

Bournemouth, Dorset and Poole MAA Green Knowledge Economy Phase 2: Strategy and Action Plan

The “Green Knowledge Economy” Framework

I coined the term ‘green knowledge economy’ in the ‘Envisioning’ report for the Bournemouth, Dorset and Poole MAA Partnership. It has created interest and the MAA Board has adopted the term as a unifying concept for the sub-regional economic strategy. But, the term is novel and needs explanation. This note gives an interpretation of the term and how we propose to use the ‘green knowledge economy’ as a framing concept for the programme of projects that could form the MAA sub-regional economic strategy.

The term ‘green knowledge economy’ refers to the new dynamics of economic development arising from the shift of green priorities to the centre of the economy and society, as reflected in government policies and market forces. We are undoubtedly witnessing this shift because of a growing awareness of climate change and its human and economic consequences, and also because the ‘green economy’ is seen as a route out of the global recession.

The ‘green economy’ can be seen as ‘greening’ the existing economy through the production and use of environmental goods and services across all sectors. Millions of new jobs and new businesses are predicted to come about as regulation and technology drivers combine to create markets out of activities that: help to protect ecosystems and biodiversity; reduce energy, materials and water consumption through high-efficiency strategies; decarbonise the economy; and minimise or altogether avoid generation of all forms of waste and pollution.

Given that **the knowledge economy is the existing economy** of advanced industrialised countries (OECD/Europe), and of the BDP Sub-Region – I have used the term ‘green knowledge economy’ to describe the ‘greening of the existing economy’. In effect the ‘knowledge economy’ has entered a new ‘green’ era, in the sense that it will be powered and shaped by ‘green’ market forces and government policies. Its dynamism will come from technological, organisation and social innovation, and like the ICT revolution the ‘green revolution’ will be characterised by long-waves of development and change in the economy. Thus, innovation in spirit and action has to be at the heart of the BDP sub-regional economic strategy.



Some key aspects of the policy shifts needed to move from the knowledge economy to the green knowledge economy paradigm are summarised in the table below:

Table 1: Transition to the Green Knowledge Economy

The Knowledge Economy (20th C)	The Green Knowledge Economy (21st C)
Competitiveness	Sustainability
Intangible Capital & Social Capital	Intangible Capital, Social Capital & Natural Capital
Wheels & Wires	Wheels, Wires, Watts Water & Waste
Services & High Technology Sectors	All Sectors
Skills – Graduates	Skills – Graduates & Intermediate (Skilled Manual)

Source: Geoeconomics, 2009

The following policy shifts at all levels, including within the BDP sub-region, are suggested by the table:

- Sustainable development should be the goal of economic development strategy
- ‘Natural capital’ should be developed as wealth creation assets and made an explicit and major focus of economic development
- 5W infrastructure (add energy, water and waste) rather than a 2W infrastructure (transport and telecommunications) should be combined with land use planning to create a more sustainable spatial structure of economic development
- ‘Cluster’ policy should be based on green strategies (not specific sectors) and designed to bring about ‘across the board’ improvements in the economy (competitiveness), society (inclusion) and the environment – the ‘triple bottom line’ of sustainability.
- Employment and skills programmes needs to deliver a ‘green collar workforce’ to support innovation across the economy – from scientists and software specialists to skilled production and construction workers (welders, sheet metal workers, installers and engineers). This means investing in level 4 (graduate) and level 3 (intermediate) training and re-training programmes, ideally linked to green building projects such as retrofitting homes with solar energy technology (see Annex 2 for typical green jobs).

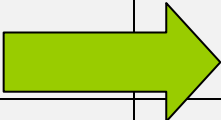
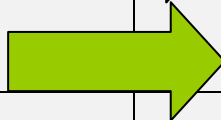


Clearly the ‘green knowledge economy’ is more inclusive in all respects. ‘Greening’ or the adoption of environmental technologies and practices applies to all sectors of the economy, and from the home to the town hall to the office tower. Further, instead of graduate-centred skills initiatives, the GKE agenda recommends investing in training and re-training programmes to scale up the skilled manual workforce. The pervasive nature of the green knowledge economy (note the parallels with ICT as ‘radical innovations’ impacting on all sectors) has profound implications for the basic principles of designing and delivering economic development strategy.

Of particular importance is the need to re-think ‘clusters’ as a basis for targeting business support in the familiar areas of skills, enterprise, innovation, infrastructure and finance. The traditional approach is to focus on clusters of industry sectors – this is most usually associated with the US economist Michael Porter. The goal of cluster strategy here is to increase *competitiveness* either at the national level or sub-national level (Porter’s ideas have been applied to countries and inner-city areas). However in reality very few sub-national economies tend to possess a *critical mass* of inter-linked firms and institutions that conform to Porter’s description of ‘clusters’.

