

Municipal Energy:

Ensuring councils plan, manage and deliver on local energy



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The Association for Public Service Excellence (APSE) is a non-for-profit local government body working with over 300 councils throughout the UK promoting excellence in public services. APSE is the foremost specialist in local council frontline service provision in areas such as waste and refuse collection, parks and environmental services, leisure, school meals, cleaning, housing and building maintenance and energy services.



Infrangilis is part strategy consultancy and part think-tank. A values-driven enterprise, Infrangilis works globally with the public sector, businesses, multi-lateral agencies, NGOs and academia to instigate or accelerate innovative solutions for an inclusive and green economy.

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Cover photos

(clockwise from top left) Alternative Energies, Jürgen from Sandesneben; Pylon, Gloscestershire, Yummifruitbat; Gas holder, Cross Gates, Leeds, Mr Barndoor; Srisailam dam, Chintohere. (Wikimedia CC)

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Foreword

APSE's Ensuring Council model was developed to promote the role of local authorities as being much wider than simply providing or commissioning services. An Ensuring Council will act as a steward of the local economy and local place; maintain and secure core capacity in delivering local services; engage in a spirit of municipal entrepreneurship and collaboration and, at its heart, develop a vibrant role for politics and social justice. Nowhere more so than the field of municipal energy do we see the Ensuring Council ethos shaping local vision for a different settlement on the planning, management and delivery of local energy.

The energy sector plays a major role in the UK economy but many now recognise that it does not always work in the most favourable way for UK consumers, whether they are households, businesses or public service providers. The perception is that customers are getting a raw deal. At the same time local authorities have seen widespread budget reductions creating pressure on councils who are seeking to find new ways to generate much needed income to support their council services. Local residents, across local authorities, often find themselves near to or living in fuel poverty, whilst Governments warn of creeping energy security issues and climate change scientists warn of the need to end our reliance on fossil fuels. So with this fusion of separate but related issues there has to be a strong and coordinated response. APSE believes that local authorities are leading the way in delivering positive on the ground action to shape a different future for the UK's energy needs. That different future is one which is based on action on a local level which embraces the spirit of municipal entrepreneurship.

This research shows that there is a renaissance in local energy. After a gap of many decades, local authorities are getting involved in the generation and provision of energy. Councils across the UK are embracing renewable energy schemes with positive outcomes for local residents, businesses and for their own budgets. Not only are local energy schemes having a positive impact on energy pricing, helping to address fuel poverty, but they are also tackling local economic issues. By planning and delivering on local strategies for energy councils are helping to grow the renewables sector, with jobs and training in both the direct energy industry jobs and also in housing, construction and related industries. At the same time they are maximising the use of renewable resources whether that is through wind, solar, tidal or a myriad of other schemes which provide a more sustainable energy solution.

This research captures the pioneering councils and highlights case studies of those who are pushing back the boundaries. From across all political spectrums and all areas of the UK councils that are embracing the planning, management and delivery of energy schemes; they are seizing the opportunity to tackle the complex policy issues of our time, and contributing to much needed new income streams for council budgets. Others now need to follow the brave pioneer councils to secure the economic and social justice rewards that are there for the taking by embracing a new era for municipal energy.

Paul O'Brien

APSE, Chief Executive

Key messages

In October 2014 the National Grid warned that its capacity to supply electricity over the winter was at a seven-year low due to generator closures and breakdowns. Spare electricity capacity, which ran at about 5% over the winter the previous year, would be nearer 4% this time around. Just four years previously the margin was 17%. This is symptomatic of the energy crisis which confronts the UK.

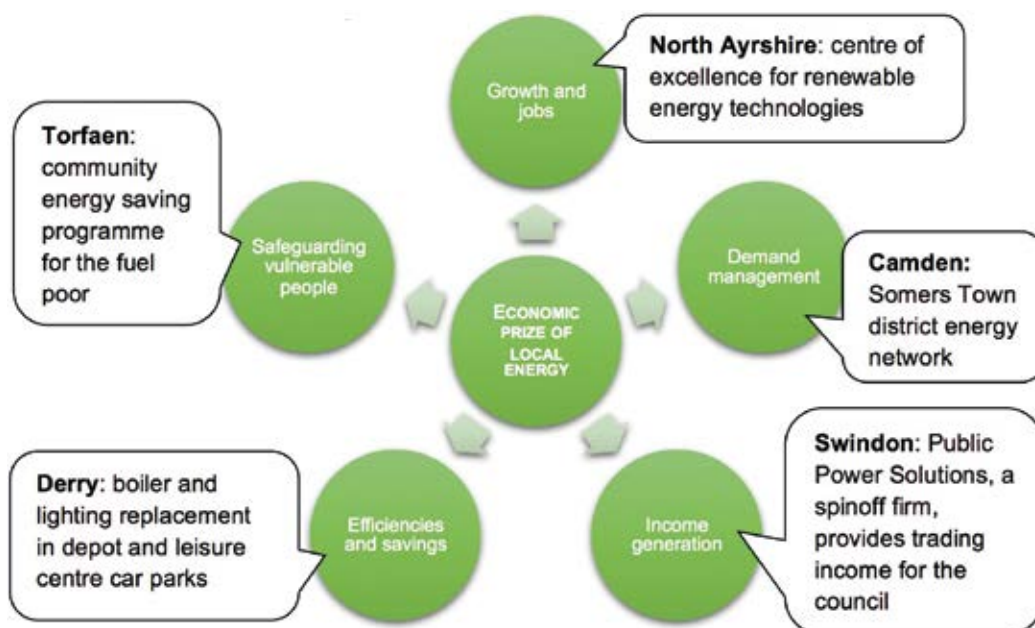
Our communities face major economic challenges related to managing the sometimes conflicting dilemmas of:

- **Security and independence of energy supply** – dealing with a reliance on imported gas and coal-fired station closures
- **Affordability of energy prices** – protecting households from fuel poverty and enabling businesses to remain competitive
- **Investment in low carbon generation** – supporting the nation in achieving legally binding EU carbon reduction targets.

Despite an era of unprecedented public spending cuts, local councils are at the heart of the solution to this enormous problem, instigating and accelerating a distributed energy strategy. In doing so, local councils recognise there is an upside to the down of an energy crisis. The energy sector is a major and growing contributor to the UK economy, supporting some 680,000 jobs across the country (1 in 45 of all jobs is linked to energy) and adding £96 billion to the economy (equivalent to 6% of GDP). Every £1 investment in renewable energy schemes delivers an average of £2.90 cashable benefits – an almost threefold return on investment. Also, on average 17 jobs can be created from investing up to £1 million in energy saving measures in buildings. More than this, energy efficiency and renewable energy can create up to 10 times more jobs per unit of electricity generated or saved than fossil fuels.

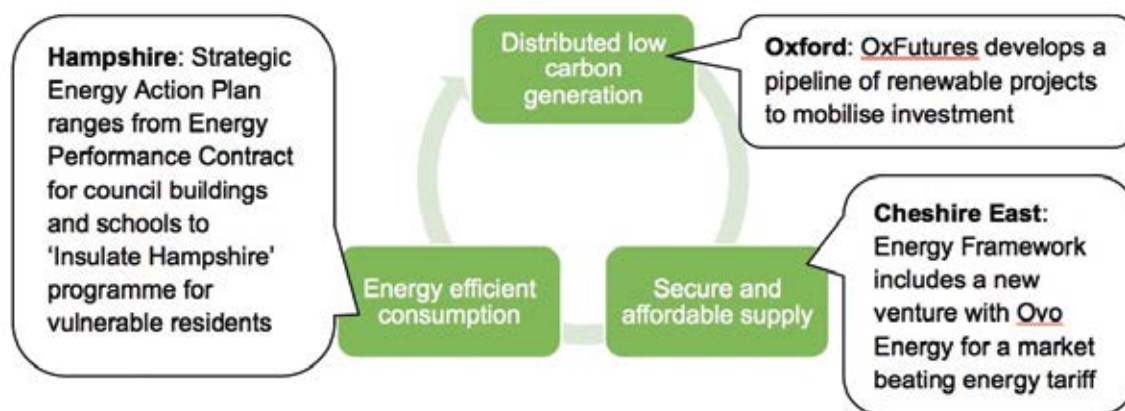
As 'stewards of place' councils have a unique role in working with local partners on the planning and management of municipal energy assets to capture the huge economic prize on offer. Hubs of excellence for renewable and efficiency technologies stimulate inward investment and create employment. District energy networks help meet local industrial and domestic demand for energy more effectively. Renewable and energy efficiency installation programmes generate revenue and save money for Town Hall coffers and household budgets alike, whilst also helping to alleviate fuel poverty. For instance in terms of leveraging spending power, on the basis there is an energy savings potential of 30-50% in existing buildings through application of readily available low-cost technologies and behavioural change, the local government sector's £750 million annual energy expenditure bill could be significantly reduced by £225 – £375 million.

Fig 1: The economic prize of municipal energy



This new wave of council entrepreneurship involves an integrated approach to the stewardship of municipal energy across key frontline services: regeneration, housing and planning; corporate resources, infrastructure and building maintenance; place; highways and street lighting; health and wellbeing; schools and education; and environmental services. Sensitivity to the cross-cutting impacts of local energy policy creates a virtuous circle, which optimises use of scarce resources, avoids conflicts and eradicates waste. This also facilitates and accelerates innovation solutions amongst councils.

Fig 2: A virtuous circle of municipal energy stewardship



As such, the municipalisation of energy is about councils taking a lead role in the breakup of a failed energy market monopoly and accelerating the transition to a civic energy future. This is similar to the German Stadtwerke model of a municipal owned and run energy company, which bold councils such as Bristol, Nottingham and Peterborough are now starting to do: for example, the Nottingham-owned and operated Robin Hood Energy Ltd. It means becoming a direct investor and implementer of a programme of energy projects, and ultimately an energy provider. Essentially, it is also about returning to the origins of municipal energy which dates back to the 1800s and the country's first municipal-led gas lamps company in Manchester. In short, this is an APSE call to go 'back to the future'.

In order to help local councils go even further when it comes to municipal energy stewardship APSE strongly believes there are opportunities for the new Government to make a clear statement of intent:

- **Recognition of the leading role of local government in delivering the energy transition** – Transition pathways research has shown that decentralised energy increases energy independence. Although challenging, it is technologically feasible to increase electricity demand in the UK being met by distributed and low-carbon sources to 50% (from 1%) by 2050. Municipally owned energy companies is a key part of the transfer to this civic energy future. So for instance, following Ofgem's 2015 policy consultation on Non-Traditional Business Models, the new approach should strongly recognise the vital role of local government.
- **Long-term support for infant energy industries** – The success of growth industries in renewables and energy efficiency across Germany, Denmark, USA and China has been supported by clear market signals which give inward investors, employers and councils the confidence to take action. DECC should set out specifically for local councils how it will support them to grow emergent sectors, for instance by increasing funding and devolving budgets for the delivery of the ECO and Green Deal schemes on an area-based approach.
- **Local sovereign wealth funds and community right to invest in municipal energy** - The new Community Energy Strategy 2014 and Infrastructure Act 2015 both place an emphasis on the importance of community ownership, including a proposal by the latter for a community right to invest up to a 5% shareholding. APSE local council members not only routinely offer more this, but also encounter challenges associated with different sections of a community's ability for or interest in ownership. The Treasury should establish a sovereign wealth fund resourced by existing centralised taxes on major energy installations which is redistributed locally, tax-free, on green projects to ensure all sections of the community have a stake and motivate public acceptance of energy infrastructure development. Councils should play a leading role in the distribution of the sovereign wealth funds.

- **Regional regulation of Distribution Network Operators and council-led microgrids** – Ofgem should pressure the DNOs to justify the cost of accessing the grid with the aim of reducing this cost. Ofgem should do this by shifting to a model of regional regulation which requires DNOs to disclose on a quarterly basis their performance against plans in terms of: current availability of access to the grid and future capacity building, resilience to severe weather, pricing and application procedures, including arbitration of disputes with rationales for the outcomes and significant financial penalties on the DNOs for compliance failure. In terms of capacity-building, there should be a time limit on proposed projects so if the capacity is not used within a certain time then the allocation is withdrawn. At the same time, if we are moving toward a distributed energy future, council leadership is required to create energy hubs or microgrids which provide access to the grid, encourage connection, and would allow for costs to be shared more proportionately.
- **National Planning Policy Framework** – DCLG should refresh planning regulations so that all new commercial and residential buildings are required to be energy resilient. For instance, a NPPF requirement for planning applications to stipulate at design stage the appropriate location of solar PV panels, solar water heating or biomass boilers in all buildings.

The objective of this APSE report is to showcase the economic prize of stewardship of municipal energy to council service managers and national policymakers. First, to highlight the multiple drivers for councils to rise to the problem and the prize of the nation's energy emergency (Chapter 1). Second, to showcase 15 case studies of how different councils are pursuing one or more of these economic opportunities in unique and difficult circumstances (Chapter 2). Third, to provide a practical guide for integrated municipal energy stewardship across council functions to help service leaders to chart a course of action with partners, including options for start-up and turnkey finance (Chapter 3). Fourth, to set out recommendations for national government to help local councils to achieve even more (Chapter 4).

