

EU Policy Conflicts over Agbiotech: Ecological Modernisation Perspectives

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Introduction

In the early 1990s agricultural biotechnology (henceforth agbiotech) was being promoted as a symbol of European progress by all EU institutions, especially the European Commission. According to proponents, agbiotech provides a clean technology for enhancing eco-efficient agro-production, while also addressing the agrochemical problems of industrial agriculture. By the late 1990s, however, ‘GM food’ became negatively associated with factory farming, its hazards, and unsustainable agriculture. GM products have generally faced commercial and/or regulatory blockages to market access in Europe. Commercial use has been limited to animal feed from soya imports and from Bt maize cultivation in Spain.

This article discusses the following questions:

- How did the EU promote agbiotech as an eco-efficient innovation?
- What societal and policy conflicts arose? likewise regulatory and commercial obstacles?
- Despite support from EU institutions, why did agbiotech encounter such great obstacles?
- How does this case indicate difficulties of eco-efficiency models and claims?

To answer those questions, this article draws on perspectives from ecological modernisation, regarding eco-efficient innovations. The article has the following structure: ecological modernisation (EM) perspectives on eco-efficient innovation and their relation to EU policy; early EU promotion of agbiotech; the 1990s agbiotech controversy; and how policy frameworks changed in response. The conclusion summarises the relevance of EM for explaining the EU-wide conflict.

1 Ecological modernisation: perspectives on eco-efficiency

In the academic literature, ecological modernisation (EM) has had an ambiguous status – as a normative standpoint, as a policy framework, and/or as a means to explain or analyse that framework. In the latter sense, EM has sought to illuminate policy changes which integrate economic with environmental criteria. According to the sociologist Joseph Huber, ecological problems arise from the industrial techno-system colonising the socio-sphere and eco-sphere. In his view, the remedy lies in an eco-social restructuring of the techno-system: ‘the dirty and ugly industrial caterpillar will transform into a[n] ecological butterfly’ (Huber, 1985: 20; translated in Mol, 1995: 37; also see Mol, 1996: 312-13).

Such improvements have been seen as overcoming the conflict between economy and ecology – theorised as interdependent features of innovation. EM emphasises the potential for re-embedding an ecological dimension of economic practices within modernist institutions, by institutionalising ecology in production and consumption processes. This could be done through government measures stimulating self-regulation of industry, thus transferring responsibilities from the state to the market (Mol, 1996: 306). This focus implicitly accepts a ‘market failure’ diagnosis from neoclassical economics – by contrast to a ‘state failure’ diagnosis which could justify state measures directing innovation along more environmentally better pathways.

Capitalist modernisation is seen as potentially benign, hindered mainly by market failure to provide appropriate incentives, thus warranting state assistance or incentives to correct the failure. ‘Eco-efficiency’ is reduced to an input-output efficiency of resource usage and pollution control (Buttel, 2000). EM is limited by ‘the preoccupation with efficiency and pollution control over broader concerns about aggregate resource consumption and its environmental impacts’, and an uncritical stance towards the transformative potentials of modern capitalism (ibid: 64).

Eco-efficiency discourses generally promote techno-fixes, as if no other diagnosis were thinkable:

[ecological modernisation] ... uses the language of business and conceptualises environmental pollution as a matter of inefficiency, while operating within the boundaries of cost-effectiveness and administrative efficiency... [EM] is... basically a modernist and technocratic approach to the environment that suggests that there is a techno-institutionalist fix for the present problems (Hajer 1995: 31-32)

In the above sense, EM is predominantly ‘techno-corporatist’, dependent upon agreements with industry for technological improvements (Hajer, 1995: 38, 281).

