

Towards a Co-operative Energy Service Sector

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The necessity for societies to reduce carbon to mitigate and adapt to the impacts of climate change is creating new opportunities for economic decentralisation. Co-operative energy services are emerging in response to this adaptation challenge. The paper describes the current situation in Denmark and the USA. Policy support from national government has been key in both these cases to the healthy development of the significant co-operative energy sector. In the UK, co-operative energy services are emerging in four main areas: community scale renewable energy, combined heat and power, mutual finance for housing retrofit services and forms of bulk purchasing and energy supply. Like the USA and Denmark, rural areas of the UK are offering niche markets to develop co-operative energy services, although weaknesses are evident including a lack of strategic thinking, poor forums for communication and knowledge transfer, and weaknesses in the areas of finance in policy-makers' understanding.

Introduction

The challenge of climate change has led to a burgeoning interest in the idea of a 'transition' from our current model of energy to one based on sustainable low carbon production and consumption, on a more localised basis. Transition has moved from ideas into practice in a rapid way. In 2005, Totnes in Devon became the UK's first "Transition Town". There are now 191 Transition towns or communities in the UK (Transition Initiatives, 2012), while worldwide, there are 376 Transition initiatives and 11 countries now have national Transition hubs. In turn, these are contributing to the formation of new co-operative enterprises in line with the idea of an 'energy descent' in our patterns of economic life. The Totnes Renewable Energy Society, for example, formed in 2007.

This paper draws on research for and follow-up to a practitioner event organised in 2011 by Co-operatives UK, working in association with the Co-operative Group – designed to explore the potential in the UK for co-operative and community energy services and the contribution that this may have for tackling fuel poverty and promoting a more sustainable economy.¹

A Short History of Co-operative Utilities

Utility co-operatives have long been successful in Scandinavian countries with Denmark and Sweden pioneering electricity co-operatives over a century ago and Finland taking a lead to develop phone co-operatives (Birchall, 1994). In Britain energy supply services developed in a different way that marginalised the opportunity for energy co-operatives. There were major problems in the late nineteenth century with private sector provision of utility services and under mayor Joseph Chamberlain, Birmingham municipal gas, water and electricity were developed through a service oriented non-profit structure (Hunt, 2004). This was replicated elsewhere nationally and thereafter public sector energy services became the norm and remained so until the mid-1980s when British Gas and the regional electricity boards were privatised.

For a long while, the model for utilities appeared to be ever more national and, when privatisation opened the space for commercial acquisitions, international. It was arguably Denmark which was first to pioneer a new, decentralised utility model, harnessing renewable energy and co-operative models of enterprise. In the mid-1970s many countries strategically reviewed their national energy policy in the wake of the Opec Oil crisis. The plan Denmark implemented has been to develop a decentralised model of energy services based on both offshore and onshore wind energy and more efficient localised forms of energy generation and heat capture including district heating, CHP (combined heart and power) and biogas. Community, co-operative and joint venture municipal and co-operative ownership structures have provided democratic legal structures for the Danish model to disperse and localise its energy services system since then.

Co-operative energy systems are tailor-made for decentralised systems of delivery. In countries where co-operative energy solutions have thrived they have succeeded by tackling energy supply problems that private sector investors cannot secure an adequate return from as the capital investment requirements are high and the price the energy market will bear is too low to provide a normal commercial return. There are other factors too. Co-operatives UK collaborated in 2004 with the DTI to research the success of the energy co-operative sector in Denmark and Sweden. This study revealed four key factors underpinning the popular and growing success of co-operative and community-driven energy services in Scandinavia:

- i. Support to communities from technical advisors and practitioners to transfer know-how.
- ii. Commitment of government and local authorities to community involvement and ownership models and to a co-operative approach with many small units of delivery.
- iii. Education and information to promote public familiarity with the range of co-operative structures and energy services.
- iv. Multiple bottom line perspective to develop a public consensus that the price of energy should not be the only driver of energy policy.

