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# Extending the policy integration concept: the case of wind power

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## Abstract

The aim of this article is to work towards a synthetic vision of policy to support renewable energies based on the notion of 'policy integration'. Drawing on analysis of the literature and informed by field-work in the wind sector in Denmark, France and the UK, it explores the extent to which policy learning over the medium term has brought us closer to policy models that integrate economic, environmental and societal desiderata into energy policy in a manner congruent with the sustainable development aspirations espoused by the European Union and its constituent states.

Whilst concentrating on wind power, this article contributes to policy theory by proposing and developing an extended conceptualisation of policy integration. Integrating environmental concerns into policy-making is well and good, but leaves open questions related to the *scope* of the integration process and to the *manners* in which it is effected. Thus the first section clarifies the policy integration concept by reference to the introduction of environmental and societal dimensions into energy policy-making on the basis of a proposed 'transition to sustainability'. The second section moves to the micro-level of electricity generation from renewables. It considers policy integration in relation to wind power along three dimensions: 1) increases in production capacity, 2) increases in institutional capacity and 3) increases in societal capacity. The conclusion proposes that a 'systemic' approach be developed to include not only the technical, economic and institutional dimensions of policy-making but also the societal dimension.

## Introduction

The article stems from an on-going research project on the political and social acceptability of wind power in Europe. Wind power is a problematic technology capable of generating not only significant quantities of electricity but also major controversies. To date, analysis of the sector has largely been undertaken by technologists and economists, but now that wind power has attracted public attention and greater political salience, increased numbers of social scientists are seeking to move beyond partial analyses and look for more comprehensive explanations of its dynamics. In this vein, the aim of this article is to work towards a synthetic vision of policy to support renewables based on the notion of 'policy integration'. Drawing on analysis of the literature and informed by field-work in the wind sector in Denmark,

France and the UK, it explores the extent to which policy learning over the medium term has brought us closer to policy models that integrate economic, environmental and societal desiderata in a manner congruent with the sustainable development aspirations espoused by the European Union and its constituent states.

Whilst concentrating on wind power, this article contributes to policy theory by proposing and developing an extended conceptualisation of policy integration. Integrating environmental concerns into policy-making is well and good, but this still leaves open questions related to the *scope* of the integration process and to the *manners* in which it is effected. Thus the first section clarifies the policy integration concept by reference to the introduction of environmental and societal dimensions into energy policy-making on the basis of a proposed 'transition to sustainability'. The second section moves to the micro-level of electricity generation from renewables. It considers policy integration in relation to wind power along three dimensions: 1) increases in production capacity, 2) increases in institutional capacity and 3) increases in societal capacity. The conclusion proposes that a 'systemic' approach be developed to include not only the technical, economic and institutional dimensions of policy-making but also the societal dimension.

## Integrating environmental and societal dimensions into energy policy

The theme of 'environmental policy integration' (EPI) has largely been conceptualised in terms of the 'greening' of sectoral policies (Lenschow, 2002). Rather than remaining a 'stand-alone' policy-making sphere, environmental considerations must become an integral part of policy arenas across the board. This prescriptive strand emerges strongly in the European Community from the 1983 'Third Environmental Action Programme' (EAP) onwards:

> 'The Community should seek to integrate concern for the environment into the policy and development of certain economic activities as much as possible and thus promote the creation of an overall strategy making environmental policy part of the economic and social development. This should result in a greater awareness of the environmental dimension, notably in fields of agriculture (including forestry and fisheries), energy, industry, transport and tourism.' Official Journal, 1983, I, 8

It was reiterated in the Fifth EAP (1993-2000) in relation to these same five policy sectors, which of course included energy. The 1992 Treaty of European Union and the 1997 Amsterdam Treaty enshrine the EPI principle, though with debateable legal effects (see Nollkaemper, 2002).

