









WHEB Group is an independent investment management firm specialising in opportunities created by the global transition to more sustainable, resource efficient economies. Established in 2003, WHEB Group is a European pioneer in sustainable investment and invests assets on behalf of institutional and private clients through listed equity, private equity and infrastructure investment strategies. With offices in London and Munich, WHEB Group's team of more than 20 investment professionals have over 250 years of combined experience.

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INVESTING IN THE LONG-TERM





Understanding long-term structural market trends is an essential skill in all types of sustainability investing. While the precise investment time horizon and vehicle may vary, this is as true in renewable energy infrastructure, as it is in private equity or in listed equities.

This second issue of the Quarterly provides three perspectives on how this long-term orientation influences our approach to investment across the three investment businesses of the WHEB Group. Urbanisation is one powerful trend that is widely recognised but also widely underestimated in its influence on the future dynamics of markets around the world. The World Economic Forum estimates that the same global urban 'capacity' – including housing, infrastructure and facilities – will have to be built in the next 40 years as has previously been built in the preceding 4,000. According to a study by the consultancy McKinsey', more than one-fifth of all humans now reside in just 600 cities that in turn generate up to 60 per cent of the world's output. By 2050 McKinsey estimates that three-quarters of humanity will be urban. This shift, while not perhaps quite immutable, is highly predictable and will radically re-shape demand for everything from healthcare to residential heating. Seb Beloe explores these trends and their implications for investors on pages 3-6.

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Ben Goldsmith tackles the topic of energy subsidies, arguing that energy markets are making fossil fuel subsidies increasingly uncomfortable for governments, both economically and politically (pages 7-8). Finally, Megan Bingham-Walker and Rob Wylie describe how the availability and cost of debt is reshaping the role of private equity investors. Rather than leveraging cheap finance to generate returns, investors are developing new approaches to create value: focusing instead on supporting the growth of portfolio companies through

insight and experience.

We hope you enjoy the Quarterly and would welcome your comments and feed-back.

"Urbanisation is one powerful trend that is widely recognised but also widely underestimated in its influence on the future dynamics of markets around the world."

Urban world: Mapping the economic power of cities, McKinsey Global Institute,

March 2011

URBANISATION

AND SUSTAINABILITY

IT'S HARD TO BE A SAINT IN THE CITY

Seb Beloe argues that urbanisation is one of the 21th century's defining features with profound and far-reaching impacts for investors.

"The devil appeared like Jesus through the steam in the street Showin' me a hand I knew even the cops couldn't beat I felt his hot breath on my neck as I dove into the heat It's so hard to be a saint when you're just a boy out on the street."

Bruce Springsteen, 1973

Bruce Springsteen's description of the malaise that surrounded urban life for much of the 1970's and 1980's provided a defining portrait of the period. But in the last two decades, the processes of re-urbanisation and gentrification in the developed world, and accelerating urban growth in emerging economies, have ensured that cities are now joining the front-line in tackling key environmental and social challenges. This has important implications for investors.





'When a man is tired of London, he is tired of life

In 1777, writer Samuel Johnson epitomised the standing that cities - and specifically London - occupied in Eighteenth Century artistic, political and cultural life. Stark contrast with the London of the late 1970's when undertakers went on strike, leaving more than 800 corpses unburied and the population back to its level at the turn of the 19th century of just over 7 million inhabitants. At the same time, many US cities were experiencing so-called 'white flight' as middle-class white families fled the city to take refuge in the suburbs, in turn triggering the economic restructuring, abandoned buildings, high unemployment and political disenfranchisement that made cities the desolate, inhospitable landscapes that inspired Springsteen's lyrics.

