Shropshire Council

Date: Thursday, 28 March 2019

Time: 10.00 am

Venue: Shrewsbury/Oswestry Room, Shirehall, Abbey Foregate, Shrewsbury, Shropshire, SY2 6ND

Contact: Julie Fildes, Committee Officer
Tel: 01743 257723
Email: julie.fildes@shropshire.gov.uk

PLACE OVERVIEW COMMITTEE

TO FOLLOW REPORT (S)

6 Place Shaping - Diversification of the Local Economy (Pages 1 - 20)

To receive a verbal report from the Head of Economic Growth on the delivery of the Council's Economic Growth Strategy and to consider progress in securing investment in the Digital and Health Care Sector.

Contact: Gemma Davies, Head of Economic Growth, tel 01743 253869

7 Corporate Climate Change Strategy (Pages 21 - 62)

To consider a report from the Sustainability Commissioning Support Officer on the Corporate Climate Change Strategy.

Contact: Sam Kirby-Bray, Sustainability Commissioning Support Officer, Tel 01743 281009

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Overview and Scrutiny

Economic Growth
28 March 2019

Shropshire Council

INVEST SHROPSHIRE

Shropshire = a £6.26 billion Economy (3.2% growth 2017)

BUSINESSES
15,480

SIMILAR POPULATION TO NOTTINGHAM BUT SHROPSHIRE IS
44X BIGGER

12,000
THE NUMBER OF BUSINESSES WHO EMPLOY LESS THAN 4 PEOPLE

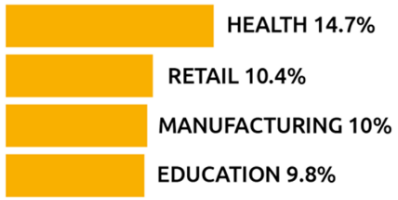
<1/5

MORE THAN 1/5 OF SHROPSHIRE'S ENTERPRISES ARE AGRICULTURAL

Shropshire Council

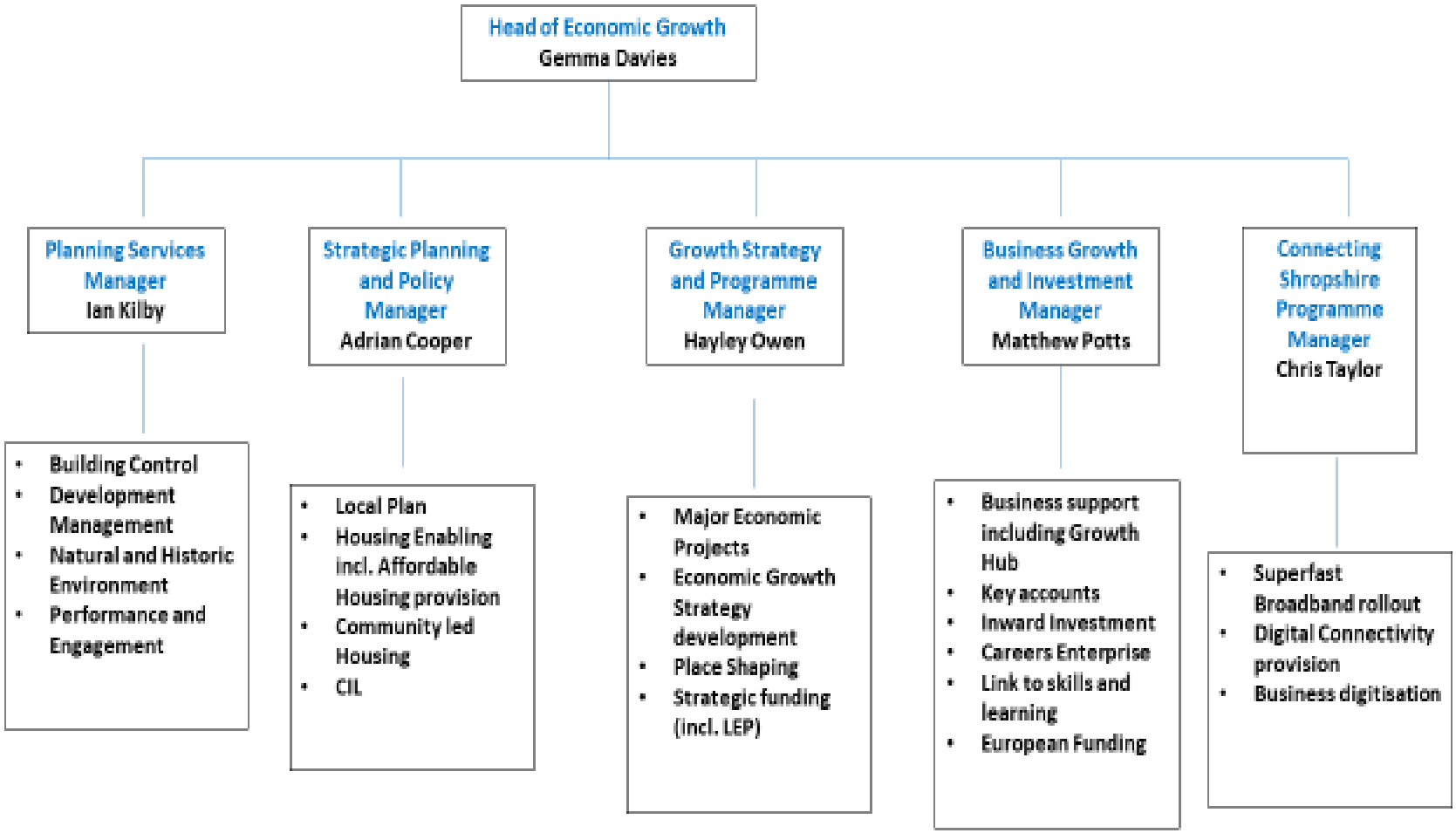
INVEST SHROPSHIRE

Jobs and Employment



Economic Growth Team Structure

February 2018



Economic Growth Strategy

Vision – To be the best place to do business and invest, renowned for its pool of local talent and expertise. We will strive to maximise our economic potential and increase productivity by fully utilising the benefits of our special environment and high quality assets.

Economic Growth Strategy

To deliver against this vision we have six priority actions:

Target actions and resources where there are economic opportunities

Enable businesses to start, grow and succeed

Deliver infrastructure to support growth

Meet skills needs of businesses and people's aspirations for work

Promote Shropshire to investors

Build our reputation as a Council that is 'good to do business with'

Economic Growth Strategy Aims

By 2021:

- 12% growth in GVA
- 3,700 new jobs
- £300 million private sector investment
- 1,375 new homes per year

Results to date - 2017

- New investment – £27.7 million
- Jobs created – 41
- Jobs safeguarded – 470
- Business Growth Programme (BGP) companies supported – 25
- BGP grants – £560,000
- BGP private sector match leveraged – £1 million
- BGP job creation – 71
- Marches Growth Hub company engagement – 751
- GVA growth – 3.2%

Results to date - 2018

- New investment – £88.25 million
- Jobs created – 330
- Jobs safeguarded – 150
- Business Growth Programme (BGP) companies supported – 49
- BGP grants – £1.1 million
- BGP private sector match leveraged – £1 million
- BGP job creation – 127
- Market Drayton Business Grant companies supported – 2
- Market Drayton Business Grant grants – £189,000
- Market Drayton Business Grant private sector match leveraged – £189,000
- Market Drayton Business Grant job creation/safeguarded – 13/7
- Marches Growth Hub company engagement – 2,543
- Marches Growth Hub events/attendees – 97/1,754

Current Enquiries

- Key Account System – Top 100, 50 fastest growers, site opportunities
- Inward Investment and Expansion Opportunities
  - High Tech Software Company
    - Potential D&B - 35 jobs retained, large scale growth
  - Manufacturing Operator
    - Relocation - 40+ jobs safeguarded
  - Manufacturer and Distributer
    - New HQ site - 56 jobs safeguarded, 20 new jobs
  - IT Hospitality Company
    - Potential D&B – 90+ jobs retained, c60 new jobs
  - Agri-food Manufacturer
    - Looking at new site options, 130+ jobs retained
  - Food and Drink Company
    - £100m investment, 25-45 jobs per annum created
  - Advanced manufacturer
    - Exploring 70-100 acre site with potential to create 250-500 jobs
  - Autonomous vehicle provider
    - Exploring test tract, production and sales opportunities
  - Market Drayton - Tern Valley
    - Building supply and demand case
  - Bishops Castle
    - ERDF funding for potential D&B proposal of four sites
  - Ludlow
    - Building supply and demand case

Invest in Shropshire Rebrand

INVEST SHROPSHIRE

NORTH SHROPSHIRE

ALLOCATED EMPLOYMENT USE B1, B2 + B8 – GREENFIELD (UNLESS INDICATED) - NO IDENTIFIED DEVELOPER

Available supply

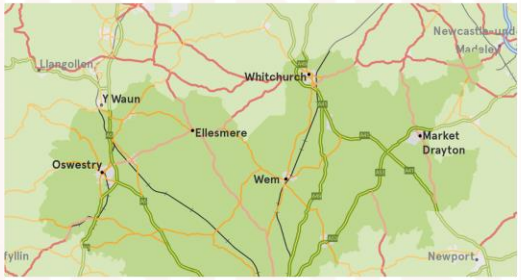
Oswestry Greenfield - 24 hectares (59 acres) + 12 hectares (30 acres) + 10 ha (25 ac) = 46 ha (114 ac)
Brownfield - 0.3 ha (0.7 ac) + 1.0 ha (2.5 ac) = 1.3 ha (3.2 ac)

Ellesmere 6 hectares (15 acres)