Meanwhile, the sustainable development (SD) agenda that arose *inter alia* from the 1987 Brundtland report - put together under the auspices of the World Conference on Environment and Development (WCED) - systematically linked environmental problems and development issues. Brundtland offered the now canonical definition of the SD concept as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987: 43). The report reiterated a view that had gained momentum over the 1980s that environmental protection, economic growth and social development were not contradictory but complementary goals. This view also argued for a deepening and broadening of 'environmental policy integration' into not just the *substance* of economic and industrial policies, but also into policy-making *procedures*. It opened the door to greater recourse to deliberative and inclusionary processes, involving a broader cross-section of the population. Calls to develop this societal dimension were taken up at the 1992 Rio world conference, integrated into the Rio Declaration (principles 10, 20-22) and developed subsequently. Latterly, the SD framework has led in the EU to a 'broad' or 'horizontal' conceptualisation of the policy integration theme, in order to complement and reinforce the sectoral or 'vertical one (Aguilar Fernández, 2003). The 'Cardiff Process', initiated in 1998, has sought to develop both conceptualisations of EPI within EU policy making spheres. The Sixth EAP – 'Environment 2010: Our Future, Our Choice' – which runs between 2001-2010, called for a deepening of EPI indicating that 'all Commission policy initiatives should be fully assessed in this light', with greater use of environmental indicators and best practice benchmarking.

In the energy sector, the aims of EPI and SD have been taken up to varying extents. Thus the Fifth EAP stressed that 'Energy policy is a key factor in the achievement of sustainable development' (Commission of the EC, 1993). However, as stressed by Collier (2002: 176), 'during the 1990s, there was little progress with the 'greening' of EU energy policy', although a number of directives were implemented to reduce toxic emissions. The more recent period has been marked by two categories

of development. One is the liberalisation of energy markets in the EU, particularly electricity and gas. The other is that renewed concerns over climate change, diversification of sources and security of supply have led to policy reforms containing a measure of EPI, with the Sixth EAP targeting climate change as one of its 'priority areas for urgent action'. Yet reforms in the wake of liberalisation have concerned energy supply rather than energy demand, seeking changes mostly in sourcing rather than use, and addressing economic and production issues rather than the societal and procedural issues enshrined with the SD paradigm.

## Policy integration, electricity generation and wind power

The stress on the electricity sector is motivated here by the necessarily restricted purview of this article, but it is also justified by the fact that EU energy policy-making - and much national policy - has in the 2000s taken a marked interest in electricity generation, whilst mostly letting other forms of energy sourcing and use bump along in a 'business-as-usual' fashion. The context for policy making has been set by the 1997 Kyoto Protocol, which called for GHG *cuts* by 'annex 1' countries of 5.2% by reference to a 1990 baseline, to be achieved by various 'flexible mechanisms'. Because of the largely untried nature of the latter, progress to implementation has been slow and uncertain. Although the EU is now putting into place a market-based GHG emissions trading system (based on directive 2003/87/EC), the policy response has to date largely favoured state-centric measures. The electricity sector has been targeted since many member states rely extensively on fossil fuel sources, producing substantial quantities of GHGs. The main instrument is directive 2001/77/EC which set targets for each member state regarding electricity generation from renewable energy sources (RES-E). The stress on RES provides one route to EPI and the 'greening' of energy policy (although renewables such as hydro and wind can have environmental costs of their own). As the major 'near-market' technology, the wind sector is now budgeted to provide the bulk of new RES-E generation in a number of EU states.

To respond to questions concerning the *scope* of the integration process and the *manners* in which it is effected, the present analysis develops the theme of policy integration along three dimensions. Firstly, measures to increase renewable

production capacity are treated in the next sub-section. Secondly, policy learning over the medium-term has resulted in a transversal policy response stressing innovation: this process is premised on an increase in institutional capacity. This theme will be treated in the following sub-section. Thirdly, a sub-section is devoted to the argument that societal policies are needed to increase social capacity and enhance acceptability.

