



The Future of Resources



The Global Challenge

Put simply the global challenge for the future of resources is to find a way in which we can establish a commercially, socially and environmentally sustainable society where there is a balance between human consumption and the availability of natural resources. We are living through a time when there is an increasing number of people consuming more and we are using more natural resources than the planet can replenish. We should all be concerned about the increasing demand / supply imbalance.

Growing populations and rising consumer demand related to both higher standards of living across all societies and pressures of consumer capitalism are increasing consumption of resources. As we head towards a global population of around 9 billion, we can also see many economies expanding which means consumption per capita of many key resources is increasing steadily: China, for example, has used more cement in the last three years than the US used in the entire 20th century, and yet there are still around 150 million Chinese people living below the poverty line.

The evidence of an unsustainable trajectory is clear despite the fact that there has been a decline in global trade growth since 2010, it is still growing and the WTO expects global GDP to continue to rise at well above 3% per annum in the years to come. Oil prices have recently been declining but we can see

rising commodity prices across many areas from wheat and rubber to nickel and steel. Production of most commodities has risen sharply over the past decade. The world's output of iron ore, for example, has roughly tripled since 2000. With nickel and copper production both now rising at more than 10 per cent over the past couple of years, we are also faced with declining grades of ore which in turn require greater energy input to extract the target resource. Demand is increasing but production efficiency in some areas is declining.

At the same time we can see growing volumes of waste especially in cities, particularly food waste – 30% of which is now thrown away every day in Europe. While energy use per capita generally improves as people move into urban environments, rising urban populations means that net energy use continues to increase in most nations. Furthermore with limits to cheap energy increasingly apparent, as we reach resource thresholds such as peak oil we are forced to exploit secondary sources such as tar sands and shale oil, which are more costly to extract and have significantly larger ecological footprints than the original oil reservoirs. This is true for the majority of minerals we need for modern society and while fracking is providing a short-term fix in some countries, it is not a long-term solution.

Reaching the Limits

We are living through a time when there is an increasing number of people consuming more and we are using more natural resources than the planet can replenish. We should all be concerned about the increasing demand / supply imbalance.

More Demand: Less Efficient Production

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More, Not Less Waste

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Decoupling

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With increasing global focus on trying to (finally) make greater progress at UN climate talks, key questions are being asked for the future. Most significantly more are questioning when the perpetual economic growth model can be substituted - whether we can achieve 'prosperity without growth' and what role decoupling of these two can play. With an ever-increasing gap between rich and poor in most regions of the world, others are asking what roles will social and economic instability and unrest play?

More are recognising that better leadership from government, business and civil society is required to ensure adequate access to resources for today and tomorrow's population without depleting or devaluing them. As our individual and collective footprints become more tangible and better communicated, bold moves to shift the dial are needed across the board. New management approaches and business models are needed that can bring

together advances in IT, industrial ecology and biotechnology for more sustainable production.

More specifically, as the principle of the circular economy gains wider traction and we see industrial and societal resources conversations shifting from 'cradle to grave' to the more holistic 'cradle to cradle', we need to better understand what changes are needed to bring this into the mainstream. We have to work out how best to see and use waste as a resource. What changes are required to industrial processes and how can we best establish an improved global accounting system that considers human wellbeing, resource use and pollution alongside GDP are two pivotal questions to address. And, at the same time, we have to fully recognize the limits to the circular economy if we are to continue with the forecasted dependency on fossil fuels as a major energy supply for the rest of the century.

Options and Possibilities

Digital Transparency

We also know that greater digital connectivity and innovation will have an impact in enabling us to both reduce the need for some human mobility and provide greater transparency on how we use our resources and with what environmental, social and financial impact.

Societal Action

There may well be a significant bottom-up groundswell of opinion in society outside government and industry that creates a socio-political shift that recognizes the resource limits problem will occur before the ecological limits are reached.

We know that over the next decade, as there is a further rise on consumer capitalism across the developing world, we will continue to see rising consumption but that in China demand for some key resources such as copper, steel and coal will finally peak. With the dual challenges of rising costs and poorer quality resources we also know that there will be improvements made in resource productivity – both in extraction and use. We also know that greater digital connectivity and innovation will have an impact in enabling us to both reduce the need for some human mobility and provide greater transparency on how we use our resources and with what environmental, social and financial impact. Airbnb and Uber are just two of the most newsworthy digital platforms that provide the connectivity for a more collaborative economy with better use of material capital.