Despite that limitation, EM perspectives can help to illuminate tensions among different environmentalist frameworks. Often citizens protest against techno-fixes which make claims for environmental improvements, especially when linked with imperatives of economic competitiveness:

... the late 1990s showed how citizens not so much opposed eco-modernist governmental policies but conceived of the environmental problem in different, more culturally loaded terms... Furthermore, governments could be seen to strengthen the ties between eco-modernist thinking and neo-liberal economic discourse... (Hajer and Versteeg, 2005: 179)

Such critical perspectives can illuminate how eco-modernist discourses are linked with specific policy agendas and cultural meanings which may drive societal conflict. Hajer’s perspective can identify socio-political tensions around an ‘eco-efficient’ innovation.

Since at least the early 1990s EU policy has emphasised eco-efficiency measures as means to reconcile economic and environmental sustainability. As an ongoing tension, EU makes symbolic declarations on ‘sustainable development’ while adopting EM strategies, which are more compatible with the European integration project. ‘[EM] is in keeping with its key tenet, namely the construction of a neoliberal free-market economy in support of industrial

competitiveness'. Sustainable development is largely understood as market-based eco-efficiency measures decoupling economic growth from environmental harm. Nature is still framed as a 'standing reserve' of exploitable resources (Baker, 2007: 302-03).

European agbiotech controversy has been analysed by elaborating EM perspectives in various ways. An early account linked EM with efforts at more stringent regulation of agbiotech (Gottweis, 1998: 232-35). By contrast, other accounts have associated EM with pro-biotech agendas. In the UK, New Labour supported GM crops as a means to maintain an economic competitive advantage, while enhancing sustainability through more intensive, eco-efficient agri-production (Barry and Paterson, 2004). UK agbiotech supporters made claims for environmental advantages over conventional agriculture. Opposition groups rejected that framework along with industrial agriculture altogether, while appealing to natural characteristics of alternatives, especially organic farming (Toke, 2002, 2004). Yet such alternatives have been theorised as a different form of ecological modernisation (Marsden, 2004). While drawing upon all those insights, this article will associate EM mainly with biotechnological claims for eco-efficiency.

2 Agbiotech promoted as sustainability via eco-efficiency

Within an overall policy emphasising eco-efficient innovations, the European Commission identified biotechnology as necessary for societal progress. Its 1993 White Paper on *Growth, Competitiveness, Employment* advocated a 'clean technology' base, which would facilitate a positive relation between the environment and economic growth. Its policy also counselled European adaptation to inexorable competitive pressures: 'The pressure of the market-place is spreading and growing, obliging businesses to exploit every opportunity available to increase productivity and efficiency' (CEC 1993a: 92-93). This imperative was linked with innovations such as biotechnology: 'The European Union must harness these new technologies at the core of the knowledge-based economy' (ibid: 7).

Likewise the 5th Environmental Action Programme (EAP) elaborated claims for technology which could provide efficiency gains towards environmental objectives:

Many of the new clean and low-waste technologies not only reduce pollution substantially, but also economise on the consumption of raw materials to such extent that cost savings can more than offset initial higher investment costs and thereby reduce unit production costs. A case in point is represented in the development and use of new techniques in the field of genetic engineering and biotechnology; these offer considerable potential for useful applications in agriculture, food processing, chemicals, pharmaceuticals, environmental clean-up and the development of new material and energy sources (CEC 1993b: 28).

Thus sustainable development was framed as resource efficiency in the image of agbiotech: greater economic efficiency would help to minimise environmental pollution. Indeed, such claims pre-dated European cultivation of GM crops: they are 'guaranteeing yields, helping to cut the use of plant health products in combating pests and diseases, and creating quality products', according to the Economic and Social Committee, officially representing the Commission's link with civil society (EESC, 1998). Such statements accepted claims from biotech companies that GM crops simultaneously achieve economic and environmental objectives, especially by reducing input costs and waste (e.g. Monsanto 1997: 16).

The biotech industry anticipated and emphasised greater market pressures on European agriculture, as both an imperative and opportunity for a biotechnological solution. Under reforms of the Common Agricultural Policy, EC agricultural subsidies would be reduced and would lose their former link with production. In the view of many company managers, market liberalisation and subsidy reduction would continue, thus offering greater opportunity to sell inputs to farmers, as well as to finance future development of GM crops (Chataway et al., 2004: 1053).

