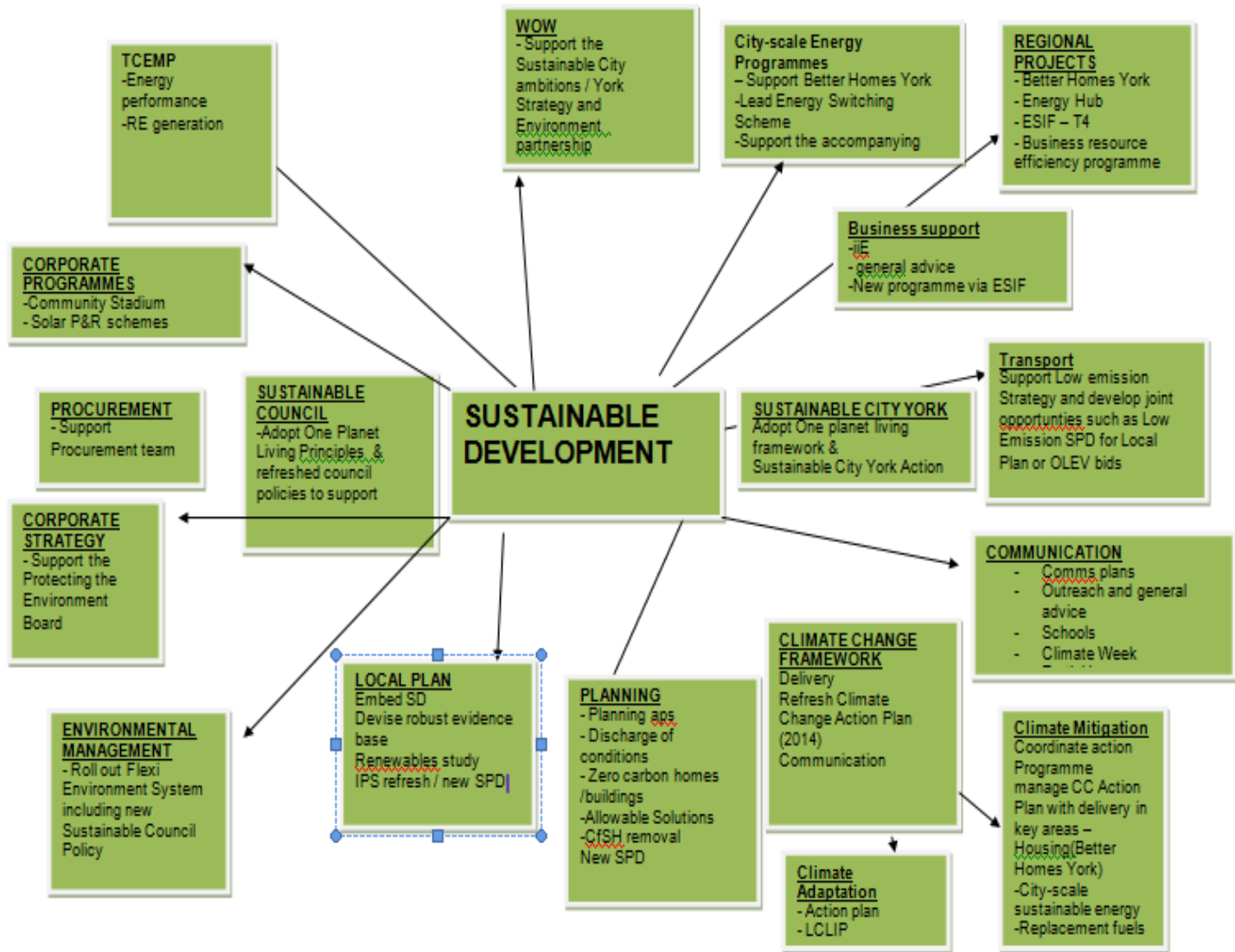




# Transformational Carbon and Energy Management Programme

Jacqui Warren  
Sustainability Officer  
City of York Council





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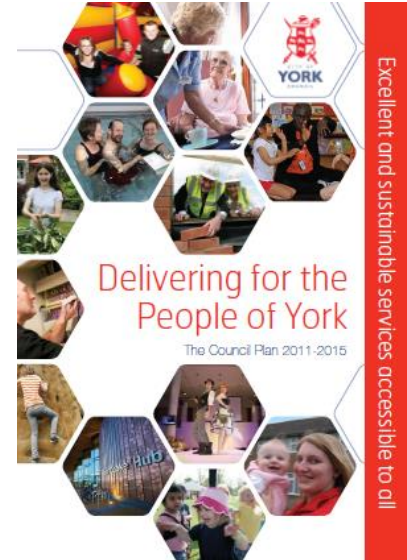
# Council commitments

## Strategic priorities:

- Create jobs and grow the economy
- Build strong communities
- Get York moving
- Protect vulnerable people
- **Protect the environment**

## Key actions:

- **Cut carbon emissions and improve air quality**
- **Accelerate renewable energy generation**
- Use its influence and resources to help manage York's green space
- maximise recycling levels
- improve the quality of streets and public spaces
- Improve how we look after our heritage



Excellent and sustainable services accessible to all







# Background

- Sustainable City
- Climate Change Action Plan
- 10 areas to address
- Priority
  - Sustainable energy generation
  - City-wide energy efficiency schemes
  - City-wide roll out of replacement transport fuels
  - Council to lead



# Background

- Carbon Management Programme
  - Target to cut carbon emissions across the estate by 25%
  - Estimated savings of 6000 tCO<sub>2</sub> (2008-13)
  - Variety of measures
- Salix pot
  - ~40 projects £350k
  - annual savings of £ 110,021 or Lifetime savings of £ 1,257,934



Over **4000 free insulation measures** installed across Homes in York; **Collective Energy Switching Scheme** saving 730 residents on average £80 - 160, New Save Money by Saving Energy community programme; 15% reduction in City-wide carbon emissions between (2005-2012) Installed **over 200 solar panels** on new Council's HQ, and on over 500 council owned homes; £1.4 million for **new bus funding**, I-Travel **Multi-modal Journey planner**, £824k funding for **15 new electric buses** for the city, **new electric charging points** to be installed throughout the city



