

The Economics of 'Bottom Up' Sustainability

Making Personal Sustainability
Decisions “Add Up”

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Introduction

- Government Inducements
- Costs and Commitments
- Performance and Payback
- Have We Missed The Bus?

Government Inducements :1

- The Feed-in Tariff (FiT) was a scheme introduced by the Labour Government in its last year in office (2009 – 10)
- Aimed at encouraging small-scale generation of electricity using eligible renewable technologies (e.g. solar PV at the domestic level)
- Programme costs are borne by all British electricity consumers proportionally by a slight increase in their annual bill
- The goal of feed-in tariffs was to offer cost-based compensation to renewable energy producers, providing price certainty and long-term contracts that help finance renewable energy investments

Government Inducements :2

- FiT encouraged ‘early adopters’ to install renewables with an initial index-linked generation rate of 43.3p / kwh
- This rate was cut within 18 months for new installations following the arrival of the Coalition Government in 2010 based on ‘affordability / fairness issues’ for all bill payers
- The rate has continued to drop (degression) and the scheme will end completely for new installations in April 2019

Costs and Commitments :1

- Whilst FiT rates were high for ‘early adopters’ the technology was also relatively expensive (e.g. a 2.3kwh system cost c£11,000 in 2011)
- RoI was estimated (positively by the installers) at 7 – 11 years i.e. a long-term commitment!



Costs and Commitments :2

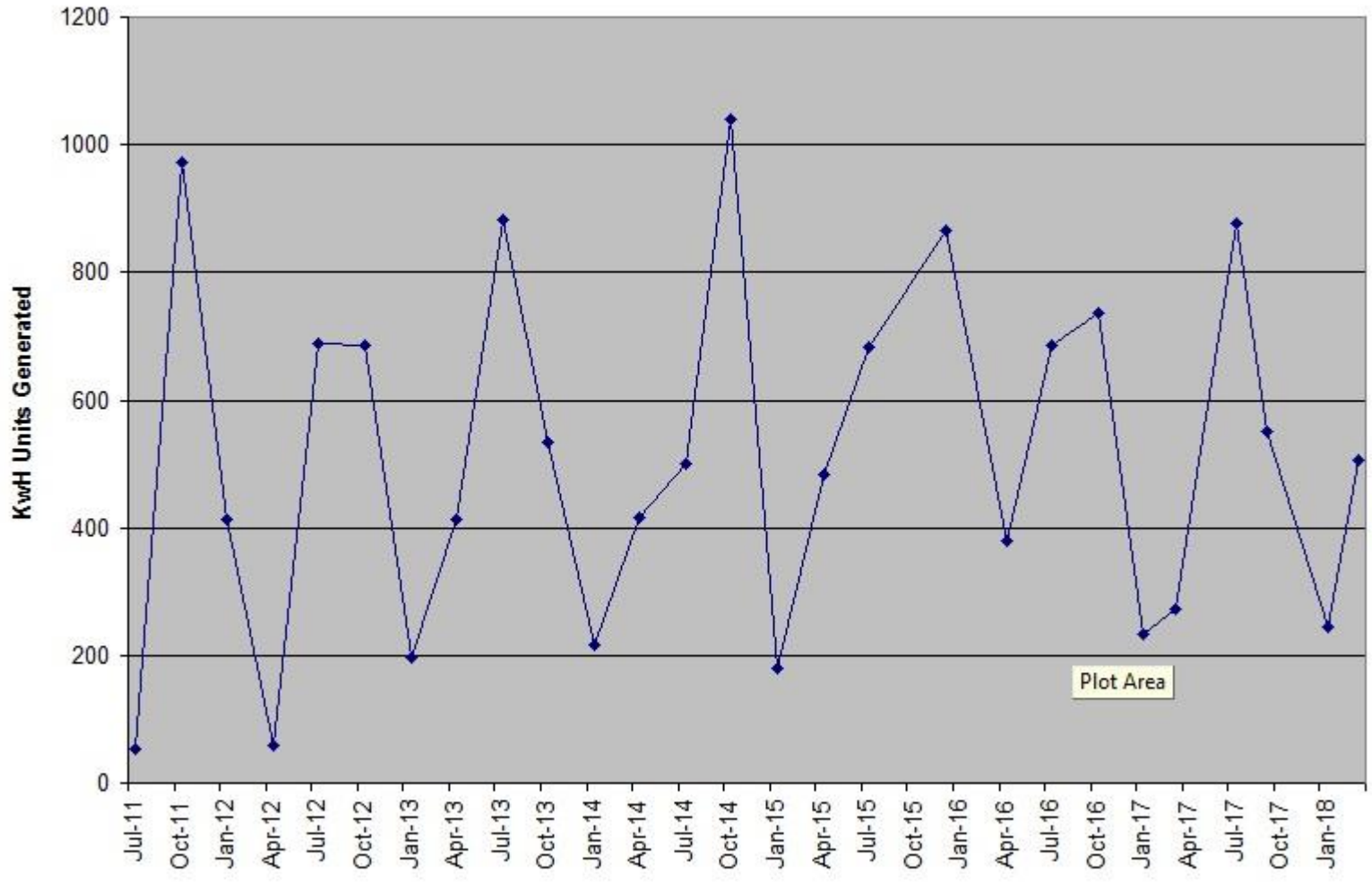
- FiT payments for PV last for 25 years from installation (until 2036 in this case)
- The FiT payments ‘stay with the home’ and are part of the fixtures and fittings if the property is sold (i.e. ‘you can’t take FiT with you’ if / when you leave!)
- However, on the plus point FiT payments are free of income tax for individual UK tax payers!

