

ecosystemmarkets
TASK FORCE



ECOSYSTEM MARKETS TASK FORCE INTERIM REPORT

NOVEMBER 2012



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"Mankind is failing to value our environment correctly. We want to change the world, to make a difference. This report is simply one output of our work, and a step towards our broader objective: our environment and its ecosystems being properly valued and protected for future generations."

Ian Cheshire, Group CEO Kingfisher, Chair of the Ecosystem Markets Task Force

Executive summary

The Ecosystem Markets Task Force

The Task Force is a practical, business led, independent review of the business opportunities arising from valuing nature correctly. A key commitment in the Government's Natural Environment White Paper last year, the Task Force aims to:

- identify the most promising opportunities for business that might be realised through an enhanced approach to the natural environment;
- make clear, actionable recommendations to Government about where things need to change; and,
- provide a compelling narrative for business.

The business narrative – why nature matters to business

Business depends on nature. We have a collective responsibility to ensure the sustainability of the earth's resources. Nature has rarely featured on the balance sheet; but the goods and services that nature provides – water, crops, biodiversity, pollination, air quality and more – underpin the success of every business.

The natural world is under pressure. We are already experiencing increasing stress on energy, resources and the wider natural environment. Climate change and extreme weather events are also increasing risks to business. By valuing nature properly these risks can be better managed.

Governments are beginning to value nature differently. The services that nature provides have been undervalued in decision-making in the past, but this is changing. In future, public policy decisions are likely to open up fresh opportunities and risks for business in new and existing markets.

Forward-thinking businesses will be the winners. With increasing demand for environmental products, processes and standards – both consumer and government-led – and mounting pressure on resources, businesses that engage early will reap the rewards from an altered competitive landscape in years to come.

Areas of opportunity

The Task Force is focusing further work and research into four broad areas: **the water cycle, food cycle, carbon and nature markets, and natural capital: resource scarcity and resilience**. This report sets out some of the potential business opportunities under consideration for each area and relevant sectors. We also highlight the cross-cutting importance of **knowledge intensive services**, as there is an increase in demand for sustainability accounting and metrics, for example.

The Task Force would like to hear from business

This Interim Report is an opportunity to test our emerging thinking with the wider business community and engage as many businesses and other stakeholders as possible in a discussion on business and the natural environment. Our final report will be published in early 2013. This will include specific opportunities for business to pursue and areas for Government, including the EU, to help provide the correct frameworks. Details on how to engage and share existing best practice are included at the end of this report.

1. Introduction: What is the Ecosystem Markets Task Force?

The Ecosystem Markets Task Force is a practical, business led review of the business opportunities that arise from valuing nature correctly.

The Task Force is a key commitment in the Government's Natural Environment White Paper, 'The Natural Choice'ⁱ. The White Paper's ambition is to create 'a green economy, in which economic growth and the health of our natural resources sustain each other, and markets, business and Government better reflect the value of nature.'

The Government has asked the Task Force to review the opportunities for UK business from expanding green goods, services, products, investment vehicles and markets which value and protect our natural environment.

Ecosystem Markets Task Force: Membership

- Ian Cheshire, Group Chief Executive Officer, Kingfisher plc (Chair of Task Force)
- Kim Buckland, Co-Founder, Liz Earle
- Vivienne Cox, former Chairman, Climate Change Capital
- Jack Frost, Director, Johnson Matthey Fuel Cells
- David Hill, Chair, Environment Bank
- Russ Houlden, Chief Financial Officer, United Utilities
- Martin Roberts, Programme Director, Cambridge Natural Capital Leaders Platform
- Amanda Sourry, Chairman, Unilever UK and Ireland
- Mike Wright, Executive Director, Jaguar Land Rover
- Peter Young, Strategy Director, SKM Enviro and Chairman, Aldersgate Group

What does the Task Force want to achieve?

The Task Force will identify specific, actionable ideas for business and Government, and will construct relevant examples to help inform both, as to how they can 'do the right thing' for consumers, business and our natural environment. It seeks to strengthen the case that economic growth and a sustainable approach to our natural resources should and must go hand in hand. A significant programme of research is underway to underpin this work (see Section 5).

The Task Force will report its findings in a final report to three Secretaries of State – Environment, Food & Rural Affairs; Business, Innovation & Skills; and Energy & Climate Change – through the Green Economy Council, in early 2013.

