



#32

October 2012

## KEY FACTORS

(hover over for links to rest of document)

- Consumer attitudes and behaviour
- Health and well-being
- Science, technology and innovation
- Energy supply and demand
- Natural resources and waste management
- Agriculture and rural communities
- Food production, processing and distribution
- Land use and land management
- Climate, environment and biodiversity
- Oceans, marine life and fisheries
- Economy and industry
- Globalisation, (geo)politics and national security
- Demographics and urbanisation



### About CERF

The Centre for Environmental Risks and Futures (CERF) is based within Cranfield University's School of Applied Sciences. Our expertise spans the natural, technological, economic and political domains. Our horizon scanning activity is part of a £1.8m project within the Centre, funded by a partnership of 12 organisations.

Visit [www.cranfield.ac.uk/sas/cerf](http://www.cranfield.ac.uk/sas/cerf) for more details.

**We value feedback - tell us what you think!**

**Send your thoughts and feedback to [a.a.rathe@cranfield.ac.uk](mailto:a.a.rathe@cranfield.ac.uk) or follow us using twitter (@TheRiskExchange), or our blog (<https://theriskexchange.wordpress.com>).**





## KEY DEFINITIONS

Throughout the document we use a number of key terms to describe the insights we generate. This page provides a quick overview of key factors (what they are and why we conduct our scanning around them), in addition to an explanation of the ratings we use to assess each insight.



KF

### What is a key factor?

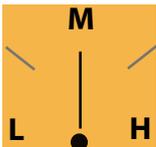
The key factors are broad drivers or areas of change, and are designed to reflect the most important topic areas shaping the future of our partner organisations. Each quarter, we analyse over 700 scanning resources to identify and highlight the 2 - 4 (or more if there are more than four issues considered to be important) most important emerging issues under each key factor, based on the level of risk or opportunity they are likely to present. The partnership includes: Defra, Scottish & Welsh Governments, DECC, Department for Transport, Natural England, Forestry Commission, Environment Agency, Scottish Environmental Protection Agency, Marine Management Organisation, Food Standards Agency and the Natural Environment Research Council (NERC).



1

### What is a horizon?

A horizon is the period of time in which a risk/ opportunity is likely to first occur and have impact. Normally, a technology horizon is very short - meaning things change very quickly. Conversely, ecological horizons can often be very long. We have decided upon three horizons to help decision makers understand the likely timescale of a first impact for each insight. Horizon 1: 1-3 years, horizon 2: 4-10 years, horizon 3: 10+ years. Please note: These horizons should not be used as an indicator of when action is needed. An event likely to occur in 15 years may still require action now to mitigate against it.



### What do we mean by importance?

Importance is an indicator of the level of likely risk and/or opportunity associated with each insight. Previously, we rated this using a simple "high, medium or low" scale. In this edition, we have expanded our method, and now present a semi-quantitative assessment, with scores ranging from 1 (low risk/opportunity) to 9 (high risk/opportunity). How does this work?

1. We ask the question, "What is the likelihood of this insight affecting the UK?", and assign a score to the answer (i.e. Not likely = 1, Moderately likely = 2, Very likely = 3).
2. We also ask "If this insight does occur, what will the scale of impact be on the environment/ economy/ society?", and again, score the answers (Low impact = 1, Moderate impact = 2, High impact = 3).
3. The final score is generated by taking an average of environmental, social and economic impacts, and multiplying this by the likelihood of occurrence.



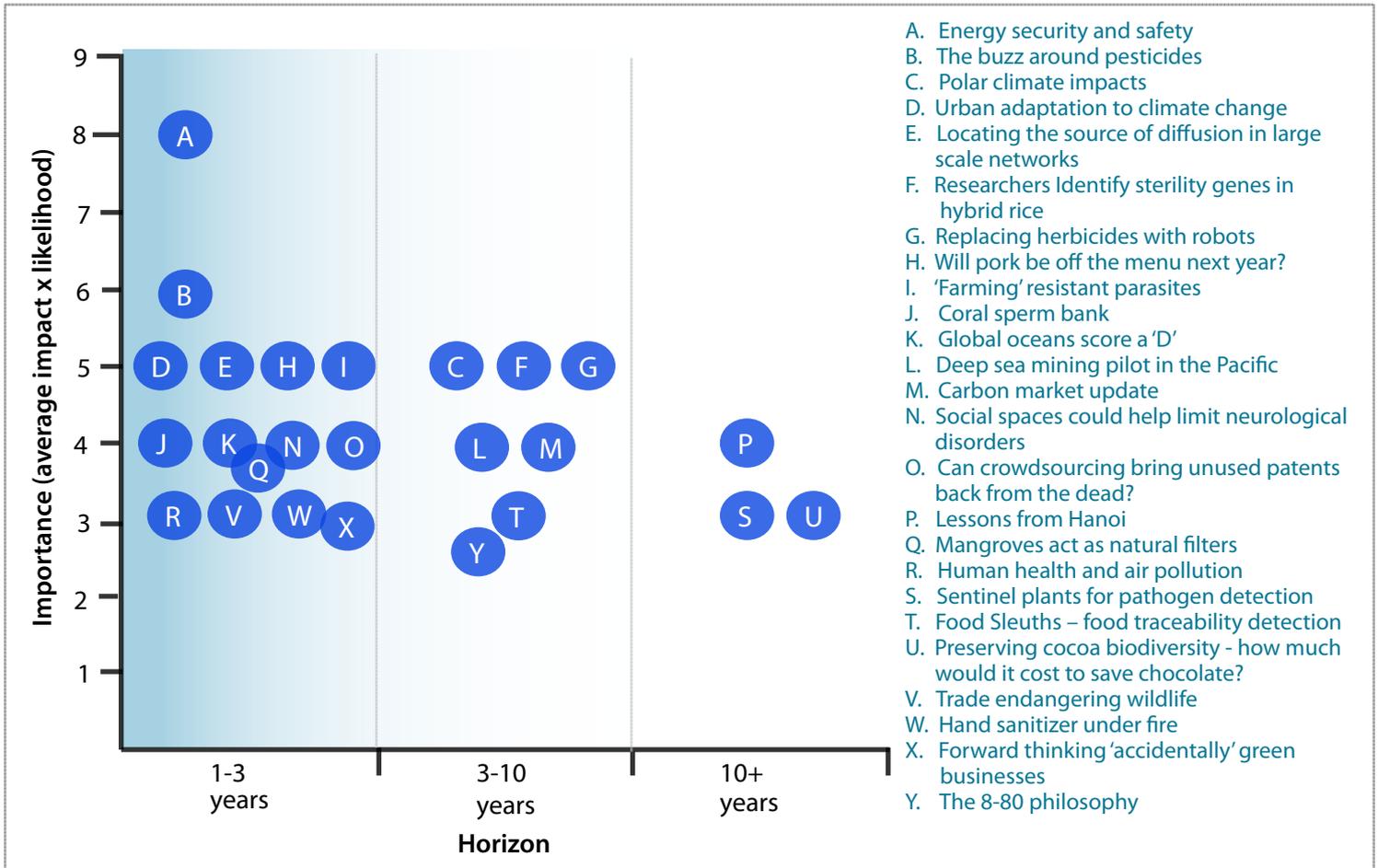
Links:

### What are the links for?

Click on the white circles to see pages with related articles in this newsletter, or click the grey circles to see related insights from past newsletters. However, we'd suggest that if you'd like to look for common or emerging issues, our website is a good place to look.