Performance and Payback: 1

- Performance is seasonal with greater generation in the summer months, but even in winter the panels make a significant contribution to meeting daytime household energy needs
- ‘Early adopter’ FiT returns are now averaging c£1,000 pa
- Further savings are delivered from ‘charging offset’ (energy usage reduction due to PV generation) and enhanced by behaviour change (e.g. ‘doing the washing in the daytime’)

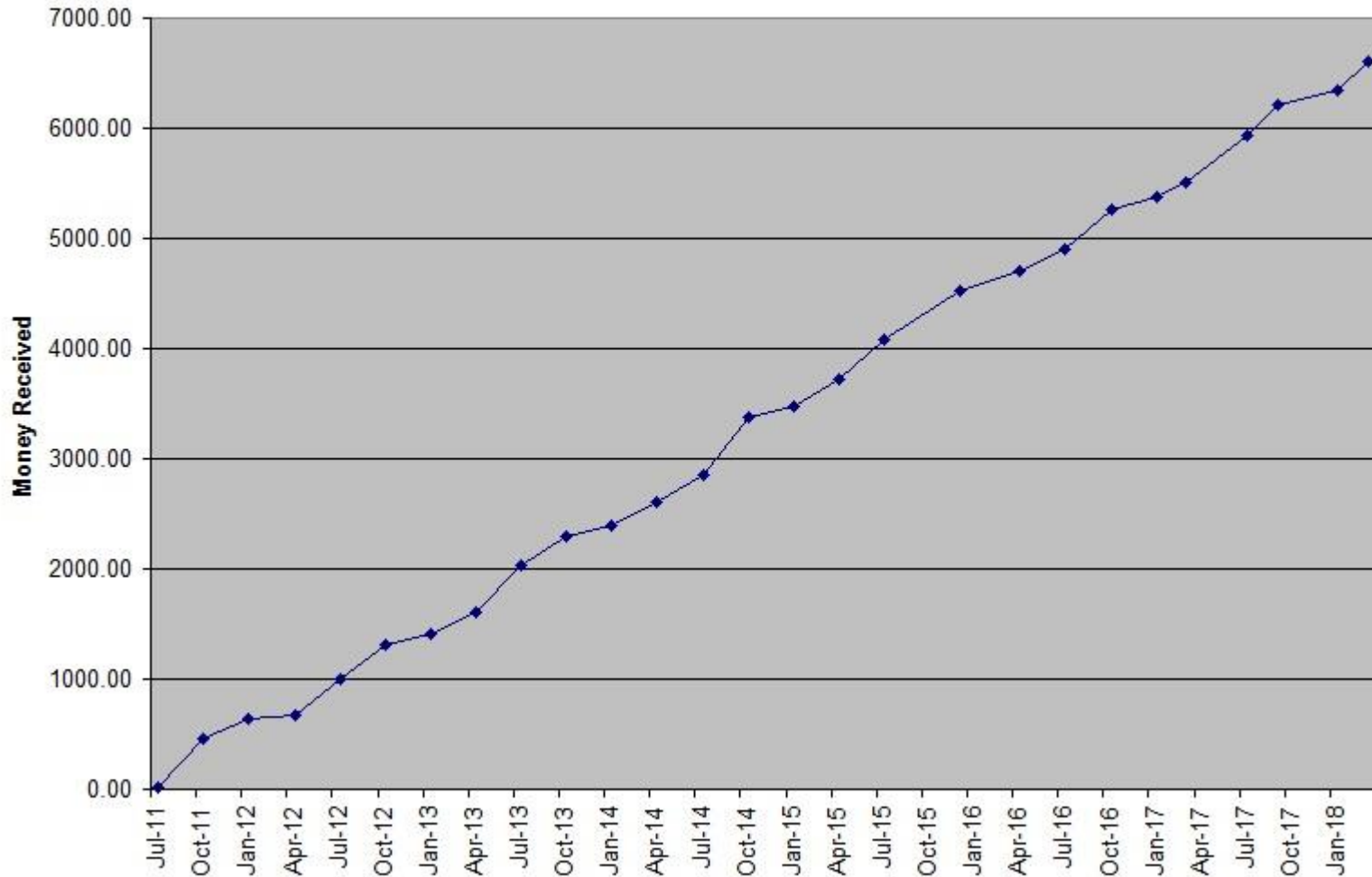
Performance and Payback: 2

KWh Generated Per Quarter



