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ENERGY SUPPLY GUIDANCE

1 INTRODUCTION

1.1 Context

Local Partnerships was commissioned by Energy Systems Catapult (ESC) to produce this 'Energy Supply guidance' under the 'Unlocking Clean Energy in Greater Manchester' (UCEGM) project. UCEGM is a pioneering scheme designed to deliver a number of renewable energy projects across the Greater Manchester City Region and create a blueprint that can be replicated in other regions across the UK aiming for Net Zero carbon emissions.

Local Partnerships has been supporting a subset of authorities within the City Region, such as Manchester, Oldham, Rochdale and Salford, to understand current challenges within the energy market. As part of our work, local authorities have identified the need for more effective energy management policies and processes to minimise costs and maximise benefits, particularly in light of significant financial pressures, rising inflation and energy costs.

The purpose of this guidance is to help councils consider the way energy is both procured and managed, in a challenging economic environment. The guidance is written to be accessible to energy managers but also provides practitioner insights for the more technical reader. A wide range of topics are covered (and illustrated with case studies), with the intention of providing an overview of the topic, whilst also providing guidance at a more practical level in some areas.

This includes:

- The importance of forecasting in order to assess current and future need
- The importance of developing an effective energy management policy
- Understanding your options to develop an effective energy purchasing strategy.

1.2 Background

Greater Manchester is a City Region made up of ten local authorities located in the Northwest of England. The City Region is governed by the Greater Manchester Combined Authority (GMCA) and has an elected metropolitan mayor. Greater Manchester has outlined an ambition to achieve carbon neutrality by 2038[1].

To support this ambition, 5 strategic 'missions' have been established[2], namely:

- Sustainable consumption and production
- Low carbon buildings
- Energy innovation
- Natural capital
- Transport
- Communication and behaviour change

[1] 5-year-plan-branded_3.pdf (greatermanchester-ca.gov.uk)
[2] Mission Based Approach to delivering the Five Year Environment Plan for GM | Platform (ontheplatform.org.uk)

The City Region's 5-year environment plan (2019–2024) outlines actions to be undertaken to address these 'missions' and progress on the 2038 carbon neutrality ambition. In relation to energy supply there are three action priorities:

- Increasing local renewable electricity generation, adding at least a further 45MW by 2024.
- Decarbonising heat out of buildings, adding at least a further 10TWh of low-carbon heating by 2024.
- Increasing the diversity and flexibility of supply, adding at least a further 45MW of diverse and flexible load by 2024.

The GMCA report annually on progress delivery on behalf of Greater Manchester against the City Region's 5-year environment plan. The GMCA Corporate Plan (2022-2025)[3] sets out further ambition to deliver an additional 300MW of renewable energy over the three-year period (in addition to the 45MW stated above).

In addition to these ambitions and action priorities, the 2022 energy crisis has put increased pressure on the local authorities within the City Region, with rising energy costs having a cumulative effect on a wide range of contracts and projects. The energy crisis has increased the importance for councils to minimise costs and maximise benefits through energy procurement.

1.3 Current Nature of the Market

Councils within GMCA are already dealing with significant financial pressures that have resulted from reductions in government funding and rising demand for services. These pressures were exacerbated throughout 2022 as the UK economy witnessed rising inflation and a growing crisis in both food and energy markets, alongside a slower-than-expected recovery from COVID-19 and Russia's invasion of Ukraine.

Most councils within GMCA have been enjoying cheaper energy that was procured two to three years ago. However, some have a more immediate need to renegotiate contracts and are now faced with electricity prices that are significantly higher than previously purchased prices. In many cases, budgets for the year had already been set before the increases to both inflation and energy prices. This has meant that local authorities have needed to determine spending priorities on other council services.

The rising cost of living, inflation and energy costs is putting increased pressure on council budgets and resources. Soaring energy bills are weighing heavily on finance officers' minds, whilst decarbonisation targets still remain.

Energy security is also high on the political agenda and recently led to the creation of a Department for Energy Security and Net Zero. Furthermore, Mission Zero[4] (an independent review of the Government's approach to delivering its net zero target) includes 129 recommendations aimed to help the UK secure net zero investments and meet its net zero target in an affordable manner. Many of these recommendations cover key local authority priority areas such as funding, electricity markets, renewable energy, and energy efficiency, many topics which are covered in this guidance.

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[3] Corporate Plan 2022-2025 (greatermanchester-ca.gov.uk)
[4] MISSION ZERO - Independent Review of Net Zero (publishing.service.gov.uk)

2 UNDERSTANDING YOUR NEEDS

2.1 Background

The UK Government has committed to reducing carbon emissions to net zero by 2050, and over 80% of local authorities have now declared a climate emergency, and a similar proportion have a climate action plan[5], and set targets for reaching the position of net zero carbon. Many of those targets are to secure net zero by 2030 – less than seven years away Local government and the public sector generally, have an important role to play when it comes to achieving the net zero target and combating the climate emergency. The biggest barrier to achieving the Government's Net Zero ambition are the emissions currently produced by public sector estates and buildings. The Net Zero Estate Playbook[6] (published in November 2021) sets out that the UK public sector estate consists of 300,000 buildings with a combined value of £515 billion and generates around 2% of the UK's total emissions. Action plans are addressing energy generation and energy efficiency of buildings as key areas of carbon reduction action.

2.2 Importance of forecasting

Energy consumption in public sector buildings is mainly driven by various factors such as:

- Building type
- Building age
- Occupancy
- Operating hours
- Type of equipment installed etc.

Reaching net zero emissions across the UK public sector estate will require large-scale electrification of both transportation and buildings. This will result in higher electricity demand, but it is unclear to what extent as uncertainties surround how quickly and extensively sectors will be electrified, and how demand for energy will change.

Technological innovation (covering conception, development, and deployment) will impact both the amount of energy demanded and the forms in which it is demanded. Energy efficiency innovations, such as LED lighting, heat pumps, and heat recovery may reduce total energy demand. Monitoring and analysis of a buildings energy consumption is therefore one of the major components of an effective energy management system. It can help owners and operators to understand a building's operational behaviour and help to identify where energy is being wasted.

Local authority energy managers are typically responsible for monitoring, analysing and maintaining energy consumption data of their buildings. They are also responsible for preparing reliable energy consumption forecasts in order to prepare their energy budget forecasts for the coming years as well as identifying opportunities of energy conservation.

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[5] Progress-in-reducing-emissions-2022-Report-to-Parliament.pdf (theccc.org.uk)
[6] Net_Zero_Estate_Playbook__1_.pdf (publishing.service.gov.uk)

Reliable forecasting of future energy consumption plays a critical role in successful implementation of Energy Management Systems (EMS)[7]. For example, an Energy Manager needs to understand both its current demand profile and forecast requirements to prevent from over committing energy spend or adversely, setting the requirement too low, introducing increased price risk from the need to procure additional electricity. Many organisations have failed to manage their energy consumption and budgeting effectively due to lack of forecasting.

Forecasting also helps in evaluating the current and future economic conditions to steer the local authorities' policies and decision making. Reliable forecasting can therefore assist a council's financial and energy management teams to set up their priorities and strategic goals and form an integral part of the annual budgeting process.

2.3 Forecasting tool

2.3.1 Electricity Consumption Forecasting Tool

Forecasting also helps in evaluating the current and future economic conditions to steer the local authorities' policies and decision making. Reliable forecasting can therefore assist a council's financial and energy management teams to set up their priorities and strategic goals and form an integral part of the annual budgeting process.

Using this Forecasting Tool, Energy Managers will be able to forecast annual energy consumption of over a five-year period (on a portfolio basis). The Forecasting Tool includes summary tables and graphs that have been designed to help convey this information to non-expert audiences and automatically links forecast consumption data with the relevant UK grid electricity carbon factor.

2.3.2 Why should you use the tool?

The benefits of using the tool include:

- Standardising how councils forecast and report electricity consumption.
- Knowing the impact decarbonisation interventions are forecast to have on future electricity consumption.
- Knowing the impact growth is forecast to have on future electricity consumption.
- Enabling consistent benchmarking.
- Providing a robust and regularly reviewed tool to calculate future electricity procurement needs and store baselines and the forecast outputs.
- Support energy management policy objectives (see Case Study 1).

2.3.3 Guidance on how to use the tool

[7] https://www.iso.org/iso-50001-energy-management.html

Guidance on how to use the tool will be disseminated through a FAQ document linked here.

To make appropriate use of the tool you will need:

- Council building asset list (including floor area information on a square meter basis).

- Your current electricity consumption (expressed in kWh) covering both half hourly and non-half hourly metered data for each building in the asset list.

