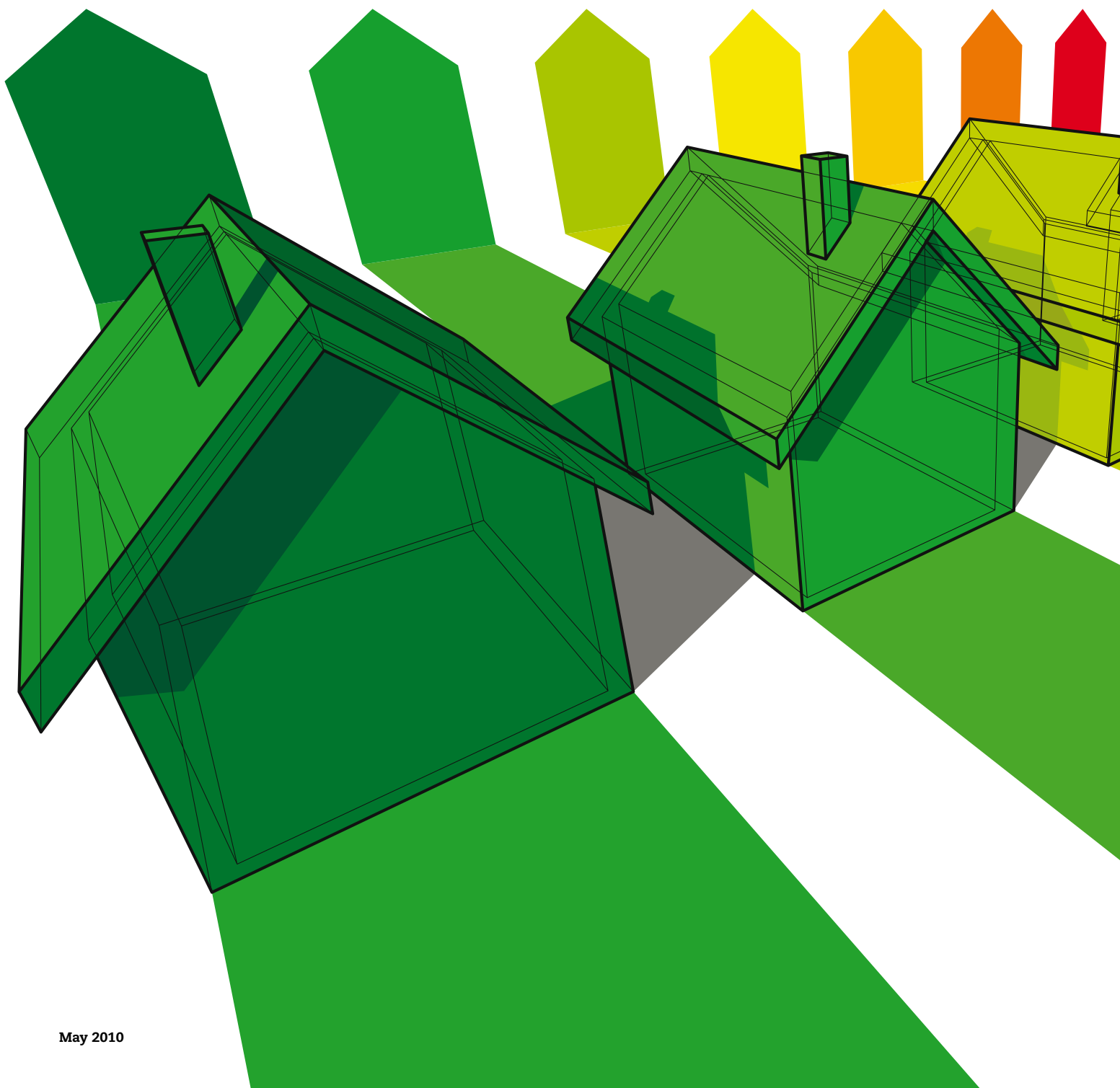


MANY EXPERTS HIGHLIGHT ENERGY EFFICIENCY AS A KEY LOW-COST AREA FOR GREENHOUSE GAS EMISSIONS MITIGATION. SO WHY IS IT UNDER-UTILISED BY THE CARBON MARKET?