Wem 12 ha (30 ac) + 4 ha (10 ac) = 16 ha (40 acres)

Whitchurch 6 ha (15 ac) + 11 ha (27 ac) = 17 ha (42 ac)

Market Drayton 29 ha (72 ac)



Identified business demand

Oswestry Manufacturing + office = 50,000 ft2

Ellesmere Manufacturing + office 10,000 ft2 + 15,000 ft2 + 5,000 ft2 + 5,000 ft2+ 5,000 ft2 + 5,000 ft2 = 45,000 ft2
Plus land for manufacturing 10 acres

Wem Manufacturing 15,000 ft2 + 5,000 ft2 + 5,000 ft2 = 25,000 ft2

BT culina Practiceplan The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust PICKSTOCK Addo

HAVEK GROCONTINENTAL Richard Burbidge abp Arla TG Group SKYJACK müller

INVEST SHROPSHIRE

SOUTH SHROPSHIRE

ALLOCATED EMPLOYMENT USE B1, B2 + B8 - GREENFIELD (UNLESS INDICATED) - NO IDENTIFIED DEVELOPER

Available supply

Ludlow Greenfield 4 ha (10 ac)
Brownfield 1.4 ha (3.5 ac)
+ 0.5 ha (1.2 ac) = 1.9 ha (4.7 ac)

Craven Arms 6 ha (14 ac)

Bishops Castle 2.5 ha (10 ac)

Bridgnorth Brownfield – 2.0 ha (4.9 ac)
+ 0.5 ha (1.2 ac) = 2.5 ha (6.1 ac)

Shifnal Brownfield 2.0 ha (4.9 ac)

Identified business demand

Ludlow Manufacturing with offices 75,000 ft2 + 25,000 ft2 + 10,000 ft2 + 10,000 ft2 + = 120,000 ft2

Tenbury Wells / Burford Manufacturing with offices 17,000 ft2 + 5,000 ft2 = 22,000 ft2

Craven Arms Processing = 50,000 ft2 Office = 30,000 ft2 Manufacturing = 20,000 ft2

Bishops Castle Office + warehousing = 10,000 ft2
Office 15,000 ft2 + 1,000 ft2 = 16,000 ft2
Manufacturing 15,000 ft2 + 3,500 ft2 = 18,500 ft2

Cleobury Mortimer Manufacturing + office 5,000 ft2 + 5,000 ft2 = 10,000 ft2

Bridgnorth Manufacturing = 60,000 ft2 +
Plus land for manufacturing = 5 acres

Why not get in touch, we would be delighted to hear from you

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GW GRAINGER & WORRALL CORAM SHOWERS esterform PACKAGING JESMONITE KERRY McCONNEL BRITPART The quality parts for Land Rovers SNG BRETT GROUP

igloo CMC CLASSIC MOTOR CARS BRIDGNORTH ALUMINIUM LIMITED PREMIER medical EVIDENTLY BETTER PRACTICE Craven Dunnill FINE CERAMIC TILES marches biogas

Shropshire Council

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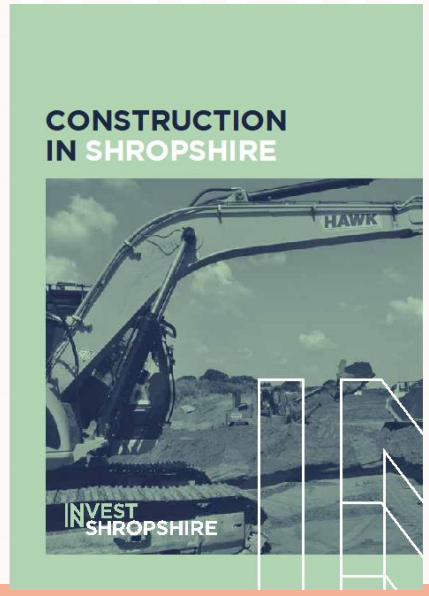
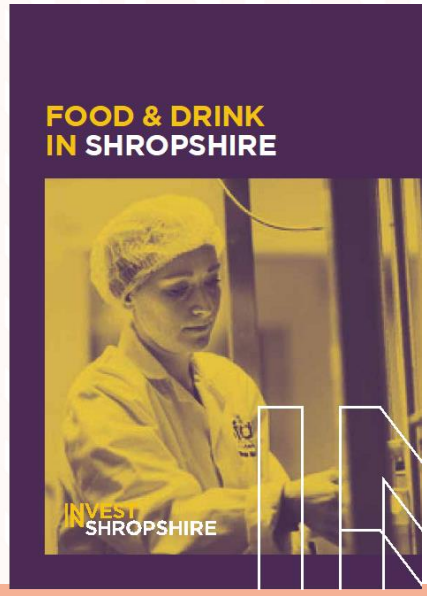
Sector Development Focus

- Six key growth sectors and two supporting sectors identified and proposition documents produced to promote to potential investors
- Documents include forewords from key local partners from each of the sectors
- Lead generation campaign focusing on sector growth is currently being developed with the first event on the food and drink sector booked for April
- The event, held at the NEC will see attendance from Invest, Harper Adams University and six local food and drink businesses in a Shropshire Pavilion promoting the region to a national and international audience





*images are of draft versions and some differ from final print versions

Sector Development Focus

- The Invest team on behalf of the Marches LEP are in the process of commissioning for a piece of in-depth sector analysis on Innovative Health
- £15,000 of funding has been secured to explore the sector including digital relationships and collaborations, data analysis and modelling, machine learning and smart speaker technology applications
- Three responses have been received and a company will be commissioned shortly to produce this piece of sector analysis
- Further studies around Visitor Economy and Digital are also being developed and/or supported by the service in conjunction with LEP partners that will be used to develop the Marches LIS

*images are of draft versions and some differ from final print versions

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Lead Generation Campaign

- MIPIM 2018
  - Attended as part of Midlands UK in partnership with Marches LEP
  - 16 pre-arranged meetings
  - 23 events attended
  - 53 contacts made
  - Continued engagement with approx. half of contacts made
  - 1 showcase event within the Midlands Pavilion
  - Production of bespoke collateral to promote opportunities
  - 1 private sector partner (Morris Property)

- MIPIM UK 2018
  - Attended as part of WMCA delegation
  - 17 pre-arranged meetings
  - 2 events attended
  - 43 contacts made
  - Primary collateral focused around Shrewsbury Big Town Plan and Investment Sites map

Lead Generation Campaign

- MIPIM 2019
  - Part of Midlands UK and in partnership with MLEP
  - Shropshire profiled under Invest in Shropshire brand
  - Held 37 pre-arranged meetings with investors and intermediaries
  - Approx. 120 contacts made
  - Hosted two showcase events in the Midlands Pavilion
  - One focusing on Shrewsbury: The Big Connection
  - The second on opportunities in wider Shropshire including Oswestry Growth Corridor and Ironbridge Power Station
  - Six sponsors – Harworth, Morris Property, WSP, LDA Design, Montagu Evans and Berrys
  - Shrewsbury Big Town Plan focused event sponsored by LDA Design and attended by 20 private and public sector representatives

Visitor Economy

- Total number of day trips = 10.36 million
- Total number of staying nights = 3.8 million
- Total visitor related spend = over £500 million
- 2011 data – needs updating
- Strategic focus
- Co-ordination role
- Campaign & funding opportunities
- Shropshire Hills Tourism Conference and Expo – 3rd April

Centres of Excellence

- Working alongside providers and businesses
- Meeting Shropshire's business sector needs now and future
- Marches Centre of Manufacturing & Technology Centre of Research for
- UCS Environmental Science and Technology (CREST)
- Harper Adams – incl. agricultural technologies and engineering, food production
- Other opportunities – digital health, creative and digital industries, construction

Shropshire Council

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Corporate Climate Change Strategy –

Executive Version

2020-2025

Securing our Future

Shropshire Council

Version	**Draft 6.2e**
Department	**Strategic Asset Management**
Author	**Samuel Kirby-Bray**
Role	**Sustainability Commissioning Officer**

Contents

Executive Summary

Reducing the Council's carbon footprint for service delivery is in line with the Governments Clean Growth Strategy (DBEIS, 2017b). This parallels cost reduction exercises and helps ensure efficient delivery of services.

The Corporate Climate Change Strategy (CCCS) supersedes the Carbon Management Plan (CMP) published in 2010 (Wagstaffe and Strivens, 2010). This set out a carbon reduction target of 35% by 2014 (2008 baseline). The ambitious target identified savings of £17m in 5 years, but was challenged by policy, austerity and resource factors. A reduction in funding and resource meant many projects were abandoned and savings not realised. Despite this, savings of £6m were realised in procurement, building operations and transport between 2009 and 2014.

The revised CCCS builds on measures already identified and will achieve further savings through a methodical approach to incrementally improve the efficiency of assets. It sets out ambitions for Shropshire Council, to succeed as a low-carbon Council with aspirations for zero carbon. Emission reductions go hand in hand with financial savings and clearly demonstrates our commitment to the environment.

Pro-active coordinated carbon reduction measures could achieve **net carbon zero by 2050.** A rapid renewable energy deployment and consumption reduction could secure net zero by 2040 together with **£5m and £20m efficiency savings and income from commercial scale renewables.** We have the capacity to generate all the energy we consume using estate natural capital. Indeed, Shropshire has the capacity to **support 20% of West Midlands electricity demand** with renewable energy; enabling a secure income for the next 50 years as fossil fuel prices escalate.

By exploiting brownfield sites, otherwise unusable estate and untapped roof capacity, Shropshire Council can step into the wholesale electricity market and self-generate for its own needs; becoming energy resilient and "future proof".