### Increasing production capacity: boosting output

As succinctly put by Haas et al. (2004: 834) 'the main focus [of wind policy] must of course always be to trigger investment in new capacity'. This is a common starting point, and taken in isolation it could suggest a rather 'productivist' or even reductionist view of the purpose of energy policy. Nevertheless, this aim opens out onto a number of associated objectives including the promotion of technological progress, reductions in costs and prices, and indeed social acceptance. So far though, most of the policy debate has concentrated on identifying a fast-track to achieving production capacity increases. The main alternative has been to choose between price-based and quota-based policies. In the jargon, these are often termed REFIT (renewable energy feed-in tariffs) versus RPS (renewable portfolio standards). Summarised briefly, the primary characteristic of a price-based (or REFIT) system is that a price per kilowatt hour is guaranteed to all targeted generation; whilst the primary characteristic of a quota-based (or RPS) system is that the policy-maker requires that a particular percentage of national output comes from a defined source, such as renewables, and puts in place market mechanisms (usually tradable certificates) to attain that quota. Table 1 offers a more detailed comparison between REFITs and RPS.

**Table 1 Comparison between REFITs and RPS**

| **REFITs** | **RPS** |
|---|---|
| **Advantages** | **Advantages** |
| Guaranteed prices bring investment security and encourages range of actors into market. | Drives down costs, as no minimum price is stipulated |
| Encourages competition between equipment manufacturers over the long term which brings costs down and increases profits for operators. | Efficient market competition organised via tradable certificates (nationally, and potentially internationally) |
| Favourable to innovation. | Technology neutral: no need to 'pick winners' |
| Favourable to range of technologies from early stage through to market competitiveness. | (*Favours near-market technologies – can be a disadvantage*) |
| Favour early growth of industry. | Favours predictable growth |
| Differentiation possible in relation to sites and wind regimes. | Allows market growth to be scheduled by timely increases in quotas |
| **Risks** | **Risks** |
| Risk of setting fixed price too high | Fluctuating certificate values and bureaucratic complexities, creating uncertainties and barriers. |
| Risk of loss of control over market growth | Incentives for exploiting cheapest sites first (as no differentiation in relation to sites and wind regime). |
| *(Encourages a large number of investors – can be considered as an advantage.)* | Favours large investors, who are few in number and demand risk premium. |

But as indicated in Table 2, the three European nations - Denmark, Germany and Spain - with the largest wind power capacity are those that implemented REFITs early and consistently. However, the British RPS - the Renewables Obligation - has not yet produced major expansion (but was only introduced in April 2002). Thus some analysts are categorical in their policy recommendation, with for example Chabot (2000), Hvelplund (2001) and Rickerson (2002) strongly advocating REFITs on the grounds that they alone have fostered dramatic capacity growth. Others make more qualified appraisals, pointing to differential outcomes arising from contextual variation and arguing that the policy mix must evolve in parallel with technological developments (Haas et al. 2004; Lauber, 2004; Reiche and Bechberger, 2004; Sawin, 2004).

**Table 2 Wind power capacity in 2003**

| | MW |
|---|---|
| EU-15 | 28,401 |
| Germany | 14,609 |
| Spain | 6,202 |
| Denmark | 3,110 |
| UK | 649 |
| France | 239 |

Source: EWEA

Over the twenty-year history of REFITs, some of their economic weaknesses have been attended to. So-called 'advanced renewable tariffs' offer stepped and degressive rates which are location specific, compensating for wind regimes and changes in technology. These measures address issues such as excessive prices and undue profits, aiming to set tariffs at levels that are 'fair and efficient' (Chabot, 2001). Examples include the German Renewables Energy Sources Act of 2000 (EEG: *Erneuerbare Energien Gesetz*), emulated by the French feed-in law of 2001, and the 2002 Spanish reform. Finally, although one of the major claimed benefits of RPS has been its neutrality in terms of technology choice, this has been questioned in the light of experience. Thus Mitchell and Connor (2004) and Foxton et al. (2004) have argued

that the Renewables Obligation fails to encourage the diversification of technology: it reinforces the position of wind (a near-market technology), but does not support emergent technologies such as wave and tidal power. However, it is uncertain whether the introduction of a REFIT would – as yet – bring the latter to market more quickly.

