COSLA

SCOTTISH FUTURES TRUST

Report on the Commercial Aspects of Local Authority Renewable Energy Production

August 2011

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CONTENTS

Foreword

The Sale of Electricity by Local Authorities (Scotland) Regulations 2010 permitted Local Authorities in Scotland to sell electricity generated from specific renewable sources. Previously local authorities were only permitted to sell electricity produced from waste or in association with heat[1]. Equivalent enabling legislation was also introduced in England and Wales.

In parallel with these developments, many Local Authorities have been developing their policies in response to carbon targets, alleviation of fuel poverty and the wider sustainability of their local area. This legislation has widened the range of financially viable opportunities in these areas which Local Government are currently developing and exploring, with a number of Local Authorities actively procuring renewable projects. Prior to this additional impetus, a track record already existed of Local Government (and the wider public sector) engaging in the renewable agenda and opportunities (primarily in relation to renewable heat) in order to take forward various policy objectives, including lowering their carbon footprint, tackling fuel poverty and promoting energy efficiency.

This report reviews the current background to renewables development within the Scottish public sector and Local Government in particular. It does not attempt to recreate the plethora of material already available or to replicate the guidance which already exists. Instead, its objectives are to record, through case studies, examples of public sector involvement in the renewables sector and to describe the main corporate and contracting structures which may be appropriate for Local Authorities to take forward these schemes, based upon their individual objectives and risk appetite. It provides a high-level route map of the decision processes which Local Authorities may wish to follow in order to determine the most appropriate structures for a given set of objectives, and comments on how these may be taken forward under common procurement frameworks.

As with such reports, it records the first steps on a renewables journey. A number of areas are highlighted for further exploration.

[1] Sections 170A (1) & (3) of the Local Government (Scotland) Act 1973

1. Introduction

This section details the scope of SFT"s report and reviews the wider UK and Scottish policy context.

In taking forward renewable energy generation projects, Authorities should consider the national and local policy objectives that their projects are addressing as these may influence the most appropriate commercial structure and the available funding.

1.1. Key legislative driver

The UK Government, through the Department of Energy and Climate Change ("DECC"), has responsibility for the development of energy policy and regulation across the spectrum of energy generation sources and activities. In 2010, DECC consulted on a prohibition within the Local Government Acts which prevented Local Government from benefiting from the sale of energy. The Sale of Electricity by Local Authorities (Scotland) Regulations 2010 was enacted following this consultation, enabling Local Authorities in Scotland to sell electricity generated from specified renewable sources as listed in the regulations[2]. Equivalent regulations were enacted in respect of England and Wales. The implications of this for Local Government are currently being carefully explored by many Local Authorities with a number of possible approaches being developed. This report has been written to help inform this activity.

This specific legislative change sits within a wider UK and Scotland specific context, which is summarised in Sections 1.4 – 1.6 below.

1.2. Scope of Briefing Paper

This report explores a range of commercial structures and funding sources which Local Authorities in Scotland may wish to adopt to take forward projects delivering renewable energy production. It examines where these have been used previously, before examining approaches to evaluating the suitability of the various options and the procurement frameworks which may be developed to implement them. The paper does not specifically focus upon the Local Authorities wider policy context for taking forward renewable energy- for example, sustainability, regeneration, minimising carbon impact, asset optimisation, fuel poverty and/or hedging against future energy costs.

[2] See Regulation 2 of The Sale of Electricity by Local Authorities (Scotland) Regulations 2010

The paper is structured as follows:

- **Recent development in the UK and Scotland**: energy sources considered; UK and Scotland policy context and recent developments within the public sector renewables arena;
- **Overview of current UK public sector experience**: focusing upon a range of case studies which provide examples of how public sector organisations within Scotland are taking forward renewables projects including Scottish Water, the Forestry Commission; Shetland Islands Council and a range of UK wide Local Government examples;
- **Summary of possible commercial structures and sources of funding**: explores the commercial structures which have been adopted to date including review of their risk profiles and potential benefits. It also examines possible funding sources including PWLB, commercial funders, energy developers and the various sources of grants/public sector loans including the European Energy Efficiency Fund;
- **Opportunities route map for Scottish local authorities**: outlines a potential decision making process for Local Authorities to determine appropriate options for renewable energy production;
- **Collaborative procurement**: identifying how preferred commercial structures can be efficiently procured across the Scottish public sector and the areas which require further development to facilitate collaborative procurement; and
- **Summary and next steps**

SFT's specific terms of reference regarding the briefing paper are included in Appendix A. The report does not consider in any detail issues relating to taxation, State Aid or Accounting treatment.

1.3. Energy Forms Considered

At the request of COSLA, the following energy forms are considered within the paper:

- **Electricity from wind turbines** – within a Local Government context this will primarily be in the form of wind farms rather than offshore turbines. Our report focuses upon the range of commercial structures adopted to date across the public sector.
- **Electricity from anaerobic digestion** – this form of renewable energy generation has been of increasing interest given Local Government's responsibility for the treatment and disposal of food waste. However, to date its adoption in Scotland has been limited to Scottish Water operating and owning a facility in Deerdykes and a number of Councils in the process of procuring such facilities (for example, Fife Council, and a joint procurement by City of Edinburgh Council and Midlothian Council).
- **Electricity from waste** – to date these energy forms have tended to be procured through wider waste management initiatives and procurements. Examples of these are considered within the case studies.

- **Electricity from photovoltaic** – the development of solar energy is gaining increasing momentum within the social housing and municipal buildings context. Many Local Authorities have adopted a facilitative role in taking forward these projects through the tendering of a right to exploit municipal and council house roofs. The impact of the recent reduction in FiTs available for large-scale solar projects may make this technology less commercially attractive.
- **Gas from anaerobic digestion –** this form of renewable energy is considered within the context of electricity generated from anaerobic digestion plants. These plants may also generate significant levels of hot water which may be utilised in district heating schemes although operational examples of these are limited at the moment.
- **Direct heat from waste and other sources** – to date CHP plants are the primary example of heat being generated from renewables sources. Some examples of these are included within the case studies, however these have not always utilised renewable sources (although they are increasingly doing so).

1.4. UK Policy Development and UK Experience

The Carbon Plan (first published in March 2011)[3] outlines the UK‟s commitment to sustainable development and decarbonisation of the UK economy. It is a Government-wide plan of action on climate change, including domestic and international activity, which sets out department by department, actions and deadlines for the next 5 years. This Carbon Plan sets out a vision of a changed Britain, powered by cleaner energy used more efficiently in our homes and businesses, with more secure energy supplies and more stable energy prices, and benefiting from the jobs and growth that a low carbon economy will bring. It identifies three areas where these policies will be implemented: (1) in the way we generate our electricity; (2) in the way we heat our homes and businesses; and (3) in the way we travel.

In order to take forward the first of these objectives, UK policy developments are continuing to evolve in response to the need to meet the UK‟s energy supply in a sustainable manner whilst still achieving the renewable energy targets which the UK has signed up to – that 15% of our electricity will be generated from renewable sources by 2020. Scottish Government has gone further and indicated a commitment that 100% of our electricity will be generated from renewable sources by 2020.

In order to achieve its targets, the UK Government has implemented a range of financial incentives to encourage the use of renewable energy sources. These often mirror the initiatives being taken forward by other European governments, addressing the needs of the European renewables industry and designed to facilitate the achievement of the European wide renewables targets. These include the use of Feed-in-Tariffs; Renewable Heat

[3] DECC The Carbon Plan.

Incentives; the Green Energy Fund and many more. Details of the funding sources available to local authorities and housing associations can be found at: Energy Saving Trust - Local Authority Funding.

Within the UK energy sector, there are a number of issues influencing the agenda and creating uncertainty as well as potential opportunities within the renewable industry. These include:

- **Establishment of the Green Investment Bank**[4]. The government recently published its proposals for the establishment of a Green Investment Bank covering the stages of its development and the types of support it may be able to provide. Due to be established in April 2012, its initial activities will be limited until such time as it achieves State Aid Clearance. By 2015, the objective is that it will have fund raising capability. Its purpose is to address market failure, either due to the perceived risks of the projects coming forward or due to capital limitations to enable the achievement of policy objectives. The three broad categories of intervention include:

    - **Risk mitigation** through for example, the provision of first loss tranches of debt;

    - **Innovative financing mechanisms** through upfront refinancing commitments guaranteeing other funders an exit strategy; and

    - **Capital provision** for example in the offshore wind industry where the scale of investment required may need to be facilitated through the provision of additional debt facilities within the market.

  As yet details regarding the objectives, powers and role of the Green Investment Bank are still emerging, although the potential availability of £18bn of capital to fund renewable projects is seen as a "key mechanism for supporting the growth of the green economy." The role of the Green Investment Bank in any Local Government initiated projects is as yet unknown although may be limited given its focus upon addressing scarcity of capital and project riskiness in areas such as offshore wind.

- **Electricity Market Reform (EMR)**[5] [6]– the EMR is the statutory consultation on the government"s preferred electricity market framework examining the reforms necessary to achieve the Government"s objectives on decarbonisation, renewable energy, security of supply and affordability. The Consultation period ran for 12

[4] The Green Investment Bank

[5] Electricity Market Reform Consultation Document

[6] Electricity Market Reform White Paper

weeks to March 10 2011, and the White Paper covering the legislative proposals to implement the new electricity market arrangements, was launched in July 2011. The EMR sets out measures to attract investment, reduce the impact on consumer bills and create a secure mix of electricity sources. The key elements of the reform package include:

  - A carbon price floor mechanism whereby a complimentary measure to the EU Emissions Trading System would be introduced to stabilise carbon price. The impact of which would be to increase wholesale electricity prices (linked to cost of carbon) and revenue certainty whilst encouraging investment.

  - A Feed in Tariff regime to replace the current Renewables Obligation support mechanism to increase revenue certainty and encourage investment. A feed in tariff with contract for difference approach was chosen over the less cost-effective premium feed in tariff.

  - An emissions performance standard to provide a regulatory limit of 450g CO_2 per KWhr on CO2 emissions for electricity generation in the most carbon intensive power stations. This will facilitate the development of new coal power stations in conjunction with CCS whilst still enabling the necessary investment in gas fired power stations to take place.

  - Maintaining security of supply through a capacity mechanism that rewards spare generation as well as supports Carbon Capture and Storage and international grid connection.

- **FiTs**[7] - the recent review of FiTs applicable to solar and anaerobic digestion projects has caused uncertainty within the market. The speed of implementation of the review findings is likely to result in projects which are well developed becoming uneconomic. The review findings have resulted in reductions to FiTs for solar PV developments > 50 Kw and to anaerobic digestion plants. Further details can be found at: DECC - FiT's Review Report. This, combined with the wider European backdrop of changes in applicable subsidies (for example, the retrospective limits applicable to solar industry subsidies in Spain) is resulting in delays in projects. There is also a wider comprehensive review planned which will affect tariffs from April 2012, the results of which are not due until early 2012, which is adding to project uncertainty.

The resolution of the policy and regulatory backdrop to both the wider energy market and to renewables in particular will be important in generating the confidence required to provide a

[7] Feed In Tariffs

strong and stable platform from which to develop renewable energy in the amounts required to meet the 2020 renewable energy targets.

1.5. UK Experience

DECC regularly monitor the trends in UK energy provision and demand – these are published annually within the Energy Trends series. In 2010 wind, hydro and other renewables are estimated to have supplied 25,734GWh – a 2% increase from 2009 with renewables accounting for 7 per cent of total electricity generation.[8] However, in the 1st quarter of 2011, the contribution of renewables was more pronounced with wind, hydro and other renewables supplying 27.5 per cent more electricity than the previous year, with hydro increasing by 56 per cent. In this quarter, wind, hydro and other renewables accounted for 8 per cent of total generation.[9]

The contribution of the renewables industry over the last 5 years is detailed within the Table overleaf. This highlights the trends and characteristics in the development of renewable energy generation which included:

- Onshore wind is the major contributor to the renewables sector accounting for 44% of installed capacity in 2009 and 28% of actual generation. The next most significant sector was large scale hydro which accounted for both 18% of the UK"s installed capacity and 14% actual generation. Finally, landfill gas from biomass although accounting for 11% of installed capacity actually contributed 20% of generation.
- The largest increase in generation was in offshore wind, representing an increase of 129% in capacity between 2008 and 2010 from 586.0Mwe to 1341.2MWe.
- In 2010 generation is estimated to have decreased in two key categories: onshore wind decreased as a result of the low wind speeds experienced; and hydro generated electricity also fell, as a result of the low rainfall in 2010, which resulted in a fall of almost one third; and
- Renewable energy capacity increased by 15% in 2010 predominantly due to a 553MW increase in onshore wind and a 400MW increase in offshore wind. Solar photovoltaic capacity also increased significantly, which is attributed to the FiT scheme. Overall, this still accounts for less than 1% of total capacity.

[8] DECC Energy Trends, June 2011

[9] DECC Energy Trends, June 2011

	2006	2007	2008	2009	2010	2010 percentage contribution
Installed Capacity (MW) *(1)*						
Wind:						
Onshore	1,650.7	2,083.4	2,820.2	3,483.2	4,036.7	44%
Offshore *(2)*	303.8	393.8	586.0	941.2	1,341.2	15%
Shoreline wave / tidal	0.5	0.5	0.5	2.5	2.6	0%
Solar photovoltaics	14.3	18.1	22.5	26.5	76.9	1%
Hydro:						0%
Small scale	153.4	166.2	173.3	186.3	195.4	2%
Large scale *(3)*	1,361.4	1,358.7	1,456.5	1,458.5	1,452.9	16%
Biomass:						0%
Landfill gas	856.2	900.6	908.3	984.9	1,024.6	11%
Sewage sludge digestion	143.8r	150.2r	147.6r	156.9r	189.2	2%
Municipal solid waste combustion	326.5	326.4	375.9	392.0	435.3	5%
Animal Biomass *(4)*	88.9	114.4	114.4	119.3	138.6	2%
Plant Biomass *(5)*	132.4	189.5	197.7	278.5	308.9	3%
Total biomass and wastes	1,547.7r	1,681.1r	1,743.9r	1,931.6r	2,096.6	23%
Total	**5,031.7r**	**5,701.8r**	**6,802.9r**	**8,029.7r**	**9,202.2**	**100%**
Co-firing (6)	310.2	247.6	226.9	254.7	390.2	4%
Generation (GWh)						
Wind:						
Onshore *(7)*	3,574	4,491	5,792	7,564	7,137	28%
Offshore *(8)*	651	783	1,305	1,740	3,046	12%
Solar photovoltaics	11	14	17	20	33	0%
Hydro:						0%
Small scale	478	534	568	598	511	2%
Large scale *(3)*	4,115	4,554	4,600	4,664	3,092	12%
Biomass:						0%
Landfill gas	4,424	4,677	4,757	4,952	5,037	20%
Sewage sludge digestion	445r	449r	532r	598r	702	3%
Municipal solid waste combustion *(9)*	1,083	1,177	1,226	1,511	1,594	6%
Co-firing with fossil fuels	2,528	1,956	1,613	1,806	2,506	10%
Animal Biomass *(10)*	434	555	587	620	670	3%
Plant Biomass *(11)*	363	409	568	1,109	1,406	5%
Total biomass	9,277r	9,223r	9,283r	10,596r	11,915	46%
Total generation	**18,106**	**19,600r**	**21,565r**	**25,182r**	**25,734**	**100%**
Non-biodegradable wastes *(12)*	651	707	736	874	922	4%

(1) Capacity on a DNC basis is shown in Long Term Trends Table 7.1.1 available on the DECC web site - see paragraph 7.85.

(2) From 2010, Beatrice (10 MW) has been included as it is now classified as a Major Power Producer , as opposed to solely supplying an offshore oil platform.

(3) Excluding pumped storage stations. Capacities are as at the end of December.

(4) Includes the use of farm waste digestion, anaerobic digestion, poultry litter and meat and bone.

(5) Includes the use of waste tyres, straw combustion, short rotation coppice and hospital waste.

(6) This is the amount of fossil fuelled capacity used for co-firing of renewables based on the proportion of generation accounted for by the renewable source.

(7) Actual generation figures are given where available, but otherwise are estimated using a typical load factor or the design load factor, where known.

(8) Latest years include electricity from shoreline wave and tidal, but this amounts to less than 2 GWh, and excludes the EMEC test facility. Generation by Beatrice is included from 2010 (see note 2).

(9) Biodegradable part only.

(10) Includes the use of farm waste digestion, anaerobic digestion, poultry litter combustion and meat and bone combustion.

(11) Includes the use of straw and energy crops.

(12) Non-biodegradable part of municipal solid waste plus waste tyres, hosptal waste and general industrial waste.

(13) Load factors are calculated based on installed capacity at the beginning and the end of the year - see paragraph 7.86.

(14) For a definition see paragraphs 7.87 and 7.88.

Source: DECC Renewable Energy Statistics, table 7.5

1.6. Scottish Context

Current energy policy in Scotland is framed by the Scottish Government plans to move towards a low carbon economy through progressively increasing the generation of renewable and clean energy in Scotland, and supporting an increase in sustainable economic growth. In addition there is an aim to increase the overall impact of energy generation and related activity such that Scotland not only maximises energy exports but also maximises the retention of wealth from that activity and also from the development of skills, intellectual property rights and manufactured products.

The Climate Change (Scotland) Act 2009[10] sets out the legislative framework for this, and the strategy to achieve it is set out in "Meeting the Emissions Reduction Targets 2010-2022: Report on Proposals" which sets out how Scotland can deliver annual targets for reductions in emissions to 2022, including a 42% reduction in emissions by 2020 compared to 1990. This is supported by a suite of documents including the Public Engagement Strategy[11] and Low Carbon Economic Strategy[12].

In 2007, all of Scotland's 32 local authorities signed up to Scotland's Climate Change Declaration. The Declaration recognises that Scottish local authorities play a key role in a collective response to the challenge of climate change, and publicly demonstrates their commitment to action. Through the declaration the Signatories acknowledge the reality and importance of climate change and are committed to:

- mitigating their impact on climate change through reducing greenhouse gas emissions;
- taking steps to adapt to the unavoidable impacts of a changing climate; and
- working in partnership with their communities to respond to climate change.

In addition to this voluntary declaration, local authorities are also bound by the Public Bodies Duties set out in the Climate Change (Scotland) Act, Part 4, guidance for which has been provided by Scottish Government.[13]

[10] The Climate Change (Scotland) Act 2009

[11] Low Carbon Public Engagement Strategy

[12] Low Carbon Economic Strategy

[13] Public Bodies Climate Change Duties

1.6.1. Policy Framework

The Scottish Government's renewable energy policy is driven by the following key policy statement

- **2020 Routemap for Renewable Energy in Scotland[14].** The Routemap for renewables is an update and extension to the Renewables Action Plan (RAP) which was initially published in 2009. The Routemap was published in August 2011 and sets out the progress made on the Scottish Government‟s national targets and objectives and what needs to happen and by when to achieve them. It now takes account of the revised more challenging objectives made by the Scottish Government of the equivalent of 100% demand for electricity to be reached from renewable sources.
- **Renewable Heat Action Plan (RHAP).** The Climate Change (Scotland) Act 2009 mandates Scottish Ministers to produce an action plan for the use of heat from renewable sources. The RHAP was published on 5 November 2009[15].
- **The Ten Energy Pledges.** The Scottish Government's 10 Energy Pledges[16] provide a strategic overview to energy issues in Scotland and how government might support the sector in the short and long term, covering a range of activities across energy generation and transmission, energy efficiency and transport.

1.6.2. Energy Targets

The key driver for renewable energy policy is the legally binding EU 2020 Target (20% of EU's energy consumption from renewable sources by 2020). This has informed Scottish and wider UK renewable energy targets.

Scotland is committed to achieving the EU 2020 target as follows:

- Renewable sources to generate the equivalent of 100 per cent of Scotland's gross annual electricity consumption by 2020, with an interim milestone of 31% by 2011[17].
- Renewables sources to provide the equivalent of 11 per cent of Scotland's heat demand by 2020.

[14] Renewable Routemap

[15] Renewable Heat Action Plan, Nov 2009

[16] The 10 Energy Pledges

[17] Energy - Renewable Energy Scottish Government Statistics

An increase in the amount of renewable energy generation (electricity and heat) as a means of reducing carbon emissions could also contributes to reductions in Carbon emissions. The Climate Change (Scotland) Act 2009[18] sets a target of reducing emissions by 80 per cent by 2050, including emissions from international aviation and shipping. It has also set an interim target for a 42 per cent cut in emissions by 2020.

The remainder of this report reviews:

- An overview of current UK public sector experience;
- A review of possible commercial structures;
- An analysis of funding sources;
- A suggested approach to developing renewable energy projects;
- Possible collaborative frameworks; and
- A summary of the next steps.

[18] Scottish Government Climate Change Act

2. Overview of Current UK Public Sector Experience

Within this section of the report we review current examples of public sector renewable energy production. These vary in terms of the commercial structures that have been adopted; the motivations for undertaking the projects; and, the risks and returns the procuring authority anticipates. When reviewing the case studies, consideration should be given to these key aspects and how they may apply to projects currently being developed.

2.1. Introduction

As part of our review of energy production in the public sector, SFT examined 14 case studies from across the UK where the public sector is involved in energy production. The case studies have been classified by reference to the commercial structures which the Procuring Authorities adopted in order to take forward the initiative. The case studies reflect the wide range of motivations for taking forward these projects, including implementation of the low carbon agenda; promoting energy efficiency; hedging against future energy cost rises or addressing fuel poverty. This section:

- provides a brief outline of the case studies; and
- draws some initial, broad conclusions based on the experience to date.

The case studies have been classified into the following broad categories of commercial structure, (more details of these structures can be found within section 3):

- **Category A – owner operator structures**: significant public sector involvement in the renewable facility, which may include involvement in designing the facility; operating the facility and maintaining it over the duration of its economic life.
- **Category B – JV and partnership structures**: where the public sector enters into some form of partnership with the private sector to develop renewable projects. This could take the form of a joint venture partnership through to more formal PPP type structures or a combination of both.
- **Category C –arm's length structures** under these structures the public sector makes no financial commitment to the projects and has little risk exposure. Examples include land lease agreements and service concessions.