The GKE model of economic development calls for a different approach to cluster strategy. Firstly, rather than the drive to increase competitiveness, clusters need to be defined in terms of the drive to increase sustainability. As such, **GKE clusters are clusters of ‘green strategies’** – as shown in the table below. Here we show four clusters of ‘green strategies’ identified by researchers and policy-makers. The high level strategies at the EU and UK levels are listed separately in Annex 1.

Table 2: The Economic Dynamics of Green Cluster Strategies (part – see also Table 3)

		Knowledge Economy: Competitiveness				
Strategies		Skills	Innovation	Enterprise	Infrastructure	Finance
Green Economy: Sustainability	Clean Energy					
	Green Building					
	Green Transportation					
	Environmental Conservation/ Resource Management					

Source: Geoeconomics, 2009

Secondly, rather than a critical mass of firms within a narrow range of sectors, **GKE strategies require strong economic communities of interest** made up of businesses and



social enterprises, public sector organisations and community and voluntary groups. These ‘communities’ may coalesce around ‘clean energy’ (e.g. alternative energy suppliers), or ‘green buildings’ (e.g. solar panel engineers), ‘green transportation’ (e.g. car pooling social enterprises) and ‘environmental conservation’ (e.g. marine scientists).

The basic thrust of GKE strategy is shown by the direction of the green arrows in the table above: from green priorities to the economy, the locus of change running across skills and employment and other aspects of competitiveness. The economic impacts will be widespread due to the convergence of markets and technologies and the upstream and downstream links in supply chains. The growth of the nebulous “environmental goods and services sector” – including its extensive supply chains – will be one major outcome. See Annex 3 for the Government’s definition of what’s in the Environmental Goods and Services sector. However the dynamics of the GKE are more pervasive – for example, in consumer goods and services, they include growing markets in re-fabricated fashion and textiles and eco-tourism. Green cluster strategies should converge and augment any sector-based cluster initiatives – for example, the creative and cultural industries, marine activities and engineering, health and education and food and drink.

The basic thrust of the MAA sub-regional strategy should therefore be to pursue green cluster strategies and projects as an *economic development programme*. The outcomes of the programme will be measured by improvements to the economy, equity and the environment – that is the ‘triple bottom line’ of sustainable development.

The locus of change in the GKE extends across the three type of capital which form the basis of wealth creation, and the management of which holds the key to long-term sustainable development: (World Bank)

- Intangible capital – a) human capital: the knowledge, skills and other competences of the workforce, or the intellectual capital embodied in innovation, finance and enterprise; b) social capital: governance, leadership and culture
- Physical capital – urban land and physical infrastructure, including plant and equipment and transport/waste/water/telecommunications/energy grids (5W)
- Natural capital – rural land (forestry, agriculture) and conservation areas, marine and coastline resources and environments

My reason for recommending the GKE concept to the MAA Partnership is that **the sub-region’s comparative advantage lies in its natural capital endowments** – the Dorset countryside, the Jurassic Coast, Poole Harbour and so on. As noted in the Envisioning report, key industries have evolved around this natural capital advantage – most notably, the variegated marine sector (science labs and university R&D, leisure and tourism, engineering and transport, etc). The development of broadband networks has, of course, enhanced these natural capital advantages by enabling businesses and highly skilled and talented people to



locate in the sub-region. The creative and cultural industries, for example, depend on electronic accessibility.

However, as we also found in the Envisioning study, the *physical capital* endowments of the area are not a basis of comparative advantage – strategic transport routes and rail accessibility to major centres, especially London need to improve considerably. Equally, there are long-term pressures on urban land arising from the area's Growth Point status within the Regional Spatial Strategy.

Our earlier benchmarking assessment of the sub-region's knowledge economy – and the Envisioning study consultations – showed that the Sub-Region's *human capital* endowments are not remarkable by national standards. The area has a big deficit of high-skill employers and sectors – in 2007, it would have needed 30% more jobs in knowledge-intensive sectors to match up with the regional average for workplace earnings (40% to equal the national average). The new Employment and Skills Board is already aware of low skills and talent retention and attraction issues.

Thus, the Sub-Region's natural capital is its main source of comparative advantage, and in this respect the dynamics of the GKE are in line with this unique and distinct comparative advantage.

Reinforcing this comparative advantage is the area's *social capital* endowments which favour the GKE. These intangible endowments include governance – such as councils and partnerships that are strongly committed to the green agenda (LA21 and other strategies), and who now recognise the opportunities for sustainable development through a sub-regional GKE strategy and programme of action. Of equal importance is the creation of a 'green society' culture – the community itself must get behind the GKE as citizens, consumers and workers if it is to lead to action and BDP becoming a leading green economy. And, creating a brand and marketing the sub-region's GKE credentials – the 'green Olympics' for example – are essential to developing a comparative advantage.