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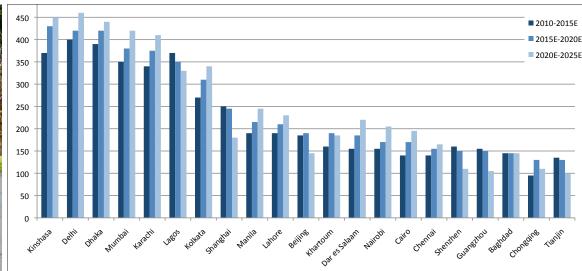
These processes began to reverse in the 1990's when wealthy suburbanites returned to cities, in turn gentrifying the decayed urban neighborhoods. By 2000, urban areas were again regaining their historic position as a desirable place to live. From 2000 to 2010, the US urban population had increased by 12.1%, outpacing the nation's overall growth rate of 9.7%. Meanwhile, in London, the population is back to over 8 million, with house prices that attest to the popularity of urban living.²

Urbanisation on steroids

The picture in emerging markets is even more striking. During 2007, homo sapiens became an urban species with over 50% of the global population living in urban centres. Such is the growth of cities in emerging markets that in less than 25 years time, more people will live in emerging market cities than anywhere else on the planet. Not one of the world's 25 fastest-growing major cities is located in a developed country. Seven are in China, six in India with the remainder scattered across Africa and the rest of Asia. Interestingly, the rate of growth in many Chinese cities is now stagnating or even declining while in many African cities, such as Kinshasa, Dhaka and Dar es Salaam, growth is still accelerating.³

Average annual additions to fastest growing cities globally ('000s)⁴





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The scale of urbanisation is hard to comprehend. The World Economic Forum estimates that the same urban 'capacity' – including housing, infrastructure and facilities – will need to be built in the next 40 years as has previously been built in the preceding 4,000 years in order to meet projected demand.⁵ And while cities cover only two per cent of the world's surface, they house 50% of the population, are directly or indirectly responsible for 70% of carbon emissions,⁶ and claim a staggering 75% of total resource consumption.⁷

City leaders are increasingly recognising the need to tackle resource consumption. "We should not follow the high-intensity model of western cities... We have to take the constraints of energy and resources into account," said Han Wenke, director of the Energy Research Institute under China's economic planning agency, in the Financial Times.⁸ According to the same article, 'China's city dwellers use three times as much electricity as rural residents, eat 10 times as much sugar and require vastly more infrastructure as they go about their daily lives. One official estimates that, for every person who moves to a city, the government spends Rmb100,000 (US\$16,000) to build additional roads, bridges, utilities and other public goods.'9

Cities need sustainability...

Cities clearly have a major environmental impact in terms of demand for natural resources, but they are also vulnerable to impacts *from* the environment - a fact that has been graphically illustrated in New York and New Orleans. In fact, almost two thirds of urban settlements with populations greater than 5 million fall, at least partly, in coastal zones exposed to flooding associated with sea level rise. Already 73% of the 22 European cities that participate in the Carbon Disclosure Project (representing more than 60m people) have experienced the physical effects of climate change. Furthermore, 53% of these cities consider these effects to represent serious or very serious risks to their residents and businesses.

...and they know it.

At a time when nation states cannot agree on how to respond to climate change, cities are picking up the baton. Accenture, the management consulting firm, states that it is working on more than 70 'smart-city' projects. New York, along with 57 other large cities representing eight per cent of the world's population and 21% of global GDP, has formed the C40 coalition to pursue action jointly on climate change. According to their 2011 report, 12 C40 cities have undertaken nearly 5,000 initiatives on climate change. These initiatives address a wide-range of issues. Beijing and Shanghai, have both taken the lead in China in reducing air pollution and carbon emissions by phasing out coal-fired power plants within the urban core. Trials of outdoor LED lighting in Kolkata have delivered energy savings of greater than 50% compared with traditional lighting technologies, 13 and in Hong Kong the figures are more like 90%. In the US, C40 cities including New York, Washington DC, San Francisco and Seattle require commercial buildings greater than 50,000 square feet to benchmark and publish their energy use. Some cities, such as New York, further require energy audits and retro-commissioning.

It is still early days for these initiatives, but there is evidence that they are remunerative. Existing initiatives taken by the C40 are anticipated to deliver annual reductions of 248 million tonnes of CO2 per annum by 2020. Londoners can be justly proud that their city has reduced its CO2 emissions by 3.6% from 2011-12. Residents of Copenhagen meanwhile should be delighted with their reduction of 5.2% over the same period.