2.2. Case Studies

SFT has reviewed a range of case studies detailed in the Table below:

Project	Renewables / other energy source				
	Wind	Anaerobic Digestion	Waste	Solar	Other
Category A – Owner Operator Structures					
Aberdeen Heat and Power					√
Fife Council Anaerobic Digestion facility		√			
Scottish Water Anaerobic Digestion plant		√			
Woking Borough Council[19]					√
Category B – JV and Partnership Structures					
Aberdeen Waste			√		
Bristol Wind Turbine project	√				
Forestry Commission Wind Farm	√				
Greater Manchester Waste Disposal Authority			√		
Nottingham Energy Recovery Facility			√		
Sheffield Energy from Waste facility			√		
Shetland Island"s Wind Farm	√				

[19] Woking Borough Council established a joint venture ESCo with Xergi Limited but as of 2004 the ESCo became wholly owned by Woking Borough Council. There is still a JV with Xergi Limited but this is within a subsidiary company with the Council retaining overall control.

Project	Renewables / other energy source				
	Wind	Anaerobic Digestion	Waste	Solar	Other
Category C– Land lease agreements and service concessions					
Forestry Commission Inverlael Hydro					√
North Tyneside Solar Panel Project				√	
Stoke on Trent Sustainable City - Solar Panel Project				√	

A summary of the background to these case studies is provided below and a more detailed analysis within Appendix B. This appendix also provides notes on the interpretation of the information provided and includes further references and contacts for these projects.

Case Study Name & Stage of Development	Description	Funding and Corporate Structure
Commercial Structure A – Owner Operator Structures		
Aberdeen City Council & Aberdeen Heat & Power Company Limited - **Operational: 2004-7 across 3 sites**	Established to develop and operate district heating and combined heat and power schemes in Aberdeen. The company has developments at Stockethill, Hazlehead and Seaton, which supply heat and hot water to a number of multi-storey flatted properties, sheltered housing complexes and public buildings. The CHP engines are gas-fired, with plans to convert some to using biomass feedstock in the future.	100% owned by Aberdeen City Council. Not for profit company
Fife Council Anaerobic Digestion Facility - **In procurement**	Biowaste infrastructure for the disposal of food waste utilising anaerobic digestion as the core element of its processing technology at Lochhead.	Council owns the site and will retain full ownership of the AD plant. D&B contract with potential for a maintenance contract.
Scottish Water	The Deerdykes facility, created by Scottish	Scottish Water Horizons issued a

Case Study Name & Stage of Development	Description	Funding and Corporate Structure
Anaerobic Digestion Plant, Deerdykes - **Operational from 2010**	Water Horizons, the public utility‟s commercial and renewable energy business, is the largest organic recycling facility in Scotland and the first site in the UK to combine anaerobic digestion and in-vessel composting. It can handle 30,000 tonnes of food waste a year. Food waste is digested in the plant and can be converted into 8,000 megawatt hours of „green‟ energy each year. The plant also produces heat which may be available for local homes and businesses and a nutrient rich digestate which can be used as a fertiliser.	design & build contract. It operates the plant itself as its technology is similar to wastewater treatment plants already operated by SW.
Woking Borough Council - **Operational**	Design, build, operate and finance of local, small-scale energy centres which provide low carbon energy of up to 5MW electricity output to the local communities. The energy centres generate both heat and electricity using CHP engines. The ESCo‟s first CHP centre was built in 2001 to supply both electricity and heat to Woking Borough Council‟s civil offices and surrounding businesses. Other projects include a fuel cell CHP project in Woking‟s Pools in the Park, and the combined CHP and photovoltaic system at Brockhill Residential Home in Goldsworth Park.	ESCO which was originally set up as a JV by the Council but subsequently became a 100% owned subsidiary. Funding from grants and Woking Borough Council via PWLB.
Commercial Structure B – Partnership Structures		
Aberdeen City Council/SITA North East Limited - **Operational 2010**	Landfill gas to electricity conversion facility included within a long term waste management services contract.	25 year waste management services contract. Financed by SITA North East
Bristol City Council Wind Turbines - **In procurement**	Design, build, operate and maintain contract to be procured by the Council with a private sector partner for two wind turbines.	Contract anticipated being for 25 years with the Council providing funding.
Forestry Commission Wind Farm	Development Agreements signed for six regions across Scotland. Individual sites are selected for development and subject to	Joint Venture Agreements Funding from the partners or bank

Case Study Name & Stage of Development	Description	Funding and Corporate Structure
- **In procurement**	development with the Forestry Commission having the option to inject equity and receiving a lease income.	funding
Greater Manchester Waste Disposal Authority - **Contract signed 2009** - **Operations due to commence 2012**	In 2009, GMWDA signed a contract with Viridor Laing for the development of new waste management facilities (including 5 MBT plants, 1 MRF, 4 IVC facilities, education centres and HWRCs) and the provision of associated services including the reception, recycling, treatment and disposal of waste to deal with 1.3m tonnes per year of household waste from the Greater Manchester area. The project also includes use of an existing thermal recovery facility in Bolton and Ineos' new EfW CHP plant at Runcorn (which will process 275,000t of SRF from the MBT plants).	PFI contract between GMWDA and Viridor Laing.
Nottinghamshire County Council - **Procurement complete June 2006. Construction not yet commenced due to a public enquiry**	In June 2006 the Council entered into 2 contracts with Veolia group companies. • One contract (worth £35m) was for minor infrastructure facilities and a new MRF. • The other contract (worth £97m) which this case study concentrates on is between the Council and NESL for the DBFO of an energy recovery facility at the old Rufford Colliery Site near Rainworth, treating 180,000 tonnes of waste each year.	Public private partnership between the Council and NESL. Funding to be provided through PFI credits (£38m) and corporate finance from Veolia (£140m)
Sheffield City Council and Veolia - **Operational since 2007**	Energy recovery plant built on Bernard Road to obtain energy from waste and produce heat for the existing district heating system. Heat is used to generate electricity, the electricity is provided to the grid and heat is used in public and private organisations and households in the area. Veolia Environmental Services (formerly Onyx) was awarded the integrated waste management contract in August 2001	Public private partnership between the City Council and Veolia.
Shetland Islands Council **Viking Energy**	Viking Wind Farm: 127 wind turbines in central Mainland, Shetland.	50/50 legal partnership between a charitable trust and the private sector. The principal form of contract is a

Case Study Name & Stage of Development	Description	Funding and Corporate Structure
Partnership - **Construction scheduled to commence 2012**	A seabed interconnector to mainland Scotland and electricity convertor station required to turn AC power from the wind farm into DC as it travels down the interconnector. This infrastructure will be constructed by Scottish Hydro Electric Transmission (part of SSE), and does not form part of the wind farm project.	JV. Funding is provided by the JV partners – the Trust, Scottish Southern Energy plc, Burradale wind farm and loans from commercial lenders and the EIB
Commercial Structure C – Land Lease agreements and Service concessions		
Forestry Commission – Inverlael Hydro - **Operational 2009**	Inverlael hydroelectric scheme built within an existing forestry plantation by Loch Broom.	Lease by Forestry Commission to RWE npower. RWE npower subcontracted the civil works and electricity generating equipment to third parties.
North Tyneside Council Solar Panel Project - **in procurement – opportunity publicised in March 2011 with contract signature planned for August 2011**	The Council is inviting expressions of interest on a service concession basis for bids from organisations who will be fully responsible for the supply, delivery, installation, connection and the long term operation, insurance and maintenance of a green energy solution system. The scheme intends to maximise the best rate of financial incentive currently offered by the UK Government throughout the contract period with the bidders assuming the commercial risk associated with the financial returns that may be generated from such opportunities.	Service Concession. No funding or payments are anticipated from the Council to the preferred partner. Partner will source funding as required.
Stoke On Trent - **Pilot study commenced**	Stoke on Trent City Council have agreed to enter into a contractual arrangement with E.ON UK for solar PV panels to be placed on a minimum of 1000 council owned houses before April 2012. To date Stoke on Trent City Council have undertaken a pilot of PV Installations to 54 council houses and have installed a 198 panel array on their civic centre roof.	Service Concession. No funding or payments are anticipated from the Council to the preferred partner. Partner will source funding as required. However, pilot study was council funded.

2.3. Emerging Themes

The review of case studies indicated a number of learning points which Authorities may wish to consider when developing their renewables strategy and individual renewable energy projects. These include:

- **Motivation for the procurement** – the case studies demonstrate a wide range of motivations for undertaking renewable energy projects, in order to address environmental, economic and social drivers. These include reducing carbon impact; addressing fuel poverty; asset optimisation; lowering energy costs and maximising returns in order to reinvest in similar projects, as well as simply generation of potentially cheaper electricity. The relationship between the motivations for undertaking projects and the commercial structures adopted are explored in more detail in section 3 of this report.

- **Clarity of objectives** – In order to establish a framework for the development of any opportunity, objectives need to be identified and clearly understood from the outset to enable the most appropriate options and commercial structures to be considered. Where the public sector has decided to use the procurement process to explore options for renewables developments - for example, in terms of the technological solution, specific development proposals, differing commercial packages - a range of issues have emerged. These include the difficulty of evaluating alternative proposals, lack of market interest and prolonged procurements.

- **Strategic Context** – there are instances where a more strategic approach could have been adopted relating to the development of policies covering renewable energy generation; tackling the low carbon agenda and maximising energy efficiency. In the current economic climate projects are being prioritised which minimise risk and the scale of the financial commitment from the procuring authority without necessarily exploring the wider agenda of an integrated programme of measures. For example, prioritising projects which are "quick wins" and can provide a return which can be ring-fenced to invest in subsequent projects that may address wider environmental and social policy objectives.

- **Planning permission and other consents** – These can take significant time to obtain, and can generate significant uncertainty for all parties. Authorities should consider whether this is an aspect of projects they wish to progress prior to procuring a partner or whether the projects are better taken forward on a joint basis with their preferred partner. If the latter approach is adopted, the contract will need to cover the impact of failure to obtain planning permission or other consents; the impact of any onerous conditions attached to the granting of the planning permission and other consents; and the ability to differentiate between delays to obtaining consents caused through no fault of the contractor and delays caused due to poor contractor project management.

- **Delivery roles and responsibilities** –a wide variety of joint venture and partnership structures have been implemented for renewables projects. These are explored in more detail within Section 3 of this report. They each expose the procuring authorities to differing roles and responsibilities, and careful consideration will need to be given between the scale of the projects envisioned; the procuring costs and timescales;

length of the operational period of the contract and the delivery of the project objectives.

- **Form of energy production** – the development of differing types of energy production can result in a broad range of risk profiles and delivery timescales for Local Authorities. For example, installing more mature technologies such as certain PV facilities, where the planning and commercial issues are more widely understood, will contrast favourably to the development of a large biomass plant in an urban area. In these areas, projects are likely to be more easily developed and external funding more readily available – for example, the availability of commercial funding and project finance is more prevalent for onshore wind developments than off-shore wind developments due to the track record of the technology.

- **Revenue risk** – careful consideration needs to be given to the level of revenue risk the Authorities are willing to accept. In the owner/operator models this can be significant. Revenue risk can relate to the sufficiency of income to meet the project costs and allow repayment of debt via energy price risk or volume risk. Authorities should carefully consider the level of risk to future energy prices. For example, taking full pricing risk provides an effective hedge against the organisation"s exposure to future energy costs. Alternatively, the project could be structured so that the electricity/heat price risk is shared.

- **Market capacity** – market capacity could be an issue in relation to a number of aspects of energy development, particularly in relation to supply chain management and the availability of both skilled labour and component materials. The approach adopted will influence to what extent this risk is borne by the Procuring Authority or the Contractor. This can be mitigated through market soundings taken during the development of the project and ensuring that the project structure addresses market concerns.

- **Regulation and financial incentives** – stability of both of these aspects are critical to establishing certainty regarding any commercial risk sharing mechanism, and whilst in the UK this appears to be relatively well understood, it remains a key area of long term concern to all parties. There are instances where possible changes in the regulation or incentives are driving the development of projects including how/when they are coming to the market as has been seen in the recent review of the FiTs applicable to AD and solar projects.

- **Sources of funding and financing** – the current economic climate has resulted in a contraction of funding and finance across both the public sector (with reductions in Local Authority capital funding as well as increases in the cost of prudential borrowing) and private sector funding (where availability of equity, corporate balance sheet capacity or debt market funding is significantly reduced and therefore attracting

higher returns and margin). However, there is still an appetite for well developed projects and evidence suggests that these projects are not being significantly delayed by the lack of availability of funding unless they are large scale PPP type arrangements such as the Manchester Waste PPP project.

- **Grid connection** – the ability for any new generation source to negotiate a grid connection in a timely and affordable manner is an essential component of the risk inherent in all new renewable energy developments, although contractual arrangements can be structured to mitigate this risk. DECC and OFGEM are currently pursuing an arrangement for License Light which will enable smaller scale producers to become licensed suppliers once they exceed 100MW when they cease to be a Licensed Exempt Supplier.

- **Asset availability** – The availability, suitability and sustainability of assets on which Local Authorities can seek to exploit renewable energy production needs to be clearly identified and understood early in the development of a strategy, and monitored regularly to ensure any preferred solutions can be delivered as required. Although some commercial structures provide the ability to identify and develop sites in conjunction with a selected partner, an understanding of the likely scale and deliverability of options is important prior to procuring that partner to ensure that the partner with the correct skills is selected.

Within section 3 of this report we outline the commercial structures adopted to date, as seen in the above case studies, including consideration of;

- The rational for adopting the structure.
- The characteristics of the different structures.
- The risks and rewards associated with each approach.

3. Summary of Possible Commercial Structures

This section reviews the commercial structures which may be applicable to renewable projects. When developing such projects consideration should be given to the objectives of the Authority; the specific characteristics of the different commercial structures and the potential risks and rewards an Authority may be exposed to.

Authorities should always seek legal advice on the most appropriate commercial structure and the applicable procurement regulations.

3.1. Introduction

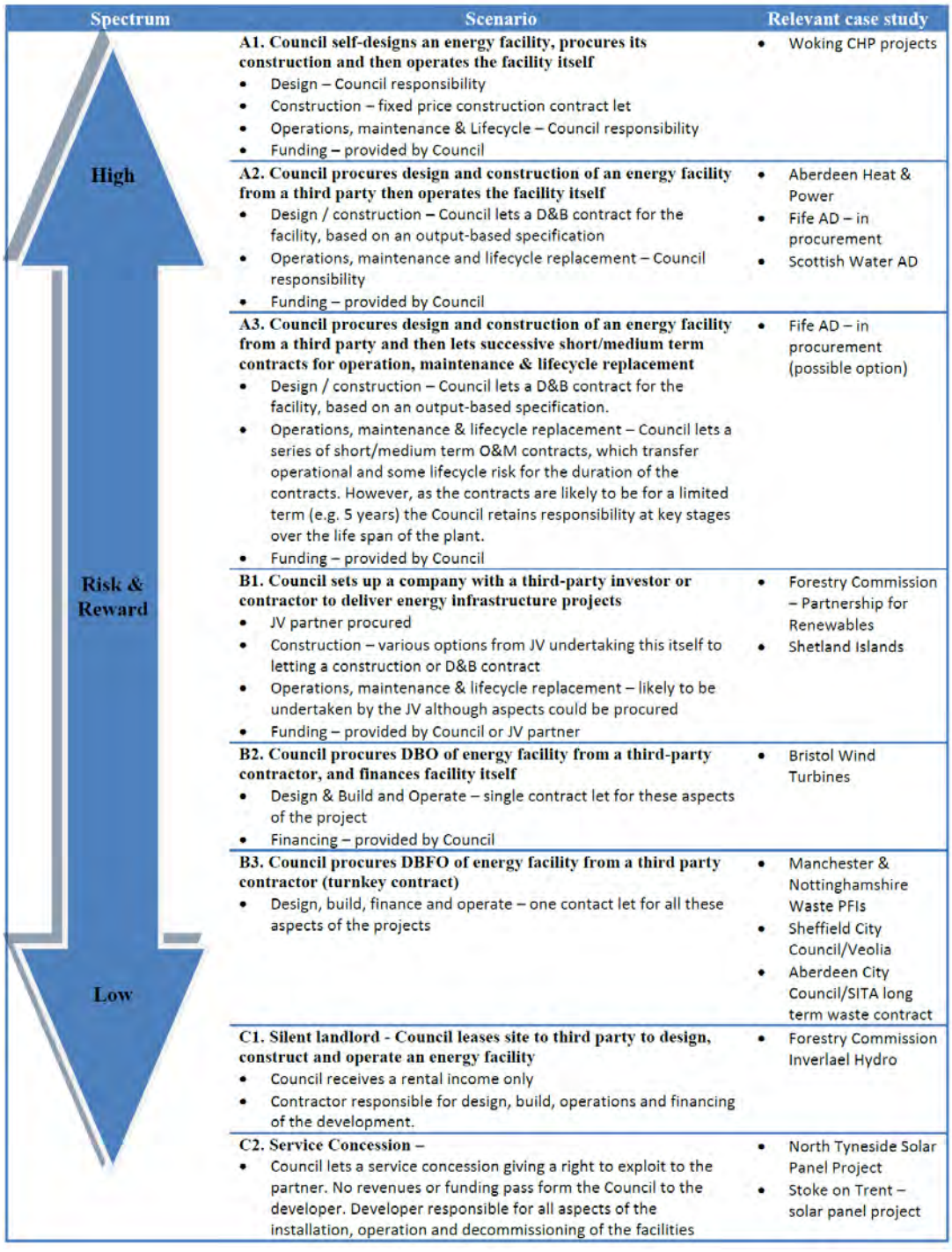
A range of commercial structures and funding sources have been developed and utilised by the public sector to deliver renewable energy projects. These can be broadly categorised as:

- **Category A – owner operator structures**: significant public sector involvement in the renewable facility which may include involvement in designing the facility; operating the facility and maintaining it over the duration of its economic life. These structures are often progressed where an Authority has a preference for full control or where there is a perceived market failure for example, with low financial returns limiting interest in projects which will address environmental or social objectives;

- **Category B – JV and partnership structures**: where the public sector enters into some form of partnership with the private sector to develop renewable projects. This could take the form of a joint venture partnership through to more formal PPP type structures or a combination of both. These structures are progressed where the public sector wish to retain an interest in the project (and often wish to transfer knowledge and experience into their internal teams). They allow risks and rewards to be shared; and

- **Category C – arm's length** under these structures the public sector makes no financial commitment to the projects and has little risk exposure. Examples include land lease agreements where the public sector effectively leases the land to a renewables developer and receives a land rental (and in some cases a share of the revenue from the electricity generated by the renewable assets developed). Service concessions involve the public sector granting a right to exploit an opportunity such as solar panels on council housing. These are often favoured in capital constrained environments where Authorities wish to maximise the environmental and social objectives whilst minimising the financial commitments and risks.

These are summarised within the following diagram in terms of the risks and rewards each structure may deliver.



We provide further details on each of the 3 structures below:

3.2. Category A – Owner Operator Structures

The owner operator spectrum of structures is characterised by the public sector taking an active involvement in the ownership and operation of the renewables projects. This section reviews the motivations for adopting this structure, outlines the characteristics of these approaches and provides an overview of the risks and rewards associated with this approach.

Motivations

Authorities appeared to adopt the owner operator approach where there was:

- A presumption that self delivery was more suitable, for example, there was existing expertise specific to the proposed technology (for example Scottish Water and its anaerobic digestion plant at Deerdykes) and/or the Authority had a more entrepreneurial approach to activities (for example, Woking Borough Council); and/or

- There was a perceived market failure and recognition that to achieve the environmental and policy goals of the Authority self-delivery would be required, for example, the London Development Agency and its proposals for CHP and local heat networks.

Characteristics of owner operator structures

Under these structures, the Authority retains the ownership of the renewable energy facility either as a division within its own organisation (for example, Scottish Water Horizons) or through a separate ESCo (for example, Woking Borough Council). The major activities undertaken on projects are:

- Design & Build– covering the physical design of any buildings and/or the technology which will be used. We assume that the design addresses any foreseeable changes in law and provides protection during the warranty period regarding the technology working efficiently for a specific set of circumstances (for example efficiency of output given the nature and availability of feedstock). The build contract covers both the construction of the facility and a defects liability period;

- Operation and maintenance– over the useful economic life of the facility is undertaken either by the Authority or a private sector partner under short-term contracts;

- Revenue – the Authority or ESCo are responsible for both the demand for their energy and the price that they will realise for this. Most Authorities manage this risk through only developing projects where there is an existing base load – for example, energy supplied to municipal buildings. Key constraints in this area are the need for grid

connections and the lack of clarity regarding the costs or timescales in which these can be delivered.

Within this category, we have identified 3 models which adopt slightly different approaches to each of the activities outlined above. These are:

	Design	Construction	Operation	Lifecycle
A1. Local Authority self-designs, procures the construction of an energy facility and is then responsible for all aspects of operation including lifecycle.	Self design	Construction contract let	Self operated	Lifecycle activities retained
A2. Local Authority procures a Design & Build contract and then is responsible for all aspects of operation including lifecycle.	Design & construct contract let		Self operated	Lifecycle activities retained
A3. Local Authority procures a Design & Build contract and then lets short term contracts for operations and lifecycle.	Design & construct contract let		Short term operational contracts are let	Short term contracts may also cover lifecycle

In these examples the procuring authority, as project sponsor, retains a significant role in the operation of the facility. Although we identified few examples of procuring authorities wishing to self-design renewables facilities there are examples where once constructed authorities wished to self-operate. These ranged from Scottish Water"s approach to the Deerdykes Anaerobic Digestion plant which they operate with a range of contracts with Local Authorities and private sector customers for feedstock. In this case the operation of an AD plant is not dissimilar to Scottish Water"s existing expertise and operational practices in

their core water and wastewater business. Within the Local Authorities sector, there are few examples of active involvement in the operation of renewables facilities. Where such examples exist, Authorities often structured their involvement through an ESCo (Energy Services Company) on an arm"s length basis for example, Woking Borough Council own 100% of Thameswey Limited who have established a range of SPVs (Special Purpose Vehicles) to develop and operate CHP plants.

