LETTERS

HAVE SOMETHING TO SAY?
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RESPONSE TO RISING CLOUDS

Dr Steedman, in his editorial 'Rising Clouds' (*Ingenia* 52) highlighted the opportunities offered to SMEs by both cloud storage and processing. I very much agree and this time it will be vital not to have another 'false dawn'. Earlier forays down this path will be familiar to many as network computing and application service provision both failed to gain traction through a combination of inadequate speed of network access and a reluctance by SMEs to relinquish direct control of their IT assets.

As my recent report *Open for Business* set out, the opportunities from both open source software and the various cloud services are legion. However, while the technology is now mature, I have real concerns about the business model and supporting contractual elements for cloud services or computing. These include:

Continuity of service The contractual agreements are complex and must focus on how to cope if things go wrong, for example how, and how quickly, will applications and data be retrieved if the cloud provider were to go into liquidation? Will data transferred outside the EU/European Economic Area under failure conditions be in potential breach of EU law? These issues are not incidental. They are fundamental to ensuring the continued integrity of key systems.

Federation between clouds A key interest for those using either public or private clouds will be interoperability between different cloud providers and portability of data and applications between cloud providers. At present, this is a major issue with common interfaces (APIs) yet to be properly defined. The European Commission report *Advances in Clouds: Research in Future Cloud Computing* has some trenchant observations in this area.

The challenge of auditing in the cloud In order to assess the integrity of IT systems, auditors traditionally rely on the two vital characteristics of control and visibility. In this new world, auditing will need to rely far more on assessment of the stated policies, rather than direct inspection. Public cloud providers in general will not accept requests for auditor site visits. There will need to be extensive cooperation between the auditors employed by those contracting services out to the cloud and the auditors for the cloud providers. It is unclear to me whether the key audit reports required under company law can properly be developed and signed off at present within the cloud environment.

While the opportunities for cloud usage are beguiling, I feel that it is still very much a case of *caveat emptor*.

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Download *Open for Business* at
www.amadeus.com/blog/17/09/open-for-business

RESPONSE TO SHALE GAS

The articles on shale gas in *Ingenia* 52 could signal rising pressure on the climate from carbon dioxide emissions as unconventional sources of fossil fuels extend the supply of hydrocarbons beyond previous forecasts. But cheaper gas could also be used with carbon capture and storage (CCS) to produce relatively low cost, low emission electricity and so help with climate change mitigation.

Fuel switching from coal to gas may also reduce carbon dioxide emissions to the atmosphere in the short term, but it is cumulative emissions that matter above all. The fossil carbon reserves in shale gas must therefore also be addressed when it is used for power generation.

It is essential that CCS plays a growing role in future natural gas use, not just in power generation from coal. CCS technologies already available can produce low carbon energy vectors – such as electricity, heat or hydrogen – at costs that, especially with cheap gas as the input, are likely to be competitive with most renewable and nuclear sources. Capital costs and operating losses will fall further if early demonstration plants give opportunities for learning by doing, but already it is clear that gas CCS power plants offer a new and unique low capital (and therefore flexible) route to decarbonising electricity production.

Secure storage is readily available under the North Sea using proven technology. Around 20 million tonnes of carbon dioxide per year are currently being captured from fossil fuel sources and injected deep underground, in North America primarily, in producing oil fields for enhanced oil recovery, but also, and solely for climate-related purposes, into deep saline formations in Norway and Algeria. Another 13 million tonnes of carbon dioxide per year are expected to be injected into deep geological reservoirs by 2015 in projects currently under construction.

In the UK, concerns are raised about the carbon implications of another dash for gas in power generation. Cheap shale gas will certainly accelerate this, but in the current ongoing debate about UK electricity market reform it is important to recognise that, with a level playing field on offer for all technologies, shale gas could also help meet our climate targets cost-effectively by powering natural gas power plants fitted with CCS.

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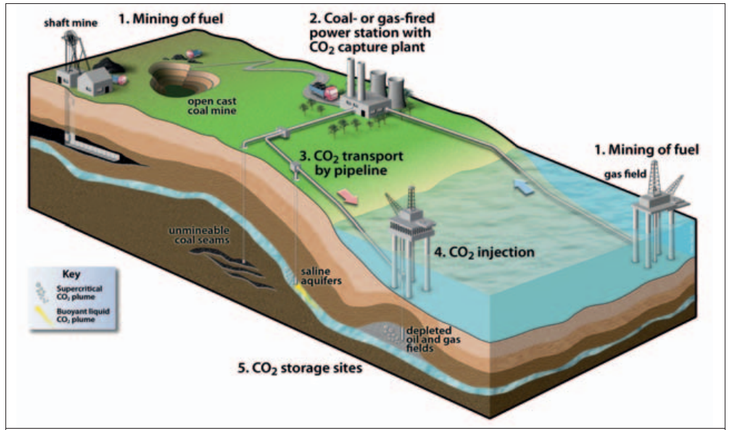

A conceptual plan for CCS, involving two common fossil fuels. Methane gas produced from offshore gas fields is brought onshore by pipeline and is burnt in a power station to generate electricity. The CO_2 is then separated from the flue gas, compressed into a dense liquid and sent offshore using a pipeline. The CO_2 goes to an oilfield, or other sealed-off porous rock formation, where it is stored kilometres underground, instead of being vented into the atmosphere from the power station © Scottish Carbon Capture and Storage