



Entrepreneurial energy

Associative entrepreneurship in the renewable energy sector in Wales

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Abstract

Purpose – The central suggestion of this paper is that innovation in the concept of entrepreneurship is overdue and that the concept of entrepreneurship needs to be extended to accommodate its often neglected collective or pluralistic dimension, a concept termed “associative entrepreneurship”. It has also been argued that there may be a natural link between sustainability and the co-operative form. In this paper these themes are drawn together by considering the entrepreneurial potential expressed by the recent creation of mutual businesses in a range of renewable energy sectors in Wales. It is suggested that, at least in the renewable energy sector and perhaps in other sectors too, innovation in the direction of sustainability may require a development of the concept of entrepreneurship in the direction of mutualism.

Design/methodology/approach – The paper takes the form of a theoretical discussion focusing around seven preliminary case studies.

Findings – As yet only a cluster of community-based enterprises have been discovered in the renewable energy sector in Wales. The authors propose to study them in detail in the next stage of the research.

Research limitations/implications – This is a developmental paper and many of its suggestions require rigorous testing. The authors would suggest that detailed case studies of the seven examples of associative enterprise in the renewable energy field outlined here, and others which may emerge during the research, would greatly enhance our understanding of what drives entrepreneurs in this field. Further research might also compare these examples with others organised according to more traditional business models.

Practical implications – In view of the urgent need to move towards a low-carbon economy and the expansion of the renewable energy sector this would require, understanding of the motivations of entrepreneurs in this sector is of great value.

Originality/value – Innovation in the renewable energy sector may be being held back by the limitations of the concept of entrepreneurship.

Keywords Entrepreneurialism, Renewable energy, Economic development, Wales

Paper type Conceptual paper



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Extending the concept of entrepreneurship

Much ink has been spilt in defining precisely what is meant by “entrepreneurship” and which factors are likely to support and expand entrepreneurial skills. Yet experts in entrepreneurship education (Warren, 2005) alongside many of those involved in developing these definitions have conceded them to be problematic, contested – even vacuous (Jones and Spicer, 2005; Williams, 2006). In his detailed semiotic analysis, Smith (2006) has argued that our current iconography of the entrepreneur is immature. Meanwhile, a paper on the characteristics of the entrepreneurial personality (Littunen, 2000) that has, in its published electronic form, been downloaded more than any other in the Emerald system, begins by stating that “Starting up a new firm is very much an individual decision”, a conclusion which it is the central purpose of this paper to challenge.

Williams (2006) arrives at the view that the three classic requirements of the entrepreneur are:

- (1) to prioritise the accumulation of money;
- (2) to spot opportunities; and
- (3) to innovate.

The implicit limitation of this view is demonstrated by the need to develop sub-categories of entrepreneurship, the most successful and wide-ranging being social entrepreneurship. Austin *et al.* (2006) elaborate a distinction between “social” and “commercial” entrepreneurship reaching the conclusion that they share many similarities as well as exhibiting obvious differences. We argue that this dichotomy is itself unhelpful, undermining the commercial potential of enterprising activity that is undertaken by groups of people using an innovative ownership and control structure, primarily the co-operative. This form of entrepreneurship we have termed “associative entrepreneurship” (Cato, 2004)[1].

Williams (2006), Smith (2006) and Warren (2005) take issue with the image of the entrepreneur as hero which is implicit in most conventional accounts. In Williams’s case the problem with the individualist depiction is not made explicit, his focus being rather the false wholesomeness of the image. Smith (2006) is concerned with the artificiality of icons in the popular media while Warren (2005) considers that the heroic assumption may in fact discourage potential entrepreneurs. By contrast, associative entrepreneurship is based on mutual values and involves the sharing of skills by groups of individuals to achieve the best outcomes for those in their group and the wider community. We have argued that it is particularly relevant in areas that have historically been dominated by nationalized industries and/or single employers, or where there has been a strong radical tradition (Cato, 2004). We use as the prototypical examples of such entrepreneurship the co-operatively owned coalmine Tower Colliery in the South Wales Valleys.

Spear (2006a, b) is thinking along similar lines in his suggestion that the concept of entrepreneurship needs to be extended to accommodate the often neglected collective or pluralistic dimension of entrepreneurship. Hulgård and Spear (2006, p. 3) argue that social entrepreneurship is of particular importance in depressed local economies:

It often operates in difficult sectors marked by low levels of available resources but where such a lack may possibly be compensated by the use of social capital. Theoretically it is

interesting since it represents a challenge to conventional thinking about entrepreneurship, which tends to emphasize the individual, whereas in social entrepreneurship there often seems to be a more collective dimension.