Performance and Payback: 3

Cumulative FiT Payments

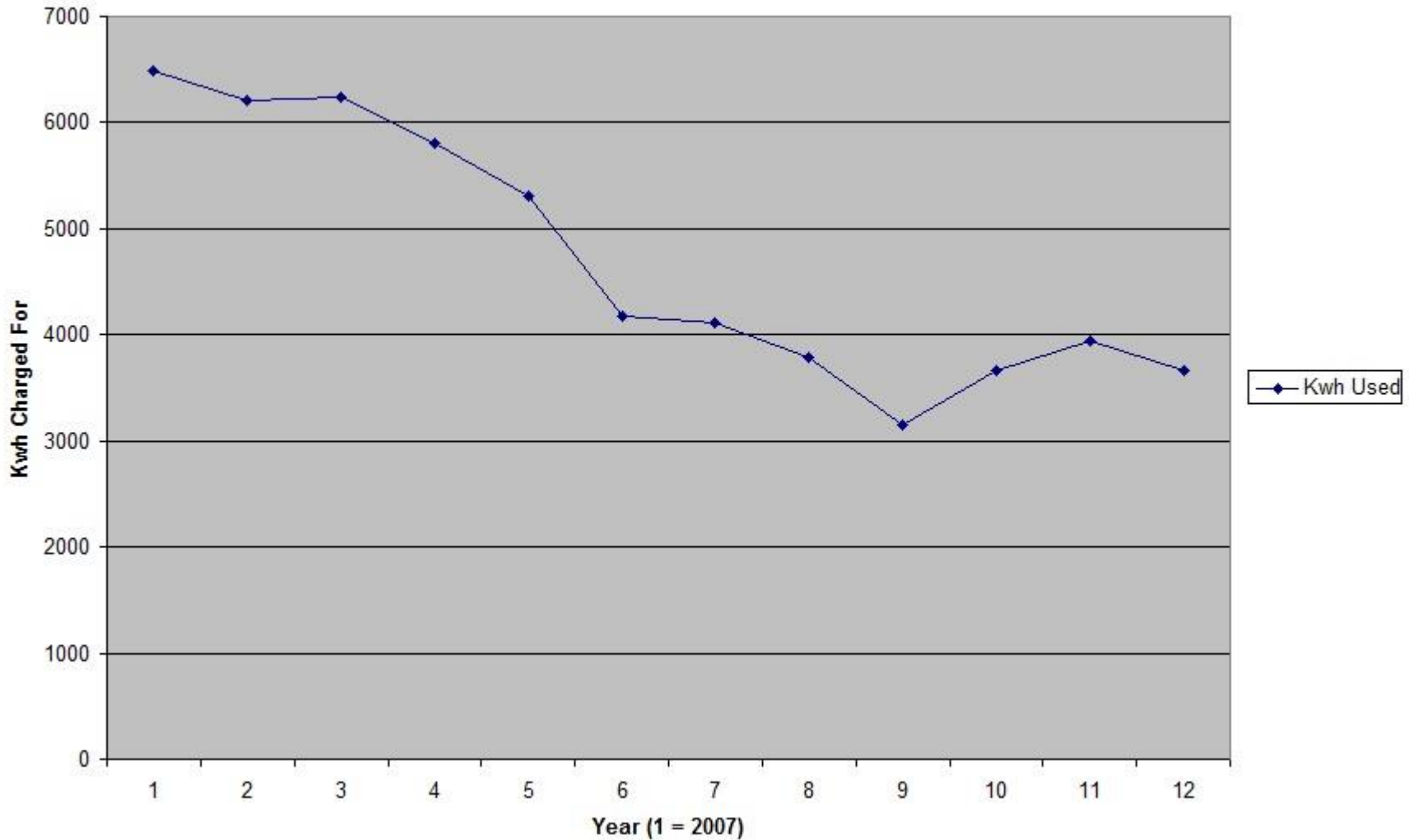


Performance and Payback: 4

- FiT isn't the only element of the PV RoI model
- “Offset” is a key element of the equation with generated electricity used within the home
- The study showed a 36% reduction in average charged electricity between the ‘pre’ and ‘post’ PV installation
- Average annual charged usage of electricity dropped from 6168 kwh to 3958 kwh
- Over the 7 year study post PV installation period this equates to an ‘offset’ saving of £2329 or c£320pa