For the first time, UK energy markets indicate a decoupling from fossil fuels; energy saving, and renewable energy industry has now matured. Efficiency in buildings with EPC and DEC reports. Other environmental issues including plastics heralded by David Attenborough. Michael Gove's 25-year environment plan, the recent IPCC report advising net zero carbon and the imminent threat of climate change; both public awareness and the stakes have never been higher.

Corporate Landlord improvements and the ambitious Marches LEP Energy Strategy projects will support transport, commerce and housing. Efficiency and renewable energy demonstrate very real savings to the public. A confident new strategy will secure Shropshire Council's roadmap to a sustainable future.

The Governments Clean Growth Strategy

Drivers to Carbon Reductions

- Global consensus on Climate Change and latest IPCC recommendations.
- UK & European targets, and international agreements.
- UK transition into a low-carbon economy.
- UK trilemma: energy resilience, costs and carbon reductions.
- Reduce revenue spend (taking an invest to save policy).
- Depletion of finite natural resources including fossil fuels.
- The UK's over-reliance on fuel and energy imports.
- The UK's over-reliance on exporting waste streams.

Government Commitments (DBEIS, 2017a)

- Improving business, homes and industrial efficiency.
- Accelerating the shift to low carbon transport.
- Delivering clean, smart, flexible power.
- 30% reduction CO2e from estate by 2020-21 (2009/10 baseline).
- A further mandatory target to be set by 2025 and for 2050.
- £255 million provided for energy efficiency improvements in England.

Local Government Commitments

- Commit 50% reduction in CO_2e across all sectors by 2025 (based on 2008/9).
- Commit to 100% CO_2e reduction by 2050 (based on 2008/9).
- Make it a priority to access central Government funds for energy efficiency.
- Exploit low-carbon funding opportunities including ERDF and Salix loans.
- Implement a clearly defined MEES (Minimum Energy Efficiency Standards) programme for Corporate Landlord (CL) buildings.
- Facilitate a Refit programme for CL buildings using DBEIS assistance.

Whilst minimising legal repercussions is a significant factor behind Shropshire Council's carbon management programme. Financial revenue savings are the key benefits to the Council associated with 'low hanging fruit' efficiency improvements.

Low Carbon Economy

Supporting the shift towards a Low Carbon Economy across all sectors is recognised as a key European and Central Government economic driver (ESIF, 2017). Securing energy jobs and utilities costs are crucial to a resilient local economy. These factors parallel the aspirations of the Shropshire Council Economic Growth Strategy (2017-2021) (Council, 2017a) and Marches LEP (Local Economic Partnership) Strategic Economic Plan (Casey, 2014) .The strategy recognises that energy infrastructure, both supply and demand, are key to unlocking future growth potential.

Sustainability Vision Statement

"Stabilise and progressively reduce our environmental footprint: *Securing our future, whilst meeting our present needs by working together to balance social, environmental and economic requirements"*

This updated strategy is a collective council response to harness all existing activity and strategies and ensure all services have a vital role to play in addressing climate change. Collective action is more effective than "islanded strategies".

The CCCS has three main objectives:

- To mitigate climate change through carbon reduction of our services.
- To adapt services and their delivery to respond to changes in the climate
- To promote sustainable practices via all services.

Solving the Energy Trilemma

Addressing UK Priorities, the 'Energy Trilemma'

Table 1 The Energy Trilemma Aims (DBEIS, 2017a)

Aim	How Achieved by CCCS
Reduce CO_2e emissions	Ensure energy and fuel efficiency is addressed in decision making for buildings and transport.
Reduce energy costs	Utilities tariff optimisation and managing assets to prioritise and building costs.
Ensure Energy Security (Future Resilience)	Keeping the lights by facilitating secure energy infrastructure, demand matching with renewable energy and storage.

The UK Energy Trilemma involves reduction in carbon emissions, whilst at the same time keeping the cost of energy supply to the consumer down to (unit rate per kWh) and maintaining energy security (basically preventing grid outages and 'keeping the lights on'). The energy trilemma is a hugely challenging task to solve, and although individuals and private sector initiatives can make a big impact, Government decision making (both National and local) have a large role to play. As does research and development, university collaborations, European funded projects and policy making, National Grid and DNOs (District Network Operators) all have a role to play.

Marches Energy Strategy

The CCCS is closely aligned with the Economic Growth Strategy and the Marches Local Enterprise Partnership (LEP) Energy Strategy (Corliss, 2018). Whereas the CCCS is an internal Corporate plan, the Marches LEP Energy Strategy engages with the private sector. The Marches area has great opportunity for not just building and enterprise energy efficiency programmes, but also untapped renewable generation to provide flexible low carbon sources of energy. These sources can provide low cost energy to businesses and communities, accommodate planned growth and support low carbon supply chains. The Marches region vision and key targets for 2030 are:

1. ***Smart control and mitigation of grid constraints.***
2. ***Innovation in agricultural technologies.***
3. ***Reliable energy supply.***
4. ***Development of the supply low carbon chain.***
5. ***Local renewable energy supply.***
6. ***Addressing high levels of fuel poverty.***

2030 Vision Statement

The Marches area has an energy generation and supply system which is flexible and reliable, delivering energy that is low carbon and low cost to businesses and communities, can accommodate planned growth and can support well developed low carbon supply chains.

Pilot	Developing a pilot grid constraints mitigation project as a national demonstrator
50%	Renewable electricity meeting 50% of local demand
1000	1000 new jobs in the Low Carbon and Environmental Goods and Services sector
≤10%	Fuel poverty reduced below 10%
Leader	Continue to be a national leader in deployment of anaerobic digestion
Centre	Create a centre for UK agriculture innovation and low carbon transition
57%	Carbon emissions excluding agriculture reduced in line with UK targets, a 57% reduction on 1990 levels

Figure 1 Marches LEP Energy Strategy Targets (Corliss, 2018)

Renewable Energy

County Potential Renewable Energy Capacity

Several studies have contributed to the summary below (Table 2), showing the total potential renewable energy resource across the Marches (Brisely *et al.*, 2011). Shropshire has a potential renewable capacity over 10GW which equates to 20% of the West Midlands total electricity demand (DECC, 2010). A significant solar, wind, hydro and biomass resource including energy crops, animal and municipal waste.

Table 2 Total renewable energy potential by local authority across the Marches region

		Herefordshire	Telford and Wrekin	Shropshire	Total (MW)
Onshore wind	Large scale	7,786	799	8,908	**17,493**
	Small scale	237	52	358	**647**
Hydro		15	2	12	**29**
Solar	Photovoltaics	67	39	116	**222**
	Water heating	53	31	90	**174**
Heat pumps	Ground source heat pumps	98	62	170	**330**
	Air source heat pumps	392	249	681	**1,322**
Biomass	Managed woodland – elec.	6	0.2	9	**15.2**
	Managed woodland - heat	7	0.2	11	**18.2**
	Energy crops – elec.	42	4	70	**116**
	Energy crops - heat	18	2	31	**51**
	Waste wood – elec.	1	1	2	**4**
	Waste wood - heat	1	1	1	**3**
	Agricultural arisings (straw)	9	2	12	**23**
	Animal waste (wet organic waste)	26	2	54	**82**
	Animal waste (poultry litter)	12	1	4	**17**
	Municipal solid waste	7	7	13	**27**
	Commercial & industrial waste	4	5	6	**15**
	Landfill gas	0	0.8	2	**2.8**
	Sewage gas	0	0.5	1	**1.5**
	Co-firing of biomass	0	0	0	**0**
Total	Electricity (MW)	8,212	915.5	9,567	**18,694.5**
	Heat (MW)	569	345.2	984	**1,898.2**
Overall	Total (MW)	8,781	1,260.7	10,551	**20,592.7**
	% of West Midlands total	16%	2%	20%	**38%**

Achievements So Far…

Energy and Water Monitoring

Table 3, 12, 13 below show total consumption across corporate buildings. Three financial years were chosen at four-year intervals: 2008, 2012 and 2016.

Table 3 Building Consumption and Running Costs (all sites)

FY2008/9	**(kWh)**	**Cost (£)**	**$kgCO_2e$**
Electric	21,257,231	£1,993,389.49	11,365,179
Gas	29,620,687	£1,023,583.05	5,438,358
Oil	1,110,154	£51,533.94	296,855
Water	13,226 (m^3)	£27,789.12	4,551
TOTAL	**52 GWh**	**£3.1m**	**17,105**

Data Populated

FY2012/13	**(kWh)**	**Cost (£)**	**$kgCO_2e$**
Electric	31,651,907	£3,933,999.87	15,710,741
Gas	35,359,098	£1,466,508.87	6,491,930
Oil	6,056,476	£424,526.23	1,619,502
Biomass	40,980	£4,332.57	520
Water	211,567 (m^3)	£719,742.38	72,800
TOTAL	**73 GWh**	**£6.55m**	**23,909**

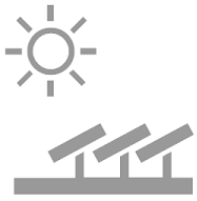
Data Complete

FY2016/17	**(kWh)**	**Cost (£)**	**$kgCO_2e$**
Electric	31,071,785	£3,958,133.61	11,944,926
Gas	30,567,833	£911,268.07	5,629,494
Oil	2,864,149	£130,292.60	767,282
Biomass	78,567	£4,475.89	998
Water	153,823 (m^3)	£586,774.89	52,915
TOTAL	**65 GWh**	**£5.59m**	**18,396**

Savings Made

Solar Photovoltaics (PV)

Solar generation is a good news story for Shropshire Council. Growing year on year since 2012, there are now 37 solar arrays installed across 26 sites. With a peak capacity of 1MW, **4.7GWh** of energy has been generated since the first installation.