This report is a part of a series of applied research by APSE on why and how local councils can make the transition to an inclusive and green economy. It builds upon earlier APSE guidance which includes the reports *The Virtuous Green Circle* (2011), *Powerful Impacts* (2012), and *Stronger Resource Efficiency for Desirable Communities* (2013). The new research underpins a major focus of APSE's work – developing a sustainable long-term strategy for local government and the services it provides in a difficult financial climate. APSE is advancing this through the development of a new vision of the 'Ensuring Council' – the local council of the future, and APSE Energy - an effective collaboration of a large number of local councils to enable and facilitate the municipalisation of energy services.

Ten things you should be doing now ...

1. Raise internal awareness amongst your council colleagues and peers on the energy imperative and the benefits of taking a direct role in municipalising energy by sharing this APSE publication with them and proposing you join APSE Energy.
2. Establish a Strategic Energy Unit or pan-council project group with other relevant agencies to oversee an integrated energy management framework: elected member leadership with a Cabinet lead and scrutiny is key here.
3. Make short and long-term energy planning a fundamental element of your local council's financial and planning cycle: This will include annual and longer-term plans (e.g. Corporate Strategy, Local Plan and LEP competitiveness strategy).
4. Consider collaborating with other local councils and support agencies before instigating or refreshing your 'all-in-one' energy management framework.
5. Prepare an energy baseline for your area so you are clear on the local challenges and prizes: you may have a heating problem today, but you may also have a power problem tomorrow.
6. Review your options to utilise new forms of start-up and turnkey finance and get investor ready: pull together a pipeline of prioritised and investable energy projects. This should include how your Local Plan will facilitate development.
7. Identify opportunities for shared services to enable you to do more with less: pool skills, budgets and government lobbying.

8. Calculate how much your area spends on all types of energy products and services (e.g. utility bills, energy efficiency measures, etc.): determine how much is locally sourced and if you can get more 'bang for your green buck'; there could be a significant multiplier economic affect.
9. Ensure you bring local residents, businesses and local MPs along with you on your journey.
10. Commit to issuing regular performance reports – internally and externally – so colleagues, voters and national government alike recognise the problem and value of the progress which you are making on stewardship of place on energy.

1. Drivers for local stewardship of energy

1.1 A letter from the frontline....

Councils across the nation face the dilemma of rising energy prices in an era of unrelenting public spending cuts. In February 2015 the UK Competition and Markets Authority published the interim findings of a government investigation of the energy market which concluded that more than 95% of dual-fuel customers of the 'big six' firms would have saved money by switching tariffs or suppliers. The savings they missed ranged from £158 to £234 a year per customer. Together the big six account for about 92% of the UK's energy supply market. The investigation follows consumer groups and politicians concerns that the firms are using their position to raise customers' prices swiftly when wholesale energy prices go up, but being slow to cut them when their costs have come down. In short, the energy market is potentially rigged against local communities.

Peterborough City Council's entrepreneurial approach to stewarding energy is helping to meet this challenge head on: boosting the area's prosperity. The council has devised a strategy to generate renewable energy and reduce energy consumption whilst supporting growth and jobs, managing demand, generating income, and creating financial savings for itself and the community. Schemes under its Energy Programme are either fully OJEU compliant or require no procurement thus enabling other councils to use them straight away and achieve similar results to Peterborough. Flagship initiatives include, amongst others:

- **Energy Performance Contract** - This framework with Honeywell is unique in the UK and has allowed the council to transform its property portfolio. All works are covered by an energy performance guarantee so all works are paid for from energy efficiency savings which de-risks the projects for any user. To date Peterborough has called off from the framework for five phases of works. Accounting for 44 properties, with a capital cost of £7.5 million, the benefits include: guaranteed energy savings (based on 80% guarantee) of £10.1 million, with a potential 20% upside of £2.5 million, potential profit for the council of £5.1 million, and carbon savings of 2052 tonnes per annum. The framework is open to all councils throughout the UK and Southend have recently become the first adopter of the framework.
- **Collective Switching** - The Council host a collective switching scheme run by iChoosr for a number of authorities. The scheme is designed to enable residents to 'group purchase' their energy tariffs resulting in savings on their energy bills. Thus far the scheme has resulted in 8 switching rounds, estimated energy savings of £752,000, 6062 switches across all authorities, current average saving of £207 per household, and 443 local switches from the first 7 rounds.
- **Green Deal** - Peterborough successfully obtained a £3.9 million grant from DECC from the Green Deal Community Fund. The fund is designed to address energy efficiency in 'hard to treat properties' in the city which require external wall insulation, loft insulation, boiler and window replacements. Together with ECO funding of £50 per carbon tonne supplied by EON, residents in the target area could benefit from Green Deal Community Funding of approximately £3500 per household, ECO Funding of approximately £2500 per household, and a Green Deal Finance Plan to supplement the difference of the installed measures meaning the household will not only cover the capital outlay of the installation, they will reduce the household energy bill by at least £100. The Green Deal Finance and external wall installation is supplied by both EON and Mark Group through a framework which is fully procured and is available for other local authorities to use.
- **Energy from Waste** - Procured under a Public Private Partnership (PPP) model and funded through the Council's prudential borrowing it differs from the recent trend for Private Finance Initiative (PFI) schemes, allowing Peterborough more influence on outcomes. With a capacity of 85,000 tonnes per annum and capable of exporting over 7MW of electricity, around 15% of the needs of Peterborough households, it is designed to be one of the most efficient facilities of its type in the UK. Also from the outset the design has been such that Combined Heat and Power (CHP) capability is built into the facility and can be accessed when economic and other factors are favourable. Innovation in contract structure was achieved by not following the PFI

route which allowed the Council to take all of the benefit of the energy generated from the facility, be that electricity or heat either directly or through the council's wholly owned Energy Services Company (ESCo) 'Blue Sky Peterborough'. This allowed the Council's partner Viridor, an experienced waste management company, to be in control of supplementary waste inputs where required so as to maximise the efficiency and energy output of the plant.

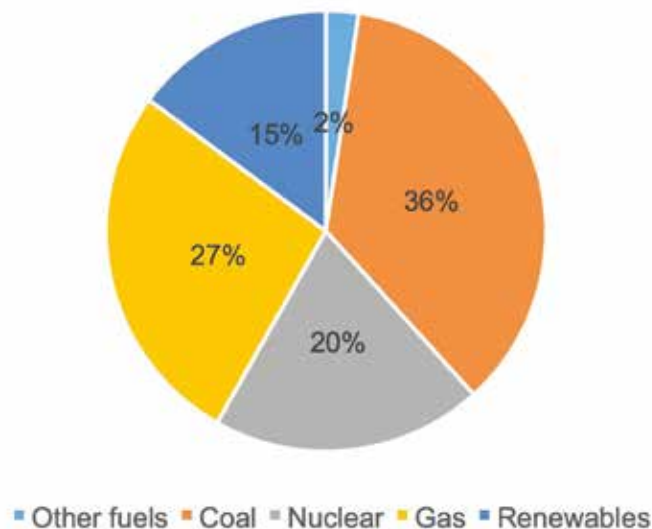
Peterborough's political vision for municipal energy is implemented through cross-working amongst council teams from finance, infrastructure, building maintenance, and environmental services; which in turn, amplify partnerships with private sector and other public bodies such as DECC, Empower, EON, Honeywell, Mears, Ovo, Viridor and others.

1.2 Secure, affordable and low carbon: the UK energy imperative

Local councils recognise the need for an energy strategy because our communities face major economic challenges related to energy supply and demand. This is in terms of managing the sometimes conflicting dilemmas of:

- **Security and independence of energy supply** – dealing with a reliance on imported gas and coal-fired station closures
- **Affordability of energy prices** – protecting households from fuel poverty and enabling businesses to remain competitive
- **Investment in low carbon generation** – supporting the nation in achieving legally binding EU carbon reduction targets.

Figure 3: Electricity generation by fuel



(Source: Digest of UK Energy Statistics, 2014)

For instance as Figure 3 illustrates, in terms of UK electricity fuel source, 27% is presently derived from gas. About 45% of this gas is imported, a figure expected to rise to about 70% by the end of this decade. This means the UK has to compete in the world market for supplies, which in turn leads to price spikes.¹ A shift to more independent and low carbon generation will require a £110 billion investment to replace current generating capacity and upgrade the grid by 2020, and to cope with a rising demand for electricity. In 2013, the UK Government published an analysis of the estimated impacts of energy and climate change policies on energy prices and bills in 2020 relative to the typical bill in 2013. It sets a target of an average household dual fuel energy bill of £1,331 in 2020, representing an increase of 6% real terms increase from 2013.²

¹ HM Government, 2011, Enabling the Transition to a Green Economy (London: HM Government).

² PwC, 2014, Energy Tracker (London: PwC).

Box 1: What basic units of measure mean

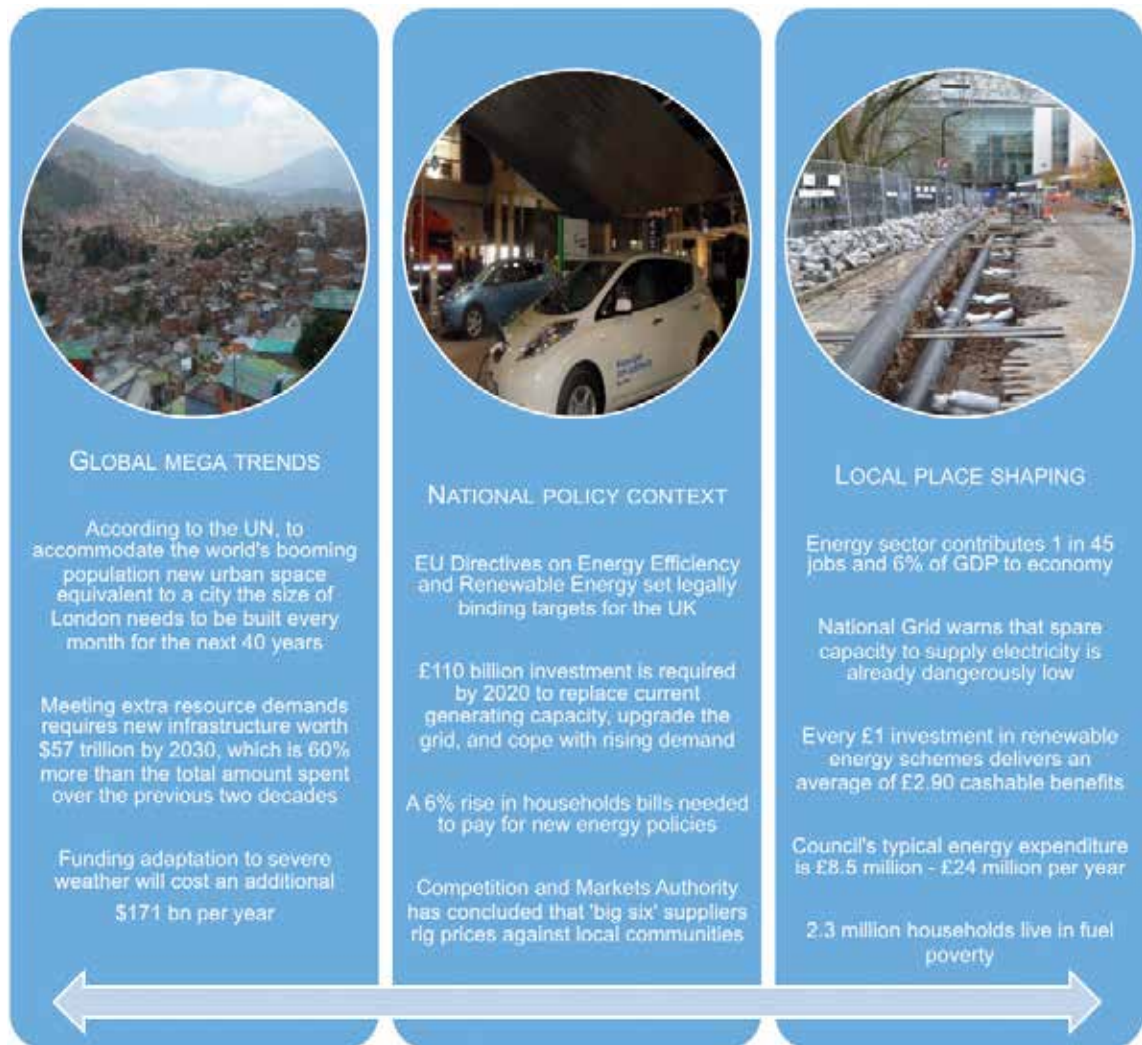
Basic units for measuring electric **power** are watts, kilowatts (1000 watts) and megawatts (1 million watts).

Energy from electricity is measured in kilowatt hours, megawatt hours and gigawatt hours (kWh, MWh, GWh). For example, 1 kWh equates to ten 100 watt light bulbs all being lit for an hour. One MWh can supply the average power for 2000 homes for an hour. A GWh can supply enough power for 1 million homes for an hour.