Risks and Rewards

The owner/operator structures expose the procuring authorities to the maximum level of risk, which needs to be balanced against both the financial benefits which may be derived from the project and the wider environmental and social policy objectives which a project delivers.

Appendix C includes a matrix reviewing the high-level risks of each of the different commercial structures. This indicates that this category of commercial structure broadly retains the risks and rewards of ownership but that the following risks may be capable of being transferred:

- Risks associated with design are likely to be transferred (under categories A2 and A3) where the design contract details the required outputs and allows flexibility regarding the design of the specific solution. As the design should also accommodate foreseeable changes in legislation and regulations and the need to meet planning and regulatory requirements there should be a reasonable degree of risk transfer.

- Risks associated with operating and maintaining the plant are broadly retained under this category of commercial structure.

    - There may be opportunities to include short to medium term (e.g. 5 year) maintenance contracts with the original construction contractor or to procure separate operation / maintenance contracts. We understand that in practice, letting maintenance contracts after this warranty period can lead to significant price volatility;

    - The risks associated with sourcing feedstock (for example for biomass plants) can influence the operational effectiveness of the plant and need careful consideration and planning during the project development stage;

    - Managing the connection and supply of electricity can be complex and should be assessed and managed carefully during the development of the project; and

    - This approach can leave pricing risk with the procuring authority which may be best value especially if it provides a hedge against internal electricity consumption but may expose the authority to additional risks.

- Under this category of commercial structure risks associated with financing the facilities during construction (save to the extent that these are transferred under the design and construction contract) and during operations remain with the procuring authorities. Equally, Authorities retain the ability to control any surpluses generated and often look to reinvest these in similar projects within their locality– for example, Woking Borough Council.

Returns for these projects will be variable and as many Local Authorities operate these businesses on the basis of the reinvestment of surpluses they may not be a reliable indicator of the economics behind the project. From our case study review we have identified IRRs of 5%- 8% on individual projects which have been pursued to address a lack of private sector interest. Where such activities are being taken forward for commercial gain the returns will be significantly higher.

3.3. Category B – JV and Partnership Structures

A range of partnership structures have been used to deliver renewables projects across the public sector often mirroring those developed for other types of service provision or infrastructure investment. These range from:

- Joint Venture ("JV") and strategic partnership structures, where the public and private sector partners each contribute specific assets (for example, land or other physical assets, capital, know-how) and enter into arrangements to deliver services or projects on a shared risk basis. These can be structured as:
    - Public sector control of the JV; or
    - Private sector control of the JV; or
- Public Private Partnerships structures, where the public sector procure the provision of a service often utilising a dedicated asset which is built, maintained and operated by a private sector partner.

These structures can be financed through a range of different funding sources including direct Council funding, partner funding, commercial bank funding including EIB (European Investment Bank) and/or capital grants.

This section reviews the motivations for adopting these structures, outlines the characteristics of these approaches and provides an overview of the risks and rewards of this approach.

3.3.1. Joint Venture Structures

In practice these structures tend to be highly variable depending upon the exact objectives that the procuring authority wishes to meet and the assets that the parties are willing to contribute. We have therefore, outlined two JV structures at opposite ends of the spectrum:

(i) where the public sector retains control of the JV vehicle. This is an approach Scottish Water has adopted with Scottish Water Solutions which delivers part of its regulated capital programme; and

(ii) where the private sector controls the JV although an element of ownership is retained by the Authority. This is the approach originally adopted by Woking Borough Council in the 1990s.

Motivations

JVs can deliver a range of benefits and the table below summarises the key motivations for Authorities wishing to adopt each of these JV structures:

JV – Public Sector Control	JV – Private Sector Control
• Control of the JV is important to ensure the Authority can deliver its programme of projects and manage its business risks. • Authority has increased exposure to the risks of the JV‟s business. • JV brings a certain skill which is beneficial to the Authority for example, development expertise, design and build expertise, programme or project management, management of energy specifics for example, grid connections, sale of energy generated. • JV structure can ensure early involvement in the identification of opportunities for renewable developments and assist in taking these forward. The projects do not need to be defined in advance as they can be developed as separate projects in ring-fenced Special Purpose Vehicles (SPVs). • JV assists in up-skilling the public sector organisation so future similar	• JV structure selected so there is visibility of activities the JV partner is undertaking and an ability to share in the rewards through shared ownership. Risk exposure is limited through the Authority only having a minority interest in the project. • JV brings a certain skill which is beneficial to the Authority for example, development expertise, design and build expertise, programme or project management, management of energy specifics for example, grid connections, sale of energy generated. • JV structure can ensure early involvement in the identification of opportunities for renewable developments and assist in taking these forward. The projects do not need to be defined in advance as they can be developed as separate projects in ring-fenced Special Purpose Vehicles (SPVs). • JV assists in up-skilling the public sector organisation so future similar

JV – Public Sector Control	JV – Private Sector Control
projects or the operation of the existing projects can be undertaken by the Authority.	projects or the operation of the existing projects can be undertaken by the Authority.

Characteristics of JVs

Typically, the public sector provides the assets required to exploit the renewables opportunities such as the land or buildings (in the case of solar) and can also provide funding. The private sector brings the skills to develop the projects, to design and build them, manage the grid connections and the sale of energy and has the commercial experience of managing the risks and returns. In certain cases they also provide funding.

Characteristics of joint ventures can include:

- **Legal form** – these can be established as separate legal entities or be based upon a contractual agreement between partners. Where separate legal entities are established these usually ring-fence the assets and liabilities relating to the project into a separate company, partnership or other entity, which will then undertake the renewables developments. If no separate legal entity is created as the JV vehicle, then individual projects will commonly be developed with the creation of a separate legal entity. This entity will contract for the design, build and operation or the design, build, finance and operation of individual renewables projects. This is the approach the Forestry Commission has adopted with Partnerships for Renewables.

- **JV Management** – there are a range of options for the management of the JV in terms of the composition of the Board, share of voting rights and the right to appoint key positions on the senior management team. In practice, these will reflect the degree of control that the procuring authority and the private sector partner wish to exert over the JV vehicle.

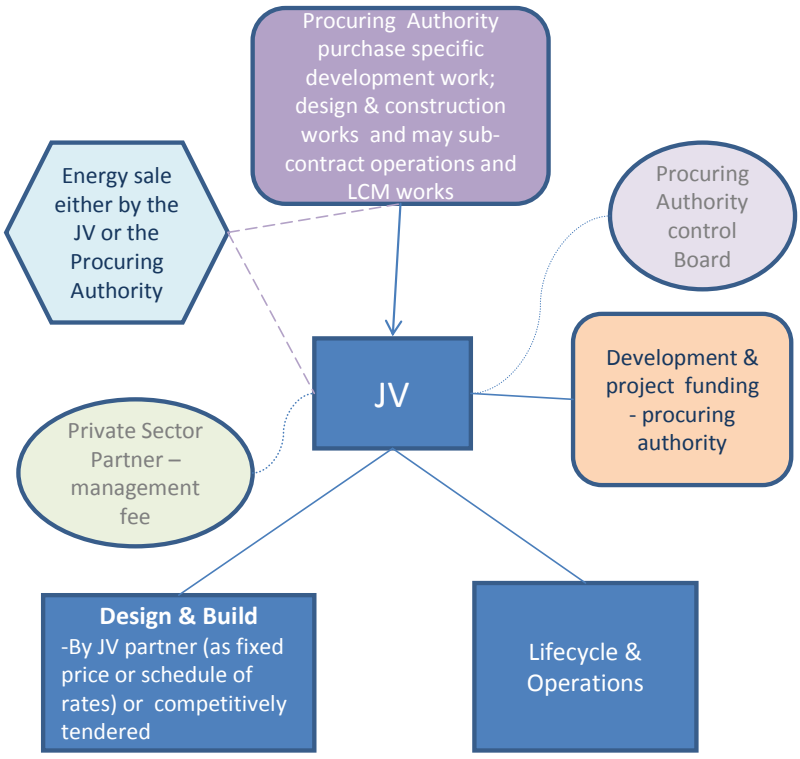
- **Returns** – these are likely to include dividend returns to all parties. Many JVs include a management fee to the JV partner which also incentivises the JV partner to manage the business effectively, to maximise returns or act in accordance with the wider objectives of the JV (for example, by reinvesting profits in new renewables projects). There is full reimbursement for any assets provided by the JV partners including secondment of key staff, repayment and interest on funding or the use of assets, for example, land and equipment.

- **Design & construction of facilities** – this may be let as a separate arm‟s length contract (in a similar fashion to the commercial structures A2 and A3 outlined above) or may be undertaken directly within the JV if the selected partner has the appropriate skills.

- **Operation, maintenance and lifecycle of the facility** - this may be let as a separate arm's length contract (in a similar fashion to the commercial structures A2 and A3 outlined above) or may be undertaken directly within the JV if the selected partner has the appropriate skills.

An example of a JV structure where the public sector retains majority control is outlined below:

JV: Procuring Authority Control JV (limited private sector returns)



JV Features:

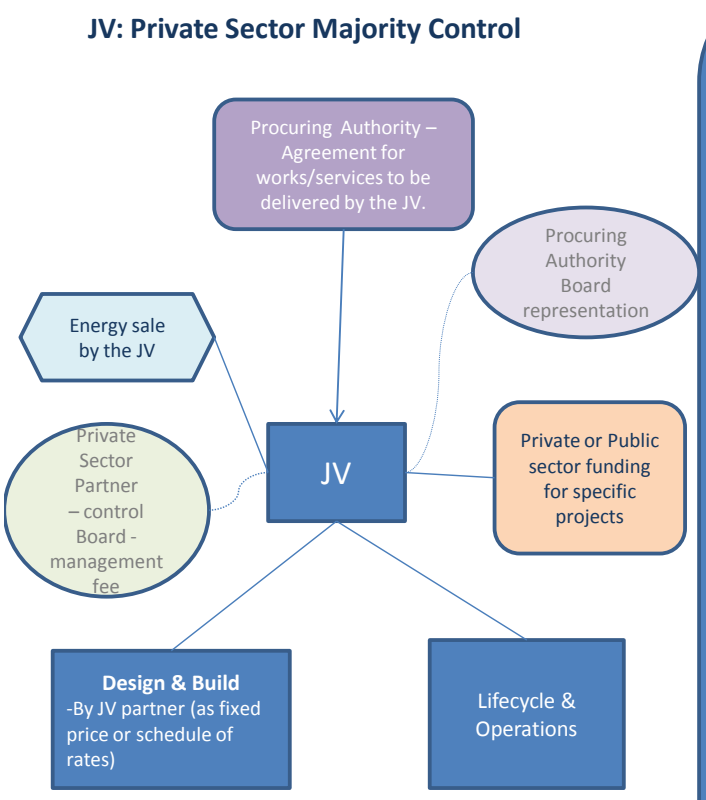
Procuring Authority
- Asset ownership remains with the Procuring Authority
-Funding is from the Procuring Authority as a purchaser of works and services.
- Procuring Authority retains control of the JV vehicle through control of the Board and voting rights
- Procuring Authority can either manage the sale of the energy or sub-contract to the JV.

Private Sector Partner
- Responsible for management of the delivery of projects form design through construction to operations and management
-Private sector partner may receive a return based on capital invested in the vehicle. However, their returns are more directly linked to the receipt of a management fee for delivering agreed projects and the ability to undertake the construction works.

Advantages and Disadvantages
Advantage of this JV structure is that it brings in private sector expertise to manage programmes of projects and in the identification and development of the technical solutions. It may also bring their expertise in to the operations and lifecycle management arena. Public sector benefit from project returns.

Disadvantaged of this structure is more limited risk transfer with losses potentially being limited to management fee deductions. Construction losses can also be transferred.

An example of a JV structure where the private sector has majority control is shown below:



JV Features:

-Asset ownership remains with the JV
-JV responsible for the generation and sale of energy
-Funding on a project specific basis from private or public sector. JV will retain significant loans which will require to be serviced.
- JV may be controlled by the private sector partner however, public sector will normally exert significant influence and control of key issues through the process of establishing the JV and the requirements included within the Articles & memorandum which cannot be amended without procuring authority agreement. Contract will also protect JV interests through rights to terminate in the event that the JV vehicle does not deliver the required works and services.

Private Sector Partner
- Responsible for management of the JV; delivery of projects from design through construction to operations and management ; sale of the energy
-Private sector partner will receive a return based on capital invested in the vehicle. Also, a management fee for delivering agreed projects and a possible share in income generation above certain thresholds. They may also undertake the construction works.

Advantages and Disadvantages
Advantage of this JV structure is that it brings in private sector expertise to manage programmes of projects and in the identification and development of the technical solutions. It may also bring their expertise in to the operations and lifecycle management arena and sale of the energy produced. It also transfers risk to the private sector who have increased exposure to the success and failure of the JV.

Disadvantaged of this structure is more limited ability for the procuring authority to benefit in the returns.

The selection of the most appropriate JV structure will depend upon the specific objectives of the Authority. Returns will vary depending upon the structures adopted and the risk and reward sharing provisions. An indicative analysis of the risks of JV partnerships is outlined within Appendix C.

3.3.2. Partnership – Design, Build & Maintain/Operate (DBO) and Design, Build, Finance and Maintain (DBFM)

These structures build upon the traditional PPP structure and are undertaken for a number of reasons. We outline below the motivations for adopting this commercial structure and provide an outline of the structures which have been adopted to date.

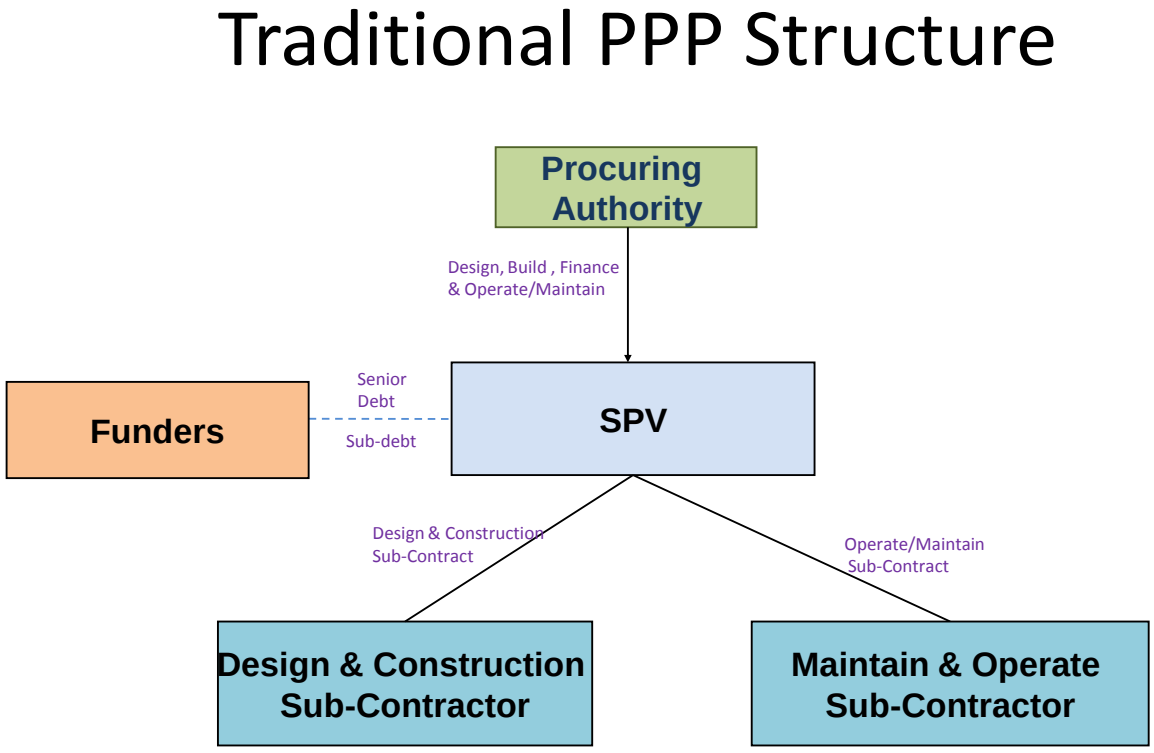
Motivations

Authorities select this approach when:

- There is a long term strategic need for the service and the Authority does not believe it has the required expertise or resources to undertake the activity itself. This is true of the large scale waste projects where renewables are often a product of the waste processing activities;
- The project is easily identifiable and can be ring-fenced in terms of delivery and funding; and
- The Authority wishes to minimise its exposure to risk and access long term capital and expertise to undertake the project. In these instances the due diligence approach of commercial lenders can bring added reassurance.

Characteristics of DBO and DBFM Contracts

The diagram below summarises the commercial structures associated with DBFM contracts which are based on the traditional PPP structure:



In these instances the procuring authority will issue a contract to design, build, operate and maintain the facility. In a traditional PPP contract this would also include a requirement to finance the development. The contractor establishes a Special Purpose Vehicle (SPV) which is solely responsible for undertaking a specific renewables project. The SPV in turn issues a sub-contract for the design and build of the facility with the construction risks transferred through this. A contract is also let to maintain and operate the renewables facility transferring these risks for the duration of the concession (normally 25-30 years but variable depending on the scale of the project). Where Councils let a DBO contract funding is likely to be

provided directly by themselves in conjunction with any available grants and occasionally bank funding.

In this example, the procuring authority as project sponsor is transferring significant levels of risk in relation to the design build, operation and maintenance of the facility. They may retain the risks associated with the funding and will receive returns which are commensurate with this risk. These types of structures are often seen within the waste industry and have been adopted on the renewables components of larger projects.

Partnership Structures - Risks and Rewards

The partnership structures permit the public sector to undertake significant levels of risk transfer often ring-fencing such risks in special purpose companies. However, the control that Local Authorities can then exert on the projects and the returns they will achieve are likely to vary to reflect the level of risk transfer.

Appendix C includes a matrix reviewing the risks of each of the different commercial structures. This indicates that this category of commercial structure includes models which allow significant levels of ownership risks and rewards to be shared with a third party development partner. In comparison to the owner managed models, the following conclusions can be drawn:

- Risks associated with design and build are likely to be transferred under all categories. As the design should also accommodate foreseeable changes in legislation and regulations and the need to meet planning and regulatory requirements there should be a reasonable degree of risk transfer. This is a significant difference to some of the owner manager structures.

- Risks associated with operating and maintaining the plant will be transferred under most partnership structures except perhaps the JV structure. In this case, if operations and maintenance activities are retained within the JV it will be due to the specific skills of the JV partner. In this case, there is likely to be greater risk transfer compared to an owner operator model.

- Risks associated with connections to the grid are likely to be transferred to the JV or PPP partner.

- Various approaches exist regarding the risk of electricity prices over the duration of the contract. These can be:

    - transferred to the private sector but in these instances returns to the procuring authorities are likely to be very low;

    - shared through a pre-agreed sharing mechanism; or

- the procuring authority takes 100% of the electricity supply as its own supply and effectively provide a hedge against future energy costs.

- Under this category of commercial structures risks associated with financing the facilities during construction (save to the extent that such risk is transferred to the construction contractor) remain with the procuring authority unless a DBFM contract is signed. However, unlike the owner operator model, Authorities‟ ability to retain control of any surpluses generated will be limited unless they have control of any JV company.

The partnership model straddles a spectrum of delivery options which allow the sharing of risks (and returns) which an Authority would retain under an owner/managed model. They often include provision for the sharing of income above certain thresholds. These structures tend to be expensive to procure and can take 12-18 months from OJEU to contract signature. As a result of this, many of the case studies to date reflect waste projects which include a component of renewable energy. These commercial structures would be able to deliver significantly smaller projects – say £20m – but are unlikely to be economic below this level. The reasons for this are explored in more detail within section 4.

3.3.3. Category C – Arm's Length Structures (for example, third party developer or service concessions)

This category of commercial structure seeks to transfer the majority of the risks (and rewards) of the project to the private sector. This section reviews the motivations for adopting this approach, outlines the characteristics associated with these projects and approaches and provides an overview of the risks and rewards of this approach.

Motivations

- Achieving environmental and social policy objectives for example, decreasing carbon emissions or alleviating fuel poverty within a capital constrained environment.

- Where Authorities do not view energy generation as a key activity they wish to undertake either as owner/operators or in a partnership structure and therefore wish to minimise their financial commitments/exposure.

A number of structures have been adopted within the renewables area including third party developer agreements and service concessions.

Third Party Developer Contracts

Third party developer contracts are the least risky from a public sector perspective. They involve the public sector making available an asset (normally land) upon which a renewables project can be developed by a third party developer. The Forestry Commission have implemented these in the Inverlael hydro electricity project and Scottish Water has wind turbines under similar arrangements. In these cases, the procuring authority will receive a lease rental and may be able to share in some of the income from electricity sales. The

contracts are typically for [10-15] years; involve limited set-up costs and no significant exposure to the development or operation of such facilities (although in some cases developers will not be interested unless planning and consents have been progressed).

Service Concessions

Service concession arrangements involve the public sector granting a right to develop and exploit the asset. This approach has been adopted on a number of solar panel projects. In these instances contractors are fully responsible for the supply, delivery, installation, connection and the long term operation, insurance and maintenance of the renewable energy solution system. The contractors assume the commercial risk associated with the financial returns that may be generated from such opportunities. Payments are made to the Procuring Authority by the contractor based on a roof access arrangement to housing stock/municipal buildings together with the possibility of a share in the revenue arising from energy generated in excess of a stated target. The duration of the contract can be for up to 25 years.

The risk matrix within Appendix C indicates that all risks are transferred except revenue risk, which would normally also be transferred, but may be shared if there are income sharing provisions within the contract.

Conclusions

A range of commercial structures and funding sources are available to Local Government bodies wishing to take forward renewables projects. The most appropriate structure is likely to reflect:

- **The specific objectives** of the Authority for example, the policy objectives they wish to meet, the degree of project control they wish to exert and the most appropriate renewable technology for the assets they have available for energy production.