In the USA in the 1933 it was apparent to President Roosevelt that rural areas could not be electrified and unemployment overcome without a non-market approach. Roosevelt sent a task force to Scandinavia to study rural electricity co-operatives (see Hall, 1988). The solution developed and introduced in 1935 under New Deal legislation was a joint venture between the US government and a new network of rural electricity co-operatives given access to low cost quasi-equity. To develop this social economic model the government provided access to low-interest public loans initially for ten years. In 1944 this subsidised finance was extended and fixed at 2% over 25 years (Coop Litigation News, 2010). This patient financing enabled a multi-state network of rural power supply co-operatives and rural distribution co-operatives to collaborate to build the network systems and infrastructure to deliver energy services across the rural America. Today over 900 mainly rural energy co-operatives own 40% of national power lines and provide light and power to 42 million people in 47 states. 11% of the power supplied is from renewable energy sources. Most of these energy co-operatives are members of Touchstone Energy, a co-operative federation founded in 1998 (Touchstone Energy Co-operatives, 2012).

In recent years, UK wind energy co-operatives and community owned CHP have developed at a steady pace and sought to learn from this experience (see Appendix). There are around 19 energy generation co-operatives trading across the UK, with a further six at launch stage. More widely, there are a total of 67 registered co-operatives and mutuals which support or deliver low carbon energy. These have raised £19,698,000 of share capital from their members (over £13m of this comes from community share issues coordinated by Energy4All and their member co-operatives). In addition to these, 2011 saw the market entry of Co-operative Energy as a national energy retail supplier.

Strengths, Weaknesses and Opportunities in the UK

A round table event convened by Co-operatives UK in 2011 brought together over 30 national experts in the co-operative and mutual sector who are working in the fields of renewable energy and housing retrofit. A key purpose of the event was to explore the role that the co-operative and mutual sector could play in tackling climate change. The discussion focused initially on identifying the current strengths and weaknesses of the sector. Table 1 sets out a summary of the findings on this.

Table 1. Strengths and Weaknesses of the Co-operative Sector in relation to sustainable energy

Strengths	Weaknesses
Specialist knowledge and innovative practitioner networks in some areas of energy services.	Lack of focus, cohesion and direction – fragmented effort by small organisations that is too slow to make a difference.
The Co-operative brand and 10 million members – plus lobbying and campaigning skills.	Lack of co-ordination, forums for communication and back office help.
Developed models for community renewables, advice and support, legal structures, volunteer involvement, share raising, Greening Together, etc.	Lack of infrastructure to scale up, lack of common standards along with isolated good practice and poor replication.
Trust in co-operatives and mutuals and growing interest in community based schemes.	Lack of mechanisms to avoid unnecessary competition.
Sources of finance capital and models for raising funds ethically and socially.	Lack of joined-up systems for retrofit work.
Allied bodies such as Friends of the Earth, Renewable Energy Association, Transition Network and Low Carbon Communities Network.	Lack of funding models for small co operatives, for retrofit work and poor access to development finance. Lack of methods for raising construction finance.
Democratic and participative structures for communities and growing track record in other fields.	Lack of awareness in the UK of the potential of co-operative and mutual models – low profile and poor image holding things back.

The event also helped to point to five areas of current and emerging co-operative and community good practice, from energy service provision and retrofit delivery through to community renewables. These included:

- Community development loan finance for housing retrofit.
- Energy service companies for social housing tenants.
- Community CHP (Combined Heat and Power).
- Rural co-operative opportunities.
- Collective purchasing.

We address each of these in turn.

Community Development Loan Finance for Housing Retrofit

Through hands-on partnerships with 19 local authorities in the South West (including: Bristol, Bath Somerset, West Dorset and South Gloucestershire), Wessex Home Improvement Loans (WHIL) has developed a model of best practice in home improvement lending. Similarly, in order to develop products that could operate under the UK Government 'Green Deal', London Rebuilding Society, Street UK Homes, WHIL, South Coast Money Line and Robert Owen Community Banking Fund are winning local authority support for 'green loan' products for carbon saving measures. Street UK Homes and London Rebuilding Society are both involved with pilots with the Energy Saving Trust on new green loans.

Depending on the different 'green finance' product, these loans are available to low-income homeowners and in some circumstances to assist private sector landlords to retrofit empty properties to provide housing for homeless people. To date, models such as these have provided £80 million in home improvement loans – while, in addition, the Home Improvement Trust has advanced over £30 million under its House Proud partnership.