(Source: Ofgem, 2015)

The need to respond to a crisis of energy supply and demand is not unique to the UK, and is shaped by global as well as national and local drivers, as depicted below.

Figure 4: Drivers of change in energy action

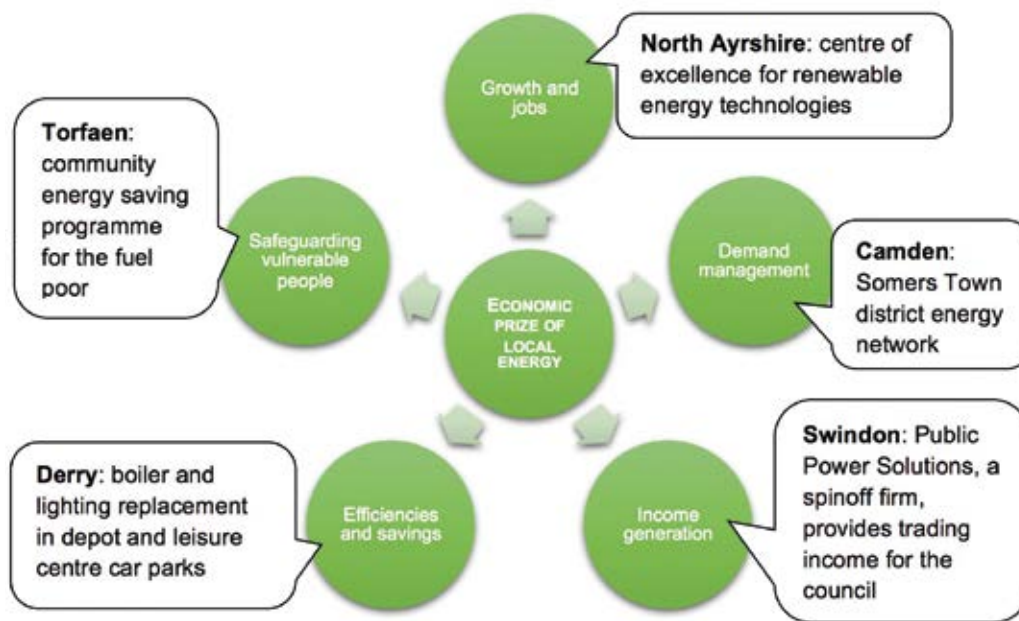


(Source: author, 2015; Picture credits: Infrangilis, 2015 and London Borough of Camden, 2015)

1.3 The economic prize of distributed energy

As 'stewards of place' councils have a unique role in working with local partners on the planning, ownership and management of municipal energy assets, as illustrated in Figure 5. Hubs of excellence for renewable and efficiency technologies stimulate inward investment and create employment. District energy networks help meet local industrial and domestic demand for energy more effectively. Renewable and energy efficiency installation programmes generate revenue and save money for Town Hall coffers and household budgets alike, whilst also helping to alleviate fuel poverty.

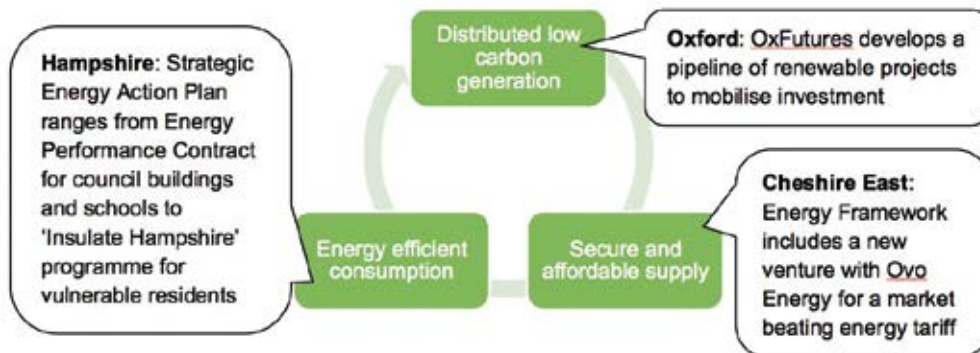
Figure 5: The economic prize of distributed energy



(Source: author, 2015. Credits: see cases in Chapter 2)

This new wave of council entrepreneurship requires an integrated approach to the stewardship of municipal energy across key frontline services: regeneration and planning, corporate resources, place, highways and streets, health and wellbeing, schools and education, and environmental services. Sensitivity to the cross-cutting impacts of energy policy creates a virtuous circle, which optimises use of scarce resources, avoids conflicts and eradicates waste. This also facilitates and accelerates innovation solutions amongst councils (As depicted in Figure 6).

Figure 6: A virtuous circle of municipal energy stewardship



(Source: author, 2015. Credits: see cases in Chapters 1- 2)

More than this, this municipalisation of energy means councils leading the breakup of the energy market monopoly, by becoming a direct investor and implementer of a programme of energy projects, and ultimately an energy provider. Doing so represents a return to the origins of municipal energy, dating back to the 1800s and the Manchester council-owned gas lamps company. This is similar to the modern German Stadtwerke model of a municipal energy company, which brave councils like Bristol, Nottingham and Peterborough already doing.

In making this case, the context in which a council operates is complex and may vary according to national policy variations, local weather and natural environment, as well as commercial sensitivities, legal powers and responsibilities (Regarding the policy context, refer to Box 2). So it is a matter of each council prioritising its own resources and budgets and influencing how its partners use theirs to meet local circumstances.

Box 2: Policy context and devolved nation variations

EU Renewable Energy Directive, 2009:

The UK is committed to a legally binding target of sourcing 15% of its final energy consumption (including electricity, heat and transport sectors) from renewable sources by 2020 (biomass, biogas, geothermal, hydro, solar, tidal, wave, wind). To meet its obligation, the government estimates that around 30% of the UK's electricity and 12% of the UK's heating will have to come from renewable sources by the end of this decade. The EU Energy Efficiency Directive 2012 aims to reduce primary energy consumption by 20% by 2020 against business as usual projections. The UK is required to comply with the Energy Savings Opportunities Scheme (ESOS) to: set indicative targets for primary energy consumption in 2020; meet annual targets for building renovation, or equivalent energy savings, on the central government estate; meet binding energy saving targets through the deployment of a supplier obligation and/or equivalent policy measures; require enterprises with at least 250 employees to undergo energy audits every four years; ensure developers of new generation installations over 20MW undertake a cost-benefit analysis of the case for developing a Combined Heat and Power (CHP) Plant; and report regularly to the EU on progress. The EU Energy Union 2015 is based on the three long-established objectives of EU energy policy: security of supply, sustainability and competitiveness. To reach these objectives, the Energy Union focuses on five mutually supportive dimensions: energy security, solidarity and trust; the internal energy market; energy efficiency as a contribution to the moderation of energy demand; decarbonisation of the economy; and research, innovation and competitiveness. For instance, it will allow a free flow of energy across borders to help secure supply in every EU country, for every citizen.

Carbon Plan, 2011:

The Plan gives greater detail about how the UK Government intends to meet the challenging targets set out in the Climate Change Act, 2008, to reduce greenhouse emissions by 80% by 2050 (switching to renewables, stronger energy efficiency in buildings, and electrification of public surface transport). Energy Market Reform actions set out in the Energy Act, 2013 include: Contracts for Difference (CFD) to provide stable and predictable incentives for companies to invest in low-carbon generation; Power Purchase Agreements (PPAs), to ensure access to markets via the availability of long-term contracts for independent renewable generators, and measures to enable the Government to take action to improve the liquidity of the electricity market, should it prove necessary. This is in addition to earlier actions including: 'CRC Energy Efficiency Scheme', a mandatory reporting and pricing scheme to

improve energy efficiency in large public and private organisations; cash incentives to encourage uptake amongst infant technologies such as the Renewable Heat Incentive (RHI) and Feed in Tariff (FITs); 'Green Deal' loans and grants to let businesses and other non-domestic organisations pay for some or all of the cost of energy-saving property improvements through savings on their energy bills over time; and the 'Smart Meter Programme' which will see gas and electricity smart meters that provide near real-time information on energy use installed in households and buildings so consumers better understand how they can save money on their energy bills and reduce emissions. Related to this, the Renewables Obligation (RO) and the Energy Company Obligation (ECO) already require major energy firms to provide financial support for independent renewable generators or community energy savings respectively. Additionally, the National Planning Policy Framework (NPPF), 2012 specifically acts as guidance for local planning councils and places a presumption in favour of sustainability development. This means councils should positively seek to meet the development needs of their area unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits. In terms of energy efficiency and renewables, this includes guidance on promoting high quality building design. The Community Energy Strategy, 2015 makes new provisions specific to promoting local community ownership. The Ofgem consultation on Non-Traditional Business Models 2015 also potentially opens the door for a greater role for local government.

Strategic Energy Framework (Northern Ireland) 2009:

The Framework prepared the ground for the country's Sustainable Energy Action 2012-2015, which has subsequently informed the production of the new Vision 2050 paper to debate the long term energy options for the country.

Low Carbon Economic Strategy, 2010 (Scotland):

As part of Scotland's overarching economic strategy it aims to become a global leader in solutions to climate change. It is to be delivered through the Environmental and Clean Technologies Action Plan and Energy Efficiency Action Plan.

Energy Wales 2012:

The paper sets out a path for Wales to make the transition to a sustainable, low carbon economy. Actions include a Green Growth Fund to support a portfolio of investable municipal energy projects, and provisions for the new Future Generations Bill, 2015 which provides scrutiny and advocacy to ensure the whole of the public sector sets and reports against long term goals.

1.3 The purpose and target audience for this report

APSE is committed to an ongoing series of applied research on why and how local councils can make the transition to an inclusive and green economy. This report is the latest contribution to this series, building upon earlier APSE guidance which includes the reports *The Virtuous Green Circle* (2011), *Powerful Impacts* (2012), and *Stronger Resource Efficiency for Desirable Communities* (2013). This new report underpins a major focus of APSE's work – developing a sustainable long-term strategy for the future of local government and the services it provides in a difficult financial climate. APSE is advancing this through the development of a new vision of the 'Ensuring Council' – the local council of the future that is imbued with the ethos of:

- **Stewardship** – ensuring the social, economic and environmental wellbeing of the local area, which is the principal role of the ensuring council
- **Core capacity** – maintaining the strategic advantages of in-house services to meet local needs
- **Municipal entrepreneurialism** – capturing opportunities for collaborative innovation and income generation
- **Collaboration** – working together with a range of service providers on a collaborative basis rather than through competition
- **Politics** – grounding local decision making in political accountability
- **Social justice** – ensuring the values of local government are founded on equality and meeting community needs.

This APSE report aims to showcase the economic prize of stewardship of municipal energy to council leaders and national policymakers. First, to highlight the multiple drivers for councils to rise to the problem and the prize of the nation's energy emergency (Chapter 1). Second, to showcase examples of how different councils are pursuing one or more of these five economic opportunities in unique and difficult circumstances (Chapter 2) (For easy user reference, Table 1 lists these case studies in terms of the different local council functions involved in realising this economic prize). Third, to provide a practical guide for integrated municipal energy stewardship across council functions to help service leaders to chart a course of action with partners, including options for start-up and turnkey finance (Chapter 3). Fourth, to set out recommendations for national government to help local councils overcome barriers to achieve even more (Chapter 4).

1.4 Synergy with APSE Energy

This is a timely opportunity for local councils to make use of APSE services to harness appetite across the sector to leverage inward investment in municipal energy: APSE Energy is already working with 44 member councils. Launched in 2014, APSE Energy's vision is to form an effective collaboration of a large number of local councils to enable and facilitate the municipalisation of energy services. By this APSE mean the public and community, as well as private, ownership and managerial control of municipal energy generation, distribution networks and delivery of energy efficiency works. Local councils working together in this way have greater influence and are able to deliver economies of scale in low carbon energy to promote economic growth and combat poverty. The aims of APSE Energy are to support councils to deliver local municipalisation of energy services and in doing so: address social objectives and deliver community benefits, such as a reduction in fuel poverty and increases in jobs and skills; and save money for councils to safeguard local services.

