

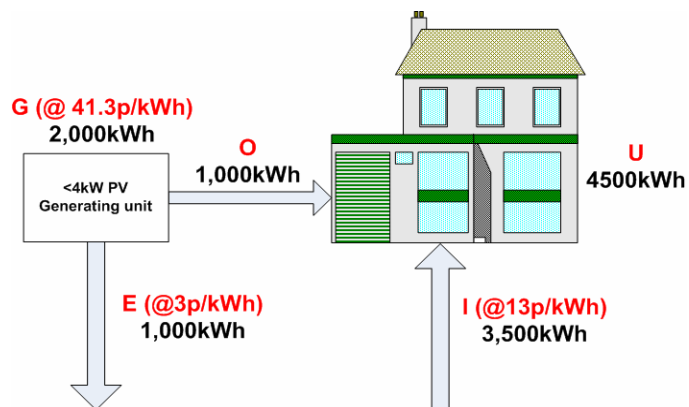


Feed-in-Tariff Finance

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Example



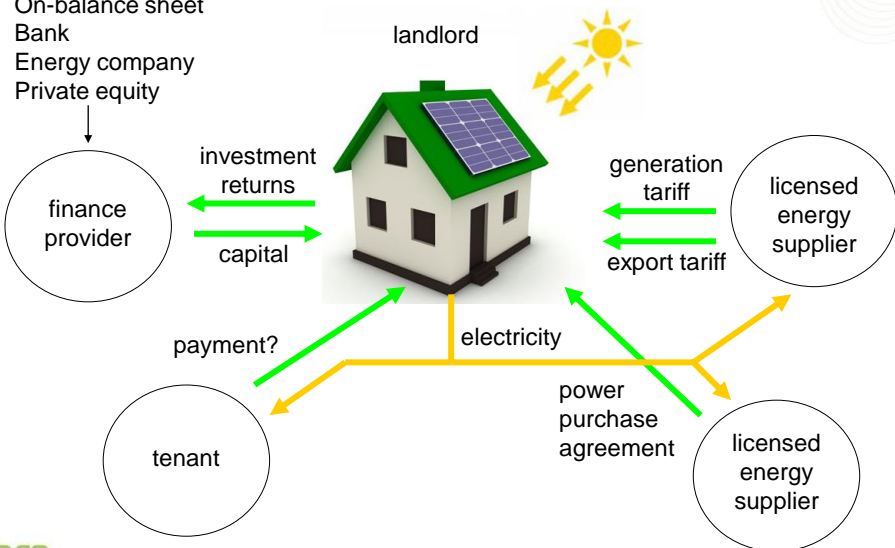
Example

Element	No generation	Generation
Import costs	4,500 x 13p/kWh = -£585/annum	3,500 x 13p/kWh = -£455/annum £130 saving
Generation tariff	0	2,000 x 41.3p/kWh = +£826/annum £826 additional revenue
Export tariff	0	1,000 x 3p/kWh = +£30/annum £30 additional revenue
Total	-£585/annum	+£401/annum £986 financial value

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The Basic Model

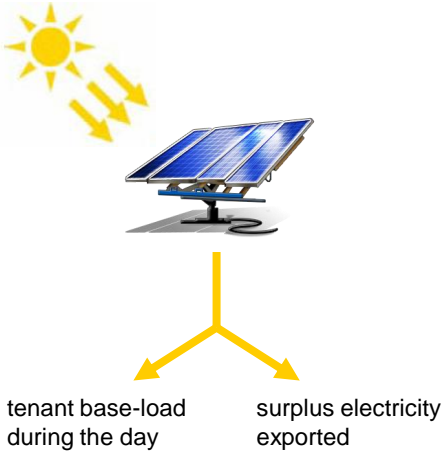
On-balance sheet
Bank
Energy company
Private equity



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Electricity Sales

- Does the tenant pay for electricity?
- If so, per unit or monthly charge?
- If so, what discount to normal price of electricity?
- Compatibility with pay-as-you-go meters?



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Basic Cash-Flows

expenses

- capital costs ←
- operations & maintenance ←
- roof lease? ←



income

- ← generation tariff
- ← export tariff or power purchase agreement (PPA)
- ← avoided costs of energy imports

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Components of Financial Analysis for PV

- **Capital cost of installed capacity** – £2,500-£5,000 per kWp
- **Annual output per kWp** – 700-1,000 kWh
- **Percentage of electricity used on-site**
 - Common parts: The more imported electricity can be displaced the better
 - Tenants: Can you capture at least some of the value to tenants of reduced electricity imports?
- **Annual operations & maintenance**
 - Insurance
 - Meter readings, monitoring of output
 - Panel inspection or cleaning, electrical inspection
 - Repair or replacement of inverters, panels, cables, meters,
- **Indexation factors**
 - Output declines every year by 0.5%-1%
 - Generation & export tariff linked to RPI
 - Energy prices – will rate of increase exceed RPI?