Performance and Payback: 5

Charged Kwh Usage Per Year

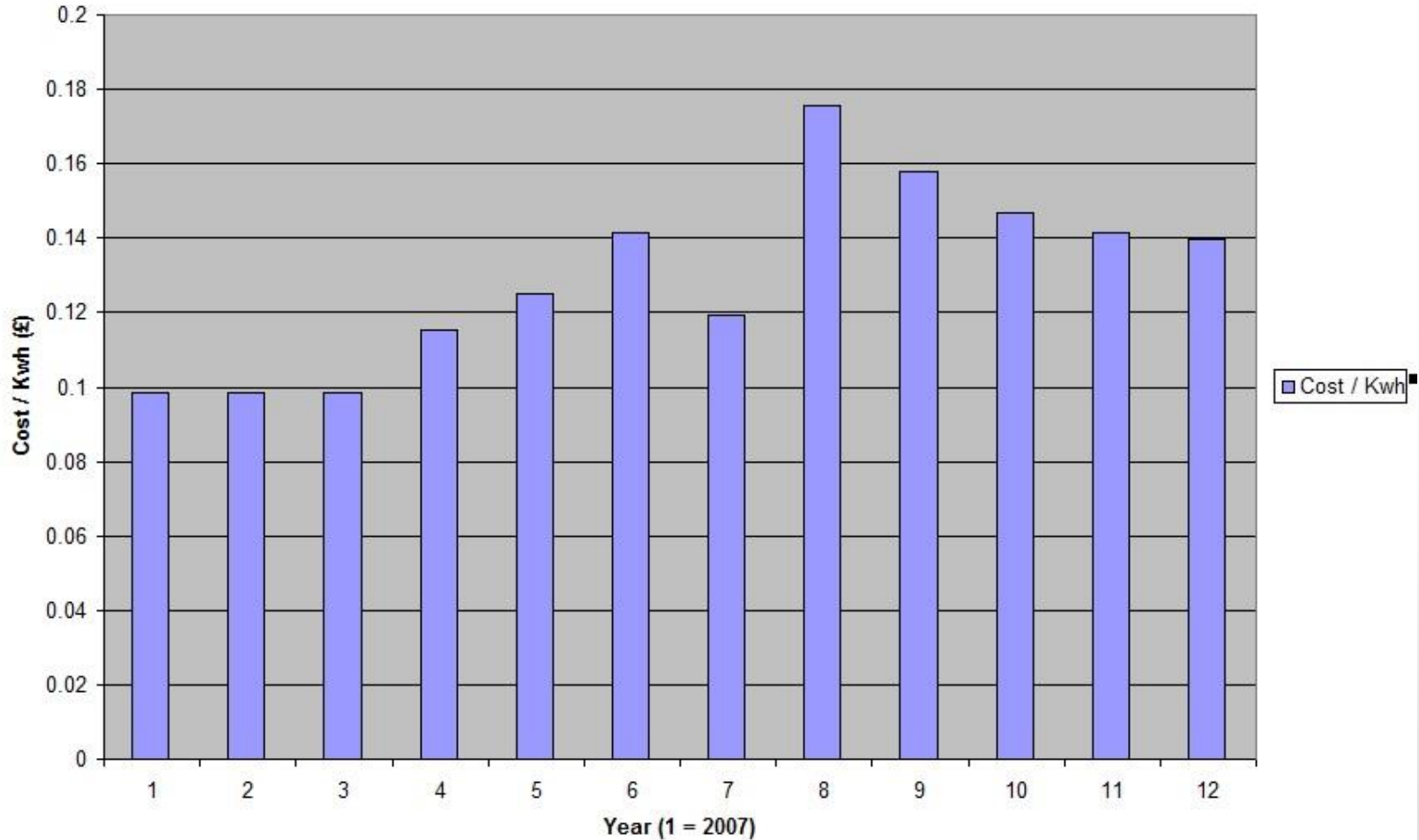


Performance and Payback: 6

- Furthermore.....
- The ever increasing cost of Kwh unit charges by the energy companies must also be taken into consideration
- Actual Kwh charges have increased from 9.84p/kwh in 2007 to 13.97p/kwh in 2018 an increase of 42%
- And they have been higher than that for part of the study period!