EU policies also extended proprietary claims on genetic resources but provoked opposition. At issue was the concept of ‘biopiracy’ – whether this meant unauthorised use of GM seeds, or rather ‘Patents on Life’, i.e., patent rights on mere discoveries of common resources. The ‘biopiracy’ issue raised doubts among those on the political Left and trade-union groups which were otherwise inclined to support technological innovation as societal progress. After a decade-long conflict, an EC Directive extended patent rights to ‘biotechnological inventions’ (EC 1998). This broadened the scope of discoveries or techniques which could be privatised. As public controversy continued afterwards, several EU member states failed or refused to incorporate the Directive into national law. Nevertheless the Directive strengthened incentives for the use of GM techniques.

So did R&D policies, especially by blurring the boundary between public and private sectors. In many EU member states, public-sector agricultural research institutes were allocated less state funds than before and were expected to substitute income from the private sector or from royalties on patents. The EU’s R&D funding priorities complemented that shift towards marketising hitherto ‘public-sector’ research (Levidow *et al.* 2002). By 1990 EC funds for biotech research became conditional upon industry partners committing resources to a project. Research was given a clear economic role, with ‘more careful attention to the long-term needs of industry’, according to managers of the DG Research Biotechnology Division (Magnien and Nettancourt, 1993: 51). In their view, ‘The most vital resource for the competitiveness of the biotechnology industry is the capacity to uncover the mechanisms of biological processes and figure out the blueprint of living matter’ (ibid: 53) Nature was conceptualised as an information machine whose deficiencies had to be corrected, as an essential means towards European industrial regeneration and competitive advantage.

Along those lines, biotech was given prominence in the Commission’s Framework Programmes, which comprised half the EU’s budget. The agenda emphasised ‘technologies needed to design and develop processes and produce “clean”, high-quality products’. GM techniques were promoted in the name of ‘pre-competitive’ research whose results could later be developed into marketable products. Framework Programme 5 (1998-2002) included a large programme on ‘Life Sciences and Biotechnology’; this echoed industry’s discourse of synergies between pharmaceutical and agbiotech research, corresponding to industrial mergers in the mid-1990s (Tait *et al.*, 2002).

In appropriating the language of sustainable agriculture, EU policy attributed agri-environmental problems to genetic deficiencies, while attributing eco-efficiency benefits to inherent properties of GM crops. Eco-efficiency was also linked with the productivity imperatives of international competitiveness. These imperatives informed the Commission’s policy of ‘risk-based regulation’, as shown next.

3 Regulating agbiotech: agri-industrial efficiency in question

After much disagreement among EU institutions on a regulatory framework for agbiotech, the result was a compromise linking product safety with the wider project to overcome trade barriers among member states (Gottweis, 2005). According to the 1990 Directive on the Deliberate Release of GMOs into the Environment, ‘completion of the internal market would be based on a high level of protection for the environment and human health’. Member states had a duty to ensure that GMOs do not cause ‘adverse effects’ (EEC 1990). The Directive left open their definition – what would count as harm.

Initial political pressures were largely hostile to the implicit precautionary basis of the Directive. Soon after enactment, it came under attack by a new consortium of chemical multinationals which were buying up seed companies; they blamed European ‘over-regulation’ for obstructing European economic competitiveness. This blame was

incorporated into Commission policy, e.g. by advocating 'risk-based regulation' (CEC 1993a), especially 'the need for balanced and proportionate regulatory requirements commensurate with the identified risks' (CEC 1994). This language could mean that any regulatory burdens must be justified by prior evidence of risk.