TOP RISKS AND OPPORTUNITIES IN THIS ISSUE

The following table highlights the 25 most important risks or opportunities identified in this quarter's horizon scan. Ratings are approximate, and will almost certainly never be "right", due to the inherent uncertainties involved in horizon scanning assessments. However, these ratings are most certainly indicative of importance, and should help you to guide intervention strategies or future research towards the biggest issues. We value any feedback on these insights and their scores.



- A. Energy security and safety
- B. The buzz around pesticides
- C. Polar climate impacts
- D. Urban adaptation to climate change
- E. Locating the source of diffusion in large scale networks
- F. Researchers Identify sterility genes in hybrid rice
- G. Replacing herbicides with robots
- H. Will pork be off the menu next year?
- I. 'Farming' resistant parasites
- J. Coral sperm bank
- K. Global oceans score a 'D'
- L. Deep sea mining pilot in the Pacific
- M. Carbon market update
- N. Social spaces could help limit neurological disorders
- O. Can crowdsourcing bring unused patents back from the dead?
- P. Lessons from Hanoi
- Q. Mangroves act as natural filters
- R. Human health and air pollution
- S. Sentinel plants for pathogen detection
- T. Food Sleuths – food traceability detection
- U. Preserving cocoa biodiversity - how much would it cost to save chocolate?
- V. Trade endangering wildlife
- W. Hand sanitizer under fire
- X. Forward thinking 'accidentally' green businesses
- Y. The 8-80 philosophy

<p> <b>Top most important issues:</b></p> <ol style="list-style-type: none"> <li>1. Energy security and safety (A)</li> <li>2. The buzz around pesticides (B)</li> <li>3. Polar climate Impacts (C)</li> <li>3. Urban adaptation to climate change (D)</li> <li>3. Locating diffusion in large scale networks (E)</li> <li>3. Sterility genes in hybrid rice (F)</li> <li>3. Replacing herbicides with robots (G)</li> <li>3. Will pork be off the menu next year? (H)</li> <li>3. 'Farming' resistant parasites (I)</li> </ol> <p> <b>Top environmental issues:</b></p> <ul style="list-style-type: none"> <li>Energy security and safety (A)</li> <li>Replacing herbicides with robots (G)</li> <li>The buzz around pesticides (B)</li> <li>'Farming' resistant parasites (I)</li> <li>Polar climate impacts (C)</li> <li>Coral sperm bank (J)</li> <li>Mangroves act as natural filters (Q)</li> </ul>	<p> <b>Top economic issues:</b></p> <ul style="list-style-type: none"> <li>Energy security and safety (A)</li> <li>'Farming' resistant parasites (I)</li> <li>Polar climate impacts (C)</li> <li>Urban adaptation to climate change (D)</li> <li>Locating diffusion in large scale networks (E)</li> <li>Carbon market update (M)</li> <li>Sterility genes in hybrid rice (F)</li> <li>Will pork be off the menu next year? (H)</li> <li>Crowdsourcing (O)</li> <li>The buzz around pesticides (B)</li> </ul> <p> <b>Top social issues:</b></p> <ul style="list-style-type: none"> <li>Bird flu disease dynamics</li> <li>Energy security and safety (A)</li> <li>Urban adaptation to climate change (D)</li> <li>Locating diffusion in large scale networks (E)</li> <li>Researchers Identify sterility genes in hybrid rice (F)</li> <li>Will pork be off the menu next year? (H)</li> <li>Social spaces could help limit neurological disorders</li> <li>Human health and air pollution (R)</li> </ul>
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## Consumer attitudes and behaviour

### Environmental marketing – make it a family matter

- A new study has found that the top concern of today's youth is caring for their family. Approximately 600 16-24 year olds were asked to choose from a list of 8 concerns, and rate which one they felt was the most important moral issue.
- Results show that looking after family is most important in 59% of cases. Putting others first came second with 12%, followed by being faithful to your partner (8%), caring for the environment (5%), religious faith (4%), paying taxes (4%), playing a part in the community (4%), and buying ethical products (1%).
- This article raises two important points. First, caring for the environment is still seemingly low on people's agendas (although the study may not be representative of the time people spend thinking/ acting on their concerns). Second, marketing environmental issues as family issues may help to raise their profile. Professor Slovic has previously shown that people perceive risks to be higher when they affect future generations. Tailoring environmental campaigns to explain the impact on "tomorrow's child" may personalise environmental risk and encourage positive behaviour change.

*This could mean developing "personal future scenarios" which describe a range of plausible futures, written from the perspective of a future child/teenager. Personal futures techniques currently exist, but are not frequently employed to highlight what the world will "look like" for our children's children if we do or don't change behaviour now. Personalising futures could have a positive impact on behaviour change in addressing waste, climate change, and energy use – all by making the environment a "future family matter".*

<http://tinyurl.com/97crdd8>; <http://tinyurl.com/cp72cqp> (pg 9 for Slovic's risk perception info)

Horizon:  
2

Importance:  
2

Links:  
N/A

### Social spaces could help limit neurological disorders

- We've known for a while that children need high levels of social interaction during their critical phase of development.
- However, new evidence published in Science, shows that mice who only experience two weeks of low social interactions after weaning, before being introduced to larger social groups, have significantly worse neurological development in the long term. What is significant is that it appears the damage caused by low social interaction is, to some extent, irreversible.
- The research highlights that interaction and social cohesion in society is critical for minimising cognitive and behavioural deficits in adults.

*Ensuring that communities are cohesive and have shared spaces such as parks for play and social interaction could be important for the long term mental wellbeing of the next generation. As communities become less cohesive, single parent families increase, and young families move further from their support networks, shared public space may become crucial for creating opportunities for interaction and neurological development. The research further highlights additional ecosystem service values associated with the provision of safe shared spaces for social interaction.*

<http://tinyurl.com/cda2t3x>; <http://tinyurl.com/cog9jz3>; <http://tinyurl.com/8pscdfg>.

Horizon:  
1

Importance:  
4

Links:  
N/A

## Consumer attitudes and behaviour

### Luxury out, ethics in?

- In times of austerity, people can be known to point the finger at the rich, particularly if there is suspicion that these individuals have come into money through anything less than the most moral practices.
- The rich are hiding their swimming pools in Greece and selling their super cars in Italy – not only to avoid revenue inspection, but increasingly because it's not socially acceptable to be rich. Swabians in southwestern Germany even have a phrase for it; "hälinge reich", which means "secretly rich".
- Overt expressions of wealth through luxury brands now have a social cost as well as a financial one, and individuals are concealing this wealth by discarding classic luxury status symbols.
- But there is another factor at work here. We are shifting away from the luxury brands which have been traditionally 'cold', quiet, exclusive and unconnected, and have found new luxury in ethical brands and social responsibility.
- Increasingly, consumers are motivated by anti-consumerism, authenticity, connection, self expression, and 'enoughness' (knowing your limits, both sustainably and financially). German chancellor Angela Merkel even has a Swabian poster girl to promote this ethos throughout Germany. She promotes fewer, quality purchases, which reduce waste and actually increase quality of life.