Meanwhile, Williams (2006) argues for a desanitising of the concept so that it may include activity that is currently found in the underground or informal economy. Such cash-in-hand work thrives in just the areas where enterprise is most needed, where high levels of persistent unemployment and low levels of formal economic activity coincide with high levels of skilled and in some cases partially disabled people (as an example see the description of the South Wales Valleys in Cato, 2004). In a separate paper, Williams (2005) argues that what he refers to as “the undeclared sphere” shows evidence of considerable self-employed economic enterprise and that public policy should focus on legitimising this rather than deterring it. While we maintain our adherence to the concept of “associative entrepreneurship”, with its association with the mutual impulse and its focus on ownership and control, the various challenges to the concept of individualist entrepreneurship suggest the need for a broader reconceptualisation; in this paper we address this need in connection particularly with the developing sustainable economy.

Research into the nature of entrepreneurship in a context of sustainability is sparse. Walley and Taylor (2002) created a typology of green entrepreneurs based on findings published in the literature on entrepreneurship. They coined the terms “innovative opportunist”, “ethical maverick”, “*ad hoc* enviropreneur” and “visionary champion”, but these terms relate primarily to the motivation of the entrepreneur in each case. So although they are useful, they do not address the issue of ownership and control which is key to our concept of “associative entrepreneurship” and our interest in the renewable energy sector in Wales.

Table I summarises the attributes of the lone, heroic entrepreneur who predominates in the entrepreneurship literature, following the qualities assigned to him by Williams (2006), whose account draws in turn on Burns (2001). The second column of Table I gives an indication of the way these qualities express themselves within the mainstream, profit-making economy. We will later suggest ways in which the same qualities may manifest themselves in the co-operative, sustainable economy that is nascent within that mainstream economy in most industrialised societies, using examples drawn from the local economy of Wales, UK.

We suggest that, as defined by the prevailing business orthodoxy, and by much of the academic literature which has followed this orthodoxy, entrepreneurship has

Attribute	Manifestation
Independence	Individualism
Achievement	Profitability and longevity of business; growth
Risk-taking	Borrowing money; moving into new sectors
Opportunism	Identifying new sectors
Innovation	Exploring new technologies or management techniques
Confidence	Ability to “go it alone” sometimes against expert advice
Energy	Willingness to work long hours and travel widely
Self-motivation	Creating own job rather than seeking work through application
Vision	Foreseeing future business developments

Table I.
Attributes of the
entrepreneur in the
mainstream economy

historically been characterised as individualist and focused primarily on profit. While there is now a flourishing literature on social entrepreneurship (Leadbetter, 1997; Waite, 2000; Shaw *et al.*, 2001; Sullivan Mort *et al.*, 2003; Nicholls, 2005, Elkington, 2006), this tends to be viewed as distinct from business activity, being rather a response to social exclusion or economic depression. We argue both that the closing of this gap is essential to the future success of our economy, and that the co-operative form, with its associative motivation and its concomitant requirement for economic success to ensure survival, is a crucial component. The rest of the paper seeks to develop this argument, using the renewable energy sector as a focus. The following sections explore why the classic business model of entrepreneurship fails in this sector. This is followed by a section offering examples of successes based on alternative, co-operative or community-based models drawn from the Welsh economy.

Unpacking concepts central to entrepreneurship

Profitability

While commentators have suggested that most owner-managers have objectives other than profit maximisation (Jennings and Beaver, 1997), it is clearly one key indicator of success for a conventional economic enterprise. It is generally assumed that we live in a “free” market, and yet many aspects of the way the market operates are suited to some forms of business rather than others (Porritt, 2006). As an example we might take an organic smallholding that produces salad crops and vegetables for distribution through a few local shops and runs its own delivery scheme. Such a farm is unlikely to avail itself of the Common Agricultural Policy (CAP) subsidies available to large farms, since the administration of such schemes is so time-consuming as to make them counter-productive. The farm will also benefit less from the government subsidy allowed to farmers through the use of low-duty red diesel, since it uses less machinery than a conventional farm. So we immediately see two ways in which the market for vegetables favours the large-scale, intensive producer.

Productivity is a key determinant of profitability and “productivity” in labour terms is generally considered in terms of the maximum output per worker, hence putting downward pressure on wages, moving production to cheaper labour-markets, and down-sizing the labour-force. By contrast, the objective of many co-operatives is the maintenance of high-quality well-paid jobs in the local economy for as long as possible (see Cato, 2004). Proponents of a sustainable economy specifically argue in its favour on the basis that it will increase levels of employment, which would run counter to the profit-driven view of productivity.

