

Full Emissions Offsetting based on Solar PV Generation: 2 scenarios (1 based on full offset of present day emissions; 1 based on offset of present day emissions without inclusion of UBICO Waste Fleet)

Tewkesbury Borough Council Solar PV Impact : Emissions Offset - All Baseline Emissions

System Sizing by Area

Area required	28,150 m²
Estimated capacity	5,630.00 kWp

System Capacity & Export

PV system chosen capacity	5,630 kWp
Solar collection factor (shading)	100 %
Current electricity tariff	15.9 p/kWh
kWh used on-site (offset)	7.5 %
Deemed export rate	92.5 %

Exported Generation

Bonus for exported units	5.5 p/kWh
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Generation Breakdown

Annual generation	5,067,000 kWh
- Offset units	380,025 kWh (See note 1)
- Exported units (see note 2)	4,686,975 kWh

Annual Revenue Breakdown

Export bonus payment	£ 257,784
Potential Import savings	£ 60,234
Total Benefit	£ 318,018

Economics

Full installed COST	£ 3,941,000
Cost per kWp	£ 700
Basic ROI	8.1%
Simple Payback	12.4 years

Panel Data


Panel type	Mid Performance
Specific peak output	200 W/m²
Annual output	900 kWh/kWp

CO2e Offset (2019 emission data)

Scenario (see note 3)	T/CO2e	Equiv Elec kWh
Baseline emissions	1,599.93	5,063.405

Installation Costs for Standard Roof Systems

Likely Installed Costs (excl. any necessary infrastructure costs)		
Solar PV - 25kW+	£ 1,000 /kWp	
Solar PV - 100Kw+	£ 800 /kWp	
Solar PV - 250kW+	£ 700 /kWp	



Orientation & Tilt Matrix:

Inclination	West					South					East									
	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	0	15	30	45	60	75	90
Vertical	90	85	60	64	67	69	71	71	71	71	69	65	62	58						
90	63	68	72	75	77	79	80	80	79	77	74	69	63							
80	69	74	78	82	85	86	87	87	86	84	80	76	70							
70	74	79	84	87	90	91	93	93	92	89	86	81	76							
60	78	84	88	92	95	96	97	97	96	93	89	85	80							
50	82	86	90	95	97	99	100	99	98	96	92	88	84							
40	86	89	93	96	98	99	100	100	98	96	94	90	86							
30	87	90	93	96	97	98	98	98	97	96	94	91	88							
20	89	91	92	94	95	95	96	95	95	94	93	91	90							
10	90	90	90	90	90	90	90	90	90	90	90	90	90							
Flat	0	90	90	90	90	90	90	90	90	90	90	90	90							

Note1: The level of offset units suggested represents approximately 55% of the combined 2019 electricity demand at TBC Offices and Leisure Centre
Note2: Exported Units - it is unlikely approval will be secured for this level of exported energy. The Distribution Network Operator should be consulted ahead of considering other options
Note3: Data calculations use only projected emission reductions in Electricity. It is currently expected emissions from other fuels will realise only minor improvements by 2030

Tewkesbury Borough Council Solar PV Impact : Emissions Off-set - Excluding UBICO Fleet Emissions

System Sizing by Area

Area required	12,750 m²
Estimated capacity	2,550.00 kWp

System Capacity & Export

PV system chosen capacity	2,550 kWp
Solar collection factor (shading)	100 %
Current electricity tariff	15.9 p/kWh
kWh used on-site (offset)	75 %
Deemed export rate	25 %

Exported Generation

Bonus for exported units	5.5 p/kWh
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Generation Breakdown

Annual generation	2,295,000 kWh
- Offset units	1,721,250 kWh (Est. 75% used on site)
- Exported units (see note 1)	573,750 kWh

Annual Revenue Breakdown

Export bonus payment	£ 31,556
Potential Import savings	£ 272,818
Total Benefit	£ 304,374

Economics

Full installed COST	£ 1,785,000
Cost per kWp	£ 700
Basic ROI	17.1%
Simple Payback	5.9 years

Panel Data


Panel type	Mid Performance
Specific peak output	200 W/m²
Annual output	900 kWh/kWp

CO2e Offset (2019 data - see note 2)

Scenario - Bold & underlined indicates scenario data is	T/CO2e	Equiv Elec kWh
Baseline emissions	1,599.93	5,063.405
Baseline emissions without emissions from UBICO Waste Fleet	724.82	2,293.884

Installation Costs for Standard Roof Systems

Likely Installed Costs (excl. any necessary infrastructure costs)		
Solar PV - 25kW+	£ 1,000 /kWp	
Solar PV - 100Kw+	£ 800 /kWp	
Solar PV - 250kW+	£ 700 /kWp	



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10	90	90	90	90	90	90	90	90	90	90	90	90	90							
Flat	0	90	90	90	90	90	90	90	90	90	90	90	90							

Note1: Exported Units - it is unlikely approval will be secured for this level of exported energy. The Distribution Network Operator should be consulted ahead of considering other options
Note2: Data calculations use only projected emission reductions in Electricity. It is currently expected emissions from other fuels will realise only minor improvements by 2030