

Brown & Co: Residential, Commercial
and Agricultural Expertise.

2015 ANNUAL FOCUS REPORT

CLIMATE, THE ENVIRONMENT
AND SUSTAINABILITY

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BROWN & CO

2015 ANNUAL FOCUS REPORT



Welcome to our view of 2015, focussing on climate and the environment, issues we believe are going to be key influencers across the market in the year(s) ahead.

Within this publication, we have an interesting collection of articles to stimulate thought and discussion. Oliver McCentyre from Barclays has given us an interesting insight into farming and finance. I am also very grateful to our other external contributors, James Brown, a plant pathologist at John Innes, Dr Stephen Dorling, from The University of East Anglia's faculty of science, Martin Sleeuw, from Adapt Low Carbon Group and Matthew Rivers from Drax. They all give their unique insights into the differing impacts sustainable resources and climate have in relation to property or agriculture.

As ever, the property and agricultural market is continually evolving. At Brown & Co, we like to see ourselves as proactive and creative within our core sectors of agriculture, land,

commercial and residential property. We have made some exciting developments within the last year, which have brought growth to our business. Most notably, the Berry Morris & Alexanders mergers giving us new offices in Banbury and Huntingdon and the new Agri-AM joint-venture with Dexion Capital. We now have over 200 employees in our team at Brown & Co, based across 15 UK and overseas offices. We remain true to our heritage and the values that have underpinned our success as we grow our teams and expertise to best support our clients businesses and investments.

Charles Whitaker
Managing Partner



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FINANCE, FARMING AND AGRICULTURE



Environmental issues within the farming sector have been at the core of recent policy decisions, none more so than its high ranking within the CAP reform which resulted in the new Basic Payment Scheme. Within the agricultural sector, the emphasis on matters environmental are both pressing in the minds of the policy and decision makers, as well as the general population. With the strength of thought behind it, its inclusion through the 'Greening' measures of BPS is of little surprise and whatever your view on it is, it looks like it is here to stay. Farmers at first felt under pressure and had concerns over

what this would mean for their businesses, however AHDB recently projected that around 80% of affected farms already comply to the 'three crop rule'. Therefore, it would appear that for the majority, the measures should hold no fears, and indicate that UK farming is already embracing the environmental aspects of their business.





“Over 60% of farmers we talked to have either already changed their farming patterns or are currently considering doing so. This adaptability is the key to ensuring a business can survive”.

Another key influence on the farming sector is the weather and neither individual farmers nor the UK industry as a whole can have any control of it. What farmers can do is adapt and change to climate patterns which could include livestock management systems, changes in cropping, or complete rotations. A questionnaire completed throughout the summer by Barclays Agriculture at industry shows and events has shown that over 60% of farmers we talked to have either already changed their farming patterns or are currently considering doing so. This adaptability is the key to ensuring a business can survive when something not within its control changes, be that as an instant reaction to the direct results of the weather, such as flooding, or when taking a long term strategic view of overall business operation when the flooding continues year after year.

The historically low base rate is reported to benefit UK borrowers at present, and the farming industry is no different - with total facilities to the industry in the Bank of England figures reaching over £19 billion. With the cost of borrowing at an all-time low, many farmers have taken the opportunity to release some equity from their asset base and invest in the infrastructure or size of their farm. As the general UK economy grows and strengthens, forecasts are ever-changing on

when the base rate will begin to increase. However, managing the potential for an increase in base rate, and therefore overall interest payments, and knowing how that will affect your business is one of the key calculations to ensure the level of borrowing is sustainable. This analysis should be undertaken in just the same way you might apply a sensitivity analysis to milk or grain price variations, when you have little control over something - it is prudent to know how fluctuations will affect your business and your cashflow.

Overall, UK agriculture is a vibrant and cutting edge industry - some of the innovation in the world of farming in recent years is a far cry from the perception of those with a more traditional view of our industry. Many believe it is a steady, slow burning sector - which in production cycle terms it can be. However, robotic milking, field mapping to determine seed, spray and fertiliser rates and electronic climate control of pig and poultry buildings, to name but a few, are an indication of the innovation and technology the industry is embracing. Greater awareness of the constant modernisation of the industry will not only drive investment within the farming community, but also help to attract the farmers and innovators of tomorrow.



UK Agriculture cannot ignore the environmental impact on its fortunes, having to respond to both environmental policies from the EU and more localised, profit influencing

weather patterns. Resilient as ever, the sector adapts to accommodate all of this.

Irrespective of any climate or environmental issues, agricultural businesses must be assured that they are fully funded in order to operate efficiently and at the same time be sure of the affordability of this funding requirement. This all comes as a consequence of monitoring and budgeting financial requirements and the costs thereof, both at the current time and into the future.

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BROWN & CO

SUSTAINABILITY AND COMPETITIVE ADVANTAGE



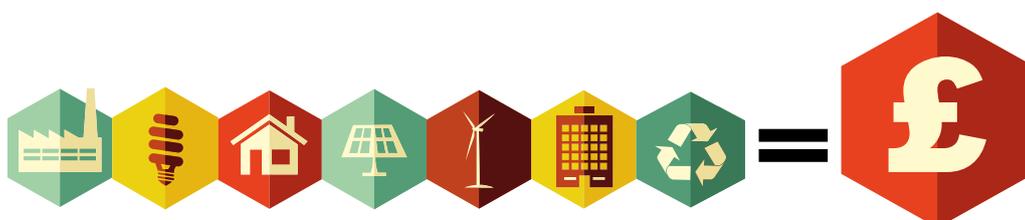
The discussion on sustainability in the built environment is being re-framed, from talk of burden to that of opportunity. While legislation and regulation have been the key drivers to date, the market forces of risk management and occupier demand for sustainable buildings are exerting increasing influence.

The recent report, *The New Climate Economy* by The Global Commission on the Economy and Climate, co-chaired by Lord Stern, concluded that, “countries at all levels of income now have the opportunity to build lasting economic growth at the same time as reducing the immense risks of climate change. The capital is available, and the potential for innovation is vast”. This was exemplified at the UN Climate Summit in New York in September 2014 where a coalition of investors including the Swedish State Pension

Fund, AP4, and one of Europe’s largest asset managers, Amundi, announced that it will reduce the carbon footprint of US\$100 billion of investments worldwide. Meanwhile, Rockefeller committed to divest from fossil fuels, and the insurance industry announced its commitment to increase its investment in “climate smart development” by a factor of ten to circa US\$420 billion by 2020. Investors such as these are calling for more investible carbon reduction projects to satisfy demand as a result of this massive reallocation of capital.

