-Yong Cai
Executive Vice President and CEO, IFC



Peter Coleman
CEO and Managing Director, Woodside



Tevin Vongvanich
CEO, PTT Exploration and Production



Peter Voser
Former CEO, Royal Dutch Shell

Global energy demand will continue to increase in the next three decades, with Asian economies taking the dominant share of the consumption growth. Pollution, climate change, sustainability of resource consumption as well as pricing and energy security considerations are driving the need for change across the energy industry.

This panel focused on how the main players in the global oil and gas industry are operating in today's environment and where the major challenges and opportunities lie for the future.

“ **Society's expectations of the resource industry are increasing, but while the demand for energy will continue to grow and with that the potentially undesirable side-effects of burning hydrocarbons, panelists expressed a belief that policy, capital markets, technological innovation and stakeholder engagement will create solutions to meet growing energy demand on a sustainable basis.** ”

Richard Manley

Meeting the energy needs of Emerging Markets

- With rapid population and economic growth, emerging countries such as China and India have become major consumers and eventually also potential suppliers of energy.
- Developing economies in particular face a challenge to simultaneously meet carbon targets and improve social welfare including air quality standards.
- Liquefied Natural Gas (LNG) and gas-fired power are expected to play a material role in the global energy mix as a result of three main attributes:
 - Availability: the globalised LNG market provides both flexibility and security of supply
 - Affordability: ubiquitous supply puts gas in a competitive cost position relative to other energy sources
 - Acceptability: gas has a significantly lower CO2 footprint than existing power sources such as coal and diesel

Developments in the international natural gas market

- The buyers of natural gas, including the Asian emerging economies as key demand centres, factor in diversity of supply, price and contract term when considering offtake contracts.
- Making supply sources more fungible, for example increasing ability to factor in shorter contract terms, would help in establishing a more dynamic international natural gas market. This needs to be weighed up against other factors such as any constraints on minimum offtake term imposed by project financing.
- Regional cooperation allows for efficient transfer of resources to meet the demand of the Asian region as a whole. For example, initiatives have been taken to create an integrated energy market in ASEAN.

“ **Gas, in any sustainable energy mix in the future, has to play an important role.** ”

Peter Voser





A call for stakeholder engagement

“
To develop energy supply for the majority of the poor people, there has to be a mix of different resources.
 Dr. Jin-Yong Cai
 ”

- Labour standards, human rights and business ethics are taking centre stage in the energy industry.
- Oil and gas exploration and development poses environmental and social concerns and it is paramount that companies engage the local communities and collaborate on community development plans. Early evaluation and communication of non-technical risks is critical for all stakeholders.
- Information asymmetry creates a trust gap between businesses and communities. To bridge this gap, companies need to ensure that the local community benefits from long-term energy projects and that these benefits are clearly communicated.

Challenges and sustainable practices

- Technological advancement is necessary to unlock potential resources in difficult areas in an efficient and clean manner. Safety practices and regulations also have to be adequately put in place to address increased risks in frontier areas.
- As the global economic growth outlook has cooled somewhat, investors have become more risk averse and capital for high-risk exploration and greenfield megaprojects has become more scarce. As a result, the role of international organizations has become more important in negotiating divergent interests.

“
Instead of reacting to the problem, we should anticipate how these problems may not or should not arise.
 Antonio Brufau
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AGRICULTURE PANEL

Opportunities and Challenges for Sustainable Development in Agriculture

Moderator:



Prof. Simon Tay
Chairman of Singapore Institute of International Affairs

Panelists:



Adi Godrej
Chairman, The Godrej Group



Ellen Kullman
Chair of the Board and CEO, DuPont



Frank Ning
Chairman, COFCO Corporation



Gregory Page
Executive Chairman, Cargill



Dr. Andrew Steer
President and CEO, World Resources Institute

As the world population continues to grow so does demand for food, and there is tremendous pressure to increase agricultural productivity amid concerns of food security.

However to do so sustainably in a context of declining arable land and water resources presents significant challenges, particularly so as climate change continues to affect weather patterns and alter global ecology.

The agriculture panel session explored how leading actors in the agricultural space are reacting to these opportunities and challenges.

