Environmental regulation, innovation and competitiveness – making the link

The European economy has two major challenges: the need to create a sustainable economy, and the need to be competitive in the global market. It is well known that our current society is not sustainable; we need to achieve a major increase in the efficiency of resource use, whilst also preventing pollution. However, at the same time we must ensure that European businesses are able to compete globally, and that they are able to create and retain jobs. These two challenges are often seen as in contradiction to each other – but, for the sake of Europe and the rest of the world, they need not be.

This paper will examine how the challenges of competitiveness and innovation interrelate, and how they link with innovation and regulation. It also discusses the likely impacts of REACH on innovation in Europe.

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Regulation and competitiveness

Many stakeholders, particularly from the industry side, portray regulation as an enemy of competitiveness. This portrayal depends on the "common sense" approach that if industry has to conform with lots of regulations they are less likely to spend time innovating, and that they are likely to move their plants away from regions with more regulations.

However, these assumptions have been challenged by many of those who have studied the issue. For example, the Harvard economist Michael Porter suggested an alternative relationship in 1995 *[1]*:

"Companies can improve resource productivity by producing existing products more efficiently or by making products that are more valuable to customers – products customers are willing to pay more for. Increasingly, the nations and companies that are most competitive are not those with access to the lowest-cost inputs but those that employ the most advanced technology and methods in using their inputs.

"Environmental progress demands that companies innovate to raise resource productivity – and that is precisely what the new challenges of global competition demand. A truly competitive industry is more likely to take up a new standard as a challenge and respond to it with innovation. An uncompetitive industry, on the other hand, may not be oriented toward innovation and thus may be tempted to fight all regulation."

In reality, competitiveness involves many different factors, including issues as diverse as levels of education, the level of corruption and the macroeconomic environment. The World Economic Forum publishes an annual list ranking the "Growth Competitiveness Index" of many of the world's nations. The top 7 nations on this list in the 2004 study were as follows *[2]*: Finland > US > Sweden > Taiwan > Denmark > Norway = Singapore.

These ratings are particularly interesting as four out of the top seven countries are bound by EU product regulations – Finland, Sweden and Denmark are EU Member States, and Norway is a member of the European Economic Area and must apply all EU internal market legislation (including REACH). It is also interesting to note that these are Nordic countries – a region which has a tradition of strong environmental regulation and social support.

China is the country most often mentioned in the competitiveness debate in Europe. There is undoubtedly plenty of cheap labour available in China, but overall competitiveness relates to much more than labour costs, and the World Economic Forum places China at number 46.

Clearly, EU businesses must compete with those in China – but they will not do it by cutting wages or through a race to the bottom on regulation. As Digby Jones, the Director General of the UK business lobby group the Confederation of British Industry, put it *[3]*:

"We've got to drive toward getting everyone's skill levels up (…). If you're trying to compete only on

price, you will fail, and you will go bust and China will have your lunch. If you move into innovation, and high value-added [products], you have nothing to worry about. Britain has got a tremendous future."

Environmental regulation and relocation

The "common sense" claim that environmental regulations lead to companies moving abroad has not been supported by research by academics – primarily because environmental regulations are such a small part of business costs. For example, a 2004 study of the impacts of air pollution legislation carried out by the British consultancy company AEA Technology for DG Enterprise *[4]* found that:

"It is extremely difficult to assess the impacts of air pollution legislation on relocation from the other factors that determine location decisions, though it is clear that labour costs and access to market are much more important than environmental legislation.

"A review here has found that industrial relocation for reasons of different environmental standards is not found to be significant from OECD countries to non-OECD countries.

"However, the evidence data on movement within OECD countries does show some evidence both for and against an effect."

The lack of evidence for environmental regulation causing companies to relocate was also pointed out by DG Economic and Financial Affairs in their review of the European Economy in 2004 *[5]*:

"Evidence on crowding out of dirty industries to pollution havens in third countries seems to be very shaky and not convincing at all.

"This might not come as a surprise given that other factors normally drive decisions of investment locations, and given the convergence of environmental standards around the world, including developing countries."

Overestimation of regulatory costs

Studies that examine past debates over costs of environmental regulation have found that costs are generally overestimated by industry, and are often also overestimated by government *[6]*. A recent example is a report by AEA Technology for the UK Government, examining the costs and benefits of a number of past air pollution regulations *[7]*.

One of the regulations examined was improved vehicle emission standards:

- a cost for the UK of £16.1-22.8 billion for 1990-2001 was estimated before the regulations were put in place;
- AEA estimated the actual cost of the regulations to be £3 billion (€4.3 billion) over the 1990-2001 period.

This example gives a 5-fold difference between the predicted costs and the actual estimated cost, which means that costs were substantially over-estimated during the period when these standards were being politically debated.

It is also interesting to note that the cost of this legislation to the UK over 11 years was similar to the predicted total costs of REACH to the entire EU economy over 11 years – €2.8-5.2 billion *[8]*. This gives an idea of the small scale of REACH costs when compared to other regulatory actions.

AEA concludes: "The analysis of individual ex ante and ex post costs has shown that in most cases, ex ante costs were over-estimates. In many cases, these over-estimates were very significant. This also leads us to the conclusion that legislation itself acts as a spur to research and innovation.