For a co-operative business even the concept of “profit” is problematic, since co-operatives cannot by their legal form generate profits to be distributed to shareholders. Many co-operators prefer to talk in terms of a “surplus” which can then be reinvested in the business or shared as a bonus between the worker-owners of the firm. The Co-operative Commission in the UK identified this as a key reason for lack of competitiveness in the sector, although others argue it is the essential commitment of the movement to reject the profit motivation of the mainstream economy (see the third principle of the Statement on the Co-operative Identity of the International Co-operative Alliance). This is clearly a source of tension which leaves co-operative businesses with a complex attitude towards profit.

Growth

A related problem of co-operative businesses operating in many sectors of the new economy is that of scale. The classic economic mantra of the green economy is “small is beautiful”, but the way our economy is presently organised favours large concerns over the smaller ones which may be more sustainable. The basis of profitability within a globalised economy is economies of scale. Yet these apparent “economies” are bought at the cost of huge environmental externalities, specifically the output of carbon dioxide required to produce the transport infrastructure to facilitate international trade, and to burn the fuels to enable the movement of the goods themselves.

A clear example is the National Grid for the production and distribution of electricity, which was designed at a time when the issue of security of supply dwarfed concerns about environmental pollution and most electricity was generated from burning coal. The Grid is now a white elephant, demonstrating both poor levels of efficiency (two-thirds of energy wasted before the final destination is reached Greenpeace, 2005) and vulnerability to sabotage, whether from terrorism or the unreliability of foreign suppliers (gas imports from Russian and Norway, or nuclear electricity imports from France). In the production, distribution and consumption of energy, small really is beautiful. Community heat-and-power systems, where biomass grown locally can be burned to produce sufficient electricity and heat for a housing estate or village, result in minimal transmission losses, a closed carbon loop (because the output from the plant is taken up by the next round of biomass growth), and only a limited production of CO₂ in the construction of the plant, compared with that required to build a large plant and transport the combustible material to it. The UK government has given support for such schemes (it defines them as “distributed energy”) in its latest energy review (Department of Trade and Industry, 2006), and the Welsh Assembly Government has conducted a review of the potential for micro-generation in Wales. However, since nothing is bought or sold once the system is running, the system is, by definition, unprofitable.

Another example of the existing market favouring large-scale over small-scale enterprise is in agriculture. Organic farming has many aspects that offer great economic as well as environmental benefit. Organic farming provides between 23 per cent (Morrison *et al.*, 2005) and 32 per cent (Soil Association, 2006) more jobs per farm than non-organic, which could lead to an increase in employment in the agricultural sector of 93,000 jobs if the whole industry switched to organic. In contrast to traditional agriculture, organic farming is attracting more, younger entrants, the average new organic farmer being seven years younger than the non-organic (Soil Association, 2006). Organic farmers are also developing just the sort of added-value activities favoured by the UK Department of the Environment, Food and Rural Affairs (DEFRA), such as on-farm processing, marketing and retailing, and establishing provenance for their product (Soil Association, 2006). However, organic farmers find it hard to compete with supermarkets (Lampkin and Padel, 1994; Kledal, 2006), who are using a whole range of uncoded public goods including the publicly funded road network and the absorption capacity of the atmosphere (i.e. their presently free right to emit exhaust-related CO₂) to achieve their lower margins.

Risk

The concept of risk and the risk-taking of the entrepreneurial individual could also benefit from some intellectual unpacking. The original conception of risk emerged in

the era of merchant capitalism, when merchants buying goods in foreign markets and chartering boats to transport them to markets where profits could be made were risking their whole fortunes on the vagaries of sea travel. In the era of bourgeois capitalism the entrepreneur's risk was rather to invest heavily in the market opportunity s/he had identified (Knight, 1933). In the modern era of corporate capitalism, where financial investment largely determines the success of a business venture, the individual's willingness to take on large levels of debt is the principal risk, and one which can produce substantial and disastrous failure as the spectacular corporate collapses of recent years (Enron and Worldcom, for example), have demonstrated. Given the nature of liability under legislation, though the entrepreneur is often insulated against the personal consequences of these financial risks (Freedman, 2000; Horvath and Woywode, 2005).

The economic sociology literature includes more sophisticated accounts of the entrepreneur. Interestingly, Casson (2005) extended the notion of the risk-taking individual to include innovators in the economy who improvise solutions to problems that cannot be solved by the traditional means. This conception has more relevance to the case studies of sustainable business we explore in a later section. Jones and Spicer (2005) begin one of their several useful deconstructions of the concept of the entrepreneur as follows (see <http://andre.spicer.googlepages.com/ExcessRevisedChapter6April04.doc>):

If we reflect on representations in economic thought or in the business press, we find that the entrepreneur hardly lives up to the critics' expectations. Instead of being a careful calculator of profit and losses, they generally appear as a deviant character. The entrepreneur is usually not someone who methodically assesses input/output ratios, but is rather the maverick, an over the top, exuberant figure; in short, a *passionate* character.

