

The new 'civic' energy sector: implications for ownership, governance and financing of low carbon energy infrastructure

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Abstract

The way UK low-carbon generation capacity is delivered is changing. Several studies have shown a move away from the dominance of corporate utility financing, to a far more mixed field of actors (PwC, 2010; Nelson & Pierpont 2013). This includes greater participation from institutional investors, medium sized private companies and independent power producers. In parallel there has been a recent surge of interest in all aspects of the energy sector from city-regions, municipalities, communities and citizen investors (Core Cities, 2013; Capener, 2014; DECC, 2014). Whilst corporate utilities and nation states are familiar actors in the energy system, the emergence of municipal energy companies, regional energy planning, community energy schemes and alternative energy finance are less well understood on a systemic level. Taken together, we define these municipal and civil society actors as the 'Civic Energy Sector', and argue that under the right circumstances, this sector could become a substantial element of the entire energy system. This paper presents findings from comparative case analysis of the UK's latent 'civic' energy sector with the expansion of this sector in Germany. The ability of such actors to deliver low-carbon generation is demonstrated in Germany, where municipalities, citizen investors and co-operatives, own between 40-50% of low-carbon capacity, and some municipalities are taking leading roles in planning for low-carbon futures (Buchan, 2012; Auer & Heymann, 2013). We use framings from ecological economics and MLP approaches to describe how institutional frameworks in Germany are far more compatible with civil society participation in the energy system. We find local banking systems, municipal utilities, and a tradition of mutual ownership are key enablers for civic energy futures.

Keywords:

Civic Energy Sector, citizen finance, municipal energy, community energy, local banking

1.0 Introduction

Ownership of the UK's energy system is concentrated in the hands of large utilities operating across generation, distribution and supply sectors. Transmission and distribution assets are largely owned by international corporations or investment funds. On the supply market, the 'Big Six' utilities supply circa 95% of domestic and 80% of commercial consumers (OFGEM, 2014). As the ownership structure of the UK energy system is characterised by large international stakeholders, so is the capital that underpins it. The capital finance for the UK energy system is drawn either from commercial bank project finance or utility equity investment, which is also drawn from an increasingly concentrated pool of large capital finance providers (Pond, 2006; Blyth *et al*, 2014)

In response, UK energy policy has been designed to address a large centralised and internationalised system with large centralised and internationalised policy. Projections of investment needs vary between £110bn by 2020 (OFGEM 2009) to up to 300bn by 2030 (see Blyth *et al*, 2014). The challenge of funding infrastructure in the UK is often framed in terms of the suitability of particular mixes of (nation) state and corporate ownership (Helm, 2013; Hall *et al*, 2012). Similarly, the challenge for energy policy in has been characterised as one of attracting large, mobile capital into energy infrastructures (BNEF, 2012/2013a). The potential for different types of capital and ownership structures (i.e. non-state and non-corporate) at the local level, has been largely ignored.

This study aimed to analyse the participation of non-state and non-corporate actors in the energy systems of the UK and Germany, where alternative ownership models are far more prevalent. The structure and drivers of the German energy sector beyond the state/corporate nexus are analysed. This analysis is used to define a further 'civic' energy sector with significant potential to contribute to low-carbon futures.

2.0 Literatures

For final analysis this research will draw on three, literatures to describe and define a civic energy sector. Firstly notions of large systems change and co-evolutionary systems literatures (See: Hughes, 1987; Joerges, 1998; Geels, 2006; and Foxon 2011) will define the role of actors, structure and agency within the energy system. Secondly the literatures on community and municipal energy provision (see: Seyfang *et al* 2013; Nolden, 2013; Bolton and Foxon 2013; Hannon *et al*, 2013) will locate the research within a group of agents who are neither corporate nor state owned, and play very different roles in the UK and German energy systems. Finally notions of civil society and civic

participation (see Edwards, 2013) will draw out the values common to those agents beyond state and corporate ownership.

3.0 Methods

This study utilised a qualitative research design, comprising secondary documentary analysis of policy and statistical publications with primary research comprising in depth semi-structured interviews. Interviewees were selected that had interests in the finance, ownership, or governance of the energy systems in the UK and Germany. Primary data comprises 28 in depth interviews with 34 individuals from across the energy value chain in the UK and Germany. The sample comprised 6 utility executives 9 energy finance providers (from hedge funds and pensions funds to citizen and co-operative finance) 6 project developers, 5 institutional investment professionals, 2 policy professionals, 2 energy journalists, 2 energy lobbyists and 2 academics.

4.0 Results and discussion

This analysis is introduced with a short historical context. Results are then structured in four parts; generation, distribution, supply and finance. In each, findings on the structure of the two energy systems are presented and those actors that are unfamiliar in a UK context are defined. Importantly, evidence from the sample on factors beyond shareholder value are presented, which mark these actors as incorporating values beyond shareholder returns. Two schemas of the respective energy systems are then presented. These demonstrate the existence of a sector within the energy system that is not driven by solely shareholder returns or is state controlled. A 'civic' energy sector is then proposed, that presents an additional opportunity for energy investment and decarbonisation for the UK system, beyond the current centralised system logic.

Prior to 1945 European electricity supply was the remit of local authorities or civic groups and networks (Julian, 2013; Wollman *et al*, 2010). The UK was no different in that circa 300 of these organisations were involved in electricity supply (Julian, 2013). Wollman *et al* (2010) find the move to nationalised energy systems in France, Italy and the UK in the post war period, as a key moment in the move away from a decentralised and diverse energy sector. Pond (2006) describes the successive Conservative governments of 1979-1997 as leading a privatisation and liberalisation of the UK energy system which was without precedent, but benefitted from having a fully nationalised industry to privatise.

