



ONE PLANET AGRICULTURE

THE CASE FOR ACTION



Soil Association

One Planet Agriculture

Preparing for a post-peak oil food and farming future

The case for action

Edited by Rob Hopkins and Patrick Holden

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From climate change to fair trade and organic food, *The Independent* has always put green and ethical issues

at the heart of the news agenda. *The Independent* has worked with the Soil Association for a number of years to encourage debate and awareness among its readers and to champion moves towards a sustainable future. Support for the *One Planet Agriculture Handbook* is a key part of this continuing collaboration.



The Countryside Council for Wales is the Government's independent adviser on matters that affect the Welsh countryside and coast, aiming to ensure that everyone values and cares for the Welsh environment.

CCW manages more than 60 National

Nature Reserves, from the dunes of Merthyr Mawr to the summit of Snowdon, widely regarded as the jewels in the crown of Wales' natural heritage.

CCW also works with farmers and other landowners of more than 1,000 Sites of Special Scientific Interest, which cover around 12% of the country, where there are many habitats and geological features of European value. And, increasingly, CCW is looking at the bigger picture, working to find sustainable ways to manage the Welsh countryside, with its wealth of plants and animals, in the face of climate change.

Introduction

Patrick Holden

I suspect that future generations will look back with incredulity on the 20th century as that period of history during which we squandered the accumulated energy capital of 150 million years of planetary evolution in a little over a hundred years.

Most of us are still in a state of relative denial about climate change. Despite the publication of the Stern Report, which supports a reduction of 60% of carbon emissions by 2050, Government responses to date have been totally inadequate. There could be no better illustration than Tony Blair's recent remarks about it being 'impractical' not to take advantage of cheap air travel.

Confronted by the prospect of apocalyptic climate change in the mid century, until recently my own direct action had been restricted to turning off lights and TV monitors, driving and flying a little less and consoling myself that as an organic farmer I was already making a substantial contribution to reducing emissions by avoiding the use of nitrogen fertiliser and other carbon emitting inputs.

In March 2006 I was shaken out of this state of relative complacency at Schumacher College, where I heard Rob Hopkins give a lecture about 'peak oil' and energy descent plans. His essential message was that we are on the threshold of 'peak oil', the year when oil extraction peaks, after which

How do we see the future?

We don't yet have a clear picture of the mid 21st century landscape of relocalised food and farming systems, but pieces of the jigsaw are emerging.

Many people are working on their farms, in their businesses and at home to reduce their fossil fuel dependency. Our forthcoming *One Planet Agriculture: Handbook for Practical Action* will bring together their pioneering work, and the lessons from this conference, into a reference tool which combines inspiration and the necessary practical information to enable each of us to move in the right direction.

The handbook will include leads, case studies and vital references. It will be a call to arms led by those who have already started on the path towards the future and want to share their experiences, failures and successes.

Please email sass@soilassociation.org if you would like to receive copies of the handbook when it is available

each citizen of the planet will have to manage (assuming equal distribution) with an oil/fossil fuel 'ration' which diminishes by 3% every year.

Project this forward and it quickly becomes clear that if the prospect of climate change is a moral wake up call, peak oil is the train coming down the tunnel to hit us whether or not we take immediate action to reduce our carbon emissions. The cumulative impact of 3% a year adds up to a 50% reduction by 2030.

Pause a moment and try to imagine what this might look like in relation to farming and food distribution. As Rob Hopkins says in his essay, the last time we had a fuel emergency on this scale was during the Second World War. But the difference is that this time we no longer have the pre-Beeching railway system, or the lattice work of small abattoirs and local food processing infrastructure. In addition most urban dwellers have no knowledge of where their food comes from, or how to grow it for themselves.

The most frightening aspect of the end of the oil age relates to the production and distribution of food. At present the populations of developed countries, especially those who live in urban conurbations, are totally dependent on 'just-in-time' distribution of food from a totally oil and gas dependent industry. If energy gets much more scarce and expensive and this precipitates trade conflict or war, it is easy to imagine a situation where cities literally run out of food. The possible consequences of the resulting chaos are disturbing to contemplate.