- Information on currently procured electricity contracts including:
  - Type of contract (e.g. Power Purchase Agreement/Electricity Supply Agreement).
  - Contract duration - Start and end dates.
  - Contract volume (kWh).
  - Details of any minimum supply volumes/ +- consumption tolerances.

- Information on electricity consumed directly from on-site generation including:
  - Site name
  - Technology
  - Total annual generation (kWh)

- Ideally you will also need information on:
  - Any planned decarbonisation interventions.
  - Any planned areas of growth (e.g. new schools being built, EV charging infrastructure) that will increase electricity demand.

The outputs from the tool will be required when making recommendations and decisions on the procurement of energy supplies.

2.4 Summary

Energy efficiency of the public sector is an important issue in the context of both the Government's net zero target and addressing the climate emergency. Buildings are the largest consumers of energy, in particular public buildings such as educational, health, government and other public institutions that are highly frequented.

Most councils have set targets to enhance energy efficiency and cut greenhouse gas emissions, aiming to mitigate the environmental impact and achieve long-term sustainable development. Therefore, accurate forecasting of electricity consumption across a local authority estate has become a prominent concern, especially against the backdrop of the current energy crisis. Electricity pricing is still sensitive to further changes in Russian gas flows, as geopolitical tensions remain high. This makes energy procurement more complex than other local authority procurement categories, particularly as price forecasts remain elevated.

To better forecast energy consumption and achieve better energy efficiency, Local Partnerships has developed an easy to use, quick and robust energy consumption Forecasting Tool. The Forecasting Tool produced can be used to forecast future council electricity consumption and procurement needs after considering the effects of decarbonisation interventions and areas of growth.

The Forecasting Tool is free to use, and a FAQ document provides guidance on how to use the tool. For any further assistance please contact Nathan.wicks@localpartnerships.gov.uk.

3 ENERGY MANAGEMENT

3.1 Background

Councils are under immense pressure, across all services, and energy management is no exception. Where a dedicated energy management team or post does not exist, responsibility for energy procurement and operational energy management can often form just one element of an officer's day to day responsibilities. The following sections outline guidance and key points for consideration for the development of an energy management post and to support existing energy managers with their role.

3.2 Council processes / sign off procedure

It is likely that, due to the volumes of power and heating fuels required across a council's estate, that procurement decisions will need to follow [council standing orders/cabinet decision] process. Decisions on the procurement approach for energy supplies may be complex – to include collaborative procurement with neighbouring authorities, the use of frameworks or a broker, length of contract and whether to purchase on behalf of other public bodies such as town or parish councils. The source of energy is also of increasing importance to many councils focussed on net zero targets, notably opportunities for self-generation and ensuring that supplies are from renewable energy generators.

Capital investment in energy efficiency and decarbonisation projects will require councils to follow their procurement and decision-making processes, which may include approvals to be sought from investment boards/delegated decisions/cabinet decisions. The price and carbon impact of energy supplies will therefore form an integral element of business cases and project proposals.

Understanding the energy procurement and energy policy landscape is critical to ensure that councils can act as intelligent clients for supply of heat and power to its assets and to deliver against its net zero ambitions.

3.3 Drivers

3.3.1 Other drivers

Energy prices

Recent geopolitical events have had an impact on global energy prices, particularly across Europe, where there has been an historic reliance on Russian [and Norwegian] gas imports. Unprecedented increases in the wholesale market prices for gas mean that many councils will be facing a much steeper increase in energy costs when it is time to reprocure.

Procuring via a framework, (discussed in more detail at 4.4 below) can provide some buffer against price volatility, as the volumes of planned purchases are included alongside other buyers which has a bearing on overall unit prices.

Increasing energy prices have a bearing on the business cases for energy related projects. For invest to save energy efficiency projects, such as lighting upgrades, this will have a positive impact on the business case by reducing the payback period. For heat

decarbonisation projects, where heating is moving from gas to electricity, the additional cost of electricity will have a bearing on the business case. For these projects, the payback periods do not fit neatly within the usual parameters used by councils for business case approvals.

Energy security and resilience

The supply and price issues experienced recently in the UK have highlighted the necessity of local resilience and security of supply. Resilience may be achieved via the use of frameworks or collaborative procurement to secure better prices and price certainty or via self-supply and renewable energy.

Net zero targets and renewable energy supply

To achieve net zero targets, many councils are looking to renewable energy supplies to reduce emissions. This should be approached with careful consideration to ensure that supplies are truly renewable and able to be counted as an offset to emissions, as outlined below at section 4.5.

3.4 Funding options

It is recognised that, following the closure of Salix funding schemes, which were dedicated to enabling public sector organisations to reduce carbon emissions further rounds of funding, principally via the Public Sector Decarbonisation Scheme (PSDS)[8], now represents the main source of funding available to public sector bodies to deliver on retrofit projects to improve energy efficiency and decarbonise heating in buildings.

Key changes to PSDS Phase 3b have included the introduction of sector caps to allocate the funding fairly across the public sector. Another key change to Phase 3b funding has been the focus on cost effective decarbonisation of heat and the overall achievement of carbon emission savings. PSDS does not allow for most quick win measures (as these are perceived to have been addressed through previous grant funded schemes – this is not always the case) that need to be addressed before decarbonisation can and should be addressed.

Mission Zero[9] includes 129 recommendations aimed to help the UK secure net zero investments and meet its net zero target in an affordable manner. Key recommendations which relate to funding are included in Table 1 (below):

Table 1: Mission Zero funding related recommendations

Mission Zero Recommendation Area	Recommendation
2 - Long-term funding certainty	• Government to lead a bespoke consultation on funding scheme design – with a ministerial champion – to report on the issues and recommend reforms to government.

[8] https://www.gov.uk/government/collections/public-sector-decarbonisation-scheme
[9] MISSION ZERO - Independent Review of Net Zero (publishing.service.gov.uk)

3 - Well-designed funding schemes	• Government to lead a bespoke consultation on funding scheme design – with a ministerial champion – to report on the issues and recommend reforms to government.
92 - Local and regional	• Central government should simplify the net zero funding landscape for all local authorities by the next Spending Review. This should include consolidating different funding pots, reducing competitive bidding processes, giving longer lead-in times where bidding remains and providing funding over the medium- rather than the short-term.
109 - Energy efficiency	• Government should ensure the right policies are in place to achieve the UK's demand reduction targets, building on the 2022 Autumn Statement announcement, with interim targets and milestones to hit this goal. Noting the UK's 2050 net zero ambitions the government should publish clear analysis of which mix of policy measures gets the UK to the 15% target and assure future funding for those policies.
115 - Energy efficiency	• Government should include an Energy Efficiency Taskforce workstream on green finance products to report by end of 2023. This should help to support those in low EPC rated properties to carry out green home upgrades and should identify opportunities to crowd-in private finance, alongside public funding.

3.5 Energy management policy

It is recommended that each council has a robust energy management policy in place and that this should be clearly communicated to all employees and visitors to premises. This guidance sets out some minimum requirements for an energy management policy, with a case study provided on Page 14.

Table 2 below outlines the key contents for such a policy, as recommended by the Energy Managers' Association (EMA). The EMA is a free membership organisation that provides a wealth of resources and training for energy officers and energy managers (see section 3.6 below).

An energy management policy should clearly link to other adopted council policies and strategies and the overarching corporate plan. This will include the following (not an exhaustive list):

- *Climate Leadership* – link to climate action plans, net zero targets (own operations and area wide).
- *Energy security and resilience* – demonstrate commitment to development of local energy networks.
- *Value for money* – budget setting and forecasting taking into account consumption requirements and purchasing and pricing strategies.

- *Procurement/commissioning approach* – securing value for money, low carbon outcomes.

- *Asset management* – building management, energy efficiency, whole life costings for newly constructed assets and major refurbishment.

Table 2: Energy Management Policy – Proposed Structure

What to incorporate	Issues for consideration
Purpose	• Key drivers (i.e budgetary certainty/ hedging against future price rises/ supplier robustness/ resilience)
Executive ownership	• Internal senior sponsor
Targets, baselining, benchmarking, monitoring and reporting	• Targets/ KPIs in place • Regularity of reviews • Ability to demonstrate value for money
Energy sources/Contracts	• Pricing strategy – options appraisal • Services required • Diversity and flexibility of supply • Access to renewable energy tariffs • Review of existing assets and income • Opportunities to increase local generation • Understanding trading volumes to assess product offers
Efficiency	• Targets for energy efficiency/ carbon reduction • Review of existing assets and opportunities assessment
Decarbonisation	• Priority for low carbon and renewable sources
Staffing and resources	• Internal vs external resource requirements • Brokerage vs in house assessment • Governance arrangements for reviewing policies and procedures

An energy management policy should have the same level of importance as health and safety, environmental and equality and diversity policies. Ownership and accountability of an energy management policy should be at a corporate level and appropriately resourced with an energy management team and associated budget.

