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Jobs, Skills and the Low Carbon Economy

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Briefing Note

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Centre for Climate Change Economics and Policy

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**Introduction**

The transition to a low carbon economy will require sufficient people with appropriate qualifications and skills to manufacture, install, operate and maintain a range of low carbon technologies and approaches. The actual numbers and types of skills required are uncertain and will depend on the speed and direction of the transition pathway, but there are reasons to doubt that market mechanisms alone will deliver the necessary skilled workers in a timely manner. This briefing note reports on work being undertaken by the Centre for Climate Change Economics and Policy to examine the roles of government, market and societal actors to ensure that appropriate and necessary skills and training provision are put in place to ensure that the UK can gain the economic and employment benefits of a low carbon transition.

Despite the recession reducing capacity challenges in some areas, the low carbon transition in the UK could still be held back as a result of skills shortages. This could mean that the UK does not benefit from a speedy and effective transition or does not gain the maximum economic and employment benefits from the transition. There appear to be issues of policy design and delivery as well as a range of roles for various low carbon stakeholders that need to be identified and addressed. The patterns of governance in this area and the ability of Government to intervene, in a financially constrained environment, are critical. This briefing note and the associated workshop aim to identify these issues and propose constructive ways forward.

Previous work by the authors has identified[[1]](#endnote-1) a number of ***potential market, government and governance constraints* *relating to the provision of low carbon skills***. These include four generic skills issues:

* **Short term attitudes** – the short-term nature of decision-making can deter employers from providing sufficient training or recruiting appropriately trained individuals;
* **Labour market structures** – the small size of most companies and the prevalence of sub-contracting in the construction sector can hold back training and multi-skilling;
* **Appropriability of skilled employees** – employers may be reluctant to provide training if the trained employees are likely to move to other companies;
* **Negative spillovers** – growth in demand for specific skills in competing sectors causing skill shortages elsewhere.

Additionally, ***four potential constraints were identified that are more specific to the low carbon transition:***

* **Uncertainty** – uncertainty around scale and rate of implementation of specific low-carbon technologies and their associated skills requirements could impact on training and recruitment decisions;
* **Technology novelty** – many low-carbon technologies may require novel skills or novel combinations of existing skills which are currently not available;
* **Scale and granularity of the transition** – some of the low-carbon technologies, notably nuclear, are large scale and require a concentrated geographically mobile workforce which can be difficult to mobilise;
* **Embeddedness and inertia** – firms’ training processes and programmes are often orientated towards existing and known technologies, rather than more risky options of investing in training towards new low-carbon technologies or opportunities.

We argue that most of these constraints, and often a combination of multiple constraints, apply in some degree to current low carbon skills developments in the UK, as well as to the broader Low Carbon Environmental Goods and Services (LCEGS) sector.

***Exemplar developments which illustrate these constraints include***:

* **Short term attitudes** –
  + - In a climate of policy uncertainty, delaying investment decisions including decisions about training can be a rational response[[2]](#endnote-2). Although this is linked to uncertainty, it is often difficult for employers to take the longer term view under which skills investments would pay back.
    - Funding for skills policy research has increasingly become employer led[[3]](#endnote-3) and subject to competitive bids[[4]](#endnote-4), this appears to have led to an increasingly short-term horizon reflecting employers’ immediate concerns. Equally, it appears that more recent studies involve fewer participants and cover a smaller scope with necessarily less emphasis on critical spillovers.
* **Labour market structures** –
  + - The construction sector operates with a large amount of sub-contracting, with about 40 per cent of the workforce operating as self-employed. This pattern of employment has been widely associated with a deficit in training provision and linked skill shortages[[5]](#endnote-5).
    - Construction sector employees often stick to single trades, which in turn means that there is little cross training and often little awareness of how one trade interacts with others or with whole house issues such as thermal bridging.
* **Appropriability of skilled employees** –
  + - Traditionally, insulation product manufacturers have used product specific training of workers to ensure that their products are installed and used correctly. These product specific qualifications have also been linked to warranty schemes run by BBA (British Board of Agrément) and CIGA (Cavity Insulation Guarantee Agency). However, the Green Deal requires that installers are qualified using qualifications based on National Occupational Standards (NOS) and based on the specification provided by the British Standards Institutes PAS2030[[6]](#endnote-6). The transition from company specific qualifications to transferable qualifications has required the rapid development of new NOS, new qualifications and putting into place training for trainers and wider training provision, which may be challenging for some manufacturers and installers.
* Both the CERT Scheme and the Green Deal have explicit attempts to take into account performance gap issues where the actual energy savings achieved are less than those predicted by the physical models. In part, these performance gaps can be explained by factors such as comfort taking and settling of insulation over time. However, there is significant variation in the in situ performance gaps by technology and it is suggested that skills are an important element underlying these differences[[7]](#endnote-7).
* **Negative spillovers** –
  + - Skills from the North Sea oil and gas industry are in demand by the offshore wind industry[[8]](#endnote-8), but the expected downturn in oil and gas employment, which was expected to free up workers, has not emerged due to increased activity due to high oil and gas prices.
    - Another possible negative spillover is with high voltage electricians between those reinforcing the national grid and those electrifying rail lines, especially the proposed electrification of the west-country mainline**.**
* **Uncertainty –**
  + - **Unc**ertainty over policy has been cited as a reason for delaying many low carbon investments and this uncertainty will also affect training decisions. Due to the current weak economic climate and downturn in construction activity, the photovoltaic panel installation industry was able to use the Microgeneration Certification Scheme (MCS) structures to ensure skilled installers were in place to deliver massive peaks in demand for installations. However, the industry is unlikely to be able to draw upon the same amount of spare capacity once the construction sector comes out of recession.
    - Currently, there is debate over a decarbonisation target for the UK electricity supply system. This has seen an unprecedented joint letter to the UK Government from the Carbon Capture and Storage Association, the Nuclear Industry Association and Renewables UK warning that the absence of such a target is putting at risk massive levels of infrastructure investment[[9]](#endnote-9).
* **Technology novelty** –
  + - The Renewable Heat Incentive will support the installation of heat-pumps and biomass heat, amongst other technologies. However, there has been limited recent experience with these technologies in the UK and this could lead to inappropriate installations and other problems.
    - Recently the Health and Safety Executive has issued a safety notice warning about the depletion of oxygen and carbon monoxide build-up when wood pellets are stored and transported[[10]](#endnote-10). The Renewable Heat Incentive will see an increase in the use of wood pellets as a heat source and this will in effect make this a new technology for many of the installers and open them and users to risks.
* **Scale and granularity** –
  + - A CITB and NSA Nuclear report argues that the civil engineering skills demand for the nuclear new build programme will be within the capacity of sector[[11]](#endnote-11). However, it identifies some areas of potential bottlenecks, notably with the modelling suggesting that, at peak, nuclear new build will require 38% of the available concreters and 30% of available rebar fixers.
* **Embeddedness and inertia** –
  + - The construction industry has been described as ‘conservative’ and “lack[ing] the necessary skills and experience required to implement novel technology”[[12]](#endnote-12). The changes to building regulations will require extensive innovation in technologies and methods. Problematically, the biggest changes will occur while the industry is emerging from recession - a period that traditionally is associated with skill shortages[[13]](#endnote-13).
    - Perceptions of the industry as dominated by ‘cowboys’ dominate popular perceptions of the repair and maintenance portion of the sector and it is hoped that the registration and licensing inherent in the Green Deal will drive up training and standards[[14]](#endnote-14). However, such long entrenched perceptions will be difficult to shift.