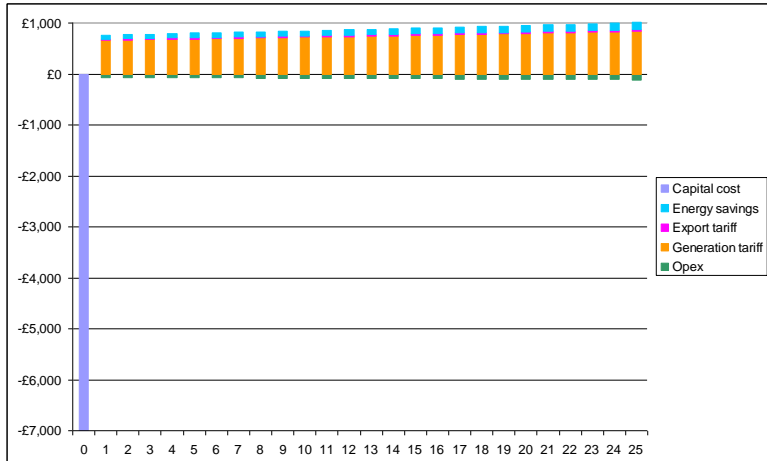
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Sample Installation

- **Installation capacity** – 2 kWp
- **Annual output** – 800 kWh per kWp
- **Capital cost** – £3,500 per kWp
- **Generation tariff** – £0.413
- **Export tariff** – £0.03
- **Percentage exported** – 50%
- **Electricity tariff** – £0.10
- **Annual operations & maintenance** – 1% of capital cost
- **Internal Rate of Return (IRR)** = 12%

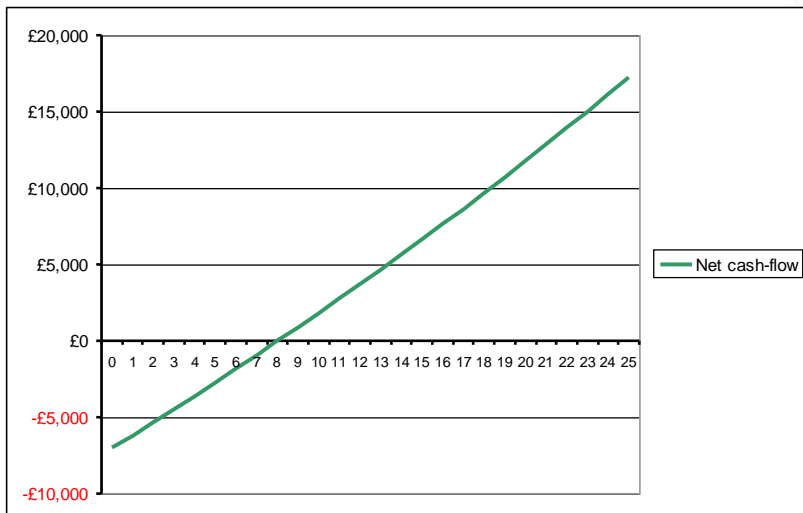
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Project Cash-Flows



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Payback



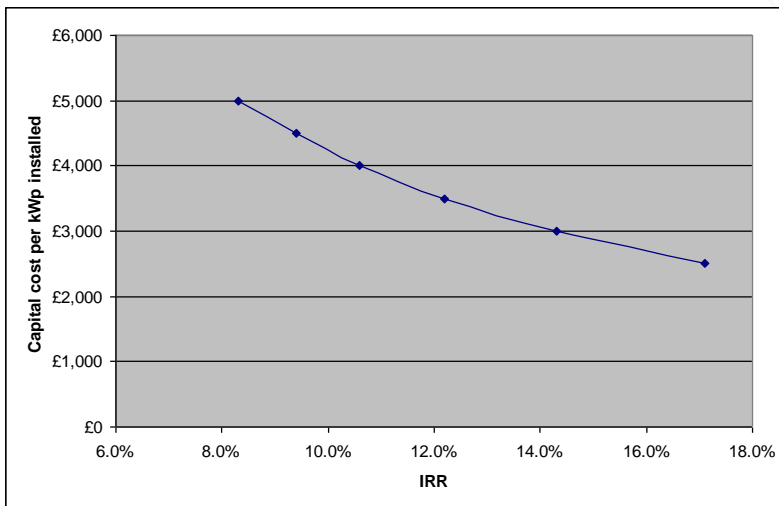
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Key Determinants of Performance

- **Capital Costs** – How far below £4,500 per kWp can you go?
- **Output** – How many kWh per kWp installed?
- **Generation Tariff** – Trade-off between economies of scale on installation costs vs. size of tariff
- **Operations & Maintenance** – How far can this be reduced without harming performance
- **Energy sales** – Can you capture value of reduced energy imports or energy exports?