With the UK’s low carbon and environmental goods and services sector currently worth in excess of £122 billion, this represents a tremendous business opportunity. Globally this sector is worth in excess of £3 trillion (estimated to reach £4 trillion in 2015), with exciting export opportunities for our leading knowledge, innovation and entrepreneurship. In addition to clean energy supply, opportunities abound on the demand side of the energy equation; delivering energy efficiency on an infrastructural scale.





In this context there is now vast potential for competitive advantage: firstly by developing sustainability-advantaged products and services that better meet customer needs while delivering environmental and social benefits; and secondly through sustainability-driven productivity gains whereby carbon, energy and water reduction acts by proxy as a driver for wider resource efficiency, directly benefitting the bottom line.

As with any business, property clients and consultants need to differentiate themselves from their competitors, and remain aligned with changing demand. Occupiers are increasingly knowledgeable about the benefits of sustainable buildings, not only to the environment but also to themselves in terms of operating cost savings, brand values, corporate responsibility, occupier comfort, wellbeing, productivity, health and educational outcomes.

Many of these benefits can be 'monetised'. The World Green Building Council's 2013 report, *The Business Case for Green Building* presents compelling evidence of the economic benefits of sustainable buildings. In particular, it cites 13 studies linking natural daylight and operable windows to increases in occupier productivity of up to 18%. Its 2014 follow-up report, *Health, Wellbeing & Productivity in Offices* cites evidence of a clear link between the design of an office and its impact on the health, wellbeing and productivity of its occupants. Employment related costs typically account for 85-90% of office operating costs, therefore, even small increases in employee health, wellbeing and productivity can result in significant financial benefit. Furthermore employers need to

attract and retain the best staff. 'Generation Y' wants to work differently, and is particularly attuned to the benefits of sustainable workplaces. So there is an opportunity to align with demand from this growing market segment.

Recognising this opportunity, The Enterprise Centre is an exemplar development by the Adapt Low Carbon Group under construction at the gateway to the University of East Anglia, part funded by the European Regional Development Fund, BBSRC, Norwich Research Park, BRE and New Anglia LEP. On target to achieve the highest sustainability standards of BREEAM Outstanding and Passivhaus certification, with an exceptionally low embodied carbon footprint through the innovative use of local bio-renewable materials, The Enterprise Centre aims to be the UK's greenest commercial building when open for business in Spring 2015. Above all, we aim to create an unparalleled working environment, fostering collaboration and innovation among start-ups and SMEs, promoting new low carbon standards and creating new supply chains with resulting circular economic benefits.

Returning to market forces, the cost premium for sustainable buildings continues to decrease as designers, manufacturers, contractors and clients simply get better at delivery; driving efficiencies and innovation through the supply chain. Recent evidence shows that BREEAM Excellent ratings for offices can be achieved at cost premiums of 0.13 to 1.71%, while in the East of England Passivhaus dwellings are being constructed at cost parity. In central London corporate occupiers are driving demand for sustainable

buildings, while investors are managing the risk of accelerated obsolescence and depreciation in value of non-sustainable buildings. With more effective information on sustainability benefits for occupiers to consider, agents to promote and valuers to analyse, there is the potential for positive price signals to drive the development and retrofit of fundamentally better-functioning buildings.



Market sentiment has noticeably shifted. Occupiers are now shaping the demand for buildings which offer an improved working environment that

will stimulate staff, create better wellbeing and ultimately lead to improved efficiency. In the past this was an aspiration, but as the green agenda takes more of a centre stage, and as delivery costs reduce (and market rents improve), more sustainable buildings should become increasingly deliverable and commonplace, and we at Brown & Co will be advising developers and occupiers accordingly.

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BROWN & CO

THE CASE FOR SUSTAINABLE DESIGN



Over breakfast with the CEO of a huge and successful property company in one of the smartest West End restaurants, I was propositioned then later commissioned to conceive and then help design the ‘world’s most sustainable large-scale development’, for London...





“We have come to the conclusion that to succeed (and with the conviction that we both must and can succeed) all key stakeholders in the process need to be prepared to do everything differently”.

A few years before this, a global oil business pension fund invited me to help plan and design ‘Europe’s most sustainable urban extension’. And in 2007 we were similarly briefed to help conceive the ‘greenest’ ever legacy for an Olympics.

I’ve made it sound like a competition in bravado and in some ways it was and perhaps still is. Say what you like but at least these people had good intent! Such aspirations are applied also and equally these days to concepts like ‘place’, ‘good design’, ‘strong community’, ‘sustainable transport’, ‘green buildings’ and even ‘sustainable lifestyles’. What on earth can it all mean?

Well, at least we helped get this stuff on the agenda. At risk perhaps of being a touch jaded one would have to say that as yet it has meant very little in practice. These ideas, or rather words, are bandied about like those in old-school mission statements; I’m thinking: ‘integrity’, ‘honesty’, ‘transparency’. Turn it around and would anyone ever state a commitment to dishonesty, obfuscation, duplicity? In land and property terms it would read, ‘I am planning a badly-designed, place-less, car-dependent, unsustainable development, with flimsy and leaky buildings and a weak community populated by outrageously wasteful people’.

In its consulting work Beyond Green seeks to give specific definition to authentic expressions of these de-based terms. And after 15 years of this we have come to the conclusion that to succeed – and with the conviction that we both must and can succeed – all key stakeholders in the process need to be prepared to do everything differently. A tall order but let’s at least be straightforward about the nature of the challenge.

Great, sustainable places and communities need a different urban form with well-connected streets, short blocks, a considered approach to the ground floor plane of entrances, corners and pavements, higher densities and better amenity. The clever massing of buildings in what we call, ‘walkable neighbourhoods’ with streets designed primarily for people and cyclists is the route to very low carbon built environments.

Smart technology, grids and very low carbon energy supply is beginning to happen and the pace of innovation would grow immeasurably with a stronger strategic policy commitment and regulatory framework; and urban places can be literally greened with a suite of ecologically sensitive interventions at the

macro and micro levels creating a greener roofs-cape, pocket parks, edible landscapes, tree planting and grander parks and water features.

