J N Dunn Group
Phoenix House, Kingfisher Way, Wallsend
NE28 9NX
United Kingdom

Contact person:
Glen Cooper
Phone: 0191 295 8550
E-Mail: glencooper@jndunn.co.uk

Telmac Developments Ltd
Paul
5a Station Terrace,
East Boldon,
Tyne & Wear,
NE36 0LJ

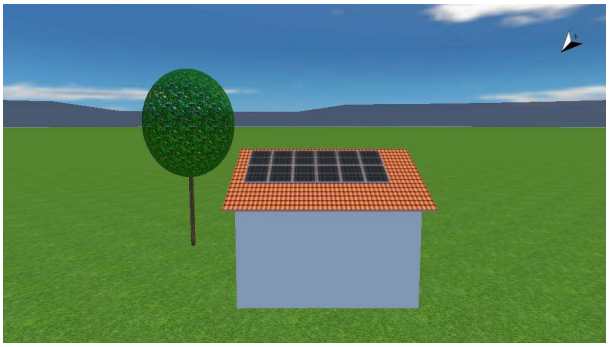
Customer No.: Plot 1
Project Name: West Boldon School Site
Offer no.: KW/ENQR00

06/06/2024

Your PV system from J N Dunn Group

Address of Installation

5a Station Terrace,
East Boldon,
Tyne & Wear,
NE36 0LJ



Project Description:
Solar PV Install Plot 1

Project Overview

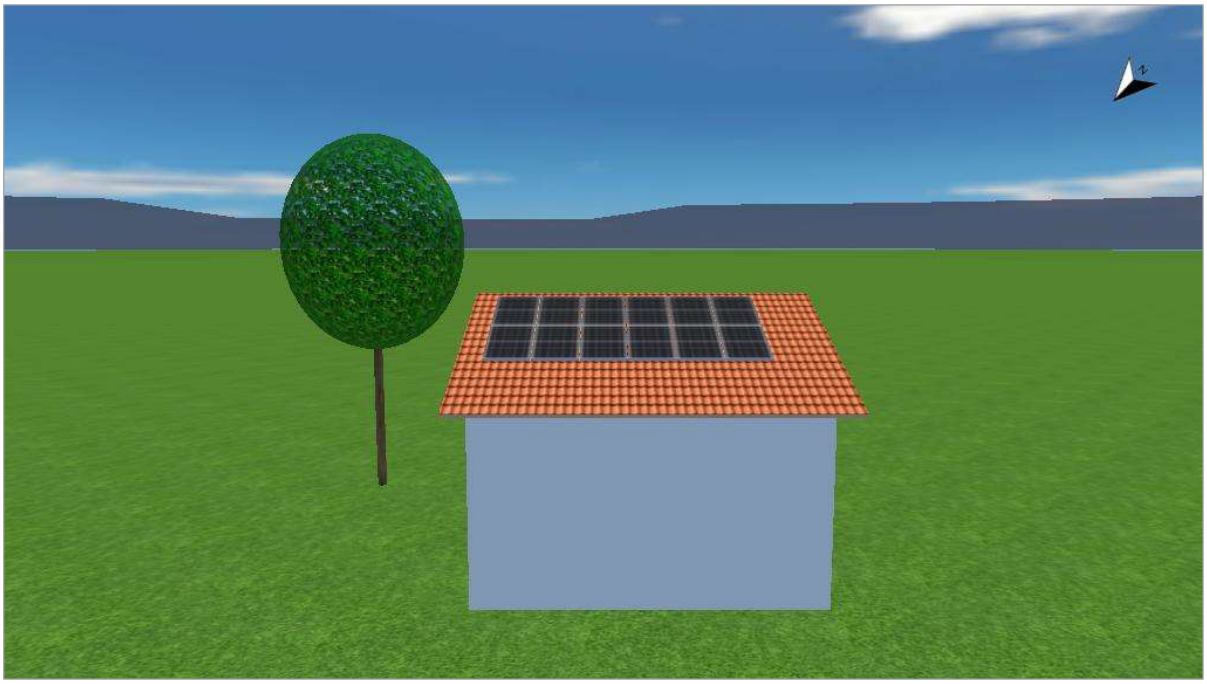


Figure: Overview Image, 3D Design

Production Forecast

Production Forecast		
PV Generator Output	4.86	kWp
Spec. Annual Yield	642.34	kWh/kWp
Performance Ratio (PR)	80.25	%
Yield Reduction due to Shading	1.6	%
PV Generator Energy (AC grid)	3,132	kWh/Year
Clipping at Feed-in Point	0	kWh/Year
CO_2 Emissions avoided	624	kg / year
Level of Self-sufficiency	24.2	%

Financial Analysis

Your Gain		
Total investment costs	4,018.97	£
Internal Rate of Return (IRR)	12.57	%
Amortization Period	8.3	Years
Electricity Production Costs	0.0713	£/kWh
Energy Balance/Feed-in Concept	Net-Metering	

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Simulation Results

Results Total System

PV System

PV Generator Output	4.86	kWp
Spec. Annual Yield	642.34	kWh/kWp
Performance Ratio (PR)	80.25	%
Yield Reduction due to Shading	1.6	%
PV Generator Energy (AC grid)	3,132	kWh/Year
Clipping at Feed-in Point	0	kWh/Year
CO_2 Emissions avoided	624	kg / year

Appliances

Appliances	2,700	kWh/Year
Standby Consumption (Inverter)	10	kWh/Year
Total Consumption	2,710	kWh/Year
Power Surplus	421.8	kWh
Solar Fraction	115.6	%

Level of Self-sufficiency

Total Consumption	2,710	kWh/Year
covered by grid	2,054	kWh/Year
Level of Self-sufficiency	24.2	%