In Germany there was no nationalisation of the electricity system (Wollman *et al*, 2010). In West Germany in particular, post-war reconstruction retained the principals of local self-government,

remaining largely under majority municipal/local private ownership. The 'stadwerke' (municipal utilities) provided energy services, the profits from which were returned to municipal budgets. As such the market reforms led by the UK, which drove a privatisation and competition agenda (Helm, 2013) did not have a state owned energy sector to break up and sell in Germany. Instead the German energy sector remained largely under municipal control until European directives, specifically 96/92/EC (Thomas, 2005), forced local monopolies to break by introducing the right to switch supplier and requiring the unbundling of generation supply and transmission. In Germany this posed a challenge to the Stadtwerke which had operated regional integrated monopolies. Many saw this as an opportunity to invite private capital into their shareholder structure or divest themselves entirely of energy obligations.

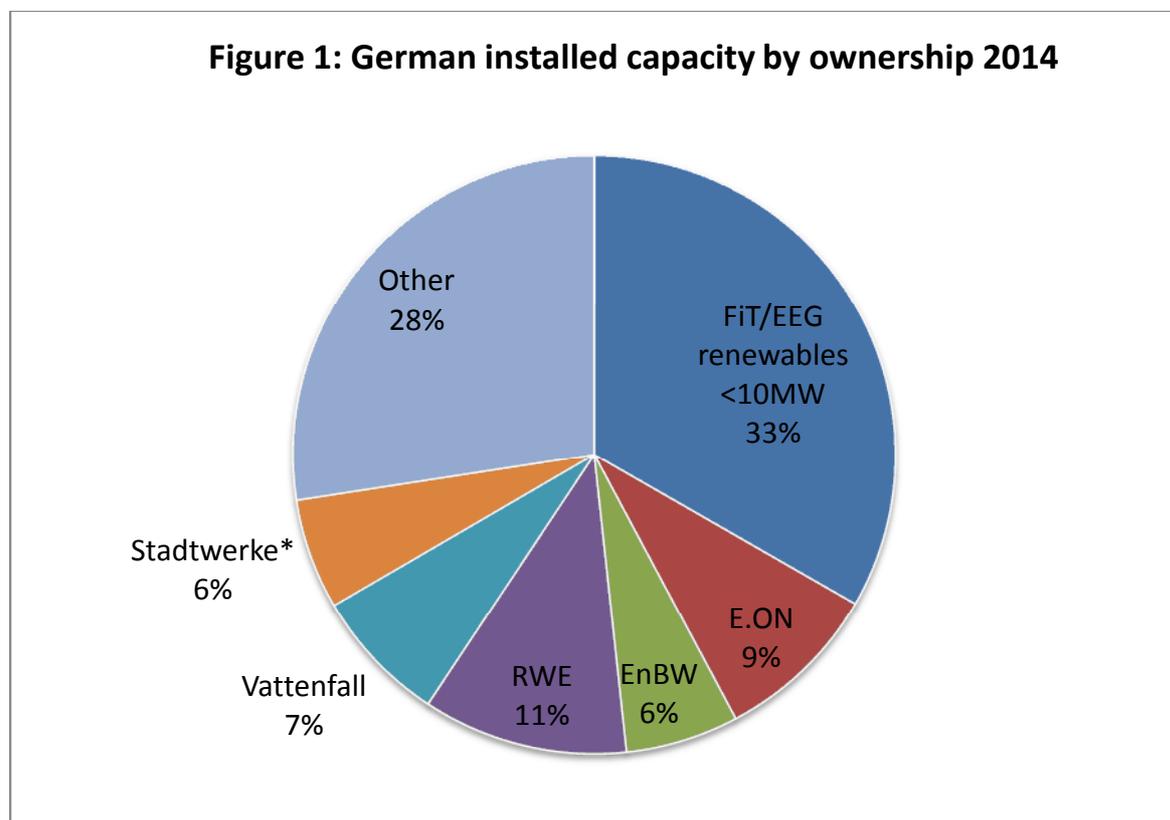
Market liberalisation saw a reduction in Stadtwerke overall, from circa 900 – 600 (Wollmann et al, 2010). However, there has been a turn back to municipal and community ownership of energy infrastructures in Germany, often referred to as re-communalisation (VKU 2012), which primarily refers to the reestablishment of the Stadtwerke but also incorporates other non-state/corporate ownership such as co-operative ventures. Overall the number of Stadtwerke active in energy has risen to approximately 850 (Hall, 2012). As of 2012, 170 communities had won back the distribution grid concession contracts, 60 new stadwerke had been formed (VKU, 2012) and much of the post-liberalisation dilution of municipal equity in stadwerke is being reversed (Wollmann et al, 2010).