Nature has rarely featured on the balance sheet; but the goods and services that nature provides – water, crops, biodiversity, pollination, air quality and more – underpin the success of every business. The Task Force believes that with the right enabling framework in place, investing in the protection and enhancement of the natural environment should make good commercial sense.

What are ecosystem services?

Ecosystem services are services provided by the natural environment that benefit people.

These include natural resources for basic survival, such as clean air and water; natural processes, such as climate regulation and crop pollination; raw materials for industry and agriculture; contribution to good physical and mental health, for example, through access to green spaces and genetic resources for medicines; and social, cultural and educational benefits from interaction with nature.

2. Why should nature matter to business?

We have a collective responsibility to ensure the sustainability of the earth's resources and its natural systems. Protected areas and legislation to conserve individual species are among the vital tools necessary to do this, and our work is additional rather than an alternative to these and other efforts to conserve the natural environment.

We see additional action as necessary because nature cannot always be easily protected through more traditional state intervention. We are currently consuming at the rate of three planets in the developed world; it is clear that new ways of doing business and of consuming will need to be found to ensure responsible stewardship of our natural environment. Natural systems have limits beyond which recovery is not possible: there are stark examples of this in collapsed fishing grounds and the extinction of species. Business risk models are not equipped well for these 'tipping points' when trends cannot be reversed. It's a risk for businesses, of all sizes and sectors, and we need to collectively find a solution that works.

'We are now living by consuming the earth's capital, not its interest.' Pavan Sukhdev, leader of UNEP projects *The Economics of Ecosystems and Biodiversity and the Green Economy Initiative*

The natural world is under pressure

- By 2050, food demand will rise by 70%, water demand by 55%.
- Energy demand is expected to rise by 40% between 2009 and 2035.
- Global population is expected to rise to 8 billion by 2030, with 3 billion new middle class consumers.
- In the UK, about 30% of services delivered by ecosystems have been assessed as currently declining.ⁱⁱ

The global economy and environment is changing at an unprecedented rate. We are already starting to see the effects of significant pressures on water, energy, resources and the wider natural environment, such as rising commodity prices. Biodiversity and ecosystems are being degraded worldwide. Climate change and extreme weather increases will intensify these pressures.

All business depends on nature

Economic growth and the individual businesses that contribute to it depend on the prudent management and use of our natural resources. Nature provides water, crops, biodiversity, pollination, air quality and more, to business, either directly or via supply chains for free; these priceless yet limited supplies of natural assets are not integrated into the cost of production and are undervalued in Government and business decision making.

'Presenting a choice between ecology and economy is a false proposition. We must pursue both together, or fail on both.'
Tony Juniper

But this is unlikely to last. As science and economics become increasingly adept at understanding the value of the 'services' that nature provides, such as natural flood defences, and as this understanding feeds into public policy decisions, it's likely to give rise to fresh opportunities and risks for business in new and existing markets.

'When we look at our supply chain we think about smallholder farmers, we think about women and employment, we think about land rights, we think about biofuels, and because we think about this holistically, our plants are getting better, our sourcing is getting better, these communities have a chance of functioning... We are showcasing a different business model that shows how you give to society and the environment, rather than just taking from them'.

Paul Polman, CE Unilever, quoted in Guardian Sustainable Business, April 2012

The **pharmaceuticals** industry is a big user of wild genetic resources, on which up to half the value of global sales is based, and at current rates of plant and animal extinction, we may be losing the potential to create one major drug every two years.ⁱⁱⁱ

Water is an essential part of our daily lives in many more ways than we realise. Food, clothing, our cars and homes, and even electricity all have water embedded in them. Embedded water is water used to produce food and non-food products. Much of the embedded water that we consume, about 70% of our water footprint, comes from other nations, as we import goods and services into our country.

For example, it takes around 150 litres of water to produce 1 cup of coffee, and around 150,000 litres of water to produce a car.^{iv}

Governments are beginning to value nature differently

The Government's priority is the economy – delivering short and long term growth, value and prosperity. At the same time, the way that Government is thinking about nature is changing.

The Natural Environment White Paper from Defra is the first on the natural environment for over 20 years, and sets out a new approach: an ambition to place the value of nature at the centre of decision making at all levels, including economic policy.

The recent Industrial Strategy: UK Sector Analysis from the Department for Business, Innovation and Skills identified 'increasing demand for environmental products, processes and standards' as one of the main four drivers for growth over the next decade (alongside 'rising incomes and changes in patterns of demand'; 'changing business practices and new technology'; and 'demographic and lifestyle changes')^v.