*This new movement of consumer behaviour is slowly penetrating Europe, and if promoted in the UK, could have a beneficial effect on society, the environment, and the economy. That's right, Gerlingen, home of Swabias thrifty postergirl, has more purchasing power (approx. £400m pyr) than any other town in Baden-Württemberg, despite its size. So a new rule is needed "quality and function, over quantity and brand".*

<http://tinyurl.com/9jtb2n8>; <http://tinyurl.com/cdr4x zr>; <http://tinyurl.com/cgvwwtd>;  
<http://tinyurl.com/862clpo>

Horizon:  
2

Importance:  
2.6

Links:  
N/A

## Health and well-being



### Hand sanitizer under fire

- One of the key ingredients in hand sanitizer, triclosan, is raising concerns after an American study showed that the chemical slows muscle function.
- Researchers are concerned about the impact of the chemical, which is also used in all manner of household objects from toothpaste to deodorant, on human and ecosystem health as triclosan is pervasive in the environment and has been detected in waterways, aquatic organisms and human blood.
- Reduced swimming ability was seen in fish exposed to the chemical and cardiac function in mice was reduced.
- It is feared that the chemical may have health implications for people with existing heart conditions.

*It is possible that triclosan in the environment is affecting species and ecosystem function in the UK, particularly in aquatic settings. Impaired muscle function may make some species prone to predators or inferior competitors, altering community make-up in an ecosystem however whether the impacts will become extensive or severe is unknown*

<http://tinyurl.com/9dpp9aq>; <http://tinyurl.com/8tsy3dn>

Horizon:  
1

Importance:  
3.3

Links:  
N/A

### Watching for water contamination

- The mechanisms to eventually create two biosensors are being developed as part of the '2012 International Genetically Engineered Machine Competition' to detect bacterial pathogens in waterways that affect both animals and humans such as *E. coli*.
- The first probe targets DNA and will produce a colour change upon detection of the target pathogen, while the second uses pathogen-specific membrane binding to identify contaminated water, again with a colour change indicating a positive detection.
- The hope is that the study will produce reliable, portable and low cost detection options for problematic aquatic pathogens, especially in remote areas, developing countries and following natural disasters.

*This technology could provide a cheap, easy means to test water quality to ensure waterways in protected areas are safe for wildlife and humans to drink. It could perhaps also be used to trace back to the source of a pathogen entering the waterway.*

<http://tinyurl.com/8zdsuu6>

Horizon:  
2

Importance:  
1.3

Links:

## Health and well-being



### Bird flu disease dynamics

- The practice of breeding game birds for hunting may be playing an important role in the propagation of bird flu and other avian diseases that could mutate to infect the human population.
- Game re-stocking is the captive breeding of birds, sometimes in crowded conditions, to be released for hunting.
- Health ecology researchers in the south of France investigated the influence of hand-reared mallards in these game re-stocking facilities on wild birds and discovered that the H10N7 strain of the virus could be detected in wild mallards when previously it was absent from the population.
- This is particularly concerning with the bird flu update from South East Asia revealing a new fatal bird-flu virus spreading through birds in Vietnam. The new virus type has a much higher toxicity than those previously recorded in the area.

Horizon:  
1

Importance:  
2

Links:  
N/A

*Understanding where disease threats may come from and how pathogens such as the bird flu virus spread is essential to control or at the least, minimise the impact, of emerging diseases on wildlife. The interactions between commercially produced birds and wild populations can then be targeted to prevent spread of these often-deadly new diseases.*

<http://tinyurl.com/9cn9eq8>; <http://tinyurl.com/cbykgy8>

### Anti-bacterial coconut oil

- An Irish research team has treated coconut oil with enzymes to create a product that halts the growth of Streptococcus bacteria which causes tooth decay, as well as attacking thrush-causing yeast.
- More research is planned to understand how the modified coconut oil interacts with bacteria at the molecular level, although it is thought that enzymes breaking down the fatty coconut oil result in acids that are effective against Streptococcus.
- In industrialised countries, tooth decay is seen in up to 90% of children and if a commercialised product could be developed with 'natural' ingredients such as coconut oil while achieving a reduction in this rate of tooth decay, the product may prove popular with parents.

Horizon:  
2

Importance:  
1

Links:  
N/A

*As antibiotic resistance increases, alternative approaches such as this become even more exciting as a tool to combat microbes and consumers may seek additives such as coconut oil as opposed to traditional chemical additives.*

<http://tinyurl.com/8rttxyr>; <http://tinyurl.com/8jgsfyu>

## Science, technology and innovation



### Locating the source of diffusion in large scale networks

- Researchers from the Ecole Polytechnique Federale de Lausanne (EPFL), have developed an algorithm that allows users to identify the source of an epidemic or information circulating within a network, using only a few measurements and a small number of sparsely placed sensors.
- The development is applicable to a wide range of situations including the more conventional application of a network configuration to detect the origins of an outbreak, whether animal or human, but the techniques can also be applied to identify the source of terrorist messages, to detect the source of leaks in complex networks (Sarin gas in Tokyo) or as tool to identify the source of a bioterrorist attack.
- For example, using the algorithm in the reconstructed message exchange for the 9/11 terrorist network extracted from publicly released news, the system produced the names of three potential suspects - one of whom was found to be the mastermind of the attacks, according to the official enquiry.

*This represents a significant breakthrough in understanding the properties of a network, with enormous potential in real life applications. Being able to identify a source allows for a quicker, more targeted and therefore potentially more effective response to undesirable events.*

<http://tinyurl.com/cxhk4tn>; <http://tinyurl.com/9dhuq46>

### Researchers identify sterility genes in hybrid rice

- Research in hybrid breeds demonstrates these tend to be more vigorous than the parent subspecies and can yield significantly larger crops of rice.
- Scientists from the National Centre of Plant Gene Research at Huazhong Agricultural University in Wuhan and the Chinese University of Hong Kong examined two subspecies of the cultivated rice (*Oryza sativa L.*), japonica and indica, and identified three genes that act together to regulate fertility in these hybrids.
- The researchers homed in on a specific region of the rice chromosome, S5, which they had previously associated with hybrid sterility. They found three tightly linked genes - ORF3, ORF4, and ORF5 - that control fertility in indica-japonica rice hybrids.