**SUSTAINABLECITYYORK**

**Renewable Energy, District Heating Park that bike** scheme; waste and recycling kerbside collections, Tour De France Grand Depart, **Edible York – York Orchard;** **Tremendous**



# Transformational carbon and energy management

- Approved in July 2014
- £128K to support set-up
- Aim - internal programme to:
  - 1) to reduce energy & water use
  - 2) financial savings 3) CO2 savings 4) accelerate RE generation & revenue generation





## To devise and deliver a transformational carbon and energy management programme

### Outcomes:

- 1. A new transformational carbon and energy management plan and a new water management plan capable of**
  - reducing energy and water consumption
  - reducing CYC's utility expenditure
  - reducing carbon emissions
  - reducing CYC's mandatory carbon reduction commitment requirements
  - increasing revenue generation through renewable energy generation
  - creating 2 invest to save programmes that could fund new projects and possible staff
- 2. Streamlined management processes and procedures** – including centralised billing and procurement of utilities
- 3. Up to 3 detailed renewable energy feasibility studies to develop investment grade opportunities from (PV and district heating)**
- 4. A long term renewable energy investment roadmap to guide and accelerate delivery of city-scale projects**

### In addition:

- 5 A new coordinated corporate utilities task and finish group to deliver the work
- 6 Accelerated delivery of a strand of the Council's Transformational Programme
- 7 Delivery of 2 outcomes of the Protecting Environment Council priority – 1) reduce city carbon emissions, and 2) clear strategy for local renewable energy generation
- 8 Commenced delivery of core element of CYCs One Planet Living ambitions and enabling it to then consider wider elements of the framework and options for city-wide roll out 📄