The Institute of Engineering and Technology (IET) state[10] that a robust energy management policy should include, at a minimum, the following headline policy statements:

[10] https://shop.theiet.org/guide-to-energy-management-in-the-built-environment

- A clear set of commitments and targets (such as net zero targets and proportion of renewable energy supply)
- A commitment to managing consumption with a clear set of objectives (such as kWh consumption by floor area)
- Compliance with legislation, recognised standards and criteria (see table xx below)
- Commitment to industry best practise and technology
- Encourages energy efficiency across organisation [e.g., within objectives for all employees and contractors]
- Understands the costs, risks and consequences of energy use and losses
- A framework to implement ongoing improvements and regular updated action plans on energy management and decarbonisation
- Understands global/national target and legislation (including timelines) to frame the development of an energy/carbon strategy

Table 3: Legislation, directives and standards for compliance

	Summary
Minimum Energy Efficiency Standards (MEES) non domestic buildings	Requirement for landlords to maintain properties to a minimum EPC rating of E[11].
Display Energy Certificates (DEC)	Operational performance ratings for public buildings[12],
Energy Performance Certificates (EPC)	Required for commercial premises rented or leased to businesses[13].
ISO 50001 – Energy Management	Guidance and standards for implementation of an energy management system, and support ISO 9001 (Quality Management System (QMS)) and ISO 14001 (Environment Management System)[14].

The data and intelligence held by councils, resulting from compliance with the above standards and directives, will provide a wealth of information to inform, develop and monitor an energy management policy.

[11] https://www.gov.uk/government/publications/non-domestic-private-rented-property-minimum-energy-efficiency-standard-landlord-guidance
[12] https://www.gov.uk/government/publications/display-energy-certificates-and-advisory-reports-for-public-buildings
[13] https://www.gov.uk/energy-performance-certificate-commercial-property
[14] https://www.iso.org/iso-50001-energy-management.html

Case Study 1: Rochdale Council – Energy Management Policy

Rochdale Council declared a Climate Emergency on 17 July 2019 and resolved to work towards ensuring that the Council is carbon neutral by 2038, recognising the leadership role it has in the borough.

As part of the Council's commitment to achieving carbon neutrality by 2038 it supports the Greater Manchester 5-year Environment Plan 2019-24[1]. One of the key themes of the plan relates to energy supply and aims to:

- "Increase local renewable electricity generation, de-carbonising how we heat our buildings, increasing the diversity and flexibility of our supply."

- The plan also sets an energy efficiency target that all public buildings should obtain an average Display Energy Certificate (DEC) rating of D or better by 2024 and C by 2030.

Furthermore, the Council's constitution Part 4(H) – Contract Procedure Rules sets out a principle that for the tendering and award of all contracts that the Council should ensure value for money. To achieve carbon neutrality and value for money the Council is therefore committed to using energy and water in the most efficient, cost-effective, and environmentally responsible manner possible.

The Council identified that energy management plays a key role, across all Council functions, which led to the publication of its Energy Management Policy in January 2022. This policy sets out the Council's efforts to reduce energy and water use and reduce its carbon footprint. The policy sets out the following seven objectives:

Objective 1 - baseline, benchmark, monitor and report on our energy performance on a quarterly basis and our carbon reporting annually;

Objective 2 - when procuring contracts for our electricity and gas supply in the future, endeavour to procure renewable energy tariffs where this can demonstrate value for money;

Objective 3 - work with Star Procurement to ensure that our energy contracts are sourced as far as practicable from ethical sources and secure value for money for the Council whilst meeting our climate change commitments;

Objective 4 - increase local renewable electricity generation, de-carbonising how we heat our buildings and increasing the diversity and flexibility of our supply;

Objective 5 - ensure that our buildings are energy efficient in accordance with the targets set out in the Greater Manchester Environment Plan;

Objective 6 - demonstrate our commitment to community leadership on Climate Change by reducing our carbon output associated with energy use; and

Objective 7 - put in place appropriate resources to support an effective energy management and procurement function through invest to save initiatives.

In addition to the this the Council has set out in an Energy Management Action Plan how the Council will achieve its objectives. The policy and the action plan are reviewed on an annual basis and any consequent amendments or changes to the policy will be incorporated.

3.6 The Energy Managers Association (EMA)

The EMA was set up in February 2012 to support energy managers through continuous improvement, the establishment of best practice and encouragement of knowledge exchange.

It is a membership organisation that represents a community of over 7,000 energy management professionals with an ambition to:

- Improve the standing of the Energy Management profession and those working within it
- Establish best-practice in Energy Management
- Put Energy Management at the heart of British business

The EMA offers members training and professional development, workshops and events, working groups, guidance and support and is worth further consideration for those looking to improve their existing energy procurement management and practices to supplement this guidance.

3.7 Summary

Energy management encompasses a broad range of responsibility and has a significant impact on council finances and service delivery. Energy managers and energy officers will be required to engage with officers across the whole council – with senior leaders in order to make the case for investment in energy efficiency and decarbonisation measures, procurement teams for secure energy supplies, building managers and occupiers on energy use and behaviour change. Having a robust energy management policy, that is given the same level of priority as health and safety and environmental policies will underpin and support energy managers and officers.

For delivery of net zero and climate action plans, energy policy will inform much of what can be delivered from large scale renewable energy supplies to building level efficiencies and decarbonisation of heat.

4 UNDERSTANDING YOUR OPTIONS

All local authorities procure the oil, gas and electricity that is used in their day-to-day operations. There are numerous options to consider when deciding how to purchase this energy. The traditional method has been to enter into a contract with an energy supplier, for both the supply of gas and electricity. Different types of contracts, and ways to procure are discussed further in this section.

No local authority, providing services, can be entirely zero carbon. This means that emissions are reduced as far as possible through the hierarchy of:

- Calculating the carbon footprint to create a base line and understand the actions required to achieve net zero.
- Seeking to reduce energy.
- Avoiding carbon emissions where possible (e.g., decarbonising heat, moving the fleet to EV's etc)
- Offsetting residual emissions (those which cannot be removed) compensated for by direct or indirect actions.
    - Direction actions include undertaking renewable energy projects whereby a local authority plans, commissions and constructs a new solar farm on its land and offsets the carbon value of the solar farm against its carbon footprint.
    - Indirect actions include more innovative ways to purchase energy such as choosing a green tariff or entering into a Power Purchase Agreement (PPA) all of which are detailed in further sections of this guidance.

4.1 Background

Historically, Local Authorities have relied on energy supply from an energy company and manage it via a fixed price contract, to reduce their risk to price increase. Although flexible price contracts often come with more risk it does not have to be all or nothing. Risk is scalable, and depending on your authorities' risk appetite there are numerous products available on the energy market, either direct with suppliers or through an energy broker.

4.2 Energy purchasing

There are three main contracting approaches available for the purchase of both gas and electricity, as detailed in the LGA's national energy category strategy[15] and shown below.

- Fixed price contracts: the price for 100% of energy volume requirement for the contract duration is fixed, and based on the energy market prices available on that day.

[15] https://www.local.gov.uk/publications/national-energy-category-strategy-local-government-2022-energising-procurement#energy-procurement

- Flexible fixed priced contracts: 100% of energy volume requirement is purchased in advance of each contract year, by following a risk management strategy.
- Flexible variable price contracts: a percentage of the energy volume requirement is purchased in advance, with the remaining volumes left open to purchase during the contract year.

4.2.1 Fixed versus flexible

Fixed price contract

A fixed priced contract has been the most common way for authorities to purchase energy. This involves the authority locking 100% of their volume requirement and energy costs on one day for a specific contract duration. This provides the authority with a set price for their gas and electricity consumption. The quoted unit price remains fixed for the entire duration of the contract. However, the price you pay per month depends on how much energy is consumed.

The main driver for securing a fixed price contract is budget certainty. A fixed price energy contract comes with little to no risk to the authority and is not impacted by the rising or falling energy market prices. The price is locked in and billed for the entire contract duration and the energy supplier takes on the market price risk. For the supplier to mitigate that market price risk they are exposed to, they add a risk premium to the authorities' final energy price. For the authority to have the greatest price stability, this attracts the largest risk premium generated by the supplier.

Table 4: Pros and cons of a fixed contract

Pros	Cons
• Budget certainty • Accurately forecast budgets and effectively manage cost	• If prices go down, you do not benefit and are stuck with uncompetitive energy prices for the duration of your contract • Risk premiums are added to the wholesale energy price by the supplier

Flexible price contracts

A flexible pricing strategy allows authorities to begin to move away from inflated premiums, generate a more market reflective price and be more dynamic in how they purchase energy. Plus, flexible pricing does not have to be all or nothing. Transitional products that look at partial pass through or partial flex allow for some or even, most of the protection to be maintained.

