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SERIES **17** | MODULE **08** | **ENERGY PURCHASING**

# Energy purchasing - the next step

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Energy often represents a significant and tangible cost, so the development of an energy procurement strategy typically creates a period of heightened interest in energy-related issues. Therefore, this decision point represents an excellent chance to promote opportunities, both for the organisation and the environment. Two questions that may help expand the scope of the energy procurement discussions are explored below:


**1) Is all of the energy purchased actually required? Is it all put to productive use?**

Consider setting aside a portion of the energy budget for an efficiency campaign. Energy systems are often compared to leaky buckets. The argument is fix the leaks, as opposed to simply buying more water. Along these lines, in 1989 Amory Lovins coined the phrase ‘negawatt’ after spotting a typo for ‘megawatt’ in the popular press. The term relates to the power saved through efficiency measures and was proposed as a way of highlighting the potential for energy efficiency to help mitigate/meet rising energy demand.

Negawatts and negawatt hours are equally relevant to energy procurement discussions, prompting the question ‘is all of the energy purchased actually required’? While this may seem a blindingly obvious question to ask, it is worth remembering that energy procurement, consumption and budgeting are visible, tangible activities that are easily understood by all involved. In contrast, energy efficiency opportunities are often hidden, intangible, and in many cases unquantified. Significant effort is required to raise the profile of energy efficiency opportunities and when requesting what often amounts to seven figure sums for the energy budget, this is arguably an ideal time to request to propose setting aside some budget to reduce consumption.

For example, could a portion, perhaps 5 per cent, of the energy budget be allocated to an efficiency campaign and other non-capex energy savings? One such project could be to support a review of BMS and other control settings and routines. These housekeeping measures can offer as much as a 30 per cent energy saving, potentially eliminating a significant proportion of future energy demand by converting it to Lovins’ zero cost negawatt hours, as opposed to expensive megawatt hours.

**2) Could there be a more attractive option than a traditional energy supply contract?**

Two examples of alternatives to continuing with a traditional energy supply contract are presented below.

Consider engaging an Energy Service Companies (ESCO) thereby paying for the outcome, not the energy.

ESCOs seek to replace the purchase of energy as a system input with the purchase of an ‘energy service’ as an output from the energy system. In doing so, organisational interests are aligned with those of the supplier. While a traditional energy supplier benefits the more energy that is consumed, and sees no incentive to support year-on-year reductions, an ESCO’s business model depends upon them achieving savings. Energy services can range from relatively light-touch options, to those amounting to full outsourcing. Examples of services provide by ESCOs include: energy analysis and audits, energy management, project design and implementation, maintenance and operation, monitoring and evaluation of savings, property/facility management, energy and equipment supply, and provision of services such as space heating and lighting[1].

An ESCO business model typically comprises[2]:

- guaranteed cost savings and/or environmental improvements;
- a service level agreement defining the required system outputs and performance levels;
- a potential funding route to replace aging equipment and reduce backlog maintenance; and
- a remuneration agreement that is typically on a ‘share of savings’ basis.

While ESCOs can potentially offer benefits, such as access to specialist expertise and systems, as well as access to finance for system upgrades; they do also come with their own challenges. In contrast to traditional energy supply contracts which are relatively short term commitments; ESCOs typically require a longer contract period of around five to 30 years. They also require a significant upfront investment of time and effort to set up. Entering into an agreement with an ESCO will also naturally involve the loss of a certain level of autonomy and control as the system is handed over to a third party.

### Terms of the agreement

Close attention should be paid to the terms of the agreement entered into, as it can often be challenging to verify savings, and it would be reasonable to assume that an ESCO will want to maximise the savings claimed since their income depends upon doing so. Tracking savings can be especially difficult in settings where the ESCO's operations overlap with other activities, making it difficult to attribute outcomes to one party or the other. A useful reference point with regards to this topic is the International Performance Measurement and Verification Protocol, typically referred to as the IPMVP standard. This standard should be applied by a qualified professional to propose how performance of the ESCO can be tracked and associated payments can be calculated. Close attention should be paid to the agreements which are developed. An example of an onerous clause seen in an ESCO offering is one which stipulated that once the ESCO identified an operational saving, the customer had ten working days to support and enact its implementation, after which the saving would be banked towards the share of savings calculation, regardless of whether the improvement had been made or not. Since many operational routines would take longer than ten days to adjust (think shift patterns, new risk assessments and a potential need to conduct new training) this would seem to be a reasonable example of a clause that disproportionately favours the ESCO.

The typical stages involved in the lifecycle of an engagement with an ESCO are:

• site survey and preliminary evaluation;
• investment grade energy audit;
• identification of possible energy savings and efficiency improvements;
• financial presentation and client decision;
• guarantee of the results by proper contract clauses;
• project financing;
• comprehensive engineering and project design and specifications;
• procurement and installation of equipment;
• project management, commissioning and acceptance;
• facility and equipment operation and maintenance for the contract period;
• purchase of fuel and electricity; and
• measurement and verification of savings.