Consequently I have started thinking about how I could start preparing for a post fossil fuel age as a citizen, a food producer and as director of the Soil Association. Our 'One Planet Agriculture Conference', this booklet and our forthcoming handbook for practical action are part of that response.

If I am honest, I would say that I have little idea exactly what the mid 21st century landscape of relocalised food and farming systems will look like. But what I have found is that the prospect of developing a strategic plan to do

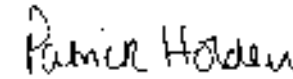
Support the One Planet Agriculture campaign

We are in vital need of financial assistance and sponsorship to kickstart this campaign

If you are able to help, please contact Helen Taylor on **0117 987 4574** or htaylor@soilassociation.org

everything we can to equip ourselves for a post fossil fuel age is, strangely, an inspirational proposition.

I do hope that after attending this conference and reading these essays you will feel the same. The scale of the challenge ahead is so great that I believe it heralds the beginning of a whole new chapter of the work of the Soil Association.



Patrick Holden
Director, Soil Association



The peak oil problem

Jeremy Leggett

We have allowed oil to become vital to virtually everything we do. Ninety per cent of all our transportation, whether by land, air or sea, is fuelled by oil. Ninety-five per cent of all goods in shops involve the use of oil. Ninety-five per cent of all our food products require oil use. *National Geographic* estimates that just to farm a single cow and deliver it to market requires six barrels of oil, enough to drive a car from New York to Los Angeles.¹ The world consumes 84 million barrels of oil a day at the time of writing. This figure is rising fast, as it has done for decades. The almost universal expectation is that it will keep doing so for years to come. The US government assumes that global demand will grow to around 111 million barrels a day by 2025. The International Energy Agency, the organisation set up by industrialised countries to give them advice on oil and other energy matters, is just as bullish. Its 2006 energy outlook forecasts 116 million barrels a day by 2030. Few question the feasibility of this requirement, or the oil industry's ability to meet it.

They should, because the oil industry won't come close to producing 110 million barrels a day. The most basic of the foundations of our assumptions of future economic wellbeing is rotten. Our society is in a state of collective denial that has no precedent in history, in terms of its scale and implications. Of the current global demand, America consumes a quarter. Because domestic oil production has

Muscle strain

"The energy in a kilogram of oil is equivalent to the output of about 24 working days or just under 200 hours of human work. That makes a day's human work equal to about 40 grams of oil, a couple of dessert-spoons full. Another way of looking at it is that a 40 litre fill-up at a petrol station is the equivalent of about four years of human manual work... a human-muscle-power-based economy would therefore be between seventy and a hundred times less productive than the present fossil-fuel powered one."

FEASTA, 'The great emissions rights give-away' (www.feasta.org)

been falling steadily for 35 years, with demand rising equally steadily, America's relative share is set to grow, and with it her imports of oil. Of America's current daily consumption of 20 million barrels, five million are imported from the Middle East, where almost two-thirds of the world's oil reserves lie in a region of especially intense and long-lived conflicts.

Every day, 15 million barrels pass in tankers through the narrow Straits of Hormuz, in the troubled waters between Saudi Arabia and Iran. The US government could wipe out the need for all their five million barrels, and staunch the flow of much blood in the process, by requiring its domestic automobile industry to increase the fuel efficiency of autos and light trucks by a mere 2.7 miles per gallon. But instead it allows General Motors and the rest to build ever more oil-profligate vehicles. Many sports utility vehicles (SUVs) average just four miles per gallon. The SUV market share in the US was 2% in 1975. By 2003 it was 24%. In consequence, average US vehicle fuel efficiency fell between 1987 and 2001, from 26.2 to 24.4 miles per gallon. This at a time when other countries were producing cars capable of up to 60 miles per gallon.

America is not alone in her addiction and her dilemmas. The motorways of Europe now extend from Clydeside to Calabria, Lisbon to Lithuania. Agricultural produce that could have been grown for local consumption rides needlessly along these arteries the length and breadth of the European Union. The Chinese attempt to emulate this model even as they enforce production downtime in factories because of diesel shortages and despair that their vast national acreage seems to play host to so little oil.