- **The risk appetite of the Authority**. The silent landlord/developer options expose the public sector to the least risk and may be appropriate where the objectives are around lowering a Council"s carbon footprint and/or increasing revenue streams with minimal risk. The commercial structures where the Authorities are responsible for owning, operating and financing a renewables facility will expose Councils to the highest risk. Procuring Authorities may be comfortable with this following an analysis of how they will monitor and manage these risks.

- **Best Value and Affordability** – Councils will need to assess these projects in the context of their duties to deliver best value and to ensure that such investments are affordable. This will include assessing the level of funding contributions required, the risk associated with that funding and the wider project risks.

The table below summarises the broad relationship between the various policy objectives and the commercial structure adopted to date.

Policy Objective	Commercial Structure		
	Owner Operator	Partnership	Arms Length
Financial Return	√√√ This model can either: (i) maximise returns for subsequent investment in less financially attractive projects; or (ii) be adopted where project returns are anticipated to be too low for it to be attractive to the private sector. Projects taken forward due to lack of private sector interest tend to provide IRRs of 5%-8%	√√ Returns are linked to (i) any financing provided; and (ii) any sharing in electricity revenue above certain pre-agreed thresholds	√ Return may be nil as no capital is invested. There may be an asset rental income stream (e.g. on land leased for wind turbines) and limited risk sharing of income.
Environmental **(e.g. reduce carbon dioxide emissions; carbon impact)**	√√√ Can be established to meet required environmental objectives. Under these structures subsequent returns are often ring-fenced to invest in other projects meeting these policy objectives.	√√√ Can be established to meet required environmental objectives.	√√√ Can be procured to meet specific environmental objectives for example, service concessions as a means to promote solar energy. However, they may also be very opportunistic in nature with ad hoc developments occurring when promoted by private sector interest.
Social **(e.g. fuel poverty)**	√√√ Under these approaches the Authorities often retain pricing risk and have maximum flexibility to address issues such as fuel poverty.	√√ In these circumstances, the partnership is likely to opt to maximise the income from energy sales and therefore the impact on social objectives may be lower unless specifically captured within the contractual documentation.	√√ These can be motivated by social policies for example, installing solar panels to address fuel poverty. However, the extent of the Council‟s influence will be dependent upon the contractual provisions. In certain structures such as the silent landlord the returns to the local community or the availability of local discounts to electricity prices may be limited.

In terms of technology, the case studies did not indicate that one procurement approach favours any one technology type although we would note for the following technologies:

- **Anaerobic digestion** – Scottish Water has the only operational AD plant within Scotland. They have developed and operate this through their subsidiary Scottish Water Solutions. However, the operation of this facility is similar to their core activities of managing and processing wastewater and sewage. The ability of the wider public sector to manage these types of projects should be carefully considered before they embark on an owner / operator commercial approach.

- **Solar** – this technology can be delivered through any of the three commercial structures identified. However, it was associated with the service concession structure with few examples of other renewable technologies being procured through such an approach.

Further details on the funding available for renewable energy projects are included within Section 4.

4. Funding for Renewable Energy Projects

This section reviews the funding sources which may be applicable to renewable projects. Careful consideration should be given to the most appropriate funding sources and how the availability of those may influence the commercial structure an Authority adopts to deliver its renewable energy projects.

4.1. Introduction

A range of funding sources are available for renewables projects with the most appropriate funding mix being dictated by the characteristics of the individual project including commercial structures, technology, scale and the differing cost of various sources of funds.

The majority of projects will be funded by both risk capital in the form of equity, and in some cases subordinated debt, with senior funding being introduced either during or following construction. This section focuses upon the commercial debt which can be provided to projects rather than the subsidy or grant structures which may be in place at any one time. Details of these can be found at: Energy Saving Trust: Funding in Scotland. These sources of grant funding will often provide either a contribution to the development and construction costs or provide a subsidy once the energy is generated. They will be assessed as part of the viability and funding strategy of the individual projects. The table below provides details regarding the various forms of funding available and a commentary on when these may be most appropriate.

4.2. Funding Sources

Funding Sources for renewables projects	Commentary
Council Funding	Increasingly, Councils are examining the opportunity of funding renewables schemes directly through either PWLB or their wider capital budgets. If funding is invested in an arm"s length company, Councils will need to comply with their Standing Orders and Local Government Regulations.
Partner Funding	Many renewables schemes are self-funded by the selected partners especially where these partners are utility companies. This funding is often replaced post-construction with commercial debt. This results in a lower cost of capital and an increase in the project"s IRR (internal rate of return). Partner funding will be agreed on an individual project basis.
Commercial Debt	This is provided by banks on normal commercial terms. It differs from project finance in that the security packages are not necessarily ring-fenced to the specific project. This type of commercial funding may be possible for projects below £15m.
Project Finance	This type of funding requires that a separate company is established which ring-fences the cash flows of the project. The project finance is then secured on these cash flows. This type of funding is common in the PPP arena and is unlikely to be suitable for projects below £20m. It is also likely to be for contract periods in excess of 15 years.
EIB	EIB lending for renewable energy has grown dramatically over the last few years to reach EUR 6.2bn in 2010. The share of renewable lending in the overall EIB energy portfolio tripled from below 10% in 2006 to more than 30% in 2010. The majority of this lending is directed to wind and solar power generation. EIB has become a key source of finance to the market in these sectors. The EIB has developed a range of other financing means, such as equity and carbon funds, to further support renewable energy and energy-efficiency projects. The Bank also works upstream with project promoters providing technical assistance to develop projects. The EIB is involved in a significant pipeline of clean energy projects both inside and outside the European Union. It is also managing and participating in several other initiatives or programmes related to energy and climate change, such as the Mediterranean Solar Plan (MSP) and the GEEREF (Global Energy Efficiency and Renewable Energy) funds. Details of EIB"s services can be found at: EIB Renewable Energy Projects

Funding Sources for renewables projects	Commentary
European Energy Efficiency Fund	A dedicated financial instrument promoted by the European Commission and the European Investment Bank in order to support energy efficiency projects and renewable energy sources, particularly at urban and regional level. It is targeted at sustainable energy projects promoted by public authorities in the EU. The funds available are up to €205m – contributed as follows EIB € 75 m, EU €125 m and Deutsche Bank €5 m. The investment manager is Deutsche Bank. The individual schemes to be financed are likely to be small although we understand that collaborative schemes will be favoured. The fund is designed to bring about environmental benefits by supporting projects that help to mitigate climate change as follows: • 70 percent of the financing will be for energy efficiency projects, such as street lighting and advanced energy metering and monitoring, plus energy efficiency in buildings; • 20 percent of the financing will be for renewable energy projects; and • the remaining 10 percent used for transport energy efficiency. Investments must achieve at least 20 percent primary energy savings for energy efficiency projects, except for the building sector where a higher percentage is required and 20 percent reduction of CO2 emissions for transport. Further details at:http://www.eib.org/attachments/eeef_faq.pdf
Grant /Loan / Incentive Funding	A range of grants, loans and incentives are available to either contribute to the capital cost of the project for example, wrap funding; funds from JESSICA if the project is also associated with urban regeneration or ERDF funding. Operational funding comes in the form of incentives such as FiTS or Renewable Heat Incentive. A summary of the current grants available can be found at: Energy Saving Trust - Funding in Scotland

4.3. Funding under the different commercial structures

The different funding sources summarised above will vary in their applicability to Local Government projects reflecting the commercial structures and the technology involved as indicated in the table below:

Funding Source	Commercial Structure			Notes
	A	B	C	
Council Funding	√	√ Not (DBFO)		Local Authority funding can be provided through capital budgets or PWLB borrowings. In the partnership models, the Authority will need to structure their funding to ensure compliance with regulations regarding on-lending. This funding would be suitable for all types of renewable energy technology although the Authority will wish to assess the risk profile of the projects.
Partner Funding		√	√	This will be negotiated on an individual project basis. The funding is often used during the development phase and replaced with commercial debt once the project is operational. The terms are likely to be specific to the project being undertaken. This type of funding would be suitable for all energy types.
Commercial Debt		√	√	This funding is likely to be most attractive in energy sectors where the technology is established. It may be available for emerging technologies but is likely to require an enhanced security package.
Project Finance		√	√	As for commercial debt. This form of funding will be suitable for long term, ring-fenced projects with a capital value greater than £20m. Project finance has been delivered for onshore wind, solar, waste and anaerobic digestion. It favours established technologies.
EIB		√	√	EIB are active within the renewables market supporting the wider EU policy objectives in this area. Their priorities and selection processes for renewables projects do vary and they should be approached on an individual project basis. This type of funding may be suitable for all energy types.
Grant/Loan/ Incentive Funding incl. European Energy Efficiency Fund	√	√	√	The terms of the individual grants will determine their eligibility to fund specific initiatives and these should be reviewed on a case by case basis. This funding may be suitable for all energy types depending upon specific terms of the scheme.

The following section provides a route map for Local Government to assist in the assessment of renewables projects and in determining the most appropriate commercial and funding structure to adopt.

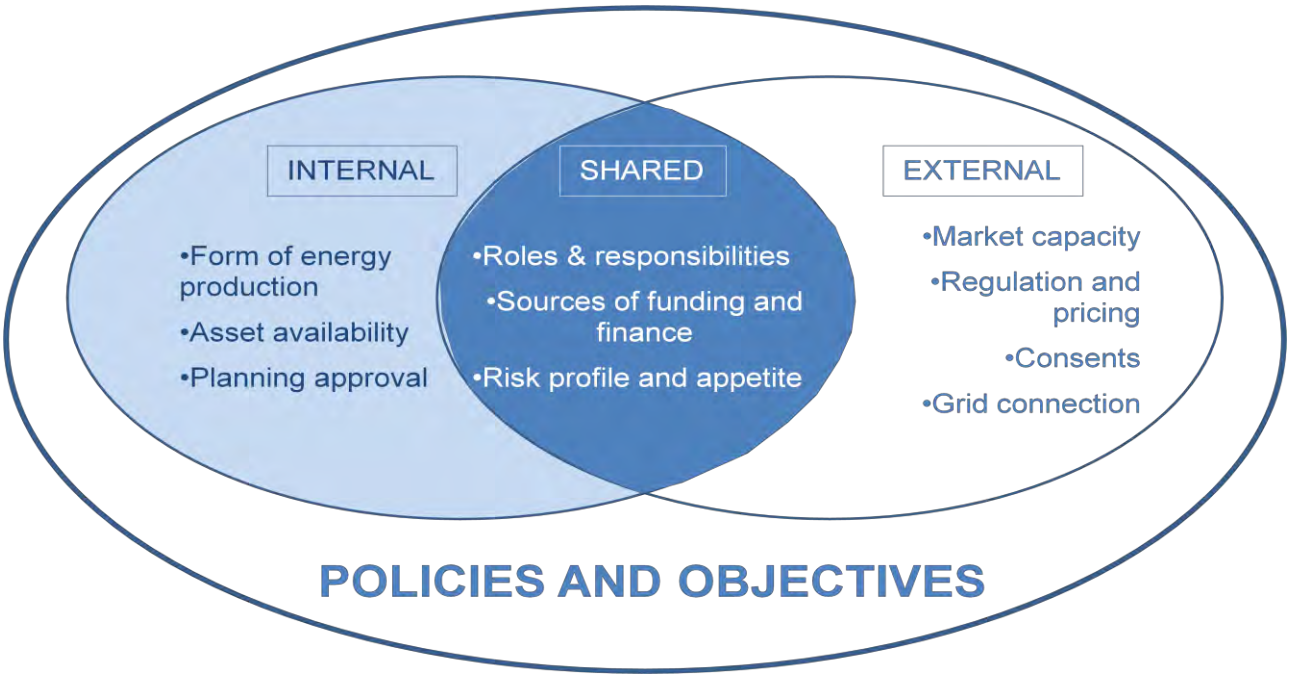
5. Opportunities Route Map

This section provides a suggested approach to the development of renewable energy projects. The process will need to be iterative as Authorities consider which assets best lend themselves to which renewable energy technology; and then evaluate the most appropriate commercial structures and funding routes

5.1. Introduction

The commercial structures outlined in the previous section provide a broad spectrum of potential ways in which Local Authorities can deliver energy production opportunities in their area, and the preferred option for any development will need to consider a number of factors, as identified in Section 2, 3 and 4. These factors are represented below in terms of those that are:

- internal to Local Authorities and therefore primarily in their control;
- external and less directly influenced by Local Authorities; and
- likely to be determined through a shared process between the Local Authorities and external third parties.



5.2. Route map

In order to put the commercial drivers and potential structures into the context of the overall decision making process, we have set out a suggested route map to assist Local Authorities. The route map provides a step by step process for any Local Authority considering establishing an energy production plan through to the delivery of individual initiatives. It provides an indication of the activities anticipated at each stage and the expected role of the key players in the public sector as well as the wider renewables and investment market.

Policy objective/outcome	•Identify the key policy objectives (such as carbon reduction, employment, fuel poverty, financial etc) and desired outcomes for the development of energy production facilities
Identify Assets	•Review asset base within an Authority to establish potential sites where renewable energy production could be developed
Identify energy form(s)	•Review the potential forms of energy production that could be appropriate for the asset base identified
Strategic feasibility	•Undertake a strategic options feasibility assessment of the potential assets and energy forms identified and the impact they could have on delivering objectives/outcomes
Strategic Commercial review	•Establish clear commercial framework for the strategic plan including the scale, nature and timing of the proposed infrastructure developments, risk profile and risk appetite.
Market Sounding	•To assess deliverability and assist prioritisation, undertake initial market sounding exercise to establish potential partners, funders as required to implement strategic plan
Opportunity specific Business Case	•Based on this interest/proposition, Authority to develop detailed Business Case(s) that clearly articulates the outcomes, commercial proposition and investment needs
Business Case review	•Public Sector review of the Business Plan to assess robustness of the proposed commercial structure and financing arrangements
Implementation plan	•Finalise commercial structure, funding requirement and develop detailed plan to deliver the preferred solution
Procurement	•Initiate procurement of the preferred option

It is worth noting that this route map is indicative and decision making will not always be sequential. In many instances, depending on the outcome of a given stage, an iterative process might be necessary. For example, the market sounding exercise may reveal capacity issues for a given technological solution and require the overall strategy to be revisited. It will also be important to consider the potential opportunities for collaboration and aggregation at key stages of the decision making process. Options for and issues related to collaborative arrangements are explored in Section 6 of this report.

5.3. Development of the Business Case

A key aspect of the decision making process that draws together all the relevant issues is the development of an opportunity specific business case, and it is in this document that the fundamentals of a preferred commercial structure will be established and set in context of the wider considerations for renewable energy production. The opportunity may relate to a specific site, the wider exploitation of the Local Authority"s assets or a collaborative opportunity. Below is a summary of the anticipated content for such a business case; a more comprehensive structure for such a Business Case is provided in Appendix D.

- **Context of the Scheme**. An outline of the overall policy objectives and desired outcomes and how the proposal delivers against these.
- **Benefits Analysis**. The benefits analysis should be structured to reflect the anticipated outcomes of the proposal and is likely to include economic benefit, carbon impact, and others such as social/fuel poverty in both a local and national context.
- **Development Investment Plan**. Providing a high level description of the development, outline costs and revenues and programme to completion.
- **Risk**. A description and full consideration of risk - including identification, allocation, mitigation and management – and the potential impact of this on project viability and deliverability.
- **Commercial and Financial Structure**. A description of the proposed commercial structure including details of key agreements / contracts likely to be required, and how the overall structure addresses the key risks and issues identified. Also to include cash flow analysis, including investment requirements and projected returns, sources of funding and key sensitivities.
- **Next Steps**. Should include discussion of programme and key milestones, critical next steps towards delivery and the strategy for taking forward the project and responsibility for doing so. This should include consideration of the procurement route, i.e. restricted procedure, competitive dialogue or, in the case of service concessions, alternative approaches as appropriate.

5.4. Conclusion

Given the objectives of the report, the focus of this section is on identifying the key commercial aspects of the opportunities route map. Clearly other components of it will require further enhancement which could be developed as part of a further phase of work.

6. Collaborative Procurement Frameworks

This section provides initial thoughts on approaches which could be jointly developed by Authorities to take forward schemes to maximise benefits, achieve economies of scale, share knowledge and facilitate funding. The suggestions range from standardisation of contracts and commercial terms for stand-alone projects to frameworks and joint procurement initiatives.

6.1. Introduction

The opportunities for common approaches to procuring renewables facilities will vary by the type of commercial structure adopted and in some cases by the technology itself. This section highlights the procurement approaches which may be appropriate and provides some background as to their applicability to renewables projects. The procurement approaches reviewed include:

- The development of standardised contracts and procurement documents for use within the Local Government sector for a series of stand-alone projects procured separately;
- The use of frameworks for the design and installation of renewables facilities and for the operation and maintenance of such facilities;
- The procurement of a joint development partner for a number of local authorities with the ability of individual local authorities to call off individual renewable projects. This could be in the form of a JV mirroring structures taken forward in other areas such as the hub initiative in Scotland, which is detailed further at 6.4[20]; or
- A specific PPP project between a number of public sector bodies for a partner to design, build, maintain and, if required, to finance a renewables development.

The Table overleaf illustrates four potential collaborative procurement approaches that may be applicable to the commercial structures identified within Section 3 of this paper:

[20] SFT: The Hub Initiative

Collaborative Procurement Approach	Commercial Structure			
	A. Owner Operator Approach	**B: JV Partner Approach**	**B: Partnership through DBO/DBFM**	**C: Arms Length** **Third party developer/ Service Concession**
Standardised Contracts and Procurement Documentation	√	√	√	√
Frameworks	√	√ Frameworks are established by the public sector but accessed by the JV partner which can provide economies of scale.	-	√ - third party developers
Jointly appointed development partner	-	√	√	√
Joint procurement for a PPP partner	-	-	√	-

Further information on each of the procurement approaches is outlined below.

6.2. Standardised Contracts

If Authorities wished to procure similar stand-alone contracts, standardised contracts and procurement documentation could be developed. This would facilitate shorter procurements and avoid duplication of effort, for example, in developing tender documentation and contracts. There are already well established contracts which have been used for private sector renewable projects which could be developed to suit public sector procurement requirements.

6.3. Frameworks

The use of framework contracts to purchase commodities or services is very well established within the Scottish public sector, for example, through Procurement Scotland and Scotland Excel. Details of these organisations and their services can be found at:

Procurement Scotland and Scotland Excel

In addition, Scottish Water has recently established it"s renewable frameworks for both solar panels and windfarms.. Further details on these can be found at: Scottish Water Frameworks

The use of frameworks by local authorities to design and build or install renewable assets, or to provide operation and maintenance services, would be possible. We would envisage that firms would pre-qualify for frameworks which could cover the supply and installation of say small-scale wind turbines or solar panels. Local authorities who wished to take forward these projects on an owner/operator type basis could then access these frameworks on a call-off basis or undertake a mini-competition to determine which supplier would best meet its specific project requirements. Frameworks are most suitable for the purchase of known commodities/equipment and of professional advisory services. Frameworks may only operate for a maximum of 4 year period however.

The Scottish Government has organised an energy purchase framework which permits the purchase of electricity from local sources. When undertaking the feasibility studies of their projects, Authorities may wish to examine this as an approach to managing the sale of electricity to the grid and their forward hedging of energy costs. In particular, the exploration of framework structures utilising particular renewable technology which operate on the basis of a power purchase agreement which is then sleeved into the Scottish Government central electricity contract is worthy of further exploration and is identified within our next steps within chapter 7 of this report. We would recommend that Local Authorities approach the contacts listed on the website above. Further details of this framework can be found at Energy Purchase Framework.

6.4. Jointly appointed development partner

There is the opportunity for a number of local authorities to procure a development partner or partners. The development partner would then work with individual local authorities to develop individual renewables projects. This approach has been adopted by the Forestry Commission, Scottish Water and is similar to the approach adopted within hub for community care facilities. These are forms of JV partnerships.

This approach would be subject to a contract between the procuring authority and the development partner, which would not necessarily require a special purpose vehicle with a separate legal entity to be established.

The individual renewables projects taken forward under the development partnership would normally require a separate legal entity to undertake the project which is likely to be based upon a design, build and operate contract or a design, build, finance and maintain contract. These would be called off from the main development partnership agreement and would not require separate procurement (on the basis that such projects were envisaged by the scope of the original procurement of the developer partner).

This concept is similar to the approach adopted by the Forestry Commission in its relationship with Partnership for Renewables, in which Scotland is split into 6 regions with a

separate development partner in each region. These partners work with the Forestry Commission to develop individual opportunities and sites, to be taken forward as ring-fenced contracts often utilising special purpose companies or vehicles (SPCs of SPVs). It is also similar in concept to the hub initiative where a Private Sector Development Partner is appointed to undertake a joint venture with various public sector organisations. This JV then establishes separate companies to take forward individual projects and more details can be found within Appendix B.

6.5. Jointly procured PPPs

These approaches are already well established in areas such as waste. In taking these forward careful consideration needs to be given to governance structures; sharing of returns (through income sharing provisions) given the share of assets contributed; and, the relative commitments undertaken by each partner (for example share of the unitary charge; share of any compensation payable to the partner for opening up or on termination.)

7. Summary and Next Steps

This section summarises the findings to date and suggests various Next Steps.

7.1. Introduction

The enabling legislation - the Sale of Electricity by Local Authorities (Scotland) Regulations 2010 – has permitted Local Authorities in Scotland (and the wider UK through equivalent legislation) to sell electricity generated from specific renewables sources. This has promoted significant interest in how such projects can be taken forward.

The first projects to take advantage of this enabling legislation – such as Bristol"s wind farm project – are often in a relatively early stage of development or about to move to procurement. Prior to the enabling legislation, many renewable projects were taken forward as part of wider waste management initiatives such as the Greater Manchester Waste Disposal PFI contract signed in 2009. Other sectors in Scotland have been able to progress their renewable energy agenda more quickly, with the Forestry Commission establishing six development partnerships across Scotland and Scotland Water progressing a number of renewables initiatives including anaerobic digestion plants, wind farms and hydro schemes.