While these considerations are important to ensure successful engagement with an ESCO, there are still many successful ESCO partnerships in place and the need for the attention to detail required shouldn't rule out the option of engaging an energy services company.

But if you're buying renewable energy, make sure it is 'additional'. First, consider installing onsite/local renewables capacity, or entering a power purchase agreement.

Renewable energy is often purchased with an ambition to do the right thing for the planet and to communicate an organisation's commitment to responsible business. As such, the aim should be to select a procurement route which supports the development of 'additional' renewables generation capacity, instead of simply buying the output from renewables facilities that already exist.

While this question of additionality may seem a fairly esoteric topic, it is becoming part of the mainstream consumer debate on sustainability. See for example Which?'s recent review of the considerable number of renewable energy tariffs available in the consumer market[3]. Which? scored tariffs based upon the percentage of the electricity supplied that was renewable, whether the supplier invests in their own renewable generation capacity, and whether they purchase renewable electricity direct from generators. The level of scrutiny of renewable energy procurement methods is rising and this topic is increasingly becoming one where informed questions from consumers should be anticipated.

### Achieving 'additionality'

Looking in a little more detail, the United Nations states that 'additionality' is achieved when an investment results in GHG emission reductions beyond those which would have occurred in absence of the investment taking place[4]. As an example of the difference between the purchase of 'additional' and 'non-additional' renewables, see the two scenarios below which are given in DEFRA's guidance on GHG reporting and how to present renewable energy consumption[5]:

Example statement for 'non-additional' renewables: "In the period covered by the report the company has purchased xMWh of renewable energy attributes, in the form of Guarantees of Origin from Norwegian hydroelectric power plants. The facilities do not receive subsidies, but the renewable power is not expected to be additional due to the age of the facilities."

This statement provides reassurance that renewables were purchased, through the reference to the acquisition of 'Guarantees of Origin'. However, the criticism of this purchasing strategy would be that the renewables facilities are long-term and pre-existing assets and that they would have been operating in any case, regardless of which particular party bought the power generated. Compare this with DEFRA's example statement for the purchase of additional renewables:

Example statement for 'additional' renewables: "In the period covered by the report the company has purchased xMWh of renewable energy attributes via a long-term Power Purchase Agreement (PPA) with an offshore wind farm in UK waters. The attributes are backed by Renewable Energy Guarantees of Origin (REGOs), and the renewable power generated is expected to be additional as the PPA has a material impact on the financial viability of the wind farm (assessed using the UNFCCC 'Tool for the demonstration and assessment of additionality': http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf)."

This statement can both prove that renewables power was purchased, via REGOs; and that the purchase delivered additional renewable capacity, since the long-term Power

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Purchase Agreement ensured the financial viability of the wind farm.

It is unlikely that the power purchased in the second example would have been at a premium price over that purchased in the first example. However, the second example is clearly delivering a higher level of environmental impact and organisational credibility with respect to the claims of environmental stewardship.

The two clearest routes to additional renewables are through the installation of onsite or local renewable generation capacity for direct consumption, or by entering into a long-term Power Purchase Agreement (PPA) with a renewables generator at a remote location. These two scenarios are discussed in more detail below.

Onsite or local renewables are sometimes referred to as a 'private wire' arrangement or a 'behind the meter' installation. This involves investment in onsite or local renewables capacity and direct consumption onsite, without use of the national grid to supply the power, hence the 'private wire' and 'behind the meter' synonyms. The generation capacity can be directly owned and managed, or a third party can invest in the assets and sell the renewable power back via a local 'private wire' to the consumer. One of the benefits of this arrangement is that a significant proportion of the unit cost of electricity is currently made up of supply and distribution charges which these local arrangements avoid, since they do not use the national grid to deliver the power.  Consideration should however be paid to regulatory developments which look set to reduce this incentive, as the regulator adapts to a future power system that will likely be increasingly decentralised.

## Agreement with generator

Long-term renewables Power Purchase Agreements (PPAs) In this scenario, the company enters into a form of direct agreement with a generator, as opposed to purchasing power off the open market. Additionality can be ensured by seeking to support the development of a renewables project that is made feasible through their entering into a long-term power purchase agreement which gives the generator certainty of income. There is a number of variants of this arrangement, the two most common variants are 'sleeved PPAs' and 'virtual PPAs'.