ROBIN LANCASTER REPORTS

Something to save



Energy efficiency is highly placed in any analysis of the major measures needed to tackle climate change. It is touted by many climate experts as a low-cost option that can generate large volumes of greenhouse gas (GHG) emissions reductions, as well as financial savings for companies. Yet, its uptake by developers of projects that create carbon offsets has been slow. Why is this? Does it mean carbon market reforms are needed or are new measures, other than market-based mechanisms, required to drive home the benefits of energy efficiency?

Those benefits have been well documented in recent times. A 2009 report by consultancy McKinsey & Co estimated that energy efficiency savings of 14 billion tonnes of carbon dioxide equivalent (tCO_{2e}) a year could be achieved by 2030. And a 2008 analysis by the Paris-based International Energy Agency (IEA) made 25 energy efficiency policy

recommendations that, it estimated, could reduce GHG emissions by around 8.2 billion t of CO_{2e} a year by 2030 (see box, page 20).

Such potential large volumes of reductions should be an attractive proposition to participants in the carbon market, particularly project developers. As Trading Carbon went to press in mid-April, the Kyoto protocol's clean development mechanism (CDM) – the world's leading scheme for carbon offset projects – had 730 energy efficiency projects out of 4,968 in its pipeline, according to UNEP Risoe Centre data.

But only 190 of those 730 projects are for so-called demand side or end use energy efficiency, where most potential GHG savings can be made. The other projects fall under supply side energy efficiency, where an industrial site has introduced its own source of power generation or made efficiency improvements to power generation.

The 190 demand side projects – across households, industries and services – represent only 3.8 per cent of projects in the pipeline, and, in terms of GHG cuts, they are estimated to generate only 60.3 million (M) t of CO_{2e} by 2020. So far, only 68 of these projects have been registered by the UN, with 25 having been issued with certified emissions reductions (CERs – CDM carbon credits). Even if supply side projects are included in the figures, it still amounts to less than 1 billion t of reductions by 2020.

So why has the CDM, so far, failed to deliver more in an area with so much potential?

The key, according to Anne Arquit Niederberger, head of San Francisco-based energy and environmental consultancy Policy Solutions, is a mismatch between the CDM and energy efficiency on many levels.

“The potential for low-cost energy efficiency reductions is huge, so there's a massive potential not met by carbon market demand. Without a stringent emissions cap driving demand, the market can't handle large volumes,” she said.