3,936,853 kWh

Generated

2,136,371 $kgCO_2e$

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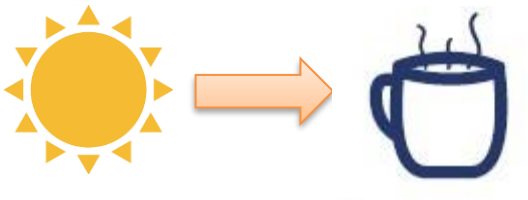


From sunshine into nearly two hundred million cups of tea…!

The total electricity generated is enough to boil water for 196,842,650 cups of tea!

Table 4 Since 2012 the financial benefits have been **£1.36m,** based on electric savings (p/kWh) as provided by West Mercia Energy and the feed-in-tariff.

Table 4 Solar Energy and Financial Benefits

	Energy (MWh)	Estimated Savings	FiT Income	Total
2012	**460**	**£44,197.02**	**£82,942.84**	£127,140
2013	603	£61,257.08	£115,751.46	£177,009
2014	616	£65,572.81	£120,639.35	£186,212
2015	626	£64,659.90	£121,532.41	£186,192
2016	841	£86,906.18	£138,752.74	£225,659
2017	755	£89,348.56	£128,964.65	£218,313
2018	804	£100,507.83	£140,819.38	£241,327
TOTAL	**4,705**	**£512,449**	**£849,403**	**£1,361,852**

Corporate Landlord Building Efficiency Savings

Based on an initial analysis of Display Energy Certificate (DEC) data, approximately 70% of Shropshire Council building energy use is associated with sites performing better than 'typical' (A to D ratings) and 30% in buildings performing worse than typical (E to G). Dramatic improvements in energy performance are possible through a combination of operational improvements and up to date building retrofit methods.

Comparing the 16/17 and 12/13 datasets, implied savings are due to a vigilant, rigorous energy and water monitoring programme (Table 5).

Table 5 Savings by Fuel and Revenue Type over 5-year period

Savings 2012-2017	**kWh**	**£**	
Electric	580,122	-£24,134 *	
Gas	4,791,265	£555,240.80	
Oil	3,192,327	£294,233.63	
Water	57,744 (m^3)	£132,967.49	
Total	**8,621,458**	**£958,308**	

*Energy saving made but cost went up due to tariff/commodity increases (£/kWh).

Table 6 Total Savings - Energy/Cost/CO_2e over five years

Building Energy	***Building Savings (£)***	***Total (CO_2e)***	
8.6 GWh	**£958,308**	**29,432 tonnes**	

Waste & Recycling

Veolia has provided favourable carbon emission data based on Shropshire Council's Municipal waste contract (**Error! Reference source not found.**).

Domestic Waste

The carbon footprint for the domestic municipal waste contract has improved by removing waste from landfill with enhanced recycling processes and generation of energy from waste (Veolia UK, 2018a) 2009 to 2016:

29,094kwhr of electricity was produced in the last year from 43.489 tonnes of general waste processed through the ERF facility, that's enough to power 9 homes for a whole year!

23,919 tonnes CO_2e

Figure 2 Veolia Energy Recovery Facility: Battlefield, Shrewsbury

Landfill Emission Assumptions

* Green House Gas (GHG) emissions are defined as CO_2e derived from UK DBEIS (Department of Energy and Industrial Strategy) regional data sets (UK Government, 2017) and targets. Landfill waste GHG emissions = 588.9 kg CO_2e per tonne. (UK Government GHG Conversion Factors for Company Reporting, 2017). Assumptions in Appendix C.

Shirehall Waste and DMR (Dry Mixed Recycling)

Error! Reference source not found. shows Facilities Management (FM) Shirehall commodity costs. DMR is currently just over 40% with scope for improvement. Kitchen waste has increased significantly (an additional £1k p.a.). Paper towels (both supply and disposal cost since non-recyclable). Efficient hand dryers may be a cost-effective alternative.

Table 7 Shirehall DMR 2025 Target

	2018 mix	Current Cost	2025 mix	Target Cost
DMR	42.26%	£3,994.84	80%	£7,950.10
General	57.74%	£8,155.60	20%	£2,972.40
Total		**£12,150.44**		**£10,922.50**

Shirehall produced 21.50 tonnes of dry mixed recycling in the last year. A Target to increase from 50% - 80% by 2025 (Table 7), will help reduce cost, environmental impact and improve our circular economy. Achieving the target of 80% DMR by 2025 will generate savings of **£1,228 p.a.**

Warp-it

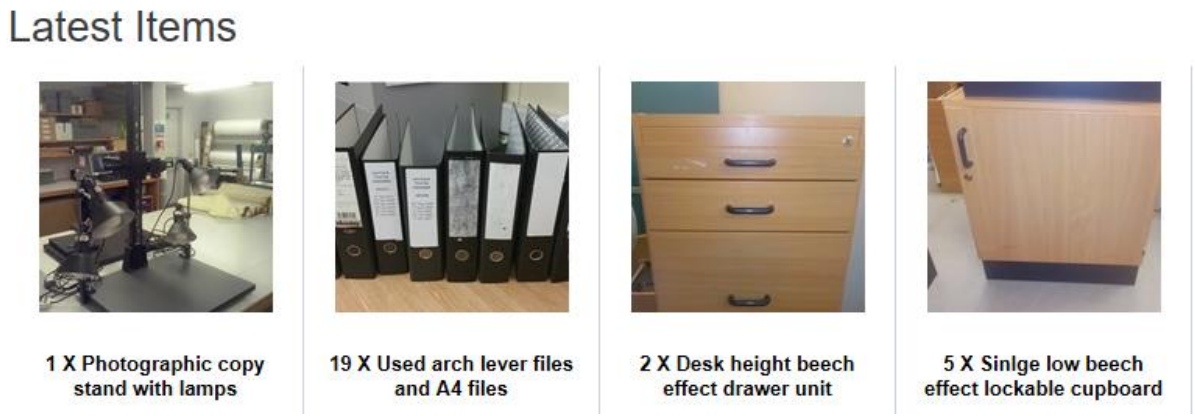
- Warp-it (Waste Action Reuse Portal) Is an Internal marketplace to encourage peer to peer trades - stops staff buying stuff the organisation already has.
- Peer to peer trades across the organisations. System knows who wants the surplus assets as soon as they are added, which reduces the need for storage.

Reuse Office Equipment

Online reuse platform makes it easy for staff to get, give and loan surplus stationery, furniture and other equipment. Within organisation, and appropriate external parties.

· Procurement tool: stops staff buying items that are already surplus.

· Waste reduction tool; new owners for items that may have been skipped.



Key Benefits

- Better management of assets coming out of buildings.
- Reduce waste cost finding homes for scrapped assets.
- Create wish lists, requirements for stationery, furniture.
- Reduce procurement costs across the budgets.
- Link up with other public organisations e.g. NHS Trusts (see here).
- Connect, support schools and '3rd sector'.
- Incremental improvements to automate a repurposing process.

- **Savings = £11,982**
- **Waste avoided = 2,138 kg**
- **Carbon = 5,016 kgCO_2**
- **Trees Equivalent = 6**

Table 8 Warp-it Shropshire Council Performance Metrics

Staff Pool Cycles

Shropshire Council Pool Cycles (SCPC) (Figure 3) have been restored and relaunched. Colleagues have sacrificed lunchtimes to help repair them. They allow staff to take daytime trips into town, to meetings or simply for a nice lunchtime ride. There are ten Giant cycles based at Shirehall (5 gent's and 5 ladies) and a further 8 at the Highways Depot Longden Road. The keys are held at the North Entrance and lockers contain spare tubes, pumps and helmets.

Figure 3 Shropshire Council Pool Cycle Images

There are regular users at Shirehall and so far, one based at the Highways Depot Craven Arms. It has not yet been widely publicised, so uptake is expected to improve with a campaign. There has been interest for SCPC at Shropshire Council offices.

The next step may be to convert 2 or more of these to electric (PEDELECs) to assist with the Shrewsbury hills!

Project Opportunities

Reduce consumption and increase renewable generation throughout Shropshire are ranked based on easiest to implement and capital spend. Each theme is shown in greater detail over the next few pages, together with a SWOT (Strengths Weaknesses Opportunities and Threats) analysis. Projects tcommissioned will outline capital costs, revenue savings, payback period, ROI and carbon reductions.

Table 9 Summary Table of Project Themes

Biodiversity, Ecology Climate Change Adaption	• ***Use Gov. 25 Year Environment Plan***
	• Optimise 'Natural Capital'
	• Increase income stream from Sustainable Tourism.
	• Increase biodiversity (flora and fauna).
	• Water retention 'soak-ups' for flood prevention.
	• ***Green Infrastructure*** has multiple benefits:
	  ○ Creates a carbon sink.
	  ○ 'Filters' local emissions and reduces noise.
	  ○ Studies show benefits to wellbeing.