*Understanding the cause of the sterility may allow scientists to overcome it. This could help in the development of more resilient and higher-yielding cultivated rice crops, providing one more tool to achieve the needed increase in caloric production to feed a growing global population.*

<http://tinyurl.com/czrja87>; <http://tinyurl.com/cjmbhn5>

Horizon:  
1

Importance:  
5

Links:

Horizon:  
2

Importance:  
5

Links:

## Science, technology and innovation



### Can crowdsourcing bring unused patents back from the dead?

- Three PhD students in the UK have developed a platform called Marbles that aims to help universities resurrect dusty old patents.
- The aim is to reverse the approach conventionally used to develop scientific research, which is based on trying to understand and find a solution for a problem.
- The platform used the collective knowledge of participants – crowdsourcing - to come up with problems that an established technology could solve. The crowd is assigned the task of finding possible applications for existing inventions or patents.
- The platform works through crowdsourcing competitions, like the X-Prize, which ask people to come up with technological solutions to a problem, cultivating a base of knowledgeable users who would submit ideas in exchange for a cash prize and points on the site (marbles).

*The approach is hoped to reduce the cost necessary for scientific research by prolonging the life of existing inventions and preventing investment into research that has been previously done.*

<http://tinyurl.com/chgafal>

Horizon:

1

Importance:

4

Links:

### Superhydrophobic coating allows water to boil without bubbles

- Researchers from Northwestern University in the US, King Abdullah University of Science and Technology in Saudi Arabia and Melbourne University in Australia teamed up to prevent water from bubbling when it boils by using tiny spheres coated with a hydrophobic material.
- The breakthrough capitalizes on the Leidenfrost effect, which states that when a liquid (say, water) comes into contact with a surface above the Leidenfrost threshold temperature, instead of simply bubbling and evaporating completely away, an insulating layer of vapor is created that protects the majority of the liquid from the searing surface temperatures.
- Because this vapor forms a layer between the water and the heating surface, the effect also reduces drag and has previously been shown to reduce in-water resistance by up to 85 percent.

*The breakthrough has potential applications in improving the efficiency of heat transfer, anti-frost technology, and reducing drag on aquatic devices or vehicles. The lack of an explosive boil-to-bubble transition would also improve safety in large industrial applications, such as the heating and cooling of metals and the water-cooling used in nuclear power plants.*

<http://tinyurl.com/dxym48l>; <http://tinyurl.com/cff6lo8>; <http://tinyurl.com/9cwxbst>

Horizon:

2

Importance:

2

Links:

N/A

## Energy supply and demand

### Extracting uranium from sea water.

- Fueling nuclear reactors with uranium harvested from the ocean could become more feasible because of a material developed by a team led by the US Department of Energy's Oak Ridge National Laboratory.
- The material, HiCap (from high-capacity), outperforms today's adsorbents, which perform surface retention of solid or gas molecules, atoms or ions. Specifically, the adsorption capacity is seven times higher in spiked solutions containing 6 parts per million of uranium at 20°C.
- In seawater, the capacity of 3.94 grams of uranium per kilogram of adsorbent was more than five times higher than the world's best at 0.74 grams of uranium per kilogram of adsorbent. The numbers for selectivity were shown to be seven times higher. "These results clearly demonstrate that higher surface area fibers translate to higher capacity".

*The idea is not new, but increasing adsorption capacity makes it a more attainable goal, expanding the reserves for a limited source of energy. Further, it is acknowledged that the cost of uranium ore is only a minor input into the cost of nuclear power, however efficient seawater uranium extraction is energy security, and thus any country with coastline could be considered to have "uranium security".*

<http://tinyurl.com/9uztrfd> ; <http://tinyurl.com/9734xzw>

Horizon:  
3

Importance:  
1.7

Links:  
N/A

## Energy supply and demand

### Using global warming to produce energy

- The great glaciers of the Alps are melting. Several climate change scenarios, some of which are based on an average temperature increase of +4°C, predict their complete disappearance by the end of this century.
- As they retreat, the glaciers uncover cavities; these fill with melt-water, becoming lakes.
- The Swiss National Science Foundation (SNSF) is funding a research project on the risks and possibilities of these new mountain lakes. Anton Schleiss, director of EPFL's Hydraulic Constructions Laboratory, is participating in a project to analyse different options for how we can take advantage of these new natural reservoirs to produce electricity.

*This project aims to inform where to invest in infrastructure in order to capitalise on the effect of climate change. Whilst the disappearance of the glaciers is undesirable, IPCC projections suggest it is unavoidable. Although the UK does not have glaciers, this insight highlights that adaptation to climate change involves finding opportunities in the new conditions. The work developed by the SNSF is at the forefront of climate change adaptation, setting the example.*

<http://tinyurl.com/coxosot>; <http://tinyurl.com/cfumctd>

Horizon:  
3

Importance:  
2

Links:

### Pillaging the moon for space energy

- Global warming, the limited nature of crude oil reserves and a universal change in the mindset over nuclear energy have created uncertainty over ensuring a stable source of clean energy for the long-term future.
- Recently, debate has started about the possibility of mining the moon for Helium-3.
- Helium-3 is a stable isotope of helium, the gas used to fill party balloons - and is notable because it's missing a neutron, an important property that means it can be used in nuclear fusion reactions to produce clean energy. Fusion reactions between Helium-3 and deuterium, which creates normal helium and a proton without a neutron, wastes less energy. It's the proton that's important; manipulating it in an electric field produces energy.
- The Helium-3 fusion process is about 70 percent efficient compared to coal and natural gas, which are only about 20 percent efficient.

*There is significant progress to be made before mining of helium-3 becomes a possibility as an energy source, including technical and logistic issues. However, in the long term it may present itself as an alternative.*

<http://tinyurl.com/cvt84fm>

Horizon:  
3

Importance:  
1.3

Links:  
N/A

## Natural resources and waste management



### Deep sea mining pilot in the Pacific

- A Canadian firm will be responsible for the first deep sea mining operation off the shores of Papua New Guinea. The Papua New Guinea Government have granted Nautilus Minerals a 20 year licence and other mining companies are waiting in the wings to see how the venture goes before launching into deep sea mining themselves.
- The ocean environment is a relatively new frontier in terms of mineral extraction and the environmental concerns are many.
- Scientists have warned that underwater mining may decimate organisms that have not yet been discovered, and sediment plumes could expose marine organisms to toxic metals. Bio-magnification is a possibility and these toxins could travel up the food chain to fish, dolphins and possibly humans.

*Deep sea mining may become a common practice worldwide if the pilot trial in Papua New Guinea proves to be profitable. However, the detrimental impacts of sediment movement and release of toxic metals must be understood before the practice is adopted globally.*  
<http://tinyurl.com/cbohza5>.

<http://tinyurl.com/cbohza5>

Horizon:  
2

Importance:  
4

Links:

### Utilising urine to capture CO<sub>2</sub>

- A Spanish researcher has proposed the use of a readily available resource – wee – to combat CO<sub>2</sub> pollution in cities.
- Urine (human and livestock) is a resource available across all human societies, is produced in large quantities and is close to the pollution hubs of large cities making it an attractive raw material.
- Every mole of ammonia in urine can absorb one mole of atmospheric CO<sub>2</sub>. The urine is mixed with olive waste water to prevent decomposition and can then be used as a CO<sub>2</sub> absorbent.
- The urine-olive water slurry can be inserted into industrial chimneys so the gasses being discharged must travel through the liquid, increasing the pressure and maximising CO<sub>2</sub> absorption. The next step in the research is to increase CO<sub>2</sub> absorption and study wastewater re-use risks.
- A detection system to show when the liquid is saturated with gas would be needed and the resulting waste product could be utilized for agricultural fertilizer.