To summarize, REFITs and RPS have led to considerable international learning regarding the promotion of RES-E. The primary aim has been to increase boost output, but lessons have also been learnt about the institutional and societal dimensions of policy options.

**Increasing institutional capacity: integrating for innovation**

Policy learning has allowed analysts to increase the number of dimensions and variables they integrate into their policy models, leading to various 'systemic' approaches which will next be illustrated.

In analysing the recent history of Dutch wind power, Agterbosch, Vermeulen and Glasbergen (2003) put forward a policy analysis based on 'implementation capacity', conceived as the interplay between four sets of systemic conditions: technical, economic, institutional and social. This approach allowed them to distinguish different combinations of conditions which variously favoured or impeded the four categories of wind entrepreneur present in the Netherlands, namely small private investors, cooperatives, established energy distributors and new commercial producers. The interest of this model is that it allows a dynamic and differentiated analysis of the evolution of the wind market. In particular, it allows disaggregation of production capacity increases by focusing on the various categories of entrepreneur and so allows better understanding of behaviour, motivation and outcomes (such as the kinds of installations they prefer). This in turn offers valuable indications on how to tailor policy more efficiently in relation to target groups (rather than adopt a 'one-size fits all' approach). However, the model tacitly accepts the 'near-market' characteristics of the technology as a given, and in concentrating on wind entrepreneurs is less informative about the other societal groups with whom they interact.

Policy analysts of the 'innovation systems' school such as Foxon et al. (2004) have developed a multi-dimensional approach to policy-making, which seeks to respond to different types of requirement at the 'pre-commercial' (e.g. both 'basic' R&D and demonstration facilities), 'supported commercial' (near-market) and

'commercial' (market maturity) stages. The value of this approach is to identify 'systems failures in moving technologies along the innovation chain' (ibid.) and - in principle - correct them. This attention to the 'innovation chain' broadens policy analysis and highlights the limitations of measures merely favouring near-market technologies. Also in the 'innovation system' school, Bergek and Jacobsson (2003) identified a four-strand approach to German policy towards the wind sector whose *combination* they consider to be the explanation for its success:

1. In the early R & D phase, policy encouraged technological variety in wind turbine construction.
2. In the later phase, it encouraged market creation and development, by bringing many investors to the market.
3. An industrial policy component fostered a domestic equipment industry.
4. The policy built on and encouraged the social legitimacy of wind energy.

What is striking in the German case is therefore the integration of different policy strands, which stretch before and beyond the simple expansion of production capacity. This is unlike recent UK and French policies which are merely set to increase wind power capacity (albeit to an as yet uncertain extent). However, there is little current prospect of an industrial policy spin-off in those countries, both because of the nature of the policy and because of 'late mover disadvantage', given the existence of dominant Danish, German and Spanish equipment manufacturers.

At the more general level, the type of multi-faceted policy-making favoured by the 'systemic' approach requires considerable *institutional reach*, in terms of maintaining a transversal and sustained approach in which different units of government collaborate over the long-term. A frequent problem, however, is that rapid, short-term policy change disrupts the required level of foresight and coordination. Thus the level of institutional capacity becomes an upstream determinant of policy ambition and success. Finally, it is interesting to note that Bergek and Jacobsson (2003: 221) stress the importance of 'legitimacy'. However, this part of their analysis is relatively brief, offering a reminder that a 'political consensus' existed in Germany from the 1980s in favour of wind. But neither the sources of the consensus, nor the means to enhance it are explored. Thus although the 'innovation systems' school is usefully developing a transversal approach, it is still largely confined to technology deployment. Political and social dimensions find their way into the analysis, but remember under-explored. This raises the question of

whether a 'systemic' approach could be developed in relation to the integration of the societal dimension.