Table 1: Municipal energy interventions involving different council services

Economic prize from municipal energy	Case studies and reference points	Local council function							Page
		Regeneration, housing and planning	Corporate resources, infrastructure and building maintenance	Place	Highways and street lighting	Health and wellbeing	Schools and education	Environmental services	
Growth and jobs	East Riding of Yorkshire Council and Hull City Council's Green Port Growth Programme	●	●	●			●		17
	North Ayrshire Council's centre of excellence for renewable energy technologies	●	●				●		18
	Oxford City Council's OxFutures pipeline of investable projects	●	●	●	●		●	●	18
	Orkney Islands Council's marine energy area	●	●				●		32
Demand management	Cheshire East Council's market beating energy tariff		●				●	●	20
	Nottingham City Council's Robin Hood Energy Ltd		●						20
	Cornwall Council's renewable energy SPD in its Local Plan								32
	Gateshead Council's Town Centre District Energy scheme	●		●					21
	London Borough of Camden's Somers Town District Energy Network	●	●		●			●	21
	Portsmouth City Council's pooling of resources in the Solent Green Deal scheme	●	●	●					32
Income generation	Belfast City Council's public bicycle sharing scheme		●		●	●			32
	Daventry District Council's solar photovoltaic programme for civic buildings		●					●	22
	Greater London's congestion charge		●		●	●		●	33
	Swindon Borough Council's spin-off company for Public Power Solutions	●	●	●					23
	Wolverhampton City Council's biomass and solar programme for civic buildings and schools	●	●		●	●	●	●	24
Efficiencies and savings	Derry City Council's boiler and lighting replacement for depots and leisure centre car parks		●		●	●			25
	Hampshire County Council's Energy Performance Programme for council estates		●						25
	Rochdale Borough Council's CRC bill reduction		●					●	33
	Salford City Council's energy efficient street lighting		●		●				32
	City of Wakefield Metropolitan District Council's energy efficient street lighting		●		●				25
Safeguarding vulnerable people	Bristol City Council's 'Warm Up Bristol'			●		●		●	27
	East Hampshire District Council's carbon neutral town	●	●			●		●	34
	Peterborough City Council's 'Ready to Switch?'	●	●	●		●		●	6
	Torfaen County Borough Council's Community Energy Saving Programme			●		●		●	27

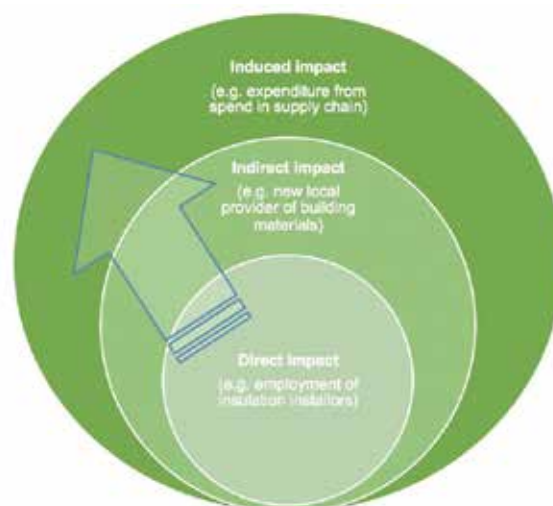
2. How councils are stewarding municipal energy

2.1 Growth and jobs

The energy sector is a major contributor to the UK economy. According to Energy UK, in 2013, annual private-sector capital investment in generation, transmission, distribution and supply was £13.1 billion (one-quarter of investment in new infrastructure that year was energy-related). Investment in renewable generation represented over half of this total investment in the energy sector, accounting for £7.4 billion (renewables provided 15% of all electricity generated that year, a 30% increase compared to 2012). The same year, £186 million was also invested in smart energy technologies, including smart meters, digital energy, smart grids, power storage, hydrogen and fuel cells. As a result in 2013 the energy sector supported some 680,000 jobs across the country (1 in 45 of all jobs is linked to energy) and contributed £96 billion to the economy (equivalent to 6% of GDP). The sector continues to grow with a 5% increase in employment compared 2012, highlighting its critical role in the economic recovery, covering a wide range of engineering, IT, construction and retail skills.³

Local economic developers and planners across the country recognise the huge value of harnessing municipal energy to support growth and create employment. This multiplier effect is illustrated below.

Figure 7: Multiplier effect - types of economic impact from investment in municipal energy



(Source: adapted from Monaghan et al, 2003⁴)

APSE research has previously discovered that £1 investment in renewable energy schemes delivered an average of £2.90 cashable benefits – an almost threefold return on investment.⁵ Also, on average 17 jobs can be created from investing up to £1 million in energy saving measures in buildings.⁶ More than this, energy efficiency and renewable energy can create up to 10 times more jobs per unit of electricity generated or saved than fossil fuels. Electricity from coal and gas creates 0.1- 0.2 gross jobs per gigawatt-hour generated. Whilst the equivalent amount of jobs generated by energy efficiency is 0.3-1.0, while wind creates 0.05-0.5 and solar electricity is 0.4-1.1.⁷

Techniques applied by councils to capture this economic value include:

3 Energy UK, 2014, Powering the UK 2014 (London: Energy UK).

4 Monaghan, P. BSR, Weiser, J., 2003, Business and Economic Development: The Impact of Corporate Responsibility Standards and Practices (London: AccountAbility; San Francisco: BSR; Branford, CT: Brody Weiser Burns).

5 APSE, 2012, Powerful Impacts (Manchester: APSE).

6 Cities-Today, 2013, 'New report reveals the social and economic benefits of green buildings', Cities-Today, 30: July 2013.

7 The Environmentalist, 2014, Green Technologies Secure Jobs, 04: December 2014.

- establishing high standards for compact, mixed-use and sustainable design for developers in the Local Plan
- direct investment and involvement in area-wide renewable energy and energy efficiency schemes to keep money circulating in the local economy which would otherwise 'leak' to other areas
- engaging with the Local Enterprise Partnership (LEP) or chambers of commerce to raise awareness amongst firms about the benefits of taking action on energy, nurture enterprise clusters of green technology companies and ensure their area is 'investor ready' by facilitating the production of reports to institutional investors such as an investor brochure detailing a pipeline of local investable energy projects.

Box 3: Carbon Disclosure Project

The CDP works with 767 institutional investors holding US\$92 trillion in assets to help reveal the risk in their portfolios. To understand the return associated with putting their capital into an area's infrastructure, investors want to know about how that local council is managing the impacts of climate change. For instance, heat island

affects and cooling in major buildings. On the basis that there is a major competition to be an attractive place for investment, 207 cities in the UK around the world, including Glasgow and Manchester voluntarily disclose their plans to the market.

East Riding of Yorkshire Council and Hull City Council

The Green Port Growth Programme (GPG) aims to capitalise on a Siemens investment by establishing Hull, East Riding of Yorkshire and the Humber area as a world-class centre for renewable energy. This will create a once in a life time opportunity to secure long term sustainable economic growth and employment for the region. As well as offshore wind, there are major opportunities in biofuels, carbon capture and storage, waste to energy, wave and tidal power generation.

The GPG Programme is administered by East Riding and Hull City Councils. With an investment of over £25.7million, the programme, which is supported by the Government's Regional Growth Fund (RGF), is designed to capitalise on renewable opportunities and to develop indigenous business growth within the renewable sector and secure long-term economic growth for the region. The project aims to provide continual support to help local businesses recognise and embrace potential opportunities within the renewables sector. Working in partnership with the private sector, the GPG will utilise the RGF to deliver a programme of activity through six business strands designed to develop all aspects of the renewables industry:

- **Employment and Skills Development** – apprenticeships, up-skilling and specialist skills training;
- **Site Assembly** – provision of appropriate and suitable employment sites;
- **Inward Investment** – engagement with Original Equipment Manufacturers (OEMs) and tier 1 & 2 suppliers, as well as delivering proactive targeted overseas visits and trade missions;
- **Business Support and Advice** – helping local businesses to enter the renewable energy supply chain;
- **Business Investment Grants** – reducing relocation/expansion costs for co-located value chain companies; and
- **Research, Development & Innovation (RDI)** – providing support for key industries working in the offshore wind and wider renewables sectors.

The goals for the six delivery strands are to: increase Gross Value Added (GVA) by £300m, up-skill and train up to 1,900 local people, develop over 90 ha of brownfield land and bring forward 70 ha of greenfield sites, secure £280 million of large inward investment, assist up to 650 local businesses to diversify and enter the supply chains of major renewables investors and their suppliers, and establish Hull as a Centre for Research, Development and Innovation (RDI) for the renewables industry.

With a unique natural location, established infrastructure, knowledge, expertise and the capability to handle a diverse energy mix, East Riding of Yorkshire, Hull City Council, nearby universities and the wider Humber area is capitalising on its strengths to put the region on the world stage for renewable energy.

North Ayrshire Council

In early 2014 North Ayrshire began development of its 'Renewables Strategy'. The strategy has the overarching aim of positioning North Ayrshire as a centre of excellence for renewable energy generation through completion of four pieces of work:

- Baseline Analysis - to understand the current energy consumption (all sectors), installed/ consented renewable energy generation capacity, and scale of step change required to meet or exceed EU/Government generation targets
- Technical Analysis - to understand the scale of opportunity for implementation of further renewable energy generation capacity across current and emerging renewable technologies, including energy storage.
- Social, Economic and Environmental Analysis - to articulate wider benefits and value added to new energy generation opportunities through the consideration of the affordable warmth agenda, employment, training, business support, community generation, energy security, and environmental benefits. Also clarification of the role the council can play in opportunities - lead, enabler, investor, etc.
- Action Programme - implementation plan for the policy and project based recommendations arising from the above analysis, including preparation of business cases for quick win proposals. To be launched in 2015, the strategy sets out recommendations for new projects and policy changes that will build on the 140MW of installed renewable energy generation that North Ayrshire have currently, to cement its position as a lead in the area of sustainable energy.

This strategy is one of a wider set of commitments by the council to plan for and invest in sustainable energy as demonstrated by its Environmental Sustainability & Climate Change Strategy 2014-2017. North Ayrshire was one of the first Scottish councils to become a signatory of the Covenant of Mayors, an EU based organisation which encourages international collaboration on the energy agenda, and which requires that member authorities commit to exceeding the EU 2020 climate change targets. The council is currently preparing its Baseline Emissions Inventory and Sustainable Energy Action Plan (SEAP). North Ayrshire is also currently in construction phase for a £5 million major solar photovoltaic/ biomass boiler retrofit programme in a number of council owned buildings, to deliver efficiency savings and environmental benefits.

Oxford City Council

The council has carbon reduction and sustainability at the heart of all of its activities and the Environmental Sustainability Team has led on a variety of pioneering sustainability projects around energy efficiency, renewable energy, fuel conservation and waste reduction. OxFutures is one of its latest interventions, to capture the economic value of municipal energy.

OxFutures is mobilising investment to develop renewable energy and energy efficiency projects across the city and county. The ambition is to position Oxfordshire at the forefront of low carbon innovation and lead on the UK's transition to a sustainable energy future. The programme has been kick-started by a £1.3 million grant from Intelligent Energy Europe to leverage investment of £20 million into municipal energy projects and create 100 jobs by the end of 2015. For instance, under the OxFutures umbrella, the Low Carbon Hub is leading on community energy by working with corporate partners, schools and communities to develop finance and manage renewable energy schemes for community benefit. Up to 3,000 local investors are being targeted to invest in share offers over three years. To date the Hub's £34 million pipeline of renewable projects includes eight community micro-hydro schemes along the Thames, solar photovoltaic (PV) projects on community buildings, a cohort of solar schools, as well as 3.5MW of solar PV with local businesses across Oxfordshire. Expected returns on share offer

investments are 5 -8% per annum depending on performance and eligibility for tax benefits. OxFutures is the start of the area's journey to make low carbon economic development mainstream and to bring £400 million of investment into Oxfordshire and create 2,270 jobs by 2020.

OxFutures will also help secure the City of Oxford's target to reduce its carbon emissions by 40% by 2020, and to reach the Oxfordshire County Council target of a 50% reduction in carbon emissions by 2030, based on 2008 levels. OxFutures is a part of a broader programme of actions on low carbon and renewable energy in Oxford which includes energy management of council estates, sustainable transport, waste reduction, domestic energy efficiency and Low Carbon Oxford partnerships with the MINI Plant Oxford, Unipart, Oxfordshire County Council, the NHS and other local stakeholders.

2.2 Demand management

Locally managing demand for energy helps to ensure council estates, local industry and households are able to enjoy secure and low-carbon fuel at more affordable prices.

Demand management is informed by an understanding of an area's generation capacity, needs of major energy users (see Figure 8) and their geographical relationship to each other. It is also vital to appreciate how a change in operating context over time is shaping user needs, be it fuel choice and price, breakthrough technologies, population shifts or climate change. For example, higher summer temperatures are projected to result in rising energy demand for cooling. Currently, cooling of buildings (including air conditioning, refrigeration and cooling of ICT infrastructure) accounts for around 4% of total UK electricity use and demand for cooling is already increasing.⁸

Figure 8: Electricity demand by sector



(Source: Digest of UK Energy Statistics, 2014)

Distributed energy systems have been equated with increased energy independence, helping to balance supply and demand. Currently, less than 1 % of UK electricity demand is met by local authority- or community-owned distributed electricity generation. Yet, although challenging, it is technologically feasible for 50% of electricity demand in the UK to be met by distributed and low-carbon sources by 2050.⁹ This civic energy transfer will be enabled by technologies which focus on decarbonising supply, energy storage, smart grids and microgrids, data centres and building systems.¹⁰

Councils up and down the country already understand that distributed energy systems and co-generation can be a more efficient form of power generation as the losses from transmission are lower providing greater fuel efficiency from generating the power on-site. For instance, Combined Heat and Power (CHP) typically only results in 15% of fuel being lost in transmission compared to conventional generation which results in a huge 47% of fuel being lost in transmission. Bringing together a compact network of major energy users in a location can benefit everyone by more effectively sharing heat and power, stabilising electricity costs over a fixed period, and helping to make savings to fund energy efficiency measures which reduce user demand.