Different suppliers will offer different products for flexible contracts, with variances on the volumes you can fix and the way your unfixed volumes will be priced. When accessing the options on the market it is a good idea to compare products across the different suppliers, yourselves, or via an energy broker. The final product chosen will depend on the authority's appetite for risk and resource for management of the contract and energy purchasing.

With a flexible contract the costs of electricity/gas are built up over time and can change on a monthly basis. This enables you to enact a chosen purchasing strategy and decide the volume amount you would like to "lock-in" at a fixed price, and the amount that will be charged at current market rates, or that you can hedge in advance. Some products have mechanisms that can provide a level of protection to current market rates if more or less than the forecasted amount is consumed, and in others you carry more of the risk.

On a flexible contract the energy prices fluctuate over the length of the contract, and the authority can purchase smaller volumes of energy throughout the contract, rather than fixing the entire volume requirement at the beginning.

The flexible products that carry the greatest risk allow you to transact up to the day of delivery, allowing you to capitalise on your market expertise, but this takes far greater time and management, and requires accurate forecasting of your energy consumption.

Table 5: Pros and cons of a flexible contract

Pros	Cons
• Can benefit from decrease in wholesale prices • Spread risk of purchasing • Risk premiums from the supplier are reduced • Non-energy charges are clearly itemised on bills, providing clearer visibility of charges	• Greater risk to the authority due to energy market price volatility • Requires management of the contract and tracking of the energy market • Requires accurate energy consumption forecasts

Deciding on the type of contract for energy procurement is not always straightforward, and there are pros and cons to each option. A summary of fixed vs. flexible is below.

Table 6: Fixed vs. flexible energy contracts

Fixed	Flexible
• Budget certainty • Unit price locked for all consumption for the entire contract period • Little to no risk to the authority • Protected from price increases • No access to price decreases • Risk premium added to price • Uniform pricing • Easier to maintain the contract	• No certainty on costs • Purchasing decisions to be made throughout the contract • Greater risk to the authority • Exposed to price increases • Can benefit from price decreases • Market reflective price • Variable pricing options • Resource to manage contract required

4.3 Market assessment

Once the authority has decided on a fixed or flexible approach to energy purchasing, it must then go to the market to obtain supplier pricing. The unpredictability of the energy market makes the decision of when to go to market more difficult for authorities. Where possible, the authority should plan around areas of volatility, avoiding the last trading

days for a month or season, or when significant cold weather is forecast. It is a good idea to remain informed on the current gas and electricity market conditions, with a basic understanding of how political, economic and supply situations will affect the prices, either up or down. Please refer to The EMA's Energy Manager's guide to electricity procurement[16] for advice on good practice.

The wholesale cost of gas and electricity fluctuates daily depending on several factors, with it ultimately coming down to the management of supply and demand. When there is a high demand for energy but limited supply, prices tend to rise, but when the demand for energy is low and there is an abundance of supply, prices can drop.

The following factors affect energy market prices:

- Demand: the demand for heating, cooling and light
- Supply: the availability of energy supply from gas, oil, coal, nuclear and renewable sources
- Storage: the amount of energy supplies available in storage (gas and battery storage)
- Weather: both weather forecast, and actual events will affect market prices. For example, spells of extreme cold are likely to drive prices up, also extreme weather can lead to disruption of infrastructure such as power lines and pipelines, leading to supply shortages
- Wind: Wind makes up a significant portion of the UK's electricity mix on windy days, but on days where the wind doesn't blow, more natural gas is diverted to power stations, increasing prices
- Generation changes: renewables are becoming increasingly important sources of generation in the UK
- Imports and exports: the transfer of energy across borders and the political interactions involved, including interconnectors and Liquified Natural Gas (LNG) tanker deliveries
- Global markets: major changes in global supplies can affect the UK's domestic energy costs
- Exchange rates: The strength of the sterling in comparison to the US dollar and Euro has a direct effect on prices due to many large power plants importing coal, crude oil, and gas from other regions
- Government regulations: new or changes to regulations can impact supply and demand costs significantly

These factors can often be difficult to predict, and a combination of them can significantly affect prices. For example, if there is a forecast cold weather snap, coupled with low wind, energy in storage is low and demand is increased it is likely energy market prices will respond bullishly (increase).

4.4 Public Buying Organisations (PBOs)

To help monior and assess energy market conditions and gain advice on procurement options, local authorities could use a PBO offering energy service frameworks or specialist procurement/consultancy service or they could instruct an energy broker.

[16] https://www.theema.org.uk/wp-content/uploads/2015/12/Energy-Managers-Guide-to-Electricity-Procurement.pdf

PBOs aggregate local authorities' energy demand to enhance their buying power within the market to provide competitive prices. The also provide a range of services including competitive management of contracts, budget forecasting, risk managed trading and procurement, and transparent not for profit pricing structure (see Case Study 2).

Framework agreements are a type of "umbrella" agreement negotiated with suppliers, by the PBOs. Using a framework ensures the buying process is fully compliant with EU and UK procurement legislation and all suppliers on frameworks have been assessed during the procurement process for their financial stability, track record, electricity and/or gas supply licence, experience, and technical and professional ability.

The following PBOs specifically offer energy service frameworks. Each framework agreement comes with standard terms and conditions.

4.4.1 Crown Commercial Service (CCS)

Local authorities can sign up to the customer access agreement for the electricity and gas frameworks, to authorise CCS to trade and purchase gas and electricity on their behalf[17].

4.4.2 Eastern Shires Purchasing Organisation (ESPO)

ESPO is managed by six-member authority councils: Leicestershire County Council, Lincolnshire County Council, Cambridgeshire County Council, Norfolk County Council, Warwick County Council, and Peterborough City Council.

ESPO has both a gas and electricity framework for authorities to access.[18] The current supplier for both is Total Energies. ESPO will act as an intermediary to buy gas/electricity in the wholesale market on behalf of the authority.

4.4.3 LASER Energy Buying Group

LASER was created and is owned by Kent County Council. The new flexible energy procurement frameworks for both gas and electricity, covering the period Oct 2024 to September 2028 are open for public sectors to join.[19]

4.4.4 North East Procurement Organisation (NEPO)

NEPO is governed by the twelve North East local authorities[20] and has both a gas and electricity framework for authorities to access[21], the current supplier for electricity is EDF Energy, and the gas supplier is Corona Energy.

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[17] https://www.crowncommercial.gov.uk/agreements/RM6011
[18] https://www.espo.org/frameworks/energy.html
[19] https://www.laserenergy.org.uk/the-new-flexible-energy-procurement-frameworks-2024-2028/
[20] Darlington Borough Council; Durham County Council; Gateshead Council; Hartlepool Borough Council; Middlesbrough Council; Newcastle City Council; North Tyneside Council; Northumberland County Council; Redcar & Cleveland Borough Council; South Tyneside Council; Stockton-on-Tees Borough Council; Sunderland City Council
[21] https://www.nepo.org/solutions/energy

4.4.5 West Mercia Energy (WME)

WME is jointly owned by four local authorities: Shropshire, Telford & Wrekin, Worcestershire, and Herefordshire councils. WME current has three gas and electricity frameworks which can be access by local authorities, town & district councils, as well as blue light services, NHS, charities and education settings. WME offers a flexible gas and electricity framework, supplied by Total Energies, as well as a fixed price as and electricity DPS framework which can be used to facilitate the arrangement of fixed term, fixed price gas and electricity contracts using mini competitions[22].

4.4.6 Yorkshire Purchasing Organisation (YPO)

YPO is owned by 13 local authorities, details for their gas and electricity frameworks for 2024 consumption are yet to be announced[23].

4.5 Energy brokers

An extract from the LGA's national energy strategy[24] below provides further information on energy brokerage services. One of the main benefits of using an energy broker is that they can assist the authority by providing advice of when to go to market, what to look out for, and when to fix energy costs. They also offer the option to fully manage your purchasing decisions, monitoring the market and deciding the best time to purchase.