Sleeved PPAs, also known as Physical PPAs, are the most commonly employed mechanism in the UK. In this arrangement an energy supplier sets up back-to-back contracts to take the output from the renewables project and deliver it through the grid/energy market direct to the end customer, without offering it for sale on the open market. The PPA customer directly purchases both the Renewable Energy Guarantees of Origin (REGOs) and the power generated.  Since the end customer's consumption will not exactly match the renewable project's output, the supplier also undertakes to balance the supply and demand for the PPA customer, trading away excess generation from the renewables project at certain times, and making up for a shortfall between the renewable project's generation and the PPA customer's demand on other occasions. The supplier is remunerated for 'sleeving' the supply through the grid/energy market and balancing the supply for the PPA customer.

Virtual PPAs, also known as Synthetic PPAs, are more common in overseas markets. Under this arrangement the PPA customer maintains a separate 'standard' energy supply contract and the generator supplies the power produced to the open market, as opposed to the PPA customer. The virtual PPA arrangement is used to allow the customer to purchase the renewable energy attribute certificates via a price guarantee arrangement which gives certainty of income to the renewables facility and some shelter from market price volatility to the PPA customer.

While the suggestions to consider negawatts, ESCOs and 'additional' forms of renewables will not be relevant to all organisations and situations, it is hoped that these options offer the opportunity to broaden the scope of traditional procurement discussions, possibly providing opportunities improve outcomes for the organisation and the environment.

Finally, note that two further CPD articles on the topic of energy procurement are available online:
• Series 15, Module 8 - February 2018 - Purchasing energy; and
• Series 12, Module 4 - September 2014 - Successful utility purchasing

These articles provide an oversight of the considerations relevant to placing traditional utilities contracts, refer to the online CPD archive for further details[6].

## References

*1) https://e3p.jrc.ec.europa.eu/communities/energy-service-companies*
*2) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/395076/guide_to_energy_performance_contracting_best_practices.pdf*
*3) https://www.which.co.uk/news/2019/09/how-green-is-your-energy-tariff/*
*4) https://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf*
*5) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/850130/Env-reporting-guidance_inc_SECR_31March.pdf*
*6) https://energyinst.org/whats-on/search/events-and-training?meta_eventId=CPD%20articles*

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## ENERGY PURCHASING

Please mark your answers below by placing a cross in the box. Don't forget that some questions might have more than one correct answer. You may find it helpful to mark the answers in pencil first before filling in the final answers in ink. Once you have completed the answer sheet, return it to the address below. Photocopies are acceptable.

### QUESTIONS

**1. What does the term 'negawatt' refer to?**
- ☐ Power generated using renewable energy sources.
- ☐ A parasitic load within an energy system.
- ☐ Power saved through energy conservation or efficiency measures.

**2. Why is the concept of a 'negawatt' relevant to energy procurement discussions?**
- ☐ The concept encourages those considering their energy procurement strategy to avoid taking their energy demand for granted and to consider options to reduce demand.
- ☐ The concept can be used to support the uptake of renewable energy sources.
- ☐ The concept can be used to ensure that power purchased has a low GHG content.

**3. Energy Services Companies typically generate their income by?**
- ☐ Providing 'energy services' as efficiently as possible and taking a share of the savings.
- ☐ Selling servicing and maintenance support, for example as part of a facilities management package.
- ☐ Selling energy intensive services as a specialist niche provider.

**4. Which of the following answers best describes the core elements of a typical ESCO business model?**
- ☐ Guaranteed cost savings and associated environmental performance improvements
- ☐ A potential funding route to replace aging equipment and reduce backlog maintenance
- ☐ A combination of all of the above

**5. What does the abbreviation IPMVP stand for?**
- ☐ The 'International Performance Measurement and Verification Protocol'
- ☐ The 'Internal Power Management Variation Protocol'
- ☐ The 'Initial Power Margin Validation Parameter'

**6. The United Nations states that 'additionality' is achieved when:**
- ☐ An investment results in GHG emission reductions beyond those which would have occurred in absence of the investment taking place.
- ☐ An investment results in GHG emission reductions, plus additional sustainability benefits, e.g. an improvement in air quality.
- ☐ An investment results in greater GHG emission reductions than forecast in the original modelling.

**7. Why is the concept of additionality important during the consideration of renewables procurement?**
- ☐ To appropriately manage any additional costs incurred by pursuing this option
- ☐ To manage the additional regulatory obligations involved in buying renewable energy
- ☐ In order to maximise the environmental benefits of a commitment to purchase renewable energy.

**8. Which of the following is another term commonly used to refer to a 'behind the meter' renewables installation?**
- ☐ 'private wire' arrangement
- ☐ 'public wire' arrangement
- ☐ 'private meter' arrangement

**9. Which cost elements of a traditional energy contract can be avoided by supplies from 'behind the meter' installations?**
- ☐ Costs relating to supply and distribution
- ☐ Costs relating to account management
- ☐ Costs relating to bill validation and payment

**10. What does the abbreviation PPA stand for? Power Purchase Additionality**
- ☐ Power Purchase Additionality
- ☐ Power Pooling Agreement
- ☐ Power Purchase Agreement

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