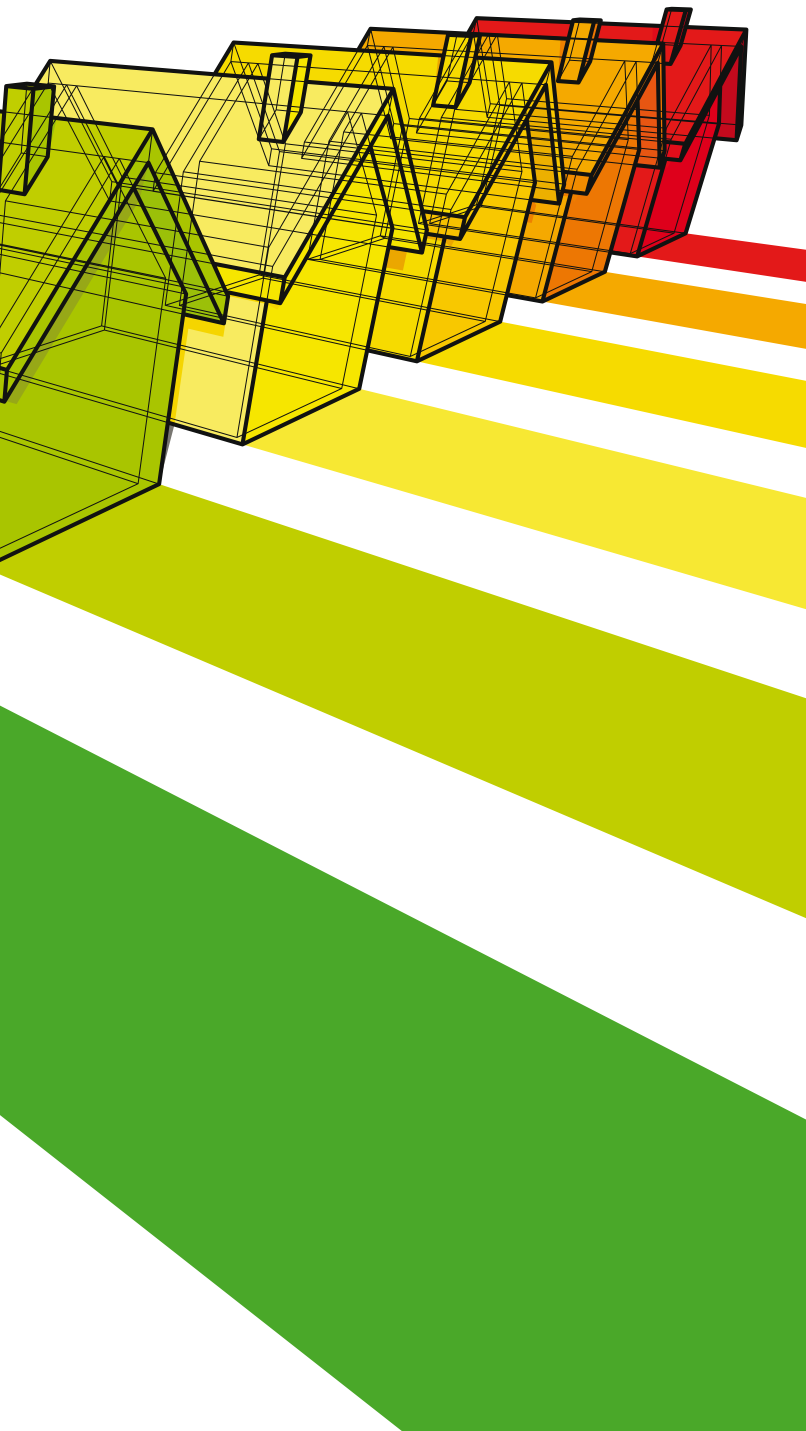
McKinsey & Co estimated that energy efficiency savings of 14 billion tonnes of CO_{2e} a year could be achieved by 2030

For example, Oslo-based energy and environmental consultancy Point Carbon estimates that demand for all Kyoto protocol credits – CERs and emissions reduction units from joint implementation projects – to 2012 is only just over 1.6 billion t of CO_{2e}.

A second mismatch is created by the many barriers to energy efficiency that the CDM doesn't address, said Arquit, adding that many of these barriers are non-financial, which is problematic as the CDM is basically a financial incentive.

For example, the ‘split incentives’ barrier, such as the so-called landlord-tenant problem, whereby the landlord provides the electrical appliances, but has no incentive to choose efficient ones as the tenant pays the electricity bill.

Other problems arise because a lot of energy efficiency projects on paper are profitable, she said, and profitable investments raise questions of ‘additionality’ – whether or not the project would have gone ahead anyway without the carbon finance. Much of the savings made by an energy



Energy efficiency leads the way on greenhouse gas savings to 2030

In a 2009 analysis by consultancy McKinsey & Co, energy efficiency topped the list of four key abatement opportunities in terms of potential GHG reductions costing less than €60 (\$81) a tonne of carbon dioxide equivalent (tCO₂e).

The report – ‘Pathways to a low-carbon economy: version 2 of the global greenhouse gas abatement cost curve’ – said energy efficiency could provide reductions of up to 14 billion t of CO₂e a year by 2030 compared with a business-as-usual scenario, which would see emissions rise by 70 billion t. This compared with a reduction of 12 billion t each from low-carbon energy supply changes and terrestrial carbon sequestration, and 4 billion t from behavioural changes.

In most cases, the efficiency improvements – such as switching to improved motor systems, insulating buildings or switching more energy efficient lighting from incandescent lighting – can be done at a negative cost to the consumer, McKinsey said. Thereby, the efficiency also brings companies significant financial benefits.