Population and income growth drive the expected increase in food consumption

- By 2050, the global population is expected to reach 9.2 billion¹, with Asia, particularly South and Southeast Asia, and Sub-Saharan Africa leading the growth.
- Over the same period, rising incomes will add 3 billion people to the ranks of the middle class, shifting diets and increasing demand for proteins.
- As a result of these changes and other trends, food consumption by calories is expected to grow by 70% between 2010 and 2050.

Sustainable development complicates output growth

- Today, agriculture and its related activities contribute about 25% to greenhouse gas emissions².
- Assuming the same proportion of agriculture's current carbon emissions, expanding agricultural output to meet global demand in 2050 will use up 80% of the world's carbon budget.
- Almost 75% of output growth from the 1960s to the 1990s came from increased usage of inputs – fertilizers, chemicals and land, a trend which is not sustainable.

Food security challenges call for political resolve

- Countries will be increasingly pressured to reconsider self-sufficiency policies that may be detrimental to global food security by negating comparative advantages and the reality of heterogeneous climate, land and water resources.
- Food security requires a paradigm shift from a local to a global vision. For example, China has built its reserves in corn, wheat and rice by building good trading relationships with Argentina and Brazil, which have comparative advantages for the growth of these crops.
- Updated regulations and the resolution of tenure issues can foster the adoption of best practices. In Brazil, legal recognition of communities in the Amazon reduced deforestation and increased agricultural output.

The only kind of food security we are going to have is a collective food security.

Gregory Page



¹ United Nations • ² Climate Institute



The slow rate of technological adoption limits productivity gains, although radical advances in technology are not required to increase productivity significantly

- The temperature-controlled supply chain in South Asia and Sub-Saharan Africa, where the population growth is the fastest, is underdeveloped.
- Whether in India, China, Indonesia or elsewhere, small landholdings combined with land rights and tenure issues have hindered agricultural modernization.
- One way of raising productivity is through the better implementation of existing agricultural technologies for which there remains tremendous potential.

Applying science on a more localized basis will help smaller farms adopt better technology

- Technology viable for large landholdings cannot be easily scaled down for smaller landholdings.
- Partnerships with local organizations (universities, NGOs and the authorities etc.) must be established to assist the localization of science and ensure that technical specifications are properly passed on to all stakeholders.
- Successful technology implementation models of small holder ventures should be publicized to create replicable examples for other ventures elsewhere.

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We should treat food in a more respectful way, because people simply expect food to be cheap and not many realise that food is the most important thing in our lives.

Frank Ning

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Proper branding of the food agenda will help increase consumer awareness and drive resource efficiency and technological change to improve food security

- Food is often taken for granted and many agriculture issues tend not to register significantly with the end consumer.
- For example, on a global scale we are wasting about 1/4 of the calories that are produced for human consumption every year. A reduction in the amount of food waste by half could potentially reduce the global food deficit by 14%.



METALS AND MINING PANEL

The future of the metals and mining industry

Moderator:



Ken Hitchner
President of Goldman Sachs Asia
Pacific Ex-Japan, Goldman Sachs

Panelists:



Murilo Ferreira
President and CEO, Vale



Brian Gilbertson
Chairman, Pallinghurst Resources



Donald Lindsay
President and CEO, Teck Resources



Clive Newall
President and Director, First Quantum
Minerals

Commodity prices have faced increasing volatility against the backdrop of changing policies and government regulations, as well as uncertainty in the broader economy.

The long-term demand trajectory and volatility of prices underscore the need to secure long-term access to resources in a more sustainable way.

This session explored how mining companies are balancing longer-term needs with near-term pressures, navigating the evolving policy landscape and frontier environments, while continuing to innovate through technologies, tools and best practices.

Striking a balance between conflicting stakeholder demands in a low commodity price environment

- Tension between shareholder pressures and local community demands are more visible and challenging in today's environment where firms face falling profits due to decreasing commodity prices.
- Major Corporate Social Responsibility initiatives which were put in place during the commodity supercycle are being revisited as companies reconsider their business models.
- Today's business climate requires companies to embrace environmental and community issues as a core part of doing business. The ability to create win-win propositions is even more vital to the long term success of mining companies today than it has been in the past.