They extend this thesis by reference to the concepts of excess and wastage. Both these concepts are clearly key challenges to a sustainable economy which must focus on the husbanding of resources and a responsible attitude with regard to waste. This is another hint that the classical conception of the entrepreneur may be unhelpful in the sustainable economy of the future. The traditional concept of the risk taken by an entrepreneur is closely allied to the view of him – or less frequently her – as a “lone hero” (Warren, 2005; Smith, 2006). For many potential entrepreneurs facing these kinds of risks alone may be too challenging, which is another of the benefits of the joint or associative form of entrepreneurship. This may be particularly the case with female entrepreneurs, whose approach to risk-taking is distinct from that of their male counterparts (Brindley, 2005), and so we might argue that associative entrepreneurship would particularly help women entrepreneurs overcome barriers to their economic initiative.

We contrast the limited nature of risk within the limited liability company to the risk undertaken by the miners of Tower Colliery, who bought their mine following its closure by British Coal. By contrast to the limited personal risk involved in corporate entrepreneurship, the risk involved in investing £8,000 of their redundancy money in a share of the co-operative colliery was considerable. This money represented their only financial security following redundancy from British Coal, and their chances of finding other employment in the future were remote (for further details on the buyout, see Cato, 2004; O'Sullivan *et al.*, 2001). Because the capital invested in a co-operative belongs to its own employees, their motivation is distinct from that of either employees or external shareholders. They have a direct personal investment in the financial success of the

enterprise, and undertake a considerable risk when they invest their own money into the business. Community-supported agriculture schemes are also changing the balance of risks and rewards between producers and the consumers, since the “customers” pay a standard rate per month regardless of the quantity of vegetables available at that season. They commit to making those payments throughout the year and whatever the vagaries of the harvest.

Beyond this personal financial risk we could also suggest the importance of addressing the significant risks that are being caused by the unsustainable way our economy is organised. The waste of carbon caused by the extended production and distribution system of the global economy is risking the very survival of the human species, as well as serious destruction of the ecosystem (Hillman, 2004; Stern, 2006). Elkington (2006) attempts to set these considerations at the heart of his analysis of the implications of the sustainability agenda for corporate governance. These risks put those faced by the lone entrepreneur into perspective.

Innovation

For the conventional entrepreneur, innovation can consist of nothing more than the identification of a market opportunity (Williams, 2006), a way of buying something where it is cheap and transporting it to a market where it can be sold for a higher return (Woodin and Lucas, 2004), or filling a niche that is not currently catered for. In the case of the innovation we discuss in this paper the motivations are distinct from those classically associated with the entrepreneur, especially the accumulation of wealth and market power because, for the reasons outlined above, these are not probable outcomes in the renewable energy sector, especially within a framework of “decentralised energy”, which a sustainable energy market requires (Greenpeace, 2005). The most important innovation found in the renewable energy sector, we would argue, is the “social invention” of the mutual model of organisation: “The form itself, in a Co-operative and Mutual Enterprise, is the product, rather than a list of separate commodities” (Yeo, 2002, p. 40).

Innovation is defined as “the economic application of a new idea” (*Oxford Dictionary of Economics*) and hence is unavoidable for entrepreneurs operating in the new markets of the sustainable economy, such as renewable energy or organic food production. However, we would argue that their most important innovations may be in the nature of the organisational form they choose and the way they choose to measure and distribute the returns from their activities. As will be made clear from the case studies, for many renewable energy entrepreneurs the wellbeing of the local community and the planet as a whole is the key motivation, rather than financial or individual gain. To this end the most efficient business model is the co-operative, which allows a fair distribution of the value generated (whether market value or not) and the automatic involvement of all stakeholders.

Associative entrepreneurship in action

Entrepreneurs are “change agents in the economy. By serving new markets or creating new ways of doing things, they move the economy forward” (Dees, 1998). Overwhelmingly in the area of the sustainable economy, whether we look to organic farming or wholefood sales, entrepreneurs are choosing associative and frequently co-operative models for their business. One of the reasons for this is that the nature of

the business relies on community consent and involvement. For example, a community-supported agriculture (CSA) – which is a green business because of the elimination of food miles by people who are supplied with vegetables from the local farm – is also naturally embedded in its community, since the customers are also the owners of the farm and also elect members from amongst themselves to form the board of directors (see, for example, www.stroudcommunityagriculture.org/). As examples of community renewables projects show (for more information see the government's Community Renewables Initiative), a wind farm that offers economic benefits to those who suffer the loss of amenity it brings with it is much more likely to meet with success in the planning process. To take another example, a combined heat-and-power scheme is not viable unless the majority of the households within a certain area are prepared to become involved in it (Co-operative Party, 2006).