Clean Growth Strategy	• Corporate projects and Marches LEP Strategy. • Sustainability West Midlands, strategic partners. • DBEIS Gov. Green Paper and Clean Growth Strategy.
Energy – Demand	• Housing Efficiency. • Private Sector Buildings Efficiency • Public Sector Buildings Efficiency.
Energy - Generation *(Renewable Energy for the Rural and Built Environment)*	• Renewable energy & load matching. • Energy Storage (electric or heat). • District heating and whole place solutions. • Exploit 'Natural Capital' - renewable energy capacity.
Finance Initiatives	• Using correct funding opportunities e.g. SALIX, • 'low carbon accounting' methods. Divestment.
ICT *(technology led solutions)*	• Energy consumption and generation display for staff. • A 'switch IT off' awareness raising initiative. Remote auto-off LAN. • Optimisation server energy consumption. • Use of offsite servers where appropriate. • Phone applications and laptop ICT solutions.
Procurement and Maintenance *(embodied carbon, materials & supply chain processes)*	• Works contractors (E.g. grounds maintenance). • Added value from waste streams (for example woody biomass). • Sourcing local contractors: goods and services. • Procurement of goods - lifetime carbon assessments (supply chain).
Recycling and Re-Purpose	• Staff awareness of in house recycling. Food-waste collections. • Warp-it scheme (a model to facilitate asset re-use and re-purposing). • Zero plastic packaging in house for 2018/19.
Social Initiatives *(People led solutions)*	• Staff awareness, training and behavioural change. • Health and wellbeing, public cost to the NHS. • Community ownership (for renewable energy). • Organisational cultural shifts to reduce 'burden to society'.
Sustainable Tourism	• "Working with communities and businesses to help make them more sustainable and promote good practice".
Transport and Travel	• Staff Travel Policy related to staff commuting and business travel, Electric Vehicle charging infrastructure.

Assets and Estates Commercial Strategy

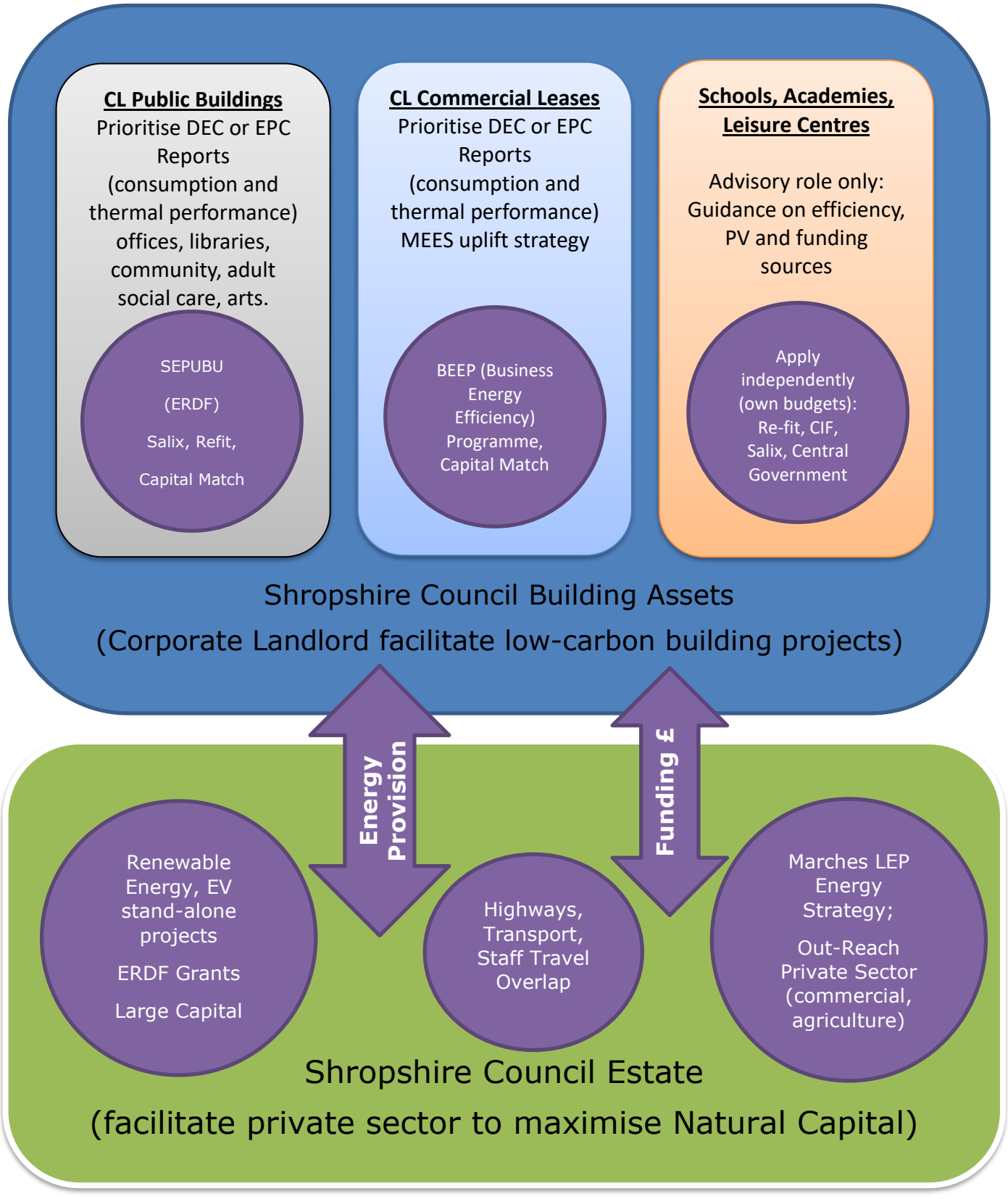


Figure 4 Deployment and Funding of Commercial Efficiency and Renewable Energy Projects on Corporate Landlord Assets and Estates

Corporate Landlord Commercial Leases

The valuation methodology of Corporate Landlord commercial leases should consider the uplift of EPC ratings. Therefore, property values should reflect their running costs.

Corporate Landlord (CL) is structured under 'Business Enterprise and Commercial Services' warrants close engagement with businesses as tenants to improve efficiency. Economic Growth have facilitated the introduction of BEEP (Business Energy Efficiency Programme) as proved successful in other local authorities in the Marches region in providing efficiency measures to commercial units. Even when this funding has expired the methodology and measures endorsed should continue to be facilitated to help the tenants secure and reduce their running costs.

Economic Growth have commissioned the Marches Energy Strategy (Corliss, 2018).The CCCS recommends that projects relating to commercial tenants should be in line with the evidence and recommendations in found in this study which specifically relate to the private sector in addition to Carbon Trust who publish standard recommendations for businesses of all types.

Theme:	**Business and SME Efficiency**
Sectors and Case Studies	Retail sector, SME's, light industry, agriculture. Renewable energy infrastructure to match growth in retail and business parks. Local energy supply demonstrated by Harper Adams University: • STEP (Sustainable Transition Energy Project). • 1MW CHP, 1MW Biomass, 1km heat network, 650kW Solar PV.
Strengths	Utilise business partnerships Marches LEP and business development.
Weaknesses	**Grid Constraints:** Historic poor investment in grid infrastructure in rural Shropshire has both restricted business growth and installed renewable energy capacity. Ill-conceived schemes or inappropriate technologies applied for the location.
Opportunity	• Collaborate with businesses, SME's and universities for low carbon projects. • Facilitate funding for businesses, School Academies and leisure centres. • Sizing renewables and battery storage based on local demand.
Threats	Economic climate, government policy, grant schemes and renewable incentives.
Internal Actions	• Economic Development and Business Growth. Corporate Landlord, PSG. • Government grant schemes and SALIX funding routes.
Funding Routes	ERDF Priority Axis 4: Supporting the shift towards Low Carbon All Sectors: (ESIF, 2017) 4b Energy efficiency in SME's and 4e: Whole Place Solutions. 4f: Research and Innovation. Government grant schemes. Business Energy Efficiency Programme (BEEP).

Public Buildings

Public buildings will be prioritised and addressed based on their DECs (Display Energy Certificates). Energy/carbon saving opportunity identification and subsequent interventions around cost of implementation and payback periods.

Theme	**Public Buildings Efficiency**
Sectors and Case Studies	SEPuBu: Adult Social Care service area and Shrewsbury Market Hall. Libraries, community use buildings are examples from partner local authorities.
Strengths	• Energy and water consumption AMR data available. • Renewable Energy Capacity: solar and wind.
Weaknesses	User engagement and relationship prior and post commission.
Opportunity	• Reduce revenue spend for building assets. • Developments in efficiency and renewable energy. • Income from FiT/RHI and energy savings. • Public buildings requiring improvements works. • Revenue reduction via 'programmed maintenance'. • Flagship demonstrators for hybrid wind and solar generation.
Threats	MEES (Minimum Energy Efficiency Standards) for public assets to be leased or sold (or opportunity depending on how viewed). Rising energy costs, carbon levies, renewable incentive cuts (RHI, FiT). Funding deadlines – ERDF. Site specific planning restrictions.
Recommended Interventions *(low-cost solutions)*	**Building orientation, construction method.** Prioritise based on DEC and EPC reports. Assets sold or leased prioritised to meet Minimum Energy Efficiency Standards (E). EPC's identify the recommended measures: **Standard electric and thermal efficiency measures:** • Building fabric thermal efficiency. Pipework lagging, end plates and joints. • Boiler plant efficiency and controls. **HVAC (Heating, Ventilation, Air conditioning and Cooling) Systems:** • Energy monitoring (AMR). LED lighting, controls. • Cooling loads (refrigeration control – retail). Variable speed drives (VSD). • Whole building Solutions incorporating several of above measures.
(more innovative)	**Demand-side smart energy management:** • Building Energy Management Systems (BEMS). • Offset demand with renewable energy (e.g. Solar PV). • Battery-storage to offset peak demand or manage based on daily use. • CHP (combined heat and power). • Heat pumps: ASHP, GSHP, Heat exchangers and waste heat recovery.
Internal Actions	For all corporate landlord, building assets to be leased or sold: Compile a MEES action list based on EPC register (band E or below) and DEC reports.
Funding Routes	ERDF Investment Priority 4c – supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including public buildings and the housing sector. Sustainable Energy for Public Buildings (SEPuBu) matched funding project already underway (under 4c). • Capital grants invest to save, development fund, SALIX, Carbon Trust loans.