'The so-called "choice" between going green or going for growth is a false one [...] in reality, with the right policies in place, green business will be a major pillar of our future growth.'

John Cridland, CBI Director-General, July 2012

Forward thinking businesses will benefit

Many businesses have not thought how dependent they are on a variety of ecosystems in the natural environment, nor how market failures are potentially threatening these systems. But there are many opportunities as well as risks for those that lead the way in rethinking their business models to cope with change. Businesses that can engage with consumers and suppliers to make these changes work for them will be the winners.

Some estimates suggest that sustainability-related global business opportunities in natural resources – including energy, forestry, food and agriculture, water and metals – may be in the range of US\$ 2-6 trillion by 2050 (in 2008 prices)^{vi}.

Risks and resilience: dependencies can be major opportunities

All successful businesses will be looking at risk and resilience, but many do not consider the risks to their business if the quality and/or availability of nature's services are affected. A business that puts a value on services it draws from nature will be able to make more informed investment decisions which mitigate risk and improve resilience.

'Businesses that fail to assess their impacts and dependence on biodiversity and ecosystem services carry undefined risks and may neglect profitable opportunities'

TEEB for Business, 2010

To take the example of climate change, the World Economic Forum's last Global Risks Report identified five risks that are of greatest importance to our economic system. Alongside chronic fiscal imbalances and global governance failures it highlighted rising greenhouse gas emissions, not least because of the relation to volatility in energy and food prices^{vii}.

Ian Kirk, Chief Executive of Santam Group notes that globally, 'insurers have observed an upward trend in weather-related insured losses due to the increase in frequency and intensity of extreme weather events and the increasing economic cost associated with them. Global reinsurance catastrophe reports confirm that 2011 was the year with the costliest natural and man-made disasters on record... This is placing pressure on the availability and affordability of insurance, slowing growth in the industry, and shifting greater risk exposure onto governments and individuals'^{viii}.

There is a need for business to consider their dependencies on natural goods and services, and those of their suppliers. Are there pressure points in the supply chain to do with scarce or vulnerable products, in the short and longer term? What effects might external factors such as climate change and flooding have on these resources?

Indicative data from Trucost suggests that if all of the **chemical industry's** environmental impacts in 2010 had to be paid for, the cost would equate to 43% of the sector's earnings in that year.^{ix}

SABMiller brewers are looking at new ways of conserving water. In India, at its Rochees plant in water-stressed Rajasthan, they have initiated programmes to protect the water supply not only for the brewery but also for local farmers, including funding the construction of four water recharge dams. These relatively low-cost structures aim to prevent the excessive run-off of water and facilitate the natural replenishment of the groundwater. There has already been an estimated net rise of groundwater by 31 feet, representing almost as much water as extracted last year by the brewery.^x

A research partnership led by **Santam Group** highlighted the importance of changes to ecosystems such as wetlands that provide buffering capacity to extreme events. For each of the risks studied – wild fires, floods, and sea storms – the report highlighted that proactive risk management to strengthen ecosystems could offset most of the increased risk associated with climate change and benefit all exposed parties: clients, communities, the insurance industry or Governments.^{xii}

Kraft Food/Cadbury: Kraft Foods is actively investing in its supply chain and in key countries where they source ingredients. Since 2008, their Cocoa Partnership – established by Cadbury – has committed £45 million to invest in cocoa farming in Ghana, India, Southeast Asia and the Caribbean over 10 years. It was established to address long-term and complex challenges facing cocoa farming including low incomes, unstable income, varying international commodity prices, limited agriculture support, low yields and a new generation who are not interested in becoming cocoa farmers. Its reforestation component aims to ensure optimum use of the acre rather than clear new forest for cocoa cultivation and protection of river banks with fast growing trees as part of a land use plan.^{xi}

Opportunities: innovation and competitiveness

There are many opportunities for those that lead the way in rethinking our business models to cope with the rapidly changing global environment. As Governments will seek to ensure that nature is correctly valued, this will alter the playing field, as we have seen with the landfill tax. The global carbon market grew from virtually nothing in 2004 to over US\$ 140 billion in 2009, largely as a result of new regulations driven by concern about climate change. Businesses that can engage with consumers and suppliers to make these changes work for them will be the winners. Several companies that have already embarked on building nature's services into their business models have shown strong commercial success following their change of strategy, including through better cost control. Among them are Puma, Unilever and Marks and Spencer.