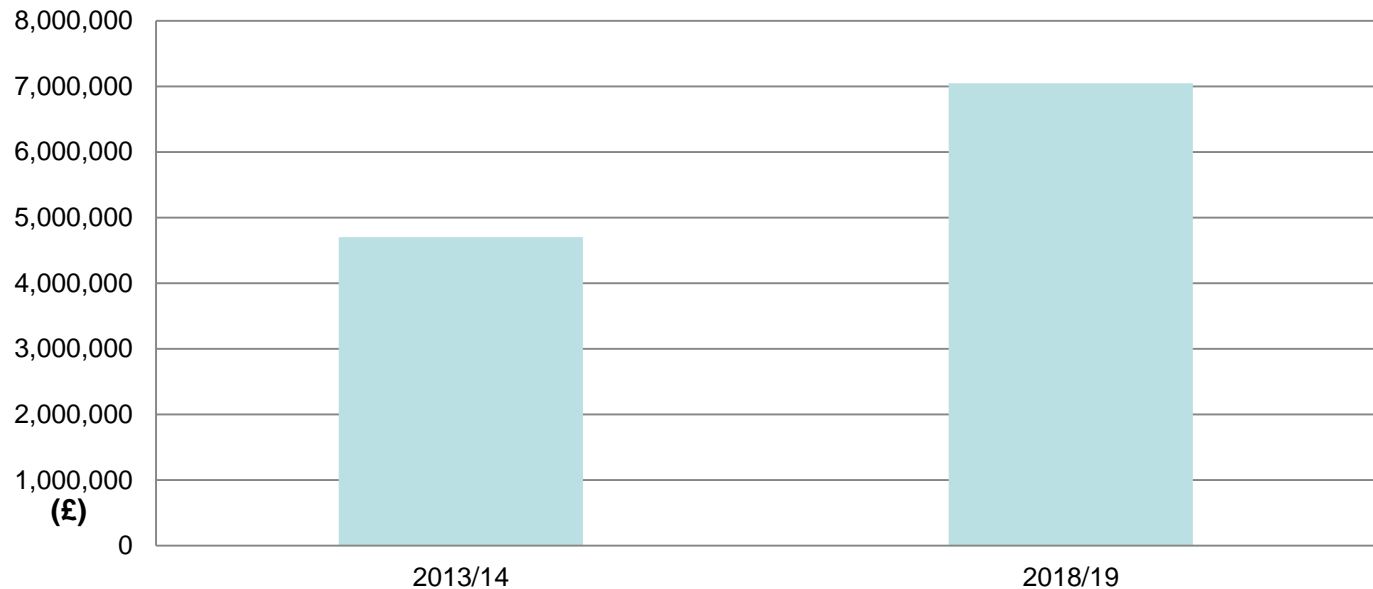
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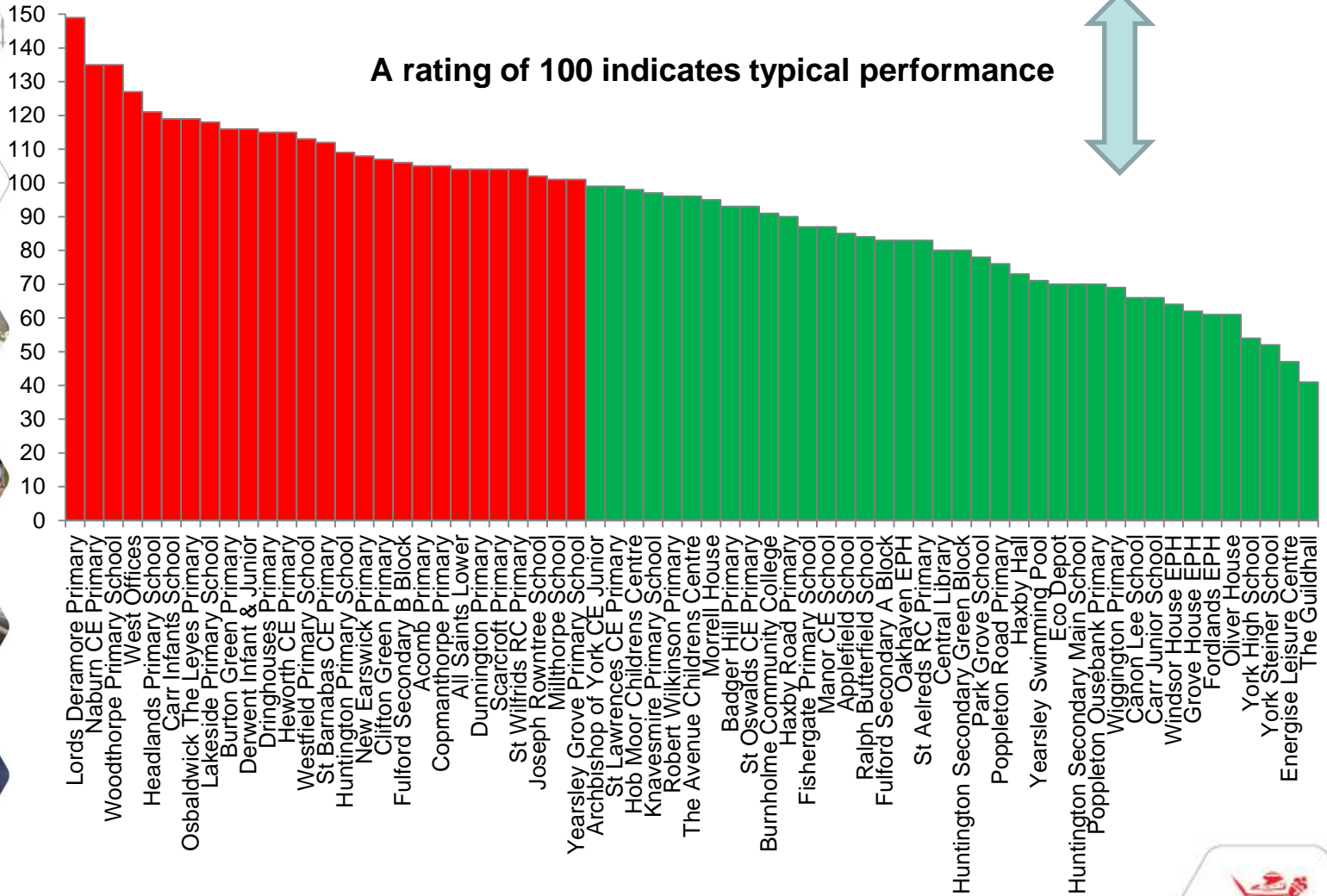
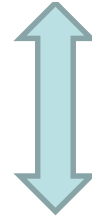
# Transformational carbon and energy management