What we don't know is whether there will be fundamental macro shifts that help or hinder progress. With economists debating whether or not several major regions are entering, or

will enter, recession and predict stagflation over the next decade, it is possible we will see another global, or multi-regional, financial crisis. Although there were some positive signs of movement at the Lima UN Climate Change talks in December 2014, we are unclear as to whether we will see significant global response to climate change in the next decade or if we will need to wait longer before we reach a tipping point for globally agreed collective action. At the same time, there may well be a significant bottom-up groundswell of opinion in society outside government and industry that creates a socio-political shift that recognizes the resource limits problem will occur before the ecological limits are reached.

Recognising that stemming the tide of rising consumerism across large tranches of global society may take some time to reset, potential solutions on the table already include improved design of products and services: This is about moving beyond transitional design for disassembly and reducing waste production to more fully embracing the principles of cradle

What do you think? Join In | Add your views into the mix



to cradle and the circular economy. It is about net positive impact and not just being carbon, water or energy neutral.

In addition, there are many initiatives underway focused on resources agreements both globally and regionally: In December 2015, we will have the Paris summit where 196 countries will meet to hopefully sign a new climate change agreement while the EC's Europe 2020 strategy includes the target of a more resource efficient Europe: (to help decouple economic growth from the use of resources, by decarbonising the economy, increasing the use of renewable sources, modernising the transport sector and promoting greater energy efficiency). Although nothing about such agreements

and targets is certain, they do at least show intent. While bilateral trading relationships are more probable, the opportunity for global and regional agreements has to be pursued.

Another potential change on the horizon is the influence of the divestment movement focused on taking action against the influence of the fossil fuel industry and calling on financial and other investment institutions to divest from associated companies. If this movement is successful and reduces the reliance on fossil fuels it could put in place the commitment socially and politically to keep existing fossil fuels in the ground. This will be accompanied by support for alternate energy systems and, with momentum may well be extended to encompass other resources.

Net Positive Impact

This is about moving beyond transitional design for disassembly and reducing waste production to more fully embracing the principles of cradle to cradle and the circular economy. It is about net positive impact and not just being carbon, water or energy neutral.

Global and Regional Agreements

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Proposed Way Forward

Sitting here in Sydney, my primary hope for the next decade is that Australia seeks to follow the lead of countries such as Germany and to become more resource efficient. In addition, my home-country could also consider the competitive advantage to be gained in leading on the creation of a Circular Economy and developing a transition pathway to pursue it: Such a shifts will require collaboration and coordination of an integrated approach across education, industry, regulation innovation and financing. We need to shorten and simplify supply chains. Taking a lesson from the past, we can maybe learn from the Australian Landcare movement, which achieved success in remediating the deterioration of Australian farmlands through bottom up collective action.

At a global level, I would advocate that we focus on changing fundamental attitudes and behaviours through encouraging education systems to work across traditional boundaries so students are encouraged to think creatively to address real world problems. Changing industrial and business models also requires current employees to develop new skills to generate change. As such, the enabling education systems

also have to operate across organizational development frameworks and programmes. We know what to do, the challenge is to do it at scale: aligning virgin material supply chains with waste and secondary use supply chains already occurs in some parts of the construction industry; some retailers have started to advocate precompetitive collaboration through the value chain to bring about systemic change; and there are numerous examples of the rise of community-based and cooperative businesses that are providing goods and services with shorter supply chains and greater provenance.

At a fundamental level some see that we need to ensure a re-evaluation of value away from traditional economic value to an integrated view of value and well-being. The ultimate aim is to re-align the money, the economy and the financial system with human and natural realities and the rest will follow. In Europe, energy company E-on has just split in two to enable it to divest of higher risk business models. Similar changes will need to occur across not just the energy sector but the wider resource supply chains.