[22] https://www.westmerciaenergy.co.uk/frameworks/gas-electricity
[23] https://www.ypo.co.uk/frameworks-home/energy
[24] https://www.local.gov.uk/publications/national-energy-category-strategy-local-government-2022-energising-procurement#energy-procurement

- There are about 2,000 brokers operating in the UK market and they primarily serve small- and medium-sized organisations, although some councils are known to use brokers.
- Historically, brokers sold fixed term standard contracts over periods of 12, 24 or 36 months.
    - There are also different types of fee charging structures that brokers typically offer:
    - fixed fee – a broker charges a fixed fee for the service that they offer
    - hybrid offer – the broker's costs are built into the unit cost of energy
- inclusive – the cost of the service is built into the unit cost of energy, but not separately identified so the buyer may not be aware of the actual cost of the service.
- Councils should ensure that broker's costs are transparent, and procurement officers should be able to see what they are paying for in terms of energy and the broker's services.
- Is the broker independent? Generally, brokers' fees come entirely from buyers, but there may be cases where brokers are incentivised to promote certain supplier's products.
- Some smaller brokers may not have access to all of the supplier offerings.
- Concerns have been raised as to whether all brokers have the necessary specialist understanding of the energy market
- Anecdotal evidence suggests that smaller councils and other smaller public sector organisations may not achieve best value from contracts through brokers. These smaller organisations are also targeted by brokers and there is pressure from brokers for councils to 'buy today' resulting in councils not fully understanding the contracts before entering into them.
- Smaller councils should therefore consider using PBOs to fulfil their energy contracts, or at least benchmarking their broker's offer against the PBO offering.

Figure 1: Notes on brokers, taken from the LGA's national category energy strategy for local government 2022

Before signing up to use an Energy Broker ensure that they meet your requirements, offer good customer service and value for money.

Case Study 2 – STAR Procurement (Report (trafford.gov.uk))

- STAR Procurement is a shared service, based in Greater Manchester which was established in 2014 with the founding Partners of Rochdale, Stockport and Trafford Councils. STAR Procurement has since secured three further Partners Tameside Council; Tameside Clinical Commissioning Group (CCG) and Trafford CCG.

- STAR is involved in all aspects of the procurement cycle, and supports its Partners throughout. The level of support provided is tailored depending on experience, risk, and value of the Partner service.

- STAR is currently influencing spend of £1.2bn per annum and has to date delivered savings of £42.4m.

- STAR has been assisting Trafford Council ('the Council) on the re-procurement of its gas and electricity supply from April 2023. The Council's gas and electricity bills have increase significantly energy costs predicted to be as follows across the Estates portfolio:

Fuel	2020/2021	2022/2023	Variance
Gas	£210.000	£736,000	+£526,000 (+250%)
Electricity	£323.000	£500,000	+£526,000 (+55%)

- In addition, street lighting energy costs have also doubled from circa £800,00 to an expected £1.6m which adds significant pressure on the council. Overall energy costs are currently expected to exceed budgets by £1.2m in 2022/23 with further pressure to be included in the Medium-Term Financial Plan for 2023/24 onwards.

- One option being considered by the Council is a fully flexible procurement strategy, which is an alternative way to purchase energy that allows organisations to take advantage of the fluctuations in the wholesale market. The approach involves ongoing tracking of the wholesale market and purchasing smaller volumes split into clips (electricity) or tranches (gas) throughout the length of a contract. The aim is to buy during price dips and avoid purchasing during price spikes or when adverse market events are shorter term.

- As part of their support, STAR and energy consultants e-energy have baselined all Local Authority partners ahead of the 2023 renewals by running a fixed price tender and using a live reverse auction software. The software is designed to procure the cheapest energy contracts on the market on any given day by forcing suppliers to competitively bid for the supply contracts. This process can be undertaken daily to track pricing.

- Suppliers are motivated to supply and bid for large volume contracts, so the higher volumes encourage commitment to a cheaper price. The Council's energy contracts have therefore been aligned with other STAR local authority partners to maximise the volume. Other STAR local authority partners are seeking approvals to procure their energy using this same strategy. The Council have estimated that entering into a flexible contract could deliver up to 5% in savings, due to the size of the combined portfolio.

4.6 Needing to renegotiate?

Various energy decarbonisation pathways have been proposed, mainly based on a fully renewable energy supply. Natural gas plays an important role in the energy systems of many local authorities and will continue to do so throughout the transition to net zero. Therefore, considering price uncertainty is very important. Councils needing to renegotiate contracts in the near future should therefore consider:

- Energy efficiency and demand reduction measures.
- The use of an Electricity Consumption Forecasting Tool to better understand procurement needs after considering the effects of decarbonisation interventions and areas of growth.
- Reassessing attitude to risk – clearly councils will be aiming to achieve best value in terms of pricing. However, a balance may need to be struck between stability (e.g. contract length) and value for money.
- Maintaining regular dialogue with suppliers or procuring organisations. Market conditions are still likely to affect the price that can be achieved. Procuring organisations should be able to advise when it is a good time to go to market, and how best to package the council's requirement.
- It is important to note that energy supply contracts entered into by local authorities, are subject to procurement rules. Each Council therefore needs to be mindful of procurement metrics already established e.g., supplier performance (both environmental and social performance).
- Ongoing alignment of the needs of all councils (not just the lead council) where energy is being procured through collaborate frameworks/ procuring organisations.
- Benchmarking of offers.
- Eligibility for the Governments Energy Bills Discounts Scheme[25].

[25] Energy Bills Discount Scheme - GOV.UK (www.gov.uk)

5 Green energy tariffs and REGOs

As set out in Section 4.1 all local authorities procure the oil, gas and electricity used for day-to-day operations. Often this is via a purchasing organisation and has traditionally covered fossil fuel supplies. One way that the procurement of energy can be improved is through selecting the electricity source from a supplier. Instead of consuming standard electricity, which is the electricity generated based on the fuel mixture of the country, local authorities may prefer to a choose a green energy tariff. Green energy tariffs involve the supplier promising to match all or some of the electricity you use with renewable energy, which it then feeds back into the National Grid.

Whilst no technical process is required, switching to green electricity can be achieved with a simple operation like changing suppliers, purchasing a green tariff is somewhat more complicated. This is because a lot of electricity, promoted as 'green' electricity, is not really green at all. To ensure that the supply under a green tariff is genuine, a local authority needs confirmation that:

- The supplier has bought the electricity from a renewable energy generator directly.
- That Renewable Energy Guarantees of Origin (REGOs) are still attached.
- Confirmation that the REGOs will be retired on their behalf to prevent them being re-used elsewhere.
- Confirmation that the revenue that will be generated will be used in new renewable energy projects.

Where power is sold as renewable energy the REGO certificates will be sold with the electricity and therefore any greenhouse gas emissions savings will normally benefit the purchaser of the power rather than the owner of the renewable energy generator. REGOs demonstrate that electricity has been produced from a renewable source. Each megawatt hour (MWh) of renewable energy will receive one REGO and it is the only mechanism for demonstrating that electricity consumed is renewable. REGO certificates are used by suppliers to meet the fuel mix disclosure in their supply licences. REGOs are an important market mechanism to enable value to be created by more desirable sources of electricity, which are backed up with certification.

The question of whether a supply is genuinely renewable is more than just looking at whether it has a REGO attached to it. There are several reasons for this:

- The first is that REGOs can be traded independently of the electricity which was produced when they were issued – so they are not really a guarantee that the electricity consumed is green.
- The second is around what constitutes 'green'. The Government announced in August 2021 that it was going to investigate what is 'green' electricity, and what could be more accurately described as greenwashing.
- Purchasing green electricity can in some cases make someone else's supply (who is not buying a specific green tariff) more carbon intensive.

Green tariffs that are procured directly with an energy generating station are therefore preferable (also see Section 6.1.2). If the confirmations set out above are achieved, then

the local authority should be able to count the carbon benefit against its carbon footprint. Notwithstanding, the details of any green tariff should be scrutinised carefully.

5.1.1 Reporting on green energy tariffs

There are various forms of renewable energy that a council could purchase. One council told us that they would like to account for:

- 100% green electricity purchased;
- green gas purchased;
- renewable energy generated on site supported with feed in tariffs – displacing grid electricity at site;
- renewable energy generated on site supported with feed in tariffs – exporting to grid;
- renewable energy generated on site with no subsidy – displacing grid electricity at site;
- renewable energy generated on site with no subsidy – exporting to grid; and
- renewable energy generated at a solar farm supported with REGOs sold to electricity market.

While we are keen to support councils in providing a good level of detail to their accounting, the accounting practice would be to report on your emissions as though you were purchasing standard grid supplied electricity. You can then make a below the line adjustment to show a net position if your electricity meets suitable criteria for being genuinely renewable. The reason for this is that it continues to provide a focus on the actual consumption and the necessary pressure to reduce consumption, whilst at the same time allowing organisations credit for purchasing suitably green electricity.