This half-century of deepening oil dependency would be difficult to understand even if oil were known to be in endless supply. But what makes the depth of the current global addiction especially bewildering is that, for the entire time we have been sliding into the trap, we have known that oil is in fact in limited supply. At current rates of use, the global tank is going to run too low to fuel the growing demand sooner rather than later this century. This is not a controversial statement. It is just a question of when.

Going, going...

"Of the 65 largest oil producing countries in the world 54 have past their peak of production."

Association for the Study of Peak Oil

Studies suggesting peak oil dates

- 2005: Kenneth Deffeyes
- 2006: Henry Groppe
- 2007: Ali Samsam Bakhtiari
- 2007: Richard Duncan
- 2007: ODAC
- 2010: Colin Campbell
- 2013: Rembrandt Koppelaar
- 2015: Jean Laherrere
- 2015: PFC Energy
- 2020: CERA
- 2030: USGS

Richard Heinberg,
The Oil Depletion Protocol
(Clairview Press, 2006)

Oil is a finite resource, and there will come a day, inevitably, when we reach the highest amount of oil that can ever be pumped. Beyond that day – which we can think of as the topping point, or 'peak oil' as it is often called – will lie a progressive overall decline in production. Putting the same question a different way, then, at the current prodigious global demand levels, where does oil's topping point lie? This is a question, I contend, that will come to dominate the affairs of nations before this first decade of the new century is out.

Already, a great battle is raging, largely behind the scenes, about when we reach the topping point, and what will happen when we do. In one camp, those I shall call the 'late toppers'; the people who tell us that two trillion barrels of oil or more remain to be exploited in oil reserves and reasonably expectable future discoveries. This camp includes almost all oil companies, governments and their agencies, most financial analysts, and most business journalists. As you might expect, given this line-up, the late toppers hold the ascendancy in the argument as things stand.

In the other camp are a group of dissident experts, whom I shall call the 'early toppers'. They are mostly people who – like me – have worked in the heart of the oil industry, the majority of them geologists, many of them members of an umbrella organisation called the Association for the Study of Peak Oil (ASPO). They are joined by a small but growing number of analysts and journalists. The early toppers reckon that 1 trillion barrels of oil, or less, are left.

In a society that has allowed its economies to become geared almost inextricably to growing supplies of cheap oil, the difference between one and two trillion barrels is seismic. It is roughly the difference between a full Lake Geneva and a half-full one, were that lake full of oil and not water. If two trillion barrels of oil or more indeed remain, the topping point lies far away in the 2030s. The 'growing' and 'cheap' parts of the oil-supply equation are feasible until then, at least in principle, and we have enough time to bring in the alternatives to oil. If only one trillion barrels remain, however, the topping point will arrive some time

Debate

"The most intriguing thing about this raging debate over whether oil production will soon peak – and put an end to the go-go days of the petroleum age – is that it's occurring at all."

Christopher Flavin, president of Worldwatch Institute

Hide and seek

"Worldwide, the frequency of finding giant oil provinces and super-giant oilfields has been declining for decades and will not be reversed. We've looked around the world many times. I'd say there is no North Sea out there. There certainly isn't a Saudi Arabia."

Francis Harper, addressing the Energy Institute conference 2004

soon, and certainly before this decade is out. The 'growing' and 'cheap' parts of the oil-supply equation become impossible, and there probably isn't even enough time to make a sustainable transition to alternatives.

Should the early toppers be right, recent history provides clear signposts to what would happen. There have been five price peaks since 1965, all of them followed by economic recessions of varying severity: after the 1973 Yom Kippur War; in 1979–80 after the Iranian revolution and the outbreak of the Iran-Iraq war; in 1990, with the first Gulf War; in 1997, with the Asian financial crisis; and in 2000, with the dot.com collapse. The most intense peaks were the first two. In 1973, the oil price more than doubled, reaching around \$35 per barrel in modern value. The cause was an embargo by the Organisation of the Petroleum Exporting Countries (OPEC), led by Saudi Arabia, and triggered through overt American support for Israel at the time of the Yom Kippur War. World oil supplies fell only 9%, and the crisis lasted only for a few months, but the effect was simple and memorable for those who lived through it: widespread panic.