4.1 Generation

Post market liberalisation, electricity generation assets in the UK have typically been delivered by corporate utilities (BNEF, 2012; Toke *et al*, 2008; Breukers and Wolsink, 2007). In 2014, there were 32 companies classed as Major Power Producers, whose primary business is electricity generation, which accounted for 82.7% of total installed capacity of 96,903GW (DUKES, 2014). Importantly company ownership data does not report the final beneficial ownership of each operator. Rutledge (2012) analyses the beneficial ownership of UK generation capacity and describes a 'Big Ten', which includes the 'Big Six', alongside ESB, Drax, GDF Suez and AES. In 2012 these ten companies collectively owned 85.8% of UK generation assets. The remaining 14.2% is made up of 64 medium sized private companies and corporate entities. For renewable generation the Big Six own 47% of renewable capacity (BNEF, 2012). Whilst renewable energies have a less concentrated ownership structure than thermal generation, beneficial ownership remains predominantly in private hands (DUKES, 2014). The community energy sector owns only 0.3% of renewable capacity; approximately

60MW (DECC, 2014). Comparable figures for municipal generation assets are unavailable but are unlikely to exceed 1% (Hannon *et al.*, 2013).

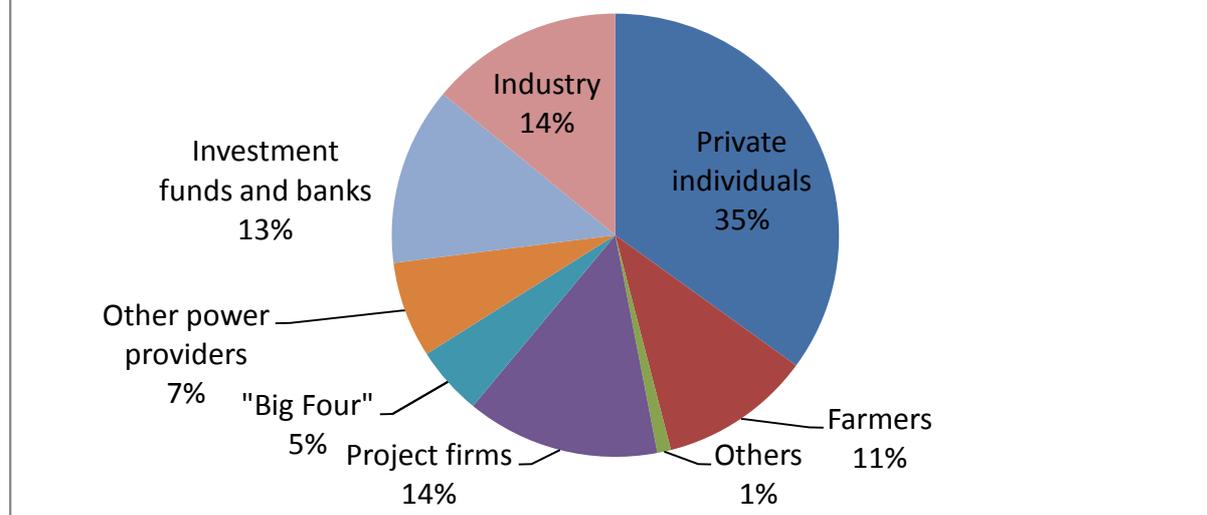
Installed capacity in Germany as measured by the Federal Networks Agency (Bundesnetzagentur, 2014) was 196,133 GW and comprises 707 individual power producing companies. There is some concentration in thermal generation with the 'Big Four' (E.ON, EnBW, RWE and Vattenfall) owning 33.4% of total generation capacity (Bundesnetzagentur, 2014). Importantly for this analysis, 6% of total installed capacity is owned by Stadtwerke (VKU, 2014), where part or all of the beneficial ownership rests with municipalities. 33% of installed capacity is made up of <10MW installations supported by the German Feed in Tariff (EEG). The remaining 28% comprises hundreds of companies with individual installations, some larger corporations with multiple sites and several co-operative and citizen wind parks.



(Source: Bundesnetzagentur, 2014)

Whilst conventional generation in Germany incorporates significant elements of municipal, citizen, co-operative and community ownership, it is the ownership structures of installed renewable capacity that vary most markedly from the UK. Whilst non-corporate/private company ownership of renewable capacity in the UK remains negligible, ownership of renewable generation assets in Germany is diverse and incorporates multiple non-corporate, non-state models.

Figure 2: Ownership of installed RE capacity in Germany (2012)



(Source: REA, 2013)

For German renewables: industry, the Big Four, project firms, other power providers and investment funds/banks account for only 53% of capacity ownership. This is further complicated by the fact the Stadtwerke are classed as 'other power producers' even though much of their beneficial ownership accrues to the municipality. Also the structure of the German banking sector means much of the 'investment funds and banks' capacity is owned by banking groups with not for profit structures, such as the co-operatives banks, Sparkassen and Landesbank (section 4.4). As such a proportion of 'investment funds and banks' can be classed as citizen financed, even though it may constitute a part share in a developer project.

For the 35% of renewables under 'private individuals' this constitutes structures through which energy co-operatives, private householders and communities develop renewable energy assets. To date, more than 800 energy cooperatives have invested over 1.3 billion euros in renewable energy projects (Weig and Muller, 2014). Julian (2014) reports the co-operative share to constitute 21% of the 34GW installed capacity under citizen ownership. If schemes are of similar size and cost per MW installed, this would equate to circa 6.2 billion Euros of citizen finance. The researched sample also explained many of the farm based schemes incorporate co-operative ownership structures due to the strong co-operative movement in the German agricultural sector.

Importantly, from municipal and co-operative respondents in particular, their participation in energy generation formed a means to several ends linked to the creation and retention of value within local economies, i.e. beyond the return of value to shareholders on global capital markets:

Interviewer: ... “the question is what are the advantages of a municipal utility versus a corporate utility”.