6 Power Purchase Agreements (PPAs)

6.1.1 Background

All renewable energy schemes will require some form of Power Purchase Agreement (PPA) to sell the electricity produced. It is unlikely that any scheme will secure a PPA at the outset for the life of the project. Different arrangements may apply during the lifespan of the project. This is particularly true under a private wire arrangement when you need to consider when designing the infrastructure how you will export power to the grid if the arrangement subsequently changes.

Grid export PPAs come in two main forms, either relatively short-term arrangements generally with the major energy suppliers, or longer-term arrangements with a single (or small group) customer. Shorter term arrangements often offer a better spot price than the longer-term ones – but there is more exposure to general price volatility.

Longer term PPA agreements are generally with commercial third parties and seek to fix prices over a set period which helps protect those entering into the PPA (both buyer and seller) from market volatility. Large corporates, such as The City of London Corporation, HSBC and Vodafone have recently used corporate PPAs for their energy needs. There are currently over 380[26] RE100 companies which have made a commitment to go 100% renewable and are taking actions such as entering into corporate PPA's to deliver on their RE100 and wider sustainability commitments.

PPA's also have a lot to offer local authorities and other public bodes taking action on reducing their direct and indirect climate impacts. Key benefits gained from public bodies entering into a PPA with a third-party generator (or their own arm- length generator) are as follows:

Secure energy price - as part of any prudent risk management approach, entering into PPAs provides some insulation against volatile wholesale power markets;

Long term hedge – utilising a PPA gives access to longer date prices;

Additionality/provenance – purchasing directly from a new incremental green generator demonstrates commitment to reducing demand on carbon emitting fuel;

Support UK climate change policy – the UK has made a legal commitment to net zero emissions by 2050. The Government's EES published in April 2022 sets out the ambition that by 2030, 95% of British electricity will be produced by low-carbon means, and by 2035 the Government aims to have a fully decarbonised electricity system. Many local councils have declared climate emergencies and have set targets to achieve carbon neutrality as early as 2030.

6.1.1 PPA structures

Whilst PPA structures continue to evolve there are typically three contract structures:

- Physical (also referred to as a 'sleeving' arrangement)
- Synthetic (or virtual)

[26] RE100 (there100.org)

- Private Wire

Case study 3 sets out approaches to selling power that have been taken by other local authorities that own/have invested in solar farms.

I Physical PPA

A Physical PPA is between a customer and a generator who are remote from one another. The public electricity network provides the connection and network charges apply. This form of contract provides a direct and verifiable connection between the electricity produced and the electricity consumed.

An overview of the contractual arrangement is shown in Figure 2 below:

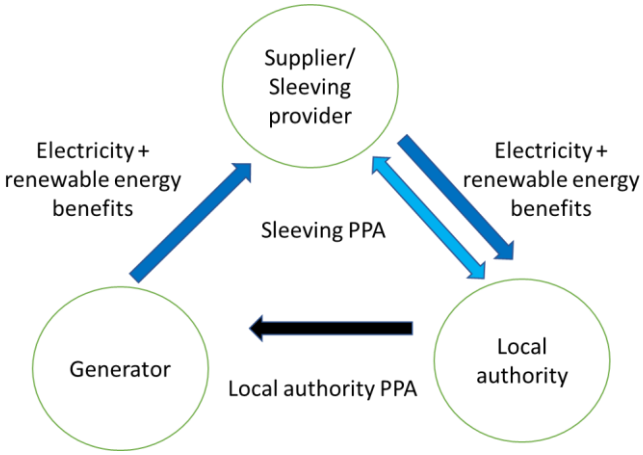

Figure 2 – contractual arrangements for a physical PPA with local authority as the off-taker

- Under this structure the off-taker enters into a long term PPA with a renewable energy generator to take some or all of the energy generated by its plant (or portfolio of plants) with a defined amount of power sold at a fixed price per MWh. Typically, the PPA will contain provisions for the sale and purchase of electricity and the allocation of any applicable renewable energy benefits, and the provisions governing that sale and purchase.

- The PPA will also include obligations to provide or procure certain metering and regulatory activities that can only be undertaken by licensed electricity suppliers (such as npower, Centrica etc). As such, the off-taker will need to enter into a back-to-back agreement with its licensed supplier under which the licensed supplier commits to undertake these obligations.

- In parallel to this arrangement the off-taker will have an electricity supply agreement with its licensed supplier under which electricity may be supplied to meet the off-taker's energy demands from time to time. The terms of supply under this supply agreement will take into account the electricity purchased under the PPA and passed through to the licensed supplier under the licensed supplier agreement. This ensures that the off-taker has the benefit of the fixed pricing for renewable energy under the PPA but the reliability of a supply agreement with a licensed electricity supplier to meet its day-to-day energy demands.

- There is generally a charge for the sleeving PPA with the sleeving provider which amounts to around 5% of the value of the wholesale electricity traded.

Both wind and solar developers have built up extensive pipelines of renewable energy projects which can give off-takers flexibility around choosing a PPA start date and the ability to dovetail into their long-term energy buying/risk management strategies. Options also exist for individual public bodies to aggregate smaller volumes to benefit from pricing.

Intermittency of renewable technologies

The intermittent nature of renewable technologies is one of the main challenges in renewable PPAs. Many offtakers are reluctant to be exposed to this risk. In physically settled PPAs, (which has historically been the most commonly used PPA structure), there is usually a party that undertakes the balancing tasks, which are necessary to achieve effective hedging via PPAs. This balancing responsibility typically includes three types of risks, which are related to variable generation patterns:

- *Balancing risk:* Risk associated to the exposure of power system costs that arise when an asset's forecasted generation is different from its actual generation. This risk is related to the imbalance cost, therefore the more an asset contributes to the power system's imbalance, the higher the cost.

- *Shape or profile risk:* For solar PV this risk is related to the variability of irradiation and is independent of the total volume generated by the asset, which will differ from a 24-hour base-load delivery quoted.

- *Volume risk:* This captures the variable generation of an asset over a certain period of time. This can be related to deviations in the long-term, such as lower levels of irradiation due to, for example, abnormal weather conditions or unplanned outages.

As mentioned above, sleeved PPA's require the involvement of a third-party licenced supplier to deal with the transfer of the power generated by the generator via the local distribution network to the buyer. The licenced supplier will also deal with payments and any additional power the buyer requires that the generator is unable to supply (to mitigate the risks set out above). There is a charge for this sleeving, which reflects network charges, any imbalance payments, and service fees which need to be taken into account in any business case considered.

Sleeving fees were typically around £6.00 per MWh (prior to Russia's invasion of Ukraine) but have since risen to around £25.00 per MWh. So for example, if the wholesale market price for electricity is £50.00 per MWh, the total costs of the electricity procured becomes £75.00. These high sleeving fees have eroded the benefits of this PPA structure and necessitated the market to explore other PPA contract types such as synthetic (or virtual) PPAs.

II Synthetic PPA

In a synthetic PPA structure no power is physically traded. Instead it is a purely financial structure where the off-taker and generator agree a defined 'strike price' to fix the cost of power between themselves for the power generated by a renewable energy facility. Each party will then enter into separate agreements with their electricity/licenced supplier to sell/acquire electricity at the spot price.

A synthetic PPA works as a financial hedge in that if the spot price in a settlement period exceeds the PPA defined strike price, the generator pays the excess amount to the off-taker for power generated in that period. Where the market price for power is less than the strike price in a settlement period, then the off-taker pays the shortfall amount to the generator for power generated in that period.

A synthetic PPA is relatively simple to enact and provides price certainty to both parties. It can be harder to demonstrate a direct connection, but this should still constitute a valid carbon reduction for an authority participating as an off-taker, provided the contracts also secure the associated renewable energy accreditations.

III Private Wire PPA

Private wire PPAs are concerned with the sale of electricity from a generator to an off-taker. Under this PPA agreement, power will normally be sold directly from the generator's facility to the off-taker, rather than being notionally passed through a national power grid. Typically, the generating facility only supplies power to the off-taker and will be located at, or close to the off-takers assets. Private wire PPAs are often utilised in conditions where the off-taker wishes to secure its own source of power. In the case of a local authority for example, an energy intensive depot or industrial estate owned by the local authority.

Private wire PPAs present an opportunity for both parties to hedge against volatility of energy prices. For a local authority generator, the private wire PPA model can provide an alternative route to market with long term revenue certainty from a credit-worthy counterparty.

The benefit that can be achieved through a private wire approach is largely dependent on the cost of the private wire. A private wire PPA typically offers savings in the form of avoided grid charges and policy costs applied to electricity imported from the grid. The generator and the offtaker share these savings, as the offtaker buys electricity below the retail cost of grid electricity while the generator sells above the wholesale market price. If substantial infrastructure is required, this may make the private wire approach uneconomic and should be explored in full as part of the business case.