***A number of potential policy responses to these skills constraints are identified in the paper, but the applicability and likely success of these in the current UK low carbon context needs to be considered*.** These include:

* **Formalisation of transferable qualifications**;
  + As the energy efficiency and other low carbon labour markets develop, there will need to be an increasing use of transferable qualifications in order to encourage the spread of good practice and to ensure that the fragmented construction labour market obtains the needed skills.
* **Legally-binding targets for carbon emissions reductions and low carbon technology deployment**;
  + The UK has legally binding long term carbon emissions targets as a result of the Climate Change Act[[15]](#endnote-15). However, shorter and medium term targets, such as for electricity system decarbonisation, are another method of providing certainty which can reduce investment costs and encourage investments in infrastructure and skills.
* **Framework contracts and agreements between actors in key sectors**;
  + National Grid have a framework contract with the Electricity Alliance with those who can provide grid reinforcement work which provides a basis for planning and limits mutual poaching of staff[[16]](#endnote-16). This is an approach consistent with HM Treasury’s Infrastructure UK Infrastructure Plan[[17]](#endnote-17).
* **Licensing and accreditation schemes for key technology sectors**;
  + The CITB, ECITB and NSA Nuclear operate card schemes with many sites operating minimum qualification standards[[18]](#endnote-18), while other schemes such as Gas Safe and the Microgeneration Certification Scheme also have minimum standards for operation.
* **Government support for skills academies and training centres**;
  + National Skills Academies that develop new qualifications in particular areas increasingly have to be self-sufficient and dependent on an employer base[[19]](#endnote-19). However, there is a case for continuing support in critical low carbon areas where the potential for significant employment creation exists. The Government has supported efforts to train trainers and training courses associated with the Green Deal[[20]](#endnote-20). There is a case for similar support elsewhere in the low carbon area, especially surrounding the Renewable Heat Incentive.
* **Support for first movers in niches**;
  + Innovation in energy, and other systems, can be encouraged through the creation and support of niches within which developments can be accelerated outside of the main-stream[[21]](#endnote-21).
* **Increasing mobility of workers**;
  + The low carbon transition will require the generation of a mobile workforce able and willing to follow the construction requirements of the low carbon transition. This will require the building upon and reinforcement of schemes such as the Engineering Construction Skills for the Future[[22]](#endnote-22).
* **Providing a clear long-term cross-sectoral framework for a low carbon transition, including skills training**;
  + The National Infrastructure Plan could be extended to cover the skills required as this could allow the avoidance of negative spillovers between sectors. However, this would need to be done at the sort of detailed occupational level that the CITB[[23]](#endnote-23) and the ECITB[[24]](#endnote-24) model future demand.

***The UK government and training bodies, such as the Green Deal Skills Alliance, are seeking to provide an enabling framework to address these constraints, for example through DECC’s Energy Efficiency Strategy[[25]](#endnote-25) and BIS’s report on ‘Skills for a green economy’[[26]](#endnote-26). These types of measures aim to support private sector investment in new jobs and appropriate skills training in this area. The workshop will explore whether further policy or implementation measures by government or private sector may be needed to address these constraints, so that they do not create significant barriers to a low carbon transition in the UK.***

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