It is the possibility to make earnings. Before, 100 years ago it was to cover the needs of inhabitants and now it’s about the local economy”

(Stadtwerke executive, 2014)

“[City name] was one of the first cities in the beginning of the 90s that set up a local climate protection concept in 2006-07 this was a programmes with measures. This was decided by the city council, in 2008 there was a climate alliance with the city and the Stadtwerke”

(Stadtwerke executive, 2014)

“we’re really democratising the energy system by allowing everyone in Germany the opportunity, or giving everyone the opportunity to participate in the system. And that’s something that has put the Energiewende at the heart of political priorities.”

(Energy Journalist, 2014)

So you can feel this entrepreneurship and this regional community thing in this kind of business. It is very impressive that there is millions and millions in investments in the region from the money of the people into regional projects using regional craftsmen etc. I think this is the key story of energy co-operatives in Germany. It’s more about regional development.

(Co-operative Banking Group Executive, 2014)

We identified the creation and retention of local value, decarbonisation, economic development and stability, and self-determination/subsidiarity as primary goals of stadtwerte, co-operatives and citizens in their participation in the energy generation sector.

4.2 Distribution

The privatisation of the UK energy system moved transmission and distribution functions to a regulated approach (Bolton and Foxon, 2013). The 14 original distribution board networks are now operated by seven groups (Ofgem, 2014) five of which are in turn owned by international conglomerates, corporations or investment funds¹ (Pond, 2006; Cumbers, 2013). Distribution networks form natural monopolies, making the construction of a competitive market difficult. As such these assets (both in the UK and Germany) operate on an allowable revenues basis where charges on consumers’ bills are regulated by specific formulae (Muller, 2011; Xenias et al, 2014). Whilst there has been recent interest from UK municipalities in distribution networks (Hall and Foxon, 2014) there is currently negligible non corporate ownership of distribution assets in the UK.

In Germany there are hundreds of grid concessions, from region wide to village scale. The VKU (German Association of Local Utilities) states approximately 60% of distribution concessions in

¹ Scottish and Southern Energy and National Grid Plc are UK owned private companies....

Germany remain with stadtwerke (Auer and Heymann, 2012). Co-operative ownership of distribution infrastructure is uncommon, but at least 9 co-operatives run distribution infrastructure in Germany (DGRV, 2013). Whilst some of the re-communalised concessions are small, there have been large re-municipalisation/communalisations, the most successful of which was in Hamburg, where in September 2013, 50.9% of voters were in favour of a re-municipalisation. The city has agreed to purchase the grid from Vattenfall for between 495 and 550 million Euros (Fei and Rinehart, 2014). There are several reasons cited for re-municipalisation/communalisation trend. The research sample identified acceleration of renewable penetration and retention of energy value as key drivers.

“..The clear goal is to accelerate the energy transition and the ways to operate the grid in terms of supporting the change to renewable energies [...] another motivation is this empowerment idea yes, this is something I have observed in many citizen driven energy co-ops, the do it yourself philosophy. We can do it on our own.”

(Source: Co-operative energy developer, 2014)

Several respondents questioned how the acceleration of grid investment to integrate renewables could be achieved through re-communalisation, given municipal/citizen grid operators are subject to the same allowable revenues structure and cannot charge any more than private grid operators. However, recent studies demonstrate the values that accrue to municipalities through increased renewable energy penetration such as increased tax bases, employment opportunities and energy security (Heinbach *et al*, 2014, Mühlenhoff, 2010; Hall and Foxon, 2014). As such there is a case for grid infrastructure under local ownership to be cross subsidised from revenues outside the regulated charge structure. This was cited several times in the primary data of this study.

The creative use of the regulated payment for grid operation should also not be underestimated as an attractive proposition for the local retention of energy value. Municipalities that recognise the co-benefits of upgrading grid infrastructure within their own territory can live with a lower return from this regulated payment and stipulate retained revenues be re-invested in smart grid services:

Interviwer: what is the effect of the company being municipally owned as opposed to owned by private shareholders?

“The main effect is we are not talking every quarter every year about results and profits. The communes [municipalities] are long term oriented, because they are very much interested in a very good and safe reliant infrastructure.”

(Stadtwerke executive, 2014)

The re-municipalisation of grid infrastructure is not wholly unproblematic however. Issues arise when capital is unable to be raised through equity issue without diluting municipal control (Buchan, 2012), and where municipalities or co-operatives also wish to develop generation capacity (which can generally be more profitable) grid infrastructure will have to compete for discretionary capital expenditure (Auer and Heymann, 2012).

What is in evidence in Germany is retention of a heterogeneous ownership structure for electricity distribution assets which is tending towards re-communalisation. Proponents believe this will accelerate the energy transition and retain values from energy infrastructures locally. Similarly to generation, our primary sample identified the creation and retention of local value, decarbonisation, economic development and stability, and self-determination as primary goals of their participation in the energy sector.

