

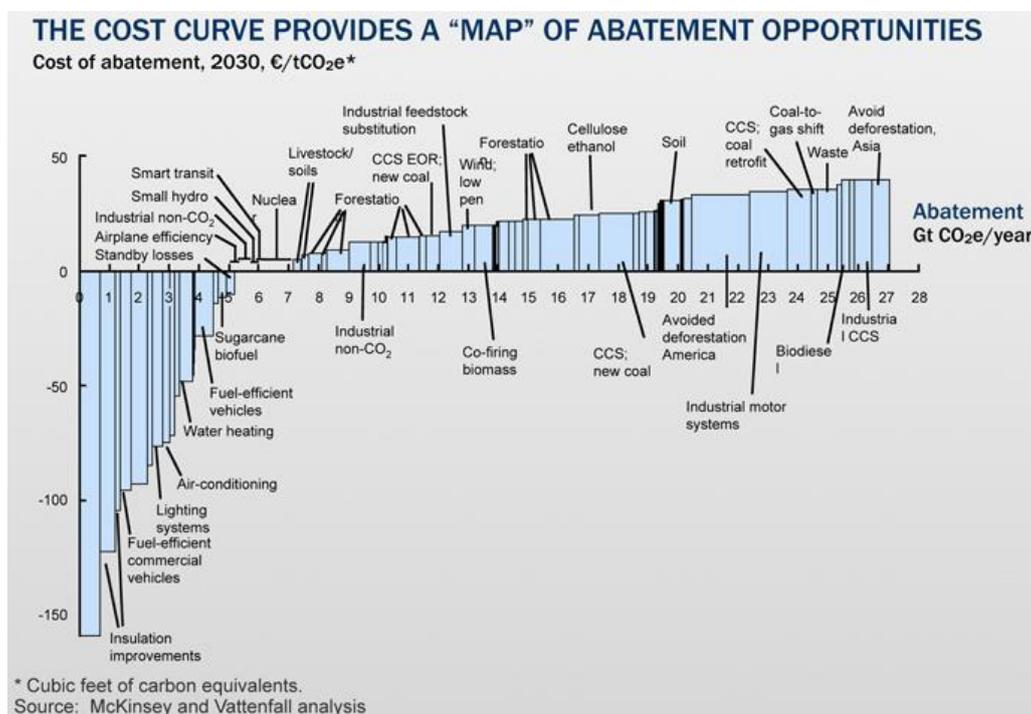
Adoption of Clean Technology

Kim Warren 25-01-10

There is increasing concern that actions to slow climate change are failing to progress, not due to lack of technology or excessive cost, but because of failure by policy-makers and corporate management to drive adoption.

A [report from Chatham House](#) finds that viable clean-tech technologies take decades to adopt, and [research by the McKinsey Global Institute and the Vattenfall Institute](#) appears to show that over 25% of global emissions could be eliminated at a *profit* and over 60% at no net cost to the global economy [figure 1].

Figure 1: The cost curve for CO₂ emission abatement opportunities



The EU's Cordis program for research funding recognises the problem and has issued a [Call for research](#) [no longer available on the EU website] into the "Interplay between social, economic and ecological systems", key extracts as follows ...

"... The topic is calling for bottom-up approaches addressing the question of how to overcome the gap between awareness of the issues at stake and the concrete engagement in sustainability-driven action, as individuals and as a society. ... The exercise shall address issues such as how to engage individuals and collectives on sustainable paths; what is needed in order to address the barriers and make the most of the drivers for sustainable development in terms of a) new policy mixes and b) new and innovative mechanisms for cooperation and partnerships between actors in public, private sector and the civil society.

... Expected impact: Better understanding of what it takes to transform the challenge of sustainable development into practice in Europe, and increased ability to develop responses on the ways in which individuals and organisations can advance towards sustainability. ..."

The form of 'the answer' to this question seems clear, if not yet the detail of what that answer might be:

1. However economically viable any sustainability solutions may be, they will not deliver results unless acted upon
2. Many such solutions are already economically viable, so initial efforts should be devoted to early and rapid adoption of those solutions
3. As technologies improve, further solutions will cross the viability threshold, so later efforts should progress onto those solutions, as this occurs

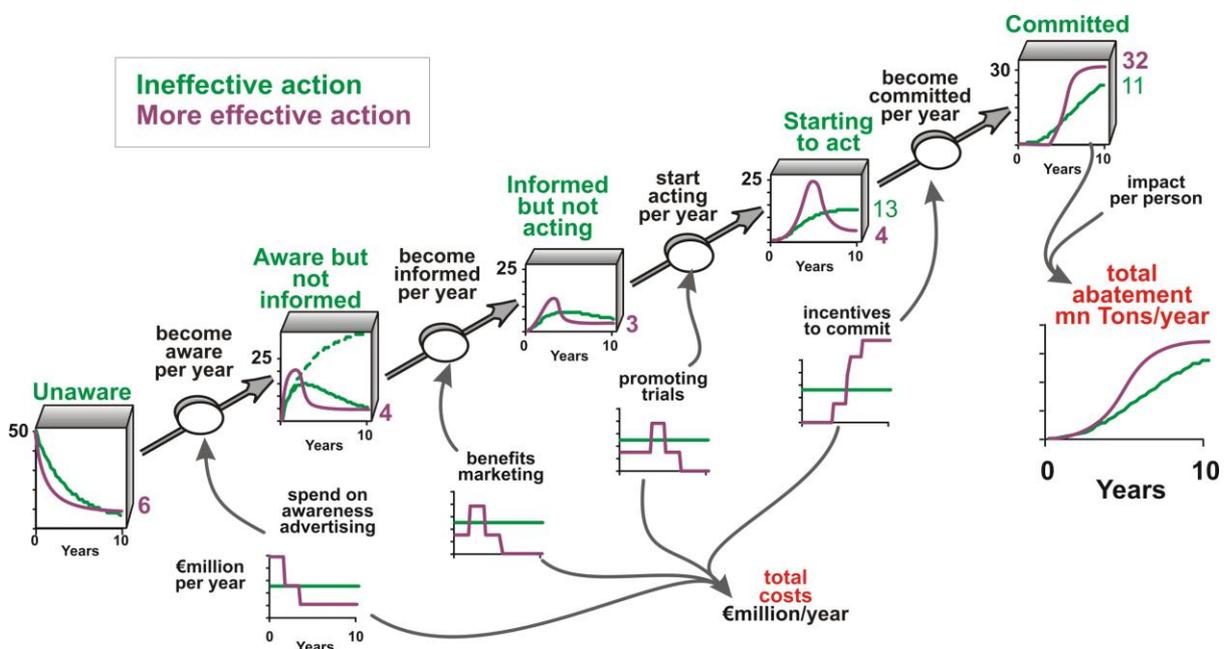
The main complication to this logic arises from the differential trajectories of alternative technologies – i.e. we might pursue solution A today, because it is viable, but in 5 years time solution B has improved so much that it would have been better not to start on A but wait for B.