A separate study by the Paris-based International Energy Agency (IEA) in 2008 – in support of the G8 countries’ ‘plan of action’ on climate change – made 25 energy efficiency policy recommendations that, it estimated, if implemented without delay could save around 8.2 billion t a year by 2030.

The IEA recommendations include: more investment in energy efficiency; national strategies and goals for energy efficiency; building codes for new buildings; mandatory energy certification schemes for buildings; mandatory performance requirements for appliances; phasing out incandescent light bulbs; mandatory fuel efficiency standards for vehicles; improved energy management for industry; and incentives for utilities to deliver cost-effective energy savings to end-users.

efficiency project are on costs, rather than the CO₂. The McKinsey report estimated, for example, that most of the energy efficiency savings are cost negative.

And, as the CDM tends to be based on the principle of payment on delivery of CERs, there are questions over how to procure the up-front financing, particularly for non-revenue generating activities, such as installing more energy efficient light bulbs in households.

“In doing any energy efficient project, if it isn’t a behavioural change then the capital expenditure is significant,” said Ed Gluckman, a managing director of carbon and energy management firm Global Carbon Exchange in Cape Town. “Even installing LEDs (light-emitting diode lights), the cost is still high, unless there’s a big bank in the background to help,” he said.

Policy Solutions’ Arquit agreed, adding that compact fluorescent lamps (CFLs) – another type of energy efficient lighting – can be as much as five times more expensive as incandescent lamps, yet the revenue from CERs is only gained after the reductions are made. “It’s not a good match for what the CDM can offer,” she said.



Ed Gluckman, Global Carbon Exchange: Capital expenditure can be significant for energy efficiency projects

Even participants involved in end use projects admit that it is a difficult area to develop under CDM.

“It is true that demand side energy efficiency has been challenging in the context of CDM,” said Alexandre Marty, head of policy for carbon and environmental products, at EDF Trading, the trading arm of France-based utility EDF. “There are a lot of parameters to handle – essentially in determining the baseline scenario and calculating the emissions reductions. A number of the parameters are out of the control of the developer and so it is quite burdensome and costly, particularly the monitoring requirements,” he said.

EDF is involved in a CDM project in India to distribute approximately 450,000 CFLs in exchange for working incandescent lights in the Rajnandgaon district of Chhattisgarh state. It is expected to generate around 200,000 CERs and similar projects across another five Indian states could lead to reductions of up to 10 Mt of CO₂, said EDF.

“There are vast differences from traditional CDM, which has one project activity in one location. This is completely different; the distributed nature and having to multiply all these small measures is quite challenging,” said Marty. “There is also a strong social component that needs to be taken into account, which needs different skills from what would be needed from doing a supply side project,” he said.

In general, project developers rarely see the energy saving benefits of these types of projects. “Basically, with the CFLs, the savings are going to the consumer – maybe also to the grid operator in terms of load management. The developer is not directly benefitting, only in the value of the emissions reductions that it will make,” said Marty.

Others agreed.

“Project proponents get more CERs from other project types,” said Steve Schiller, principal of Schiller Consulting, a California-based energy and environmental consultancy, and also a member of the UN’s CDM small-scale working group.

“To justify the effort, proponents of these projects tend to be interested in the social side of the project as well as

the financial side,” he said, adding that measurement and verification is a big issue for energy efficiency, even outside of the CDM. “It’s counterfactual; how do you measure something that doesn’t exist,” he said.

So what attracts a developer to such projects?

In the example of the Indian CFL project, it offers “scalability and is also close to the company’s core business: demand side management,” said Auroskanda Vepari, an originator at EDF Trading.

The post-2012 carbon world is also an attraction, said Marty. “There is a better prospect for credits from these types of projects to be used for compliance,” he said, in reference to the strong hints from the European commission, for example, that only high quality offsets – ones with a strong sustainable development component – will be eligible for compliance in the EU emissions trading scheme from 2013.

The company is also looking to a relatively new CDM methodology – AMS II J – to boost future CFL projects.

AMS II J provides a more efficient framework for developing CFL projects, said EDF. “It really simplifies the approach to the project and standardises the parameters required by taking a conservative approach,” said Marty.