4.3 Supply

The electricity supply market in the UK is dominated by the Big Six major suppliers who own circa 95% of domestic supply and 80% of commercial supply (Ofgem, 2014b). At the end of 2013 there were 24 companies in total offering electricity and/or gas supply to households and 30 companies offering electricity and/or gas supply to commercial consumers (Moss and Buckley, 2014; Buckley and Moss, 2014). Whilst the market shares of the Big Six are falling overall, the domestic supply market can still be characterised as relatively uncompetitive and there have been concerns raised by the regulator as to the poor outcomes being realised by householders and SME's (Moss and Buckley, 2014; Ofgem, 2014b)

There are early signs of diversification in the UK supply market, this diversification for domestic consumers characterises a number of low-carbon energy suppliers, a co-operative supplier and a private supplier focussed on promoting community energy². These smaller ecologically or socially focussed suppliers also offer business services, but supply market diversification for commercial customers is largely accounted for by supplier arms of corporate generators (Moss and Buckley, 2014). This supply market structure demonstrates a low level non corporate agents. The concentration of the market has also led to the frustration of renewable energy schemes as vertically integrated utilities have a disincentive to support sustainable power purchase agreements with smaller generators. This has led the UK government to recently consult on the possibility of acting as a purchaser of last resort (DECC, 2014a)

² Ovo Energy has a specific commitment to supporting local and community energy

The German electricity supply market comprises over 1000 companies (E.ON 2012). This however includes approximately 850 Stadtwerke that often will only supply domestic customers within their territorial footprint, though larger Stadtwerke will supply business customers beyond their territory. The same is true for the 60-70 co-operative utilities reported as active in energy supply by the sample. The actual choice for the German household therefore is between 102 electricity suppliers on average (BDEW, 2012). Definitive market shares are difficult to attain. For example VKU cites Stadtwerke as holding a 46% electricity supply market share³ whilst TNS cite 31%⁴. The domestic market share of the Big Four reported by BDEW (2012) was 43.8%, which similar to the UK case has declined in recent year but only from a high of circa 50% (Buchan, 2012).

The existence of a supplier landscape with a high degree of municipal involvement in the form of Stadtwerke changes the use to which profits from electricity supply are put. Where almost 100% of the profits from the UK electricity supply companies are distributed through international capital markets, the profits from stadwerke can be used for a number of social, environmental and economic development goals which may or may not be energy related. For instance the Stadtwerke of Cologne returned circa 265 Million Euro in added value to the city in 2011, most of which was derived from energy services and supply (Stadtwerke Köln, 2012). Stadwerke however are diverse organisations. Respondents described a spectrum of stadwerke from those that were deeply supportive of citizen energy to those which were ambivalent or hostile based on the effect of citizen energy on thier business models. These results do not describe municipal energy companies as universally positive and unproblematic entities, it was however clear that their ability to appropriate value from energy supply means that a proportion of energy value can be locally retained and recycled into decarbonisation and energy transition, the fiscal stability of the local state and cross subsidy of the goals of civic actors and civil society.

4.4 Finance

The centralisation of energy finance in the UK, mirrors a similar centralisation of the UK finance sector more generally (Preig and Greenham, 2012). Data in Blyth *et al* (2014) and BNEF (2012) Describe the Big Six as accounting for approximately 50% of capacity spend over recent years. There is a large proportion of non-utility generation finance in the UK. Where this has traditionally come from and where it may come from in the future is a key concern for UK energy policy (DECC, 2012), the UK sample described the non-utility element of capacity investment:

³ <http://www.vku.de/en/ueber-uns.html>.

⁴ <http://www.tns-infratest.com/presse/presseinformation.asp?prID=3298>

“Pretty much all wind has been financed in two ways: half has come from the balance sheets of the utility companies and the other half has come from banks, project finance from banks”

(Institutional Investment Professional, 2013)

“The two main ways that [energy] infrastructure has been financed so far are companies building infrastructure themselves using their own funds, so on balance sheet, and then the other way is project finance”

(Institutional Investment Professional, 2013)

In the UK, relying on utility balance sheet finance and project finance from banks is to rely on two highly centralised and internationalised sources of capital. In 2011, the statistics for the UK banking sector are almost a carbon copy of those for the energy supply sector. Six large banks mainly multinational), accounted for 92% of personal current accounts, 85% of mortgages and 88% of small business accounts (Boyle, 2011). This centralised banking system with a small number of large providers is the same sector utilities and project developers have drawn on for debt finance for financing energy infrastructures. Another striking parallel with the German case is the diversity of ownership structures. In the UK in 2011, 82% of total deposits resided in commercial banks with only 18% in mutual hands (World Bank, 2011). For Germany only 36% of deposits rested with commercial banks, 24% with mutual and 40% with not for profit savings banks (op cit.).

This has had two effects on UK energy investment. Firstly the availability of capital is tied to volatile financial markets and secondly the ability of multinationals and investment capital to lend to small to medium scale project developers is very low. Commercial banks were very exposed to capital market volatility during the financial crisis (Preig and Greenham, 2012), the availability of project finance for the energy sector, which relied on these commercial banks, began to run dry:

“the crisis has had maybe an impact probably on the availability of debt finance, where its relatively concentrated in a small number of banks. It is also much more challenging to get long term financing for the life of the asset, so the banks don’t really want to lend on any proposition much longer than 5-7 years. So the availability of 15-20yr money for energy projects is gone”.

(Infrastructure investor UK, 2013)

At the same time as project finance reduced, utility balance sheets became constrained (Blyth *et al*, 2014). With familiar avenues for energy system finance proving insufficient, UK electricity market

reform responded by designing a policy package that would attract the ‘mainstream’ investment community, i.e. pension, sovereign wealth, insurance and hedge/wealth funds.