Combine these kinds of elements together and with a bespoke financial model and investment structure as we aim to do at Beeston Park - our own urban extension in Broadland, Norfolk - and we believe we’ll not only create a very attractive, high value place to live, offering a better quality of life for households of all kinds, but that it will attract and retain entrepreneurs and make it super-easy for people to live in environmentally sustainable ways.

We need exemplars of course that prove these ideas and this is why several years ago we created Beyond Green Developments, to try to put these ideas into practice. In a few years I hope that you will be able to visit the emerging place at Beeston Park and see for yourselves what a difference these ideas can have when they are translated in a disciplined way into homes, streets, green spaces, energy systems that you can visit, live and work in and, in due course, observe better everyday ways of living.



COMMERCIAL PROPERTY

IS THE COMMERCIAL SECTOR ENVIRONMENTALLY FRIENDLY?



The commercial and residential development sector has, over the last decade, become more environmentally aware but mainly through imposition. Legislative obligations have been imposed upon it to improve its energy efficiency. The residential development sector has had to embrace what is known as Code Levels.

These are environmental measures including insulation and power savings. These agreed code levels are imposed by the planning authorities on developers via Planning Consents. The initiatives are to ensure all new dwellings are to a certain standard, and over time these standards would become more stringent. The commercial sector has BREEAM which is similar to the residential Code Levels. More recently Energy Performance Certificates (EPCs) have been introduced with assessment between A to H, and these assessments are mandatory for most buildings. Brussels has an eye to having a pan European assessment of building efficiency. From 2018, no commercial building with heating will be allowed to be let or sold with an EPC rating below an E. It would be prudent to assume that, over time, Governments and possibly the European Union will start to push this base level higher.

Much of the above came in either before or during the recession. As there was little building at all over the last seven years, much of the industry just added these obligations to their already long list of economic concerns. Time has moved on and the recession is, to some degree, behind us. Commercial landlords, developers and occupiers are far more aware of environmental issues. Being businesses cost savings are a priority. With ever increasing power costs, cost savings on heating and lighting are important factors particularly in factories and warehouses. Modern cladding is now very efficient and the cost of replacing old cladding can be looked at in terms of heat saving, and therefore, cost savings for both tenant and landlord. Many occupiers are looking for more roof lights in buildings so as to increase natural light, which saves on electricity whilst also improving the well-being and working environment. Rainwater harvesting systems are now much more common, particularly for large buildings with significant roof space.



“From 2018, no commercial building with heating will be allowed to be let or sold with an EPC rating below an E.”

There are examples where highly environmentally friendly designs, which are correspondingly efficient, can and do command higher rents than their more conventional counterparts. This goes a long way to defray the additional costs to build or refurbish such units.

Residentially we are now seeing some bespoke eco home schemes with Code Levels at 6 or 7 being built. These are environmentally designed identifying matters such as renewable energy to power homes, very high insulation capabilities, installations such as reed bed sewerage systems, and building from renewable products. These are

more expensive to build than conventional housing but can, in the right location command corresponding premiums when sold making the schemes financially viable. Such schemes can also benefit from certain planning advantages. Planning consents can, with very high environmental credentials, gain planning consent where conventional schemes would not achieve consent. Because of the high build costs, Section 106 and other planning obligations may be reduced or waived to reflect this. We are also beginning to see schemes where residential or commercial applications are submitted if they are run by co-located renewable energy plants such as solar or biomass combined heat and source systems as part of a single application.

Through a combination of legislation and hard economics new and refurbished buildings, both residential and commercial, can and will become more environmentally efficient. It is safe to say that all new builds will be more environmentally efficient than their predecessors simply through design and modern building materials.

With a better economy, some of the environmental opportunities will be adopted for company profile reasons irrespective of legislative imperatives and hard economics. However, whatever the motivation this sector of the property market has been forced to embrace environmentally efficient designs in a variety of ways and it is now accepted as the norm. It is putting its own house in order.