*Urine is an untapped resource and any use that results in beneficial environmental outcomes should be pursued. However, the cost of infrastructure installation may be prohibitive if there is no incentive for businesses to filter their emissions in this way.*

<http://tinyurl.com/8ag4n62>; <http://tinyurl.com/8pq56zt>

Horizon:  
3

Importance:  
1.3

Links:

## Natural resources and waste management



### Three-in-one flood control

- Singapore has created a flood control structure, the Marina Barrage, that is multi-purpose in that it also captures and stores valuable water supplies and provides an attractive outdoor leisure space for the community.
- Singapore receives over 100 inches of rainfall a year and flash flooding in low-lying and urban areas is an issue. The Marina Barrage is a low-level dam that synchronises with the tides to control water levels and prevent flooding.
- Water storage is also an issue for the land-poor nation and the structure makes use of an urban catchment area to collect water while blocking salt water from the Marina channel that feeds into the ocean.
- The resulting reservoir provides social amenities in terms of an outdoor facility for water sports and a green grassy park on the roof of the structure itself for activities such as picnicking or kite flying.

*Successful forward-thinking international developments such as this can be used as a blueprint for UK development. If the UK can follow suit and ensure any new flood management structures are multipurpose, social, economic and environmental goals may be able to be achieved in unison.*

<http://tinyurl.com/cr68t2d>

Horizon:  
3

Importance:  
1.3

Links:  
N/A

## Agriculture and rural communities



### Replacing herbicides with robots

- A US company has received funding to commercialise a prototype weed-pulling robot that will reduce herbicide use. The 'lettuce-bot' uses algorithms to detect and differentiate between plants, even if they are touching. When it detects a weed, it injects enough fertiliser to kill the weed, without the need for pesticides.
- It is expected that the technology will not only be more cost-effective than current approaches, but also has the potential to reduce the weight of US pesticide used "by over 250 million pounds a year".
- The technology is currently limited to lettuce production, and will require new algorithms to be developed to be applied to different crops.

*The issue of weeds becoming more resistant to pesticides is a global problem, and therefore the development and commercial viability of such techniques will become increasingly important and be applicable to both organic and conventional production. Reducing pesticide use will also reduce environmental damage and related economic costs associated with remediation.*

<http://tinyurl.com/cbeo4co>

Horizon:  
2

Importance:  
5

Links:  
N/A

### Sentinel plants for pathogen detection

- A Colorado State University laboratory is developing a unique plant-based method of detecting the arrival of high risk agricultural pathogens in new areas which will allow widespread, continuous and real-time monitoring.
- By designing receptors that influence the plant's signalling pathway, the team are working on making plants de-green, or become white when infected with a pest.
- The pilot system is being developed for the plant pathogen *Xylella fastidiosa*, an economically devastating bacterial pathogen that has not been detected in the UK to date.

*Although this biotechnology is still being developed it has the potential to provide the UK with a cost effective, passive method for detecting emergency plant pests. This concept could be implemented on a nationwide scale, or on a national park or SSSI scale to detect pathogens that are currently in the UK, but have not yet spread to conservation zones.*

<http://tinyurl.com/98e3wel>

Horizon:  
3

Importance:  
3.3

Links:  
N/A

## Agriculture and rural communities



### Lessons from Hanoi

- The 2nd Global Conference on Agriculture, Food Security and Climate Change, which took place in Hanoi, Vietnam in early September, stressed the urgency of “climate-smart” agriculture. This seeks to increase agricultural productivity in an environmentally and socially sustainable way, whilst strengthening resilience to climate change, reducing greenhouse gas emissions and increasing soil carbon stocks.
- It includes proven practical techniques, such as mulching, intercropping, conservation agriculture, crop rotation, integrated crop-livestock management, agro-forestry, improved grazing and improved water management, as well as innovative practices such as better weather forecasting, drought- and flood-tolerant crops and risk insurance.
- Two approaches for implementation emerged:
  - Use landscape approaches to integrate agriculture, forests, fisheries and water resources, and
  - Strengthen the private sector’s involvement in order to scale up climate-smart agriculture projects.
- Thanks to an innovative programme set up by local authorities in Ninh Binh Province, Vietnam, called “living with floods” the region has shown remarkable resilience to severe floods that hit the area in early September 2012. As the world’s second largest rice exporter, ensuring the resilience of the country’s agriculture is essential for both food security and international supply.

Horizon:  
3

Importance:  
4.7

Links:

***The increased frequency of extreme weather events in the UK demonstrates the urgent need for the UK to adapt and adopt climate-smart agriculture in a similar way. The 3rd Global Conference will take place in South Africa next year.***

<http://tinyurl.com/c5dlgx2>

## Food production, processing and distribution



### Food Sleuths – food traceability detection

- Food fraud, economic adulteration and food counterfeiting are estimated to account for worldwide losses of \$49 billion. Quite often this does not manifest itself as sickness or cause the consumer any harm, so is not a high priority for regulators. Commodities that are marketed as premium products such as, for example, “grass-fed beef” or organic free-range eggs provide the incentive to cheat and mislabel.
- The new solution is an optical stable isotope analyser. These measure the stable isotopes in a gas, therefore requiring samples to first be converted to a gas via combustion, after this, light is bounced off the gas. Depending on the rate at which light is absorbed and diffused in the gas, researchers can determine the isotopes present.
- Subtle, detectable variations in these isotopes coincide with climate, growing conditions and manufacturing processes, ratios, of say carbon and nitrogen, can give an indication of whether an animal was fed on grass or grain. Similarly, by mapping hydrogen and oxygen concentrations, the process can determine where bottled water was pumped from.
- In contrast to previous methods, these spectrometers are now small enough to fit in a rucksack, making the process far more accessible.

*This technology could have potentially significant implications for UK food tracing, reducing food fraud and associated economic losses that otherwise go undetected, and protecting producers of “premium” commodities. It is also important to note that although the test equipment is getting more portable, the overall system remains complex and this may not prove a universally applicable technology.*

<http://tinyurl.com/bor7r23>

Horizon:  
2

Importance:  
3.3

Links:  
N/A

### Will pork be off the menu next year?

- A global shortage of cereal crops, driven mainly by drought in the US, has led to huge spikes in the cost of pig-feed. This in turn means that the cost of producing a pig is now much higher than the price a farmer can sell their animals for.
- Despite previous price spikes in feeds in 2008 and 2011, retail pork prices have remained relatively stable and many farmers are no longer making a profit. The introduction of the pig welfare directive regulations (which the UK already adheres to), that will come into force at the end of the year, have already pushed up pig prices elsewhere in the EU.
- The UK imports about 60% of its pig meat from other EU countries, and the industry is expecting the amount of pork available for importing to be significantly less over the next year.