In particular, compared with the AMS II C methodology – which the Rajnandgaon project uses – it reduces the monitoring requirements as it doesn’t require individual bulb usage to be metered.

But, although the AMS II J methodology was approved by the UN in 2008, it has yet to be used for a registered project.

“We knew that the version approved wouldn’t work,” said Policy Solution’s Arquit, who has worked on the development of this and other CDM methodologies. “We had long discussions about it (with the UN), but it was still approved with all the problems that made it not viable,” she said.

A third version of the methodology is in operation, with a fourth version about to be submitted to correct the problems, said Arquit. “It’s been a two-year process, yet knowing we had these problems at the start,” she said.

Unfortunately, when it comes to end use energy efficiency, the experience with AMS II J is not unique.

“A lot of energy efficiency methodologies are not used. They were approved with flaws from the start,” said Arquit.

Most of the CDM efforts have centred on the use of small-scale methodologies (AMS) – which, in itself, restricts the carbon finance returns due the size of the project. And where large-scale methodologies have been approved – for example, AM46 – they have proved difficult to implement.

“The level of complexity in AM46 is just mind boggling,” said EDF’s Marty. “All the constraints and burdens of monitoring make it a huge endeavour,” he said.

As Trading Carbon went to press, only two projects – both still at the validation stage of the approval process – were listed in the UNEP Risoe Centre’s database as using AM46.

However, one of the projects – the large-scale distribution of CFLs in Ecuador – is close to completing validation, said Wolfgang Wetzler, senior project manager at Energy Changes, a Vienna-based developer involved the project.

“In one month, we are going to finish the validation and most of the project parts are successfully implemented,” he

told Trading Carbon. “I think when you take enough time for the preparation and work like a tour guide, an impossible project will be possible,” he said. According to the project design document, the Ecuador CFL project could generate almost 4.4 million CERs.

More CERs could also be generated by energy efficiency projects through the CDM’s programme of activities (PoAs) – which, for many, is seen as a perfect fit for end use energy efficiency projects. Programmatic CDM groups several small emissions savings activities, which would be uneconomical on their own, under one PoA.

“You could do a lot of energy efficiency projects under PoAs. It’s where it belongs,” said Schiller, at Schiller Consulting.

“PoAs have been conceived as the right framework for (energy efficiency) projects, but we are waiting for operational feasibility,” said EDF’s Vepari. “There a few projects out there, but there are issues still to be ironed out,” he said.

So far, only two PoAs have been approved, due to problems

A lot of energy efficiency methodologies were approved with flaws from the start

Anne Arquit Niederberger, Policy Solutions

such as the liability of the projects’ designated operational entities – UN-appointed auditors that help with the approval process (see Trading Carbon, April 2010, pages 32–33).

As a result of all these concerns with CDM project development in this sector, several people question whether it is the most appropriate mechanism for utilising the many benefits of energy efficiency.

“I don’t believe that one shoe fits all,” said Schiller. “One of the problems with the CDM is that it is the only mechanism for doing things in non-Annex I (developing) countries. But one mechanism is not able to do everything. There is a need for different mechanisms for specific investments in developing countries. The CDM isn’t going to cut it on its own,” he said.

Building codes or performance standards could work through ‘nationally appropriate mitigation actions’ (Namas) by developing countries or sectoral approaches, he said.

Namas were first discussed at the UN climate meeting in Bali in 2007 and are in December’s Copenhagen accord. They refer to any action, probably on a voluntary basis, taken by developing



Anne Arquit Niederberger

UK CRC energy efficiency scheme

The UK CRC energy efficiency scheme started on 1 April and covers organisations that consume more than 6,000 MWh of electricity a year, which the UK Department of Energy and Climate Change (Decc) estimates at around 5,000 entities. These organisations will have to record and monitor their carbon dioxide (CO₂) emissions resulting from electricity use and purchase allowances equivalent to their emissions each year. Companies can also trade the allowances.

Decc hopes that the scheme will save around 4 million tonnes of CO₂ emissions by 2020.

A further 15,000 organisations with a half-hourly electricity meter, but which don't consume enough electricity to qualify for the scheme and so do not have to buy allowances, will also need to make an emissions 'information declaration'.