Heritage Assets

Theme	***Historic Buildings Efficiency***
Case Studies	Historic public buildings; museums, arts and theatre venues.
Strengths	Shropshire has more listed and historic buildings than most counties and receives a good tourist income stream from this perspective.
Weaknesses	Listed status adds to complexity and expense of retrofitting.
Opportunity	Offers higher potential savings than new builds. Works could be done during improvement maintenance as a programme of retro-fitting. Comprehensive guidance is supplied by English Heritage and there is much that can be achieved.
Threats	Funding deadlines – ERDF
Heat Interventions	• EPC recommendations (under MEES) • Secondary glazing panels. Solid wall insulation. • Upgrade or optimize existing boilers and controls.
Electric Interventions	• AMR / Energy monitoring, LED Lighting and controls. • Renewable energy microgeneration and demand management.
Follow up	Strategic Asset Management, PSG, Planning, Natural & Historic Environment. Utilise English Heritage and Historic England National Guidance
Funding Routes	• ERDF 4c. Sustainable Energy for Public Buildings (SEPuBu). • Internal invest to save model to reduce revenue spend.

Leisure Centres

Whilst there is great opportunity for efficiency improvement in leisure centres, they are largely long-term leases outsourced by commercial business tenants / franchises, therefore outside of Shropshire Council control. Despite this, innovative solutions are being explored in partnership with leisure centres to offset energy costs. In urban areas a combination of mains gas and solar PV (photovoltaics) are technically feasible. In more rural locations heat pumps, solar thermal and solar PV are likely candidates to employ. External, private sector funding (potentially ERDF and Central Government Grants) to help meet the shift to low carbon across all sectors.

Libraries

Like all public buildings, Library assets vary in age from relatively newly commissioned buildings: 2000s, 90's, 70's, 60's 1900's Victorian and pre-Victorian. The common issue as with all buildings is correctly setting the heating temperature and to come on at the correct times (i.e. only when the buildings are occupied). This should be a very simple step and low-cost initiative to implement. Like all buildings the efficiency of heating systems and the correct use/behaviour of staff will reflect on the bottom line running costs.

Schools / Academies

A large proportion of these are schools within the county are classed as D, E & F rated buildings (Display Energy Certificates), so there is certainly scope for thermal efficiency improvements as well addressing increased electric consumption such as lighting and ICT. Whilst Government funding of academy schools can lead them to be further removed from the influence and guidance of the local authority, all schools have responsibility for their own every day running costs through their Dedicated Schools Grant (DSG) allocation of funding.

The CCCS role is purely to engage and advise schools to improve their energy efficiency. Shropshire Council will assist so far as providing an information 'fact-pack' with respect to energy efficiency, solar PV (if they have it). This will also provide information for finance available; to which they can apply on their own terms. Independent schools and academies are funded directly from the Government. With grant schemes and targeted advice such as Carbon Trust and low interest loan schemes such as SALIX to assist them. Academies are also free to buy-in to the Councils PSG (Property Services Group) maintenance services.

Theme	**Schools / Academies Efficiency**
Case Studies	Mount pleasant Primary school (academy). St Georges Clun Primary School.
Weaknesses	• 33 % shift to Academies (~30% at present). • Less scope for influence, despite increase in ICT energy consumption.
Opportunity	• PSG rolling maintenance programme. • Engagement with renewable energy and efficiency by offering advice. • Integrate into the curriculum as a teaching aid and demonstrator. • Setup displays for generation and energy use.
Threats	Conversion of schools to academy trusts makes the administration of PV and provision of sustainability advice more complex.
Recommended Heat Interventions	• EPC recommendations (under MEES) address 'easy-win' heat losses. • Optimize HVAC systems boiler plant & thermostats controls. • Optimise BMS / BEMS controls install where appropriate. • Phase out oil plants for GSHP, ASHP or biomass.
Recommended Electric Interventions	• Energy self-monitoring to address high ICT baseloads • LED Lighting upgrades (when re-fitting). • Manage Solar PV installations and evaluate potential to expand. • Feasibility for school wind-turbine demonstrators.
Internal Actions	PSG. School commissioning, Learning and Skills, School head and governors.
Funding Routes	• ERDF 4f (Academies) or SEPuBu funding or 4c (publicly operated). • Low interest loans (SALIX, Carbon Trust). • Invest to save to reduce revenue spend. • Independent applications if independent or academy trust.

Commercial Scale Renewable Energy Projects

Theme	**Energy Generation and Demand Matching – (Urban or Rural)**
Case Studies / Potential Sites	Surplus or disused Estates land, brownfield or contaminated land, agricultural partnerships, public building themed solutions such as leisure centres or libraries. • Assess site geology and geography, building's roof capacity.
Strengths	• Reflect Government 25-year Environment Plan (Government, 2018b)and DBEIS Clean Growth Strategy (U. Government, 2017a). • Renewable capacity available; solar, wind, hydro ('Renewable Energy Capacity Study for the West Midlands | Sustainability West Midlands', 2018)
Weaknesses	Building and environmental planning restrictions. Historic / listed buildings. Grid constraint issues in rural areas (could be overcome by battery storage).
Opportunity	• Integrated building or whole place solutions prioritised by load type. • Low Carbon Economy Government strategy. • Community energy model to catalyse PV rollout. • Shropshire has a high renewable energy resource capacity.
Threats	Procurement policy, planning permissions, local opposition.
Recommended Interventions	**Maximise on Natural Capital / Natural Assets:** • Improve administration for renewables incentives. • Evaluate solar potential on roofs and ground-mounted through estate. • Evaluate suitable sites for wind turbines and hydroelectric. • Energy provision in country parks and AONB. **Innovative Renewable Energy Solutions and Storage:** • Battery storage for demand side management. • Water Harvesting and solar irrigation. • Solar PV matching to EV (electric vehicle) charge points. • District Energy, Heat Networks, and Smart-Grids for businesses and housing. **Feasibility of a community energy schemes; assess building assets:** • Power consumption and grid constraints, generation resource. • Planning and environmental, ownership and legal constraints.
Internal Actions	Estates, Strategic Asset Management. Countryside, MCS valuations. Interest groups (SPARC, Share Energy, Connected Energy), Oswestry Town Council Stakeholders (e.g. town or district councils, businesses or public ownership).
Funding Routes	• Funding available under ERDF Priority Axis 4a and 4f terms. • Low interest loans with a given payback period (e.g. SALIX). • Community share-ownership models. Community Energy Supply. • CIL – levies to raise budgets – generate income stream for infrastructure. • Tax uplift in land value (£47/m2). Meets 10% requirements, highways. • Capital spend for local infrastructure and assets and estates.

Housing Sector

Despite the Government dropping the zero carbon homes initiative in 2016, domestic housing has seen steady efficiency improvements and greater awareness of building thermal efficiencies. Predominantly white goods, IT electrical efficiency improvements and LED lighting. Energy efficiency has improved due to building regulations, energy assessments such as SAP, Energy Performance Certificates. The Council is not held responsible for this as largely works commissioned by private developers. However as a local authority trading standards officers ultimately audit housing standards and the private rental market which is regulated by the Government domestic MEES (Minimum Energy Efficiency Standards) (DBEIS, 2017e). Energy Saving Trust offer a multitude of recommendations for households in energy efficiency and domestic renewable energy.

To reach net zero by 2050 or the more ambitious target of 2040; there remains a lot of work to be done. Key for this sector including affordable homes to achieve at least an EPC rating at least a B, optimize the design, orientation and source of materials for affordable homes to reduce the carbon footprint. Self builds and Passivhaus offer enhanced opportunities and design criteria for net zero or carbon negative designs.

Theme	**Housing Efficiency**
Case Studies	Social and supported housing are outsourced from the Council since 2009 (when Shropshire Council became unitary).
Strengths	• Core DEV plan. • Average EPC SAP rating for STAR Housing is 65.35%. • Affordable Warmth Scheme: Marches Energy Agency • Support and guidance to low-income families and fuel poverty households.
Weaknesses	• Improvements only via Housing Associations and developers. • Cannot ascertain energy totals for domestic housing. • Government zero carbon bid for domestic housing by 2016 was scrapped.
Opportunity	• Scope for community led initiatives (list) including domestic energy advice. • Further engagement with community initiatives
Threats	Engage with SC process, local planning and zero budget available.
Recommended Interventions	• Engage developers: Bring average SAP up to 70% or EPC B. • Cavity wall and above required roof insulation 250→300mm. • Ensure construction materials – adhere to building regulations. • Smart metering (water, gas, electric).
Internal Actions	• Shropshire Housing Group. • Housing Associations, STAR (social housing). • Housing Options. • WME, Energy Saving Trust.
Funding	Community driven initiatives only and personal applications to grant schemes.
Routes	Star Housing, developers schemes in collaboration with central Gov. / MHCLG

Biodiversity and Climate Change Adaption

Theme	**Biodiversity and Climate Change Adaption**
Case Studies	Green Acres Farm (Rural Unit), agricultural land and other rural estates.
Strengths	Preserving soil quality, water quality and maintaining biodiversity.
Weaknesses	Substantiated evidence to quantify carbon sinks and Shropshire's 'natural capital'.
Opportunity	• 25 year Environment Plan announced by DEFRA (Government, 2018a) • Utilise natural assets for energy and food production. • Partnerships with commercial agriculture. • Towns would benefit from green infrastructure improvements.
Threats	Inaction has consequences for both local flood prevention and global GHG mitigation. A Reactive/or non-policy threatens local economy, and revenue from tourism.
Recommended Interventions	• Carbon sinks. • Green infrastructure. • Water Harvesting. • Soil preservation (agriculture). • Flood water soak-ups.
Internal Actions	Biodiversity, ecology public protection, countryside, outdoor recreation.
Funding	ERDF 4a, 4e, 4f. Other ERDF Biodiversity funding routes.
Routes	Government grant schemes.