Anticipated energy expenditure  
(£ millions)



# Stock performance now

A rating of 100 indicates typical performance



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# New TCEMP – 1) Energy Efficiency of stock

- Need projects to make-up the programme
- Determine the estate
- Once estate is agreed, need to understand what potential there is to improve energy performance
- Limited capacity in-house





# Energy Performance Contracts (EnPc)

- EnPc are contracted to install energy conservation measures in identified buildings and guarantee annual energy savings over an agreed payback period.
- Cut running costs, CO2, energy
- Secure financial saving over a period of time
- Contracting model transfers risk of performance to the ESCo
- Deliverable with existing staff
- National RE:FIT scheme available



# RE:FIT

- Improve energy efficiency of public sector estates
- Based on London RE:FIT programme
- National Local Partnerships and DECC rolling out across UK
- OJEU compliant framework open to all LAs
- Fully supported
- Includes energy efficiency and solar measures

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# RE:FIT Stages

Prepare Organisation and Sign up

Including signing Client Agreement to use RE:FIT Framework

Identify Resources

Agree estate & collate data  
and Lead Officer

Agree a funding approach

Prepare Project Brief

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# RE:FIT Stages

Run Mini-Competition

Award and develop Investment Grade Projects

ESCo develops IGP for each building

Agree work and savings to be guaranteed

Install and Measure

Install agreed measures in phased approach

Measure and verify performance

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# RE:FIT

- Cost - Approx £40k
- Can recoup through savings
- No need to fund audits or deliver measures.
- Guarantee financial savings and delivery
- Local Partnerships support CYC
- Currently signing agreements with RE:FIT
- 3mths for mini-tender and award

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# Financial savings

- TBC at the investment grade proposal stage

- **Financial savings / revenue generation**

The RE:FIT programmes in other parts of the UK are performing well and making guaranteed annual financial savings. Such schemes have guaranteed between 18 – 30% reduction in energy costs. Based on CYC current proposed 3 phased approach the following reduction in energy costs could be possible:

Phase	Reduction in energy costs (£)	Estimated timescales – installation	Estimated timescales – Yr 1 guaranteed savings
1	100,000	Autumn 2015 - Jan 2016	Jan 2017
2 & 3 (including schools)	350,000	Jan 2017	Jan 2018
1,2 and 3 – roof mounted solar	TBC	No earlier than autumn 2015 - Jan 2016	Potential earlier than Jan 2017



# TCEMP – 2) Accelerate renewable energy

## Background

- Strong political will to accelerate renewable energy across the wider City.
- Sustainable Energy Road Map
- 4 stages
- Focus on Solar in short term





	Stage 1	Stage 2	Stage 3	Stage 4	
	September-December 2013	January- July 2014	August- December 2014	2015 onwards	
	Understanding & refining renewable energy opportunities	Accelerating the opportunity to develop large-scale solar power	Finalise solar schemes	Development of other renewable energy options	