Evidence from the more established practice in the USA indicates how much further the community finance partnership approach with local authorities can be developed. In Chicago, for example, social lenders have advanced loans for repairing, improving and building 28,000 homes, helping to reinvest an estimated \$1.1 billion in the city's low-income neighbourhoods. There are 230 members of NeighborWorks America working in 4,400 urban and rural communities across the USA (NeighborWorks America, 2012). Since 1991 they have assisted 1.8 million low-income households with their housing needs and since 2001 they have directly invested or leveraged the reinvestment of \$18.1 billion in the local communities they serve.

Energy Service Companies for Social Housing Tenants

There has been interest over some time in different forms of Energy Services Companies (ESCOs), including in relation to the energy needs of social housing tenants. An unsuccessful effort to set up a Birmingham ESCO by ART Homes, a decade ago, inspired a second successful initiative in the West Midlands. Richard Baines, the architect member of the ART Homes team worked with Black Country Housing

Association to develop EnergyExtra. This ESCO has been trading for nine years and has 15 housing association and local authority backers. It currently provides energy advice, discounted energy efficient appliances and energy from a preferred supplier (Scottish and Southern Energy) for 40,000 tenants. EnergyExtra has become the largest ESCO for retailer consumers in the UK.

Dundee City Council established a similar preferred supplier arrangement with Scottish and Southern in 2001 (see, for example, Birmingham Settlement Community Energy Research and Bristol Energy Centre, 1993). These affinity deals provide between £10 and £30 per tenant signed up and can generate a substantial revenue stream. This is a good two-way deal as it costs energy suppliers £50 to £60 to sign up new customers through other forms of marketing and sales. Dundee has 14,000 tenants and it is moving towards an income of £70,000 a year which it uses to fund free energy advice services and some grant-funded measures.

The challenge of financing major improvements to high-rise Council housing and public sector buildings is another critical area where fresh thinking is needed. Here the scope for the development of ESCOs linked with an Energy Savings Co-operative has real promise. The key difference between this model and traditional suppliers is that the contract would specify that customers are charged for the output of energy services not the kWh of energy consumed. The enterprise would have an interest, shared with consumer, to keep the actual use of energy to a minimum.

Community CHP (Combined Heat and Power)

Community (or district) heating is an energy supply system based on a shared boiler plant for either a block of flats or a number of buildings. In fact, the first commercial power plant ever established in the USA in 1882 by Thomas Edison was in fact a CHP plant that captured waste heat from generation and provided warmth for buildings in the district (Cogeneration News and Technologies, 2012). Economic and carbon savings can be secured by bulk buying fuel for community heating and using renewable sources of energy, including biomass, biogas and geothermal. Conventional power stations lose 45% to 65% of the heat they generate. CHP systems can heat a whole neighbourhood or a small town and achieve energy efficiency levels of 89%.

Denmark has for the past three decades integrated renewables (wind) and combined heat and power (both fossil fuel based and biomass) into its energy mix. Over 60 per cent of its space heating is derived from district heating and CHP. Around three quarters of the district heating networks are owned by their consumers; just over a quarter is owned by local authorities.

One community heating project in Aberdeen shows the scope to cut carbon and tackle fuel poverty – the four million households in the UK for whom the cost of keeping warm represents a tenth of their income or more. Starting in 1999, the city set out an Affordable Warmth Strategy to tackle the thermal inefficiency of its 26,500 council houses. As part of this strategy the council identified a key role for CHP district heating in a number of city areas with high rise blocks. To set up the CHP service the local authority established an independent, community-owned, not for profit company, Aberdeen Combined Heat and Power Company Ltd. The first project in Stockethill retrofitted four multi-storey blocks and 288 flats (Energy Saving Trust, 2003). 98% of residents were council tenants and 70% were in fuel poverty. Buildings connected

have seen emissions reduced by approximately 56% and fuel bills cut by up to 50% (Aberdeen City Council, 2011). Tenants pay for their heat and power through their rent and the community-owned CHP company provides local accountability. A major economic advantage of CHP is that, because heat is not a regulated energy service, no VAT is payable, if it is incorporated into the rent.