Finance Initiatives

Theme	**Finance – 'Low Carbon Accounting Methods'**
Case Studies	In house exercise to optimise bills – Shropshire Council finance and 'low carbon accounting' methods. Universities now practice **Divestment**.
Strengths	Other universities and local authorities have proved this to work
Weaknesses	• Revenue spend based on fuel, energy, water and carbon levies. • Above accounting done in isolation through all Council processes. • Cases for carbon reductions often overruled by other financial decisions.
Opportunity	Integrate carbon accounting methods fully into all financial assessments, SAMIS data, budgets and departmental cost centres.
Threats	Separating revenue spends, not accounted for in investment decision making.
Recommended Interventions	• Analysis of all revenue spend data using Systems Link and SAMMIS. • Address climate change levies (CCL) in energy bills • Carbon offsetting where appropriate. • **Divestment** of investments in fossil fuels (pension funds for example) • Low carbon energy tariffs promoted where possible.
Contacts / Follow up	Finance, Economic Development. ERDF funding. Government Grants, Carbon Trust. Use funding opportunities when they present themselves e.g. 0% interest loans.
Funding Routes	Invest to save with payback periods, considered more frequently for assets. Revenue spend budgets. Internal development fund.

Recycling and Repurposing (the circular economy)

Government legislation (landfill tax) to reduce, reuse, recycle and treatment of waste.

Theme	**Waste and Recycling**
Case Studies	Veolia, SATH NHS Trust Warp-it (Warp-it, 2018). Veolia Battlefield (UK, 2018b).
Strengths	In house and municipal recycling contract with Veolia. Office equipment and furniture repurposed and managed in-house.
Weaknesses	• Lack of awareness in Council's staff, habits and behaviour. • Local emissions from landfill as waste transport to be considered. • Complications district schemes not complete: Battlefield Business Park. • Administration of repurposing assets and equipment hampered.
Opportunity	• Reduce landfill tax (£86.10 per tonne). • Reduce emissions and improve waste streams. • Save costs on new equipment. • Formalise intranet portal for in-house assets, to 'repurpose' equipment.
Threats	• Legal disclaimers necessary. • Risk assessment required for passing on equipment, not for profit.
Recommended Interventions	• Staff awareness and Zero Plastics for Shropshire Council 2019 campaign. • Formalise in-house recycling of assets: Office furniture, IT equipment. • Logistics for re-purposing assets and storage. • Shropshire Council Recycling Network (SCRA). • Optimise existing recycling plants: waste to energy
Internal Actions	Facilities Management, waste services, Digital Media, web team, publicity, Shrewsbury NHS Trust, Veolia.
Funding	ERDF low carbon and Government grant schemes available. SALIX.

Social Initiatives

Theme	**Behaviour Change & Community Initiatives**
Case Studies	Carbon Trust (Trust, 2017), University of Sheffield, SaTH Trust (Jones, 2017).
Strengths	Community group led schemes such as "Keep Shropshire Warm" (VCSA, 2017). Walking and Sustrans National Cycle Network (NCN, 2017b).
Weaknesses	Lack of community engagement.
Opportunity	Engage with community interest groups to facilitate faster uptake of renewable energy, electric vehicles and energy infrastructure where Council budgets are tight. Community ownerships business models can help facilitate complex renewable energy projects: • Assist the county to reach its renewable energy capacity targets. • Reduce county carbon footprint & improve public relations / corporate image. • Community engagement can help secure the success of projects.
Threats	Non-engagement with community interest groups, lowers the Council's public image and stagnate progress in renewable energy and electric vehicle uptake.
Recommended Interventions	• Raising awareness & training courses (HR). • Launch sustainability e-learning module, staff questionnaires and quizzes. • Sustainability Champions in every office. • Staff visuals of energy logging and generation: ICT solutions and phone apps.
Contacts / Follow up	• Green Shropshire Exchange, Low Carbon Network, Share Energy. • Community and Living, Environment and Planning • Shropshire Provider Consortium (SPC) • Voluntary Community Support Associations (VCSA) • Shropshire Rural Community Council (SRCC)
Funding	GOV grants and low interest loan schemes.

Transport Fleet

A range of solutions are available to improve the efficiency of diesel and petrol internal combustion engine (ICE) vehicles. The transport fleet has been gradually improved by stepping up its Euro rating to the latest standard (Euro 6).

Alternative technologies such as hybrid and full electric vehicles (EV) are becoming more viable. To this effect Transport plans to roll out EVs across its entire fleet which will dramatically reduce the fleet vehicles carbon footprint (Table 10).

Table 10 Transport Fleet Fuel/Cost/CO_2e

Year	*Cost (£)*	*Miles (p.a. est.)*	*Carbon (t.CO_2e p.a.)*
2012-13	£0.6m	54,557	21.9
2013-14	£0.5m	44,205	17.9
2014-15	£0.4m	32,233	13.0
2015-16	£0.3m	27,573	11.1
2016-17	£0.3m	27,862	11.9
Total (5yrs)	**£2.0m**	**186,430**	**76 tonnes**

Theme	**Sustainable Travel**
Case Studies	Ludlow Park and ride. NHS Trust SATH Lift Share Scheme (SaTH, 2018).
Strengths	• Good train connections in Shrewsbury. • Cycle and walking routes: Sustrans National Cycle Network.
Weaknesses	• Traffic congestion at rush hour, car-parking. • Internal annual spend on travel expenses (£2m → £1.7m).
Opportunity	• Re-launch Council Travel Plan and raise awareness through staff training. • Partner successful schemes such as NHS Trust. • 'Sustainable travel' one-stop shop for staff.
Threats	**Non-action**, car-parking a National crisis. Policy based purely on road transport has a track record of negative environmental, health and social consequences.

Recommended Interventions	**Implement an Active Travel Plan** (internally and external: public transport policy).
	• Analyse commuting statistics and staff travel.
	• Implement effective car-parking strategy.
	  ○ Parking spaces reserved for staff who lift share.
	  ○ Strategic park and ride schemes to reduce congestion.
	• Negotiation of public transport routes.
	• Traffic reduction and regulation schemes.
	• Promote travel outside of peak times.
	Travel Co-ordinator (Sustainable Transport Champion):
	• Promote and improve teleconference facilities.
	• Promote use of Enterprise Car-Club (pool cars) and car sharing.
	• Promote or incentivise zero carbon transport (e.g. cycling, walking).
	• Discounts for staff travel on bus and trains.

Actions	Transport, Highways, Public Protection, Planning, HR.
Funding	• ERDF low carbon funding, Government grants.

Electric Vehicles (EV)

Theme	**Electric Vehicles and Charge Points**
Case Studies	• A49 electric vehicle rapid charge points, Herefordshire charge points.
Strengths	County rural by nature which necessitates dominance of road transport.
Weaknesses	• Trials and provision ad-hoc and no EV strategy exists at present.
Opportunity	• Partner with energy provider for charge points. • Partner with SME's on business parks etc. • Innovative load matching with solar PV.
Threats	• Missing government targets and funding opportunities. • Inadequate provision of EV charge points. • Over-reliance on car manufacturers to lead proprietary solutions. • Grid Capacity to support EV charge network and domestic supplies.
Recommended Interventions	• Promote staff uptake of EVs and hybrid/EV pool cars • Introduce staff charge points (e.g. Shirehall)
Internal Actions	• Transport, Highways, Public Protection, Economic Growth, Marches LEP, PSG, HR. GSX, EON, Ecotricity.
Funding	• ERDF Low Carbon 4a-f, low interest loans, government grant schemes. • Favourable EV grants available.

EV Drivers and Opportunities

1. Cleaner and more efficient (~80% compared to 40% for reciprocal engines).
2. Mitigate dangerous local emissions and GHG emissions.
3. Shift transport energy sources from fossil fuel sources to renewables energy.
4. Help the transition towards a low carbon economy.
5. Reduce the carbon footprint and local emissions in the transport sector.
6. Exploit the business case for reduced running costs of EV's.
7. Match local renewable generation opportunities to charge points.

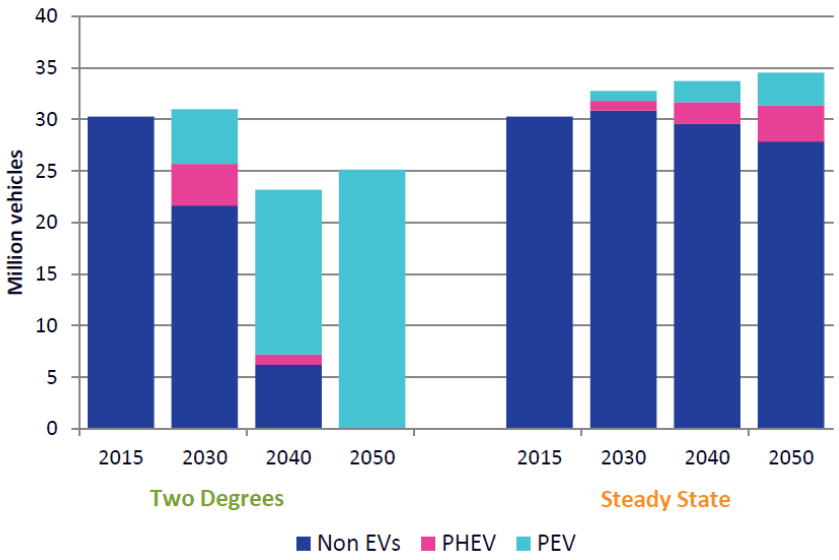


Figure 5 National numbers of electric vehicles on road (Grid, 2017)

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Corporate Climate Change Strategy

Executive Version 2020-2025

Securing our Future

Service Area	**Strategic Asset Management (Assets and Estates)**
Author	Samuel Kirby-Bray
Role	Sustainability Commissioning Officer

Contents

Solving the Energy Trilemma

Aim	How Achieved by CCCS
Reduce CO_2e emissions	Ensure energy and fuel efficiency addressed in decisions for buildings and transport.
Reduce energy and fuel costs	Utilities tariff optimisation manage assets & building costs.
Ensure Energy Security **(Future Resilience)**	Energy resilience, Demand matching, Renewable energy and storage.