Sustainable Energy Road Map	<p><i>Checklist for this stage:</i></p> <p><b>Governance</b></p> <ul style="list-style-type: none"> <li>✓ Set up a project team to support and oversee the development &amp; delivery of all stages</li> </ul> <p><b>Update Study</b></p> <ul style="list-style-type: none"> <li>✓ Commission new study to update 2010 strategic study and identify wider array of opportunities for low carbon / renewable energy generation (inc. Wind, hydro, geothermal, waste &amp; biomass), including:               <ul style="list-style-type: none"> <li>o Identifying appropriate sites for large solar farms (PV opportunities)</li> <li>o Refining locations for hydro, wind and explore other new opportunities excluded from the original study</li> <li>o opportunities for renewable energy generation from all major development sites in Local Plan</li> </ul> </li> <li>✓ Utilise study to refine the Local Plan's CC1 policy</li> </ul> <p><b>Low Carbon District Heat Networks (LCDHN)</b></p> <ul style="list-style-type: none"> <li>✓ Feed strategic sites into LCR's Heat Map for York</li> <li>✓ Incorporate results and opportunities from the York Heat Map into submission draft of Local Plan</li> </ul> <p><b>Other</b></p> <ul style="list-style-type: none"> <li>✓ Evaluate the need for detailed sustainable energy generation planning guidance in light of recent government calls / reviews</li> <li>✓ Sign up to APSE's Energy Collaboration</li> </ul>	<p><i>Checklist for this stage:</i></p> <p><b>Solar</b></p> <ul style="list-style-type: none"> <li>✓ Showcase opportunities with large scale solar developers/companies</li> <li>✓ Carry out options &amp; financial appraisal for potential sites</li> <li>✓ CYC Consider opportunities to fund/part fund solar farm energy opportunities</li> <li>✓ Report to appropriate boards &amp; Cabinet on any solar energy sites/opportunities &amp; initial options for delivering such schemes</li> <li>✓ Identify further resources needed to deliver investment ready solar opportunities</li> </ul> <p><b>LCDHN</b></p> <ul style="list-style-type: none"> <li>✓ Based on LCR York Heat Map, carry out 3 pre-feasibility studies</li> <li>✓ Commission 1 detailed study to further develop network opportunity &amp; business case development</li> <li>✓ Apply for DECC HINDU funding</li> </ul> <p><b>Other</b></p> <ul style="list-style-type: none"> <li>✓ Utilise study in stage 1 and 2 to refine the Local Plan's CC1 policy</li> <li>✓ Develop SPD to support an adopted Local Plan</li> <li>✓ Identify further avenues to deliver sustainable energy through the planning system i.e. CIL &amp; Allowable Solution and explore ESCO/ JVs</li> </ul>	<p><i>Checklist for this stage:</i></p> <p><b>Solar</b></p> <ul style="list-style-type: none"> <li>✓ Begin detailed feasibility studies and business case development for solar energy opportunities</li> <li>✓ Report to cabinet on any investment ready solar energy projects by December 2014</li> <li>✓ Begin delivery &amp; procurement process for solar energy projects by Jan 2015</li> </ul> <p><b>Other</b></p> <ul style="list-style-type: none"> <li>✓ Based on the study and Local Plan policies work with developers to ensure strategic sites coming forward in years 1-5 of the Local Plan generate low carbon / renewable energy</li> </ul>	<p><i>Checklist for this stage:</i></p> <p><b>Wind</b></p> <ul style="list-style-type: none"> <li>✓ Report to Cabinet on wind energy generation opportunities and the next steps to development</li> <li>✓ Carry out high level options and financial appraisals for wind generation (This will not be possible until solar energy generation opportunities have sufficiently progressed)</li> </ul> <p><b>Others</b></p> <ul style="list-style-type: none"> <li>✓ From the study in Stage 1, investigate other opportunities &amp; begin the development of these (* this will not be possible until solar energy generation opportunities have sufficiently progressed and is dependant on results of the study in Stage 1)</li> </ul>	
		← Opportunities as they arise (* dep. on capacity) →			