Renewable developers are generally facing increasing delays and high costs to connect to the regional distribution networks because of constraints on National Grid’s network. This makes a private wire model more attractive provided that the generation equipment is connected to the consumer “behind the meter” and doesn’t need a grid connection. However, grid constraints are affecting private wire projects that need to connect to the grid, e.g. to export excess generation and/or import power.

Private Wire Considerations

- Requires a local offtaker with an appropriate demand.
- Reliance on a single large customer - a key requirement is finding an offtaker with sufficient covenant strength (financial capacity and assurance) to guarantee revenue certainty. The generator would typically require the offtaker to guarantee to take a high proportion of the plant’s generation for the full term of the PPA or otherwise pays compensation to the generator to cover expected revenues over the project term. Assessing the financial capacity and the willingness of an offtaker to provide financial assurance that that they will not default on their

commitments (either through their own treasury or via a bank contract) should be something that councils take into consideration when considering a private wire opportunity.

- Back up generation/grid connection is likely to be required due to the intermittent nature of solar generation. It maybe that one or both of the parties will require a physical connection to the distribution network. The offtaker may require a back-up grid supply, either because of the intermittent nature of the solar supply, to hedge against the risk of the generator not meeting demand at peak times, or for reassurance that it can still get power during shutdowns or service failure. This will have a level of capacity charge.

- Avoidance of embedded costs and network charges. The financial case for private wire PPAs subsists, despite regulatory changes in recent years which have increased network charges and supplier levies. Any discount would need to be shared with the offtaker, as part of the transaction pricing mechanism. This however, could change over time if the regulatory regime changes. Ofgem is continuing to make a number of reforms as part of its day-to-day regulation of the energy markets – i.e., continuing to review embedded benefits and use of system charges as they apply to those connected to the distribution network or via a private wire.

- Electricity licensing exemptions will need to be applied.

To summarise, for any local authority looking to proceed with a private wire arrangement, we would recommend the following activities:

  - Conduct a review of interested parties within an appropriate proximity.
  - Ensure the credit and long-term locational standing of any counterparty.
  - Seek legal advice on any required licenses and stay within relevant limits.
  - Develop an appropriate power purchase agreement to mitigate its risk profile.
  - Sell the power at an appropriately benchmarked price.
  - Develop and maintains a detailed subsidy control audit trail.

6.1.2 Electricity supplier green PPAs

Securing a ‘green’ tariff from your existing supplier or another major energy company may on the face of it appear to be an attractive option. There are however significant hurdles to this approach in that PPAs with major suppliers are hard to justify in terms of additionality as most of the schemes listed would have entered into a PPA with a large electricity supplier regardless of the specific demand from one customer. There is also the possibility of being accused of ‘green washing’ as by allocating renewable energy generation to a specific customer the supplier is potentially increasing the carbon intensity factor for electricity supplied to its other customers who are not on a specifically 100% renewable energy tariff.

The only potential exception to this is a supply contract with one of the cap exempt energy suppliers, however commercial tariffs are not always available and the potential exposure to significantly higher costs. Ofgem has categorised three suppliers as having cap exempt tariffs these are Good Energy, Green Energy UK and Ecotricity.

6.1.3 Direct PPAs with generating stations

It is possible to procure electricity directly from a generating station, through either a sleeved or a synthetic PPA. Either of these arrangements is compliant in terms of carbon accounting. For example, The City of London Corporation procured a long term sleeved PPA with a solar farm in Dorset in 2021. In terms of carbon accounting this option is much stronger than a PPA with a major energy company because it is easier to demonstrate both permanence and additionality and has more future cost certainty than a PPA with a cap exempt supplier.

6.1.4 Carbon accounting practice

A local authority will be able to account for the electricity produced from renewable energy generation against its Scope 2 emissions. These are the emission produced by the consumption of grid supplied electricity. It is not possible to use renewable energy generation to offset against Scope 1 emissions in the UK.

Recommended practice in the UK is for organisations to undertake dual accounting for the use or generation of renewable energy. Under this methodology the initial assessment is undertaken using grid supplied electricity and then an adjustment is shown 'below the line' for the renewable energy. In this way it is possible to retain visibility over both total consumption of electricity (and the success or otherwise of energy efficiency measures) and the use of carbon. In order for renewable energy to be reliably used in carbon accounting it is necessary to consider three things:

- Whether or not the use of renewable energy directly contributes to additional renewable energy resource in the UK. Any scheme which would have gone ahead regardless of the arrangement should not be included in carbon accounting measures. In particular, the Council should be wary of supplies which are part of much wider arrangements where the allocation of a project to a particular customer would lead to the general supply for customers not on a 'green' tariff having a higher carbon intensity.

- Permanence of the arrangement – any initiative which can easily be reversed e.g. if budget cuts are required these should not be included in carbon accounting measures.

- Traceability - this means the extent to which it is possible to be certain that the electricity purchased has been generated at the point specified. This is governed in the UK by REGO certificates, a scheme which is administered by OFGEM.

In this context permanence would mean an arrangement that the Council would be unable to reverse easily. This could be fulfilled either with a long term direct PPA with a new renewable energy generating station or by ownership of a new renewable energy generating station. In terms of 'long-term' there is no specific definition – but anything less than 10 years is unlikely to be sufficient. As the UK Government has declared a

target of having a carbon neutral electricity supply by 2035[27] then a PPA that lasts until 2035 would meet the requirement.

6.2 Importance of internal council stakeholder engagement

Given the complex nature of PPA transactions, it is essential to involve key internal stakeholders at an early stage in the process and frequently through the development process. Executing a successful PPA transaction will require engagement across several professionals within a local authority. Energy, procurement and sustainability teams have critical roles. Treasury, legal and finance are also likely to be involved. A local authority will need to select a “Champion” to act as a liaison between the internal decision-making group.

One of the main challenges in progressing a PPA transaction is a lack of understanding of the energy market and how energy is procured by a council. Early engagement can yield a greater understanding of differing options and assumptions, generate better information and collaboration, as well as increasing overall acceptance of a decision-making process. Needless to say, the senior management team and members need to be brought onside to have any chance of moving forwards on a PPA transaction.

The energy sector is one of the worst possible for the inclusion of acronyms, technical terms and jargon. However, if properly and clearly explained, these concepts are no more complicated than other areas of a council’s business. Often, frequently used terms have other common names. Another potential challenge is inexperience of approaching third party suppliers to engage in the project and/or PPA discussions (again, early engagement is important). For councils which use procurement or other energy purchasing professionals, they should be willing and able to take on this facilitation role.

[27] Plans unveiled to decarbonise UK power system by 2035 - GOV.UK (www.gov.uk)

Case Study 3 - Local Government PPA Progress

The table below sets out approaches to selling power that have been taken by other local authorities that own/have invested in solar farms. Many of the options taken by other local authorities, are no longer available or do not currently provide value for money. For example, from recent market engagement the costs associated with sleeving fees have significantly eroded the benefit of a physical (sleeved) PPA approach, with a movement towards synthetic (or virtual PPAs).

Local Authority/Project	Type of PPA	Comment
City of London – 49.9MW South Farm Solar Farm (Dorset)[28].	Physical/Sleeved 15-year corporate PPA with Voltalia.	Standard PPA arrangement. The developer (Voltalia) was not in a position to build the project until the income was secured by a PPA. By signing up to the deal, the City of London has facilitated the development of the solar farm. Sleeving fees are currently prohibitive. The transaction concluded in November 2020 when sleeving fees were low (around £2.50 - £3.50 per MWh).
West Suffolk Council – 12.4MW Toggam Solar Farm[29].	Project receives income under the Renewables Obligation Certificates (ROCs) scheme as well as income from sales of electricity generated. West Suffolk have previously used the E-Power auction to secure an annual power purchase agreement.	ROCs scheme is now closed.

[28] City of London Corporation signs first of its kind £40m PPA for Dorset solar site | Solar Power Portal
[29] Toggam solar farm (westsuffolk.gov.uk)

Cardiff City Council – 9MW Lamby Way Solar Farm[30].	Private Wire	Private wire network from the solar farm to a Welsh Water treatment facility. Behind the meter private wire network where generation is netted off against consumption.
Cambridgeshire County Council – 12MW Triangle Solar Farm (Soham)[31].	Contracts for Difference (CfD) renewable AR1 auction (Strike price of £79.23)	The Triangle Solar Farm in Soham was an early pilot case for the Council and has since become the Council's flagship project. The project became operational in January 2017. Triangle Solar Farm is supported by the Council's successful bid to the Government's Contracts for Difference auction. Consideration of wider market competition and associated economic challenges.
Warrington Borough Council - Cirencester Solar Farm (23MW solar farm and 46 MWh battery storage facility)[32].	Hybrid power purchase and battery optimisation agreement with Statkraft.	Council appointed a specialist supplier (Statkraft) to manage the hybrid electricity trading nature of this project. Structing involves a sleeving fee plus a percentage fee for revenue generated from optimisation/trading activities.
Swansea Bay University Health Board – 4MW Brynwhillach Solar Farm[33].	Private Wire	3km private wire network from the solar farm to Morriston Hospital. Behind the meter private wire network where generation is netted off against consumption.