Rural Co-operative Opportunities

Rural areas have access to a diversity of renewable energy resources from wind to hydro and from wood to biomass. Rural communities are often not linked to gas supplies and sometimes poorly linked to electricity. Finding creative ways to plug this energy services gap has driven community renewables innovation over the past 15 years in many rural areas of Scotland, Cumbria, Cornwall, the Midlands, the North East and Wales.

Baywind Energy Co-operative was formed in 1996 to provide community ownership of the Harlock Hill wind farm in Cumbria (Brown, 2004). The Swedish renewable energy company, Vindkompaniet provided initial development expertise. However it was the co-operative that raised £1.2 million in capital through a share issue to build two turbines on the site and subsequently raised a loan from the Co-operative bank to acquire three further turbines on Harlock Hill from Vindkompaniet. In 2001 a further share issue raised £670,000 for a wind turbine at the Haverigg II site.

Baywind set up Energy4All in 2002 as a technical advice and development service to promote co-operatively owned energy projects. Energy4All is owned by the growing number of renewable energy co-operatives it has supported. There are now seven members and between them they have raised over £13 million in share capital. One of the larger members is Westmill Wind Farm Co-operative in South Oxfordshire. It has raised £4.4 million from over 2300 investor members (Brown, 2008).

A number of Community Land Trusts either have or are seeking to develop community renewable schemes. The Isle of Gigha Heritage Trust in Scotland was established in 2001 through a £4.15 million community buy out of the island (National Community Land Trusts Network, 2012). Since then, the trust has improved the existing housing stock on Gigha and built 18 new affordable homes and a community wind farm.

Collective Purchasing

It is not straightforward for households to come together for joint purchasing in energy. Even so, research by the Co-operative Party has shown that savings of 10 to 20% for households is achievable through energy bulk buying and an energy co-operative. There are several ways to build consumer ownership and secure significant savings through co-operative models. Woonenergie in the Netherlands acts as an energy broker for Aedes, the Dutch national federation of housing associations. Woonenergie buys energy at wholesale prices, operates the marketing and customer services for 60,000 tenant households but sub-contracts an energy supplier to handle the billing (Northern Ireland Housing Executive et al, 2010). Annual savings to tenant households is about 60 euros.

In Belgium a charity, ACW, helped the households in the province of Limburg to set up an energy brokerage in 2003 with the aim of achieving savings for households

comparable to the economies available to large corporate customers of energy companies (Erbmann et al, 2009). Grass roots action, community meetings and door-to-door promotion led to a 75% take up in some areas. In the first year savings of 15-20% were achieved. ACW has mobilised a strong volunteer network and the model has spread to other parts of Belgium. Over 15,000 households have joined and average savings of 250 euro have been reported. ACW has expanded its service to focus on the collective purchasing of energy efficiency measures, solar thermal and photovoltaic installation.

In rural areas many homes are off grid and dependent on paraffin heating oil and wood. The Energy Co-operative in south-eastern Pennsylvania was sponsored in 1979 by a successful food co-operative to bulk-buy heating oil (Northern Ireland Housing Executive et al, 2010). It now provides this service for 6,500 members. Annual membership fees range from \$30 to businesses and \$15 for households. No fee is charged to low-income, retired and disabled members. The success of the bulk-buy service and membership growth enabled the Energy Co-operative to secure an energy supply licence in 1998.

Co-operatives UK is now working in partnership with the Department for Business, Innovation and Skills to run an Innovation Prize for collective purchasing and it will be of interest to see whether sustainable energy is a model where consumer power, acting co-operatively, can become a force for good.

Conclusion

The challenge of climate change is, in part, a clash of timescales. As the 1992 follow-up report to the original Club of Rome report stated: “the world system does not run out of land or food or resources or pollution absorption capacity, it runs out of the ability to cope” (Meadows et al, 1992). Utilities have emerged in previous eras through grass-roots co-operative and community enterprise, but equally they have required an appropriate framework within which to do so. It is far from clear whether the emerging co-operative and community initiatives in the UK can develop fast enough for the transition ahead that is required for a low-carbon future, or that the national framework is in place for them to do so. Yet the ability to cope, in the examples we have given and the opportunities identified by practitioners, suggest that there is hope yet for the emergence over time of a significant and vital co-operative energy services sector in the UK.