In this section we consider this form of entrepreneurship in the field of renewable energy innovation in Wales. In a theoretical paper without application to any specific economic sector, Freel and Harrison (2006), found that co-operative entrepreneurship is fundamental to innovation. We have argued elsewhere the existence of an essential link between a sustainable economy and the co-operative form (Cato *et al.*, 2006), which we have suggested operates through the concept of shared responsibility, both for a business and for the environmental and social wellbeing of the planet and the human community. This case has been supported by research from Canada (Novkovic, 2006) in the area of energy efficiency education and explored more generally in connection with sustainability by Elkington (2006).

Here we make this case particularly in the context of one sector in one local economy: the renewable energy sector in Wales, UK. We identified the existence of a cluster of environmental co-operatives while conducting an audit of Welsh co-operatives in 2004 (see Arthur *et al.*, 2004a) and later explored the conceptual relationships between sustainable business and the co-operative form (Cato *et al.*, 2006). We are now developing this work by exploring in depth a small number of businesses that result from associative entrepreneurship in the renewable energy sector in Wales. The concept of “associative entrepreneurship” is a relatively new one in the academic literature: the definition arises from the operational definition of the social economy we developed for our audit work in Wales (see Cato *et al.*, 2004). This definition involves a number of dimensions according to which businesses broadly conceived as operating within the social economy can be placed and, in contrast to some other looser definitions of “social enterprise” (for a fuller discussion of this aspect of various definitions see Pearce, 2003), considers the issues of ownership and control to be of central importance. As will emerge below, the businesses we are considering here are not all strict co-operatives, but all involve a strong commitment to community involvement and only one is privately owned. The results presented here arise from a preliminary exploration of these businesses and one of the objectives of the further research we propose will be to tighten our theoretical definitions and develop a closer understanding of how ownership and control relate to the nature of this sector of the sustainable economy.

The following sections present outline case studies of associative entrepreneurship in the renewable energy sector in Wales. Rather than selecting a sample we offer a complete list of what exists so far, with only brief details of each case. We are proposing to follow up on this initial paper by undertaking in-depth qualitative

research into the seven cases (Stake, 2000; Eisenhardt, 1989) so far identified and any others that may emerge through a process of snowball sampling during the research. We consider this very much as a preliminary stage of research, a testing of the water, and hence we consider the case-study method the most appropriate. Other approaches – such as survey methodology – were considered but it was concluded that the potential population available is both too small and too varied to produce any meaningful generalisations. We are also committed to the need for those involved in these community-based enterprises to exert sufficient power during the research process (Quattrone, 2006), which we consider requires the close interaction between research and researched that the qualitative case-study method ensures. The information presented below is little more than a thumbnail sketch of each of the projects (which are at different stages of development), a result of both limitations of space and of our current knowledge. However, we consider that the thesis of associative entrepreneurship is highly relevant in this sector and that it may be helpful to theorists of entrepreneurship as a framework for considering the increasing number of instances of co-operative enterprise in the field of renewable energy. Since our aim is to understand the motivation of associative entrepreneurs, our primary research will be qualitative in focus. However, we will also make use of existing quantitative, and especially financial, information about the enterprises we study and carry out a thorough analysis of the secondary material that is available.

One of the foremost theorists of entrepreneurship, Mark Casson, has produced several detailed studies of the potential for entrepreneurship in Wales (generally amongst Welsh speakers) which tally with conclusions reached by a study into the labour-market of the Welsh Valleys (Cato, 2004). Casson (2005) argued that a limited ideology and an inadequate emphasis on co-operation was holding back enterprise in the Welsh context, specifically that it was aggressively competitive and individualist and that this was a bad fit with the minority language culture of Wales.

Community heating with biomass

Case 1. Llanwddyn local biomass heating. Llanwddyn local biomass heating, the first community wood-heating project in Wales, is located in the small village of Abertridwyr, near Lake Vrynwy. The district heating scheme includes 30 out of 38 households on the estate as well as the community centre and school. The project has been coordinated jointly by Powys Energy Agency and Powys County Council, which jointly own the scheme, together with Severn Trent Water, the Forestry Commission and community representatives. It is thus a public sector project but with intense community involvement and significant economic benefits to the local economy. The system is powered by a 520 kW wood-chip boiler. The wood fuel is sourced (60 per cent minimum) within a 20-mile radius of Llanwddyn, encouraging local supply. This is chipped and stored around a quarter of a mile from the boiler itself. The contract to install and maintain the boiler is with Dulas Wood Energy Ltd. Funding has been received from EU Objective 2, the Powys County Council Local Regeneration Fund, the Energy Savings Trust Community Energy Programme, Severn Trent Water, the National Assembly for Wales, the Welsh Development Agency and the Home Energy Efficiency Scheme.