SUSTAINABLE BIOMASS

A UNIQUE ROLE IN THE UK ENERGY MIX

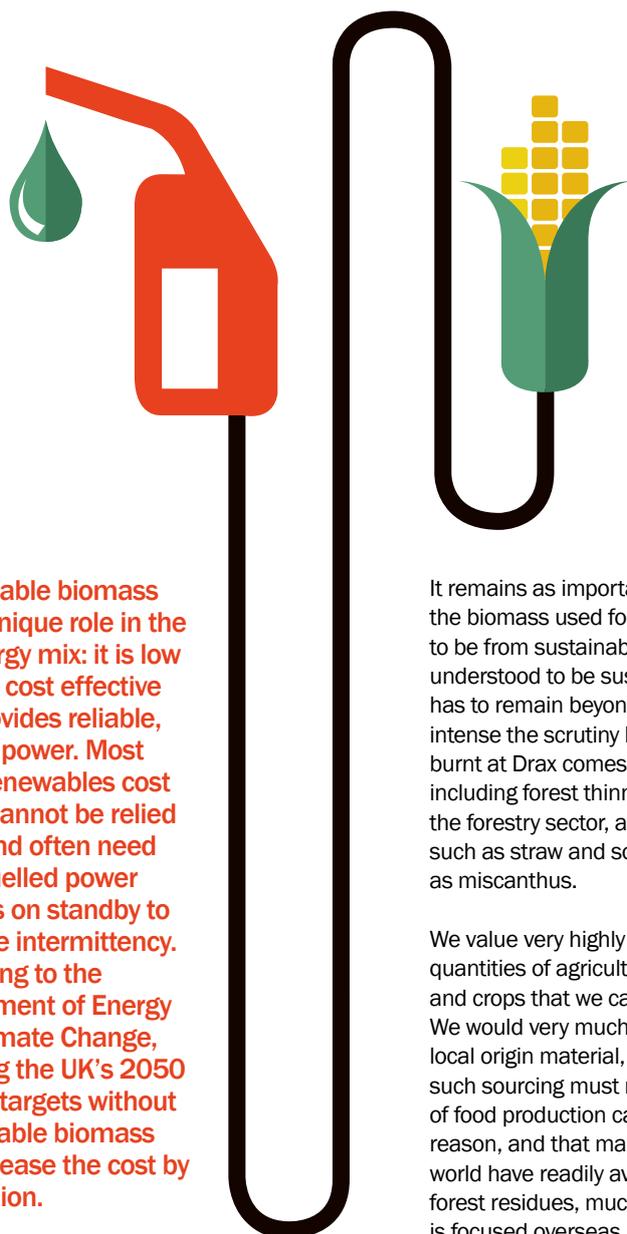


The past year has been an eventful time for the sustainable biomass industry. Drax has been a very busy place and our evolution from the owner and operator of a single, albeit large, coal-fired power station to a group whose activities span the whole biomass supply chain continues. Over the last year Drax has seen notable progress across all key areas of our business: biomass sourcing, generation and supply. Our own biomass fuel sourcing and processing business in the US continues to grow. Bespoke biomass receiving, storing and distribution facilities have been commissioned at the Drax Power Station in Selby, North Yorkshire and our retail business, Haven Power, continues to find success with its renewable power offering for business customers.

Our ambition remains to convert three of the six generating units at Drax Power Station to burn sustainable biomass in place of coal, with a fourth unit under evaluation. We have already converted two units and plan to convert the third in 2015/16. Our transformation is the largest decarbonisation project in Europe and will make Drax the largest renewable generator in the UK and one of the largest in Europe. While some other renewables technology projects may claim to have similar capacities, their intermittency and therefore load factor, leaves them trailing when it actually comes to electricity dispatched. Our two converted units alone supply more than enough renewable electricity to meet the needs of two million homes.

Ensuring that the UK's transition to a low carbon economy is done cost effectively, through the use of biomass, helps keep our economy competitive and supports growth and jobs both in the development and operations phases. At Drax Power Station, for example, work provided to one contractor alone created or safeguarded more than a thousand jobs.

The case for sustainable biomass generation in the UK is as compelling as ever, but it has seen challenge from, mostly poorly informed, sources. Regrettably, and somewhat akin to the farming sector, the majority of people (of all walks of life) are too distant from the realities of rural activity and assume that by burning biomass we are responsible for the destruction of the rain forest!



Sustainable biomass has a unique role in the UK energy mix: it is low carbon, cost effective and provides reliable, flexible power. Most other renewables cost more, cannot be relied upon and often need fossil fuelled power stations on standby to mitigate intermittency. According to the Department of Energy and Climate Change, meeting the UK's 2050 carbon targets without sustainable biomass will increase the cost by £44 billion.



It remains as important as ever for all of the biomass used for power generation to be from sustainable sources and be understood to be sustainable. Our industry has to remain beyond reproach however intense the scrutiny becomes. The biomass burnt at Drax comes in many forms, including forest thinnings and residues from the forestry sector, agricultural residues, such as straw and some energy crops, such as miscanthus.

We value very highly the relatively modest quantities of agriculturally derived residues and crops that we can source in the UK. We would very much like to have more local origin material, but are acutely aware such sourcing must not be at the expense of food production capability. For this reason, and that many other parts of the world have readily available and low cost forest residues, much of our procurement is focused overseas. It is important to remember that we already source the majority of our coal from overseas, so in effect we are simply replacing one imported fuel with another.

Whatever the origin of our biomass it must meet the exacting standards set out in our sustainability criteria. Our sustainability policy, which has been in place since 2008, is designed to ensure that we can verify both the legality and sustainability of all the biomass burnt in our power station. Our procurement process ensures that the production and delivery of our biomass significantly reduces greenhouse gas emissions compared to coal-fired generation. We have long believed and advocated that mandatory criteria are the best way to ensure that all the biomass used in

electricity generation is demonstrably sustainable and delivers major carbon savings relative to fossil fuels. The reality is that it will only be in April 2015 that well defined regulatory criteria will apply, and we are confident that we are already meeting, and will continue to meet, these new requirements. **Sustainability is absolutely critical to our entire strategy.**



Sustainability and energy security are very real concerns faced by both the national Government and at the farm gate. More and more end users are demanding higher

sustainability criteria for raw materials which are passed down the supply chain, which have potential to increase production costs faced by farmers. We have more recently seen energy security at the farm level move up the agenda, with many businesses taking to renewable electricity and heat generation. Taking control of energy costs and receiving the Government subsidies available can improve profitability significantly. Sustainability will become increasingly important to the UK agricultural sector while it also contributes to the UK energy mix.

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FARMING AND SCIENCE IN INTERESTING TIMES

CHALLENGES FROM CLIMATE,
TRAVEL AND REGULATIONS.



Science has had enormous benefits for food production. Arable farmers use the products of science enthusiastically: the best new crop varieties, the most effective chemicals, excellent agronomy – and more. Thanks to farmers' use of scientific advances, food is, for most people, more reliable and cheaper in relative terms than ever before. Yet there are clouds looming – even a 'perfect storm' of threats to this largely happy situation. How can scientists help farmers overcome them?

From my own point of view as a plant disease specialist, the greatest threats to reliable food production in the UK are regulations which lack a scientific basis, increased global movement of diseases and the uncertainty arising from accelerating climate change. One of the cornerstones of the Green Revolution has been plant breeding. It will continue to be important, especially when combined with the full range of agricultural technologies.

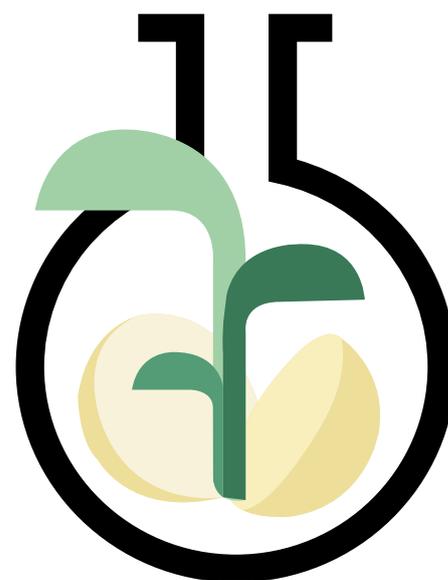
There are increasing signs that climate change is changing the distribution and impact of plant diseases. The mild winter of 2013/14 stimulated Septoria and yellow rust of wheat. The hot spring of 2007 generated the largest epidemic of wheat brown rust in living memory. Tan spot, a disease previously common in warmer countries, has started to appear regularly in Britain. We do not know how the climate will affect other diseases, not least because extreme weather events are predicted to become increasingly common.