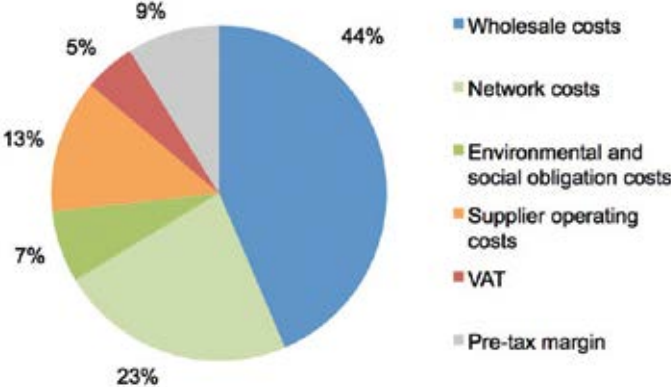
⁸ DEFRA, 2012, Summary of the Key Findings from the UK Climate Change Risk Assessment 2012 (London: DEFRA).

⁹ Realising Transition Pathways Research Consortium, 2015, Distributing Power: A Transition to a Civic Energy Future (Bath: Realising Transition Pathways Research Consortium)

¹⁰ Arup, 2015, Energy in Cities (London: Arup).

Various capital options are available, including zero outlay. Wholly owned council energy companies or joint ventures with the private sector may be seed funded through prudential borrowing, local authority pension schemes, or financial mechanisms established in the Local Plan. For example, the PWLB, a Section 106 Agreement, Community Infrastructure Levy (CIL) or another form of developer tariff or Land Value Capture instrument.

Figure 9: Breakdown of fuel bill costs



(Source: Ofgem, 2015)

Through the Energy Market Reforms set out in the new Energy Act 2013, some councils are now even directly trading in the energy market, to 'get rid of the middleman' and derive a better energy tariff for the council and local communities. As figure 9 highlights, this is on the basis that a significant part of the typical energy bill is made up of supplier operating costs. These costs can be reduced through distributed energy.

There is an important distinction here about the issue of market failure and the role of local government. Councils are already starting to intervene in the market directly by setting up local supply 'white label' arrangements (e.g. Cheshire East and Ovo's 'Fairer Power'), community owned models (e.g. Argyll and Bute's 'Our Power'), or municipal owned companies (e.g. Nottingham's 'Robin Hood Energy Ltd'). There are pros and cons associated with each business model, in terms of the risk-reward relationship for a wholly public owned, hybrid public-private, and private owned energy company. For instance, the Fairer Power white label is a device to use the trusted council brand to attract customers to a private firm, but the custom belongs to Ovo, not Cheshire East. Whereas, Cheshire East Council's direct investment in geothermal energy may have a higher cost to the public purse, but perhaps has greater long term potential for the council and the local economy.

Cheshire East Council

In late 2014 the council boldly announced it will directly provide a market beating energy tariff with its energy partner Ovo, offering lower cost gas and electric for residents of the borough (with an intention to widen the offer to other geographical areas as the scheme grows). The 'Fairer Power' scheme aims to provide a 'cheaper' tariff rate (including for prepayment meters) than the big 6 energy companies, thereby reducing bills and combatting fuel poverty. This is the first time since 1948 that a local council has entered into the energy market directly. From spring 2015 onwards, the Cheshire East municipal energy supplier scheme will offer savings from switching of up to £300 a year to over 160,000 households, including social housing, as well as businesses.

Using a municipal energy supplier also means more income will recirculate in the local economy, improving prosperity. This on the basis that Cheshire East households each spend on average £1,300 a year on energy, predominantly with the big six energy companies. Over £200 million of residents' money per year ultimately leaves Cheshire East to companies outside the borough.

Cheshire East's move to trade directly in the energy market follows the launch of its new Energy Framework in 2015 which provides a strategic, holistic and co-ordinated approach to the energy

agenda. Through alternative delivery vehicles notably Cheshire East Energy Ltd, it focuses on bringing all the strands of the council's activity on energy together and sets a vision and action plan which is split into three strands:

- Affordable Energy – putting residents first;
- Growing Energy Businesses – developing a municipal energy economy; and
- Independent Energy – secure, distributed and locally managed energy services.

For instance, in 2011/12 alone low carbon industry in Cheshire East employed 2,500 people across 245 companies and achieved sales of £240 million. The general trend for growth in sales in this industry in Cheshire East is 4.3% annually; something the council wants to nurture. One way the council is supporting this is its innovative work on a series of deep geothermal energy projects. Cheshire East is only one of six areas in the country that can access 100 degrees underground heat sources. Its geothermal scheme, which is under development, is estimated to create 60 jobs initially, with many more to follow as the emergent industry grows and is mainstreamed (in Germany, the industry employs over 9,000 people).

Gateshead Council

Since 2011 the council has been developing a district energy network to serve the town centre and Gateshead Quays area. The initial scheme is costed at £15 million, and funded 100% by Gateshead Council, through prudential borrowing. The council will establish its own ESCo to operate the district energy scheme. Its commercial offer is simple, the council guarantees to provide lower cost, lower carbon heat and power, for the duration of supply contracts, so customers will always pay below the market rate for heat and power. The council's rationale for funding the scheme is to be in control of the business operation of the scheme, and future expansion of the network, which will enable it to use the energy supply offer as another incentive to attract commercial and housing developers to Gateshead, thus improving economic growth and regeneration of the borough.

The new, low carbon, energy centre will export both heat and power for sale directly to customers via a 3km underground network of heat pipes and high voltage 'private-wire' electricity cables. The scheme is based on two 2MW gas fired Combined Heat & Power (CHP) energy centres generating an estimated 16GWh of electricity per year initially, located on Baltic Business Quarter. Gateshead Council is approaching the end of its procurement process to appoint partners to build the energy centre and network, which will be operational from early 2016 and will serve a range of public and private organisations. At present, the scheme is projecting to supply customers with approximately 75% of electricity from gas CHP, with the remaining 25% being exported to the grid, and sold to suppliers through a long term power purchase agreement. Current estimates are for 5GWh of exported electricity per year, although this will reduce as the scheme expands, and takes on new electricity customers. Initially, the scheme will serve 6 public buildings, 6 commercial buildings and 350 domestic properties, supplying lower carbon, lower cost heat, direct to customers. Planned extensions to the scheme could see the scheme serve other public and commercial buildings, and a further 200 social housing units. Longer term, the scheme is sized to supply heat to all potential new retail/commercial development in the town centre, as well as 1,000 new build homes, which are planned to be constructed over the coming 5-10 years.

London Borough of Camden

The Somers Town District Energy Network is one of two council-led low carbon district energy projects. It is under construction and involves the council building and operating its own energy network serving commercial and domestic buildings next door to the British Library and St Pancras International/Kings Cross railway stations. The business case for London Borough of Camden's investment is a significant net present value improvement over business as usual during the 15 year operation and maintenance contract once electricity sales commence. The project is split into three phases:

- **Phase 1** – heat only energy centre to 339 Camden homes.
- **Phase 2** – CHP installation at the energy centre and a proposed private wire electricity supply

to a high profile commercial third party building in 2016/17 (the 3rd party building is currently under construction).

- **Phase 3** – proposed extension to a redeveloped local primary school and new Council led housing development in 2016/17.

Phase 2 is conditional on the finalisation of electricity supply agreement, but a memorandum of understanding is in place between the parties which defines, as far as possible, the detail of the supply terms. The combined Phase 1 and 2 project has been awarded to Vital Energi. Phase 1 is due for completion in summer 2015.

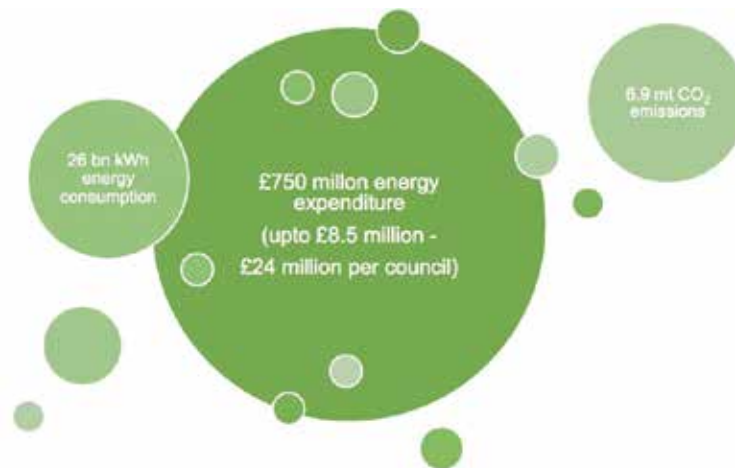
Phase 3 extension feasibility is currently being assessed using DECC Heat Network Delivery Unit funding. Subject to a positive conclusion to this assessment, connection will form part of the planning requirements for the new school and Council led housing development.

Capital expenditure of £4.9 million for the Phase 1 and 2 project is funded partly by a Section 106 Agreement with the third party developer (£3.8 million) and by invest-to-save council funds (£1.1 million). The Section 106 Agreement also contained a condition relating to the future supply of electricity from the energy centre to the building in question.

2.3 Income generation

In spite of unprecedented public budget cuts, the footprint of local government is still huge, as depicted in Figure 10. Councils are working hard to leverage their spending power on fuel bills to generate new income streams. One primary source of income has been the three main Government cash incentives which councils have tapped into: the Renewables Obligation (RO), the Feed in Tariff (FIT) and the Renewable Heat Incentive (RHI). Capital options include reserves, prudential borrowing, and private investment. A revolving fund is often established to finance projects on a case-by-case basis, whereby the initial outlay is returned with interest through future income receipts.

Figure 10: Annual energy consumption of local government sector



(Source: adapted from Office of Government Commerce; credit: Carbon Trust, 2012¹¹)

Some councils are going a step further, commercially exploiting their in-house 'know-how' to provide energy solutions to their sector peers. This often takes the form of a spin-off limited liability company, which is part or wholly owned by the council.

Daventry District Council

During 2011-12 Daventry successfully installed council-owned properties with solar PV panels to provide revenue benefit in the form of immediate electricity savings and income over a 25 year period from FITs payments, whilst simultaneously reducing CO₂ emissions. The scheme was immediately seen as a win-win by senior management due to the combination of cost and environmental benefits.

¹¹ Carbon Trust, 2012, Saving Energy in Local Authority Buildings (London: Carbon Trust).

Effective south-facing roof space was identified on four council buildings and checks made to ensure there would be sufficient space to provide systems large enough to provide the required income and that the roofs had sufficient structural loading capacity. PV systems sized 27 Kilowatt peak (kWp), 16 kWp, 49 kWp and 147 kWp were installed on the council's Lodge Road Civic Offices, The Abbey Advice and Resource Centre, Daventry Leisure Centre and on the tenanted headquarters of Hambleside Danelaw, Daventry, respectively. All four systems were installed by Evo Energy Ltd, the first three following a restricted tender approach and the last one procured through the Nottingham City Council Solar PV Framework.

A budget of £0.5 million was agreed for the project to install the four PV systems, funded through planned capital finance, with a payback period of 11-12 years. The first three systems were modelled to generate 73,484 kWh each year and to produce £12,466 of income from FITs together with electricity savings of £5,292 in the first year. However during the first year they generated 80,158 kWh (about 9% above model). The fourth system at Hambleside Danelaw generated 41,000kWh against a model of 37,100 kWh (about 10% above model). Performance figures to December 2014, about 21 months after installation, show total energy generation of 484 kW, total FITs payments of £68,631, and total emissions reduction of 258 t CO₂.

Swindon Borough Council

Public Power Solutions (PPS) is a wholly owned company of Swindon Borough Council with turnover of £12m and employs 55 staff. PPS is working in partnership with Swindon Borough Council to help them achieve a 200MW target of renewable energy by 2020. PPS are currently developing a number of large scale schemes for the council including a low grade agricultural farm and closed landfill which are both owned by the Borough. These schemes will have major community benefits, including providing the council an opportunity to invest.

PPS have recently delivered a 7MW scheme in Braydon, Wiltshire to Bath and West Community Energy & Wiltshire Wildlife Trust. This project has been opened up for community investment returning 7% year on year. On 19th March 2015 PPS were also awarded planning permission by the Secretary of State DCLG for a 41MW solar park at the Science Museum, Wroughton. This project has the potential to be the largest community owned solar park with all the site being available for community investment through a 'Big 60 Million' bond offer.

As well as solar development, PPS also run the UK's only large scale solar Dynamic Purchasing System (DPS). The OJEU compliant DPS will enable local authorities to procure all the services required to develop, finance and build solar parks in an efficient and low cost way.

All PPS projects have an element of community investment and community benefits. The Science Museum project will offer a 6% return on 5 year bonds through a Big 60 Million and a community benefit fund of circa £40,000 a year for the life of the project. This fund will be used for community projects within Swindon and Wiltshire.

While the PPS model is commercial, it is very different from the conventional commercial sector given its public service heritage. With capacity, the prospect of selling retail to local customers is another key opportunity and way to further benefit local residents.

In addition, PPS also run a waste solutions business processing Swindon's household waste into a valuable fuel in a Solid Recovered Fuel facility which is unique in the UK.