Case 2. Dinas Mawddwy community biomass heating. In this case the initiative for a biomass heating project arose from two enterprising individuals within the village of

Dinas Mawddwy in Powys. A preliminary public meeting was held in October 2004 to discuss the proposal being developed by the two community enterprises – Ecodyfi (see case study 4) and Adfywio Mawddwy – to offer householders, businesses and other building users the opportunity to buy locally produced heat from a biomass boiler distributed around the village by a small district heating system. One aim is clearly to reduce the environmental impact of heating and increase efficiency by producing it close to the final user, but another is to keep value in the local economy by using local forestry resources, increasing the number of local jobs in energy production, and raising the value of the local multiplier. Security of supply and a contribution to reducing carbon emissions were other benefits discussed at the meeting. Discussion is ongoing and the project has not yet become a business.

Case 3. Abergynolwyn community biomass heating. Abergynolwyn is a village of 176 households at the foot of Cadair Idris in Snowdonia. It is not connected to the gas network and so most homes have no central heating. The villagers of Abergynolwyn have formed a community energy company called Cwmni Egni Abergynolwyn to lead a project intended to bring a wood-fuelled biomass district heating system to the village. The proposed scheme would include a wood-fuelled boiler, together with a circulating hot-water system; it would also include the upgrading of properties to allow them to benefit from the heating system. According to Mid Wales Energy Agency, the survey shows that 76 per cent of households would join a biomass district heating scheme, which would reduce annual domestic fuel bills by an average of £134.42 to £488.58 *per annum*. The total project costs are calculated at £2.3m, which would be recouped four times over during the 50-year life of the scheme. It would also save around 55,000 tonnes of carbon dioxide emissions. The project has passed the stage of a feasibility study and funding is currently being sought.

Community wind-farms

Case 4. Bro Dyfi Community Renewables. Since April 2003 the first wind turbine in the UK to be established and owned by the community has been producing pollution-free energy in the Dulas Valley. The 75 kW turbine is located on land just above the Centre for Alternative Technology (CAT), which purchases all of the power generated. It is a prototypical example of associative entrepreneurship, coordinated by Bro Dyfi Community Renewables Ltd, a co-operative registered under the Industrial & Provident Society Acts. Members of the community were offered the opportunity to buy shares in the co-operative, and the issue was substantially over-subscribed (further details can be found in Leaney, n.d.). They receive a small dividend with the rest of the income generated from the sale of electricity being put into an Energy Conservation Fund, which supports energy-efficiency initiatives in the local area. The project was assisted by grants from the European Regional Development Fund, the Energy Saving Trust and the Scottish Power Green Energy Trust. The co-operative has recently held another over-subscribed share issue to pay for a larger 500 kW Nordtank turbine and tower bought second-hand from Germany. Ecodyfi secured £43,000 of European funding through Mid Wales Energy Agency for the project. Interest earned on this investment will be used to support community regeneration. The community benefits from the electricity generated, while the reduction in CO₂ emissions are a clear contribution towards mitigating climate change.

Case 5. Cwmni Gwynt Teg Cyf. Moel Maeologan windfarm is operated by Cwmni Gwynt Teg, a co-operative of three farming families in the Conwy Valley of North Wales. It has two operational wind turbines that are producing electricity for the local grid system with a combined output of 2.6 megawatts per hour – enough to supply 1,600 homes. Moel Maeologan is the first community project of its kind in the UK, being 100 per cent locally owned and with all income generated remaining in the area. The second phase of the project – Ail Wynt, meaning “second wind” – is to install nine more turbines to generate a further 30.7 MW per year. This will mean that the wind farm supplies electricity to 16 per cent of the homes in Conwy. While only three families participated in the first scheme, the second has been funded by a bond scheme with shares being available to local residents. In addition Cwmni Gwynt Teg donates £50,000 per year to Conwy Energy Efficiency. Overall, between 40 and 50 per cent of profits are donated to the community. In addition, the community has been involved in planning the project and siting the turbines, which has reduced opposition. Funding was made up of loans from Triodos and Barclays Banks and money from the EU Objective One Fund.