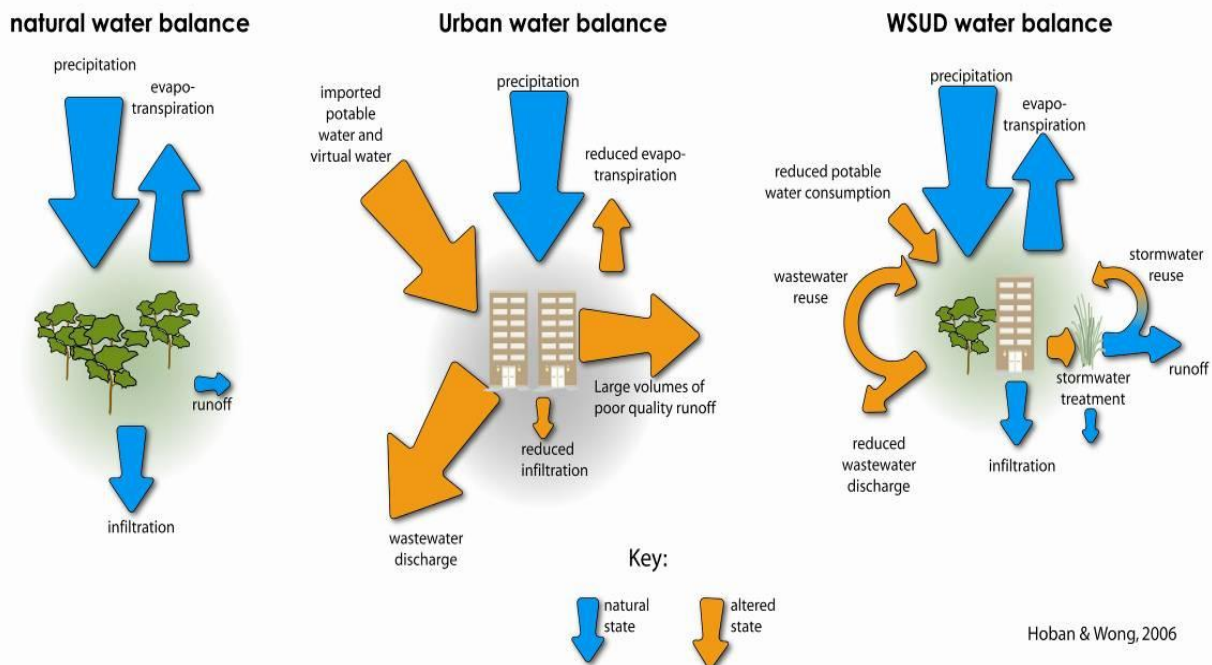
More and more, consumers are favouring products they perceive to be more sustainable or ecologically friendly. For example, sales of certified 'sustainable' forest products quadrupled between 2005 and 2007, and markets for certified agricultural products are estimated to increase from \$40bn in 2008 to \$210bn in 2020^{xiii}.

'M&S have proved sustainable business can be profitable. In 2007 plan A was a £200m investment and I said it wouldn't make any profit in the first 5 years. But in the 2010 annual report the auditors said £50m of extra profit was attributable to doing the right thing. So there's proof.

'If you want customers to tell you that you need to do something, you're too late. Good business leaders should be half a step ahead of what customers want ... That's what innovation is about. With Plan A we didn't wait for consumers to tell us. With Fairtrade we didn't wait for the consumers to tell us. And with charging for plastic bags, we didn't wait for consumers to tell us. We just did it.'

Sir Stuart Rose, former Executive Chairman, Marks & Spencer, quoted in Guardian Sustainable Business, March 2012

Rethinking 'business as usual': the figure below highlights water sensitive urban design (WSUD), an approach to planning and designing urban environments that integrates all parts of the water cycle. By thinking differently about the water cycle, environmental and business benefits can be realised at the same time. For example, business opportunities could exist related to wastewater and storm water reuse and reduced water consumption.