7.2. Commercial Structures – determining the most appropriate approach for your projects

Section 3 of this briefing paper reviews a wide range of commercial structures which have been adopted across the public sector to deliver projects which include a renewables element. These include owner managed structures, partnership structures, land lease agreements and service concessions. The applicability of the different structures will be dependent upon the assets available; the nature of the project to be taken forward (i.e. scale, technology); the objectives of the procuring authority and their risk appetite. Section 5 provides a route map of how individual projects can be assessed by Authorities. This provides a guide to the key steps in the appraisal of a renewables project and the selection of appropriate commercial structures.

7.3. Procuring Renewables Projects

There are a number of mechanisms by which Local Authorities can take forward and make use of common procurement frameworks. Within Section 6, we outline four approaches which could be adopted:

- The development of standardised contracts and tender documents for use across the Scottish Local Authority sector for stand-alone projects;

- The use of frameworks for the design and installation of renewables facilities and for the operation and maintenance of facilities;

- The procurement of a joint partner for a number of local authorities with the ability for individual local authorities to call off individual renewable projects. This could mirror the structures taken forward in other areas such as the hub initiative in Scotland; and

- A specific PPP/JV project between a number of public sector bodies for a partner to design, build, maintain and, if required, to finance a renewables development.

7.4. Next Steps

There are a number of themes emerging from this review which deserve further exploration and research. These include:

1. **Experience sharing and monitoring** - continuing to collate information, monitor and build upon public sector best practice experience of renewables projects. This could include developments such as standardised procurement documentation and contracts across the public sector, and active knowledge sharing between procuring authorities. The learning points from projects should be tracked to ensure that best practice is continually evolving.

2. **Assessing demand for common procurement approaches** - examining the need and Local Authority appetite for the common procurement models reviewed in this report. For example, the use of frameworks to purchase the installation or maintenance of renewables facilities is only likely to be viable if there is sufficient demand. This should be assessed so that, if required, the approaches can be procured on a timely basis.

3. **Joint Working – Joint Development Partners** - there may be benefits to the procurement of a joint development partner across a number of Authorities. The joint development partner would take forward a range of individual projects for a number of Authorities. This would have the advantage of minimising procurement times over a number of projects and enabling one partner to work proactively to identify viable renewables projects. However, it may be felt that this would be limiting unless the selected partner could provide access to a range of renewables technologies.

4. **Route map development and consultation** - the concepts outlined within the route map should be further explored and enhancement made to those areas not the main focus of this report. This could be done through detailed consultation over the summer

period with certain group including: Scottish Renewables, local authority professional groups, SOLACE, Energy Officers Network and Waste Managers Network.

5. **Pathfinders** - consider the opportunities for pathfinder projects to be identified. The aspects of these which worked well or where lessons were learned could then be applied to subsequent projects developing best practice across the sector. These could reflect a range of commercial structures and renewable technologies with priority being given to those projects which are most developed to ensure dissemination of information to other projects. Any such approach could be applied to small scale stand-alone projects or larger, collaborative projects. The key issue will be to select a project which is deliverable within a time frame which allows the dissemination of any lessons learnt on a timely basis.

Appendix A – Scope of Briefing Paper

COSLA: Energy Production in the Public Sector

Introduction

Following internal discussion, COSLA has approached SFT to assist in the development of a briefing note which will facilitate Local Government development of renewable energy projects in conjunction with the private sector. This follows a 2010 change in the Local Government Miscellaneous Provisions Act 1976 which permitted Local Authorities to sell electricity generated from renewable sources.

This paper summarises our understanding of the objective of this study and provides a guide to the type of activity we will undertake.

It is understood that a draft report is required by mid May 2011.

Objective

To identify and outline possible commercial structures to deliver energy production within the Scottish public sector and to identify approaches such as common procurement frameworks which may help standardise the potential relationship between the public and private sectors.

Output

Development of a briefing note on the commercial structures available to deliver renewable energy projects involving Local Government/the wider Scottish public sector and the private sector. This will cover:

a. Background:
    i. legislative context
    ii. energy forms considered (electricity from turbines, anaerobic digestion, waste and photovoltaic; gas from anaerobic digestion and direct heat from waste and other sources; others not identified by the COSLA brief but which may be worthy of consideration e.g. solar)
    iii. UK policy developments and experience e.g. the development of the Green Investment Bank; DECC guidance

b. Scottish Context: summary of the Scottish policy context e.g. the National Renewables Infrastructure Plan and how this links to major investment development and micro developments. Link to UK wide developments.

c. Overview of Current UK Public Sector Experience: - of heat, gas and electricity generation including case studies (for example, a selection of Sheffield, Manchester, Bristol, Aberdeen, Shetland Islands and Scottish Water as outlined in the COSLA brief and others to be identified). *Local Authorities are invited to suggest specific case studies for review although it should be noted that, due to time constraints, it is envisaged that only eight can be reviewed in detail. Any such suggestions should be forwarded to SFT by 21 March to viv.cockburn@scottishfuturestrust.org.uk.*

d. Summary of Possible Commercial Structures and sources of funding: for example, joint ventures; partnerships (e.g. Trust structures); private sector developments etc. and identification of possible funding sources for example, PWLB, commercial funders (e.g. Co-op and Barclays), private sector funding through JV arrangements etc….

e. Opportunities for the Scottish Public Sector: to assess the potential commercial structures and their suitability for the types of renewable projects the Scottish public sector may wish to take forward.

f. Common procurement frameworks: identification of possible common procurement frameworks and recommendations regarding the development of these - for example, areas where further research may be required; implementation issues to be considered; the development of specific guidance.

g. Summary and Next Steps: – summary of the findings and identification of the next steps to take forward the initiatives.

Appendix B – Case Studies

Introduction

SFT has reviewed a broad range of case studies designed to capture a cross section of the available commercial structures and the different renewables technologies. The case studies have been recorded within a standard template. Explanatory notes regarding this template are provided below. The aim of our review was to draw out the differences and classify each project in terms of the contract structures described in Section 3.

Standard Case Study Template – Explanatory Notes

A standard template was completed for each project to allow for a comparison between all case studies. The template covers:

- **Parties section** - reflects the nature of the contract and who is leading the project.
- **Type of contract** - records whether a party is classified as principal or supporting. For example a joint venture such as the Shetland Islands Wind Farm the principal party is the JV company (Viking Energy Partnership) and the supporting parties are the companies behind the JV - in this case Shetland Charitable Trust and Scottish and Southern Energy plc. This differs from a lease agreement such as Inverlael Hydro where RWE npower plc is the principal party and the forestry commission the supporting party. It differs again from a PPP contract where the principal party is the Local Authority and the supporting party the private company.
- **Infrastructure** - briefly describes the project to provide context to the information that follows.
- **Project details** - covers basic information such as how, and by whom the facility / site will be operated including:
  - **Commercial structure** between the parties, for example is it an ESCo or JV.
  - **Form of the principal contract -** this could be a standard form contract (such as NEC, JCT etc.), a PPP/PFI type contract, the local authority‟s template or a contract specifically designed for the project.
  - **Who installs / maintains the facility / equipment** and therefore takes construction and /or maintenance risk.
  - **Who owns the site / kit -** this doesn‟t need to be the same company.
  - **Who does the facility / kit revert to on contract expiry** and therefore who takes residual value risk.

- **Electricity Sale / Heat production** – details the type / quantity of energy produced; where it is provided to; which party sells it and which party receives income. In most cases any electricity is provided to the grid and in the case of plants (for example, Energy from Waste, biomass) some will be used to power the plant. The party that sells the electricity will vary depending on the project, the asset, the existing conditions and the parties involved in the contract. The party which receives income from the energy depends on the contract structure. There is often a sharing structure agreed within the contract. In the case of PPP projects such as Nottinghamshire Energy Recovery facility there is a sharing mechanism which comes into force if income from the plant surpasses a certain level. Within Joint Venture structures the income is shared and where the council have procured a D&B contract such as Fife AD plant, they will be able to keep all the income.

- **Inputs and outputs** – this section of the case study template was often more difficult to populate. The set up costs, operation and maintenance costs and incomes are often commercially sensitive and therefore have not been disclosed in some cases. Income can be derived from Renewable Obligation Certificates (ROC), Levy Exemption Certificates (LEC), Feed in Tariffs (FIT), Renewable Heat incentives (RHI) and Carbon Reduction Commitment credits (CRC Credits) as well as the sale of electricity to the grid. Stating the amount of energy produced by the site / facility made it easier to compare different sized projects and sites. For example, FIT"s are only available for projects that produce less than 5MW.

- **Timing of the project** - provides an indication of the timescales involved in procuring an energy / heat production facility. Most of the contracts are for between 20-30 years with the exception of Local Authorities that secure a D&B contract and separate operating contracts such as Aberdeen Heat and Power (AHP). Typically, AHP lets 10-year maintenance contracts with CHP equipment suppliers, and 3-year maintenance contracts for heating infrastructure contained in flatted properties.

- **Funding** - identifies the different sources of funding available to Local Authorities wishing to implement renewable energy projects. The sources include loans from commercial banks, the EIB, the treasury, equity from the private sector and prudential borrowing. Again the contract structure would determine how much (if any) funding the public sector would require and the term of the funding agreement.

- **Key Drivers, Project Successes and Barriers to Success** – these were examined to determine what lessons could be learnt from the case studies. The biggest issue raised as a barrier to success was the planning process, both delays caused and the perceived issue regarding conflict of interest. Nottinghamshire County Council signed their contract in 2006 but has still not received planning permission due to the application being called in for public enquiry. Shetland Islands Council quoted the issue of conflict of interest between the Local Authority procuring its proposed wind farm and

the council planners granting planning permission. However they stated that this was more a perceived issue and can be handled if dealt with early in the process.

The following tables provide detailed information on the case studies where these are publicly available. We have also included details of alternative commercial structures adopted in other sectors.

Category A: Owner /Operator Case Studies:

Aberdeen City Council: District Heating		
Parties	Principal parties	Aberdeen City Council, Aberdeen Heat & Power Company Limited ("AHP")
	Supporting parties	N/A
Infrastructure	Brief description	Established to develop and operate district heating and combined heat and power schemes in Aberdeen. The company has developments at Stockethill, Hazlehead and Seaton, which supply heat and hot water to a number of multi-storey flatted properties, sheltered housing complexes and public buildings. The CHP engines are gas-fired, with plans to convert some to using biomass feedstock in the future.
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	AHP was established by ACC in 2002 as a private company limited by guarantee, operating at arm"s length from ACC. It operates on a not-for-profit basis (i.e. surpluses are re-invested or used to subsidise energy costs to customers).
	[21]Form of principal contract(s)	Project specific agreements between ACC and AHP for the financing, development and operation of individual schemes.
	Who installs/ maintains the facility/ kit	AHP responsible for delivering each scheme and operating it thereafter. AHP tenders sub-contracts for the design, supply / installation and maintenance of each scheme.
	Who owns the site/ kit	AHP or ACC, depending on whether the assets are located in ACC tenanted properties or energy centres leased to AHP.
	Who does the facility/ kit revert to on contract expiry	As above
Electricity Sale/ Heat Production	Who is energy provided to	Heat and hot water supplied to ACC tenanted properties and to some Council-owned facilities. Right-to-buy residents are billed individually by AHP. Majority of electricity sold to grid electricity supplier,

[21] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Aberdeen City Council: District Heating		
		with the remainder used operationally (e.g. to drive heat distribution pumps) or sold via small-scale private wire arrangements.
	Which party sells energy	AHP
	Which party receives energy income	AHP receives income from ACC for the sale of heat and hot water. AHP receives income from sale of electricity to grid electricity supplier (and, to a lesser extent, via private wire arrangements), which is used to defray operating costs and subsidise the cost of heat supplied to tenants.
Inputs and Outputs	Set up costs (inc. procurement and D&B)	Stockethill: c.£1.6m Hazlehead: c£0.9m Seaton: c £3.4m
	Annual O&M costs	Undisclosed
	Energy/ heat produced	• Stockethill Energy Centre - CHP capacity 210 kWe; Heat demand 3,000 MWh p.a. • Hazlehead Energy Centre – CHP capacity 300 kWe; Heat demand – 5,600 MWh p.a. • Seaton - CHP Capacity – 1,063 kWe; Heat demand 11,200 MWh p.a.
	[22]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	N/A – but may be relevant for future if convert to biomass.
	Other income	Undisclosed
Timing	Planning status	Granted for all schemes
	Procurement status	N/A
	Service commencement	Stockethill: 2004 Hazlehead: 2006 Seaton: 2007
	Contract duration	Typically, AHP lets 10-year maintenance contracts with CHP equipment suppliers, and 3-year

[22] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Aberdeen City Council: District Heating		
		maintenance contracts for heating infrastructure contained in flatted properties.
Funding	Funding source(s)	Majority of funding is made available by Aberdeen City Council through its capital housing programme. Additional funding in the form of grants from Community Energy programme and commercial loans.
	Funding term	Commercial loan for Stockethill: 10-year term.
Background to decision making:	Key drivers	Primary driver: improved affordability of energy bills / reduced fuel poverty. Secondary driver: reduction in CO2 emissions.
	Project successes	Increased affordability of heating bills. Reduced susceptibility to fuel poverty. Reduced CO2 emissions. NHER of flatted properties increased to acceptable standards. Increased marketability of ACC rental properties Improved health outcomes / comfort for tenants COSLA Excellence Award 2008.
	Any barriers to success	Capital cost of extending underground heat network to new schemes.
Further details	Contact, website address, publications	Email: info@aberdeenheatandpower.co.uk http://www.aberdeenheatandpower.co.uk/ tel.: 01224 482620 Aberdeen Heat & Power Company Limited 43 Regent Court Aberdeen AB24 1SZ

Fife Council: Anaerobic Digestion Facility		
Parties	Principal parties	Fife Council
	Supporting parties	D&B contract out for procurement.
Infrastructure	Brief description	Biowaste infrastructure utilising anaerobic digestion as the core element of its processing technology at Lochhead.
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	Subject to negotiations, but potentially no formal new entity between the public and private sectors (e.g. a company) will be formed. Instead it will be a contractual relationship.
	[23]Form of principal contract(s)	D&B contract (with potential for additional maintenance contract).
	Who installs/ maintains the facility/ kit	Facility and kit to be: • installed by private sector partner; • operated by Council. Potential for private sector partner to maintain the facility and provide specialist technical support.
	Who owns the site/ kit	The Council owns the site and will retain full ownership of the AD plant.
	Who does the facility/ kit revert to on contract expiry	The Council will maintain ownership of the site and the AD plant.
Electricity Sale/ Heat Production	Who is energy provided to	The biogas will be converted into renewable power and heat through the existing CHP energy facility at Lochhead. Electricity will be exported to the grid, and heat will be exported into the existing district heating system in Dunfermline.
	Which party sells energy	Commercial position subject to negotiation.
	Which party receives energy income	Commercial position subject to negotiation.

[23] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Fife Council: Anaerobic Digestion Facility		
Inputs and Outputs	Set up costs (inc. procurement and D&B)	D&B Contract: £11m - £14m.
	Annual O&M costs	Circa £1.5m/ year (excluding capital costs and interest).
	Energy/ heat produced	1.4 MW renewable power and heat/ annum from 43,000 tonnes of waste.
	[24]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Planning application estimates £1.2M / annum
	Other income	Other outputs include 15,000 tonnes of fertiliser and 10,000 tonnes of compost. No income is forecast to be generated from fertiliser.
Timing	Planning status	Council has submitted a planning application to the planning authority (7 March 2011).
	Procurement status	OJEU for D&B contractor published 5 November 2010.
	Service commencement	Planned for 1 April 2013.
	Contract duration	D&B contract period plus any agreed term of maintenance obligations.
Funding	Funding source(s)	To be determined following submission of final business case.
	Funding term	To be determined following submission of final business case.
Background to decision making:	Key drivers	Treatment of Council's green waste.
	Project successes	Project still at procurement stage.
	Any barriers to success	Project still at procurement stage.
Further	Contact, website	• Chris Ewing, Environmental Sustainability

[24] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Fife Council: Anaerobic Digestion Facility		
details	address, publications	Manager, Tel: **08451 55 55** 55 + Ext 44 04 46 • http://www.fifedirect.org.uk/news/index.cfm?fuseaction=news.display&objectid=397689E1-A15B-84D6-15B0E770F9909C80 • http://www.fiferenewables.com/files/Fife_Strategy_new_report.pdf • http://www.tendersdirect.co.uk/Search/Tenders/Expired.aspx?ID=%20000000003060947&sect=W076&cat=20&Source=Categories • http://www.publictenders.net/tender/82589

Scottish Water – Anaerobic Digestion Plant, Deerdykes		
Parties	Principal parties	Scottish Water
	Supporting parties	HBS Construction Ltd (previously Henry Boot Scotland) and Monsal Ltd provided technical advice and designed and built the plant. Grant funding from Zero Waste Scotland (including WRAP).).
Infrastructure	Brief Description	The Deerdykes facility, created by Scottish Water Horizons, the public utility‟s commercial and renewable energy business, is the largest organic recycling facility in Scotland and the first site in the UK to combine anaerobic digestion and in-vessel composting. Food waste is digested in the plant and can be converted into 8,000 megawatt hours of „green‟ energy each year - enough electricity to power up to 2,000 homes. The state-of-the art Anaerobic Digestion facility at Deerdykes, the site of a former wastewater treatment works, can handle 30,000 tonnes of food waste each year. The anaerobic digestion process breaks down the waste to produce biogas which can then be used to provide electricity to power the works itself with surplus offered to the National Grid or exported directly to local businesses. The plant also produces heat which could be used in district heating schemes for local homes and businesses in the Cumbernauld area. The process also creates nutrient rich digestate which can be used as a fertiliser to improve Scotland's soil, reducing the need for chemical fertilisers whose manufacture has a significant environmental impact.

Scottish Water – Anaerobic Digestion Plant, Deerdykes		
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	Undertaken by Scottish Water Horizons, a fully owned subsidiary of Scottish Water which is responsible for the utility"s commercial operations.
	[25]Form of principal contract(s)	Design & Build
	Who installs/ maintains the facility/ kit	Installation: HBS Construction Ltd & Monsal Ltd Maintenance: Scottish Water
	Who owns the site/ kit	Scottish Water
	Who does the facility/ kit revert to on contract expiry	Not applicable
Electricity Sale/ Heat Production	Who is energy provided to	• Electricity - which will be used to power the works on site, with surplus used by Scottish Water which helps its carbon credentials and price risk management. • Heat - which may be used in district heating schemes to provide heat to local homes and businesses in the Cumbernauld area. Potential to produce 1.1MW of heat. 6,400MW of hot water will be produced annually. The process also produces nutrient rich digestate which can be used as a fertiliser Scottish Water Horizons is also assessing the production of biomethane from biogas at Deerdykes. The intention is that this sustainable vehicle fuel would be used by Scottish Water's fleet.
	Which party sells energy	The renewable energy generated is used by Scottish Water.

[25] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Scottish Water – Anaerobic Digestion Plant, Deerdykes		
	Which party receives energy income	Scottish Water Horizons
Inputs and Outputs	Set up costs (inc procurement and D&B):	Capital cost £7.2m. Other costs not publicly available
	Annual O&M costs	Undisclosed
	Energy/ heat produced	1MW of electricity and 1.1MW of heat
	[26]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Undisclosed
	Other income	Undisclosed
Timing	Planning status	Plant is operational so planning and permits all received. The development of recycling at Deerdykes is as follows: • 2002 – Redundant sewage treatment works • 2005 – Garden waste composting plant • 2009 – Kitchen waste composting in enclosed systems • 2010 – Anaerobic digestion. Fully enclosed system producing renewable energy.
	Procurement status	Complete
	Service commencement	Plant operational since 2010
	Contract duration	Not applicable
Funding	Funding source(s)	The facility benefited from a £1.7million grant from Zero Waste Scotland (previously the WRAP organics programme). Remainder self-funded by Scottish Water Horizons.
	Funding term	Not applicable
Background to decision making:	Key drivers	Scottish Water is the largest user of electricity in Scotland. It is also required to meet the sustainability

[26] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Scottish Water – Anaerobic Digestion Plant, Deerdykes		
		objectives set by its owners the Scottish Government.
	Project successes	Undisclosed
	Any barriers to success	Undisclosed
Further details	Contact, website address, publications:	• http://www.scottishwater.co.uk/portal/page/portal/SWE_PGP_COMMERCIAL/SWE_PGE_COMMERCIAL/SWE_BUS_4_SCOTWST/SWE_BUS_ENVIR • http://blog.monsal.com/index.php/news/monsals-ad-food-waste-plant-at-deerdykes-is-now-treating-the-edinburgh-food-waste-collections/ • http://www.scottishwater.co.uk/portal/page/portal/SWE_PGP_NEWS/0910%20-%20September%202010/NEWS_SEPT10_DEER

Woking Borough Council		
Parties	Principal parties	Thameswey Energy Limited (TEL): an energy service company ("ESCo") incorporated in 1999 for the production of electricity, distribution and trade in electricity and supply of steam and hot water.
	Supporting parties	Woking Borough Council Xergi Limited
Infrastructure	Brief description	Design, build operate and finance of local, small-scale energy centres which provide low carbon energy of up to 5MW electricity output to the local communities. The energy centres generate both heat and electricity using CHP engines. The ESCo"s first CHP centre was built in 2001 to supply both electricity and heat to Woking Borough Council"s civil offices and surrounding businesses. Other projects include a fuel cell CHP project in Woking"s Pools in the Park, and the combined CHP and photovoltaic system at Brockhill Residential Home in Goldsworth Park.
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	The ESCo (Thameswey Limited) is a private limited company which is wholly owned and funded by Woking Borough Council. It was originally set up as a JV with Xergi Limited and a Danish pension fund but was bought out by the Council in 2004. Xergi Limited retains a 10% shareholding in the SPVs who deliver the CHP projects – Thameswey Energy Limited and Thameswey Central Milton Keynes Limited. The partnership with Xergi arose because the Council required the finance and expertise of the private sector to finance and implement large scale projects.
	[27]Form of principal contract(s)	DBO contracts between the ESCo and Woking Borough Council to provide small-scale CHP plants within Woking.
	Who installs/ maintains the facility/ kit	Xergi Limited installs the kit. Thameswey Limited operates the plant.