"In cost-benefit analysis, the 'typical' assumption has been that the cost estimates are far more accurate than the benefits analysis. The data in this study shows that this conclusion is rarely valid."

Innovation – the key to both competitiveness and sustainability

It is clear that society needs to develop new ways of doing things, and new products to do them with – this will require considerable innovation. It is also clear that Europe will need to be innovative in order to be competitive. It is therefore important to understand what innovation is, and how it can be promoted.

Innovation has two components *[9]*:

- the rate of innovation is the quantity of innovations produced over a given period of time;
- the direction of innovation is related to the quality of innovation produced and its socially beneficial or damaging consequences.

Knowing the rate of innovation is not enough – the direction is crucial. An increase in unsustainable innovations (e.g., new disposable products) is not going to help achieve a more sustainable society.

Innovation is not evenly distributed – one company might be very innovative, whilst another might be more dependent on existing products. Innovation theory states that three factors are required for innovation to happen *[10]*:

- Willingness
  - Including a company's capacity to change and the extent of its knowledge that change is possible
- Opportunity
  - Supply side: technology exists or could be developed
  - Demand side: regulatory requirement; opportunity to save costs or add to profits; pressure from workers or public
- Capacity
  - Knowledge about better techniques, and the level of skill base at the company.

Regulation is important both to create the demand for innovation (and therefore the rewards for those companies that meet this demand), and to ensure that innovation is in the direction of sustainability. As the AEA report, above, concluded, innovation frequently acts to bring down the real cost of regulation to a level much lower than the predicted cost.

What will the effects of REACH be on innovation – positive or negative?

One of the arguments frequently used by industry is that the cost of complying with REACH will take resources away from research and development. Leaving aside the issue of whether research and development funds are really reduced as a result of regulatory compliance costs (rather than the funding coming from price changes, reduced profit, etc.), REACH is only likely to have such an impact if costs of compliance are significantly higher than normal variability in costs.

A few reports have claimed that REACH costs will be very high, for example the studies produced by Arthur D Little in Germany [*11*] and by Mercer consulting in France [*12*]. However, these studies have been widely condemned by economists [*9, 13, 14, 15*], though they have been remarkably persistent in the political debate.

However, other economic studies have found costs similar to those calculated by the European Commission [*8*], and have then compared these costs with other variable business costs, concluding that the changes in costs as a result of REACH will not be significant [*15*]:

"Price changes of the same magnitude as the costs of REACH are commonplace in industry, and do not prevent profitable operation.

"The spot price of crude oil varies by a greater percentage in almost every week, while the EU-15 price index for all intermediate manufactured goods varies by a greater percentage in almost every month."

Moving away from the issue of the cost of REACH, the key question becomes: To what extent can REACH promote innovation, and therefore competitiveness?

REACH includes a number of direct provisions which make innovation easier, and which should increase the rate of innovation, in particular:

- it reduces the burden of regulation on new chemicals, taking the threshold for notification from 10 kg / year at the moment, to 1 tonne / year under REACH;
- it creates new research and development exemptions of 5 years in the first instance, extendable by a further 5 years.

In addition, REACH has a number of measures which will affect the direction of innovation, increasing market pressure for safer products, e.g.:

- registration is simpler for chemicals not classified as dangerous, with no exposure assessment or risk assessment required. This will reward companies producing the safest chemicals;
- the new Authorisation process only affects chemicals meeting the criteria of very high concern, creating regulatory and market pressure away from these chemicals and towards safer alternatives;
- in certain circumstances, the Authorisation procedure will oblige companies to use available safer alternatives, assisting those companies that develop them;
- increased flow of information on chemical properties and risk management requirements will encourage downstream users to use the safest chemicals.

REACH will also have a substantial impact on the way chemicals are sold and used, for example promoting closer links between producers and users, as the producer will usually need to define safe use for downstream uses. Close contact between producers and customers has been shown to promote innovation [9].

REACH changes the distribution of costs in the value chain, as a result of increasing producer responsibility:

- chemical producers and importers will need to do more hazard and risk assessment of their chemicals, but they should have the expertise to do this;
- downstream users will be able to reduce their safety assessment costs, freeing them to focus on the service provided by chemicals, which is their area of speciality.

REACH will create new opportunities for innovation in the supply chain, as the players adjust their roles to take advantage of the new system, for example:

- chemical producers and importers will be encouraged to create and assess new exposure scenarios, promoting new uses of their products;
- formulators and distributors will have new opportunities to produce exposure scenarios to support their own customers, for example in sectoral or niche markets;
- downstream users will be able to innovate with uses of chemicals, knowing that the uses will be safe if they follow exposure scenarios in the Chemical Safety Reports.

Conclusions

The world faces a massive challenge in achieving a more sustainable future, and it is clear that Europe has a responsibility in leading this transformation as a major developed economy with a commitment to sustainability. However, this role as a leader should benefit rather than burden European companies, as they will be at the leading edge of the move to sustainability, as first movers into more sustainable technologies.

Europe is not going to compete in the global economy on the basis of low labour costs; it must instead provide more sustainable products. To encourage this transformation, Europe needs good, sustainability-orientated regulation, such as REACH. REACH will assist innovation through a combination of focussed deregulation, a re-ordering of the value chain and by promoting safer chemicals.

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