*The National Pig Association warns that unless pork prices go up by a “modest amount now” to keep pig farmers in business, shortages will bring “inevitable record prices” in 2013. Whether UK consumers are prepared to spend more to buy British pork and support pig farmers is not yet known. Both consumers and producers may need support in order to safeguard British pork production and that low income families may struggle to afford even the cheaper cuts of pork. There is the potential need to raise awareness that producers cannot absorb these increases without passing on some of that cost to retailers and consumers.*

<http://tinyurl.com/chht5h4>; <http://tinyurl.com/8ksf3cf>

Horizon:  
1

Importance:  
5

Links:

## Food production, processing and distribution



## Preserving cocoa biodiversity - how much would it cost to save chocolate?

- The Global Network for Cacao Genetic Resources has estimated the annual cost of safeguarding the preservation of global genetic cacao diversity at \$1,832,736, published in a new report 'The Global Strategy for the Conservation and Use of Cacao Genetic Resources'.
- Despite its importance in global trade and to the livelihoods of several million small farmers in the tropics who are involved in its cultivation, cocoa was not designated as a priority crop in the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).
- The future of the world cocoa economy depends on the availability of genetic diversity and the sustainable use of this broad genetic base to breed improved varieties. Many factors, including changes in climate and land use, deforestation, pests and diseases and extreme weather events are contributing to an irreversible loss of the cacao genetic diversity. The specific goal of The Global Strategy is to optimise the conservation and maximize the use of cacao genetic resources as the foundation of a sustainable cocoa economy.

*International collaboration is essential for effective management of cacao genetic resources, however funding is currently below optimal levels, while support for the two international collections is not secure over the long term and many national collections are struggling. With the UK chocolate industry worth £3.6 billion, the UK should be aware of the situation and the need to support the Global Strategy in order to preserve cocoa diversity and promote a sustainable economy for cocoa.*

<http://tinyurl.com/crc3lwq>

Horizon:  
3

Importance:  
3.3

Links:

## Land use and land management



### Mangroves act as natural filters

- Mangrove deforestation occurring in New Caledonia is causing concern, and not just because the intrinsic value of the mangrove forests is being lost by the island nation.
- New Caledonia has a booming mining industry with the country containing 30% of the world's nickel deposits. Heavy metal extraction creates toxin –laden sediment which is washed out to sea during extreme weather events leading to water contamination and affecting biodiversity.
- A recent study has shown mangrove forests to be an effective heavy metal sink, trapping heavy metals and providing a buffer for the ocean.
- Deforestation is occurring faster than regeneration in New Caledonia and this practice may lead to the dissemination of accumulated pollutants.
- Using environmental valuation techniques it would be possible to account for the loss of mangrove forests in terms of the loss of regulating services and therefore the cost of remediation of heavy metals that would accumulate in the ocean if the mangrove trees were removed. In the context of the UK, wetlands, marshes and farmland buffer strips provide similar ecosystem regulating services.

***This research shows that natural systems (such as mangrove forests) can provide important ecosystem services even in a human-modified environment and their role should be fully understood before destruction or removal.***

<http://tinyurl.com/9gxabbo>; <http://tinyurl.com/8memzej>

Horizon:  
1

Importance:  
3.9

Links:

## Land use and land management

### Making the most of rooftop real estate

- A Japanese city has started using its land in the most efficient way possible by maximising rooftop productivity.
- Ashikaga city is promoting a scheme to lease the roof-tops of public facilities for the installation of solar panels so private energy companies can use the space for renewable energy generation.
- Businesses lease the rooftop space for solar panels on the condition that they supply the public facilities with power in times of environmental disaster or supply-demand shortfall induced power disruption.
- Leasing fees will be set based on local government electricity prices.

***Not only does this arrangement make the most of valuable land by utilising vertical space, but it encourages the use of renewable energy sources and provides energy resilience in the face of environmental disasters.***

<http://tinyurl.com/94m5jaw>

### Noise pollution is getting louder

- Approximately 30% of the European population is regularly exposed to a level of noise that disturbs speech or sleep which has prompted a movement towards the preservation of 'quiet areas'.
- A Greek study has found that parcels of land that are over 10km<sup>2</sup> and not subject to any human-generated noise (which are therefore eligible as quiet areas) are predominantly agricultural land and forest semi-natural areas. Wetlands and water bodies seldom make the cut.
- As well as impacting on human wellbeing, noise pollution can change species assemblages and negatively affect wildlife by making it difficult to communicate or detect prey. Naturally quiet areas are thought to support high levels of biodiversity, although particular species may favour noisy sites as a refuge from predators.
- The Campaign to Protect Rural England (CPRE) has completed a nationwide survey to determine what tranquillity means to people and natural sounds ranked highly on the resulting list.

***Noise pollution is becoming a more widely recognized issue and the protection of quiet areas may be the way forward in ensuring both people and wildlife can escape from the noise pollution experienced in urban or industrial zones. Land use conflict between the increasing need for urban development, and the conservation of low-noise areas and the ecosystems they support suggests this emerging issue is likely to become more contested in the future.***

<http://tinyurl.com/bqszfgr>; <http://tinyurl.com/3pnm2g8>; <http://tinyurl.com/cg7b2yd>;  
<http://tinyurl.com/8choxj5>

Horizon:  
2

Importance:  
2

Links:

Horizon:  
2

Importance:  
2

Links:

## Climate, environment and biodiversity

### The buzz around pesticides

- Evidence is mounting regarding the environmental damage caused by 'nerve-agent' pesticides such as Cruiser OSR, which contains the active ingredient thiamethoxam derived from the neo-nicotinoid family of insecticides.
- Cruiser OSR is used to treat rapeseed crops however, two recent studies suggest strong links between its use and the decline in pollinating insects. Neo-nicotinoids are used on 30% of UK croplands and though effective at disrupting the nervous system of pests (e.g. aphids) the unintended consequences of pesticide use include impacts on pollinators.
- A French study recently showed that even non-lethal amounts of pesticide may affect a bee's ability to return home, thus putting the colony at risk of Colony Collapse Disorder.

***The challenge is to strike a balance between pest control and minimising environmental damage, and this may be achieved through a change in operation and application or the use of new, less dangerous pesticides.***

<http://tinyurl.com/8ufe2lb>; <http://tinyurl.com/96qawgz>

Horizon:  
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Importance:  
6

Links:  
N/A

### Polar climate impacts

- The impacts of climate change are observed across the globe, however it is the polar regions where the effects are most noticeable. Recent findings suggest that climate change is having a major impact on polar mechanisms that regulate the earth's climate.
- Antarctic 'bottom water' fills most of the deep ocean basins around the world. Generated in Antarctica these waters are cooled by the overlying air and made more dense (or saltier) by the formation of ice. This dense water sinks and spreads northward forming a deep ocean current that helps regulate the planet by distributing heat and carbon. Scientists have discovered that vast quantities of this water are disappearing or warming, which may have important ramifications for earth's climate.
- In the Arctic, scientists have observed the largest degree of icecap melt ever measured. Driving this reduction was a mix of warming temperatures and stormy weather. Ice cover is expected to reach a minimum this September. With greater ice melt comes increased open water, which is more effective at absorbing heat and exacerbating warming.