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Capital Cost & IRR



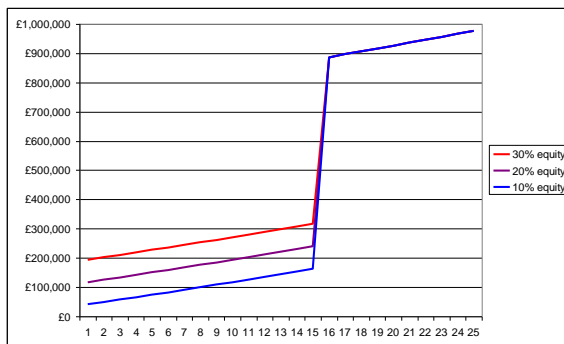
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Sample Project

- 1,000 units @ £7,000
- Total capital costs = £7,000,000
- Arrangement and due diligence fees of £200,000
- 15 year loan at 7% interest rate
- Equal annual instalments
- No energy savings or income from tenants for electricity
- Annual EBITDA = £755,000-£978,000

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Performance at Different Equity Levels



Equity level	Equity IRR	Average DSCR	Net cash-flow
30%	14%	1.45	£11,000,000
20%	16%	1.28	£10,600,000
10%	18%	1.14	£10,100,000

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Funding Options

- **Third-party solutions**
 - Up-front capital costs met by third party, which also owns and maintains equipment
 - Tenant receives electricity for free or at a discount
 - Landlord may receive rental payments
- **Full recourse finance**
 - Financial institution lends to the organisation – debt secured against its balance sheet
- **Non-recourse finance**
 - Financial institution lends to a Special Purpose Vehicle (SPV) – an independent company
 - Bank only has recourse to SPV's assets in case of problems or default
- **Limited recourse finance**
 - Financial institution lends money to SPV with capped recourse to organisation
- **Leasing**
 - Organisation pays financial institution rent for renewable energy equipment
 - Operating vs. financial leases – different balance sheet treatment for now
- **Shared equity**
 - Organisation invests in a third-party solution via an investment vehicle

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External Finance

- **Lenders (banks and other financial institutions)**
 - Required return = 3-8%
- **Private equity/investors**
 - Seeking returns of 9-12% unleveraged
- **Long term investors (e.g. pension funds)**
 - Potentially lower returns required (5-8%)
 - Will not take on risks associated with installation
- **Balance sheet quality**
 - Will existing lenders allow more debt?
 - Will new funders be comfortable with balance sheet quality?
 - Is your organisation willing to take on more debt?
- **Ability to provide equity**

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Evaluating Finance Options

Method	Positives	Negatives
Full recourse	+ operational flexibility + retains upside + cheaper debt?	- adds debt to balance sheet - equity requirement - installation & operating risks
Non- or limited recourse	+ balance sheet protected + installation & operating risks reduced + retains upside	- funder determines scale of installation - equity requirement
Third party solution	+ no installation & operating risks + potential energy cost savings	- funder determines scale of installation - ongoing exposure to provider - no upside

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Goals

- **Planning permission**
- **Voluntary environmental target**
- **Reduce or fix energy costs**
- **Investment returns**
- **Generate income stream to finance other activities, e.g. energy efficiency refurbishment**
- **Capital appreciation of property assets**
- **Attract tenants (environmental credentials, lower energy bills)**

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Making it add up

- **Need to establish compatibility between**
 - Organisation's goals, e.g. reduction of fuel poverty, improving rental yields
 - The portfolio (what returns achieved from which buildings)
 - The finance provider's required rate of return
- **The business plan**
 - Understanding the optimum, feasible deployment of renewable energy technology across the portfolio
 - Realistic timeframes and returns
 - Supply chain issues – quality of kit and installers, potential bottlenecks
 - Adequate internal resources
 - Access to appropriate expertise
- **Tenant issues**
 - What consultation required?
 - What tenant education required?
 - Compatibility with tenants' current energy supply arrangements
 - What, if anything, do tenants pay?
 - Need to form an ESCO?
- **Certainty on revenue streams for external investors**
 - Insurance, quality of installation and maintenance, management focus, etc.

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Thank you

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