In the short term, a greater threat is the spread of disease internationally as a result of travel and trade. This shot into public consciousness in 2012 with the outbreak of ash dieback, a catastrophic disease native to East Asia with huge long-term implications for forestry and wildlife in the UK. Less well-known is the equally dramatic movement of new races of wheat yellow rust. This has been happening since 2001 and has accelerated in the last three years. My colleagues Diane Saunders and Cristóbal Uauy at JIC, along with researchers in Denmark, France, Pakistan and elsewhere, are using genomic

technology to characterise DNA variation in the rust fungus and thus locate the origins of the new races. The research is suggesting ways in their movement could be limited.

Plant breeding is crucial for combatting diseases. Breeders exploit knowledge of the genomes of crop plants in several ways. Individual DNA variants are used as markers for useful traits because it can be easier to select plants with a DNA tag than to score the trait itself; this approach is used routinely in F1-hybrid crops such as maize and increasingly in small-grain cereals. Genetic maps of several DNA markers can be used to produce good combinations of several genes; my colleague Paul Nicholson has taken this approach to separate a gene for eyespot-resistance in wheat from one which reduces yield. Finally, breeders can use information about the distribution of large numbers of markers to broaden the genetic basis of disease resistance; JIC is working with NIAB (Cambridge), Reading University and wheat breeding companies to develop this strategy.

Alongside genomics, breeders now have better ways of identifying disease-resistant plants. A benefit of international travel is that they can run trial nurseries in areas where the climate is most favourable for a disease. In a few years, the use of drone technology to score field trials more accurately and more often will increase the precision of selecting for disease resistance and other traits. Despite these advances, plant breeding remains a slow process. The new European Union regulations of plant protection



chemicals have been criticised by many in the farming industry for diverse reasons. For me as a plant pathologist, it is worrying that they do not consider how new diseases will be controlled. It took 30 years from the emergence of Septoria as an important disease in the late '70s before breeders could produce a steady stream of wheat varieties with moderately good resistance. For Ramularia of barley, advances in genetics, pathology and breeding are speeding things up—it will take perhaps 20 years. In the meantime, farmers have controlled these diseases using fungicides effective against a wide range of pathogens.

New technology is allowing scientists to make new discoveries faster than ever before. Yet crop research is a slow business and there are no magic bullets to deal with new threats. Farmers need to be able to use the best available varieties, chemistry and agronomy to protect our food supply.

WATER OF GROWING IMPORTANCE

Following such a seemingly wet period over the last few years, particularly in the East of England, it may be difficult to consider water as a resource under stress. However, in the recent past, UK water resources have been under considerable pressure. In many catchments, not just in the south and east, there was little or no water available for abstraction during dry periods. Predictions indicate that the extremes experienced are likely to become more common in the future due to climate change.



Whether you are a climate change sceptic or not, The Environment Agency are monitoring catchments very carefully and when short term abstraction licences come up for renewal every effort should be made to safeguard every last drop.

On a light land farm the availability of sufficient water to irrigate specialist crops in rotation can easily add £1,000 per acre to the capital value of the land if not more. When the increase in capital value is considered alongside the

uplift in earning potential for the land over and above a combinable crop rotation, the availability of irrigation water is a resource that concerted effort should be made to protect and enhance.

Whilst the number of agricultural abstraction licences greatly exceeds the number of abstraction licences for public water, it will always be licences for public water that will take precedence over agricultural water in dry

times. The impact on agriculture of these cuts can be significant, despite the fact that irrigated agriculture equates to only 1% of water use nationally.

The Water Act 2014 received Royal Assent on the 14th May 2014. The purpose of the Act is to reform the water industry to make it more innovative and responsive to customers and to increase the resilience of water supplies to natural hazards such as drought and floods.



The main changes brought about by the Act that will have significant bearing on farmers are the abstraction licence reform Issues which include time limiting of some licences, more power to be granted to the Environment Agency to control abstraction in times of drought, over abstracted catchments will be subject to more scrutiny and a potential loss of ability to claim for compensation for loss of licensed quantity when it can be proved that abstraction is causing environmental damage.

Over the last decade, Brown & Co have been actively involved in assisting clients in ensuring that abstraction licences are safeguarded. One particular method of doing so is the construction of winter storage reservoirs to create a buffer during periods of peak rainfall.

We have had significant success in securing grant aid for such projects on behalf of our clients latterly through the 'Rural Enterprise Grant' administered by DEFRA which was available for funding of up to 40% of capital costs of reservoir projects.

Capital grant funding has been unavailable for all of 2014, but the new Countryside Productivity Scheme will be launched in 2015 with one of the focuses being water resource management.

Anyone that has a project in mind is advised to prepare in good time. Grants will be awarded on a competitive basis and applicants who can make their case stand out will have a much better chance of securing funds.

Heightened pressure on summer abstraction, coupled with the potential of shorter term licences, is likely to push more growers to examine more closely their water resource position and look to secure water availability.

When planning a water storage project the first step should be to obtain the necessary statutory consents – abstraction licensing and planning permission. This process can take several months and should be explored very early in the process and form the first part of any feasibility study.

The next step is to appoint a firm with experience in reservoir design and undertake the necessary soil tests to locate the most suitable site for the reservoir, taking into account existing or planned infrastructure. The cost of a project can be significantly reduced if there is clay on the farm. As a guide to basic reservoir costings, Butyl-lined reservoirs cost in the region of £12,000 per million gallons versus a Clay-lined reservoir being in the region of £6,000 per million gallons.

Grant funding has historically been available for capital costs including water efficient application equipment and three competitive quotes will be required for all aspects of the scheme.

Brown & Co secured over £1.4m of grant aid in the last round of funding for clients investing in water management schemes and are well placed to assist in securing some of £140m of grant aid to be made available in the next round.