Peak cars

Car use is also falling in many cities. According to researchers from Curtin University in Australia, during the period 1995 to 2005 per capita car use fell 1.2% in London, 3.7% in Stockholm and 7.6% in Vienna. Even in the US, some cities have experienced precipitous declines (albeit from very high levels). In Atlanta, per capita car use declined by 10.1% and in Houston the reduction was 15.2%. Even in the 'car capital' of Los Angeles, per capita use declined two per cent between 1995 and 2005.

The researchers suggest several reasons for the switch from private vehicles to public transport, ranging from improved public transport to the impact of the 'Friends' TV series in popularising urban culture. The cost of fuel is also likely to be a key factor. Either way, the implications are profound not just for car manufacturers but, with 1.4% of European GDP accounted for by transport fuel taxes, also for governments.¹⁵

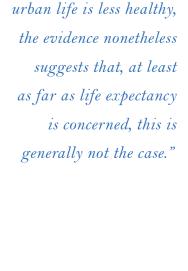
The future is urban

An urban future will influence demand for basic commodities such as concrete and steel from which city infrastructure is still largely constructed. This story is well-known, but is only part of the picture. The focus is also increasingly on the use of technology in intelligent infrastructure – the use of LEDs and smart controls in street lighting, equipping buildings with automated energy systems and the emergence of new businesses built around collaborative models of consumption. Even the auto industry is shifting its focus from car ownership to car 'usership' as the future model for urban areas.¹⁶

Collaborative consumption' as a model is not limited to cars - think Zipcar or Streetcar - but is also evident in bike-sharing schemes, peer-to-peer banking, product sharing and even shared accommodation such as Airbnb. The high densities of communities in urban areas facilitate and accelerate these business models. Waste management too is becoming much more intelligent with automated tracking of refuse collection¹⁷ and recycling of materials taking place within the city – helping cities source their raw materials from their own waste. But urban densities also mean that other industries such as healthcare and education also benefit strongly from the process of urbanisation. Typically, a ten percentage point increase in a country's rate of urbanisation translates into a ten per cent greater tertiary education enrolment ratio.¹⁸

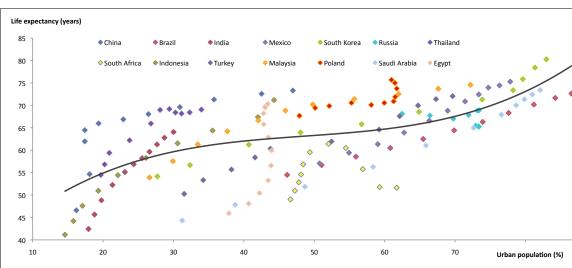
It is a similar story in healthcare. In China, the proportion of urban expenditure as a portion of total health care expenditures was around 73% from 1996 to 2010 even though a majority of people still lived in rural areas during this period. While it may often feel like urban life is less healthy, particularly in the mega-cities of the emerging economies, the evidence nonetheless suggests (see table below) that at least as far as life expectancy is concerned this is generally not the case. ²⁰

Life expectancy at birth versus urban population rate in emerging markets (1960 to 2010, 5-year intervals)21

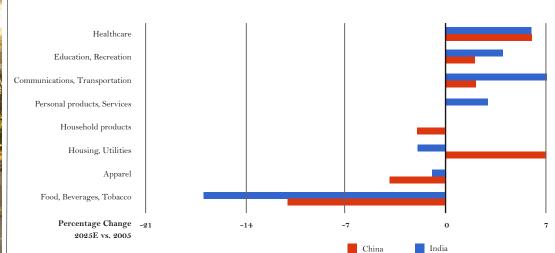


"It may often feel like









Interestingly, healthcare and education are typically two areas of discretionary spending that are prioritised by the emerging urban middle class. Given the better access to healthcare and educational facilities, combined with larger incomes, it is perhaps not surprising that educational attainment and life expectancy are higher in cities compared with rural areas.

Environmental sustainability may ultimately be more attainable in an urban future. While absolute levels of impact are clearly overwhelming connected to cities, on a per capita basis the story is more complex with most cities delivering significantly lower emissions than in rural areas, particularly where urban density is high.²²

It may still be hard to be a saint in the city but, whatever else the future holds, for most people it will be urban. The technologies, products and business models that best cater to and are designed for the overwhelmingly urban lifestyles of the future are the ones to back.