Small-scale hydro electricity generation

Case 6. Talybont-on-Usk: community hydro scheme. The UK’s first community-owned hydro-electric scheme is owned by Talybont-on-Usk Energy, a community-based charitable company in Powys. The scheme comprises a 36 kW turbine and began generating electricity for the national grid in February 2006. The group worked on a voluntary basis over four years to establish the project, and money raised from the sale of electricity is invested in an energy fund to support either renewable energy or energy efficiency projects. The plant is sufficient to supply an average of 50 houses. The design and installation of the hydro turbine and ancillary equipment cost around £90,000, from which income of around £17,000 a year through electricity sales is anticipated (annual figures for the first year of operation should be available soon). All the capital for the scheme was raised from grants, so that income that is not required for routine maintenance will be available for investment in further similar projects in the same community. The CO₂ emissions saved by the scheme are predicted to reach some 240 tonnes; a reduction of 3.6 tonnes of sulphur dioxide and one tonne of nitrous oxides per year will also be achieved compared with generating the same amount of electricity in a coal-fired station.

Case 7. Maes Glas: small-scale hydro. Tegwyn Jones is more of a traditional entrepreneur who has already completed one hydro-electric scheme on his hill farm near Mallwyd, Powys and is now planning to add a second. Although he is the sole owner of the scheme and the proceeds accrue to him he does see a community angle, since he hopes the generation of power will enable his sons to continue to work the land after him, thus sustaining incomes in the community at a level impossible with sheep hill-farming. He has received a 30 per cent grant from European funding to put towards the costs of the turbine, which generates 95 kW when in full flow, which is sold to London Electricity.

The preliminary case studies give a clear idea of the range of renewable energy being generated by these community schemes and the variation in range of involvement and share of product by the local community, which differs greatly from case to case. Ownership ranges from being wholly with the community, as in the case

of Bro Dyfi, through being entirely public sector, as in the case of Llandwddyn, to a fully private scheme but with much of the profit being reinvested in the local economy in the case of Moel Maelogan. In all the cases heavy community involvement was necessary, since it facilitated the planning process and a critical mass of local householders were required to be involved to make most of the schemes viable. There seems to be a strong *prima facie* case for calling the initiators of all these projects “associative entrepreneurs”, since their motivation included a commitment to benefit the community as well as personal advancement.

Discussion and conclusion

This is an exploratory paper, which provides theoretical insight into entrepreneurship in the renewable energy sector in Wales. The purpose of this paper is to suggest a way of conceptualising the entrepreneurship we find in the renewable energy sector in Wales. Because it is exploratory, this section consists of a series of hypotheses which we will endeavour to test during the fieldwork stage of this research. Our first, and most important, hypothesis is that the decision to be entrepreneurial is not essentially an individual decision. We have identified a number of examples of people who felt the need for a group of a certain size in order to be able to initiate enterprise. In the next stage of this research we would like to explore whether the decision to be entrepreneurial in association with others was a positive decision, i.e. a commitment to group enterprise, or a negative one, i.e. based on the psychological or capital limitations of the individual who initiated the project. We would also like to explore whether, as we hypothesise, this form of entrepreneurship has an essential link to the development of enterprise in sectors linked with sustainability.

Our guiding thesis is that a sustainable economy may require a larger role to be played by associative rather than individualist entrepreneurship, and hence we are led to ask the question: which aspects of the classic entrepreneur will survive in a sustainable economy? Table II offers some hypothetical responses to this question, revisiting the classic traits of the entrepreneur identified by Burns (2001) and suggesting their possible manifestations in the sector that is the focus of our research attention. We plan to explore the validity of these hypothesised attributes in the in-depth research phase, but initial suggestions as to which traits are evident in which cases are offered in Table II. At present these are just suggestions based on our preliminary investigation of the seven examples of community renewable energy schemes in Wales. This is an exploratory paper and many of its suggestions require rigorous testing. We suggest that detailed case studies of the seven examples of associative enterprise in the renewable energy field outlined here, and others that may emerge during the research, would greatly enhance our understanding of what drives entrepreneurs in this field. Further research might also compare these examples with other businesses in the same sector organised according to more traditional business models.

We found that all the case-studies demonstrated independence in the sense of wishing to provide energy to their local community that was independent of the National Grid. In most cases the entrepreneurs were concerned to achieve sustainability, although in cases 5 and 7 financial achievements were more important. In the context of associative entrepreneurship profitability needs to be interpreted as sufficient surplus to allow the business to continue: the satisfaction of this criterion was unclear in the first three cases, which are either nascent or publicly