Conveniently for biotech companies, EU regulatory procedures identified no risks by adopting a narrow definition of environmental harm. As critics had warned, the familiar 'pesticide treadmill' could be supplemented by a genetic treadmill; in particular, insecticidal or herbicide-resistant crops could generate resistant pests. But these scenarios were dismissed as merely agronomic problems which also sometimes resulted from conventional pesticide techniques. Some member states sought more evidence or control measures regarding such potential effects, but their requests were marginalised in the EU-wide procedure (Levidow et al. 1996, 2000). Amid national differences over regulatory standards, these were levelled down through Commission decisions to approve GM crops for commercial cultivation in 1996-97. Thus safety claims accepted the normal hazards of intensive monoculture.

Claims for beneficent eco-efficient products were turned into an ominous prospect, however, especially through analogies with the 'mad cow' scandal. This had undermined the credibility of official safety claims for food products, while also aggravating suspicion towards intensive agricultural methods. When the Commission approved an insecticidal maize in January 1997, despite opposition from member states, criticism came from a wide range of organisations, even from the European Parliament. The mass media echoed attacks on the Commission for 'recidivism', i.e. for repeating its crimes over approval of British beef. Extending such analogies, activists cited unpredictable effects of agbiotech as grounds for a moratorium on GM products.

Opposing agbiotech, critics warned against various risks: GM crops would impose 'uncontrollable risks', would spread 'genetic pollution', would extend 'unsustainable' intensive agricultural methods which had already generated agri-food hazards, and would extend corporate power over the agri-food chain (Levidow, 2000). Activists eventually generated a broad opposition among civil society: according to opinion surveys, the public distrusted the role of the biotechnology industry in developing new products (Gaskell and Bauer, 2001: 71).

Thus critics challenged the biotechnological promise that more efficient agri-inputs would remedy environmental problems. They also counterposed different agriculture models, e.g. organic farming and alternative cultivation methods such as Integrated Pest Management. Protest was driven mainly by activists from environmentalist and farmer groups. In some countries, e.g. France and Italy, mass organisations of small-scale farmers played political roles in generating mass opposition to GM crops. In response to public controversy, some governments devised a more cautious regulatory approach, went beyond 'risk' to 'sustainability' issues and/or promoted alternative development pathways. Four national examples briefly illustrate those pressures and responses.

In the late 1990s the French agbiotech debate expanded from 'risk' to sustainability issues, now framing agriculture as a common good linking producers with consumers. Some industrial-type farmers had sought access to GM crops as a means to enhance their economic competitiveness. By contrast, the Confédération Paysanne attacked such products as a multiple threat – to their economic independence, to high-quality French products, to consumer choice and even to democracy. They counterposed their own *paysan savoir-faire*, as a basis for a different societal future (Heller 2002). They advocated de-intensification measures, based on 'remunerative agricultural prices and sustainable family farming, with multiple benefits for society' (CPE 2001). Supporting agbiotech in principle, the French government initially led EU-wide approval of a GM herbicide-tolerant oilseed rape, but

soon reversed its stance and blocked approval. This regulatory blockage responded to expert concerns about a genetic treadmill, while also accommodating public anxieties and peasant opposition.

Italian anti-agbiotech opponents sought to protect the agro-food chain as an environment for craft methods and local specialty products, known as *prodotti tipici*. The Italian Parliament had already allocated subsidies to promote such products and foresaw these being displaced by GM crops. According to a Parliamentary report, the government must 'prevent Italian agriculture from becoming dependent on multinational companies due to the introduction of genetically manipulated seeds'. Moreover, when local administrations apply EU legislation on sustainable agriculture, they should link these criteria with a requirement to use only non-GM materials. Parliament was adopting arguments from Coltivatori Diretti, a million-strong union of mainly small-scale farmers who opposed GM crops (Terragni and Recchia 1999). Implicitly responding to these pressures, Italian authorities obstructed regulatory approval of GM crops.

The Austrian government was already promoting organic agriculture in the early 1990s, and agbiotech opponents turned GM crops into a symbolic threat to that alternative economic strategy. Austrian regulators unfavourably compared potential environmental effects of GM crops to methods which use no agrochemicals, among others grounds to oppose commercial approval (Torgersen and Seifert 2000). Civil servants drew links between the Precautionary Principle and sustainable development. In their risk-benefit analysis of GM crops, risks were always uncertain, while benefit was understood as promoting the political aim of a society oriented towards sustainability, understood mainly as organic farming (Torgersen and Bogner 2005).