[27] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Woking Borough Council		
	Who owns the site/ kit	Homes supplied with electricity by the ESCo are served by a network of private electricity wires, owned and operated by the ESCo.
	Who does the facility/ kit revert to on contract expiry	Ownership is retained by Thameswey Limited.
Electricity Sale/ Heat Production	Who is energy provided to	Energy is provided to institutional, business, residential customers and municipal buildings.
	Which party sells energy	Heat and power are supplied by the ESCo using both privately owned electricity and heat distribution networks and the public electricity network. The private wires have points of connection to local distribution networks which are in turn connected to the National Grid.
	Which party receives energy income	The ESCo.
Inputs and Outputs	Set up costs (inc. procurement and D&B)	Not disclosed.
	Annual O&M costs	Not disclosed.
	Energy/ heat produced	The first phase of the first town centre private wire CHP/ absorption cooling district energy system comprised: • 1.46 MWe of CHP; • 1.4 MW of heat-fired absorption cooling. The site exports a minimum of 30% surplus power over the public wires to sheltered housing residents and other local authority buildings.
	[28]Income from ROCs/ LECs/	The ESCo"s income from the Council in the financial year 2009/ 2010 was £1,953,595[29] for energy, heat

[28] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

[29] http://openlylocal.com/suppliers/19002-thameswey-energy-limited

Woking Borough Council		
	FITs/ RHI/ CRC credits/ energy sale/ rent	and other services (including operation of leisure centres). For domestic customers in social housing, the ESCo provides electricity below the rate of other suppliers. As well as energy revenues, income includes ROCs and CCL.
	Other income	IRR (minimum project return) reported to be 8%.
Timing	Planning status	Several projects are already operational.
	Procurement status	Several projects are already operational.
	Service commencement	Several projects are already operational.
	Contract duration	20 to 30 year project business plans.
Funding	Funding source(s)	• Capital receipts and loans from the Council; • Grants including a £545,000 grant from Defra under its Community Energy Programme for the provision of private wire electricity to 906 homes and replace individual electric heating systems in 136 homes with radiators served by community energy. • Revenue costs of the sheltered housing PV roof projects are met through income received from tenants (as an element of the applied service charges). • For the energy plant £.2.2M Woking Borough Council £250K Xergi £2.6M Grants £7M Woking Borough Council Loan
	Funding term	50 years
Background to decision making:	Key drivers	• The climate change agenda; • Local (decentralised) energy generation; • Energy use in buildings. • Tackling Fuel Poverty
	Project successes	• Council energy consumption savings; • CO2 emission reductions; • Sustainable energy self generation;

Woking Borough Council		
		• Increased energy efficiency of residential property; • Delivery of low emission electricity in competition with conventional suppliers.
	Any barriers to success	• CHP and renewable energy generators embedded in the local distribution network were treated as central power stations, so potentially attracted TUOS and DUOS charges, fossil fuel levy, VAT and climate change levy. Developing a private network enabled the ESCo to avoid charges usually associated with the use of the grid.
Further details	Contact, website address, publications	• http://www.woking.gov.uk/environment/climate/Greeninitiatives/sustainablewoking/thamesweyenergy.pdf • http://www.thamesweygroup.co.uk/what-we-do/low-carbon-energy-generation-and-supply/ • http://www.woking.gov.uk/environment/climate/Greeninitiatives/sustainablewoking/energystation.pdf • http://www.woking.gov.uk/environment/climate/Greeninitiatives/sustainablewoking/defra.pdf • http://www.woking.gov.uk/environment/climate/Greeninitiatives/sustainablewoking/lses.pdf • http://www.iag.org.uk/events/files/14_Ray%20Morgan.pdf

Category B Case Studies:

Aberdeen City Council, SITA North East Limited		
Parties	Principal parties	Aberdeen City Council, SITA North East Limited
	Supporting parties	SITA Power, renewable energy division of SITA UK
Infrastructure	Brief description	Landfill gas to electricity conversion facility
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	Long-term waste management services contract
	[30]Form of principal contract(s)	Long-term waste management services contract
	Who installs/ maintains the facility/ kit	SITA North East Limited
	Who owns the site/ kit	SITA North East Limited
	Who does the facility/ kit revert to on contract expiry	Aberdeen City Council has an option to purchase the equipment on termination of the waste management services contract at market value.
Electricity Sale/ Heat Production	Who is energy provided to	Grid under PPA
	Which party sells energy	SITA North East Limited
	Which party receives energy income	Contractual revenue sharing mechanism
Inputs and Outputs	Set up costs (inc. procurement and D&B)	c.£1m
	Annual O&M costs	Undisclosed
	Energy/ heat produced	1.5MW
	[31]Income from ROCs/ LECs/	ROCs

[30] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Aberdeen City Council, SITA North East Limited		
	FITs/ RHI/ CRC credits/ energy sale/ rent	
	Other income	Undisclosed
Timing	Planning status	Planning permission granted
	Procurement status	N/A
	Service commencement	March 2010
	Contract duration	Remaining term of 25-year waste management services contract (expires 2025)
Funding	Funding source(s)	Financed by SITA North East
	Funding term	N/A
Background to decision making:	Key drivers	Primary: revenue generation Secondary: reduction in greenhouse gas emissions
	Project successes	Revenue has exceeded expectations in first year of operation Good operational track record
	Any barriers to success	No
Further details	Contact, website address, publications	Peter Lawrence Strategist – Waste Management Email: plawrence@aberdeencity.gov.uk Tel 01224 523268

[31] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Bristol City Council: Wind Turbines		
Parties	Principal parties	Bristol City Council
	Supporting parties	Design, build, operate and maintain contract to be procured by the Council with a private sector partner.
Infrastructure		Two wind turbines in Avonmouth.
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	The Council will enter into a contract with a private sector partner to design, build, operate and maintain the wind turbines. Community involvement through RenewableUK's Community Benefit Protocol, which sets a minimum payment of £1,000 per year per megawatt of installed capacity (as backed by the Secretary of State for Energy and Climate Change).
	[32]Form of principal contract(s)	Likely to be FIDIC
	Who installs/ maintains the facility/ kit	Private sector developer.
	Who owns the site/ kit	Council owned land.
	Who does the facility/ kit revert to on contract expiry	It is currently anticipated that the turbines will remain within full Council ownership.
Electricity Sale/ Heat Production	Who is energy provided to	Subject to outcome of procurement exercise.
	Which party sells energy	Subject to outcome of procurement exercise. The Council waited for the legal change required for local authorities to sell electricity from wind generation before moving the project forward.
	Which party receives energy income	The Council. It is anticipated that any finance generated by the project will be used to fund future carbon reduction projects.

[32] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Bristol City Council: Wind Turbines		
Inputs and Outputs	Set up costs (inc procurement and D&B):	
	Annual O&M costs	
	Energy/ heat produced	• Each turbine will have a 2-3MW capacity. • Estimated annual energy production is between 9.6GW and 12.6GW/ annum.
	[33]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	
	Other income	Undisclosed
Timing	Planning status	Planning approval gained in January 2009.
	Procurement status	PIN published 13 08 2010 for contractor to design, build and maintain the turbines. OJEU to be published once outstanding issues resolved.
	Service commencement	Subject to outcome of procurement exercise.
	Contract duration	Anticipated to be 25 years
Funding	Funding source(s)	Prudential borrowing
	Funding term	20 years
Background to decision making:	Key drivers	• Bristol promotion as a "Green Capital"; • Council policies on energy management and CO2 reduction.
	Project successes	Undisclosed
	Any barriers to success	A planning condition deals with the impact of the turbines on Filton Airfield's radar. The status of which is currently unclear due to the sale of the airfield.
Further details	Contact, website address, publications:	• indira.norton@bristol.gov.uk (Energy Management Officer at Bristol City Council) • www.bristol.gov/bristol4wind • http://www.idea.gov.uk/idk/core/page.do?pageId=25443721

[33] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Bristol City Council: Wind Turbines		
		• http://www.bristol.gov.uk/committee/2010/ua/ua000/0325_14.pdf • http://www.bwea.com/pdf/publications/CommunityBenefits.pdf

Forestry Commission Wind Farms – South East & Central Belt		
Parties	Principal parties	Partnerships for Renewables (PfR) Forestry Commission Scotland (FCS)
	Supporting parties	PfR is owned by Carbon Trust, HSBC Environmental Infrastructure Fund and OPTrust Private Market Group
Infrastructure	Brief Description	In 2009 the FCS signed a framework agreement with PfR to develop and construct wind farms within the Central Belt and Borders area of Scotland. As part of their study PfR have now identified 9 possible sites and are in the process of more detailed investigations. A similar approach has now been rolled out across Scotland with the FCS entering into an additional 5 agreements with the following parties: • South West Scotland – Scottish Power Renewables (UK) Limited • Central Scotland – PNE Wind UK • West Scotland – E.ON Climates & Renewables UK Developments Limited • North West Scotland – E.ON Climates & Renewables UK Developments Limited • North East Scotland – Fred Olsen Renewables • Additionally SPR will prospect for small (<5MW) wind sites across the whole country
Project Details	Commercial structure (e.g. JV/ ESCO/ public body/ company)	A Framework agreement between FCS and PfR which gives FCS the option to enter into a lease, or joint venture arrangement for each site to be developed.
	[34]Form of principal contract(s)	Either Lease rental agreement or JV equity agreement
	Who installs/ maintains the facility/ kit	PfR
	Who owns the	Forestry Commission owns the site

[34] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Forestry Commission Wind Farms – South East & Central Belt		
	site/ kit	
	Who does the facility/ kit revert to on contract expiry	Forestry Commission owns the site
Electricity Sale/ Heat Production	Who is energy provided to	The National Grid
	Which party sells energy	PfR
	Which party receives energy income	PfR
Inputs and Outputs	Set up costs (inc procurement and D&B):	Undisclosed
	Annual O&M costs	Undetermined as yet, the scale of the development is not established
	Energy/ heat produced	FCS anticipate c.300MW installed in the PfR area with another 500MW from the other 5 lots mentioned above This should result in total installed capacity across the National Forest estate of some 2GW or thereabouts
	[35]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Undisclosed
	Other income	Across the whole 2GW programme there is the opportunity to achieve a £30 million annual net income. Communities will receive £5k per MW of installed capacity (PfR area…"upper quartile" community benefit).
Timing	Planning status	Feasibility study
	Procurement status	Joint agreement with PfR signed in Oct 2009. Subsequent agreements signed early 2011.
	Service	It can take more than three years to design, consent

[35] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Forestry Commission Wind Farms – South East & Central Belt		
	commencement	and construct even the simplest commercial scale wind turbine
	Contract duration	20 years
Funding	Funding source(s)	Funding from a number of sources including the Development Partner, FCS and commercial lenders (either commercial debt or project finance). There are also opportunities for communities to invest in the schemes.
	Funding term	Unknown
Background to decision making:	Key drivers	• Improve existing system of ad hoc leasing to maximise the benefits that the FCS can receive from renewable energy.
	Project successes	• Partnership agreements for 5 other lots now agreed.
	Any barriers to success	• Unknown
Further details	Contact, website address, publications:	• http://www.forestry.gov.uk/newsrele.nsf/aa14185030b005dc8025751b004c36d9/4fe278576be121ec8025765300343cc3!opendocument • http://www.pfr.co.uk/forestrycommissionscotland/ • http://www.forestry.gov.uk/windhydro

Greater Manchester Waste Disposal Authority		
Parties	Principal parties	Greater Manchester Waste Disposal Authority ("GMWDA"): a statutory entity carrying out waste duties and activities on behalf of 9 authorities.
	Supporting parties	• Viridor Laing (Greater Manchester) Limited ("Viridor Laing") – a consortium made up of Viridor Waste Management Ltd and John Laing Investments plc. • Ineos Runcorn (TPS) Limited ("Ineos") – a consortium made up of Viridor Waste Management Ltd, John Laing plc and Ineos Chlor Limited.
Infrastructure	Brief description	In 2009, GMWDA signed a contract with Viridor Laing for the development of new waste management facilities (including 5 MBT plants, 1 MRF, 4 IVC facilities, education centres and HWRCs) and the provision of associated services including the reception, recycling, treatment and disposal of waste to deal with 1.1m tonnes per year of household waste from the Greater Manchester area. The project also includes use of an existing thermal recovery facility in Bolton and Ineos" new EfW CHP plant at Runcorn (which will be able to process up to 325K per annum of SRF from the MBT plants).
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	Contractual arrangements only with private sector developers. Two SPVs have been formed
	[36]Form of principal contract(s)	PFI contract between GMWDA and Viridor Laing.
	Who installs/ maintains the facility/ kit	Viridor Laing and Ineos.
	Who owns the site/ kit	• GMWDA owns or has a long leasehold on all of the project sites in Greater Manchester and leases/ licences them to Viridor Laing.

[36] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Greater Manchester Waste Disposal Authority		
		• Ineos owns the EfW CHP plant at Runcorn which takes RDF from the MBT plants. There is no asset reversion at the end of the PFI for this site, though a 15 year arrangement to opt (at GMWDA"s discretion) to access the site or sell capacity for a further 15 years
	Who does the facility/ kit revert to on contract expiry	The facilities all revert to the GMWDA with the exception at the Ineos site.
Electricity Sale/ Heat Production	Who is energy provided to	Half the energy produced by the MBT/ AD plants will run the site, and the other half will be fed into the grid (estimated at 4MW). The Bolton plant produces around 7MW of power (net) for the grid. The Ineos site produces both electricity (29MW at capacity) and steam, all of which is used on that site.
	Which party sells energy	The private sector developer sells the energy to the grid.
	Which party receives energy income	Sale of power reduces the level of the Unitary Charge, GMWDA also have arrangements for sharing third party income and super-profits.
Inputs and Outputs	Set up costs (inc. procurement and D&B)	£400m: D&B facilities under the main contract £231m: D&B of Runcorn EfW CHP plant
	Annual O&M costs	Undisclosed
	Energy/ heat produced	• Each MBT/ AD plant will produce 4MW. • Bolton TRF produces 7MW. • Ineos" Runcorn plant will convert SRF from the MBT plants into 29MW of electricity and 26 tonnes per hour of steam.
	[37]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy	Undisclosed

[37] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Greater Manchester Waste Disposal Authority		
	sale/ rent	
	Other income	Undisclosed
Timing	Planning status	Planning achieved.
	Procurement status	Contract signed in April 2009.
	Service commencement	The facilities (other than Ineos‟ plant) are scheduled to be operational in 2012. Ineos‟ plant is scheduled to be operational in 2013.
	Contract duration	25 years
Funding	Funding source(s)	• £245m loan from commercial banks (Bank of Ireland (£55m), BBVA (£55m), Lloyds TSB (£95m) and SMBC (£40m) • £182m loan from EIB • £120m loan from Treasury Infrastructure Fund • £35m loan from GMWDA • £85m equity from Viridor Waste Management Ltd • £68m capital contribution from GMWDA • £124.5m PFI credits from Defra
	Funding term	Various – commercial bank debt has c 18 month tail
Background to decision making:	Key drivers	• Maximise recycling and composting (minimum 50%) and minimisation of landfill (increasing environmental awareness) • Over-reliance on landfill – if most favourable modelled scenario project would see landfill of waste reduced from 94% to 9% by 2015 • Changing legislation • LATs • Ageing/ lack of appropriate facilities
	Project successes	• Planning permission had been received for the majority of projects by the time financial close was reached, which substantially lowered the risk of planning failure. • 32 of 42 facilities in Greater Manchester are now completed, completion of all expected 2012.
	Any barriers to success	• Largest waste contract to be procured by a local authority in the UK – huge commitment of time and resource. • It took 4 years from issue of the OJEU notice to reach financial close – 12 months of which caused

Greater Manchester Waste Disposal Authority		
		by illiquidity in the financial markets (credit crunch). • Funding crisis: insufficient sums could be borrowed from the banks, so the Treasury and GMWDA itself had to step in to plug the gap.
Further details	Contact, website address, publications	• http://www.gmwda.gov.uk/clientfiles/File/Delivering%20the%20Recycling%20and%20Waste%20Management%20Contract%20v20.pdf • http://www.ineoschlor.com/efw/energyfromwaste.shtml • http://www.gmwda.gov.uk/recycling-and-waste-management-contract • http://meetings.gmwda.gov.uk/mgConvert2PDF.aspx?ID=7702 • http://www.pennon-group-annual-report.co.uk/chief-executives-overviews/chief-executives-overview-viridor/ • http://www.viridor-annual-report.co.uk/financial-statements/notes-to-the-financial-statements/principal-subsidiary-and-joint-venture-undertakings/ • http://www.pennon-group.co.uk/pennon/en/aboutus/ghistory?t=&s=&st=&link=18

Nottinghamshire County Council		
Parties	Principal parties	Nottinghamshire County Council Nottinghamshire Environmental Services Limited ("NESL").
	Supporting parties	In 2006, NESL was 100% owned by Veolia ES Aurora Limited.
Infrastructure	Brief description	In June 2006 the Council entered into 2 contracts with Veolia group companies. • One contract (worth £35m) was for minor infrastructure facilities and a new MRF. • The other contract (worth £97m), which this case study concentrates on, is between the Council and NESL for the DBFO of an energy recovery facility at the old Rufford Colliery Site near Rainworth, treating 180,000 tonnes of waste each year.
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	Public private partnership between the Council and NESL.
	[38]Form of principal contract(s)	Project agreement. In 2006 there was no standard form contract, but it reflects the general principles of PPP/ PFI.
	Who installs/ maintains the facility/ kit	NESL
	Who owns the site/ kit	NESL will obtain a leasehold interest in the site from the Council.
	Who does the facility/ kit revert to on contract expiry	The Council.
Electricity Sale/ Heat Production	Who is energy provided to	Electricity produced by the energy recovery plant will be used to power the plant, with the balance (13MW) exported to the grid.
	Which party sells energy	NESL
	Which party	As is common on PPP/ PFI/ DBFO projects, income

[38] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Nottinghamshire County Council		
	receives energy income	received by NESL from electricity is subject to a sharing mechanism with the Council when it surpasses the level underwritten by NESL in the financial model. Should the steam from the ERF be used for CHP applications, any profit resulting will also be shared.
Inputs and Outputs	Set up costs (inc. procurement and D&B)	In 2006, the ERF contract was reported to be worth £97m. As construction has not yet begun, it is not known what the actual cost will be.
	Annual O&M costs	Undisclosed
	Energy/ heat produced	15MW energy.
	[39]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Undisclosed
	Other income	Undisclosed
Timing	Planning status	Planning application submitted November 2007. In March 2009, the Secretary of State for Communities called in the application for a public inquiry (Sept 2010). This inquiry closed in October 2010 but a final decision has not been issued. If planning permission is not obtained, or if construction costs for the ERF rise above the agreed ceiling, the ERF contract will be null and void.
	Procurement status	Procurement completed in June 2006.
	Service commencement	Some services are already being delivered to the Council under the smaller contract including the provision of a MRF and management of HWRCs. Service commencement of the ERF is dependent on obtaining planning permission.

[39] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Nottinghamshire County Council		
	Contract duration	26 years.
Funding	Funding source(s)	For both contracts: • PFI credits of £38m • Corporate finance from Veolia: £140m (to be refinanced after several years)
	Funding term	No commercial bank debt.
Background to decision making:	Key drivers	• Increase recycling levels and reduce proportion of waste going to landfill. • Meet the Government"s performance standards for waste management
	Project successes	Undisclosed
	Any barriers to success	• The contract signed in 2006, but planning permission has still not been obtained. • Veolia instigated judicial review proceedings when an interested party sought the release of financial documents pursuant to the Audit Commission Act 1998.
Further details	Contact, website address, publications	• http://www.veoliaenvironmentalservices.co.uk/Nottinghamshire/Facilities/Planned-facilities/Energy-Recovery-Facility/ • http://www.nottinghamshire.gov.uk/home/environment/recycling/pfiwaste/wastepficontract.htm • http://archive.defra.gov.uk/environment/waste/localauth/funding/pfi/documents/project-notts.pdf • http://www.veoliaenvironmentalservices.co.uk/Documents/Publications/Nottinghamshire/Energy_Recovery_Proposals.pdf

Sheffield City Council		
Parties	Principal parties	Sheffield City Council, Veolia
	Supporting parties	Constructions Industrielles de la Mediterranee S.A (CNIM) and Clugston Ltd
Infrastructure	Brief Description	Energy recovery plant built on Bernard Road to obtain energy from waste and produce heat for the existing district heating system. Heat is used to generate electricity, the electricity is provided to the grid and heat is used in public and private organisations and households in the area. Veolia Environmental Services (formerly Onyx) was awarded the integrated waste management contract in August 2001
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	Public Private Partnership between City Council and Veolia
	[40]Form of principal contract(s)	Turnkey contract with a Limited Liability Partnership.
	Who installs/ maintains the facility/ kit	The works are subcontracted to CNIM and Clugston. Veolia maintain the facility / kit.
	Who owns the site/ kit	Undisclosed
	Who does the facility/ kit revert to on contract expiry	Undisclosed
Electricity Sale/ Heat Production	Who is energy provided to	Electricity is used to power the plant and the remainder is exported to the grid
	Which party sells energy	Undisclosed
	Which party receives energy income	Undisclosed

[40] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Sheffield City Council		
Inputs and Outputs	Set up costs (inc. procurement and D&B):	£68M
	Annual O&M costs	Unknown
	Energy/ heat produced	• 45 - 60 MW thermal energy • 21 MW electricity
	[41]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Undisclosed
	Other income	Undisclosed
Timing	Planning status	Complete
	Procurement status	Procurement completed August 2001
	Service commencement	Site became operational in 2007
	Contract duration	35 years
Funding	Funding source(s)	Undisclosed
	Funding term	Undisclosed
Background to decision making:	Key drivers	Capacity of existing waste incinerator was exceeded in 2000 and changes were needed before the deadline for bringing plants into compliance with the EU Waste Incineration Directive in 2005.
	Project successes	• The site has won an ICE Yorkshire Design award 2005 • The plant will generate over 110,000MWh of electricity in a year and provide over 95,000MWh of thermal energy to the largest district heating network in the UK
	Any barriers to success	Undisclosed
Further details	Contact, website address, publications:	• http://www.veoliaenvironmentalservices.co.uk/Sheffield/Energy-Recovery/ • http://www.wasteawareness.org/mediastore/FILES/13507.pdf

[41] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Shetland Island Councils		
Parties	Principal parties	Viking Energy Partnership: a 50:50 partnership between Viking Energy Ltd and SSE Viking Ltd.
	Supporting parties	• Viking Energy Ltd is 90% owned by the Shetland Charitable Trust, and 10% owned by the developers of Burradale Wind Farm; • Shetland Charitable Trust purchased the shareholding in Viking Energy Ltd owned by Shetland Islands Council in 2007. 21 of the 23 trustees also sit as councillors; • SSE Viking Ltd is a subsidiary of Scottish and Southern Energy plc.
Infrastructure	Brief description	Viking Wind Farm: 127 wind turbines in central Mainland, Shetland. A seabed interconnector to mainland Scotland and electricity convertor station to turn AC power from the wind farm into DC as it travels down the interconnector is also required. This infrastructure will be constructed by Scottish Hydro Electric Transmission (part of SSE), and does not form part of the wind farm project.
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	50/50 legal partnership between 2 private companies, one of which has a charitable trust as a majority shareholder. Accounts of the partnership are regulated under the Partnerships (Accounts) Regulations 2008. Shetland Charitable Trust is both a registered charity and a trust governed by a trust deed.
	[42]Form of principal contract(s)	Partnership agreement Shetland Charitable Trust as a majority shareholder has shareholder agreements with the minority shareholders. Connection agreement with National Grid.