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THE LONG

GOODBYE

Ben Goldsmith outlines three reasons why global fossil-fuel subsidies will not last a generation.





Fossil fuel subsidies are a familiar topic in environmental circles. But, even so, an annual increase in global hydrocarbon subsidies of 30% to \$523bn went relatively unremarked when it was announced by the International Energy Agency in late 2012¹. Combined with the scale of subsidy is the sheer complexity of the support. The OECD² has counted over 250 separate mechanisms ranging from direct consumer subsidies, for example by keeping retail fuel prices artificially low when compared with an international reference price, to producer support ranging from underwriting risk, selectively reducing, rebating or removing taxes that would otherwise be paid or transferring funds directly to producers. In spite of the scale of these subsidies and the complexity in their provision, there are fundamental factors at work which ultimately will make fossil-fuel subsidies unsustainable and will lead to their decline and allow other forms of energy to compete more easily.

First, in the last ten years or so the prices of many soft and hard commodities have increased and become more volatile. According to a report written by consultants MJB&A for a US taskforce on natural gas markets³, 'global commodity prices on the whole appear to be getting more volatile, having shifted from a fairly calm 15 year period from 1990 to 2004 to an upward trend from 2004 to 2010'. Clearly the advent of cheaper shale gas has altered the trend in the US, but even here price volatility is still expected to remain an issue. As James Rogers, CEO of Duke Energy put it, "Ben Franklin said there are two certainties in life: death and taxes. To that, I would add the price volatility of natural gas." Add global geopolitics and the strategic vulnerabilities in energy supply chains – an issue not lost on groups determined to antagonise the West – and continued price volatility is inescapable. This volatility, combined with price increases in many parts of the world, exposes governments to a subsidy gap that is both unpredictable and, most likely, widening. Renewable energy by contrast invites a narrowing cost gap – because of declining equipment costs, ostensibly zero fuel costs, and little dependence on unstable supply chains.

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Secondly, pressure is building for greater transparency and accountability in the fossil fuel industry. Reforming subsidies is politically difficult due to voters' dependence on expensive forms of hydrocarbon energy and is, in the words of the OECD, 'not easy due to the vested interests of those that benefit from them and the limited available data'. However, more transparency is being delivered by projects such as the 2011 OECD Inventory of Support to Fossil Fuel Production or Use'. The energy industry also moved down the Edelman Trust Barometer in 2012, enjoying the trust of only 53% of those surveyed. An increasingly unpopular industry,

defending expensive subsidies, is clearly not well-placed to escape the moving frontier of better governance and accountability which has already swept many industries before it.

"The question is, are such tax breaks merely delaying our inevitable energy transition?" Finally, energy users can be expected to become increasingly autonomous in their consumption of energy. Reduced demand for electricity plays a part. The Chairman and CEO of the US utility Xcel believes energy efficiency is dampening demand in the US by 0.7% per annum. In 2012, most major European countries also saw reductions in energy demand, with a significant part due to governmental energy efficiency initiatives. At the same time, energy users are increasingly producing their own electricity. In Germany, where renewables are furthest advanced, 37% of renewable energy generation infrastructure is owned by households. Utilities and financial investors are second with 25%, with farmers at 20% and industry at 16%. In the UK, over a third of UK businesses are also considering generating renewable energy on their premises, the principal reason being a desire to control energy costs more effectively. These shifts won't happen across Europe overnight, but they are progressively weakening public support for fossil fuel subsidy paid for by tax-payers.

Subsidies for fossil fuels have existed for as long as the industry. It is perhaps no surprise that, in spite of calls by the OECD and the G20 to phase out harmful fossil fuel subsidies and echoed in person by President Obama¹¹, the reality has proved extremely hard to deliver. Indeed, when new forms of fossil fuel are discovered, such as the recent shale gas finds under Blackpool in the UK, they are immediately welcomed with the announcement of new tax breaks. The question is: are such tax breaks merely delaying our inevitable energy transition? I would argue they are, and that accelerating rather than delaying the advent of a level playing field for different energy sources is in the greater collective long-term interest.