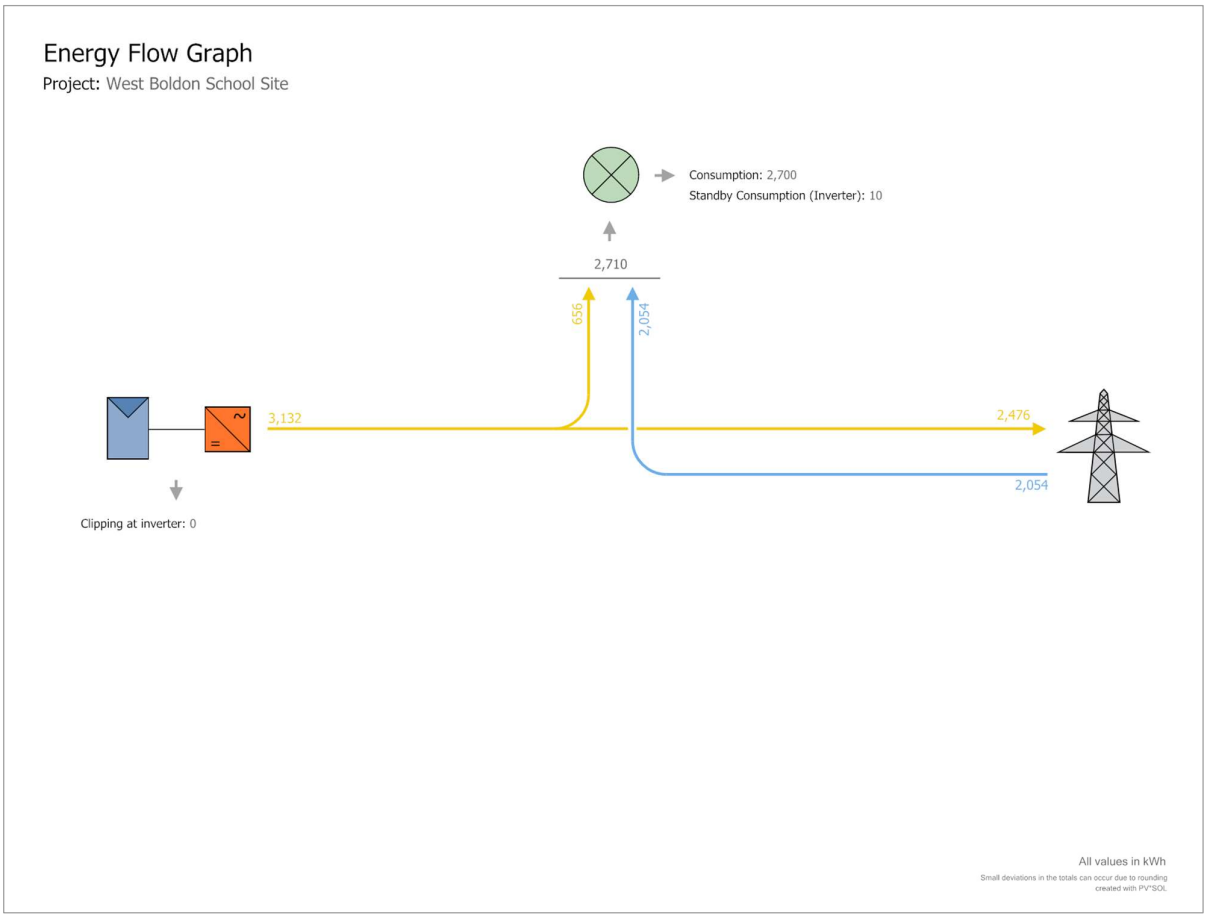


Figure: Energy flow

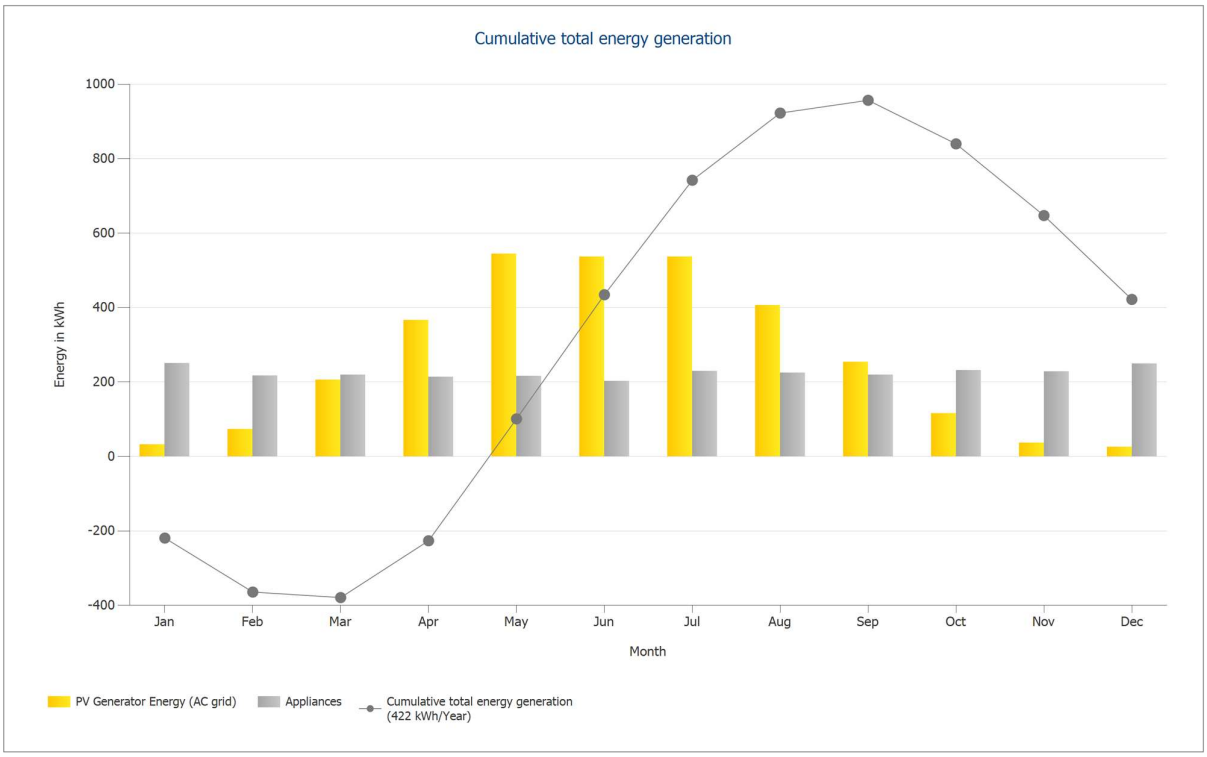


Figure: Cumulative total energy generation

Results per Module Area

Building 01-Roof Area Northwest

PV Generator Output	4.86	kWp
PV Generator Surface	23.43	m²
Global Radiation at the Module	723.89	kWh/m²
Global Radiation on Module without reflection	800.23	kWh/m²
Performance Ratio (PR)	80.52	%
PV Generator Energy (AC grid)	3132.18	kWh/Year
Spec. Annual Yield	644.48	kWh/kWp

PV System Energy Balance

PV System Energy Balance

Global radiation - horizontal	**1,004.36**	**kWh/m²**	
Deviation from standard spectrum	-10.04	kWh/m²	-1.00 %
Ground Reflection (Albedo)	7.24	kWh/m²	0.73 %
Orientation and inclination of the module surface	-197.69	kWh/m²	-19.74 %
Module-independent shading	-3.64	kWh/m²	-0.45 %