The embargo was short-lived in large part because the Saudis feared that if they kept it up they would create a global depression that would cripple the Western economies, and hence their own. As it was, the short embargo created a miserable economic recession. I spent much of it doing my homework by candlelight. I didn't see much of my father. He was queuing for petrol.

The second and worst oil shock was triggered by the toppling of the Shah of Iran in 1979, and prolonged by the outbreak of the Iran-Iraq War in 1980. The first shock did not push prices as high as those at the time of writing, but the second shock pushed them to more than \$80 a barrel in today's terms. Again panic reigned, even though the interruption to global supplies was only 4%. The crisis ended in 1981 when the price fell for three main reasons. First, the Saudis opened their taps. With their huge reserves, mostly discovered in the 1940s and 1950s, they were able to act as a 'swing producer', increasing the flow to bring prices down just as they had decreased it in 1973 to push

Petrol head – and heart

"I feel it is my duty, given the social and economic chaos peak oil will undoubtedly produce, to stick very closely to defensible assumptions. If you ask me do I personally think we'll make it to 2010 my answer is probably not. Random factors and Murphy's law more or less rule out everything running smoothly. This however is not analysis but gut feel and hunch. On the hunch basis 2008 would probably be my answer, but 2010 my analysis."

Chris Skrebowski, editor, *Petroleum Review*, in conversation, April 2006

prices up. Second, new oil came on-stream from giant oilfields in more stable regions of the globe, including the North Sea. Third, large amounts of oil were released from government and corporate stockpiles.

These three reasons are high on the list of why we should worry today, because in the face of another shock things could not be resolved in a similar way. First, there are grounds to worry that the Saudis are pumping at or near their peak, no longer able to act as a swing producer. Second, the early toppers fear that there are no more giant oilfields left to find, much less wholly new oil provinces like the North Sea. Third, there is not much oil in storage, relative to current demand. The modern world works on the principle of just-in-time deliver. Our economies, overall, are more efficient in their use of oil than in the 1970s – a point much emphasised by late toppers – but the sheer weight of demand is much higher today, and it is still growing without an end in sight, or even strong governmental or corporate leadership demands that there should be one.



Jeremy Leggett is the author of *Half Gone: Oil, Gas, Hot Air and the Global Energy Crisis* (Portobello Books, 2005) and is CEO of Solar Century.

This essay is an abridged version of an article which will appear in the forthcoming Handbook for Practical Action.

Reference

1. 'The price of steak', *National Geographic*, June 2004



ANDY GOLDRING

The essential re-localisation of food production

Richard Heinberg

The world is changing before our eyes – dramatically, inevitably, and irreversibly. The change we are seeing is affecting more people, and more profoundly, than any that human beings have ever witnessed. I am not referring to a war or terrorist incident, a stock market crash, or global warming, but to a more fundamental reality that is driving terrorism, war, economic swings, climate change, and more: the discovery and exhaustion of fossil energy resources. As someone who has written and lectured extensively on the subject of peak oil, it is my assertion that our dependency on energy resources which are inherently limited in quantity and about to become scarce is a matter of the greatest importance. Perhaps nowhere is this more noticeable and important than in the area of food and farming

I believe we must and can de-industrialize agriculture. The general outline of what I mean by de-industrialization is simple enough: this would imply a radical reduction of fossil fuel inputs to agriculture, accompanied by an increase in labour inputs and a reduction of transport, with production being devoted primarily to local consumption. Fossil fuel depletion almost ensures that this *will* happen. But at the same time, it is fairly obvious that if we don't *plan* for de-industrialization, the result could be catastrophic.

One way or another, re-ruralization will be the dominant social trend of the 21st century. Thirty or forty years from

Pictured: Patterns of urban land use in Slovenia

Oil-free agriculture

"Agriculture can get off oil without having to look too far for alternatives. Farming was almost exclusively a solar industry until the 1950s, when the 'green revolution' applied manufacturing methods to food production and turned farming into a fossil fuels dependent industry. Energy use in agriculture increased four-fold from the 1950s to the 1990s."