[30] https://www.bbc.com/news/uk-wales-54513348

[31] Triangle Solar Park - Cambridgeshire County Council
[32] Warrington Borough Council: Investing in Renewable Energy with Community Municipal Bonds | Local Government Association
[33] Green for go at Morriston Hospital's unique new solar farm - Swansea Bay University Health Board (nhs.wales)

In addition, we are also aware that Bristol City Council and Devon County Council have explored PPA structures:

- An action in the Bristol City Council Climate Emergency Action Plan 2022-2025[34] is to set up an energy 'sleeving pool' to enable the Council to purchase locally produced renewable energy from community generators and extend locally produced renewable electricity sleeving arrangement to all Council operated sites by Autumn 2023. The Council currently has a small-scale sleeving arrangement to supply key buildings (such as the city hall) but plans to create a dynamic system where there is more than one generator, and the Council is the end user. The Council's scheme is based on creating a 'sleeving pool'[35], whereby new generators can be added as time goes on and different types of generation can also be added to the system.

- Devon County Council has been looking at developing a synthetic PPA[36] and has undertaken significant work in this area. It is not yet clear if the Council has resolved to take forward its PPA plans but seems likely to do so.

6.3 Summary

All renewable energy schemes will require some form of PPA to sell the electricity produced. A PPA is a technical name for a long-term contract for the buying and selling of electricity. An example presented above is whereby a local authority agrees to buy electricity directly from an energy generator which benefits both parties. On the one hand, they enable the generator to secure the funding necessary to build and operate the renewable energy project, On the other hand, they allow the purchaser of the power (i.e the local authority) to hedge against market price volatility beyond the time horizons available in traded electricity markets. It can also provide carbon benefits and under the right circumstances can be netted off the local authority's carbon footprint, thereby giving it valuable progress towards its net zero carbon targets.

Private wire PPAs also present an opportunity for both parties to hedge against volatility of energy prices. For a local authority generator, the private wire PPA model can provide an alternative route to market with long term revenue certainty from a credit-worthy counterparty.

Given the complex nature of PPA transactions, it is essential to involve key internal stakeholders at an early stage in the process and frequently through the development process. Many of the approaches to selling power that have been taken by other local authorities that own/have invested in solar farms are no longer available or do not currently provide value for money. As such, a number of local authorities are exploring alternative

[34] Bristol City Council Climate Emergency Action Plan
[35] Bristol City Council's energy bills more than double - Bristol Live (bristolpost.co.uk)
[36] Devon | Synthetic power purchase agreements - YouTube

structing approaches such as sleeving pools' and synthetic PPA options. Executing a successful PPA transaction will require engagement with professional advisors.

7 Conclusions

- Councils generally are already dealing with significant financial pressures that have resulted from reductions in government funding and rising demand for services. These pressures were exacerbated throughout 2022 as the UK economy witnessed rising inflation and a growing crisis in both food and energy markets, alongside a slower-than-expected recovery from COVID-19 and Russia's invasion of Ukraine.

- Most councils have been enjoying cheaper energy that was procured two to three years ago. However, some have a more immediate need to renegotiate contracts and are now faced with electricity prices that are significantly higher than previously purchased prices. In many cases, budgets for the year had already been set before the increases to both inflation and energy prices. This has meant that local authorities have needed to determine spending priorities on other council services.

- The rising cost of living, inflation and energy costs is putting increased pressure on council budgets and resources. Soaring energy bills are weighing heavily on finance officers' minds, whilst decarbonisation targets still remain. Energy security is also high on the political agenda and recently led to the creation of a Department for Energy Security and Net Zero.

- Energy management encompasses a broad range of responsibility and has a significant impact on council finances and service delivery. Energy managers and energy officers will be required to engage with officers across the whole council – with senior leaders in order to make the case for investment in energy efficiency and decarbonisation measures, procurement teams for secure energy supplies, building managers and occupiers on energy use and behaviour change. The cheapest kilowatt is the one that is not used.

- It is recommended that each council has a robust energy management policy in place and that this should be clearly communicated to all employees and visitors to premises. The challenge for local authorities has been how to design efficient and robust decarbonisation strategies while facing highly uncertain, volatile, and high fuel prices. Measures that provide the highest level of financial should be the focus for public sector organisations looking to achieve energy cost savings in response to the current energy crisis.

- Reliable forecasting of future energy consumption plays a critical role in successful implementation of a local authorities energy management policy and system. An Energy Manager needs to understand both its current demand profile and forecast requirements to prevent from over committing energy spend or adversely, setting the requirement too low, introducing increased price risk from the need to procure additional electricity. Many organisations have failed to manage their energy consumption and budgeting effectively due to lack of forecasting.

- Forecasting also helps in evaluating the current and future economic conditions to steer the local authorities' policies and decision making. Reliable forecasting can therefore assist a council's financial and energy management teams to set up their

priorities and strategic goals and form an integral part of the annual budgeting process.

- All local authorities procure the oil, gas and electricity that is used in their day-to-day operations and have numerous options to consider when deciding how to purchase their energy. The traditional method has been to enter into a contract with an energy supplier, for both the supply of gas and electricity. More innovative ways to purchase energy, include self-supply, choosing a green tariff or entering into a PPA.

- Whilst switching to green electricity can be achieved with a simple operation like changing suppliers, purchasing a green tariff is somewhat more complicated. This is because a lot of electricity that is promoted as 'green' is not really green at all. To ensure that the supply under a green tariff is genuine, details of any green tariff should be scrutinised carefully, and confirmations sought.

- Given the complex nature of PPA transactions, it is essential to involve key internal stakeholders at an early stage in the process and frequently through the development process. Many of the options taken by other local authorities, are no longer available or do not currently provide value for money. Executing a successful PPA transaction will therefore require engagement with professional advisors as well as across professionals within a local authority.

- A number of local authorities have successfully invested in renewable energy generating assets and there are likely to be opportunities for other local authorities to follow suit. Local authorities are significant consumers of electricity and by investing in generation to meet their own needs, can make a significant contribution to the delivery of that renewable energy ambition.

8 Glossary of Terms

Any engagement with the energy/renewables industry will involve a degree of technical language and common terms. It is not necessary to have a detailed technical vocabulary, however an understanding of some of the basic terms and concepts will aid understanding in the preceding sections of this document.

BMS	Building Management System
CCC	Committee on Climate Change
CCS	Crown Commercial Service
CfD	Contract for Difference – current large-scale subsidy regime
DEC	Display Energy Certificates
DESNEZ	Department for Energy Security and Net Zero
EMA	Energy Managers Association's
EMS	Energy Management Systems
EPC	Energy Performance Certificates
ESA	Energy Supply Agreement
ESC	Energy Systems Catapult
ESPO	Eastern Shires Purchasing Organisation
EUR	Euro (European currency)
EV	Electric Vehicle
FiT	Feed in Tariff – previous subsidy regime
GMCA	Greater Manchester Combined Authority
IET	Institute of Engineering and Technology
KW/KWh	Kilowatt or kilowatt hour. Standard measurement of electricity (used on electricity bills)
LNG	Liquified Natural Gas
MEES	Minimum Energy Efficiency Standards
MW/MWh	Megawatt or megawatt hour. Measurement of electricity equivalent to 1,000 kW or kWh
NEPO	North East Procurement Organisation
NG	National Grid – operator of the transmission system for electricity
OFGEM	Electricity industry regulator
PBO	Public Buying Organisations
PPA	Power Purchase Agreement – contract for the buying and selling of electricity
PSDS	Public Sector Decarbonisation Scheme
PV	Photovoltaic i.e. turning light energy into electricity
QMS	Quality Management System
RE100	Global scheme for companies to declare their intention to use only 100% renewable electricity
REGO	Renewable Energy Guarantees of Origin – scheme administered by OFGEM to provide transparency to customer about the source of their electricity
RO	Renewable Obligation – previous subsidy regime
ROC	Renewable Obligations Certificates issued under the RO
VfM	Value for Money
WME	West Mercia Energy
YPO	Yorkshire Purchasing Organisation

Vicky Kingston, Strategic Director - Energy, Local Partnerships
Email: vicky.kingston@localpartnerships.go.uk
Tel: 07876 594041

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