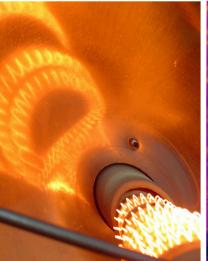
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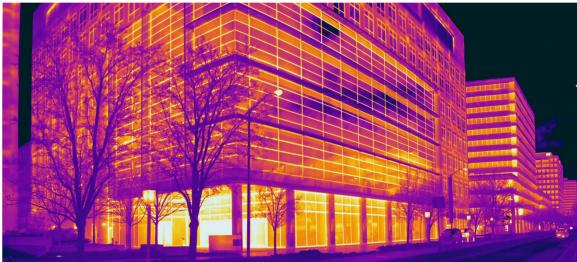
PRIVATE EQUITY JIM,

BUT NOT AS WE KNOW IT! _

Dr. Rob Wylie and Megan Bingham Walker of WHEB Capital Partners LLP explain why resource efficiency-focused private equity is well-placed to add value – even in an age of low leverage.

The past few years have been a challenging time for private equity ('PE') funds of all shapes and sizes. On the one hand, there have been a series of high profile business failures of capital intensive venture stage companies such as US-based Solyndra. On the other, the traditional leveraged buyout model ('LBO's') has yet to recover from the collapse of Lehman Brothers and the consequent high price and low availability of debt. But in this challenging era, a new approach is emerging. This is still private equity, but not perhaps as we once knew it.





Thermal image of office blocks - WEMS, a company providing wireless building energy management systems, typically delivers energy savings of 15 to 30%

In addition to the challenges associated with LBOs and capital intensive businesses, the IPO market also remains effectively shut. As a consequence, PE firms are having to look to trade acquirers and secondary buyouts as the primary exit route for their portfolio businesses. Understanding what these buyers are looking for is critical in delivering good risk-adjusted returns to investors in PE funds. Of course, trade buyers in different industries will have their particular requirements, but in our experience they tend to be particularly focused on acquiring profitable "earnings enhancing" companies rather than early stage technology ventures still burning cash.

"A clearly differentiated technology is important, particularly where this is sold into markets that are large, growing and unsubsidised."

There are also some important characteristics that make an acquisition target particularly attractive to trade buyers. A clearly differentiated technology is important, particularly where this is sold into markets that are large and growing such as markets for resource efficiency technologies. Blue-chip reference customers are valuable in giving potential buyers confidence in the strength of the company. Being able to produce and rapidly increase the availability of the product or service, combined with recurring revenues and low capital requirements, are also attractive characteristics.

For an investment fund in a developing market of innovative technologies and business models, it is important to demonstrate the underpinning validity of a fund's proposition. For WHEB Partners, this is about resource efficiency which sits at the heart of the value offered by our portfolio companies and by extension, of our investment funds. In order to achieve this, each portfolio company is analysed to determine the resources in the form of carbon, avoided landfill, water and energy that are saved by its products and services. In 2012, WHEB Partners Fund 2 delivered in the aggregate 300,000 tons of carbon emission reductions, 422,000 tons of

landfill reductions, electricity savings equivalent to the annual consumption of over 15,000 people and water savings of 73 million m³. These contributions underpin the value of our portfolio companies and ultimately of the portfolio itself.

The essential role of the PE firm is to invest in and support portfolio businesses to help them grow to the point where these features can be demonstrated to the broader market – and then to sell the business at attractive multiples of the initial investments. Given limited financial leverage, the added value offered by PE firms at this stage of business growth can be critical. Investors with deep knowledge of the relevant markets can support and accelerate business growth in the following ways:

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- Making high-level introductions to potential corporate partners who can offer additional distribution routes for products and services and may become potential acquirers. For example, we have recently introduced EVAP a manufacturer of compostable bioplastic that substantially extends the shelf-life of fresh produce to limited partners linked to supermarket chains interested in the technology.
- Recruiting well-rounded management teams with the skills required to manage increasingly complex organisations. For example, we have recently recruited a new Chairman and CEO for Wireless Energy Management Systems alongside our investment. We have found that companies with £10 to £50m of turnover often undergo a major upheaval in developing management teams with the right skills. Having the right executive team members, supported by experienced non-executive directors, is essential in enabling a business to achieve its full growth potential.
- Helping to manage rapid revenue growth. Growth stage companies have to be adept at keeping many balls in the air. Developing existing product lines, launching new products, penetrating new geographic markets and undertaking M&A opportunities all vie for management attention. Investor directors who have commercial backgrounds are well-placed to assist with these complex business decisions.
- Optimising the business model based on a thorough understanding of customer requirements. It is important to be responsive to market demand as we have found with our portfolio company Resysta. Initially Resysta focused on the sale of their recycled, wood-substitute material, but have adapted this model to allow corporate customers to licence the technology to produce the materials themselves.
- Finally, experienced PE firms can also help the exit process, an area where few management teams have significant experience. Having investor directors who have done it before and have the relevant industrial, financial and advisory contacts and understand the pitfalls involved is essential. This was certainly the case in our recent sale of a significant part of our interest in friedolaTech to the Soros-backed PE firm Silverlake Kraftwerk, a sale that returned €20 million to our limited partners, representing an internal rate of return of 33%.

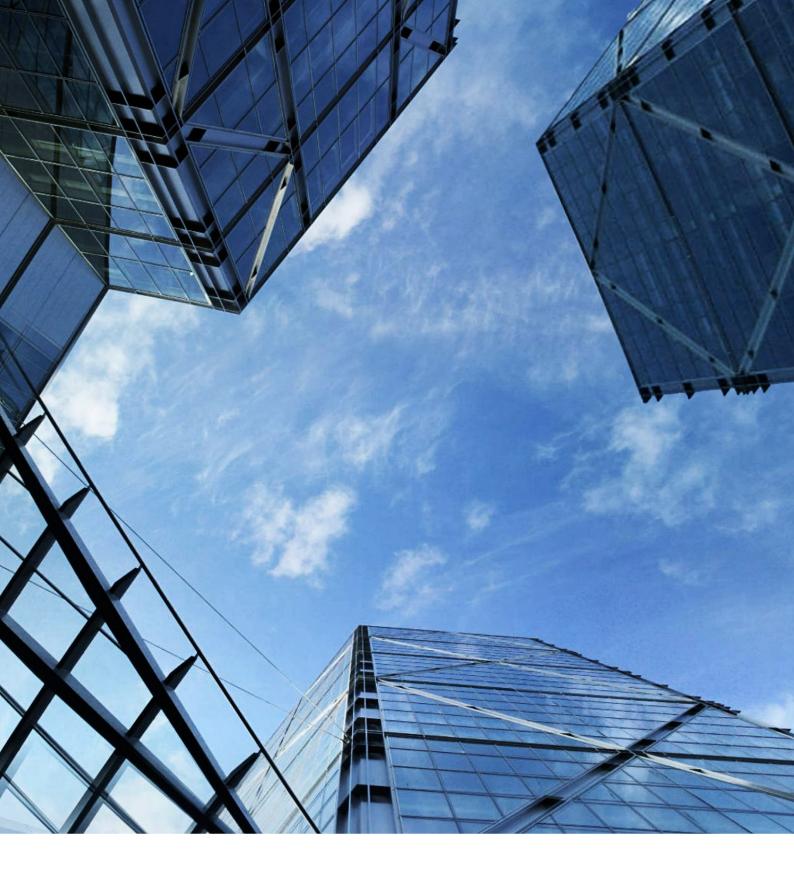
Whether this focus on growth capital combined with more active portfolio management represents a genuinely new approach to investment is debatable, but what is clear is that the easy debt that was available during the first decade of the millennium is showing little sign of returning. In an era characterised by limited appetite for capital-intensive venture investment, and high and volatile natural resource prices, we believe investment focused on resource efficiency, growth stage companies and technologies is more sustainable for all parties concerned.

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2 Fitzhardinge Street, London W1H 6EE Tel: +44 (0) 203 219 3441 info@whebpartners.com www.whebgroup.com