Attribute	Manifestation in	
	Conventional entrepreneurship	Associative entrepreneurship
Independence	Individualism	Insulation of community against destructive forces of globalisation, e.g. <i>raison d'être</i> of Dyfi Community Renewables (case 4)
Achievement	Profitability and longevity of business; growth	Sustainability: the guiding principle of cases 1, 2, 3, 4, and 6
Risk-taking	Borrowing money; moving into new sectors	Balancing job survival against innovation: major concern with cases 5 and 7
Opportunism	Identifying new sectors	Identifying new sectors: true in all cases
Innovation	Exploring new technologies or management techniques	Exploring new forms of organisation structure: true in all cases
Confidence	Ability to "go it alone", sometimes against expert advice	Based on mutual support: evident from community basis of cases 2, 3 and 4
Energy	Willingness to work long hours, travel widely	Willingness to work long hours: unknown at this stage
Self-motivation	Creating own job rather than seeking work through application	Based on mutual support: research needs to explore comparison between community enterprises and smaller co-ops, e.g. cases 5 and 7
Vision	Foreseeing future business developments	Foreseeing and envisioning environmental sustainability: especially cases 1, 2, 3, 4 and 6

Table II.
Attributes of associative entrepreneurs in the sustainable economy

owned; case 4 has a secure market position since its output is supported by one customer; cases 5, 6, and 7 are primarily concerned to achieve sufficient surplus for business to continue. As far as risk-taking is concerned, this classic feature of the entrepreneur is demonstrated in all cases since all are pioneers in a new field, however especially so in cases 5 and 7, which can be considered examples of farm diversification. All cases have also demonstrated opportunism by engaging in an emerging market. As far as confidence goes, our hypothesis is that in the case of associative entrepreneurship this emerges from community support. We cannot draw firm conclusions at this initial stage of the research, but would hypothesise that such support should be particularly strong in cases 2, 3, and 4, which are most firmly tied in to their local communities. We cannot draw any conclusions about the energy shown by the entrepreneurs without further research. Self-motivation is likely to differ between the community-based businesses and those that are just co-operative ventures between a small number of individuals, i.e. cases 5 and 7. This can only be verified in the next stage of the research. All cases have demonstrated vision in involving themselves in an emerging market; the vision of a sustainable future is a less strong motivation in cases 5 and 7, which are more motivated by financial objectives than the other cases.

Table II suggests the differences between the conventional model of the entrepreneur and its expression in the renewable energy sector in Wales. However, in other ways we find striking similarities between associative entrepreneurs in the

renewable energy sector and the traditional entrepreneurship model. The ability to innovate is a key aspect of the entrepreneurial personality as identified by Burns, and this is also central to the desire to engage in the field of renewable energy generation, which is a new industry all of whose participants are pioneers. This implies risk, and the ability to accept that the project will fail – another key characteristic of the entrepreneur. In the case of the enterprises we have studied here the financial risk may be less, since many are buffered by grants and local authority investment. However, they are risking a great deal of their personal time, effort and reputation in a sector that is still in the early stages of development. As most of the entrepreneurs are still at the pioneering stage of such activity, they are likely to be in the “entrepreneurial learning process” (Littunen, 2000). All the entrepreneurs studied here have displayed the ability to spot a new opportunity, which Burns identifies as a key characteristic of the entrepreneur. We hope to explore all these characteristics and their expression in this particular sector in the next stage of this research. For this next stage we will conduct semi-structured interviews with the leading entrepreneurs and community representatives from each case identified here and analyse the results, comparing their responses with the traits of the entrepreneur identified by Burns. This will allow us to explore further our hypothesis that entrepreneurs in the renewable energy sector are more likely to work associatively or co-operatively than as individuals. While conducting this research we have become aware that there are similar developments taking place in Scotland, and we may take this research forward by comparing developments in Wales and Scotland.

If, as Schumpeter suggested as far back as 1942, the role of the entrepreneur is to drive the creative-destructive process of capitalism, never have such people been more important than in this century when we need rapid and creative innovation in response to the threats of climate change and resource depletion. He wrote that “the function of entrepreneurs is to reform or revolutionize the pattern of production”. We would suggest that, in spite of their reluctance to make profits, he might find the very dynamic and creative business people he was writing about in the renewable energy co-operatives rather than the boardrooms of corporations. Our hypothesis is that the sustainability revolution that is the inevitable response to climate change requires an equally revolutionary change in the conception of the entrepreneur, to one committed to the wellbeing of the community as well as, or perhaps instead of, individual profit, and one who works together with others co-operatively rather than as a lone hero.

Note

1. There is a plethora of terms feeding into the academic literature to describe economic activity that is primarily socially motivated, of which the most popular by far is “social enterprise”. Others include community enterprise and green entrepreneurship. The advantage of our term “associative entrepreneurship” is that it sets the issue of ownership and control at the heart of the discussion. This clearly delineates such activity from economic activity that merely has a different kind of motivation. For more explanation, see Cato (2004).

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