# Transformational Carbon and Energy Programme

## Sustainable Energy Road Map

- 4 stages
- Understanding & refining renewable energy opportunities - Completed
- Accelerating the opportunity to develop large-scale solar power:
- Due to RO subsidy changes we accelerated action in large-scale PV
- Soft market tested opportunity

# Transformational Carbon and Energy Programme

## Solar Implementation Plan

- Developers said not possible to deliver by March 2015
- Utilities Board agreed to take a corporate approach and to collate a full estate portfolio to then procure a partner in 2015/16
- Better coordination
- Created a portfolio\* incld. P&R sites, Land and roof sites.
- Created a solar implementation plan



# Transformational Carbon and Energy Programme

## Solar Implementation Plan

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# Solar Implementation Plan

## *The short term vision*

- *To make full use now of the potential for sustainable, renewable energy across the Council's estate, and to work towards , in the longer term, delivering localised energy services that generate and sell low cost energy and help alleviate fuel poverty and create secure revenue streams to help support vital council services.*

# Short term Plan: Solar



	Stage 1	Stage 2	Stage 3
	<b>December – December (TBC) 2015</b>	<b>January 2016</b>	<b>January 2017 onwards</b>
	Collation of Solar PV Portfolio, business case development & procurement of solar solution	Implementation Phase	Further Implementation and development of other renewable energy options
<b>Strategic Implementation Plan</b>	<ul style="list-style-type: none"> <li>✓ Collate solar PV portfolio including P&amp;R sites</li> <li>✓ Begin delivery of roof based sites through RE:FIT</li> <li>✓ Soft market test land-based opportunities</li> <li>✓ Develop business case and determine Delivery models for land-based sites</li> <li>✓ Prioritise P&amp;R sites</li> <li>✓ Engage with planning</li> <li>✓ Engage with DNO</li> <li>✓ Cabinet approval to procure a delivery model</li> <li>✓ Devise and procure solution</li> <li>✓ May link to OLEV Cities bid</li> </ul>	<ul style="list-style-type: none"> <li>✓ Continuation of roll out of roof based opportunities with PD rights</li> <li>✓ Prioritise P&amp;R sites for large scale roll out</li> <li>✓ Begin planning processes for large</li> <li>✓ planning processes for P&amp;R sites</li> <li>✓ Evaluate wider opportunities for energy supply to city</li> </ul>	<ul style="list-style-type: none"> <li>✓ Continuation of roll out of projects</li> <li>✓ Continuation of roll out of projects Using Renewable Energy Study explore wider technology opportunities across City</li> </ul>