***The observed changes in the climate are evident, however the questions remain about how we deal with them. Decreasing ice cover in the arctic is leading to increased exploration of hydrocarbons, a growing tourism industry and the potential for development of shipping routes. The question remains whether we should take advantage of the warming climate or protect the sensitive regions that are increasingly becoming exposed.***

<http://tinyurl.com/cdoybhn>; <http://tinyurl.com/bwjks7>; <http://tinyurl.com/8sagrgc>

Horizon:  
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Importance:  
5

Links:

## Climate, environment and biodiversity



### Human health and air pollution

- Air pollution impacts to human health are estimated to reduce human lives by eight months to two years, depending upon the region in which one lives.
- A recent report by the European Environment Agency states that microscopic particles, among the most harmful forms of pollution, remain at dangerous levels around Europe. Though policies are in place to reduce emissions and much success has been achieved (e.g. sulphur dioxide emissions did not exceed limits in 2010) much more can be done.
- By World Health Organisation (WHO) standards, all EU urban populations were exposed to dangerous pollution. Moreover, pollutants are systematically polluting the environment by entering water bodies, impacting agriculture and entering the food chain.

*Combating the problem requires a collaborative effort given the transient nature of air pollution and should integrate multi-faceted solutions. For example, increasing green space may lead to improved urban air quality while providing additional social benefit.*

<http://tinyurl.com/d39q4yd> .

Horizon:

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Importance:

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Links:

## Oceans, marine life and fisheries



### Coral sperm bank

- Less than a third of corals have legal protection from damaging activities and fishing and the oceans are both warming and becoming more acid, meaning the future is looking bleak for these sessile organisms.
- Seed banks are commonly used to store precious genetic material from plants, such as the globally renowned Svalbard Global Seed Vault. A similar concept has been applied to corals with the creation of a coral sperm bank that contains over a trillion sperm.
- It has been suggested that conservation efforts to protect existing reefs may be a lost cause by 2050 and in light of this predicted failure some researchers are collecting frozen coral sperm.
- Embryonic cells are also being harvested and stored, some of which have properties similar to stem cells and have the potential to grow into adult corals.
- The hope is that the initiative will maintain genetic diversity and that the preserved material could later be used to regenerate degraded reefs.

*The idea of the coral sperm bank seems a sensible conservation measure in the face of climate change in order to secure the future of our currently diverse, but threatened reef systems. Perhaps the concept of DNA preservation and storage needs to be explored for a range of threatened species, both terrestrial and marine.*

<http://tinyurl.com/8k8ye3f>; <http://tinyurl.com/8dl9bl2>

Horizon:  
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Importance:  
4

Links:  
N/A

### Global oceans score a 'D'

- An international team of 65 has taken on the daunting task of assessing the health of coastal oceans for every country and territory in the world that borders the sea.
- A scoring system has been developed that can be used to assess ten factors (which are biodiversity, tourism and recreation, food provision, carbon storage, coastal protection, natural products, clean waters, artisanal fishing opportunities, sense of place and coastal livelihoods and economies) to give an overall score for the stretch of water 200 nautical miles from the coast.
- The global average was 60 out of 100 with the highest score going to Jarvis Island off Hawaii with a score of 86 and the lowest score going to Sierra Leone with a score of 36 while the UK was just above average with a score of 61.
- The next step is assessing the health of deeper offshore waters.

*It is hoped that this ocean health index will guide national and international ocean management as the seas are an interconnected resource. The scoring system offers future opportunities for individual countries (including the UK) to judge their own success or failure and can place the most emphasis on whichever of the ten criteria is deemed most important to their culture or priorities, be that food provision or the conservation of biodiversity.*

<http://tinyurl.com/8csvnp6>; <http://tinyurl.com/9pjm6t7>

Horizon:  
1

Importance:  
4

Links:  
N/A

## Oceans, marine life and fisheries

**'Farming' resistant parasites**

- Salmon is Scotland's number one food export product and there are hopes to increase production and expand the industry further.
- However, Scottish salmon farmers are using record quantities of pesticides to counter parasite resistance. A 110% increase in the amount of pesticide used has only resulted in a 22% increase in productivity due to pesticide-resistant 'superlice'.
- Additionally the chemicals used are highly toxic to marine crustaceans such as lobsters, crabs and shrimp.
- Conversely it is argued that the chemicals are necessary and their impact is relatively localised and short-lived.

*Increased use of pesticides and the resulting pesticide resistance is a growing problem in a range of industries, particularly in marine environments where the pesticides applied can drift, and the approach of upping application levels only exacerbates the problem. We may be facing a future with a range of pests that can no longer be managed by traditional chemical means.*

<http://tinyurl.com/cc7hnpp>; <http://tinyurl.com/d4a9vnv>

**Horizon:**

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**Importance:**

5

**Links:**

N/A

## Economy and industry



### The flip side of citizen science

- Although community participation in conservation schemes is often actively encouraged, there are concerns about internet wildlife enthusiasts inadvertently affecting the agricultural industry.
- Biosecurity scientists have raised the issue of online miss-identification of agricultural pest species and the potential trade implications.
- The concern is websites where people can post photos of insects that they have found and ask 'the internet' what they are. If it is a new pest is misidentified as an unwanted quarantine pest, this can be picked up by other countries who then shut trade before the country with the potential infestation can respond, which has huge implications for the agricultural industry.
- The apple pathogen fireblight (*Erwinia amylovora*) which stopped trade of New Zealand apples into Australia for years is an example of the trade implications resulting from a contested pathogen distribution.

Horizon:  
1

Importance:  
1.7

Links:  
N/A

***Conveying risk information accurately is a difficult task and the internet is a medium in which it is impossible to control information flow. For this reason the only realistic way to manage this potential issue is by having strict, universally agreed guidelines in place for when to block trade with a country that has an outbreak of an unwanted pest.***

<http://tinyurl.com/cgfm2t5>; CRCNPB Science Exchange February 2012.

### Carbon market update

- A truly global carbon market is looking likely with Australia and the European Commission agreeing to link their carbon trading schemes by 2018.
- This would benefit both parties by allowing Australian companies to buy cheaper EU carbon credits and providing a much-needed boost for the flagging European market.
- Australia has also scrapped its carbon floor price after businesses argued that they would face higher prices than European competitors. The demand for credits outside of the EU will help stabilise carbon prices and may work towards changing the current low prices seen as a result of oversupply.
- The move would help carbon trading gain momentum and perhaps prompt other countries or regions to link in with Australian and Europe.

Horizon:  
2

Importance:  
4

Links:

***Carbon trading has moved down the agenda as dealing with the global financial crisis has taken priority in recent years. However, this Australian-European agreement is a positive move towards renewing interest in developing a truly global, carbon market.***

<http://tinyurl.com/cbj6p8k>

## Economy and industry



## Forward thinking 'accidentally' green businesses

- A number of novel businesses have achieved success and differentiated themselves through the concept of "harvesting idle assets".
- Examples such as Skype, which removes the need for travel for a face to face meeting, or companies that let people lease their car or parking space when not in use can be a highly effective way of stripping out a whole layer of resource use. In particular, technology based and skills-matching projects are emerging.
- The clothing company Patagonia has taken what can be considered a very high-risk approach by telling consumers not to buy their jacket, attached to a message to use what they already have and to come back when a replacement is really necessary. This encourages re-use and implies quality products, ensuring customer loyalty.
- These types of business models achieve environmental benefits indirectly by using disruptive innovation to produce a desirable behaviour, product or service.