Performance and Payback: 7

Average Cost / Kwh 2007 - 2018

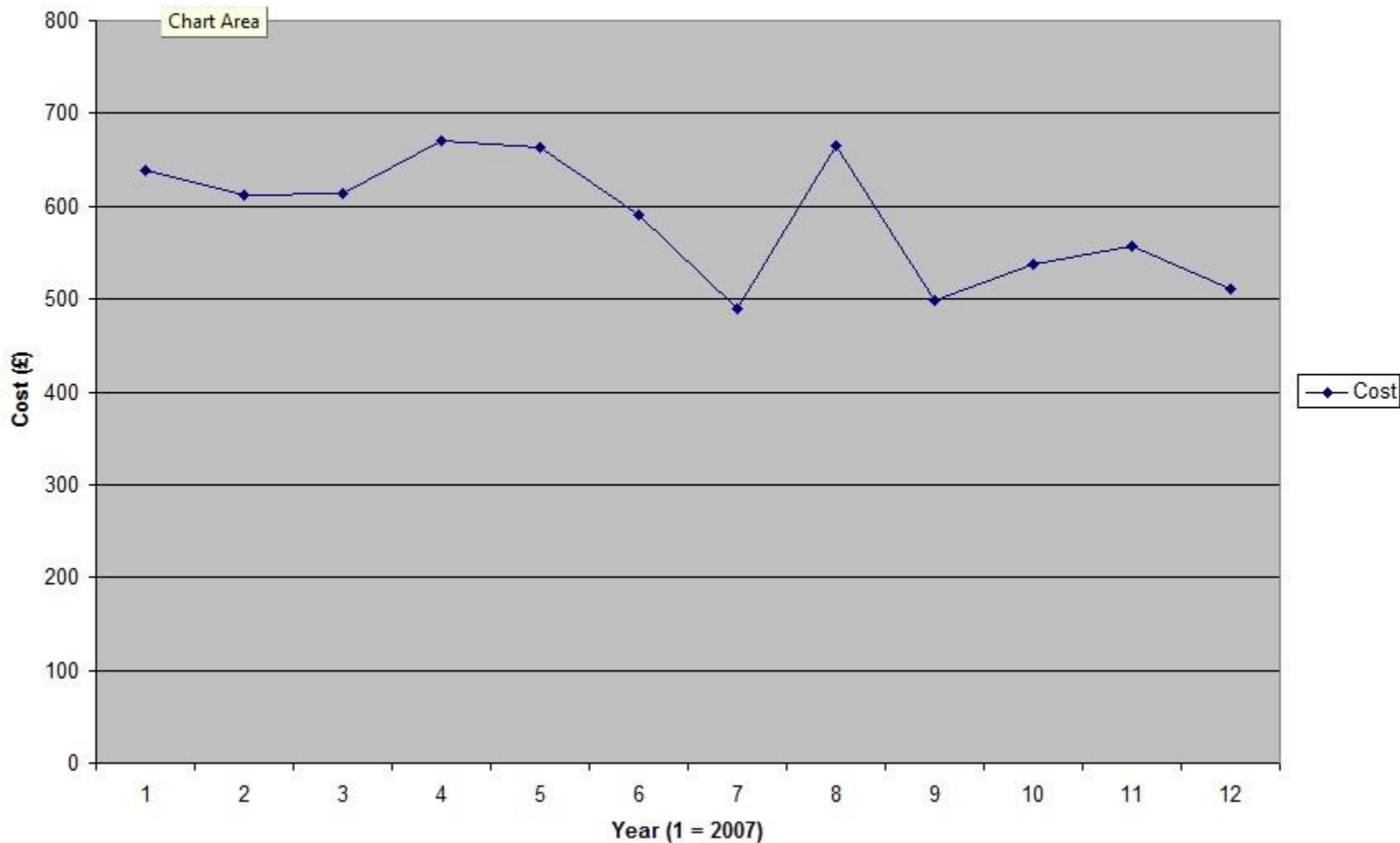


Performance and Payback: 8

- This ‘northwards march’ of electricity prices has had a dampening effect on the impact of household bill reductions post PV installation
- However, had the system not been installed average bills for electricity for the study house would be c£900pa instead of the post PV average of c£531pa