# Current solar work

- APSE Energy commissioned
- Preliminary, strategic study of 7 sites across Park and Ride sites, landfill site and farm
- Site Visits
- Officer meetings
- DNO \*
- Legal issues
- To identify show stoppers
- Recommendations



# Financial model

Owner of Solar Photovoltaic Power Plant	
Name	2.5m <sup>2</sup> Car Park Mounted Project
Company:	Car Park System
Address	Rowcliffe P & R

Project Summary	
Business Model:	Export Electricity
Type of Installation	Ground Mounted
Average Plant Size	2,500.00 k <sup>2</sup> /h
Electricity Generated	2,272,050.00 k <sup>2</sup> /h/p.a
Irradiation Per k <sup>2</sup> /p	318 k <sup>2</sup> /h/k <sup>2</sup> /p
Radiation Database	Classic PVGIS

Revenue Streams		
Incentive	0.0616	£/k <sup>2</sup> /h
PPA	0.06	£/k <sup>2</sup> /h

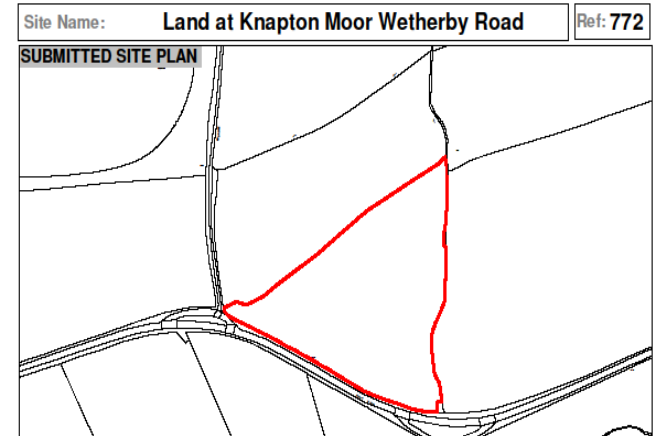
Project Financial Ratios	
Project IRR	6.82%
Equity IRR	43.4%

Capital Structure		
Costs	£	3,125,000.00
Development costs	£	50,000.00
<b>Total Costs</b>		<b>£ 3,175,000.00</b>
Leveraging Options		
Equity (Investment)	0%	£ -
Debt	100%	£ 3,175,000.00
Nominal Debt Interest Rate		£ 0.05

Financials		
	1st 12 months	25 Years Total
Electricity Generated k <sup>2</sup> /hrs	2,272,050.00	52,893,630.96
Incentive	£ 133,958.28	£ 3,361,947.91
PPA	£ 136,323.00	£ 5,968,720.49
Offset Electricity Saving	£ -	£ -
Insurance	£ 7,500.00	£ 256,183.23
(CBT) Per MW	£ -	£ -
<b>Gross Income</b>	<b>£ 276,281.28</b>	<b>£ 9,257,161.15</b>
Leveraged		
Investment	£ -	
Net Profit		<b>£ 9,257,161.15</b>
Unleveraged		
Investment	£ 3,175,000.00	
Net Profit		<b>£ 9,257,161.15</b>



# Knapton Moor



- 1.5MW
- 1,363,230 kWh/p.a
- Capital Cost £1.45m
- IRR 9.47
- Payback 9yrs
- List of recommendations to carry forward



# Next steps

- Prioritise 5/7 to carry forward
- Carry out recommendations
- Engagement with key parties
- DNO