In the UK agbiotech critics drew an analogy between GM crops, industrialized agriculture and the market pressures which led to the BSE crisis. These suspicions were echoed widely in civil society and even in government agencies. The Consumers Association attacked the agro-food industry for its 'unshakeable belief in whizz-bang techniques to conjure up the impossible – food that is safe and nutritious but also cheap enough to beat the global competition' (McKechnie 1999). As official advisors to the government, nature conservationists warned that broad-spectrum herbicides could increase harm to wildlife habitats in or near agricultural fields. According to a report of the UK Environment Agency, agbiotech products became controversial because they are designed for an 'increasingly intensive monoculture'. Therefore GM crops should be evaluated in a wider debate about sustainable agriculture, 'not just relative to today's substantially less-than-sustainable norm', argued their report (Everard and Ray 1999).

In various ways across European countries, agbiotech was turned into a symbol of agri-industrial threats, a misguided efficiency and neoliberal globalisation. Playing on consumer anxieties about food safety, radical environmentalists built an anti-agbiotech coalition counterposing various alternatives: food sovereignty, local control of food production, 'natural' food, etc. Those issue-framings relate to rival political economies: radical greens advocated decentralising the economy, in opposition to a globalised agri-industrial production (Hines 2000; Woodin and Lucas 2004).

Also contentious were rules for labelling products as 'GM'. Protests demanded comprehensive GM labelling, so that consumers would not be unwittingly 'force-fed' GM food and could make their own judgements on product safety. In the late 1990s the food industry and likewise the EU eventually accommodated demands for more stringent rules. Soon European food retail chains excluded GM grain from their own-brand products, rather than apply a 'GM' label. Consequently, GM grain found a market only for animal feed, whose products required no GM label (Levidow and Bijman, 2002). By the late 1990s agbiotech products were being blocked through a commercial boycott, more than by any

regulatory obstacles. Lacking a market for GM grain, European farmers were deterred from cultivating GM crops, except in some maize fields in Spain, which otherwise would have a shortage of animal feed.

4 Regulatory changes versus agri-efficiency

In response to public controversy, environmental risk criteria became broader and so less amenable to the agri-efficiency for which GM crops were designed. Some governments restricted or even banned GM products which already had EU approval. In 1999 the UK announced a voluntary moratorium on commercial cultivation of GM crops, given the scientific uncertainties about how herbicide sprays on herbicide-tolerant crops could affect farmland biodiversity. This move aimed to allow time for commercial-scale testing of herbicide usage and its effects, thus delaying an awkward political decision.

Moreover, in 1999 the EU Council blocked consideration of any more GM products. Several members demanded that the EU regulatory procedure must first incorporate more stringent, precautionary criteria. This procedural blockage, which became known as the de facto moratorium, expressed a policy impasse over regulatory criteria, as well as difficulties in addressing public concerns.

The EU Council moratorium stimulated changes towards broader regulatory criteria for agbiotech. In consultation with member states, the Commission revised the 1990 Directive. The revision encompassed a broader range of risks, e.g. wider effects of herbicide usage and delayed or indirect effects. It also required that scientific uncertainty be made explicit about any 'identified risk', potentially as a basis to require commercial-stage monitoring for specific risks. The Directive now required public consultation (EC, 2001). Together these changes potentially required greater evidence of safety before and even during commercialisation, along with greater public accountability for regulatory decisions.

In parallel with these legislative changes, the Commission extended earlier arguments about biotechnological imperatives. Given the 'revolution taking place in the knowledge base of life sciences and biotechnology', this could provide a major contribution to the EC 'becoming a leading knowledge-based economy'. At the same time, the Commission emphasised the scope to shape innovation for greater societal benefit:

Europe is faced with a major policy choice: either accept a passive and re-active role, and bear the implications of the development of these technologies elsewhere, or develop pro-active policies to exploit them in a responsible manner, consistent with European values and standards. The longer Europe hesitates, the less realistic this second option would be (CEC 2002: 7).