Reflection on the Module Surface	-76.34	kWh/m²	-9.54 %
Global Radiation at the Module	**723.89**	**kWh/m²**	
	723.89	kWh/m²	
	x 23.433	m²	
	= 16,962.89	kWh	
Global PV Radiation	**16,962.89**	**kWh**	
Soiling	0.00	kWh	0.00 %
STC Conversion (Rated Efficiency of Module 20.75 %)	-13,443.73	kWh	-79.25 %
Rated PV Energy	**3,519.16**	**kWh**	
Module-specific Partial Shading	-29.96	kWh	-0.85 %
Low-light performance	-160.25	kWh	-4.59 %
Deviation from the nominal module temperature	9.67	kWh	0.29 %
Diodes	-1.13	kWh	-0.03 %
Mismatch (Manufacturer Information)	-66.75	kWh	-2.00 %
Mismatch (Configuration/Shading)	-5.69	kWh	-0.17 %
PV Energy (DC) without inverter clipping	**3,265.05**	**kWh**	
Failing to reach the DC start output	-0.01	kWh	0.00 %
Clipping on account of the MPP Voltage Range	0.00	kWh	0.00 %
Clipping on account of the max. DC Current	0.00	kWh	0.00 %
Clipping on account of the max. DC Power	0.00	kWh	0.00 %
Clipping on account of the max. AC Power/cos phi	-1.03	kWh	-0.03 %
MPP Matching	-3.83	kWh	-0.12 %
PV energy (DC)	**3,260.18**	**kWh**	
Energy at the Inverter Input	**3,260.18**	**kWh**	
Input voltage deviates from rated voltage	-11.64	kWh	-0.36 %
DC/AC Conversion	-116.36	kWh	-3.58 %
Standby Consumption (Inverter)	-10.40	kWh	-0.33 %
Total Cable Losses	0.00	kWh	0.00 %
PV energy (AC) minus standby use	**3,121.79**	**kWh**	
PV Generator Energy (AC grid)	**3,132.18**	**kWh**	

Financial Analysis

Overview

System Data

PV Generator Energy (AC grid)	3,132	kWh/Year
PV Generator Output	4.9	kWp
Start of Operation of the System	09/09/2024	
Assessment Period	20	Years
Interest on Capital	1	%