[42] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Shetland Island Councils		
	Who installs/ maintains the facility/ kit	Subject to outcome of procurement exercise but likely to be a form of warranty with the supplier being responsible for maintenance and then passing to Viking after an undetermined time. Viking is then likely to tender a service contract.
	Who owns the site/ kit	The site is owned by multiple landowners, several of whom have crofting tenants. Viking Energy will enter into leases with the landlord covering the life of the project, and will not take ownership. Landlords with crofting interests will share the income from the rental with their tenants equally. The single biggest landlord is the Council. Viking Energy Partnership will own the electricity generating equipment.
	Who does the facility/ kit revert to on contract expiry	The land will revert to the landowners on completion of the leases. The wind turbines will be decommissioned before handover.
Electricity Sale/ Heat Production	Who is energy provided to	The power generated by the wind farm would feed the Shetland grid first before exporting power to the Scottish mainland (via a sub-sea interconnector cable).
	Which party sells energy	Viking Energy Partnership. The partnership is not under an obligation to sell the power from the wind farm through SSE – this will only happen if the power is being sold at the demonstrable and benchmarked wholesale market rate.
	Which party receives energy income	No counter-party has been agreed for the eventual off-take arrangements. SSE group remain an obvious possibility but there are lots of other potential counter-parties and there is no requirement to sell to or through SSE. This will only be agreed by the Shetland side of the partnership if it is demonstrably equal to or beneficial over other alternatives. As this project will involve considerable commercial finance then the financiers will also have to be satisfied regarding any contracts (financial or otherwise).

Shetland Island Councils		
Inputs and Outputs	Set up costs (inc. procurement and D&B)	Total project cost: £685m (not including public enquiry if it arises) Initial development costs (including environmental impact assessment): £4m.
	Annual O&M costs	Undisclosed
	Energy/ heat produced	Expected generating capacity (per turbine): 3.6 MW. Total capacity of 457MW.
	[43]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Expected total income of £930m to Shetland across project lifetime (including an estimated £23m/ year for the Trust, wages/ rents to local landlords and crofters, and £1m/ year in local community benefit payments).
	Other income	Undisclosed
Timing	Planning status	Wind farm approved by Shetland Islands Council. Final decision to be taken by the Scottish Government"s energy minister. Electricity convertor station: permission in principle approved by Shetland Islands Council (2/2/11).
	Procurement status	Construction scheduled to commence 2012.
	Service commencement	5 year construction period (end of 2016).
	Contract duration	25 year project duration (after which planning permission runs out and turbines are likely to be at end of useful economic life).
Funding	Funding source(s)	A number of options are being considered, one possible option is: • Equity from SSE: £68.5m; • Equity from Trust: £62m; • Equity from Burradale wind farm: £7m; • Loans from EIB and other commercial lenders: £548m.
	Funding term	15 years or above.

[43] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Shetland Island Councils		
Background to decision making:	Key drivers	Climate change. Energy security.
	Project successes	Undisclosed
	Any barriers to success	Dialogue with stakeholders after the application under Section 36 of the Electricity Act for consent to construct was originally submitted in 2009 demonstrated that changes would need to be made to satisfy their concerns (including in respect of bird habitats, peat lands and archaeology). Therefore the project was delayed to allow the application to be re-submitted in 2010. There was a perceived conflict of interest during planning discussions but these proved to be more perceived than actual.
Further details	Contact, website address, publications	• david.h.thomson@shetland.gov.uk • http://www.vikingenergy.co.uk/

Category C Case Studies:

Forestry Commission – Inverlael Hydro		
Parties	Principal parties	RWE npower plc
	Supporting parties	Forestry Commission Scotland
Infrastructure	Brief description	Inverlael hydroelectric scheme built within an existing forestry plantation by Loch Broom.
Project Details	Commercial structure (e.g. JV/ ESCo/ public body/ company)	Contractual relationship between RWE npower and Forestry Commission Scotland.
	[44]Form of principal contract(s)	Lease by Forestry Commission Scotland (as landlord) to RWE npower. RWE npower subcontracted the civil works (Mott Macdonald and Global construction Ltd) and electricity generating equipment (Gilkes) to third parties.
	Who installs/ maintains the facility/ kit	RWE npower
	Who owns the site/ kit	Forestry Commission Scotland owns the site.
	Who does the facility/ kit revert to on contract expiry	The site will remain within the ownership of Forestry Commission Scotland on termination of the lease.
Electricity Sale/ Heat Production	Who is energy provided to	Electricity is transferred to Scottish Hydro Electric Power Distribution"s local electrical distribution network.
	Which party sells energy	RWE npower
	Which party receives energy income	Subject to the terms of the lease.
Inputs and	Set up costs (inc.	Construction costs approximately £5m.

[44] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Forestry Commission – Inverlael Hydro		
Outputs	procurement and D&B)	
	Annual O&M costs	Undisclosed
	Energy/ heat produced	2.5MW of electricity.
	[45]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Undisclosed Lochbroom Community Council received a community benefit cheque from RWE npower for £35,000 on completion of construction. As part of the rental agreement, RWE npower credited Forest Enterprise with a restoration bond of £10,000 on commencement of the lease – repayable on termination of the lease.
	Other income	Undisclosed
Timing	Planning status	Construction complete.
	Procurement status	Construction complete.
	Service commencement	Construction began in March 2008 and completed in May 2009.
	Contract duration	Undisclosed
Funding	Funding source(s)	Funded by RWE npower.
	Funding term	Undisclosed
Background to decision making:	Key drivers	Undisclosed
	Project successes	Undisclosed
	Any barriers to success	Undisclosed
Further details	Contact, website address, publications	• http://www.rwe.com/web/cms/en/312972/rwe-npower-renewables/sites/projects-in-operation/hydro/inverlael/project/ • http://www.gilkesenergy.com/uploads/projects/id1/inverlael_lr.pdf • http://www.forestry.gov.uk/pdf/Scotlandannualreportaccounts0910.pdf/$FILE/Scotlandannualreport

[45] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Forestry Commission – Inverlael Hydro		
		accounts0910.pdf • http://www.forestry.gov.uk/newsrele.nsf/WebPressReleases/E3A56C7F36DCBC79802575F3004B206A • http://www.highland.gov.uk/NR/rdonlyres/784A84C3-D6CE-451F-99FC-6B3611839863/0/rp06406.pdf

North Tyneside Solar Panels Project

North Tyneside Solar Panels Project		
Parties	Principal parties	North Tyneside Council
	Supporting parties	In procurement so yet to be identified
Infrastructure	Brief description	The Council are looking to appoint a partner to install a green energy system into its housing stock and public buildings. The contract winner will finance, operate and maintain the system. The North Tyneside option would involve companies, attracted by the potential financial return under the feed-in tariffs, offering free installation and long-term maintenance of solar panels. Ian Conway, head of the council‟s North Tyneside Homes, said the 25-year tariff payments went to the installers, while council tenants would enjoy free daytime electricity – worth an average of around £150 a year. The council would also benefit from “roof rent” from the installers. Another benefit would be the saving of about a tonne of carbon dioxide emissions per home per year – cutting the council‟s carbon footprint and helping combat climate change. Mr Conway said the average solar panel installation was around £8,000-£10,000 per home. He said this would be expected to generate between £850-£900 in tariff payments annually, which over 25 years was an inviting return on installation costs. North Tyneside Council has 15,500 homes and around 7,000 southerly facing properties have been identified as potentially suitable for solar panels. The Council is inviting expressions of interest on a service succession basis for bids from suitably experienced organisations who shall be fully responsible for the supply, delivery, installation, connection and the long term operation, insurance and maintenance of green energy solution system that

North Tyneside Solar Panels Project		
		maximises the best rate of financial incentives currently offered by the UK Government throughout the contract period with the bidders assuming the commercial risk associated with the financial returns that may be generated from such opportunities. The successful provider is expected to maximise the revenue yielded through the Feed in Tariff scheme currently offered by the UK Government, with payments to the Council being made by the provider based on a roof access arrangement for Council housing stock together with the possibility of a share in the revenue arising from energy generated in excess of a stated target. There will also be the potential to provide green energy solutions to public maintained buildings in North Tyneside. The Council will appoint one provider. The duration of the contract will be 25 years. It is anticipated the Contract will be awarded around July/August 2011.
Project Details	Commercial structure (e.g. JV/ ESCO/ public body/ company)	Service Concession
	[46]Form of principal contract(s)	To be confirmed during the procurement process
	Who installs/ maintains the facility/ kit	Preferred Partner
	Who owns the site/ kit	Preferred Partner
	Who does the facility/ kit revert to on contract expiry	Preferred Partner
Electricity Sale/ Heat Production	Who is energy provided to	Undisclosed
	Which party sells energy	Undisclosed

[46] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

North Tyneside Solar Panels Project		
	Which party receives energy income	Undisclosed
Inputs and Outputs	Set up costs (inc. procurement and D&B)	Undisclosed
	Annual O&M costs	Undisclosed
	Energy/ heat produced	Undisclosed
	[47]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Companies, attracted by the potential financial return under the feed-in tariffs offering free installation and long-term maintenance of solar panels. The council would also benefit from "roof rent" from the installers.
	Other income	Undisclosed
Timing	Planning status	Undisclosed
	Procurement status	In procurement – service concession publicised in March/April 2011 with a pre-qualification process being undertaken by the Council. However, full EU procurement rules do not need to be followed (although the principles will be followed) as it is a service concession. The Council is hoping to sign a contact with a preferred partner in August 2011.
	Service commencement	Undisclosed
	Contract duration	25 years
Funding	Funding source(s)	Private sector
	Funding term	Undisclosed
Background to decision making:	Key drivers	Undisclosed
	Project successes	Undisclosed
	Any barriers to success	Undisclosed

[47] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

North Tyneside Solar Panels Project		
Further details	Contact, website address, publications	mike.forrest@northtyneside.gov.uk http://www.publictenders.net/tender/98216 http://www.journallive.co.uk/north-east-news/todays-news/2011/02/22/solar-panel-plans-for-north-east-homes-61634-28210024/#ixzz1LILPmqK1

Stoke on Trent Sustainable City		
Parties	Principal parties	Stoke on Trent Council E.ON & Kier Stoke JVCo
	Supporting parties	Kier Stoke is a JV between Stoke on Trent City Council and Kier Maintenance
Infrastructure	Brief Description	Stoke on Trent City Council have agreed to enter into a contractual arrangement with E.ON UK for solar PV panels to be placed on a minimum of 1000 council owned houses before April 2012. To date Stoke on Trent City Council have undertaken a pilot of PV Installations to 54 council houses and have installed a 198 panel array on their civic centre roof.
Project Details	Commercial structure (e.g. JV/ ESCO/ public body/ company)	The contractual agreement with E.On is a Roof Rent – 1000 installations (minimum) The 54 property pilot and the large installation on their Civic Centre were self funded and delivered as a part of the existing joint venture contractual arrangements with Kier Stoke JVCo.
	[48]Form of principal contract(s)	Works and services
	Who installs/ maintains the facility/ kit	The solar panels are installed by Kier Stoke who are subcontracted by E.ON. E.ON is responsible for the maintenance of the panels.
	Who owns the site/ kit	Site is owned by the council 1000 installations - Solar panels will be owned by E.ON The installations on the 54 pilot properties and the Civic Centre are owned by the City Council.
	Who does the facility/ kit revert to on contract expiry	At contract expiry the council have the choice of keeping the panels free of charge or E.ON will remove them and make good any damage to the roofs caused by the installation of the panels.

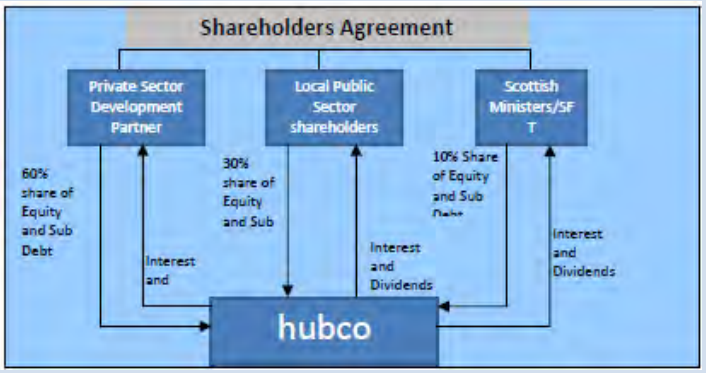
[48] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

Stoke on Trent Sustainable City		
Electricity Sale/ Heat Production	Who is energy provided to	For the 54 pilot properties and the 1000 + properties the tenants will be able to use the electricity free of charge. Whilst any surplus to be exported to the grid and the council will receive the income for the 54 pilot properties and E.ON for the 1000+. The electricity produced by the panels installed on the Civic Centre will be used by the council, and it is not anticipated that any surplus will be fed back into the National Grid, due to the base load energy requirements of the building 365 days per year.
	Which party sells energy	E.On will sell any surplus energy back into the National Grid. Stoke on Trent City Council will sell any surplus energy produced by its 54 pilot properties back into the National Grid.
	Which party receives energy income	Stoke on Trent City Council for its self-funded installations and E.ON for the 1000+ installations.
Inputs and Outputs	Set up costs (inc procurement and D&B):	Civic Centre project cost = £134,500 54 pilot installations = £360,000 The 1000+ installations will attract an annual roof rent payable to the Council for 25yrs.
	Annual O&M costs	unknown
	Energy/ heat produced	For house roofs minimum of 1.8KW/hr Civic centre roof 30kwh
	[49]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	Civic centre expected to attract £9,400 per year in FiTs, these will be received by the City Council. The 54 pilot properties will attract a FiT payment of around £600pa per property. The City will receive an annual roof rent for each of the 1000+ properties for 25yrs (amount is commercially confidential).
Timing	Planning status	Varies due to number of projects. To date none of the projects has needed to seek planning permission.

[49] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

Stoke on Trent Sustainable City		
	Procurement status	OJEU procurement processes employed to appoint both Kier Stoke JVCo and E.ON.
	Service commencement	Varies due to number of projects.
	Contract duration	1000 + installations = 25 years from commission The Kier JVCo will remain in place for a minimum of 7 years.
Funding	Funding source(s)	Stoke-on-Trent City Council – Capital programme E.ON
	Funding term	Not disclosed
Background to decision making:	Key drivers	Stoke on Trent is working towards establishing a policy framework which will see a sustainable energy future for the city. In addition the city has high levels of fuel poverty, energy produced from the solar panels will be provided to tenants free of charge.
	Project successes	Not disclosed
	Any barriers to success	VAT needed to be investigated by a specialist as there was some disagreement as to whether the works undertaken to fit the solar panels are tax exempt. To overcome this Stoke-On-Trent Council have included a provision in their agreement such that where applicable the tax liability will be met by the provider (E.ON).
Further details	Contact, website address, **publications**	Phil Dawson- phil.dawson@stoke.gov.uk and Nick Jones – nicolas.jones@stoke.gov.uk http://www.stoke.gov.uk/ccm/content/council-and-democracy/communications/2011-press-releases/05-2011/145-11.en

Alternative Commercial Structures - Case Studies:

South East Hub		
Parties	Principle parties	SE HubCo
	Supporting parties	All local authorities, NHS boards, Fire and Police Services across Edinburgh, Lothian and the Borders. Space Consortium led by Galliford Try
Infrastructure	Brief Description	The hub Initiative is a national delivery model based on a long term public, private partnership that will facilitate joint outcomes and help bring real improvements to local services. Its aim is to increase the effectiveness of community planning processes by supporting local services improvements by more efficient planning, procurement and delivery of community based premises.
Project Details	Commercial structure (e.g. JV/ ESCO/ public body/ company)	The public sector territory participants enter into a joint venture with a private sector development partner (PSDP). The JV is called HubCo and is limited by shares.  Hubco provides: **Ongoing Partnering Services:** These ongoing services are provided by hubco to assist the territory participants in discussing and planning accommodation and service delivery requirements and facilitating the joint working that will lead to delivery of collaborative projects.

South East Hub		
		Project Development Partnering Services New projects within the scope of hub are then delivered through hubco by its supply chain as either D&Bs or DBFMs without going through a further European Procurement Process.
	[50]Form of principle contract(s)	The form of D&B Agreement and DBFM Agreement is agreed with hubco a standard when it is established and is a standard form hub Programme document (not an NEC, JCT etc). On each project the individual Public sector authority or authorities will be the client.
	Who installs/ maintains the facility/ kit	hubco procures delivery of the services through its supply chain members.
	Who owns the site/ kit	Public Sector
	Who does the facility/ kit revert to on contract expiry	Public Sector
Electricity Sale/ Heat Production	Who is energy provided to	N/A
	Which party sells energy	N/A
	Which party receives energy income	N/A
Inputs and Outputs	Set up costs (inc procurement and D&B):	N/A
	Annual O&M costs	N/A
	Energy/ heat produced	N/A
	[51]Income from ROCs/ LECs/	N/A

[50] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

South East Hub		
	FITs/ RHI/ CRC credits/ energy sale/ rent	
	Other income	N/A
Timing	Planning status	Construction of first project commenced
	Procurement status	Private Sector Development Partner appointed August 2010
	Service commencement	Construction started January 2011
	Contract duration	20 years with potential 5 year extension
Funding	Funding source(s)	Hubco is funded initially through working capital loans from shareholders and on an ongoing basis through a project development fee generated from new projects delivered. D&B projects are capitally funded either through central government, the relevant authority or a combination of these. DBFMs are funded through subordinated debt from hubco shareholders and senior debt likely to be provided by a bank.
	Funding term	Vary by project.
Background to decision making:	Key drivers	• Improving the efficiency of delivery for community-based health and local authority facilities; • Delivering economies of scale through shared facilities; • Maximising the best use of public resources; and • Providing continuous improvement in both cost and quality in public procurement.
	Project successes	
	Any barriers to success	

[51] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

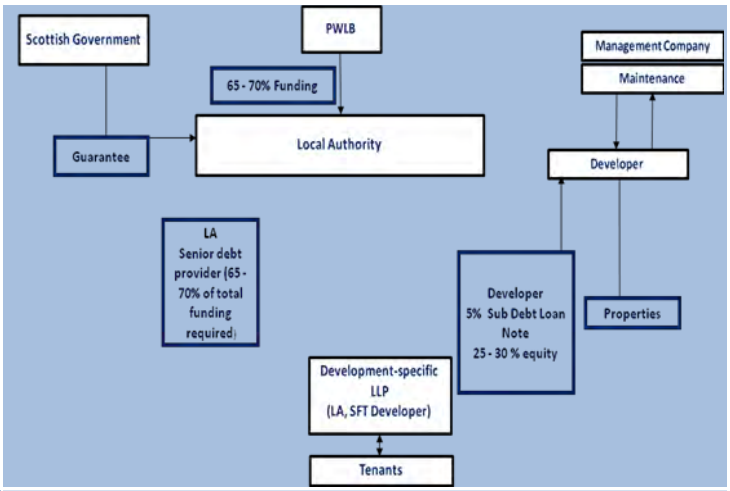
South East Hub		
Further details	Contact, website address, publications:	http://www.scottishfuturestrust.org.uk/a.asp?a=22 http://www.scottishfuturestrust.org.uk/docs/78/hub%20South%20East%20draft%20Stategic%20Delivery%20Plan%20updated.pdf

National Housing Trust		
Parties	Principal parties	Local Authority, Private Sector Developer and NHT
	Supporting parties	Scottish Government
Infrastructure	Brief Description	The National Housing Trust initiative is an innovative partnership approach aimed at boosting the supply of affordable homes in Scotland. The initiative will deliver housing for rent at below market rents whilst at the same time supporting economic recovery through stimulating the construction industry and safeguarding jobs.
Project Details	Commercial structure (e.g. JV/ ESCO/ public body/ company)	Special Purpose vehicle (SPV) consisting of Local Authority, SFT and developer.
	[52]Form of principal contract(s)	Framework Agreement and a suite of documents including; Members Agreement, Management and Maintenance Agreement, Take Out Agreement, Loan Agreement etc.
	Who installs/ maintains the facility/ kit	Developer builds homes
	Who owns the site/ kit	SPV buys homes once complete
	Who does the facility/ kit revert to on contract expiry	SPV sells homes between 5-10 years after completion
Electricity Sale/ Heat Production	Who is energy provided to	N/A
	Which party sells energy	N/A
	Which party receives energy income	N/A
Inputs and Outputs	Set up costs (inc procurement and	LLP set up costs split between SFT and developer. Each party is responsible for their procurement costs.