D Pimentel and M Giampietro, *Food, Land, Population and the US Economy* (Carrying Capacity Network, 1994)

now I believe there will be a major shift towards a more historically 'normal' ratio of rural to urban population, with the majority once again living in much smaller towns, villages and farming communities. More food will be produced in cities than is the case today, but cities will also be smaller. Millions more people than today will be in the countryside producing and distributing food.

They won't be doing so the way farmers do it today, and not in the way farmers did it in 1900. Indeed, we need perhaps to redefine the term 'farmer'. We have come to think of a farmer as someone with 500 acres and a big tractor and other expensive machinery. But this is not what farmers looked like a hundred years ago, and it's not an accurate picture of most current farmers in less-industrialized countries. Nor does it coincide with what will be needed in the coming decades. We should perhaps start thinking of a farmer as someone who may well have three to 50 acres, who uses much more hand labour plus perhaps drafts animals complemented by strategic use of a small tractor that is fuelled by ethanol or biodiesel produced on-site.

Doing the maths

We should also start thinking about there being a lot more farmers. How many more are we talking about? Currently the UK has 541,000¹ farmers, depending on how we define the term. One of the lessons we can see from the experience of Cuba and its transition away from fossil-fueled agriculture over the last 15 years is that it found it required 15–25% of its population to become involved in food production. In the UK in 1900, nearly 40% of the population farmed; the current proportion is less than 1%.

Do the maths for yourself. Extrapolated to this country's future requirements, this would suggest a sixteen fold increase, over eight million farmers, unimaginable, at least in the short term. But if not 40%, what proportion of the nation's workforce would be needed in a post fossil fuel agriculture? It is a critically important question, not unrelated to the challenge that confronted the UK the last time there was a fuel crisis - during the Second World War. Even doubling the agricultural workforce will need a

Buena vista

Pictured right, urban agriculture in downtown Havana, Cuba

One in five to farm

"I have now come to see that one of the most pressing tasks for all humanity is to work out what would be an ideal ratio of rural to urban people – basically the ideal proportion of farmers – in each community. Indians to whom I recently put the question thought that half-and-half was about right (reducing present farmers by about 10%). In Britain, one might intuitively suggest, 20% would be reasonable, increasing the present quota of farmers by about twenty-fold."

Colin Tudge, *So Shall We Reap* (Penguin, 2003)



JOHN M MORGAN

major strategic plan and entail policies for education and training, housing and incentives to entice young people back onto the land.

The stereotypical British farmer is a middle-aged, white male, but the millions of new farmers in our future will have to include a broader mix of people, reflecting the UK's increasing diversity. A positive trend worth noting is the growing number of young adults – in their thousands – becoming organic or biodynamic farmers. Farmers' markets and CSAs are also established or springing up across the country.

What will it take to make these tentative trends the predominant ones?

• *Good and helpful Government policies*

There will need to be a further shift towards supporting sustainable farming systems based on smaller farming units and then rewarding those that make the effort to reduce inputs and to grow for local consumption.

• *Land reform*

All of these new farmers will need access to land, and there must be some means for assisting in making farms or smaller parcels of land available for this purpose. New ownership models such as co-ops and CSAs have

The answer is 'yes!'

"The oft-repeated challenge is 'Could organic farming (or agro-ecology, local production, small farms, farming without pesticides) ever really feed the entire population of a country?' Recent Cuban history – the overcoming of a food crisis self-reliance, smaller farms, and agroecological technology – shows us that the alternatives can indeed feed a nation, and thus provides a crucial case study for the ongoing debate."

Peter Rossett and Martin Bourque, *Sustainable Agriculture in Resistance* (Food First Books, 2002)

an important role to play.

- **Education**

Universities and community colleges have both the opportunity and responsibility to quickly develop programs in small-scale ecological farming methods – programs that also include training in other skills that farmers will need, such as in marketing and formulating business plans. Apprenticeships and other forms of direct knowledge transfer will also be important.