Economic Parameters

Internal Rate of Return (IRR)	12.57	%
Accrued Cash Flow (Cash Balance)	7,509.36	£
Amortization Period	8.3	Years
Electricity Production Costs	0.0713	£/kWh

Payment Overview

Specific Investment Costs	826.95	£/kWp
Investment Costs	4,018.97	£
One-off Payments	0.00	£
Incoming Subsidies	0.00	£
Annual Costs	0.00	£/Year
Other Revenue or Savings	0.00	£/Year

Remuneration and Savings

Total Payment from Utility in First Year	0.00	£/Year
First year savings	441.99	£/Year
Net-Metering Tarif (Example)		
Energy Price	0.1637	£/kWh
Compensation for Surplus	0	£/kWh
Inflation Rate for Energy Price	4	%/Year

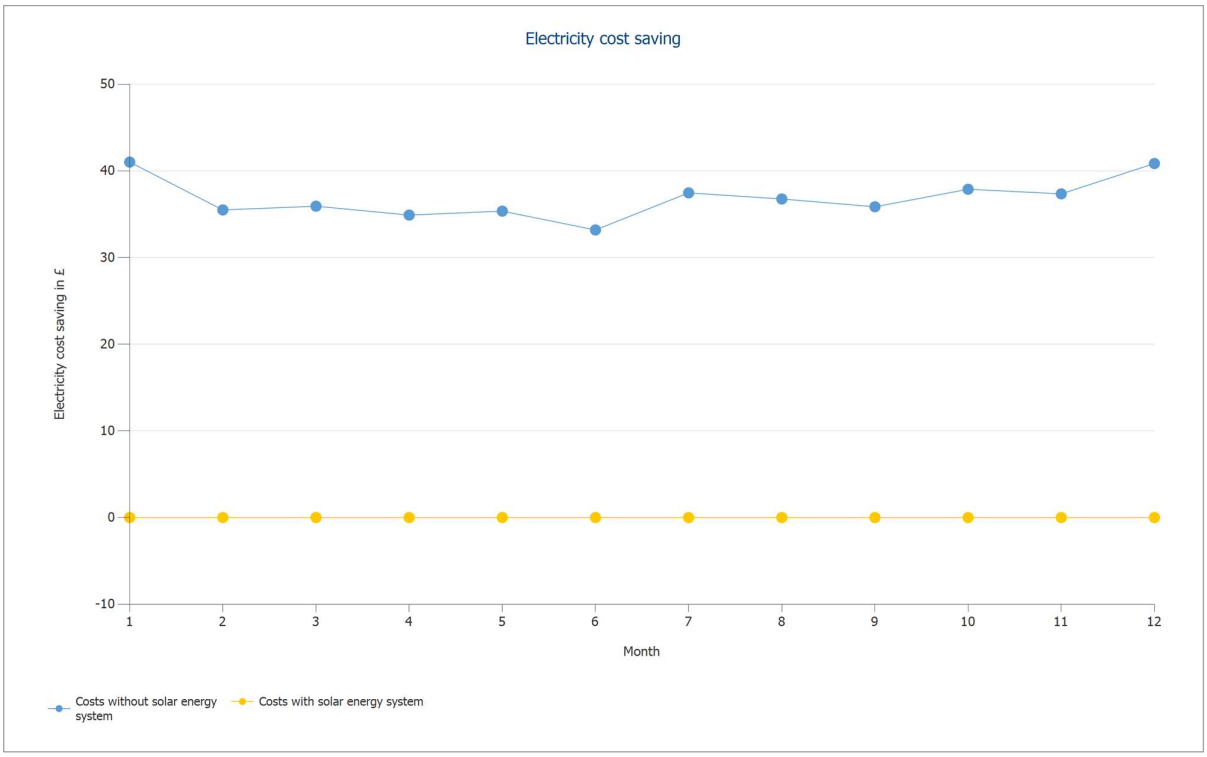


Figure: Electricity cost saving