<http://waterbydesign.com.au/whatiswsud/>

In the area of risk itself, 'the need for climate-resilience is becoming a source of innovation and business opportunity for insurers and the traditional skills of insurers in risk-modelling and scenario building 'can assist in identifying cost-effective measures and plan for future uncertainties.'^{xvi}

Creating clothes from waste products (such as unwanted clothing, waste plastic and rubber) can create opportunities for **SMEs**. For example, **Worn Again**, a UK up-cycling company, has worked with McDonalds to design new uniforms for its 85,000 staff and with Eurostar to produce new train managers bags.^{xiv}

There are opportunities for innovation in the use of **construction materials** to reduce dependence upon energy intensive and oil-dependent materials which have a high carbon and environmental footprint and exposed to rising oil prices. For example, US firm **Evocative** turns agricultural waste into biodegradable solid board insulation material.^{xv}

Jaguar Land Rover is developing a new metal alloy and a closed loop recycling process which increases their use of recycled aluminium. The new alloy tolerates higher levels of impurities from previously disregarded aluminium scrap castings, reducing the amount of aluminium sent to landfill. Developing the closed loop recycling process also reduces transport emissions because it uses materials recycled in the UK, instead of importing castings from a German supplier. Their work complements their ongoing research into recycled aluminium through both REALCAR and REALCAR 2. These projects, funded by the Technology Strategy Board, aim to reduce aluminium waste and develop the UK aluminium recycling infrastructure by increasing the composition of recycled aluminium used in vehicle manufacture to 75%.^{xvii}

South West Water's 'Upstream thinking' helps farmers and land managers to keep peat, soils and natural fertilisers on their land and funds actions to improve water and slurry management. Strong projected benefit to cost ratios – in the region of 65 to 1 or better over 30 years and will cost just 60 pence per customer by 2015.^{xviii}

The Task Force believes there are further opportunities in the area of **knowledge intensive services**, whose rapid growth is evidenced in the Government's recent Industrial Strategy. The UK plays a leading role internationally in ecosystem-related knowledge and there is an opportunity to build on this knowledge base in order to maximise business opportunities relating to ecosystems; this is addressed further in the next section.

3. Areas of opportunity

The Task Force is focusing further work in the lead up to its final report into four different, though interdependent, areas, which we believe to have high value both for nature and business: the water cycle, food cycle, carbon and other markets for nature, and natural capital: resource scarcity and resilience.

We have filtered ideas based on the scale of the issue, its relevance and impact. We intend to come up with a limited list of practical suggestions for business to pursue, and also recommendations for Government where intervention would assist in the creation of new markets. Business opportunities include risk/cost avoidance.

In addition to the four areas highlighted in the table, there are a number of areas that may provide more cross-cutting business opportunities such as **the knowledge economy**, as well as links to financial and professional services such as engineering, consulting, legal, and scientific. These cross-cutting business opportunities are likely to be relevant to the specific opportunities explored under the four areas of work, for example, the development of metrics/sustainability accounting that would be required to underpin a new market.

Water Cycle

Includes water resources, both quantity and quality, wastewater, and issues of flooding

What are the potential opportunities for business?

Better water management can assist UK business competitiveness. Potential for significant export potential (e.g. through new environmental technologies) given UK expertise across water sector taking advantage of the \$480 billion pa global market in water products and services.

What are the benefits to the environment?

Conserving water is important to biodiversity, as freshwaters are a vital part of UK ecosystems. New investment in catchment management could deliver water quality benefits and flood risk mitigation.

Relevant sectors

Very cross-cutting, wide range of business sectors including food & drink, retail, manufacturing, water supply, energy, agriculture, insurance sector.

Case study

United Utilities established the Sustainable Catchment Management Programme (SCaMP) in 2005 to improve wildlife habitat and water quality. It is an example of innovation in demonstrating that investment in natural infrastructure can provide cost effective business solutions to meeting water quality standards.^{xx}

Food Cycle

Includes nature in agriculture and fisheries

What are the potential opportunities for business?

Food certification and labeling schemes offer benefits through market growth, reputational and brand development and risk management. **Reducing food waste** could save UK businesses up to £800 million annually in reduced raw materials and waste disposal costs. **Renewable energy** offers huge opportunities for farm businesses; bioenergy is projected to deliver 16% of the UK energy supply by 2040. **Reform of the Common Agricultural Policy (CAP)** has potential to support a wide range of rural business opportunities, adding value to land management.

What are the benefits to the environment?

Food production has major impacts on ecosystems; sustainable production systems can reduce these impacts. Reducing food waste will mitigate the effects of increased output and the impacts of waste disposal. Expansion of renewable energy on farms will cut greenhouse gas emissions as well as reducing impacts of waste. Better use of the £3.5 billion CAP budget could deliver a wide range of benefits for UK ecosystems.