### Increasing social capacity: integrating societal policies

Now that the technical feasibility of wind power has been demonstrated and steadily improved, the question of the social acceptability of wind power is emerging as a key issue. Anti-wind protest groups have achieved prominence in Britain and France (for example, the 'umbrella' organisations Country Guardian and *Vent de colère*), but are also emerging in every country where wind projects are being promoted. Space does not allow treatment of their arguments here,[1] but the core contention of critics is that wind power entails economic, social and environmental costs.

Whilst policy-makers have been attentive to the economic costs of wind power – both as regards the 'internalisation of externalities' and by drawing up more 'fair and efficient' remuneration systems – less attention has been paid to other costs. Environmental costs have re-emerged during in the planning process in the guise of concerns over landscape, amenity and the preservation of biodiversity. Although social costs have been noted by many analysts (and some politicians), considerable research is still required to ascertain the societal issues related to wind (and probably to other forms of decentralised RES). Thus Ekins (2004: 1092) argued that complexities surrounding attitudes and values related to both land-based renewables and nuclear need to be understood for 'a new social contract (…) to be struck'. Changes in public awareness involve complex processes that go well beyond the consumption of well-intentioned but superficial 'information campaigns'. Cognitive issues, notably the compatibility of new RES with dominant expectations regarding energy sourcing and use, are now understood to require more research. Thus Bell, Gray and Haggett (2004) have explored the 'social gaps' lying between apparently high levels of public support for wind power emerging from opinion polls and a low success rate in UK planning applications.[2] Devine-Wright (2004) has noted that 'research is fragmented and has failed to adequately explain, rather than merely describe, perceptual processes', whilst Strachan and Lal (2004: 568) refers to a 'mandatory requirement' for more work on the social and environmental impacts of

[1] For discussion, see Szarka (2004)
[2] For an analysis of the complexities of the UK planning process, see Toke (2004).

wind. Thus much of what is currently known about the societal dimension of policy integration is partial, being a by-product of measures to increase production capacity.

Specifically, the value of REFITs in terms of reducing social costs by increasing social acceptance has been stressed by advocates. REFITs have allowed large numbers of small investors to enter the wind market. In Denmark, by 2001 about 150,000 households owned or held shares in wind turbines (Lauber, 2002: 302). In Germany, some 90% of turbines are privately owned and approximately 200,000 individuals own shares in cooperatives (Rickerson, 2002). Sawin (2004: 25) offers even higher estimates, claiming that 85% of wind capacity in Denmark arose from local initiatives, and that 340,000 Germans have invested in wind. But if this ownership trend undoubtedly connects with higher levels of social acceptance in Germany and Denmark than in Britain or France, the direction of causality is still unclear. Has social acceptance, driven by 'green' values, led to stakeholding in the form of individual or shared ownership? Or has rent-seeking behaviour, expressed through ownership, promoted acceptance? Of course, the two categories of motivation can be mutually reinforcing at the societal level, making it difficult to disentangle them. Further, as pointed out by Hvelplund (2001: 21), REFIT regimes - which are favourable to a large range of investors - offer an element of social justice based on a local redistribution of profit:

> 'People like wind turbines when they own them and are not annoyed by the noise and visual inconveniences, especially when getting fair compensation. However, with a system of distant utility or shareholder owners, the local inhabitants get only the disadvantages and no compensation. This is seen as unjust and increases local political resistance to wind power.'

It is clear from fieldwork contacts with anti-wind protesters in Britain and France that one cause of rejection is the feeling of injustice engendered by outside firms who exploit a local resource and impose burdens, but offer no community benefit or compensation. Moreover, incentives to social acceptance have been totally absent from RPS schemes, such as the UK Renewables Obligation. Such schemes have encouraged developers to seek out the windiest sites, many of which are in highly valued landscapes and ecologically sensitive locations, meaning that the potential environmental costs are high.