The shift toward mining in more remote and difficult territories poses a real challenge to the industry

- New projects generally require more complex infrastructure, for example operating in locations as high as 4,000m above sea level. As mining projects increase in scale, major power projects and larger housing developments will be required to support operations.
- Water poses a related challenge, and substantial amounts of capital have been channeled into desalination and other technologies.
- As firms venture into tougher and more remote geographical areas where local communities lack clean water and other basic services, success will depend on ensuring the local communities also gain long-term benefits.



Public understanding of the industry's challenges and risks is a critical ingredient for creating the right regulatory parameters

- Mining companies, governments and investors are all incentivized to promote public knowledge regarding the industry and environmental considerations, creating a framework for informed open discussion and positive action.
- Communication of case studies and broader collaboration are essential methods for helping to address common misconceptions.

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The challenges will get greater, but the industry will find a way.

Donald Lindsay

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Towards a more sustainable mining industry

- Public sustainability rankings provide transparency and additional pressure for companies to improve their sustainability performance.
- Despite the challenges inherent in adopting an environmentally-friendly approach in remote regions, a number of companies have taken steps towards a greener approach.
- Some of these companies have successfully incorporated renewable energy sources in their mining operations and implemented technologies that result in a reduced environmental footprint.

Collaborating with local communities to create lasting improvement

- Where efforts have been made to understand the local communities and to seek to provide mutually beneficial solutions, the track record of success is clear.
- This includes, for example, the incorporation of water purification for nearby towns as part of mining operations.
- Community impact efforts need to consider all aspects of interaction, including education, employment, biodiversity and ecosystem improvement.



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It is very important that there is a net positive impact in everything we do.

Clive Newall

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LUNCH FIRESIDE

Changing resources landscape and the role of capital

Moderator:



Marc Gunther
Editor-at-Large, Guardian
Sustainable Business US

Panelists:



Dr. Ngozi Okonjo-Iweala
Minister of Finance,
Federal Republic of Nigeria



Dr. Han Seung-Soo
Former Prime Minister,
Republic of Korea

As the world population increases and economies in the developing world grow, governments are coming under pressure to manage their growth in an environmentally-responsible and equitable way. Environmental sustainability has therefore become a critical factor in economic planning and capital deployment decisions.

The lunch fireside explored the role of public and private capital in achieving environmentally and economically sustainable development, with a focus on the emerging economic powerhouses in Asia and Africa.

The focus was also on how to best build domestic resource capacity, set policy and leverage limited public budgets to create the optimal environment for investment and innovation to thrive.

The interaction among the private sector, government and international bodies is crucial to achieving sustainable growth

- In the midst of the global climate change agenda, the interaction among three key pillars, i.e., the private sector, government and international bodies, are crucial to foster sustainable growth. The private sector and government strive towards profitability and societal benefits respectively, and these two objectives may not necessarily converge.
- While tensions are inevitable, the private sector, government and international bodies can work together to cooperatively manage the challenges of achieving sustainable development.
- Moving forward, innovation has the potential to replace capital and labor as the key factor of production to facilitate the world's transformation from a fossil fuel dependent growth model to a new quality-oriented, low carbon growth model.

Developing countries are well positioned to improve on the past consumption and production patterns of developed countries

- Developing countries will play an important role in the discussions at the UN Framework Convention on Climate Change (UNFCCC) 21st Conference of the Parties on Climate Change.
- Countries such as China, India, Indonesia and Nigeria, as their economies develop, will be enormously important in terms of both global production and consumption. Early engagement between international bodies and developing country governments is critical.

“

I think that the prospect and dream of leapfrogging [from diesel generators to more sustainable forms of energy] is possible. A part of it is happening now.”

Dr. Ngozi Okonjo-Iweala

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Public policy as a key tool to direct capital flows

- Effective public policy directs rather than obstructs the flow of capital. Nigeria has demonstrated the use of pricing policies to pursue sustainable development, effectively transferring funds arising from subsidy cuts to investments in new infrastructure and public health.
- The UNFCCC Green Climate Fund is another example of how market forces can be applied. The fund acts as a mechanism to support the transfer of technology from developed to developing countries, helping the latter grow in a sustainable manner.