Relevant sectors

Agriculture and fishing sectors but also cross-cutting range of business sectors affected including food & drink, retail, manufacturing, water supply, energy.

Case study

UK's largest single glasshouse, Cornerways Nursery, uses recovered CO₂ and heat from neighbouring British Sugar's Wissington factory, with plants growing at twice normal rates.^{xix}

Carbon and nature markets

Includes nature based carbon offsetting markets and new nature markets such as biodiversity offsetting

What are the potential opportunities for business?

Nature based carbon markets - reputational / CSR benefits. **Expansion of biodiversity offsetting** – increased certainty and quicker planning decisions; reputational benefits to construction industry. Market opportunities for conservation banking and provision; Substantial opportunities to farming/landowning businesses for supplying offsets; potential UK market of £500+ m/yr; worldwide market currently worth up to \$3bn.

What are the benefits to the environment?

New investment in woodland, wetlands and peatland for a range of benefits beyond carbon reduction including biodiversity, flood alleviation and recreational opportunities. No net loss of biodiversity arising from development, and potential for substantial net gain; potential for pooling of offsets to establish larger more viable habitat creation and restoration sites; potential to increase rate of habitat creation/restoration in UK by factor of 10 or more.

Relevant sectors

Firms wishing to offset carbon for CSR purposes; professional services growing around metrics, certification, brokerage etc which may be exportable. Construction (residential, industrial, commercial), mining and quarrying, land conservation; professional services that may be exportable.

Case study

In the US, biodiversity offsets (wetlands and endangered species) has an estimated annual market size at minimum of £1.15-1.86 billion. The system stimulates third party investment in offset creation as well as standardized units of trading. Wetland or conservation banks may be privately or publicly owned.^{xxii}

Natural Capital: resource scarcity and resilience

Reviewing resource security and resilience in context of broader ecosystem resources.

What are the potential opportunities for business?

A broader perspective on renewable and non-renewable critical materials could help identify new opportunities for UK business. Financial opportunities relate to better business management of risks, driving forward resource efficiency, new technological and service solutions and new business models (e.g. 'circular economy' business models). Identification of resilience issues linked to ecosystems.

What are the benefits to the environment?

A step change in understanding businesses' dependencies on natural capital is a necessary step towards strategies for better management and more sustainable use of natural resources. Improved possibilities for conservation of more fragile ecosystems through enhanced recycling of materials.

Relevant sectors

Relevant to a wide range of business sectors.

Case study

Mondi, the integrated paper and pulp multinational used ecosystem screening tools to identify growing water stress in a South African catchment, enabling it to identify future constraints and opportunities for efficiencies in forest plantations and mills.^{xxi}

4. What next?

What the Task Force will do next?

The Task Force very much welcomes comment on this Interim Report.

Over the remainder of this year we will work with interested parties to develop a shared evidence base / rationale for: (i) the most promising business opportunities and; (ii), refine any cross-cutting themes / messages to Government. This work will inform our Final Report in early 2013.

The Task Force will also lead an awareness-raising exercise upon publication of the final report, working with bodies such as CBI and BITC to get the subject of ecosystem markets firmly onto businesses agendas.

Our work will come to an end in 2013 so please get involved now and help shape the 'business view' to Government in this important area. Once we've reported back to Government, it will publish a response to our recommendations and, we hope, help facilitate work to enable opportunities for business.

What should business do?

The Task Force's hope is that different sectors and individual businesses will find our report and the accompanying body of work helpful. The Task Force will report to Government, but we hope our work will provoke a response from business too.

This might be by (i) using our work as a basis to take advantage of opportunities, where these don't need further enabling work by Government; and / or (ii), by using our narrative to integrate inputs and services derived from the natural environment into their core planning and decision-making processes.

At this stage the Task Force is interested to hear your views:

- Are the areas that the Task Force is currently pursuing the right ones? Are there big ideas here that are missing?
- Are there things that prevent you valuing nature's services correctly? What are they and what would help you to overcome them?
- What would need to change in your sector or business area for you to value nature more highly?
- You may be a business wanting to 'do the right thing' for nature, but you have encountered barriers, perverse incentives or unintended consequences? If so please let us know, there may be barriers we can help fix.
- What is the role for Government in enabling some of these opportunities? What evidence could you share to build the case for Government action?