"At a basic level, the impact on the bottom line will be very small," said Ben Wielgus, an adviser in the sustainability team at professional services firm KPMG in Manchester. "But many organisations are not aware of the significance of fines if they fail on data requirements," he said.

"There's every chance the scheme will not be universally complied with," said Noel Doran, a senior associate in the environment and planning group at law firm Taylor Wessing in London. "The penalties are designed to make non-compliance costly," he said.

In the early part of the scheme, little trading activity is expected, with most companies concentrating on simply understanding the CRC.

"The scheme itself is the immediate focus," said Stephen Sweet, an environmental services manager at Deloitte in London. But, he added, that the trading side "will have to be thought about in the near future – (determining) a trading strategy and how to actually buy allowances from others."

countries to reduce GHG emissions (see Trading Carbon, April 2010, pages 30–31). Sectoral approaches would use a performance standard or baseline across an industry sector to determine emissions reductions (see pages 10–14).

"Efficiency would benefit from more mechanisms," Schiller added. "The CDM has a dual purpose – sustainable development and GHG mitigation. There's a conflict there and the CDM suffers from trying to do both. For example, replacing kerosene lamps with LEDs is a great technology that people can move to. There are GHG reductions, but if you don't get the project right on the GHG side then you are going to allow people in Europe and Japan to emit more GHGs," he said.

"I've tried hard to get the CDM to support energy efficiency, but I'm at the point where I see a need to find a better way," said Arquit at Policy Solutions. "My conclusion is that other approaches might be the right way to go," she said. Particularly given that "the CDM theoretically only contributes to climate mitigation to the extent that it lowers mitigation costs and thereby encourages capped countries to

take on more ambitious commitments than they otherwise would have, but I see no indication that this is a likely scenario," she added.

Although Global Carbon Exchange still develops projects that create carbon credits, the company has moved away from that being its core business, said Gluckman. "When I joined the company a couple of years ago, 90 per cent of our focus was on emissions reduction projects. The first thing I did was an audit of all projects and what I found was long lead times because of lengthy validation and verification," he said. "Now we cherry pick our projects, in particular, doing them with a strong project owner who has the ability to pull the project together," he added.

Offset projects now account for a much smaller part of the company's business, but it is still heavily involved in the promotion of energy efficiency activities with its core business involving energy efficiency audits and GHG emissions reduction strategies for companies.

Gluckman views the carbon market as an awareness builder in this area, adding that the market is not "significant enough to really push large-scale projects forward."

Others, with experience of the carbon market, are having similar thoughts.

"We should avoid the conclusion that the carbon market is the solution to everything. A carbon price is important, but it shouldn't be thought of as a panacea," said Arquit at Policy Solutions.

Internationally, she thinks energy efficiency needs to be discussed on the same level as the efforts to reduce emissions from deforestation and degradation (Redd+) – which has a dedicated funding initiative and is likely to be pursued outside of the CDM context.

"I think there needs to be a dedicated mechanism to fund energy efficiency activities in developing countries. False expectations for the carbon market have detracted from this discussion. There is a lot of money going into CDM capacity building in Africa, for example, but I question whether that's the smart thing to do. We know there are barriers to investment and they are nothing to do with the price of carbon," she said.

"We know pretty much what policies and measures need to be put in place – for example, the IEA's 25 policy recommendations. We know the basic building blocks and so can come up with a menu that can be supported," she added.

Other policies are being implemented already or are planned that aim to drive energy efficiency, for example, the UK's CRC energy efficiency scheme – which started on 1 April (see box, page 22) – and an energy efficiency trading system under development in India. Yet, companies, even in the midst of economic recession, have opportunities for efficiency savings that they are not taking.

"Every company out there can increase efficiency by between 5 and 30 per cent a year," said Global Carbon Exchange's Gluckman, adding that, as well as energy usage, water, waste, paper and transport can all be areas to improve a company's carbon footprint and save money.

"Energy efficiency and general efficiencies are the best place for chief executive officers to put money during a recession. If you can't find a better place, then you should give it back to the shareholders," he said. ●