*“The main way we have to finance the transition is going to be through project finance, but the banks who currently do manage project finance aren’t going to be able to do it so the **mainstream investment community** is going to be looked to”*

(Institutional Investment professional, 2013 [our emphasis])

The ability and willingness of the mainstream investment community to sufficiently capitalise the UK’s energy transition is beyond the scope of this paper. What is clear is that neither utility balance sheet finance, project finance from international banks, nor mainstream investment finance is likely to capitalise myriad citizen, municipal and co-operative distributed renewable energy schemes of £20m and below:

“...there’s not many banks out there that will loan on small scale community schemes. You can only talk to the big banks if you’re borrowing millions of pounds, that’s when they’re really interested in you.”

(Co-operative energy developer UK, 2013)

“...the pension funds don’t have much expertise in this area, they don’t have the capacity to go around finding projects, they tend to want to invest 50mill euros at a time so they want big projects [...] a scale that pension funds can invest in”

(Institutional RE Investor UK, 2013)

It has been difficult for smaller, distributed renewable energy schemes to source appropriate levels of finance; an issue also explicitly recognised in DECC’s community energy strategy as a ‘finance gap’ for projects where ‘city’ level project finance does not usually start below £20m (DECC, 2014 p.52). The emergence in 2012 of the UK’s Green Investment Bank, capitalised with £3.8bn public funds has lent £1.4bn to date to predominantly independent private power provision. DECC aspires to allow the GIB to lend to community energy as a separate portfolio (DECC, 2014 p. 57). There are movements toward a smaller scale citizen finance sector in the UK. Abundance⁵ offers citizen finance debentures for small scale investors, Pure Leapfrog⁶ aim to build portfolios of projects in order to reduce financial risk through aggregation. The County of Hampshire is in the process of establishing a community bank tasked with delivering a low carbon economy. They explicitly cite the German banking model as key to supporting renewable energies (Future Solent, 2014). For now however the finance gap remains real for UK community, citizen and municipal energy schemes.

⁵ <https://www.abundancegeneration.com/>

⁶ <http://www.pureleapfrog.org>

The expansion of citizen, municipal and co-operative stakes in the German sector is due in no small part to having a financial structure that incorporates three traits unfamiliar in the UK's centralised sector: local subsidiarity, public benefit values and promotional lending.

There is a well-established local banking sector in which the scales of loans are more compatible with distributed energy schemes. The two main institutions comprising this sector are the German Savings Banks Group (Sparkassen and Landesbank) and the German Co-operative banks (Volks and Raiffeisen Banks). The savings banks and co-operative banks are not small players, in 2014 they together comprised over 62% of all small business loans, almost 100% of loans to tradespeople, 50% of consumer credit, 42% of loans to municipalities and 60% of mortgages (DSGV, 2014). Each regional Savings or co-operative bank is a separate institution. Where the UK has 162 banks Germany has 2,000 (Preig and Greenham, 2012). However, much like the stadtwerte, not all customers can access all savings/co-operative banks as many the savings banks and Volksbanks are territorially bound:

“The difference between a savings bank and other lenders is that the savings bank will not withdraw [...] it is anchored within that local area and also bound to only operate in that local area, will have to live off the profits that it can make in that local area. [...] So each and every savings bank can adapt its actual business to the condition it finds in the local area; and that is very important. That is this decentralised model.”

(German Savings Bank Group Employee, 2014)

“...the local co-operative banks, they are rooted or backed in the regions [...] In Germany we have a little bit less than 1100 Volksbank and Raiffeisen banks [...] we don't want to have such big units that we are not near enough to the customers and therefore we are still quite a lot of Volksbank and Raiffeisenbank so that they are anchored in the regions on a local level.”

(German Co-operative Bank Group Employee, 2014)

This decentralised model has been proposed as an additional banking sector for the UK, which would better support household and SME lending (Civitas, 2013; Boyle, 2011). The sectors involvement in energy finance is less well documented. The territoriality principal and proximity to customers and business was cited several times by interviewees and within accompanying literature as key to designing small scale investment vehicles to allow citizens to invest in local energy projects. Typically the 'citizen' finance model is operated by the savings banks. Investment products are devised by individual savings banks that are suited to their local area. Customers of the bank can choose to place savings in energy related schemes at little or no risk to the depositor. These instruments may take the form of local bonds or energy savings accounts, enabling small scale savers to hold a productive stake in the energy transition. Whilst there is no special relationship to stadtwerte, as

the majority lender to German public authorities, the savings bank group is closely invested in municipal as well as citizen energy schemes (see DSGVO, 2012 p.30-31)

For the co-operative banks customers are often members of the mutual bank, the natural channel for energy related investment is through the circa 800 energy co-operatives described in section 4.1:

“So there’s a close relation between the co-operative banks and energy co-operatives on the regional or local level. So a lot of new renewable energy co-operatives were founded or were supported by co-operative banks. So they supported business plans so they built the right stuff”

(German Co-operative Bank Group Employee, 2014)

Both the savings and co-operative bank groups are bound to their locality and must find their primary revenues within this territory. Both have found small to medium scale renewable energy productive terrain for investment, and do not recognise a ‘financing gap’, as finance for small to large scale renewable schemes is possible through their respective local and regional structures.

Secondly the aims and objectives of this local banking sector are compatible with notions of subsidiarity/self-government, economic stability, environmental protection and social welfare. Because of this, both the savings bank group and the co-operative banking sector are specifically supportive of local ownership and control of the energy sector:

politically we have a very clear opinion about what we call re-communalisation. So also in Germany not all the energy suppliers are in municipal hands, there is a strong tendency to switch that and we support that switch. How do we do that? First of all we are advocating all kinds of decentralised energy supply, that is energy creation but also energy efficiency and we are doing that not only with municipal clients we are doing that also with business clients and private clients.