Marches Energy Strategy

Pilot	Developing a pilot grid constraints mitigation project as a national demonstrator
50%	Renewable electricity meeting 50% of local demand
1000	1000 new jobs in the Low Carbon and Environmental Goods and Services sector
≤10%	Fuel poverty reduced below 10%
Leader	Continue to be a national leader in deployment of anaerobic digestion
Centre	Create a centre for UK agriculture innovation and low carbon transition
57%	Carbon emissions excluding agriculture reduced in line with UK targets, a 57% reduction on 1990 levels

Renewable Energy

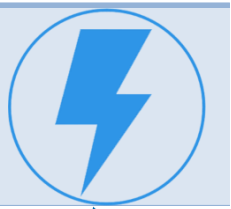
- Potential renewable capacity over 10GW.
- 20% of the West Midlands electricity demand (DECC, 2010).
- Significant solar, wind, hydro and biomass resource including energy crops, animal and municipal waste.

Achievements Building Running Costs

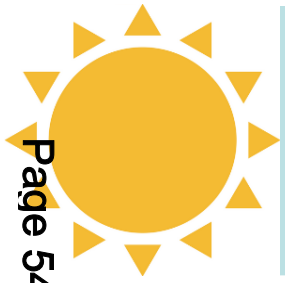
Total Energy	GWh	Cost (£)	$kgCO_2e$
FY2012/13	73	£6.55m	23,909
FY2016/17	65	£5.59m	18,396

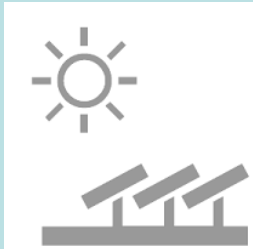
Savings	8	£1m	5.5 t.CO2e

Savings Building Running Costs

2012-2017	**kWh**	**£**	
Electric	580,122	-£24,134 *	
Gas	4,791,265	£555,241	
Oil	3,192,327	£294,234	
Water	57,744 (m^3)	£132,968	
Total	**8,621,458**	**£958,308**	

Achievements – Renewable Energy





3,936,853 kWh Generated

2,136,371 kgCO_2e Saved

From sunshine into nearly two hundred million cups of tea…!

Achievements – Renewable Energy

	Energy (MWh)	Savings	FiT Income	Total
2012	460	£44,197.02	£82,942.84	£127,140
2013	603	£61,257.08	£115,751.46	£177,009
2014	616	£65,572.81	£120,639.35	£186,212
2015	626	£64,659.90	£121,532.41	£186,192
2016	841	£86,906.18	£138,752.74	£225,659
2017	755	£89,348.56	£128,964.65	£218,313
2018	804	£100,507.83	£140,819.38	£241,327
TOTAL	**4,705**	**£512,449**	**£849,403**	**£1,361,852**

Domestic DMR (Dry Mixed Recycling)

Energy Recovery Facility (ERF)
Battlefield, Shrewsbury

Benefits	Annually
electricity produced	9,094 kWh
	(9 homes a year!)
waste processed	43.5 tonnes
avoided -5 years	**24,000 tonnes CO_2e**

Commercial DMR (Dry Mixed Recycling) -Shirehall only

	2018 mix	Current Cost	2025 mix	Target Cost
DMR	42.26%	£3,995	80%	£7,950
General	57.74%	£8,156	20%	£2,972
Total		**£12,150**		**£10,923**

Warp-it (Waste Action Re-use Portal)

- **Savings = £11,982**
- **Waste avoided = 2,138 kg**
- **Carbon = 5,016 kgCO_2**
- **Trees Equivalent = 6**

Latest Items

1 X Photographic copy stand with lamps

19 X Used arch lever files and A4 files

2 X Desk height beech effect drawer unit

5 X Sinlge low beech effect lockable cupboard

Savings you have made Shropshire Council

CO2 (KG) SAVED	CARS OFF THE ROAD	WASTE AVOIDED (KG)	TREES EQUIVALENT	TOTAL SAVINGS (£)
0005016	0000002	0002138	0000006	0011982

See More Metrics

Shropshire Council Pool Cycles

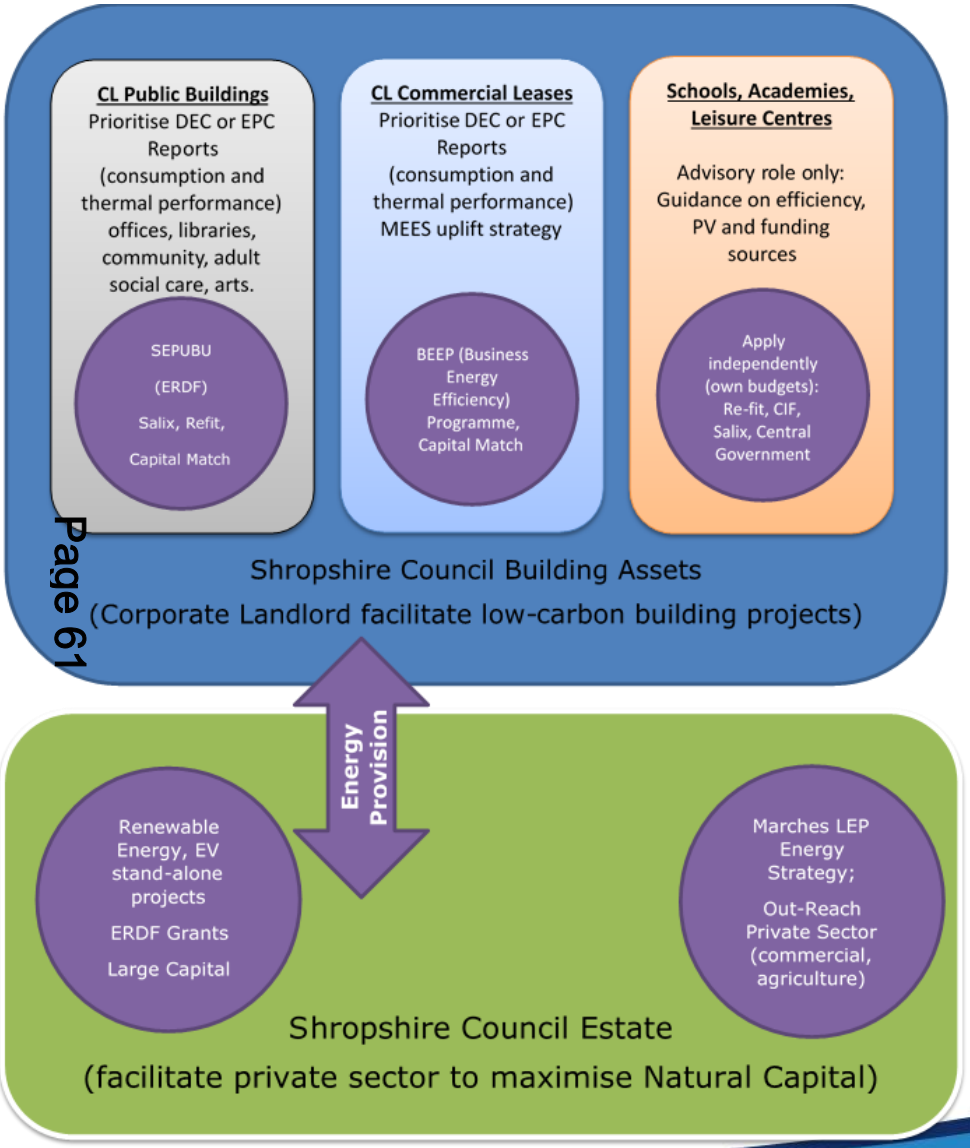
- 20 cycles
- (10 Shirehall)
- 10 Transport Depot
- Future trial PEDELECs

Project Opportunities

Biodiversity, Ecology **Climate Change Adaption**	• **Gov. 25 Year Environment Plan and DEFRA.** • **Flood soak ups and carbon sinks.**
Clean Growth Strategy	• Corporate projects and Marches LEP Strategy.
Energy – Demand **(reduce consumption)**	• Public Sector & Private Sector Buildings Efficiency. • Housing Efficiency and zero carbon housing.
Energy - Generation **(Renewable Energy)**	• Renewable energy & load matching. • Energy Storage (electric or heat). • District heating and whole place solutions.
Finance Initiatives	• Using correct funding opportunities e.g. SALIX,
ICT (technology led)	• Energy consumption and generation display for staff. • Phone applications and laptop ICT solutions.
Procurement **(materials & supply chain)**	• Sourcing local contractors: goods and services. • Procurement of goods - (supply chain).
Recycling and Re-Purpose	• Optimise in house recycling (DMR). • Warp-it scheme (Re-Use Network). • Zero plastic packaging in house for 2025.
Social Initiatives **(People led solutions)**	• Staff awareness, training and behavioural change. • Cultural shifts, organisational recognition. • Health and wellbeing, fitness and productivity.
Transport and Travel	• Business travel, Electric Vehicle charging infrastructure.

Corporate Landlord

Energy Efficiency
Renewable Energy



Thankyou for Listening
Any Questions?