Yet the success of REFITs in bringing small investors into the market cannot be claimed as a universal consequence, nor is it likely to continue indefinitely. The French REFIT, which was introduced in 2001, prompted a large number of proposals for wind turbine installation. But very few involved small investors. In part, this is because the French financial regulatory system makes cooperative financing of wind installation near impossible. But it is also because the financial requirements are now significantly greater than they were in the 1980s and 1990s, when relatively small turbines - arranged singly or in small clusters - could be purchased and erected by farmers and cooperatives. The recent trend has been to rapid upscaling along two dimensions: bigger turbines (in the one or two MW class) arranged in bigger arrays. A medium sized wind farm of 10MW costs around 10 million euros, with mega-projects of 100MW plus at the planning stage. This scale of investment can only be undertaken by large companies and consortia. The era of small-scale financing and ownership of grid-connected wind turbines seems to be ending, so closing a particular route to building social acceptance.

This reinforces the need to find new ways of enhancing community participation and stakeholder involvement. A number of modes can be identified, but it must be acknowledged that their use has mostly been experimental to date. They include:

1. Empowerment through decision-making: where the community votes on whether or not to proceed with a wind farm project e.g. Awel Aman Tawe in Wales.[3]
2. Local community benefits: where profits from wind farms are recycled in local projects via a community trust.
3. Local taxation: in France, wind farms - like other firms – pay a local business tax, known as the *taxe professionnelle*, revenue from which can be considerable for a cash-strapped small *commune* and can be recycled to finance community schemes.
4. Incentives to local energy consumption: making ‘green’ energy available more readily and / or more cheaply to locals.
5. Economic regeneration: where profits from wind farms are used to stimulate local job creation in sectors other than electricity generation.

[3] See Hinshelwood and McCallum (2001), and the following website: http://www.awelamantawe.org.uk.

6. Environmental regeneration, where profits from wind farms are used to improve the ecological quality of surrounding land (e.g. in cases where it was low in biodiversity and/or amenity).

Clearly, there is a need for development and experience-gathering across these modes, with careful evaluation of their feasibility and outcomes. For example, developers can be reluctant to distribute profits: partly on the basis that they take the risks and so merit the profits (although procedures for sharing risks with local communities can also be developed) and partly because trust schemes based on a percentage return may be badly received and counter-productive (e.g. interpreted by locals as a cheap 'buy-off', or by the council as bribes in exchange for planning permission). However, these problems may themselves be part of a wider climate of distrust, which itself needs to be acknowledged and addressed. This would suggest a need for enhanced consultation and participation procedures, in some instances upstream of bringing actual projects forward. An interesting attempt to develop such a 'user-guide' is the '*Outil d'insertion sociale et territoriale des éoliennes*' ('Instrument for the social and territorial integration of wind turbines'), prepared by the French Energy Efficiency Agency (ADEME, 2002).

In summary, a number of societal measures aimed at enhancing acceptability can be envisaged, though with the caveat that outcomes will depend on the freely consented commitment of political and social actors. Acceptance is not usually to be commanded.

## Conclusions

Policy learning over the long-term has allowed the broadening of the concept of policy integration, by the incorporation of both environmental and social dimensions. However, the learning process has also identified problematic and controversial trade-offs as regards recourse to different energy sources for electricity production, and to conflicting desiderata related to wind power in particular. Now that the parameters for success in achieving production capacity increases are relatively well-understood, attention shifts to wider issues of institutional capacity and societal capacity. We may be moving closer to policy models that integrate more fully and systematically these various dimensions in a manner congruent to the sustainable development aspirations

espoused by the European Union and its constituent states. Consequently, a key aim of this article has been to develop an extended conceptualisation of the policy integration notion. However, in the societal area policy makers are still at the lower end of the learning curve. A task for the social science research community is to convince the political and economic actors of the need to foster the development and generalisation of societal engagement in a cross-section of renewable energy sources. Otherwise the idealistic aspirations of the 'sustainability transition' may flounder due to incomprehension and inertia, or be undermined by top-down coercion and over-reliance on market mechanisms.

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