- **Financial Support**

Since few if any farms are financially successful the first year or even the second or third, loans and grants will also be necessary to help farmers get started.

- **A revitalization of farming communities and farming culture**

Over the past decades UK rural towns have seen their best and brightest young people flee first to distant colleges and then to the cities. Farming communities must be interesting, attractive places if we expect people to inhabit them and for children to want to stay there.

What I have set out above is clearly a tall order. However, we are not talking about merely a good idea. This is a survival strategy. It may seem that I am describing and advocating a reversion to the world of 1800, or even that of 8,000 BC. This is not the case. As we build a different food system we will inevitably be building a new kind of culture, certainly very different from industrial urbanism but probably also from what preceded it. As always before in human history, we will make it up as we go along, in response to necessity and opportunity.

Perhaps these great changes won't take place until the need is more obvious and irresistibly pressing. Maybe the price at the pump needs to get to £5 a gallon. Perhaps unemployment will have to rise to ten or twenty or 40% before embattled policy makers begin to reconsider their commitment to industrial agriculture. But even in that case, as in Cuba, all may depend upon having another option already articulated. Without that, we will be left to the worst possible outcome.

Rather than consigning ourselves to that fate, let us accept the current challenge – the next great energy transition –

No alternative

"Localisation stands, at best, at the limits of practical possibility, but it has the decisive argument in its favour that there will be no alternative."

David Fleming,
The Lean Economy (2007)

as an opportunity not to vainly try to preserve business as usual but rather to re-imagine human culture from the ground up.



Richard Heinberg is the author of *The Party's Over*, *Powerdown*, and his latest book *The Oil Depletion Protocol*. He is a journalist, educator, editor, and lecturer, and a core faculty member of New College of California (www.richardheinberg.com).

This essay is an abridged version of an article which will appear in the forthcoming Handbook for Practical Action.

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1. <http://statistics.defra.gov.uk/esg/quick/agri.asp>

A vision for food and farming in 2030

The case for an energy descent plan for UK agriculture

Rob Hopkins

The age of cheap oil draws to a close

Whether cuts in fossil fuel consumption will ultimately be imposed by peak oil, by climate change or both is uncertain, but what is clear is that the age of cheap oil is drawing to a close, and that we are in no way prepared for life after oil. As Colin Campbell puts it, peak oil “is a turning point in history of unparalleled magnitude, for never before has a resource as critical as oil become headed into decline from natural depletion without sight of a better substitute”.¹

In terms of agriculture, our situation is especially precarious. At a time in history when we need a resilient, highly skilled and thriving farming sector, capable of offering the country food security, we find agriculture confused as to its ultimate purpose, constrained by bureaucracy and dependent on cheap oil. Indeed, conventional farming, since 1945, has evolved into a system for turning oil into food, a process it does with considerable inefficiency. Peak oil is primarily a problem of liquid fuels, the liquid fuels on which our centralised just-in-time food distribution system relies. We have, in effect, become completely reliant on the unreliable.

The transition away from dependence on cheap oil will not be an easy one, but it will happen whether we want it to or not. Creating a low energy, more localised, self-reliant agriculture is not an overnight job. It takes planning, time, imagination and creativity.



ANDY GOLDRING

Is this Britain's urban landscape in 2025?

Pictured above right, an example of productive urban land use in Poland

Lack of planning

“...what is remarkable is the failure of politicians to start planning in any way for this inevitable transition, or even to start preparing their electorates for its inevitability.”

Jonathan Porritt, *Capitalism: As If The World Matters* (Earthscan, 2005)

What might a post-peak agriculture look like?

What might a more localised food system look like in 20–25 years? Over this period, farming will need to experience a remarkable transformation, akin to a renaissance. Its key characteristics will be diversity, a focus on local markets and needs, and a much reduced dependence on external inputs (energy, fertilisers etc). It will need to create more livelihoods and a workforce with a very different skills base. The ability of such an approach to build local resilience will have knock-on effects throughout the local economy, as more money is spent locally and new businesses are generated. While there will clearly still be some trade in food, it will favour rail and canals once again, and although there will be imports from abroad, they will tend only to be of crops that cannot be grown here.