Key Features of the GKE Framework

The Green Knowledge Economy framework presented in Table 3 is a conceptual framework for the Green Knowledge Economy which will be used by the Geoeconomics team as a model for policy design and innovation, project identification and prioritisation, indicator-building, and establishing effective and participatory governance systems.

The Framework is designed to encourage an action/project-based approach to economic development strategy. It will be used to identify projects and activities that are classifiable within the 'green cluster strategies' shown in the GKE Matrix. What are the impacts of these projects/actions on economic competitiveness and wealth creation – and sustainability? The Matrix is meant to be read from left to right, across the rows rather than down the columns.

Table 3: The GKE Strategy Matrix

GREEN CLUSTER STRATEGIES AND ACTIVITIES	COMPETITIVENESS & WEALTH CREATION				SUSTAINABILITY		
	Intangible Capital Human and Social Capital	Physical Capital	Natural Capital	Impacts	Economic	Environment	Social
EGS = Environmental Goods & Services Sector	Skills Innovation Enterprise Finance Governance	Infrastructure Urban Land	Rural land ecosystems				
<p>Clean Energy EGS Business Growth: Solar/PV, hydro, wave & tidal, biomass, wind, geothermal, renewable consulting, additional energy sources, CCS, Carbon finance, Energy Mgmt</p> <p>Increase carbon / GHG reduction activity (finance, solutions)</p> <p>Increase renewable energy (electricity & heat) activity</p> <p>Increase energy saving activity</p> <p>Drive low carbon innovation and skills across sectors & supply chains</p> <p>Promote low carbon goods & services (finance, solutions)</p>							
<p>Green Building EGS Business Growth: Building technologies</p> <p>Improve energy efficiency & GHG of existing buildings (Retrofit)</p> <p>Achieve zero carbon targets for schools, buildings, homes and govt est</p> <p>Investment decisions based upon whole life value</p> <p>Spatial planning supports sustainable communities</p> <p>Drive sustainable design in the construction sector & supply chains</p> <p>Reduce embodied carbon of materials and increase local sourcing</p>							
<p>Green Transport EGS Business Growth: Alternative fuels, alternative fuel vehicles</p> <p>Reduce vehicle emissions</p> <p>Drive low carbon vehicle innovation</p> <p>Support low carbon local transport planning</p> <p>Increase walk, cycle, bus and train provision</p> <p>Increase end-of-life vehicles re-use, recycling & waste reduction</p> <p>Promote the use of green ICT</p>							
<p>Resource Management & Environmental Conservation EGS Business Growth: Air pollution, Environmental consultancy, Environmental monitoring, coastal protection, Maritime Pollution control, Noise vibration, Contaminated land, Waste mgmt, Water & Waste Water, recovery & recycling</p> <p>Deliver sustainable procurement and enable growth of GKE</p> <p>Encourage pro-environmental behaviour through lifetime of project</p> <p>Encourage sustainable consumption & production, e.g. eco-designed products or reduced products and waste</p> <p>Enhance and restore local land / ecosystems</p> <p>Encourage sustainable Food & Farming</p> <p>Encourage sustainable water and flooding management</p> <p>Increase recycling and reduces resources into the waste stream</p> <p>Encourage climate change adaptation</p>							



Annex 1: EU and UK Strategies

Clean Energy

EGS Sector - Hydro, wave & tidal, Biomass, wind, geothermal, renewable consulting, PV, Additional energy sources, CCS, Carbon finance, Energy Management

Low carbon industrial strategy

UK Carbon budget (Climate Change Act & EU ETS carbon trading)

Renewable Energy Strategy

Heat and Energy Saving strategy

Building a low carbon economy: unlocking innovation and skills

Green Buildings

EGS - Building technologies

Energy efficiency of existing buildings subject to HIP / EPC / DEC

Zero carbon targets for schools, buildings, homes and government establishments

Sustainable communities (DCLG planning policies) PPS1 etc

UK strategy for sustainable construction

Regional Spatial Strategy / LDF targets

Green Transport

EGS: Alternative fuels, alternative fuel vehicles

Vehicle emission standards

Low carbon vehicles strategy

Renewable Transport fuel obligation

LA Local transport plans assess for carbon reduction, air, access.