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Notes

- 1 The results of this event have been published – see Conaty (2011). This paper draws directly and in a significant way from the research and analysis in this paper.

Appendix

Sustainable Energy Generation Co-operatives in the UK

Name of Co-operative	Trading Activity	Formed
Baywind Energy Co-operative	Generate energy from renewable sources and to promote the conservation of energy.	1996

Boyndie Wind Farm Co-operative	Established to allow the community in Banffshire to own a share in the first wind farm co-operative for Scotland.	2005
Bro Dyfi Community Renewables	Wind.	2001
Community Power Cornwall	Development and operation of small to medium scale community owned renewable energy installations.	2008
Fenland Green Power Co-operative	Established to enable members of the public to own a stake in their local renewable energy resource and thus benefit from the sale of green electricity.	2004
Great Glen Energy Co-operative	Established in 2008 for the purpose of owning a share in the Millennium wind farm located near Invergarry.	2008
Green Energy Nayland		
Hook Norton Low Carbon	A community mutual, set-up to purchase goods and services on behalf of members to reduce the carbon front print of the local community.	2009
Isle of Skye Renewables Co-operative	Established in 2007 for the purpose of owning a share in the Ben Aketil wind farm located near Dunvegan.	2007
Kilbraur Wind Energy Co-operative	Established in 2008 for the purpose of owning a share in the Kilbraur wind farm located near Golspie.	2008
Ouse Valley Energy Services Company	Energy advice and development of renewable energy in the Ouse Valley.	
Oxford North Community Renewables	Solar, aiming to increase the amount of renewable electricity being generated in North Oxford, provide cheaper electricity for the school, provide funds for further carbon reducing activities in North Oxford, raise investment from those with a connection to The Cherwell School or North Oxford, providing a reasonable rate of interest.	
River Bain Hydro	Established as an Industrial and Provident Society for the Benefit of the Community for the specific purpose of owning the River Bain Hydro Electric Scheme.	
Settle Hydro	Established as an Industrial and Provident Society for the Benefit of the Community with the specific purpose of owning the Settle Weir Hydro Electric Scheme. The Society will generate revenue by selling 'green' hydro-electricity.	
Sustainable Hockerton		
Torrs Hydro New Mills	Development of renewable energy (hydro) in the New Mills area.	2007
West Oxford Community Renewables	Development of renewable energy in West Oxford.	2009
Westmill Solar	Solar.	
Westmill Wind Farm Co-operative	Set up to generate and sell electricity from renewable energy sources (wind power), promote energy conservation within the local community, and provide education on climate change issues.	2004

Bath Community Energy	A community finance mutual that promotes, facilitates and operates a renewable and low-carbon energy and energy efficient projects in Bath and the surrounding areas.	2010
Esk Energy (Yorkshire)	Hydro — Whitby Esk Energy.	
Sheffield Renewables	Development of renewable energy in Sheffield.	2009
Stockport Hydro		
Totnes Renewable Energy Society	Development of renewable energy resources.	2007
Wey Valley Solar Schools Energy Co-operative	A community owned energy co-operative, set up by local people to install and run electricity generating solar panels on state schools in the Waverley and Guildford area.	
Bridport Energy Services Company	Works with local people to help develop renewable energy, providing public education and promotion material.	2009
Brighton Energy Co-operative	To develop renewable energy resources in Brighton and Hove for the benefit of the local community, promoting renewable energy and energy efficiency.	2010
Community Energy Warwickshire	Developing and operating community-owned renewable energy projects and promoting energy efficiency and carbon reduction.	2010
Cwm Arian		
Five Valleys Energy Co-operative	A Community-owned and governed green energy generation and consuming co-operative.	2010
Isles of Scilly Renewable Energy		
Low and Behold	Developing co-operative waste to heat plant in Herefordshire.	
Low Carbon Gordano		2011
Maidenergy Co-operative	To further local sustainability projects in Maidenhead.	2010
Norton Energy Community		
Unity Wind	Wind.	2007
Valley Wind Co-operative	Valley Wind is a co-operative working towards a wind power development in Kirklees.	2009
Wadebridge Renewable Energy Network		2011