The key question of the EU research Call, and the key challenge, is how to drive adoption. This is not a technological question, or even predominantly an economic one – it's a marketing challenge. Many sectors already have high expertise in driving adoption of products, services and behaviours, both by individuals and organisations.

- Fast-moving consumer goods companies drive uptake of new products
- Consumer service firms drive adoption of new behaviours, e.g. Starbucks
- Business-to-business providers drive adoption of products and services, e.g. SAP accounting systems

The challenge such organisations overcome is to move the target audience through 3-4 main states [1] making them *aware* of the product or service [2] *understanding* it, not just functionally – what it does – but emotionally – why you should want it [3] *adoption* – buying or using it, and sometimes [4] *commitment* – total loyalty to only that product or service. Figure 2 shows how a simulation portrays the movement of a product through these stages over a 36-month period, with two scenarios showing more or less effective choice of marketing priorities.

Figure 2: Adoption pipeline for CO₂ emission abatement [illustrative]



The challenge with GHG-abatement - most immediately the options to the left of the cost-curve in figure 1 - reflects these issues:

- Virtually no-one – people or organizations - is aware of the available solutions [most may not even understand why anyone should be interested in seeking such solutions]
- ... or that they are already economically feasible

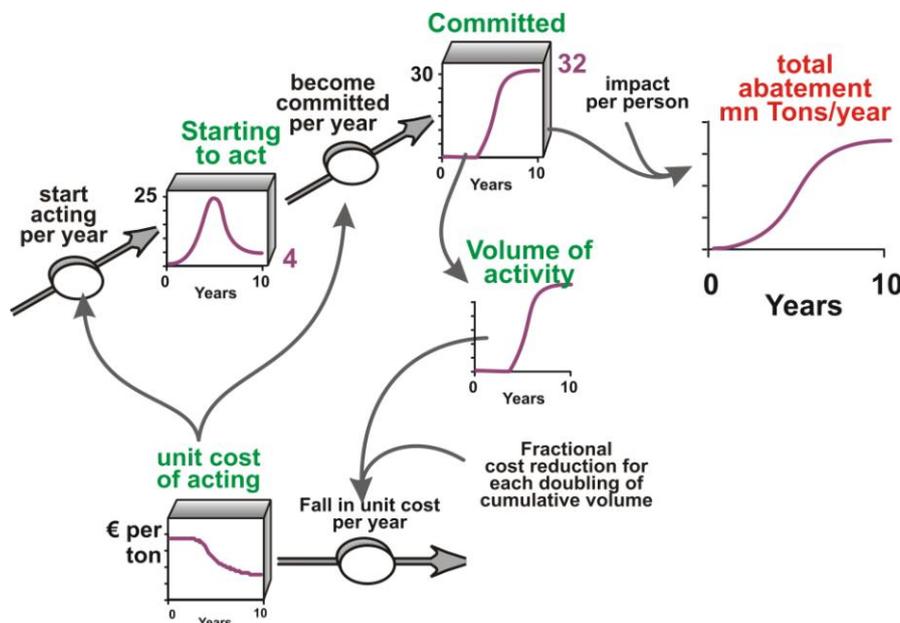
- They are under-sold, so there is minimal adoption
- ... so their availability and attractiveness is unknown, so very few people commit to acting on them.

Policy options to get this system moving might include:

- Mass awareness-advertising, and information-advertising
- Regulation – to enforce the adoption
- ... plus subsidy and taxation changes to both increase the adoption incentives and move more options to the net-savings positions, at least from the point of view of the individual person or organisation.

To illustrate the challenge - the UK Carbon Trust are tasked with driving this system amongst businesses. The way to kick this system into action is to start with the most economically viable options and drive them fast and hard. Instead, the Carbon Trust provides 'energy audits' that generate a daunting evaluation of everything that an organisation could do. The result is an investment case that is complicated and expensive, and therefore rarely acted upon. The Carbon Trust's other efforts focus on early-stage subsidy of new technologies – but more fundamental R&D is not what is required, rather, the rapid-scale implementation of already proven technologies. If this were to occur, it would then trigger further experience-curve and scale-related economies that would make those technologies still more attractive [figure 3].

Figure 3: Experience-curve cost reductions interacting with accelerating adoption



These mechanisms are well-known, and the data on the situation is easily researchable. They are amenable to powerful policy interventions by Government, and to strategic initiatives by larger corporate suppliers of clean-tech solutions, such as intelligent power-systems and insulation products.

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