[52] This could be, for example, a standard form contract (such as NEC, JCT, ICE or FIDIC), a PPP/ PFI type contract, a local authority template, or a contract designed specifically for the project.

	D&B):	
	Annual O&M costs	Developer responsible for maintenance of homes.
	Energy/ heat produced	N/A
	[53]Income from ROCs/ LECs/ FITs/ RHI/ CRC credits/ energy sale/ rent	N/A
	Other income	When SPV sells homes, the LA loan's will be repaid, then the developers, the public sector will receive proceeds above an IRR of 20%.
Timing	Planning status	Varies between projects
	Procurement status	At framework agreement / call-off stage
	Service commencement	Once houses built 2012-2013
	Contract duration	Framework Agreement = 4 years Scottish Government guarantee = 10-12 years.
Funding	Funding source(s)	Local Authorities fund 65-70% of the homes through the SPV using money borrowed from PWLB, the developer provides the remaining 30-35% through a mixture of loans and equity. Rent from the housing is used by the SPV for maintenance and interest on loans. Prior to the 10th anniversary of completion the homes are sold and the proceeds used to repay loans and provide return to developers.

[53] ROCs = Renewable Obligation Certificates. LECs = Levy Exemption Certificates, FITs = Feed-In Tariffs, RHI = Renewable Heat Incentive, CRC credits = Carbon Reduction Commitment electricity generating credits.

		
	Funding term	Initial term 6.5 years
Background to decision making:	Key drivers	• Need for affordable housing • Rental levels sufficient to cover interest on LA loans • Developers leaving land available for housing
	Project successes	• Viable LLP
	Any barriers to success	• Not disclosed
Further details	Contact, website address, publications:	http://www.scottishfuturestrust.org.uk/docs/157/NHTInformationMemorandumSep2010.pdf http://www.scottishfuturestrust.org.uk/a.asp?a=124

Appendix C – Risk Transfer

Within this Appendix, we have summarised the different levels of risk transfer of the commercial structures reviewed within Sections 3 of this report. This is intended to be a high-level review of the key risks associated with the commercial structures identified, namely:

- **Category A – owner operator structures**: significant public sector involvement in the renewable facility which may include involvement in designing the facility; operating the facility and maintaining it over the duration of its economic life;
- **Category B – JV and partnership structures**: where the public sector enters into some form of partnership with the private sector to develop renewable projects. This could take the form of a joint venture partnership through to more formal PPP type structures or a combination of both; and
- **Category C – land lease agreements or service concessions**: where for land lease agreements the public sector effectively leases the land to a renewables developer and receives a land rental (and in some cases a share of the revenue from the electricity generated by the renewable assets developed). For service concessions, the public sector grants a right to develop or exploit an opportunity.

The risk matrix identifies the following three types of risk treatment:

T Risk transferred to the private sector

S Risk shared between the public and private sectors

R Risk retained by the public sector

In practice, the level of risk transfer may vary for each individual projects, especially those structured around Joint Venture partnerships. In this case there can be a significant variation in the level of risk transferred to the private sector reflecting procuring authorities‟ ultimate objectives for the projects. This manifests itself in the risk matrix as a shared risk position for the majority of risks under a JV structure.

Renewables: Typical risk allocation associated with different commercial delivery structures

Risk	Description of risk	Local Authority as Owner			Partnership Models			Third Party Developers & Concessions	
		A1. Local Authority self-designs, procures construction, self-operates	A2. Local Authority procures D&B contract, self-operates	A3. Local Authority procures separate D&B and O&M contracts	JV: public sector control[54]	JV: private sector control	PPP either a DBO or DBFM	Silent Landlord	Service Concession
Design	Incorporates design failures which result in poor performance of the facility	R	T	T	T	T	T	T	T
Consents[55] – planning permission / environmental	Consents are unavailable, or delayed, or granted subject to unanticipated / onerous conditions. These are often pre-conditions to a project progressing resulting in a shared risk.	R	S	S	S	S	S	S/T	T

[54] Precise risk allocation will depend on what assets each party is contributing to the joint venture (e.g. land, capital, know-how) and the precise contracting relationship.

[55] In some cases obtaining planning permission and other key consents will be a pre-requisite for a project to go ahead. In other cases projects may be initiated without planning permission or other key consents being in place, with the consequences of failure to obtain such consents being shared.

Risk	Description of risk	Local Authority as Owner			Partnership Models			Third Party Developers & Concessions	
		A1. Local Authority self-designs, procures construction, self-operates	A2. Local Authority procures D&B contract, self-operates	A3. Local Authority procures separate D&B and O&M contracts	JV: public sector control[54]	JV: private sector control	PPP either a DBO or DBFM	Silent Landlord	Service Concession
Consents – other	Consents are unavailable, or delayed, or granted subject to unanticipated / onerous conditions. This risk is assumed to be transferred under design & build contracts once planning permission has been obtained	R	T	T	T	T	T	T	T
Financing	Unavailability of sufficient funding; variance between actual and forecast financing costs	R	R	R	S	T	R/T[56]	T	T
Construction[57]	Variance between actual & forecast	T	T	T	S/T	T	T	T	T

[56] Financing risk will be transferred under a DBFM structure where the private sector partner also sources commercial debt. Under a DBO contract the financing risk will be retained by the Authority.

[57] Assumes a fixed-price construction contract is let. Under a JV structure with public sector control some elements of risk may exist if they are undertaking aspects of the construction themselves.

Risk	Description of risk	Local Authority as Owner			Partnership Models			Third Party Developers & Concessions	
		A1. Local Authority self-designs, procures construction, self-operates	A2. Local Authority procures D&B contract, self-operates	A3. Local Authority procures separate D&B and O&M contracts	JV: public sector control[54]	JV: private sector control	PPP either a DBO or DBFM	Silent Landlord	Service Concession
	construction costs								
	Responsibility for consequences of delay to completion of construction & commissioning[58]	S	S	S	S	T	S/T	T	T
Operation and maintenance	Variance between actual and forecast operating and maintenance costs following initial warranty periods	R	R	R/T[59]	R	S/T	T	T	T

[58] Delays to construction can result from a number of causes, and the financial and other consequences will vary according to the reason for the delay. Some types of delay (e.g. supply chain issues) will be a contractor risk, with others (e.g. a change in the public sector‟s requirements) being a retained risk, or a shared risk (e.g. force majeure type events). More risk is transferred under DBO / DBFO models, as the services period will normally be reduced in the event of a delay to construction.

[59] Assumes operating risk is transferred for the duration of successive short-medium term O&M contracts. Long-term increases in operating & maintenance costs are a retained risk.

Risk	Description of risk	Local Authority as Owner			Partnership Models			Third Party Developers & Concessions	
		A1. Local Authority self-designs, procures construction, self-operates	A2. Local Authority procures D&B contract, self-operates	A3. Local Authority procures separate D&B and O&M contracts	JV: public sector control[54]	JV: private sector control	PPP either a DBO or DBFM	Silent Landlord	Service Concession
Change in law	Responsibility for consequences of unforeseeable changes in law (taking effect during operational phase)	R	R	R	S	R/S	R/S[60]	T	T
Revenue	Variance between actual and forecast income from off-takes (e.g. due to	R	R	R	S	R/S[61]	R/S[62]	S/T[63]	T

[60] Under DBO / DBFO models, the private sector may share in the risk of certain types of change in law, with the risk of other changes in law being retained by the public sector.

[61] For certain partnership models, the private sector may be willing to guarantee certain levels of revenue from off-takes during the operational phase.

[62] For certain partnership models, the private sector may be willing to guarantee certain levels of revenue from off-takes during the operational phase.

[63] For certain projects (e.g. wind farms), part of the rent payable for the leased land may be linked to actual power or income generated ("top-up" rent).

Risk	Description of risk	Local Authority as Owner			Partnership Models			Third Party Developers & Concessions	
		A1. Local Authority self-designs, procures construction, self-operates	A2. Local Authority procures D&B contract, self-operates	A3. Local Authority procures separate D&B and O&M contracts	JV: public sector control[54]	JV: private sector control	PPP either a DBO or DBFM	Silent Landlord	Service Concession
	fluctuations in demand and/or unit price obtainable for heat and/or electricity generated)								
Lifecycle	Variance between actual and forecast lifecycle replacement costs (following initial warranty period)	R	R	R/T[64]	S	S/T	T	T	T
Technology obsolescence	Technology remains operable (assuming ongoing maintenance and lifecycle replacement), but more efficient technologies become available	R	R	R	S	S	R	T	T

[64] Assumes some lifecycle risk can be transferred for the duration of successive short-medium term O&M contracts. Long-term increases in lifecycle costs are a retained risk.

Risk	Description of risk	Local Authority as Owner			Partnership Models			Third Party Developers & Concessions	
		A1. Local Authority self-designs, procures construction, self-operates	A2. Local Authority procures D&B contract, self-operates	A3. Local Authority procures separate D&B and O&M contracts	JV: public sector control[54]	JV: private sector control	PPP either a DBO or DBFM	Silent Landlord	Service Concession
Residual Value	Variance between actual and forecast residual value	R	R	R	S	R	R	T	T

Appendix D –Business Case Template

Executive Summary

1. Introduction

Setting out the purpose of the Business Case, structure of the document and background

This should include details of:

- Key sponsor(s)
- The vision, aims and objectives of the energy production proposal

2. Context of the Scheme

This section should:

- Outline the overall strategic policy objectives for renewable energy production and how the proposal contributes to achieving the desired outcomes
- Consider how the proposal delivers / fits with other local, regional and national policy objectives and initiatives
- Identify key stakeholders, land owners and partners and their likely roles and resources in relation to the proposal
- Describe the scope of the proposals e.g. a description of the technology to be used, location of the development, infrastructure needs and early priorities,
- The anticipated energy production and the likely revenue sources created

3. Benefits Analysis

The benefits analysis should be structured to reflect the anticipated outcomes of the proposal outlined in Section 2 above. It is anticipated that this would be projected over a 25 year period (or the likely contract period if less) and include:

- Economic assessment to incorporate an assessment of the counterfactual i.e. what would have happened if the proposal did not occur as well as an assessment of the economic benefits (in terms of GVA, number of jobs, wider investment etc) the intervention showing minimum, most likely and maximum impact over the appraisal period
- A measure of the Carbon benefit resulting from the renewable energy production

- A measure of other desired outcomes such as impact on social/fuel poverty, other community benefits
- In terms of the potential impact at a national level, consideration should be given as to how the proposals will deliver benefits nationally, the likely form these will take and how they fit with the strategic objectives of the Scottish Government

4. Development Investment Plan

Details of the development should include:

- A high level description of the proposed development (location, technology, grid connection etc)
- Costings (including risk allowances and optimism bias) for the proposal and details of any supporting advice, work or consideration to date
- Proposed programme for implementation
- Profiling of revenues

5. Risk

Consideration of risk: including risk identification, allocation, mitigation and management. Such elements may include:

- Key viability risk - considerations including:
    - LA vires (including asset ownership issues and access to funding)
    - Procurement approach and strategy
    - Revenue stream and certainty of use
    - State aid (if applicable)
- Key delivery risk considerations including:
    - Robustness of technology
    - Planning consents
    - Project risks e.g.:
        - Cost over runs
        - Delays in starting / finishing construction
        - Changes in the economic environment

The Business Case should include a consideration of the opportunities for transferring risk to the private sector (and the likely pricing of that risk)

6. Commercial and Financial Structure

This section should consider:

- Commercial structure proposed including details of key agreements / contracts likely to be required, and where applicable / available, an outline of the basis of such documents
- How the overall structure addresses the key risks and issues identified under section 3
- Cash flow analysis, inc investment requirements and projected returns
- Sources of finance and related certainty, (as outlined within section 4) particularly if private sector funding
- Any existing / other available sources of funding and finance, both public and private
- Key assumptions (e.g. cost and source of any funding, inflation) and ratios (where applicable) utilised in the Financial Model
- Sensitivity analysis considering key variables: delay, interest rate movements, inflation rate movements, FIT levels, increased construction costs, etc
- Proposed governance and management structures and roles of key parties / individuals
- Procurement and how Value for money will be delivered / assessed
- The delivery section should also consider:
    - How will the development be monitored and managed
    - Resourcing at different levels e.g. Local Authority, overall delivery and any, if required, additional vehicles
    - Internal / external resources available, and their suitability, for the delivery / management of the development
    - How both the public and private sectors are incentivised, and details of any underlying payment mechanisms, key payment milestones, etc
    - Details of key individuals

7. Next Steps

Should include discussion of:

- Programme and key milestones
- Critical next steps towards delivery
- The strategy for taking forward the project and responsibility for doing so

8. Conclusion

Summary of the case

Annexes

Detailed analysis and assumptions to support the case should be inserted / attached. This should include, but not be limited to:

- The outturn of any options appraisals in support of decisions
- The Financial Model
- The Benefits Assessment

Appendix E –Glossary

Term	Meaning
Anaerobic Digestion	Is the decomposition of animal wastes and other biomass material to elementary nutrients and humus by bacterial action. Biogas is produced which can then be used to produce electricity.
Carbon Emissions Reductions Target (CERT)	A statutory obligation on the six largest energy suppliers to deliver energy efficiency improvements in housing.
Combined Heat and Power (CHP)	Refers to a heating technology which generates heat and electricity simultaneously, from the same energy source
COSLA	The Convention of Scottish Local Authorities is the representative voice of Scottish local government and also acts as the employers‟ association on behalf of all 32 Scottish Councils.
DBFM	Design, Build, Finance and Maintain – this is generally the convention under which PPP/PFI projects are carried out where the majority of risk and reward is transferred to the Private Sector.
DBFO	Design, Build, Finance and Operate – very similar to DBFM, this is the generally used term for PPP/PFI roads projects where the majority of risk and reward is transferred to the Private Sector.
DCFM	Design, Construct, Finance and Maintain – very similar to DBFM, this is generally the convention for PPP/PFI prison projects. The key difference being that, under DCMF prison projects, the majority of the services provided within the prison are carried out by private sector employees, unlike, for example, a school where the maintenance is undertaken by the private sector but the core teaching function remains within the public sector.
DECC	Department of Energy and Climate Change created in October 2008.
Design and Build (D&B)	The D&B contractor enters into a contract to design and build a project that complies with a performance specification.

Due Diligence	The process of assurance / validation of information provided in connection with a transaction, prior to entering into binding agreements.
Energy from Waste (EfW)	The term used to describe the combustion of waste material under controlled conditions in which some or all of the heat released is recovered for a specific beneficial purpose.
Equity	Ordinary share capital invested in the project company by the sponsors and any third party investor. A wider definition of Equity includes loan stock or loans made by shareholders. Typically equity has the last claim upon the project's income, hence the highest risk and is therefore is the most expensive source of finance.
ESCo	A special purpose vehicle that facilitates the delivery and operation of an energy services scheme.
European Investment Bank (EIB)	The long-term lending institution of the European Union.
Feed In Tariff (FiT)	Payments to incentivise the installation of small scale, low carbon electricity generating technologies. Available for individuals, local authorities, community groups and other organisations who install low carbon electricity generating technologies up to 5MW.
Framework	A contractual structure whereby one or more suppliers are appointed for a fixed period to supply goods or provide services. Individual purchases can then be made by a purchasing authority under agreed terms.
Internal Rate of Return (IRR)	A measure of financial return. The nominal internal rate of return on an investment calculated on a cash basis on the aggregate of the Equity and Subordinated Debt invested. This can be referred to on a "Real" or "Nominal" basis.
Joint Venture (JV)	A contractual agreement joining together two or more parties for the purpose of executing a particular business undertaking. All parties agree to share in the profits and losses of the enterprise according to their agreement.
Lifecycle	Lifecycle relates to the replacement of the major components of a building so as to ensure the performance of the facility is maintained for the full contractual period. Projects generally require a reserving regime based on the timing and cost of replacement in order that funds are available as and when

	required.
Limited Recourse finance	A lending arrangement where the lender is permitted to request repayment from the sponsor if the borrower fails to meet their payment obligation provided certain conditions are met. Generally, limited recourse only applies to a specific and limited amount.
Non Recourse Finance	A lending arrangement whereby the lender is not permitted to request repayment from either the project sponsor or a parent company. In the event the borrower fails to meet its payment obligation, the bank will then require security packages which enable them to step into the project.
Official Journal of the European Union ("OJEU")	The forum in which the majority of procurements regulated by the EU public procurement regime are first advertised to the market.
Power Purchase Agreement (PPA)	Contracts between two parties, one who generates electricity for the purpose of sale (the seller) and one who is looking to purchase electricity (the buyer). There are various forms of Power Purchase Agreements; these are differentiated by the source of energy harnessed (solar, wind, etc.).
PPP	Generally, any public private partnership between the public and private sectors for the provision of works and/ or services.
Private Finance Initiative (PFI)	PFI is one tool in the PPP toolbox (see "PPP" above). PFI was launched by the UK government in 1992. The principle of PFI is that a public sector body obtains a service rather than an asset. A private sector contractor funds any asset required and is then paid for the services provided.
Prudential Borrowing	Borrowing by a Local Authority that takes place through the public works loan board.
Public Works Loan Board (PWLB)	A statutory body whose function is to lend money from the National Loans Fund to local authorities and other prescribed bodies, and to collect the repayments.
Renewable Heat Initiative (RHI)	A government scheme to provide long-term financial support to renewable heat installations to encourage the uptake of renewable heat.
Renewable Obligation Certificate (ROC)	A certificate issued to an accredited generator for eligible renewable electricity generated within the United Kingdom and supplied to customers within the United Kingdom by a licensed electricity supplier. The default level of support is one ROC for

	each megawatt hour (MWh) of eligible renewable output generated, but different renewable generating technologies are eligible for different levels of ROCs. ROCs can be sold by generators to electricity suppliers in addition to the electricity generated.
Residual Value	The expected value of a capital asset at some future date, normally at the end of a contract.
Senior Deb t/Funding	A loan typically provided by a financial institution to a Project. This debt will have first call on a project's cash flows and security arrangements.
Special Purpose Vehicle / Company (SPV/C)	A company set up solely with the intention of carrying out a specific project or activity. This allows the operations of the company to be ring-fenced from other activities. Also assists with off balance sheet treatment.
Subordinated Debt	Funding generally provided by the shareholders. It ranks behind senior debt and therefore, is the risk capital in PPP style transactions.
Turnkey	A term used when the subcontractor provides all materials and labour for a job

Appendix F –Useful Links

Description	Site
Government	
Department of Energy and Climate Change (DECC)	http://www.decc.gov.uk/
DECC Energy Trends	http://www.decc.gov.uk/en/content/cms/statistics/publications/trends/trends.aspx
EIB Energy Efficiency Fund	http://www.eib.org/attachments/thematic/renewable_energy_and_energy_efficiency_en.pdf
Electricity Market Reform	http://www.decc.gov.uk/assets/decc/consultations/emr/1041-electricity-market-reform-condoc.pdf
Energy Savings Trust - funding information	http://www.energysavingtrust.org.uk/business/Business/Local-Authorities/Funding/Funding-in-Scotland
Energy Savings Trust - Local Authorities	http://www.energysavingtrust.org.uk/business/Business/Local-Authorities
European Investment bank - Renewable Investments	http://www.eib.org/projects/topics/environment/renewable-energy/index.htm
Energy Efficiency Fund	http://www.eib.org/attachments/thematic/renewable_energy_and_energy_efficiency_en.pdf
Feed In Tariffs	http://www.fitariffs.co.uk/
Procurement Scotland	http://www.scotland.gov.uk/Topics/Government/Procurement/npcoe
Public Works Loan Board	http://www.dmo.gov.uk/index.aspx?page=PWLB/About_PWLB
Renewables Action Plan	http://www.scotland.gov.uk/Publications/2009/07/06095830/0
Renewable Heat Action Plan	http:\www.scotland.gov.uk\Publications\2009\11\04154534\

Description	Site
Scotland Excel	http://www.scotland-excel.org.uk/
Scottish Government	http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185
Scottish Government Climate Change Act	http://www.legislation.gov.uk/asp/2009/12/contents
The Carbon Plan (March 2011)	http://www.decc.gov.uk/assets/decc/What%20we%20do/A%20low%20carbon%20UK/1358-the-carbon-plan.pdf
The Green Investment Bank	http://www.parliament.uk/business/committees/committees-a-z/commons-select/environmental-audit-committee/inquiries/green-investment-bank/
The Sale of Electricity by Local Authorities (Scotland) Regulations 2010	http://www.legislation.gov.uk/uksi/2010/1908/contents/made
The 10 Energy Pledges	http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Action/economic-recovery/10-Pledges
Towards a Low Carbon Economy for Scotland	http://www.scotland.gov.uk/Publications/2010/03/22110408/00
Case Studies and Other	
Web links for case studies can be found in the individual case study information in Appendix B	
Burcote Wind	http://www.burcotewind.com/
Clean Tech Matters (Ernst Young)	http://www.ey.com/Publication/vwLUAssets/Cleantech-matters_FW0009/$FILE/Cleantech-matters_FW0009.pdf
Crisis or not, renewable energy is hot (PWC)	http://www.pwc.com/gx/en/utilities/renewable-energy
HBJ Gateley	http://www.hbjgateleywareing.com/services-for-business/climate-change-and-environment/
Mcgrigors Renewable Energy	http://www.mcgrigors.com/sectors/energy_folder/energy/renewable_energy.html
Sustainable Cities (Grant Thornton)	http://www.grant-thornton.co.uk/thinking/elevate/index.php/article/sustainable_c

Description	Site
	ities_how_business_can_help_green_the_public_sector/
Official Journal the European Union (OJEU)	http://www.ojeu.eu/