But this [re-communalisation and local energy schemes] is really something where civil society, where communities where municipalities where people from outside the authorities get together and try to create something and try to be independent and take some responsibility for their lives and that is something that is very close to the founding mission of the savings banks. So we want to enable people to take responsibility for their own lives and do something about it. And that’s the whole point

(German Savings Bank Group Employee, 2014)

We asked the board members of the co-operatives what’s the main motivation to run the co-operatives [...]. They said we want to promote renewable energy, we want to be a part of the energy transition was one reason and the other reason was the promotion of regional development. Energy

co-operatives are local companies, they pay tax to local authorities. That's different to a national or international project developer who runs a wind farm here in Brandenburg close to villages and nobody is involved. So the benefits of these projects remain in the region and that is very important. That's why a lot of co-operative banks support the foundation of these energy co-operatives.

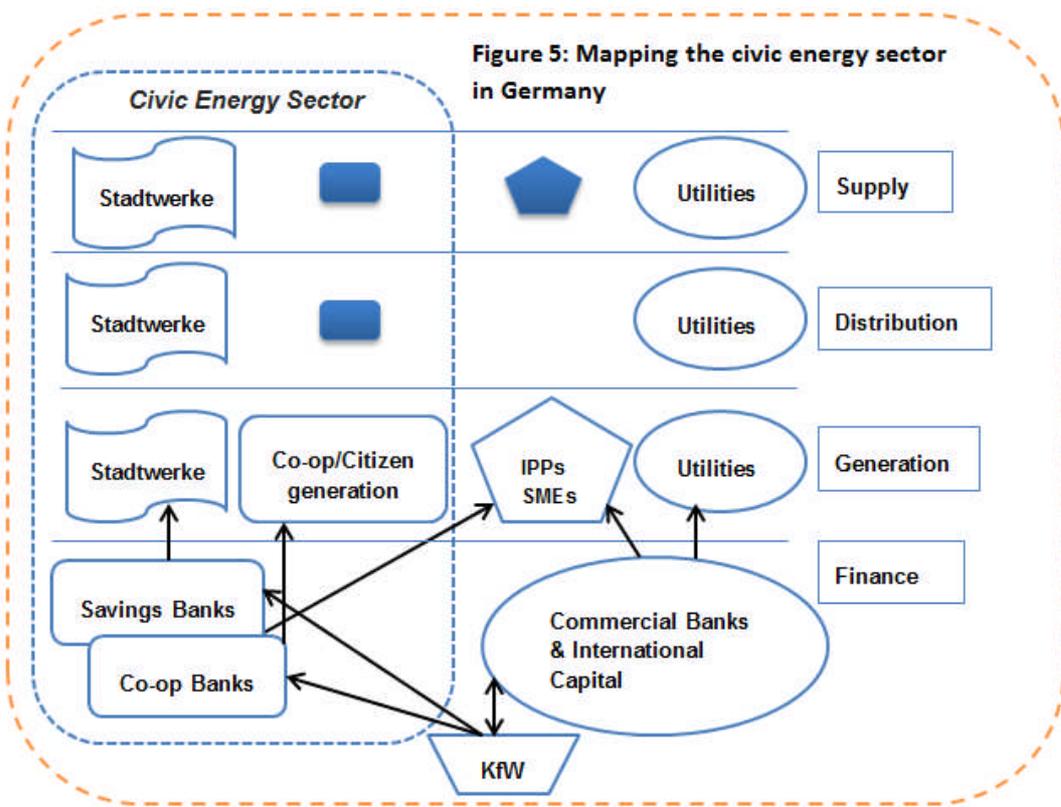
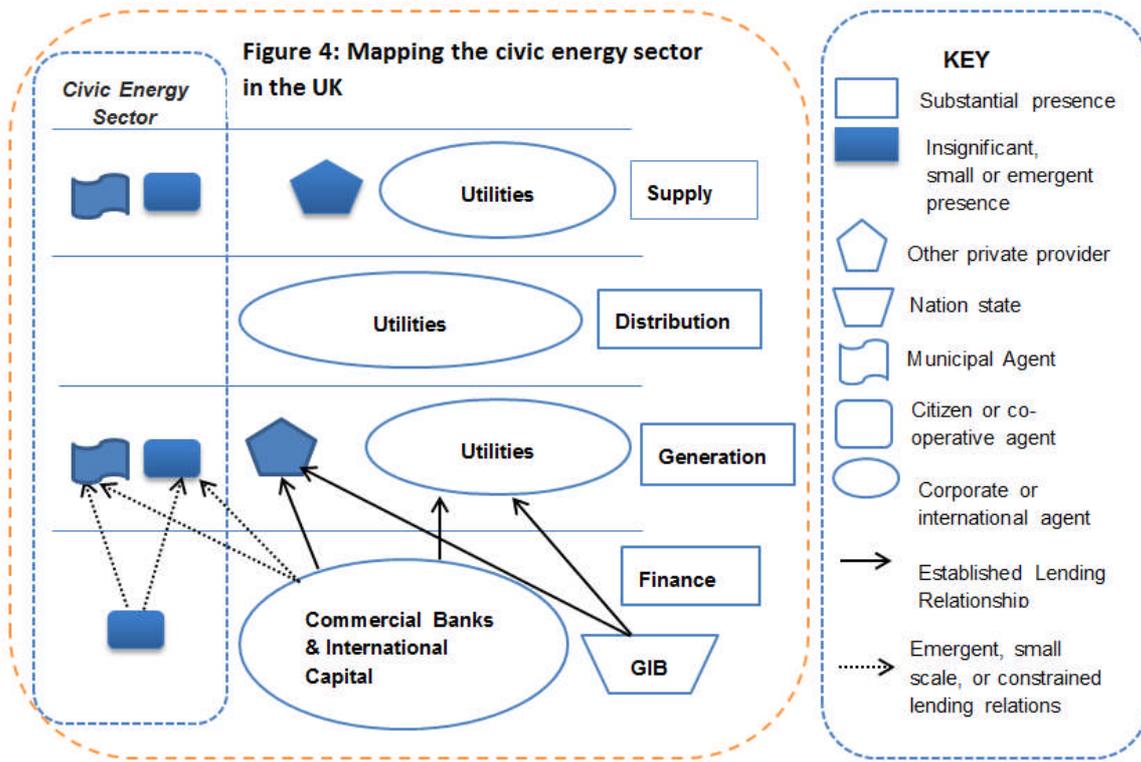
(Co-operative Banking Group Employee, 2014)