Wolverhampton City Council

Since 2010 Wolverhampton has been successfully rolling out its renewables programme for civic buildings and council housing. Initial pilots focused on solar, before extending to biomass. The business case for action is built around the benefits of a new income source, utility savings, and lower carbon footprint.

In 2011 the Kier Group was appointed to install a 49kW PV system at the Wolverhampton Civic Centre. With a total project cost of £130,000, annual FIT income of £14,000 and imported electricity saving of £3,700, this yields a payback period of 7.5 years. Following this early success, since 2014 a second

programme of solar panels is being implemented across seventeen council buildings. (This is one of three current c£1 million budgets over five years spanning the council's activities). At a cost of £0.87 million and worth £128,000 in annual income to the council, the payback period is 6.6 years. Future options for solar installations also being investigated include council car park shelters, the Civic Halls refurbishment and schools. During 2014 funding of £1.05 million was also agreed for a schedule of containerised biomass boiler installations at various council properties. From the schedule of six sites, the first new boiler was installed in spring 2015, a 200 kW unit for Aldersley Leisure Village. The council already had one containerised biomass boiler installation at Goldthorn Park School – this was paid for out of the council's in-house Energy Fund, with money paid back using RHI payments. Wolverhampton has three other schools with biomass boilers installed in the existing boiler houses. Furthermore, Wolverhampton Homes, an ALMO responsible for council housing, has managed a portfolio of renewables installations for solar PV and biomass. For instance, in 2011 a biomass system at Heath Town – an estate mixture of deck access and high rise – was funded by the government's Community Energy Savings Programme (CESP) with a contribution of £0.85 million from British Gas, delivering 6m kWh or one third of total demand and annual carbon savings of 1,100t. The cost of wood chippings initially affected savings, but this will provide the council the opportunity to draw down RHI payments of around £120,000 per annum.

The council's insights from this renewables programme is contributing to actions in the Black Country LEP's 'Green Growth Plan'. This includes a project for Optimising Regional Clusters of Smart Electricity Networks (ORCSEN), funded by Innovate UK and led by Encraft and which was due to commence in April 2015. The goal is to create a more open and flexible electricity distribution infrastructure to unlock the full economic benefits of distributed generation, electric vehicles and energy efficiency investments (for example solar PV on brownfield sites or new and widespread deployment of plug-in vehicles).

2.4 Efficiency and savings

On average there is an energy savings potential of 30-50% in existing buildings through application of readily available low-cost technologies and behavioural change.¹² This means that the local government sector's £750 million annual energy expenditure bill could be significantly reduced by £225 – £375 million.

The procurement of green technologies and automated meter reading equipment (AMR) and application of behaviour change programmes all play a useful role in reducing or eliminating the cost pressures of energy expenditure. Understanding where the major cost centres are and the potential to limit this liability is key to prioritising a council's intervention. As Figure 11 shows, space heating in particular, followed by lighting and cooling/ventilation tend to be the main areas of focus.

Figure 11: Local councils' energy expenditure - percentage cost



(Source: adapted from Carbon Trust, 2012)

Revolving funds are again a familiar method to help councils make efficiencies and savings for service budgets. Here they operate as an internal or third party loan scheme, whereby the council borrows money to fund energy efficiency technologies or education programmes, which is then repaid from the utility savings made as a result. Model Energy Performance Contracts (EPCs) are one approach

¹² UNEP, 2013, Sustainable Buildings and Climate Initiative (Paris: UNEP).

designed to assist public sector organisations retrofit their buildings by installing energy conservation measures to reduce carbon emissions and achieve substantial guaranteed annual cost savings. The improvements to the buildings are often installed by an in-house team and/or through an ESCo that designs and implements the conservation measures and guarantees the energy savings.

Derry City Council

To realise cost savings for the council, the Energy Management Department in Derry is implementing an energy efficiency programme with a roster of actions ranging from installing roof space insulation and heating system replacement at depots to new lighting for council-owned car parks.

Examples include: the replacement of leisure centre car park lights with LED alternatives at a cost of £15,303, saving £6,528, with a payback period of 2.3 years, and annual CO2 reduction of 29.6 tonnes; a new boiler plant at the maintenance depot at a cost of £6,331, saving £1,414, with a payback period of 4.5 years, plus an annual CO2 reduction of 8.43 tonnes; and the installation of process water system pumps with variable speed drive's at a cost of £13,967, saving £5,786, with a payback period of 2.4 years and resulting in annual CO2 reduction of 27.59 tonnes.

Derry's Energy Management division considered both cost and performance in its procurement of alternative technologies. For instance, sourcing types of LED lighting which not only typically use 85% less energy than other bulbs, but also offer a type of 'white light' that provides equal comfort and safety for night time visitors at the leisure centre's car park.

Hampshire County Council

The Hampshire Strategic Energy Action Plan 2014-2018 sets out a pipeline of projects for the council to provide community leadership for resilience to the risks of energy security, affordability and carbon emissions. The plan is a major contribution to the council's ambitious vision for a sustainable low carbon economy in Hampshire.

Council initiatives to manage municipal energy range from an Energy Performance Programme for council-owned buildings and renewables installations for its schools through to 'Insulate Hampshire' which helps vulnerable residents affected by fuel poverty.

The first phase of the council's Energy Performance Programme is set to save 2.2mWh of energy per annum. Over the life of the energy efficiency measures it will result in cost savings of approximately £3.3 million. This equates to a payback period of 7 years.

City of Wakefield Metropolitan District Council

Wakefield is implementing a pipeline of strategic projects on municipal energy, ranging from a Carbon Management Programme (CMP) for council-owned buildings and estates to an Affordable Warm Plan to counter domestic fuel poverty, amongst other initiatives.

Since its CMP was launched in 2012, Wakefield has funded a number of capital projects, secured on a case by case basis. The council has developed its CMP plan to realise significant cost and carbon savings. It includes a commitment to work towards a target of reducing CO2 by a minimum of 11.11% by 2016, with aspirations to reach 17.70% by 2020. This will in turn result in reductions in services operating costs.

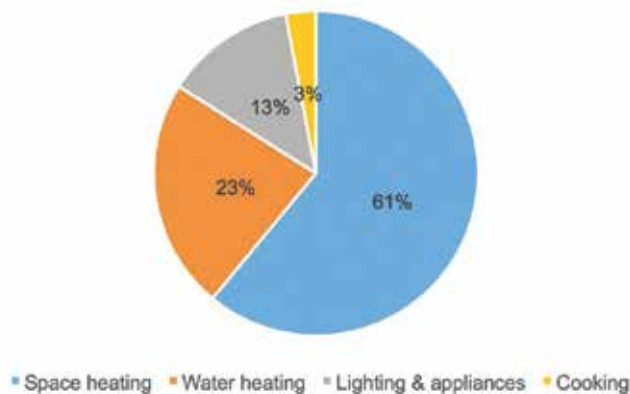
As part of the CMP, one new major action for the council is investing £21 million in a street lighting energy efficiency project over 3 years. Installation of LEDs and a central management system is predicted to save £1.7 million in energy cost and 8,269 tonnes CO2. The scheme will see the council use a new high-tech system monitor, which shows when street lights need maintenance, and also enable lighting levels to be changed throughout the night. The cost of street lighting has risen from just under £1 million in 2009 to £2.3 million in 2013, and energy costs could have risen to £3.1 million by 2019-20 if the old system was not replaced.

2.5 Safeguarding vulnerable people

More than 1 in 10 UK households live in fuel poverty, which means about 2.3 million households are struggling to heat their homes. Severe bouts of cold or heat are a danger to public health. Older residents, very young children, and people with serious medical conditions are particularly vulnerable to the effects, and are at risk of heart attacks, strokes, lung illnesses, depression and other diseases. On average, there are around 25,000 excess winter deaths each year in England.¹³ New roles and responsibilities placed on local councils by the Public Health Outcomes Framework and Health & Social Care Act 2012 means council social care and wellbeing budgets are being stretched and tested along with those of local NHS and civil society partners.

Despite this challenge, councils across the country have already mobilised to resource the safeguarding of vulnerable communities against cold snaps and heatwaves. Understanding where the major cost centres are and the potential to limit this burden is key to prioritising a council's intervention. As Figure 12 shows, space heating in particular, followed by water heating and lighting tend to be the main areas of focus.

Figure 12: Average energy use in the home



(Source: Energy Saving Trust, 2015)

Key interventions include: directly trading in the energy market; working in partnership on Affordable Warmth interventions through whole-area housing energy conservation schemes; education and self-help such as 'Green Neighbour' programmes or 'collective switching' which enable hard-to-reach households to consume more fuel for less; and assisting Health and Wellbeing Boards to develop their Join Strategic Needs Assessment (JSNA) and prepare local Cold Weather and Heatwave Plans. The new Community Energy Strategy 2014 also places a fresh impetus on Local Plans to facilitate establishment of community owned energy schemes. For instance, council-run switching schemes are already helping well over 100,000 households save £10 million on their gas and electricity bills. These actions not only protect vulnerable residents in the short-term, but also help to provide long-term solutions which connect communities to break down silos, boost local capacity for self-sufficiency and shape places.

Box 4: Energy customers missing big savings

A recent investigation of the energy market by the Competition and Markets Authority (CMA) found that more than 95% of dual-fuel customers of the 'big six' firms would have saved money by switching tariffs or suppliers. Missed customer savings ranged from £158 to £234 a year per customer. The big six account for about 92% of the UK's energy supply market. CMA's investigation follows public concern that the firms are using their position to raise customers' prices swiftly when wholesale energy prices rise, but being slow to cut them when their costs fall.¹⁴

¹³ Public Health England, 2014, Cold Weather Plan for England.

¹⁴ CMA, 2015, 'Energy market investigation', <https://www.gov.uk/government/news/energy-market-investigation-updated-issues-statement>, website accessed February 2015.

There are again a number of key Government incentives or support schemes which councils are accessing to take action: notably the Green Deal and ECO. These funds are being matched and leveraged through planned council service budgets, or in partnership with the local NHS, residents associations and social landlords, and energy service firms.

Bristol City Council

Bristol is the 2015 'Europe Green Capital', a prestigious award recognising the city's forward thinking and integrated approach to becoming a sustainable city. This is reflected in the way it oversees action on municipal energy through the council's Strategy Energy Unit. As part of one strand of activity in relation to domestic retrofitting the Unit operates Warm Up Bristol, a city-wide initiative designed to make homes across Bristol warmer and healthier places to live, cheaper to heat and less carbon intensive.

Each year in Bristol around £108 million is spent on heating homes, a third of which could be saved if all houses were insulated in line with current building standards. Through Warm Up Bristol there is a wide range of home improvement measures on offer, ranging from solid and cavity wall insulation to double glazing, draught proofing and new boilers. The Unit is working with other local services such as Bristol Water and the Fire Service to ensure all efficiency measures are considered. Warm Up Bristol is also supporting growth in Bristol by using a largely SME supply chain to do the works, creating around 50 local jobs.

Warm Up Bristol launched in late 2014 and is set to run for four years. Seed funding for Warm Up Bristol is resourced through the council being awarded a £2.5 million technical assistance grant under the European Investment Bank's European Local Energy Assistance (ELENA) programme to develop investment programmes in energy efficiency and renewable energy projects in Bristol and the wider sub-region – with an estimated potential investment of up to £140 million.

Torfaen County Borough Council

Torfaen is committed to community energy saving schemes to tackle fuel poverty in the borough. A critical factor in meeting this obligation is the council's successful track record in accessing funds from energy suppliers and the government to run a variety of schemes, including Welsh Government Maximising ECO funding (£3.1 million), and Arbed (£2.5 million), CERT (£0.5 million) and CESP (£0.9 million), all of which were delivered in partnership by Torfaen.

The CERT scheme ran from March to December 2012 resulting in: 435 residents receiving cavity wall insulation which saved them approximately £140 on their energy bills; 702 residents receiving loft insulation, saving them approximately £180 on their energy bills; and approximately 28,000 tonnes of carbon being saved as a result of these measures being installed. About 22% of the measures were installed in properties where residents were identified as being in receipt of specific benefits. The CESP scheme ran in three areas within Torfaen resulting in: 142 residing receiving external wall insulation, saving them an average of £490 a year; 77 residents receiving loft insulation, saving an average of £180; 20 residents received new boilers, saving them £310; and approximately 21,500 tonnes of carbon was saved as a result of installing these measures.

Torfaen's impressive track record in securing funds and working in partnership, especially with Melin Homes, to deliver projects is supported by its ability to provide value for money. Based on the 'Value Wales Community Benefit Measurement Tool', for every £1 invested in Maximising ECO or Arbed projects in Torfaen there has been a return of £2. The figure of £2 is the highest amount that can be achieved with the tool and the Arbed project administered by Merlin was the first in Wales to accomplish this. In addition to tackling fuel poverty, the schemes are also supporting growth. The total combined employment impact of these schemes is the creation of 24 new jobs, 2 apprenticeships, and the retention of 10 existing jobs.