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EXTREME WEATHER EVENTS:



THE IMPACT ON GLOBAL CROP PRODUCTION

Ten years ago, most of the talk around climate and its impacts on food and farming focused on the decades ahead and the opportunities and challenges which climate change might bring. This remains a hugely relevant issue of course, not least regarding investment decisions, supply chain planning, the food versus fuel debate and sustainable intensification more generally. However, the weather and climate of the here and now have taken centre stage in recent years, placing enormous stress on food production systems through a plethora of extreme events, contributing significantly to volatility in commodity prices. Where once we focused almost exclusively on the weather in our own backyard, now we have more than one eye on the impacts of weather conditions around the world, for example in South America, Eastern Europe, Australia, China and North America. Commodity markets speak of 'needing a weather event' to introduce another round of volatility, and financial opportunity, into the market. A record breaking year of local production on-farm is no longer a guarantee of a good financial return.

We had to face food price shocks in 2007 and 2011 which were in part responses to actual weather and climate events, the latter also subsequently being related to political instability in North Africa. During 2014 there has been widespread coverage of a forecast event, an El Niño, which has introduced some instability and speculation into markets.

El Niño is fundamentally a warming of the surface waters in the Eastern Pacific Ocean, typically lasting a few months to a year, but its ramifications for unusual weather conditions are felt more widely around the world, although less clearly in the UK. As I write, this 2014-15 El Niño is still struggling to show its hand as of mid-December. However, we shouldn't be surprised by the impact of this forecast because previous actual El Niño events have resulted in extreme weather events around the world, lasting many months, a good example being the 1997-1998 El Niño (Figure 2), the largest such event in recent times. El Niño events tend to increase globally averaged temperature. While El Niño conditions tend to discourage hurricane intensification in the North Atlantic, we nevertheless estimate that

total global insured and uninsured losses associated with natural catastrophes are higher in moderate El Niño years. Unpicking the overall effects on food and agriculture of actual and forecast El Niños is a challenge, now that we also have to factor in market responses 'before the event'.

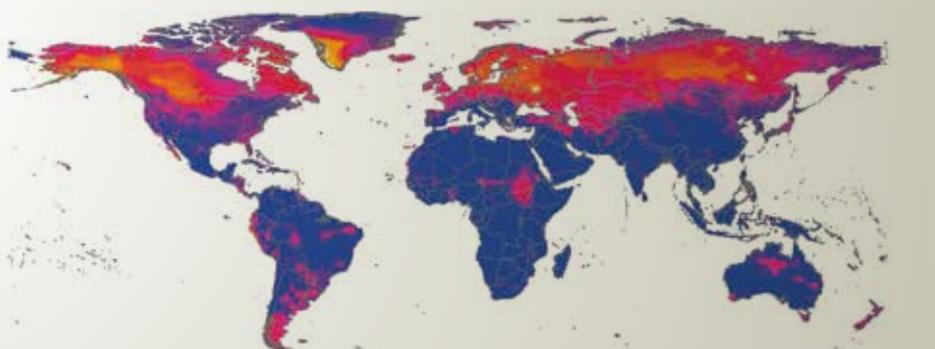
Returning to future climate change then, 2014 saw the publication of further synthesis of latest scientific findings by the Intergovernmental Panel on Climate Change (IPCC). There are many global climate models, developed by research institutes around the world, which are inter-compared as part of this process, producing a range of possible futures. Despite the uncertainty, one sobering result, shown in Figure 3, is that a very high proportion of these models agree that air temperature will, in the period 2021-2050, increase to levels which exceed typical current adaptation strategies (defined as beyond two standard deviations higher than the baseline 1961-90 period). The strength of this model consensus can easily be overlooked, but at our peril.

So what about the more local weather events of 2014? Winter 2013-14 was incredibly stormy, mild and wet in the UK and recovery from flooding still continues. April 2014, like so many other recent Aprils in this brave new era, was another pale shadow of the long term average, in this case markedly warm across the UK and also dry across large parts of the arable growing region (and similar in that respect to April 2007, 2009, 2010, 2011 and 2013). Spare a thought for colleagues across the Channel who had to endure hail the size of tennis balls and associated flooding on June 8th and 9th in France, Germany and the Netherlands. Nevertheless, spring, summer and autumn have overall been relatively kind to UK crops from a weather perspective and 2014 has also provisionally been a good year for UK wine production – cheers.

Figure 2: 1998 mean temperature (standard deviation relative to long-term average)



Figure 3: The number of global climate models, from a group of 17, simulating a change in mean temperature which is beyond typical planned adaptation thresholds (more than two standard deviations above the baseline 1961-90 mean) by 2021-2050.



THE INTEGRATED CHALLENGE:

CLIMATE, AGRICULTURE AND FOOD SECURITY



There is considerable uncertainty surrounding climate change. There are some facts that we can be reasonably sure of though. Average global temperatures are rising (2014 is likely to be labelled the warmest year on record by the World Meteorological Organization (WMO)) and are likely to continue rising over the coming decades because of the stocks of greenhouse gases already in the atmosphere. These rising temperatures are now having a measurable impact on glaciers, ice caps, sea levels, rainfall patterns and weather “events” (see previous article). At this point in time average temperatures are 0.7 °C above pre-industrial levels and many commentators believe that an overall rise of 2 °C is the threshold beyond which impacts are likely to be severe. Given the current trajectory (see Fig. 1.1) limiting the rise to 2 °C appears unlikely.

Emissions from fossil fuels and cement (GtCO₂/yr)

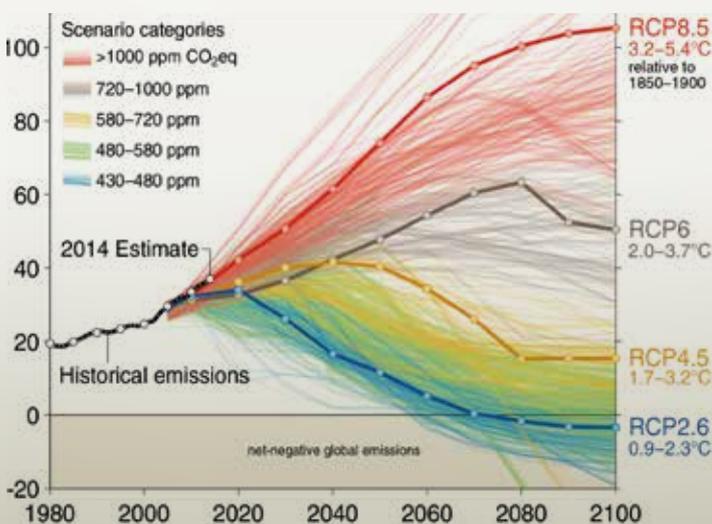


Fig 1.1: Emissions are on track for 3.2-5.4 °C “likely” increase in temperature above pre-industrial. Large and sustained mitigation is required to keep below 2 °C
Source: Over a 1,000 scenarios from the IPCC Fifth Assessment Report are shown. Fuss et al 2014; CDIAC; Global Carbon Budget 2014.