Agriculture's role in feeding the nation will become its key priority. The building of organic matter in soils due to their ability to lock up carbon will also become a key aspect of the Government's carbon reduction strategy. The focus for farmers will become providing for local markets, assisted by local authorities' procurement policies and the rising prices of conventionally-produced food. Farmers will grow a wider range of produce than at present, and our diets will, of necessity, become more seasonal.

Self-reliance

"That the way down can be prosperous is the exciting viewpoint whose time has come. Descent is a new frontier to approach with zeal ... if everyone understands the necessity of the whole society adapting to less, then society can pull together with a common mission to select what is essential. Presidents, governors, and local leaders can explain the problem and lead society in a shared mission. Millions of people the world over, if they see the opportunity, can be united in the common quest for a prosperous way down. The alternative is a world of selfish battles for whatever resources remain."

Odum and Odum,
A Prosperous Way Down
(2001)

Farms will also become host to a diversity of enterprises. Some will begin producing the materials needed by a building industry now using more local building materials, such as clay plasters, cob and hemp/lime blocks, as well as local timbers. The integration of perennial tree crops, such as specially bred varieties of walnut, sweet chestnut and hazel will become a feature of farms, both for their crop yields and for their carbon sequestering abilities. Others may focus on growing organic mushrooms, both for culinary and for medicinal uses. Some will specialise in growing hemp for fabrics, or producing wood pellets or biofuels such as biodiesel or ethanol for the local market. For some farms, the installation of a methane digester will mean that they are able to supply heat and power to the neighbouring community.

These diversified farms will themselves be part of the fabric of a more diversified rural economy. Planning policies and regional development will prioritise the re-establishment of local infrastructure. Local abattoirs, dairies, small scale processing and farmers co-operatives will become the norm, carefully planned and sited so as to maximise energy efficiency and minimise transportation. The links between town and farm will be stronger, farms seen as a key resource for food, culture and ecology.

Urban agriculture will also become a priority for urban planners and communities. Cities will need to be rethought as productive places. A massive programme of productive tree planting would bring fruit and nut trees into every park and school ground. Urban market gardeners will begin to colonise land around the edge of the cities, producing a diversity of fresh produce for local markets with extremely low food miles. Large parks may well be redesigned so as to feature a diversity of allotments, market gardens and horticultural training centres.

Schools will start to grow much of the food they consume on their grounds. Farmers Markets will continue to flourish and expand throughout the country, serving as community focal points and as triggers for a huge revival of local food culture. Back garden and allotment food production is already a very popular leisure activity, but the Government

Self-reliance

"It's easy to dismiss the principle of self-reliance by pointing to many complex products that communities cannot manufacture on their own. The goal of a self-reliant community, however, is not to create a Robinson Crusoe economy in which no resources, people or goods enter or leave. A self-reliant community simply should seek to increase control over its own economy as far as is practicable."

Michael Shuman, *Going Local*
(Simon & Schuster, 2000)

may well go on to make gardening a key aspect of their carbon reduction and health promotion strategies. Local varieties of fruit and vegetables will become highly treasured, and the teaching of intensive organic gardening techniques should become a core part of the National Curriculum, as part of a programme of ensuring the nation's food security.

Agriculture will bear little resemblance to how it looked at the beginning of 2007, yet will also have little in common with the farming of 1940, 1890 or 1400. Food and farming in 2030 will utilise the best in appropriate technology, intelligent design and the conscious application of ecological principles. It will replace the monocultural approach cheap oil made possible with careful design and observation, and smaller scale, more diversified systems.

Energy descent plans

"How can we get from where we are now, an oil dependent economy with very little food security, to a localised, resilient and self reliant food economy? This is not easy, indeed it is a task of unprecedented proportions, given that the peak in world oil production may only be three or four years away. It is a challenge likened by some as being akin to a wartime mobilisation".² The tool we are developing for this is energy descent planning.