Department of Transport white paper - delivering sustainable rail 2007

End-of-life vehicles - reduce waste & promote collection, re-use & recycling & components

Digital Britain & Green ICT strategy

Environmental Conservation & Resource Management

EGS: Air pollution, Environmental consultancy, Environmental monitoring, Marine Pollution control, Noise vibration, Contaminated land, Waste mgmt, Water & Waste Water, recovery & recycling

UK sustainable procurement strategy & action plan

Pro-environmental behaviour framework

Sustainable consumption & production framework

Producer responsibility framework and legislation

Sustainable Food & Farming strategy

Pitts review flooding & water management (CFMP, WF Directive)

UK Waste strategy, increase recycling and reduce resources into the waste stream



Annex 2: The Green Collar Workforce (indicative)

Green Jobs: Types of Occupations Generated by Six Types of Green Cluster Strategy

Strategies for Green Economy Investments	Representative Jobs
Building Retrofitting	Electricians, Heating/Air Conditioning Installers, Carpenters, Construction Equipment Operators, Roofers, Insulation Workers, Carpenter Helpers, Industrial Truck Drivers, Construction Managers, Building Inspectors
Public Transport	Civil Engineers, Rail Track Layers, Electricians, Welders, Metal Fabricators, Engine Assemblers, Production Helpers, Bus Drivers, Transport Supervisors, Dispatchers
Energy-Efficient Cars	Computer Software Engineers, Electrical Engineers, Engineering Technicians, Welders, Transportation Equipment Painters, Metal Fabricators, Computer-Controlled Machine Operators, Engine Assemblers, Production Helpers, Operations Managers
Wind Power	Environmental Engineers, Iron and Steel Workers, Millwrights, Sheet Metal Workers, Machinists, Electrical Equipment Assemblers, Construction Equipment Operators, Industrial Truck Drivers, Industrial Production Managers, First-line Production Supervisors
Solar Power	Electrical Engineers, Electricians, Industrial Machinery Mechanics, Welders, Metal Fabricators, Electrical Equipment Assemblers, Construction Equipment Operators, Installation Helpers, Labourers, Construction Managers
Cellulosic Biofuels	Chemical Engineers, Chemists, Chemical Equipment Operators, Chemical Technicians, Mixing and Blending Machine Operators, Agricultural Workers, Industrial Truck Drivers, Farm Product Purchases, Agricultural and Forestry Supervisors, Agricultural Inspectors

Source: *Job Opportunities for the Green Economy*, Robert Pollin and Jeannette Wicks-Lim, Political Economy Research Institute, University of Massachusetts, June 2008

Top Green Economy Careers in the US

Agricultural Inspector, Architect (Environmental /Sustainable Design), Bicycle / Scooter Technicians, Biologist (Conservation), Building Operations Management, Business Manager, Camp Counselor, Career Consultants (Green), Car Manufacturing (Green), Chemist (Environmental), Climate Risk Analyst, Climatologist/Environmental Meteorologist, Community Affairs Manager, Complementary Health and Medical Care, Construction (Energy Efficiency - Green Building), Corporate Social Responsibility Professional, Ecologist, Economists (Environmental), Educators (Ecological), Emissions Manager, Emissions Trader, Energy Manager (Renewable), Engineers (Environmental / Pollution Control), Engineers and Developers (Sustainable Energy), Engineer/Biologist (Renewable Fuels/ Bio-Mimicry), Entrepreneur (Green), Environmental Health and Safety (EHS) Technicians, Fashion Designer (Green), Financial analyst/adviser specializing in socially responsible investing, Foot Massager, Food Scientist, Forester, Fund-Raising Director, Furniture Builder (Eco-friendly), Green Travel and Hospitality, Heating, air conditioning and refrigeration mechanic and installer, Hydrologist / Environmental scientist, Industrial Designer (Sustainable), Interface Designers, Interior Designer (Green), iPod/ iPhone Doctors, IT Specialists (Green Software and Hardware Developers), Landscape Architect (Green), Lawyer (Environmental), Lobbyist, Organic Food and Farming Production Specialists, Pest Control Technician, Pollution Control Technician, Protection Technician, Scientist (Environmental), Solar Installation, Sustainability Specialists, Toxicologist, Urban Gardeners, Waste Management, Wind Energy Developers and Construction Professionals

Source: Posted on Google by [Tracey de Morsella](#), 30th March 2009, [Green Jobs & Careers](#). The list is compiled from eleven sources: Fast Company, Fortune, Hotjobs, CareerBuilder, Greentech Media, Forbes, E Magazine, Super Eco, Inventor's Spot, Eco Salon and Boston.com



Annex 3: The Environmental Goods and Services Sector (government definition)

Level 1	Level 2
Environmental	Air Pollution Environmental Consultancy and Related Services Environmental Monitoring, Instrumentation and Analysis Marine Pollution Control Noise & Vibration control Contaminated Land Reclamation & Remediation Waste Management Water Supply and Waste water Treatment Recovery and Recycling
Renewable energy	Wave & Tidal Biomass Wind Geothermal Photovoltaic
Emerging Low Carbon	Alternative Fuel Vehicle Alternative Fuels Additional Energy Sources Carbon Capture & Storage Carbon Finance Energy Management Building Technologies

Source, BERR 2009