2014 witnessed some milestones on the path to what many are billing as the all important United Nations Climate Change Conference (COP21) to be held in Paris in December 2015. Indeed it probably is going to be the single most important event for the post-2020 era since the failed Copenhagen summit of 2009. The climate conference in Lima in December made some modest steps forward mainly in setting out a framework for the upcoming negotiations but as ever, serious divisions remain between developing countries and developed over who will actually foot most of the bill. The answer to this question must of course take into account who bears responsibility for where we are today, but also take into account the growing emissions of rapidly industrialising developing countries (India is often singled out as well as the more obvious China).

The UNFCCC in Paris is intending to be different to Kyoto which was very much a top down process. This time Governments are being asked to submit their individual commitments in a clear, transparent and understandable way. This is due to happen by April 1st 2015 and it is these commitments that ultimately will be used to formulate the Paris Treaty – which is therefore intended to be a bottom up approach. Whilst this should mean that a legally binding treaty gets agreed, the danger is that it uses the lowest common denominator in order to reach an agreement.

However, in many ways – the most important elements of the deal are already agreed. The EU and subsequently China and US (through a bilateral agreement) have already set out their commitments for the post 2020 period (see right). Without these commitments it was widely believed it would be impossible to extract further (and ambitious) commitments from the rest of the world given these three entities make up approximately half of overall global emissions (Fig 1.2). Many commentators believe that taken in the round, the above is unlikely to contribute sufficiently to the international target of limiting warming to 2 degrees.

EU's commitment:
40% reduction (compared to 1990 levels) by 2030. At least 20% of the EU's €960 billion budget for the 2014-2020 period should be spent on climate change-related action.

China's commitment:
to reach peak carbon emissions by 2030 (if not sooner). To reach this goal China has pledged clean energy sources will account for 20% of China's total energy production by 2030.

United States' commitment:
26-28% by 2025 (compared to 2005 levels). This is double the pace of reduction targeted for the period 2005-2020.

Commitments from the three largest emitters ahead of COP21 in Paris in December 2015:

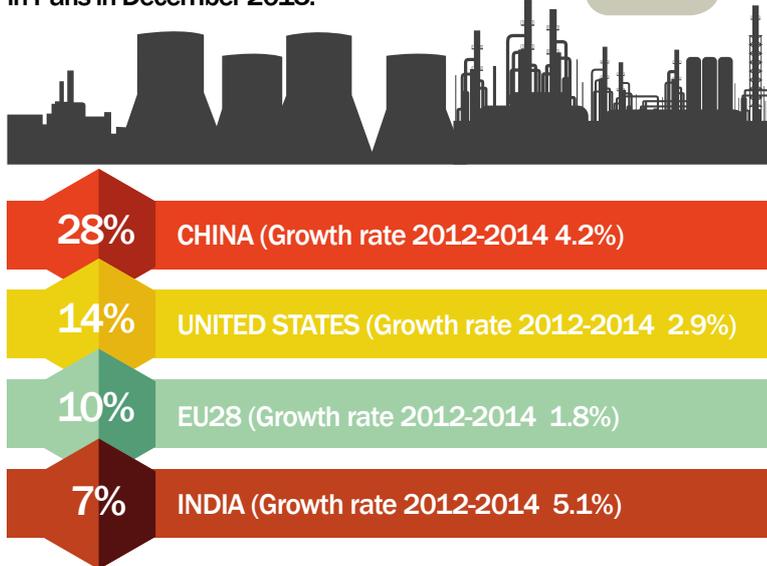
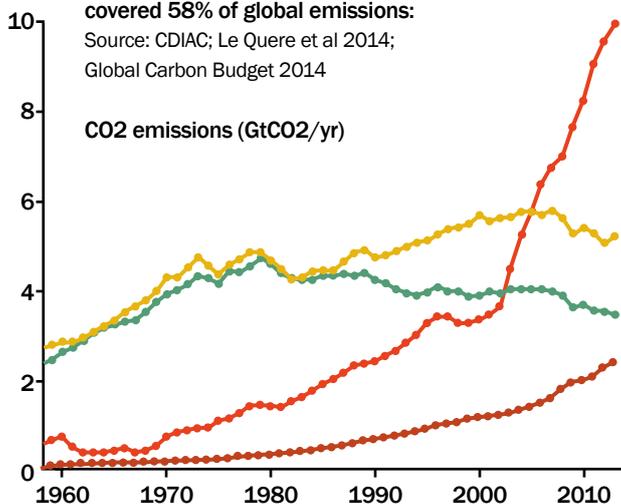


Fig 1.2: The top four emitters in 2013 covered 58% of global emissions:

Source: CDIAC; Le Quere et al 2014; Global Carbon Budget 2014



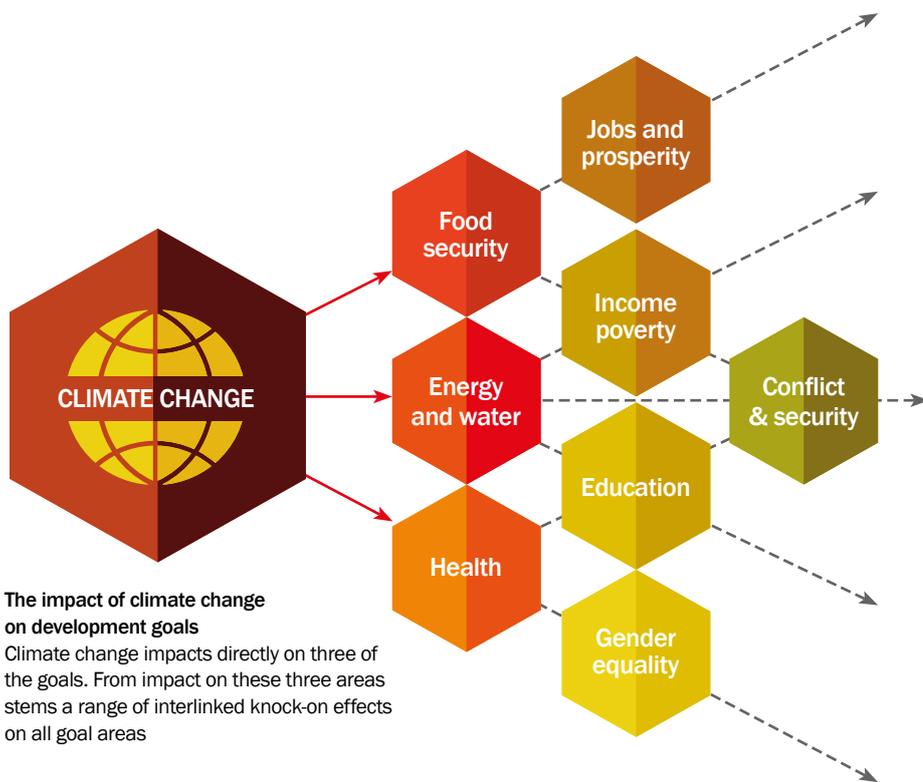


SO WHAT'S CHANGED IN 2014 RELATING TO CLIMATE CHANGE AND WHAT ARE THE CONNECTIONS WITH AGRICULTURE AND FOOD SECURITY?

Well – three things have changed. Firstly there has been a shift in thinking away from mitigation of climate change having to be a substantial and continued economic burden. Instead the overall investment plans of the World Economy are enormous (Euro 315bn “investment offensive” from the EU alone over three years) and the question now being asked is can all that investment be used to put the world economy on to a long term low carbon trajectory. In other words can investment be used to stimulate growth particularly in ‘green’ engineering, construction and research and development.

The second thing that has changed is that Food Security policies increasingly recognise climate change as a major threat to food and nutritional security. Rather than discussing climate change and its effect on crop yields and emissions, there is now a much greater prominence given to Food Security. Governments are seeking to address the linkages through support to “climate smart agriculture” defined as “agriculture that sustainably increases productivity, resilience (i.e. adaptation), reduces/removes greenhouse gases (mitigation) and enhances achievement of national food security and development goals” (FAO 2010). Whilst this may not have an immediate impact on UK agriculture the impact further afield may potentially be significant.





The impact of climate change on development goals

Climate change impacts directly on three of the goals. From impact on these three areas stems a range of interlinked knock-on effects on all goal areas

“Agriculture is being charged with: delivering food and food security to nine billion people whilst at the same time reducing or removing greenhouse gas emissions – in a climate that is warming and becoming more prone to extreme weather events. Just a simple task then...”

The third thing that has changed is a shift in thinking from institutional investors which, if it gathers pace could well have a significant impact on the investment landscape going forward. At the UN conference in New York in September 2014 a coalition of institutional investors committed to decarbonizing investments worth \$100 billion by December 2015 and disclosing the carbon footprint of investments worth five times that much. Three major pension funds announced they would accelerate their investments in low carbon investments across asset classes by circa \$31 billion by 2020. The reason this is significant is because it signals a shift in how institutional investors are viewing the climate/sustainability narrative. Previously “clean energy” has been viewed as an investment opportunity but the announcements in September signal a shift in perspective so that as well as opportunity, climate change may also now be an investment risk that needs addressing through the divestment of fossil fuel companies. This was underlined when Swedish Pension fund AP2 announced they were cutting 12 coal companies and eight oil and gas production firms from their portfolio. Stanford University’s \$18.7 billion

endowment announced in May that they were selling out of fossil fuel related companies while the \$860 million Rockefeller foundation also announced its intention to divest from coal and oil.

So what does all this mean for Agriculture? Well, if food security policies increasingly recognise climate change as a major threat to food and national security – can agriculture respond to the challenge and answer that threat. At the UN climate conference in September the “Global Agricultural Alliance” was launched that aims to enable 500 million farmers worldwide to practice climate smart agriculture by 2030. This aims include: sustainable increases in productivity (and incomes); greater resilience of food systems; reduction or removal of greenhouse gas emissions and improvement of food and nutrition security. In other words – agriculture is being charged with: delivering food and food security to nine billion people whilst at the same time reducing or removing greenhouse gas emissions – in a climate that is warming and becoming more prone to extreme weather events. Just a simple task then....

Part of the answer has to lie in “adaptation” which is rapidly replacing “mitigation” as the main policy tool going forward. Another part of the answer has to be investment in technology (GM included) to increase productivity and a third element has to include increasing Research and Development funding into “climate smart” agriculture. Climate negotiations in 2015 and thereafter will need to recognise the pivotal role agriculture has to play in both absorbing greenhouse gases (soils and forests) and delivering enhanced food security to nine billion people (by 2050).

All in all there is much to do to conceptualise policies that fully respond to the new challenge of creating a sustainable food system in an age of climate change.

2014 ACTIVITY HIGHLIGHTS

ANOTHER GREAT YEAR FOR BROWN&CO...

So much has happened in 2014 that we have been spoilt for choice when it comes to selecting the best bits, but we have and here they are... some of the activities we have been involved in, at work and at play, which we hope will give you a flavour of life at Brown & Co!

- A: Brown & Co stand at Cereals show.
- B: Brown & Co sailing team take to the waters in the 2014 Hardwick trophy.
- C: Rutland ploughing match.
- D: Brown & Co managing partner with Michael Alexander on merger with Alexanders Huntingdon office in December 2014.
- E: Brown & Co Retford office decorated for the town's war weekend.
- F: Partners and professional staff at new Banbury office.
- G: Lincolnshire Rural Charities Dinner, Brown & Co were one of the sponsors (photo with celebrity chef Simon Rimmer).
- H: Surveyors 7's - an annual event Brown & Co always enter with their team of 'Friesians'!
- I: Bury Bulldogs - sponsored by Brown & Co Bury office.
- J: The Brown & Co team 'Christmas Jumper Day' at our Norwich Office.





2015 ANNUAL FOCUS REPORT

CLIMATE, THE ENVIRONMENT
AND SUSTAINABILITY

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