Active Divestment

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Impacts and Implications

Shifting The Dial

We may see increased IT enabled transparency in traditional industrial processes and greater collaboration between firms across different sectors and between firms within sectors all focused on tangible but significant shifts in priorities and activities.

If we can achieve a shift in attitudes and behaviours supported and cemented by mandatory agreements, then we will see changes at multiple levels. If exports from minerals decline further in Australia we will need a new base upon which to grow national wealth going forward.

Globally the primary opportunities (across all themes) include the acceleration of current approaches and undertaking more research into renewable energy sources, products and services to replace fossil fuels. Supporting this will be a drive for changes in consumption patterns and changes in accumulation of material status symbols but, with the current desire for greater personal wealth evidently in full force, this may take longer than the next decade to course-correct. More immediately we may see increased IT enabled transparency in traditional industrial processes and greater

collaboration between firms across different sectors and between firms within sectors all focused on tangible but significant shifts in priorities and activities.

As the Stockholm Resilience Institute has highlighted, there are nine so called planetary boundaries – areas where we are in danger of exceeding the Earth's natural thresholds. Ideally these should not be overstepped if mankind is to continue to live on earth in a viable manner. However we have already left over three of these boundaries - climate change, biodiversity and the nitrogen cycle. Without fundamental and significant global shifts now, and not tomorrow, we stand little chance of regaining the balance. A more informed, better understood, clearly communicated and socially embedded view of how we use and reuse our resources is imperative.

Lead Expert – Professor Suzanne Benn

**Professor of Sustainable Enterprise,
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Lead expert on the Future of Resources.

Professor Suzanne Benn is Professor of Sustainable Enterprise in School of Management, UTS Business School. In this position she provides leadership within the Business School and across UTS, working with other disciplinary areas and external stakeholders to promote sustainability. She was previously Professor of Education for Sustainability, Director of ARIES and Head of the Graduate School of the Environment at Macquarie University, Sydney. Professor Benn has modified and taught curriculum on sustainable business at the University of Shanghai, and led the introduction of these programs into the undergraduate and postgraduate curriculum at UTS and at Macquarie. She has a strong interest in interdisciplinary curriculum development and holistic approaches to learning for sustainability.



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About Future Agenda

Context – Why Foresight?

In an increasingly interconnected, complex and uncertain world, many organisations are looking for a better understanding of how the future may unfold. To do this successfully, many companies, institutions and governments are working to improve their use of strategic foresight in order to anticipate emerging issues and prepare for new opportunities.

Experience shows that change often occurs at the intersection of different disciplines, industries or challenges. This means that views of the future that focus on one sector alone have limited relevance in today's world. In order to have real value, foresight needs to bring together multiple informed and

credible views of emerging change to form a coherent picture of the world ahead. The Future Agenda programme aims to do this by providing a global platform for collective thought and innovation discussions.

Get Involved

To discuss the future agenda programme and potential participation please contact:

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Future Agenda 1.0

The Future Agenda is the world's largest open foresight initiative. It was created in 2009 to bring together views on the future from many leading organizations. Building on expert perspectives that addressed everything from the future of health to the future of money, over 1500 organizations debated the big issues and emerging challenges for the next decade. Sponsored globally by Vodafone Group, this groundbreaking programme looked out ten years to the world in 2020 and connected CEOs and mayors with academics and students across 25 countries. Additional online interaction connected over 50,000 people from more than 145 countries who added their views to the mix. All output from these discussions was shared via the futureagenda.org website.

Future Agenda 2.0

The success of the first Future Agenda Programme stimulated several organizations to ask that it should be repeated. Therefore this second programme is running throughout 2015 looking at key changes in the world by 2025. Following a similar approach to the first project, Future Agenda 2.0 builds on the initial success and adds extra features, such as providing more workshops in more countries to gain an even wider input and enable regional differences to be explored. There is also a specific focus on the next generation including collaborating with educational organizations to engage future leaders. There is a more refined use of social networks to share insights and earlier link-ups with global media organizations to ensure wider engagement on the pivotal topics. In addition, rather than having a single global sponsor, this time multiple hosts are owning specific topics either globally or in their regions of interest. Run as a not for profit project, Future Agenda 2.0 is a major collaboration involving many leading, forward-thinking organisations around the world.

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