Thirdly a key enabler of the local finance sector is the existence of refinancing loans from the German public development bank KfW. KfW utilises its strong credit rating to source capital market finance and offers refinancing options for renewable energy and energy efficiency loans. This is not the only capital the local banking sector draws on for energy finance as depositor capital is still important, however the KfW promotional lending enables more small to medium energy schemes to be delivered through the local sector (KfW Bankengruppe, 2012). Between 2009-2013 the savings banks and co-operative banking group accounted for on average 74% of the 16.2 Billion Euros distributed through KfW promotional lending (pers comms, 2014). An important principal in this promotional lending is the savings and co-operative banks take part of the finance risk. This diversifies risk through balance sheet of KfW (and thus the German state) and the strong credit ratings of the savings and co-operative banking groups.

In Germany, a dense network of locally rooted banks is able to offer renewable energy loans on favourable terms to small, medium and (utilising regional partners) sometimes large renewable energy schemes. They do so because renewable energy in Germany is a sound investment, but also because it is compatible with their respective founding principles, investment priorities and governing values. These principles and governing values are closely related to the values expressed by German respondents in the generation, distribution and supply sectors and again include self-determination, local economic stability, energy decarbonisation and public welfare. The next task within this analysis was to map these actors with common values.

5.0 Mapping civic energy in Germany and the UK

The common values outlined above are a more than an ethical niche within the German energy sector. They permeate a substantial parts of the system. In figures 4 and 5 below representative schemas of the UK and German energy systems are presented. They identify where these common values are present, and which actors incorporate aims beyond shareholder value return.



5.1 Defining a civic energy sector

Whilst there have been many investigations into specific elements of the community, municipal, co-operative, and citizen financed energy sectors in both the UK and Germany this is the first attempt to propose a common value set is evident between the non-corporate, non-state stakeholders. The

stakeholders that exhibit these values have a much greater share of the German energy system than they do in the UK.

What is important in the German case is the institutional integration between these agents. This research identified retention of local value, decarbonisation, economic development and stability, and self-determination/subsidiarity as key themes for each of these groups. The values identified cut across German public opinion as well as through energy stakeholders; 83% agree both profits and costs should be shared between citizens and industry, 79% support citizen participation in the energy transition and 75% support citizen management of decentralised renewables (DW, 2013). In order to build similar institutional integration and expansion of these stakeholders in the UK energy sector, these agents would benefit from a definition that marks them as distinct from the state/corporate dualism. Building citizen participation into energy transitions can leverage new investment and secure acceptance beyond that enjoyed by private developers and corporate utilities alone (Nolden, 2013; Seyfang *et al*, 2013).

The current definition of 'community energy' in the DECC (2014) Strategy limits the scope for new ownership structures to expand in the energy sector by excluding municipal supply, distribution and generation and social housing providers. Equally, the Local state and alternative banking sector do not fall under traditional definitions of 'community' ownership. As such this non-corporate, non-state sector should be broadened in definition to a 'civic' energy sector, which would include municipal, citizen, community and co-operative ownership structures for generation, distribution, supply, and finance.

The identification and definition of a 'civic' energy sector below is rooted in two established notions arising from the notion of citizenry from the Latin 'civis' which confers two forms of collective identity. These are civic and civil society. Both of these ideas are important to this analysis, as we show they can have substantive bearing of the directions of socio technical change.

These terms need careful definition as they are often interchanged. The Oxford English definition of civil society identifies a 'community of citizens linked by common interests and collective activity' whereas 'civic' is defines a 'Relating to a city or town, especially its administration; municipal'. As such any reference to civil society can exist beyond the local state, whilst 'civic' has a particular geography and incorporates the local state or municipality. Given the locally rooted nature of the stadtwerke, energy co-operatives, citizen energy installations and the finance that underpins them, the adoption of 'Civic' as a framing for this sector is apposite. Whilst this research has characterised the UK's civic energy sector as niche, there is evidence of a revitalisation of civic energy participation

running through recent rhetoric (See: Newcastle City Council, 2014: Core Cities, 2013; Platt *et al*, 2014).

In the full contribution, the theoretical definitions civil and civic society will be expanded. The conclusion of this contribution, is that in defining a 'Civic' energy sector one might identify alternative movements for energy provision beyond the state/corporate nexus, that incorporates values of decarbonisation, economic development and stability, and self-determination/subsidiarity.

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