In our political system, short term planning is often the norm. Often decisions that will make things harder in the short run but better in the long term fail to be implemented for this reason. Looking 20 years ahead to a vision of a low energy world, consensus becomes more possible. Energy descent planning offers the possibility of harnessing the imagination and energy of a wide range of players in the creation of a dynamic vision of UK food and farming's transition to a lower energy future.

The essence of an energy descent plan is that it creates a vision of an abundant low energy future. While the transition away from fossil fuels will be a task of unprecedented proportions, at the same time it offers the potential for a society which is better in many ways, more connected to nature, healthier, with more meaningful work, access to nutritious food, enhanced social capital and more

The Kinsale energy descent plan

Energy descent planning emerged from the world's first two year permaculture design course at Kinsale Further Education College in Ireland. Students were set a project to design a way that the town could move beyond oil as a positive transition. The resultant document, *Kinsale 2021 – An Energy Descent Action Plan*, has sparked many similar initiatives around the world, as communities attempt to design a future for themselves beyond oil.

Kinsale 2021 can be downloaded for free from www.transitionculture.org

co-operation. Energy descent plans are still an emerging approach at the early stages of being applied to a handful of communities, but the model offers a useful tool for a revisioning and redesigning of food and farming in the UK.

The six core considerations for an energy descent plan

1. Create a sense that something is happening

Creating a sense that this is an historic process will be key to its success and to its engaging all the parties necessary to its carrying sufficient weight.

2. Ask the right questions

There is no point in making plans for the future that assume plentiful supplies of cheap oil and gas will continue into the indefinite future. Assuming rising prices and increasing scarcity will allow us to make far more realistic plans which actually address the challenges. We also need to ask, among other things, whether organic agriculture could actually feed the UK, how much agricultural land is actually available and what would be the most effective use of that land?

3. Plan for the great reskilling

Beyond the peak, our building industry will need to relearn how to use local materials; our doctors will need to become familiar with herbal medicines produced locally alongside the more conventional medicines. Richard Heinberg has argued here that we will need a vastly increased workforce within agriculture. The level of reskilling that this will necessitate is huge, and is not something that can happen overnight. How we communicate these skills, especially to the young, will be a key aspect of any energy descent plan.

4. Find new ways to engage people

New ways of drawing people into the formulation of an energy descent plan for food and farming will be key to its success. A range of tools now exist for ensuring public participation in these kinds of processes, all methods of engaging large numbers of people in constructive dialogue and brainstorming.

5. Stress the new opportunities

The farming sector has the possibility of a great revival in its fortunes if it is able to imaginatively seize the opportunities presented. There are sound business arguments for planning ahead for life beyond oil, and

Avoiding dissent

"I use the term 'descent' as the least loaded word that honestly conveys the inevitable, radical reduction of material consumption and/or human numbers that will characterise the declining decades and centuries of fossil fuel abundance and availability."

David Holmgren,
What Is Sustainability?
(Sustainability Network, 2003)

for seeing the challenges presented by peak oil as being opportunities for a more integrated, vibrant, diverse and localised future, rather than as some currently present it, a cue for the wall-to-wall planting of biofuels.

6. Vision and backcast

Once a vision of post-peak food and farming has been created, a powerful tool is the use of backcasting. David Cook defines backcasting as "placing ourselves in the future and imagining that we have achieved success. Then we look back and ask the question: "how did we achieve this?"³ Backcasting allows the creation of a practical, tangible yet ambitious pathway to a post-peak agriculture. It offers a clear 'roadmap' in which everyone can see their role.



Rob Hopkins is co-ordinator of Transition Town Totnes and publisher of www.transitionculture.org. He is researching a PhD at Plymouth University looking at community responses to peak oil and energy descent planning.

This essay is an abridged version of an article which will appear in the forthcoming Handbook for Practical Action.

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Soil Association

South Plaza
Marlborough Street
Bristol BS1 3NX

T 0117 314 5000

F 0117 314 5001

E info@soilassociation.org

www.soilassociation.org

Soil Association Scotland

Tower Mains
18 Liberton Brae
Edinburgh EH16 6AE

T 0131 666 2474

F 0131 666 1684

E contact@sascotland.org

www.soilassociationscotland.org

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