Performance and Payback: 9

Charged Kwh Costs Per Year



Performance and Payback: 10

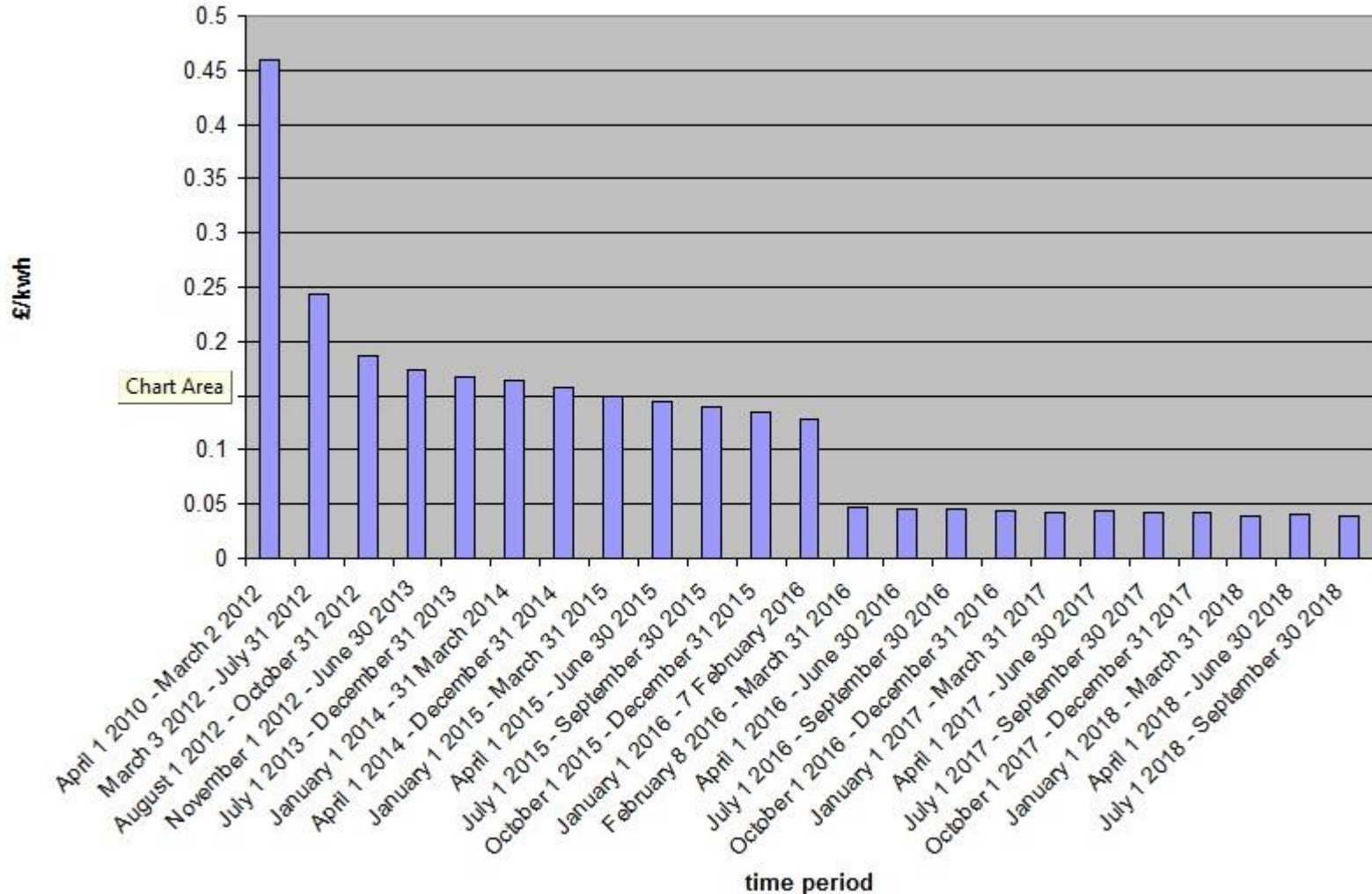
- After over 7 years 'full payback' has not been reached
- The initial cost of installation of £11250 has not yet been recouped.
- As of September 2018 FiT payments and offset had yielded $£6900 + £2329 = £9229$
- The system still has £2021 to recoup which will be achieved on previous performance by 2020, within the initial 7 – 11 target stated by the installers

Have We Missed The Bus? : 1

- However....
- For small scale (<4kw domestic installations) those later installations (post 2012) receive much lower FiT payments than the generous 'early adopter' rates
- All FiT payments for new installations end in March 2019

Have We Missed The Bus? :2

Max FiT Rates For PV Below 4kw



Have We Missed The Bus? : 3

- Increasing electricity prices and reducing PV panel costs will be the main drivers for post FiT installations
- There is still a definable case for domestic PV investment
- A 2.8kw PV system with domestic water booster is now installed for <£5,000
- Less than half the cost of the 2.3kw study system (without water heating booster) 8 years ago
- But extrapolating energy bill reductions due to PV will give a new (and lower) economic justification model

Have We Missed The Bus? : 4

- Yet PV installations are still taking place
- New 'add on' technologies are emerging (e.g. solar water heaters and storage batteries) are helping
- The economics may still be attractive in some cases but payback periods are likely to be longer
- 11 – 14 years are likely to be the norm post March 2019



Have We Missed The Bus? :5

- Current government policy to encourage domestic PV installation now relies on market forces alone as opposed to incentivisation to pump prime a market policy makers now regard as ‘mature’
- Is this likely to have a ‘slow down’ impact on domestic PV take up?
- Gone are the RoI’s of up to c12% on PV investments from those ‘early adopter’ days
- c6.6% is a more likely maximum RoI post April 2019
- Such an incentive is anticipated by policy makers to be enough for significant volumes of installation
- However, when average domestic home occupancy is c7 – 8 years against a potential payback of up to twice that time, means the jury on that issue remains ‘out’

Have We Missed The Bus? :6

- Still, there are always those ‘special cases’ where such an investment is still more than worthwhile!