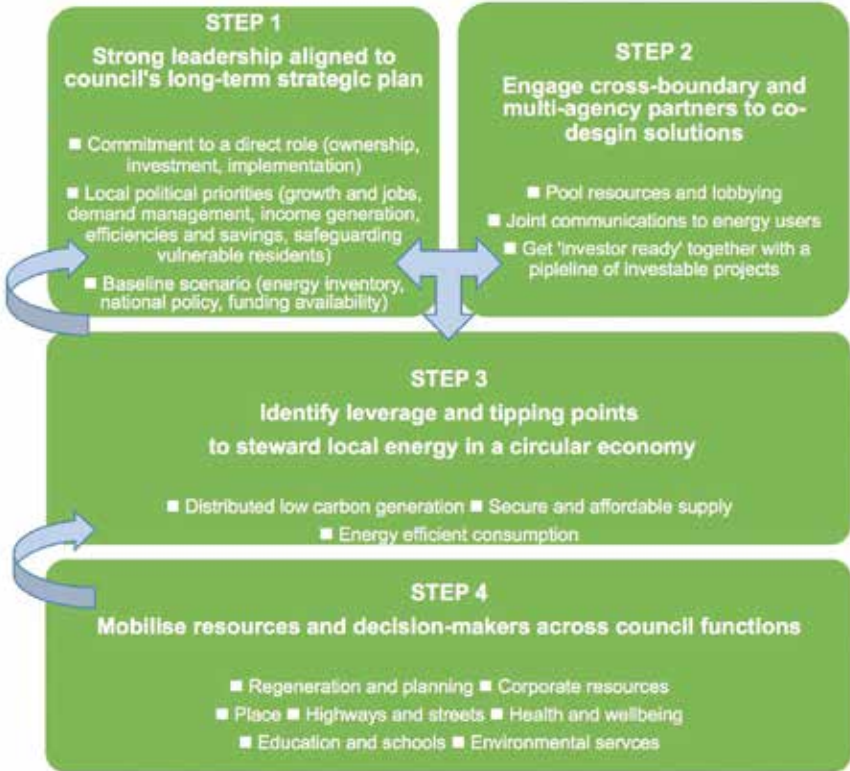
3. A decision-making framework for integrated municipal energy stewardship

The previous chapters set out why and how councils around the country are pursuing the economic prize of municipal energy management in unique and difficult circumstances. This chapter distils lessons learned to present a model to guide service managers in their decision-making on the stewardship of energy, suggesting options for start-up and turnkey finance, and summarising the ‘ten things you can do now’.

3.1 Step-by-step process for constructing an integrated approach

A major factor in successfully constructing a strategy and policy for stewardship of municipal energy by a council is adopting an integrated approach on energy management that considers an array of complex issues. Illustrated in Figure 13 below is a four-step framework to help a council embed the right kind of decision-making in its system planning, governance and leadership team. It is intended to act as a virtuous circle, to drive ever higher standards and performance on municipal energy stewardship.

Figure 13: Process steps for constructing an integrated approach to municipal energy stewardship



(Source: author 2015. Credits: APSE, 2014)

Step 1: ‘Strong leadership on municipal energy aligned to your council’s long-term strategic plan’

Means being brave and considering doing things differently where you can. Setting out a political vision which commits the council to a direct role in the municipalisation of energy, recognising the risk-reward of different business models of ownership, investment and implementation (wholly public owned, hybrid public-private, and private owned). For instance, the merits of the Nottingham council-owned Robin Hood Energy Ltd versus Cheshire East’s white label arrangement with the private supplier Ovo. This will be aided by ensuring the business case proposal focuses on close-to-home issues for

politicians and service managers, local business and voters alike in terms of a contribution to growth and jobs, demand management, income generation, efficiencies and savings, and safeguarding vulnerable residents. Council leaders may require different data to voters or business to be persuaded about the strength of the evidence, as it may involve them making trade-offs between competing priorities. Whilst monetisation of costs and benefits is usually a powerful approach it is not universally necessary, indeed it can be counter-productive if it is not handled correctly when dealing with an emotive issue such as death as a result of severe cold. For example, the great merits of Torfean County Borough Council's community energy saving programme is the social value of helping fuel poor households, by comparison Swindon Borough Council's spin-off company Public Power Solutions is a significant contributor to new income.

To inform this business case, a critical output here is the development of a baseline scenario in terms of an energy inventory to map current status, modelling future needs, generation capacity, an understanding of national policy responsibilities and enablers, and funding availability. It is also essential that this strategic planning is done in a holistic way and for a long-term period. Single issue strategies fail to recognise inter-connectivity and the value of wider policy integration for current and future generations of communities. This framework is intended to compliment and amplify other APSE work and stakeholder initiatives which seek to inform why and how local councils should manage municipal energy as it relates to economic, social and environmental impacts. Box 5 signposts some of the most important initiatives.

Box 5: Useful tools, guidelines and standards

- APSE 'Powerful Impacts' and 'The Virtuous Green Circle' reports
- BSI 'Smart Cities Framework' and ISO37120 'Standard on Sustainable City Indicators'
- Carbon Trust 'Enplanner – low carbon planning toolkit'
- CDP Cities disclosure for institutional investors
- EU 'Mayors Adapt' signatory platform
- ICLEI 'Sustainable Energy Action Plan' e-wizard
- Joseph Rowntree Foundation's 'Climate Just' portal

Building the organisational capacity of the council's area as a whole to take all future decisions – short and longer term - on energy management in a strategic, effective and accountable way may mean ensuring energy stewardship is formally stipulated as a priority in a council's constitution, governance rules, corporate strategy and service plans, risk register, staff induction and performance reward packages. Similar to the example set by Hampshire County Council's 'Strategic Energy Action Plan'. Bringing a single and powerful voice to the table can assist this, notably the appointment of a Cabinet Lead Member for Energy.

Step 2: 'Engage multi-agency and cross-boundary partners to co-design solutions'

Recognises the importance of bringing together key delivery agents, from the public and private sector, at the beginning of the process to ensure the choice of solutions is the best available and to avoid procurement problems later on (After all, even if the council decides to set up and run its own municipal energy company it may want to invite contractors to tender for some phases of work during design, build and operation). At this stage it is vital to determine if any insights arising during Step One of the Framework will require revisiting, for instance if its decided there is an opportunity to pool resources then the council may need to re-rank its choice of priorities to ensure there is mutual benefit for all parties. For example, akin to London Borough of Camden's 'Somers Town District Energy Network'. Different partners may have control or influence over different parts of the energy network (e.g. a Distribution Network Operator (DNO) charging a fee for the connection of distributed systems to the National Grid). At this point it is also vital to ascertain any commercial sensitivities in sharing financial information to avoid delays further down the line. Working collaboratively also means getting 'investor ready' together, for instance compiling a brochure of investable projects for local or institutional investors, like Oxford City Council is doing via the 'OxFutures' initiative.

Step 3: 'Identify key leverage and tipping points to steward municipal energy in a circular economy'

Requires determining how the council can make specific interventions given the priority areas - lead, enabler, investor, etc. For instance, new design standards in the council's Local Plan requiring all commercial and residential buildings to be energy efficient, or joint procurement frameworks with other council buyers on collective switching to make operational savings. For example regarding the latter, as is the case with Peterborough City Council through its 'Ready to Switch' scheme with 15 other councils. At this point an important consideration is a system thinking approach to dealing with complexities and unintended consequences. Systems thinking refers to how a small shift in one thing can produce big changes elsewhere (e.g. a reduction in household energy bills that results in people spending more money on energy intensive luxury goods). The leverage points allow a council to select the best places to make adjustments and changes within the system, such as resource constraints, information flows, rules and powers. To do this also means understanding what conditions or tipping points within an energy network will bring pressure (e.g. how many user spikes by major energy consumers at peak time hours will lead to a blackout, or how weak signup to a collective switching offer renders the scheme ineffective). At this stage, again, it is vital to determine if any insights arising during Step One and Step Two of the Framework will require revisiting. Again, different partners may have control or influence here (e.g. government approval for a council to competitively challenge the energy tariff offered by a local utility supplier).

Serious consideration here needs to be given to the right type or mix of investment model given a council's particular financial or regulatory context. For instance, some interventions may incur nil costs to a council whilst others could involve lots of time-consuming grant applications or major levels of debt. (Section 3.2 sets out some start-up and turnkey finance options in more detail). It is also crucial to be clear on who funds the intervention, who benefits from it and also when this benefit occurs. Regarding the latter point, weighting costs and benefits at different points in time is a recognition that investments can produce a stream of net benefits that run into the future. This creates a risk or uncertainty (e.g. inflation or defaulting on debt), which means the value of money is discounted over time. In order to calculate how much an investment is currently worth, a comparison can be made between the net benefit received in one time period with the net benefit received in another. Linking or weighting of the costs and benefits that occur over a period time is known as Net Present Value (NPV). A positive NPV indicates an investment's benefits outweigh its costs.

Step 4: 'Mobilise resources and decision-makers across council functions'

Underlines the necessity of bringing senior managers along with you on the journey of change. Winning support from political leaders will not deliver results on its own. Service directors across a number of functions need to be engaged and convinced too given the unique expertise, experience and legitimacy their teams will bring. This will help to ensure it is optimally built into corporate strategy and help to guarantee control, central coordination and oversight for the implementation of a multi-disciplinary process. The establishment of a cross-department project team of officers or a Strategic Energy Unit, as in the case of Bristol City Council, is one key way to assist development.

This also recognises the fact that once a business case has been accepted, it may require regular interim reports on outputs before a final outcome is realised, and may also need to be re-submitted as circumstances change (e.g. economic downturn or a change of leadership): support of senior managers will be essential to this process. As such, pilots that are scalable as well as customised to a council's needs can be a powerful way for political leaders to justify the investment to voters. A satisfaction survey amongst residents can be one helpful way to validate a business case. At this stage, once more, it is vital to determine if any insights arising during Step Three of the Framework will require revisiting, for instance if pilots identify more effective education campaign approaches to persuading vulnerable residents to prepare for cold or hot weather. This, in turn, will further inform what the council's priorities are or should be, returning us full circle to Stage One of the Framework.

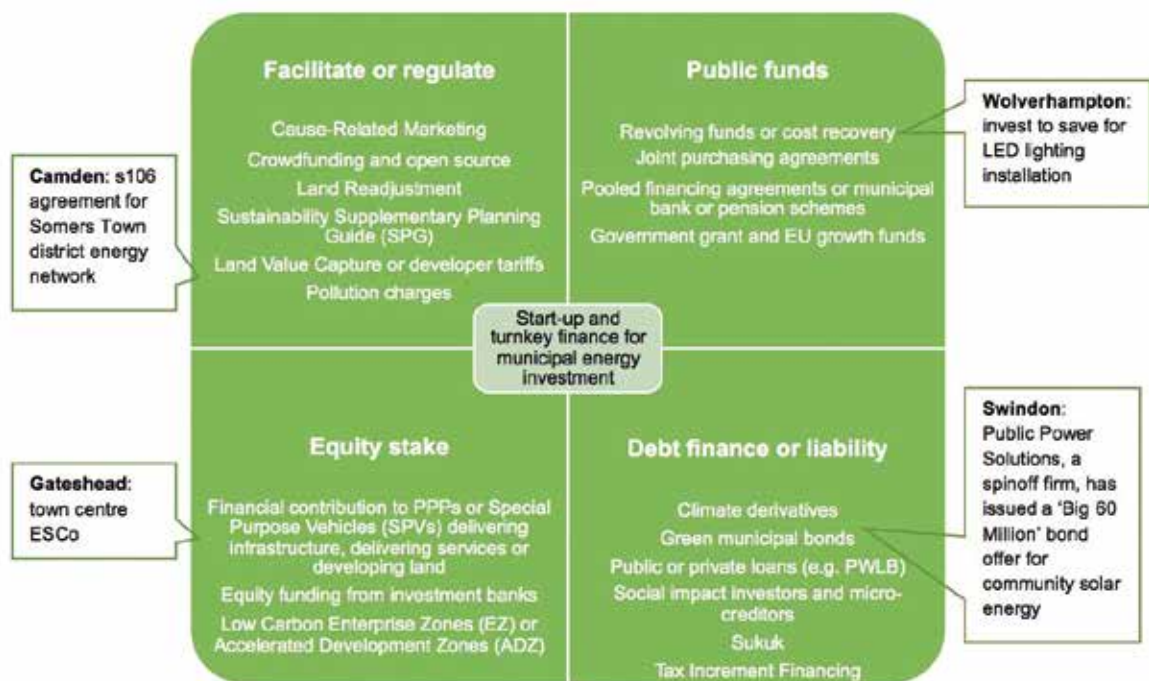
3.2 Start-up and turnkey finance

When it comes to investing in municipal energy, many councils face the perfect storm, quite literally - a shrink in their budgets and those of multi-agency partners at the same time as communities and

business are turning to them for more help. Given this context, it is useful to consider the full variety of financial instruments available to a council. Figure 14 below presents four investment categories, which involve varying levels of debt or return (Table 2 contains an explanation of each instrument):

- Facilitate or regulate - zero or low-cost policy interventions which incentivise or force residents and businesses to display positive behaviours or make positive investments.
- Public funds - government or other public support through grant or enabling policy, and the sharing of resources with other like-minded councils.
- Equity stake - contributions to profit-making ventures which are controlled and owned in full by the council or jointly with the private sector.
- Debt finance or liability – a promise to repay or reward some kind of loan with interest – financial or non-financial - to a creditor or investor.