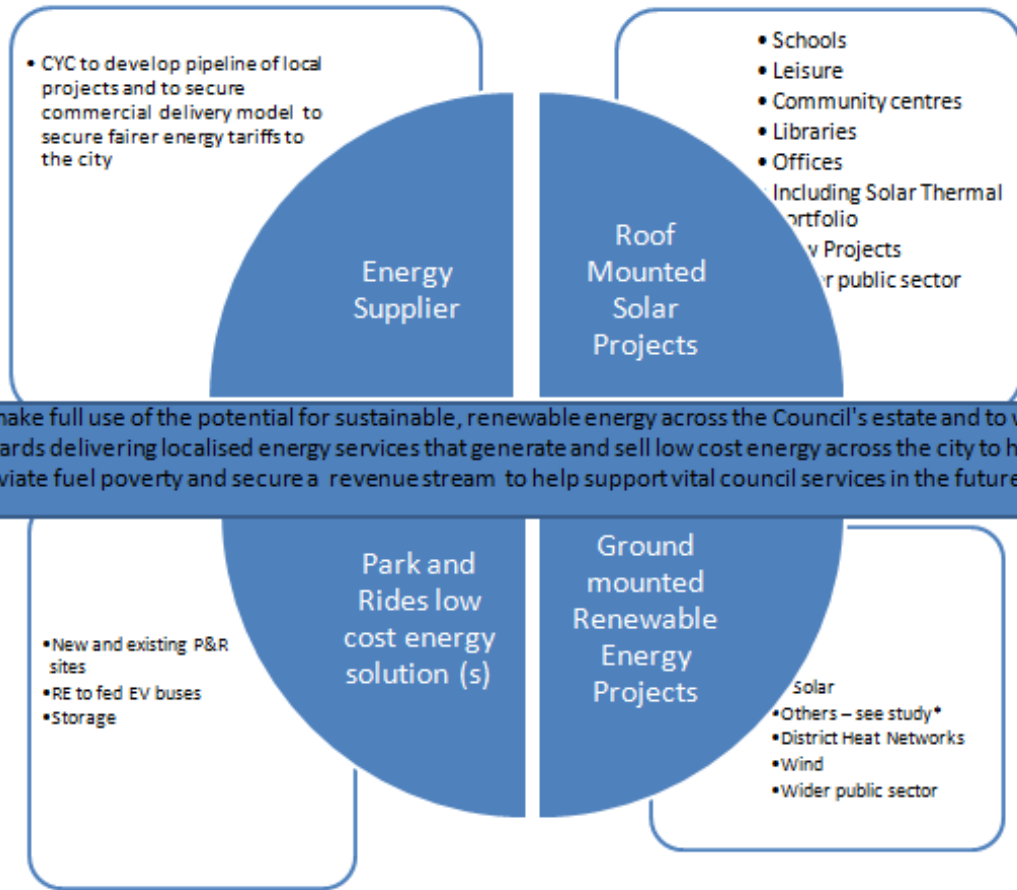
# Proposed timetable

- Preliminary work on setting up the programme and work on all sites – January 2015 onwards
- Prioritise easy win sites
- DNO & Pre-App work
- Join APSE Solar Procurement F'work
- Cabinet approval **June\*** 2015
- Procurement
- Grid connection offer
- Planning consent
- Schemes built out by March 2016



# Solar Implementation Plan

- *Longer term*
- *To make full use now of the potential for sustainable, renewable energy across the Council's estate, and to work towards , in the longer term, delivering localised energy services that generate and sell low cost energy and help alleviate fuel poverty and create secure revenue streams to help support vital council services.*





# Longer term ?.....

- Energy Services Company (ESCo) to provide energy and related services for specific projects / overall coordination
- CYC signed up to APSE Energy
- Vision is the municipalisation of energy services
- Public ownership and managerial control of local energy generation and distribution networks
- Councils as energy suppliers
- Sell energy at a fair price
- Tackle CO2 emissions, fuel poverty and aid economic regeneration



# Conclusion

- Through RE:FIT will create a programme of works to improve energy performance of CYC buildings & install solar schemes on roofs across the estate
- Procure a solar partner to design, build and install schemes on sites such as P&Rs
- Continue to explore longer term options
- Don't need to decide straight away
- Get delivering





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