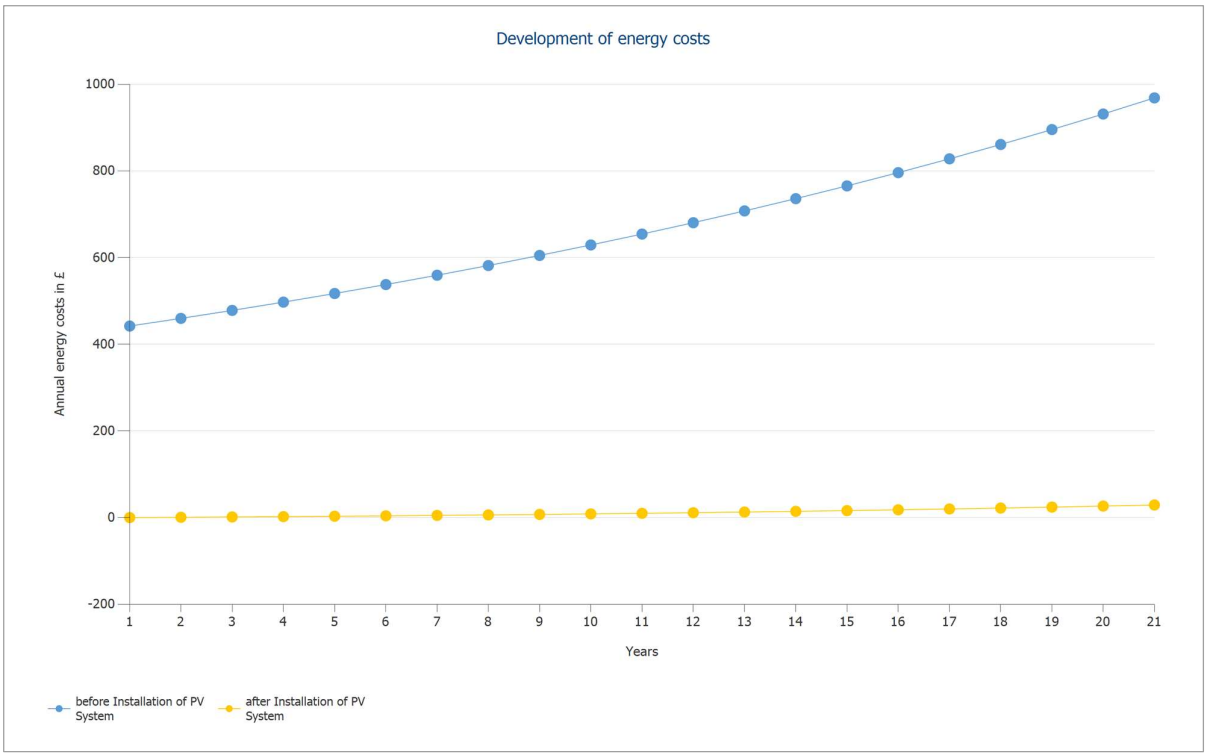


Figure: Development of energy costs

Cash flow

Cash flow

	Year 1	Year 2	Year 3	Year 4	Year 5
Investments	-£4,018.97	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£426.79	£449.94	£462.60	£475.63	£489.02
Annual Cash Flow	**-£3,592.18**	**£449.94**	**£462.60**	**£475.63**	**£489.02**
Accrued Cash Flow (Cash Balance)	-£3,592.18	-£3,142.25	-£2,679.64	-£2,204.02	-£1,715.00

Cash flow

	Year 6	Year 7	Year 8	Year 9	Year 10
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£502.78	£516.93	£531.48	£546.44	£561.81
Annual Cash Flow	**£502.78**	**£516.93**	**£531.48**	**£546.44**	**£561.81**
Accrued Cash Flow (Cash Balance)	-£1,212.22	-£695.29	-£163.81	£382.63	£944.44