Creating an environment that is conducive to private sector investments

- Governments should not shy from making the initial investments required to spur R&D and entrepreneurial activity, whilst also encouraging investment from domestic and international sources.
- By providing the appropriate business environment, the Nigerian government has enabled significant indigenous and international investment in its solar, wind and traditional energy industries.

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If we can somehow change this balance between subsidy and equity, then perhaps, we will be able to move faster to the sustainable development goal globally.

Dr. Han Seung-Soo

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YOUNG LEADERS DIALOGUE

Challenges to Corporate Sustainability in the Face of New Economic Realities

Moderator:



Prof. Kenneth Richards
NUS Business School, Visiting
Professor

As world economies develop and a significant portion of the global population transitions into the middle class, global prosperity needs to be achieved in an environmentally sustainable way.

Panelists:



Richard Manley
Co-Head of Asia Pacific Equity
Research, Goldman Sachs



Neil McGregor
Senior Managing Director, Temasek



Dr. Andrew Steer
President and CEO,
World Resources Institute



Takayuki Sumita
Director-General for Oil, Gas and
Mineral Resources, METI

The Young Leaders Dialogue allowed university students to participate in an intimate and robust exchange of information with key decisionmakers around best practices and ideas on how we can achieve this goal.

Sustainable development leads to continued economic growth for all stakeholders

- It is possible to increase prosperity, nutrition, education and overall quality of life for communities at a sustainable rate through sustainable development.
- A real life example of this is Japan, where over the last 3 years total energy demand was successfully reduced by 3.4%, whilst still growing their GDP by 2%.
- The companies that successfully adopt sustainable practices will be best positioned to grow into market leaders.

Prioritizing sustainable development begins with educating communities about its importance

- Whilst this is a difficult endeavour, social attitudes are beginning to change at all levels, leading to a more holistic perspective of growth.
- Technology has allowed individuals to raise awareness of sustainable development and also to widely and instantly track the activity and impact of companies in their community.

The mismatch between the horizons of stakeholders and the horizon required for payoffs from sustainable practices is a major hurdle to widespread adoption

- Average CEOs have tenures of up to 8 years, governments are generally elected for up to 4-5 years and average hold periods of institutional and hedge fund investors are less than one year.
- Finding solutions for sustainability requires thinking about payoffs over a much longer period, and there is more work to be done to address durational mismatches.

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Part of the challenge is that it is complex, we are going to have to make trade-offs, we are going to have to use judgment, we are going to gather lots of ideas, and lots of data.

Prof. Kenneth Richards

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Implementing appropriate long-term incentives and performance measurement and reporting systems is critical

- Corporations can institutionalize the right standards by setting up appropriate incentive structures and by developing holistic benchmarks incorporating sustainable practices.
- Those who can clearly communicate to stakeholders that they have adopted sustainable practices are likely to benefit from increased engagement from their customers as well as from investors who increasingly value sustainability.

“

If the consumers have no clear understanding on the importance of sustainability issues, then companies cannot close the gap [between meeting the needs of both the consumers and the environment.]

Takayuki Sumita

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Governments can design simple mechanisms and initiatives to encourage sustainability

- A good example is the Japanese Top Runner Mechanism, where the government creates a virtuous circle by setting sustainability standards and every few years bringing the standards into line with the top performer. By doing this, leading companies are incentivised to improve their efficiency in anticipation of meeting the next level of regulatory efficiency standards and hence gaining advantage over competitors.
- Similarly, the Japanese “Cool Biz” initiative encourages male workers to work without ties and jackets during summer, allowing air-conditioned buildings to be maintained at a higher temperature.

The use of technology is enabling more effective and collaborative ways to advocate sustainable practices

- The NGO movement is becoming increasingly sophisticated in terms of obtaining and analysing large amounts of real time data to work with the private sector in a way that is more effective and constructive.
- For example, the World Resources Institute, has created a sophisticated water risk tool which companies can use to assess risk to their supply chain and their environmental impacts.
- Proliferation of big data analysis will play an important role in empowering stakeholders with information to identify business partners with sustainable practices.
- Widespread access to and use of social media will continue to provide an interactive forum for a two way discussion of sustainability between businesses and communities.



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