***Encouraging businesses to think outside the box can result in profitable ventures that are great for the environment, and this type of business model should be actively promoted. Making the most of what is already out there can be a rewarding (both financially and environmentally) approach to business.***

<http://tinyurl.com/cgrmrq3>

**Horizon:**  
1

**Importance:**  
3

**Links:**  
N/A

## Globalisation, (geo)politics and national security



### Energy security and safety

- The search for new sources of hydrocarbons is driving exploration to high-risk parts of the globe. Regions such as the deep ocean and the arctic pose a particular challenge for drilling, often stretching the technical capacity of the equipment for safe operation.
- The arctic region holds massive hydrocarbon potential, and as sea ice weakens and retreats conditions become more favourable for exploration.
- Royal Dutch Shell are currently driving exploration in the region, however the company has postponed drilling upon release of information that an oil containment device may not have undergone sufficiently rigorous testing. In light of the recent Deepwater Horizon disaster in the Gulf of Mexico, governments are keen to ensure that safety measures are in place to avoid a similar catastrophe.

Horizon:  
1

Importance:  
8

Links:

*Recent regulation coming from the EU requires offshore operations to consider environmental risks along with health and safety. However, exploration in the arctic is multinational thus complicating issues about environmental governance and regulation. Opportunity exists for the UK to play a pivotal role in setting a collective standard of operation in these sensitive regions.*

<http://tinyurl.com/99kmfqx>; <http://tinyurl.com/9cmsqw4>

### Urban adaptation to climate change

- A city's ability to cope with higher temperatures and changing precipitation patterns depends upon a number of factors including population density, demographics, availability of green space and geographic location.
- While urban adaptation to climate change appears to be an issue of local governance, cities in Europe are strongly linked and therefore require a broader perspective. Challenges faced in one urban region may have an impact on the economy and/or quality of life in another.
- To understand these issues, the European Environment Agency has released a report that maps out the capacities of different European cities to cope with the impacts of a changing climate in terms of their awareness (knowledge and equity), ability (access to technology and infrastructure) and action (economy, resources and institutions).

Horizon:  
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Importance:  
5

Links:  
N/A

*This information is expected to facilitate multi-level discussions and information/experiences shared abroad may add value to adaptation plans within the UK.*

<http://tinyurl.com/d5r33zx> ; <http://tinyurl.com/9jlkc6e>

## Globalisation, (geo)politics and national security



### Trade endangering wildlife

- The illicit capture and trade of wildlife products has garnered the attention of the UN General Assembly during discussions about strengthening national and international governance.
- International trade in endangered species products is estimated to be worth \$8-10B per year globally.
- President Ali Bongo of Gabon recognises the damage this does to his country's environment and biodiversity and intends to strengthen Gabon's criminal justice system to combat the problem. However, the low risk high reward nature of the crime makes combating it very difficult, especially in poorer regions of the world.

*Tackling this problem will require an international effort with the WWF calling for consumer countries to reduce their demand of endangered species products. For the UK, this translates in to tighter border controls and stricter penalties for those participating in this illegal activity.*

<http://tinyurl.com/cxwrr3w>

Horizon:  
1

Importance:  
3.3

Links:  
N/A

## Demographics and urbanisation



### The 8-80 philosophy

- A Canadian company has developed the concept of 8-80 cities, the philosophy that a city that is good for eight year olds and eighty year olds will be a great city for all citizens.
- The company has worked in four continents and has used this exposure to a range of diverse environments to collect and share their international best practice guidelines for creating people-friendly cities.
- Cities adopting the 8-80 approach strive for social equality and sustainable happiness, nurture the need for physical activity and prioritize human interaction, while creating spaces for fulfilling these goals.
- The Danish city of Copenhagen has adopted this concept by installing miles of solar-lit bike super highways that allow commuters to get home faster than they would by car. This is not an environmental movement, but bicycles are becoming the logical transport choice as they are the fastest, most convenient and cheapest option.

*Urban design to please all sectors of society as well as providing a highly functional cityscape is a major challenge facing town planners. The 8-80 concept may provide a helpful guiding vision for future developments.*

<http://tinyurl.com/ccjnztk>; <http://tinyurl.com/c6wy558>

Horizon:  
2

Importance:  
2.7

Links:

### Shoe box apartments

- San Francisco is a desirable city and is facing growing pressure to provide housing for an influx of urban dwellers. The city currently has almost no vacancies.
- The city is toying with the idea of constructing micro units for singles and couples to increase living densities without using more land area.
- The housing units will be just bigger than a parking spot and a consequential effect will be de-cluttered living, with a lack of space forcing people to be choosy about their purchases.
- With residents purchasing less it may be that apartment buildings provide communal 'product libraries' for goods that are expensive, take up space and are used infrequently for those who live in the micro-units to share.
- It is argued that the lack of personal space will make communal spaces more important, fostering human interaction which may lead to the exchange of ideas and more innovation.
- Following the downsizing trend, a house is being constructed in Poland that is only 47 inches wide and wedged between two buildings which is intended to be a space for visiting artists to stay and work temporarily.

*The idea of communal product libraries is a potential solution for alleviating some of the issues caused by an influx of people into cities that are already crowded and space poor. What people will lose in terms of personal space will hopefully be counteracted by the perceived benefits of simplified living and the social interaction generated by sharing communal resources.*

<http://tinyurl.com/c3c889h>; <http://tinyurl.com/9rbyhr9>

Horizon:  
2

Importance:  
2.7

Links:  
N/A

## Demographics and urbanisation



### Will generation Y remain city-lovers?

- Generation Y, otherwise known as the millennials, are city lovers, but whether they will remain that way inclined is yet to be seen.
- In the US the group of 20-34 year olds have embraced the city lifestyle for both economic and cultural reasons, and currently the number of urban dwellers continues to rise.
- But this group has also delayed marriage, childbearing and the formation of households, so what will happen when the generation Y cohort want to 'settle down' and raise a family? There is the potential for another migration out to the suburbs as was seen with the baby boomers, although as city living standards improve there is also the real possibility that the millennials will stay in city settings.
- Urban Institute estimates that generation Y will make up 15-18 million new households in the US in the 10 year period between 2010 and 2020. It is thought that this group will play a significant role in shaping the future housing market but how they will shape it depends heavily on economic constraints or opportunities.

*Understanding generation Y's preferences and likely migration patterns, if any, will be imperative for planning successful urban development and providing for growing populations in particular areas.*

<http://tinyurl.com/d8meoh3>; <http://tinyurl.com/8xa6zgw>

Horizon:

3

Importance:

2

Links:

N/A