Cash flow

	Year 11	Year 12	Year 13	Year 14	Year 15
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£577.62	£593.87	£610.58	£627.75	£645.41
Annual Cash Flow	**£577.62**	**£593.87**	**£610.58**	**£627.75**	**£645.41**
Accrued Cash Flow (Cash Balance)	£1,522.06	£2,115.93	£2,726.50	£3,354.26	£3,999.66

Cash flow

	Year 16	Year 17	Year 18	Year 19	Year 20
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£663.56	£682.22	£701.40	£721.12	£741.40
Annual Cash Flow	**£663.56**	**£682.22**	**£701.40**	**£721.12**	**£741.40**
Accrued Cash Flow (Cash Balance)	£4,663.22	£5,345.44	£6,046.84	£6,767.96	£7,509.36

Degradation and inflation rates are applied on a monthly basis over the entire observation period. This is done in the first year.

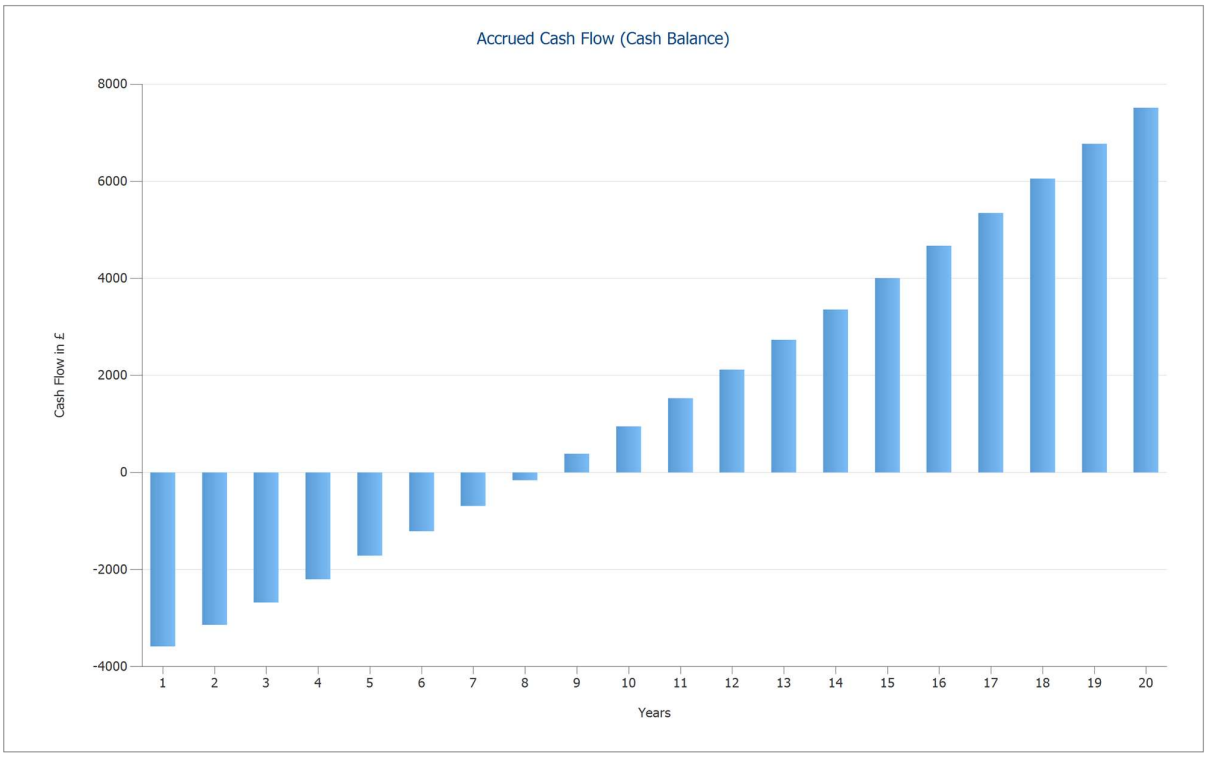


Figure: Accrued Cash Flow (Cash Balance)