Its strategy document celebrated the prospects for GM crops to generate 'more sustainable agricultural practices', which were equated with eco-efficiency measures such as pesticide reduction (CEC 2002: 6, 15). Technological progress carries socio-ethical implications, which 'cannot be adequately addressed within the narrow context of regulatory product approvals'; consequently, EU procedures need transparency, accountability and participatory approaches. Nevertheless, regulatory oversight 'is the expression of societal choices': rules should ensure that market mechanisms function effectively, so that safe products become available to accommodate consumer preferences (ibid: 14, 21). Consequently, regulatory oversight bore the burden of societal conflict over agbiotech, in the absence of any procedure for evaluating agricultural development pathways.

In parallel with the changes in EU law, the Commission sought to restart the EU-wide regulatory procedure, which had been stalled since 1999. In its view, precaution could not justify blockages or bans on the GM products under consideration. When the regulatory procedure finally resumed in 2003, member states applied even more stringent criteria than in the late 1990s, leading to more disagreements over new GM products, again mainly herbicide-tolerant and/or insect-resistant crops. More member states than before challenged

the available evidence of safety and raised extra uncertainties; some criticisms came from governments which anyway opposed GM crops in general (e.g. Italy, Greece, Austria). Environmental NGOs continued to attack safety claims, while counterposing alternative agricultures. Whenever the Commission sought EU approval for a specific GM product, there was little support from member states, so the Commission lacked legitimacy when approving the product (Levidow et al. 2005).

Also in response to the EU Council demands, with strong support from the Parliament, new legislation further broadened the criteria for 'GM' labelling. Formerly this requirement depended upon the presence of detectable DNA or protein in GM food. Under a new law, 'GM' labelling was now required for any food or feed product containing GM material, regardless of detectability; and its presence must be traceable throughout the agro-food chain (EC 2003a, 2003b). This effectively required labelling for a broader range of products than before. With this extra weapon, NGOs made further efforts to deter food companies from using GM grain, whose use was mainly limited to animal feed.

The inadvertent spread of GM material became another contentious issue. European agbiotech opponents had warned against the prospect that GM crops would irreversibly 'contaminate' the environment and non-GM crops. This could mean that they require a GM label, thus incurring financial loss for non-GM farmers. Yet segregation measures to limit the spread could impose economic burdens on GM farmers and so constrain crop cultivation.

To regain control over the 'contamination' issue, the Commission developed a 'co-existence' policy for ensuring farmers' free choice to cultivate GM, conventional or organic crops. This policy sharply distinguished between environmental issues, which were appropriate for risk regulation under the Directive, versus merely economic damage from the spread of 'safe' GM material to non-GM crops (CEC 2003). But this key distinction was challenged, blurred and undermined, even by a legislative change. Again under pressure from the Parliament, the Commission agreed to amend the Deliberate Release Directive so that 'Member states may take appropriate measures to avoid the unintended presence of GMOs in other products' (EC 2003a: 20).

Such segregation measures were being developed by many national or regional authorities. For some, 'coexistence' policy increasingly meant segregation measures which would marginalise or preclude GM crops. In a Europe-wide charter of regional authorities, they discursively linked 'GMO-free zones' with food sovereignty, 'quality' labels on food products and regional biodiversity. The charter identified GM crops as a threat to 'sustainable and organic farming and regional marketing priorities for their rural development' (FFA 2005).

Ostensibly about 'GM contamination', this conflict expressed rival development pathways – GM crops as eco-efficiency measures for agri-industrial development, versus alternatives through an agrarian-based rural development (Levidow and Boschert, 2008; Marsden, 2004, 2008; Marsden et al., 2002). Agbiotech opposition was joined by the Assembly of European Regions, which proposed that coexistence would be based on in-depth feasibility studies examining the environmental, socio-economic and cultural impact of GMOs. Areas could be designated as 'GMO free' in order to protect any added value of certified quality products (AER/FoEE 2005). This proposal generalised from stringent rules already being devised by some regional authorities, especially as a means to protect product 'quality' as recognised by consumers.