Figure 14: Different types of financial instrument for council investment



(Source: adapted from UNEP, forthcoming 2015.¹⁵ Credits: see cases in chapter 1-2; ADB, 2012; BLP, 2013; Monaghan, 2010; Monaghan, 2012; UN-Habitat, 2013)

All councils are not the same however. Different types of financial instrument will appeal or deter a council based on its particular capacity to plan and partner for investment, its particular legal powers and duties, the strength of the balance sheet, and the treatment of credit and debt. For instance distributed energy typically has a high CAPEX but relatively low OPEX¹⁶, so it is important to understand how what contributions it makes to the short, medium or long term financial strategy of the council and how capital investments may yield revenue returns.

¹⁵ UNEP, forthcoming 2015, Leveraging Investment for Resource Efficient Cities (Paris: UNEP)

¹⁶ UNEP, 2015, District Energy in Cities (Paris: UNEP).

Table 2: Description of financial instruments

	Instrument	Description
Facilitate or regulate	Advertising or Cause-Related Marketing (CRM)	Releasing the asset value of prime marketing space. (CRM is a form of advertising associated with Corporate Social Responsibility) (e.g. Coca Cola's £0.3 million sponsorship of Belfast City Council's public bicycle sharing scheme).
	Crowdfunding	The practice of funding a civic project or venture by raising many small amounts of money from a large number of people, typically via the internet (e.g. Oxford City Council's renewable energy share offer to 3000 local investors through OxFutures, Abundance, Big 60 Million, Trillion Fund).
	Land Readjustment	Re-plotting of urban parcels to rationalise urban space and create room for public infrastructure. Private land owners give up a portion of their land but gain access to valuable infrastructure (e.g. a plot of land for a solar farm)
	Land Value Capture or developer tariffs	Strategic taxes or charges on key sites to recoup capital costs in recognition of how their rental or sales price will rise upon development completion, such as a Community Infrastructure Levy or Section 106 Agreement. May involve selling developer rights as opposed to the land itself (e.g. London Borough of Camden's utilising a Section 106 Agreement to contribute £3.8 million capital expenditure for its Somers Town District Energy Network).
	Pollution charges	Cost recovery to pay for public services to clean up the impact of emissions and to invest in cleaner alternatives (e.g. Greater London's congestion charge has generated about £1.2 billion of net revenue over ten years which has been invested in public transport, road and bridge improvement and walking and cycling schemes).
	Sustainability Supplementary Planning Document (SPD) within the Local Plan	Voluntary and mandatory standards for building regulations in relation to sustainability characteristics (e.g. Cornwall Council's Renewable Energy SPD contains guidance on a range of technologies, an explanation of community ownership, and effective community engagement before planning applications (in particular for wind turbines and solar farms)).
Public funds	Joint purchasing agreements	Councils coming together to bulk buy green goods/services to reduce costs or increase value for money through the benefits of agglomeration (e.g. Portsmouth City Council is a partner in Solent Green Deal, a consortium of local authorities offering impartial advice and information to residents, landlords and tradespeople).
	Pooled financing agreements	Councils coming together to co-invest in infrastructure at a reduced cost or lend to each other at soft rates.
	Municipal or national development corporations, banks or pension schemes	Local or national agencies which have facilities to support general development financing, comprising non-reimbursable and reimbursable funds (e.g. a number of English local authorities are exploring how to facilitate the establishment of a local bank to follow the lead of Cambridge & Counties Bank, which is a unique partnership between Trinity Hall, Cambridge and Cambridgeshire Local Government Pension Fund). The Green Investment Bank also provides a national facility for local councils.
	Low Carbon Enterprise Zones (EZs) or Accelerated Development Zones	A geographically defined area offering certain incentives (i.e. tax breaks or grants) to businesses that choose to locate within the zone. Often one component of an overall economic growth strategy, aimed at enhancing the competitiveness of industry, and also intended to realise agglomeration benefits from clustering industries in one area (e.g. Orkney, Western Isles and Highlands Energy Enterprise North Area which supports the assembly, storage and servicing on marine energy devices).
	Revolving funds	Internal or soft loan scheme whereby the council spends or loans money at zero or low interest to fund eco-efficiency technologies in municipal buildings, which is then repaid from the utility savings made as a result (e.g. Salford City Council joint venture Urban Vision is a partnership between Salford City Council, Capita and Galliford Try, which has installed LED street lights and a central management system to save energy costs of £20 million over 20 years).
Equity stake	Financial contribution to PPPs or Special Purpose Vehicles (SPVs) delivering infrastructure, delivering services or developing land	Often a dedicated business that provides a range of services such as an Automated Meter Reading (AMR)/Smart Grid, Energy Performance Contracting (EPC), Contracting for Difference (CFD), or Energy Services Company (ESCo) that designs and implements utility saving or power generation projects (e.g. Gateshead Council's ESCo to operate a £15m district energy network to serve the town centre and Gateshead Quays area).
	In-kind contribution to PPPs or SPVs delivering infrastructure, delivering services or developing land	Similar to above but with non-financial contributions such as through a gainshare model (whereby the private sector provides the upfront capital for a council's revolving fund) or the redirection of local municipal pension funds.

Debt finance or liability	Climate derivatives	Carbon trading or credits such as the Carbon Reduction Commitment (CRC) Energy Efficiency scheme, EU Emissions Trading Systems (EU ETS) and the Clean Development Mechanism (CDM), whereby finance is provided by companies seeking to reduce their emissions liabilities. The CRC scheme requires participants to buy allowances for every tonne of carbon they emit relating to electricity and gas, as reported under the scheme (e.g. Rochdale Borough Council's annual CRC bill in 2013/14 was £0.3 million, and the installation of 500mw wind turbines in Hopwood will help to reduce this liability whilst also generating £0.4 million annual income).
	Green municipal bonds	A bond is a promise to pay a loan with interest and issued by a council or Government to fund capital expenditure projects. Some municipalites present the bond to the market as sustainable to attract new types of responsible investors (e.g. Cross Key Homes, with the council's advice as a board member, issued a £150 million green bond for 250 new homes which will be super energy efficient and affordable. It is the UK's first bond for social housing).
	Social impact investors or micro-creditors	Responsible investors or lenders who offer finance because of wider sustainability returns and/at lower rates. Usually targeted at small or social enterprises during start-up phase or next-phase growth.
	Sukuk	A special form of bond that complies with Islamic law and investment principles which prohibit lenders from charging interest. The certificate constitutes partial ownership in a debt. Capital protection is provided by a binding promise to repurchase certain assets.
	Tax Increment Financing	A special form of bond which exacts current value from future tax receipts arising from a boost to GDP associated with a particular major development (i.e. housing, public transport) (e.g. East Hampshire Borough Council is exploring the use of TIF to co-finance its Whitehill & Bordon eco town development, one aim of which is to have zero carbon buildings by 2036).
	Regional development banks	The European Investment Bank has facilities to finance green projects, whether as part of infrastructure projects such as energy, water management, or roads, or as standalone.

The selection of financial instruments in a council's delivery model involves evaluating the desired 'impact' (e.g. growth, savings, quality of life, etc.) against the 'ease of implementation' (i.e. quick wins, biggest returns on investments, acceptable risk, etc.). Analysis of these two factors will be key to the selection of the right instrument.

It is sometimes assumed that investment in managing municipal energy will not generate benefits in the short term nor generate direct benefits to councils. The case studies in Chapter 2 illustrate that neither of these assumptions is necessarily correct.

3.3 Ten things you should be doing now ...

1. Raise internal awareness amongst your council colleagues and peers on the energy imperative and the benefits of taking a direct role in municipalising energy by sharing this APSE publication with them and proposing you join APSE Energy.
2. Establish a Strategic Energy Unit or pan-council project group with other relevant agencies to oversee an integrated energy management framework: elected member leadership with a Cabinet lead and scrutiny is key here.
3. Make short and long-term energy planning a fundamental element of your local council's financial and planning cycle; this will include annual and longer-term plans with projects and ongoing work which will only be fully realised in 50 -100 years' time (e.g. Corporate Strategy, Local Plan and LEP competitiveness strategy).
4. Consider collaborating with other local councils and support agencies before instigating or refreshing your 'all-in-one' energy management framework.
5. Prepare an energy baseline for your area so you are clear on the local challenges and prizes: you may have a heating problem today, but you may also have a power problem tomorrow.
6. Review your options to utilise new forms of start-up and turnkey finance and get investor ready: pull together a pipeline of prioritised and investable energy projects. This should include how your Local Plan will facilitate development.
7. Identify opportunities for shared services to enable you to do more with less: pool skills, budgets and government lobbying.
8. Calculate how much your area spends on all types of energy products and services (e.g. utility bills, energy efficiency measures, etc.): determine how much is locally sourced and if you can get more 'bang for your green buck'; there could be a significant multiplier economic affect.
9. Ensure you bring local residents, businesses and local MPs along with you on your journey: energy price spikes may be a clear priority to them if a ward is particularly vulnerable to fuel poverty or local industry is a major energy user, but investing in other issues such as renewable

energy may be less obvious before the country's coal-fired power stations are retired.

10. Commit to issuing regular performance reports – internally and externally – so colleagues, voters and national government alike recognise the problem and value of the progress which you are making as stewards of place on energy.

4. Recommendations for government to deliver Municipal Energy

This final chapter concludes with a list of policy proposals that the new Government should commit to delivering in order to help local government go even further when it comes to local energy stewardship. Based on discussions with councils amongst its 229 member network, APSE strongly believes there are actions national government can take to support local councils to overcome barriers to distributed energy.

Recognition of the leading role of local government in delivering the energy transition

Transition pathways research has shown that decentralised energy increases UK energy independence. Although challenging, it is technologically feasible to increase electricity demand in the UK being met by distributed and low-carbon sources to 50% (from 1%) by 2050. Municipally owned energy companies is a key part of the transfer to this civic energy future. So for instance, following Ofgem's 2015 policy consultation on Non-Traditional Business Models, the new approach should strongly recognise the vital role of local government.

Long-term support for infant energy industries

The success of growth industries in renewables and energy efficiency across Germany, Denmark, USA and China has been supported by clear market signals which give inward investors, employers and councils the confidence to take action. This is built upon a long-term government commitment to assist infant industries through incentives (grant-in-aid, tax relief), robust carbon pricing (emissions permitting), and local content requirements for Foreign Direct Investors (to tie incentives to local benefits such as jobs and education). DECC should set out specifically for local councils how it will support them to grow infant industries, for instance by increasing funding and devolving budgets for the delivery of the ECO and Green Deal schemes on area-based approach.

Local sovereign wealth funds and community right to invest in municipal energy

The new Community Energy Strategy 2014 and Infrastructure Act 2015 both place an emphasis on the importance of community ownership. The latter includes a proposal for a community right to invest up to a 5% shareholding. APSE local council members not only routinely offer more than this, but also encounter challenges associated with different sections of a community's ability for or interest in ownership. The Treasury should establish a sovereign wealth fund resourced by existing taxes on major energy installations which is redistributed locally, tax-free, on green projects to ensure all sections of the community have a stake and motivate public acceptance of energy infrastructure development. Councils should play a leading role in the distribution of the sovereign wealth funds.

Regional regulation of Distribution Network Operators and council-led microgrids

Energy Market Reforms set out in the Energy Act 2013 do not go far enough when it comes to oversight of DNOs. Confusion and disagreement over local access to and pricing of connection to the National Grid undermines municipal energy. Ofgem should pressure the DNOs to justify the cost of accessing the grid with the aim of reducing this cost. Ofgem should do this by shifting toward a model of regional regulation which requires DNOs to disclose on a quarterly basis their performance against plans in terms of: current availability and future capacity building, resilience to severe weather, pricing and application procedures, including arbitration of disputes with rationales for the outcomes and significant financial penalties on the DNOs for compliance failure. Specifically in terms of capacity-building, there are examples of parts of the grid being allocated for projects which never happen, so reducing capacity all around, and so there should be a time limit on proposed projects so if the capacity is not used within a certain time then the allocation is withdrawn. At the same time, if we are moving toward a distributed energy future, council leadership is required to create energy hubs or microgrids which provide access to the grid, encourage connection, and would allow for costs to be shared more proportionately.

National Planning Policy Framework

The National Planning Policy Framework (NPPF) needs to be revisited to ensure stronger incentives and restrictions to promote local energy stewardship. The NPPF is intended to act as guidance for local planning councils in drawing up plans and making decisions about planning applications. In terms of energy, this includes guidance on promoting better design for energy efficiency and renewables. This is not sufficient to avoid the huge cost of not advancing diverse and distributed municipal energy networks which support national energy independence and resilience. DCLG should refresh planning regulations so that all new commercial and residential buildings are required to be highly energy resilient. For instance, a NPPF requirement for planning applications to stipulate at design stage the appropriate location of solar PV panels, solar water heating or biomass boilers in all buildings.

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