You can contact the Task Force Secretariat at ecosystemmarketstaskforce@defra.gsi.gov.uk. If you are interested in engaging in more detail on any of the four work areas set out in Section 3, a number of discussion papers will be published shortly by the research team supporting our work, which set out that team's thinking on the most promising business opportunities in those areas. These will be published at: www.defra.gov.uk/ecosystem-markets.

5. References and work to date

Task Force's evidence work to date

Phase 1 evidence work (completed):

- April 2012 Workshop on opportunities for UK business that value and/or protect nature's services.
- May 2012 - Paper for the Ecosystem Markets Task Force - "Top 10 opportunities", Professor Ian Bateman, Head of Economics for the UK National Ecosystem Assessment.
- June 2012 – Scoping study Phase 1: Opportunities for UK business that value and/or protect nature's services – commissioned by the Valuing Nature Network on behalf of Defra and NERC.
- July 2012 – Response Summary of Call for Evidence – Defra.
- July 2012 – Evidence Review: Business opportunities from the natural environment - a business sector approach – Defra .
- July 2012 – Update on work to date.

Phase 2 evidence work (on-going):

- September 2012 – Scoping study Phase 2 begins.

For further details of all the papers published in Phase 1 see:

<http://www.defra.gov.uk/ecosystem-markets/work/evidence/>

Listed references

- ⁱ 'The Natural Choice: securing the value of nature'
<http://www.defra.gov.uk/environment/natural/whitepaper/>
- ⁱⁱ 'How to feed the World in 2050', Food and Agriculture Organisation of the United Nations:
http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf; OECD Environmental Outlook to 2050
<http://www.oecd.org/env/environmentalindicatorsmodellingandoutlooks/oecdenvironmentaloutlookto2050theconsequencesofinaction.htm> ; IEA World Economic Outlook (2011)
<http://www.iea.org/publications/worldenergyoutlook/> ; United Nation Population Division report: <http://www.un.org/esa/population/publications/wpp2000/chapter5.pdf>; National Ecosystem Assessment <http://www.defra.gov.uk/environment/natural/uknea/> .
- ⁱⁱⁱ Evidence Review Paper: Business opportunities from the natural environment - a business sector approach, Defra July 2012 <http://www.defra.gov.uk/ecosystem-markets/work/publications-reports/>
- ^{iv} Waterwise <http://www.waterwise.org.uk/pages/embedded-water.html> ; Water Footprint.Network www.waterfootprint.org
- ^v Industrial Strategy: UK Sector Analysis at <http://www.bis.gov.uk/assets/biscore/economics-and-statistics/docs/i/12-1140-industrial-strategy-uk-sector-analysis.pdf>
- ^{vi} The Economics of Ecosystems and Biodiversity (TEEB) for Business Report, 2010, www.teebweb.org .
- ^{vii} 'Global Risks 2012 – Seventh Edition' <http://reports.weforum.org/global-risks-2012> .
- ^{viii} Ian Kirk, Chief Executive of Santam Group at <http://www.climatewise.org.uk/thought-leadership/> .
- ^{ix} Evidence Review Paper, Defra, as before
- ^x 'SABMiller: tackling the ripple effect of water scarcity' at <http://www.guardian.co.uk/sustainable-business/best-practice-exchange/sabmiller-tackling-ripple-effects-droughts>
- ^{xi} http://www.businesscalltoaction.org/wp-content/files_mf/1286825168BCtACadburyCocoaPartnershipCaseStudy.10.10.2010ForWeb.pdf
- ^{xii} http://www.unepfi.org/fileadmin/documents/insurance_changing_risk_landscape.pdf
- ^{xiii} TEEB for Business, as before.
- ^{xiv} Evidence Review Paper, Defra, as before
- ^{xv} Evidence Review Paper, Defra, as before
- ^{xvi} John Coomber, former CEO of Swiss Re and Chairman of ClimateWise at <http://www.climatewise.org.uk/thought-leadership/>
- ^{xvii} Evidence Review Paper, Defra, as before
- ^{xviii} Evidence Review Paper, Defra, as before
- ^{xix} Evidence Review Paper, Defra, as before
- ^{xx} <http://corporate.unitedutilities.com/scamp-index.aspx>
- ^{xxi} Evidence Review Paper, Defra, as before
- ^{xxii} <http://www.ecosystemmarketplace.com/documents/acrobat/sbdmr.pdf>