5 Conclusion: contending development pathways

Let us return to the original questions about how to explain the EU policy conflicts over agbiotech. Some EM perspectives can help to explain how agbiotech was promoted as a benign eco-efficient tool essential for both environmental improvement and economic competitiveness, as a basis to gain government support, especially from the European Commission. Agbiotech was promoted as both an instrument and beneficiary of neoliberal policies – by extending patent rights, by making the public sector more dependent upon private finance, and by elaborating ‘risk-based regulation’, so that narrowly-defined risks could be the only basis for questioning EU-wide commercial approval of a GM product. Safety standards were linked with the imperative to create a single market, in turn necessary for global competitiveness.

By the mid-1990s, EU-wide disputes arose over the appropriate regulatory criteria. The dominant policy accepted industry claims for eco-efficient, safe GM products, taking for granted the normal hazards of intensive monoculture such as pest resistance. Yet some policymakers sought to test claims for eco-efficiency through better evidence, before and during commercial use of GM crops, especially regarding the prospect of a genetic treadmill. As in other regulatory areas, Commission policy featured tensions and shifts between these two different environmental bases for an EU internal market (cf. Weale and Williams 1993).

Meanwhile NGO campaigns were questioning GM crops as the supposed solution for agro-environmental sustainability problems. Through mass protest since the late 1990s, agbiotech was popularly stigmatised as a threat to the environment, sustainable development and democratic accountability. Critics diagnosed agri-industrial efficiency as a fundamental threat to alternative pathways, understood along lines of an agrarian-based rural development. Such agendas undermined the EM perspective that ‘the dirty and ugly industrial caterpillar will transform into an ecological butterfly’ (Huber, 1985), at least in the agbiotech case.

Societal conflict arose partly from an overall EU policy seeking innovation which combines greater economic efficiency with less pollution, while representing this policy as ‘sustainable development’ (cf. Hanf, 1996; Baker, 2007). For agbiotech in particular, Commission policy relegated societal choices to regulatory oversight (CEC, 2002), which thereby bore the burden of societal conflict and so remained contentious. Such conflict was translated into disputes over the appropriate regulatory criteria – e.g. for risk assessment, labelling, segregation, etc. All those criteria became more stringent and thus more amenable to civil society efforts at blocking market access to GM products. By 1999 food retail chains were boycotting GM grain, which has found a market only in animal feed.

Those societal conflicts and their outcomes cannot be readily explained by EM perspectives which attribute sustainability problems to market failure, in turn due to inadequate state incentives for eco-efficient innovation. The EU case is better understood through critical perspectives on EM: namely, state failure (or perhaps refusal) to evaluate various options for an environmentally more sustainable agriculture. EU institutions embraced techno-fixes amenable to privatising knowledge for agri-industrial systems, so governments were seen ‘to strengthen the ties between eco-modernist thinking and neo-liberal economic discourse’ (Hajer and Versteeg, 2005).

Moreover, Europeans were told that they had no choice but to accept agbiotech as a development pathway towards a better future. In response, opponents turned into agbiotech into a test of democratic accountability for societal choices (Levidow and Carr, 2010). Eventually broad opposition networks counterposed alternative development pathways, thus opening up societal futures.

Acknowledgements & methods

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- ‘Safety Regulation of Transgenic Crops: Completing the Internal Market?’, funded by the European Commission, DG XII/E5, Ethical, Legal and Socio-Economic Aspects (ELSA), Biotechnology horizontal programme, during 1997-1999.
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- ‘The Politics of GM Food’, funded by the ESRC, during 2000-2002.

This paper draws upon analyses already carried out from those research projects. It includes just a few citations selected from original sources, supplemented by citations from EC policy statements.

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