



# CUTTING COSTS: THE ENERGY POTENTIAL OF UK COMMERCIAL ROOFTOPS

**A Study by Kingspan Energy  
8th October 2014**



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## INTRODUCTION

Welcome to this study on the potential cost savings commercial rooftop solar photovoltaics (PV) offers to UK plc.

The case for commercial rooftop solar PV has so far rested primarily on the green credentials of the technology. The lack of a definitive case for short-term return on investment on the capital costs of installing rooftop PV has been a barrier to widespread uptake.

We believe that there is now a clear and compelling economic case for its adoption.

The cost of solar PV panels has plummeted, and even though Feed-in Tariffs have been cut, the potential savings versus rising grid-based electricity bills have increased.

Furthermore, energy security is a growing concern for UK businesses, with geopolitical instability and the threat of future blackouts potentially impacting business continuity.

It is in this context that we launched our unique fully-funded solar PV solution for commercial rooftops; eliminating the need for capital investment, and removing the final barrier to widespread adoption.

This solution allows businesses to immediately benefit from reduced electricity bills, index-linked to inflation, and reduced supply risk - without any capital or maintenance investment whatsoever.

As this study shows, the opportunity to the UK of commercial rooftop solar PV is vast, even without taking into account the inevitable long-term price increases of traditional grid-based power. If you factor in the potential to make our existing buildings more energy efficient to reduce electricity consumption, the impact on UK plc's bottom line could be remarkable.

This is why Kingspan Energy exists. Our fully-funded solution is just one component that supports the wider philosophy of Kingspan Insulated Panels; to deliver Cost-optimal, Energy-saving buildings.

This study was compiled to show that the opportunity for businesses is there for the taking. While a UK-wide transformation cannot happen overnight, the time for businesses to invest in commercial rooftop solar PV is now.



Gilbert McCarthy  
Managing Director, Kingspan Insulated Panels

## STUDY FINDINGS

British businesses could save over **£5bn** per year in electricity bills, at current price and consumption levels, by installing fully-funded rooftop solar PV systems on south-facing commercial roofs.

This total annual saving is equal to 12.97% of the UK's annual corporation tax bill. This would be effectively equivalent to a cut in the corporation tax rate of **2.72%** (from 21% to 18.28%).

The total annual saving on electricity bills is equal to **0.32%** of UK GDP.

The average British business with a half-hourly meter (effectively any Medium-sized business or larger) could save **£31,147** on annual electricity bills immediately, with no capital outlay.

The UK has approximately **2,500km<sup>2</sup>** of south-facing commercial roof space, of which just **61%** (1,525km<sup>2</sup> or 589 sq. miles) would need to be covered with solar PV systems to meet current annual business electricity demand.

British businesses of all sizes consumed **199,738GWh** of electricity last year. Based on the average cost per kWh for British businesses, this translates to a total bill of approximately **£20.4bn**.

These figures are based on installations under Kingspan Energy's fully-funded model, with no capital outlay to install the system. The electricity unit prices from these systems are index-linked, so the potential savings are set to increase as traditional grid-based electricity costs rise.



## METHODOLOGY

This study draws conclusions from analysis and processing of data from a variety of sources.

These include a mix of data published by UK Government departments, and Kingspan Energy data on the efficacy and cost of PV systems. The full range of primary sources for this research is listed below.

The tables overleaf show how each of the relevant figures has been achieved, with reference to the appropriate sources and pertinent notes.

## SOURCES

1. Digest of UK Energy Statistics 2014 Chapter 5: Electricity July 2014, p. 134, table 5.1
2. DECC Sub-national Electricity Consumption Statistics December 2013 (2012 data), p. 17, table 4
3. DECC Quarterly Energy Prices September 2014, p. 76, table A4
4. DECC Quarterly Energy Prices September 2014, p. 40, table 3.4.2
5. DECC-supplied figure
6. Kingspan Energy-supplied figure (average annual production per PV m<sup>2</sup>)
7. Kingspan Energy-supplied figure (average cost per kWh based on reduction to current average grid costs)
8. World Bank data <<http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>> accessed 01.10.14
9. HMRC Corporation Tax Statistics September 2014, p. 24, table 11.1A



**TABLE 1**  
**BUSINESS ELECTRICITY**  
**CONSUMPTION DATA**

<b>Data</b>	<b>Figure</b>	<b>Source</b>	<b>Notes</b>
Total UK Industrial electricity consumption 2013	98,007 GWh	1.	-
Total UK Commercial electricity consumption 2013	79,035 GWh	1.	-
Total UK Public Administration electricity consumption 2013	18,822 GWh	1.	-
Total UK Agricultural electricity consumption 2013	3,874 GWh	1.	-
Total UK Business electricity consumption 2013	199,738 GWh	Sum of the above.	Excludes consumption in transport premises.
Average annual electricity consumption for Half-hourly metered UK businesses	1,074,041 kWh	2.	Average excludes NI consumption. Figures for non-domestic HH meters; 4.5% of non-domestic meter total and representing larger consumers. 2012 data. DECC defines this consumption level as Small/Medium 3.

**TABLE 2**  
**CURRENT BUSINESS**  
**ELECTRICITY BILL DATA**

<b>Data</b>	<b>Figure</b>	<b>Source</b>	<b>Notes</b>
Average cost per kWh for UK businesses	10.20 p	4.	Includes Climate Change Levy at 0.541p per kWh. Excludes VAT.
Average cost per kWh for UK businesses that consume 500 - 1,999MWh	10.55 p	4.	Includes Climate Change Levy at 0.541p per kWh. Excludes VAT.
Total UK Business annual electricity bill	£20,373,276,000	Total UK Business electricity consumption 2013 x Average cost per kWh for UK businesses.	Includes Climate Change Levy at 0.541p per kWh. Excludes VAT.
Average annual electricity bill for Half-hourly metered UK businesses	£113,311.33	Average annual electricity consumption for HH metered UK businesses x Average cost per kWh for business consumers within that consumption band.	Includes Climate Change Levy at 0.541p per kWh. Excludes VAT. Figures for non-domestic HH meters; 4.5% of non-domestic meter total and representing larger consumers, 2012 data.

**TABLE 3  
COMMERCIAL ROOFTOP PV  
ELECTRICITY PRODUCTION DATA**

<b>Data</b>	<b>Figure</b>	<b>Source</b>	<b>Notes</b>
Total UK south-facing commercial roof space	2,500,000,000 m <sup>2</sup>	5.	Not all south-facing commercial roof space will be solar PV-appropriate.
Average annual production per m <sup>2</sup> of Kingspan Energy commercial rooftop solar PV installation	130 kWh/m <sup>2</sup> /yr	6.	Based on average UK PV production figures of 850 kWh/kWp.
Total UK south-facing commercial roof space required to meet current UK business electricity demand	1,536,446,153.85 m <sup>2</sup>	(Total UK Business electricity consumption x 1,000,000) / Average annual production per m <sup>2</sup> of Kingspan Energy commercial rooftop solar PV installation.	-
Percentage of total UK south-facing commercial roof space required to meet current UK business electricity demand	61.46%	Total UK south-facing commercial roof space required to meet current UK business electricity demand / Total UK south-facing commercial roof space x 100.	-

**TABLE 4**  
**COMMERCIAL ROOFTOP PV**  
**ELECTRICITY BILLS & SAVINGS DATA**

<b>Data</b>	<b>Figure</b>	<b>Source</b>	<b>Notes</b>
Average cost per kWh for UK businesses from Kingspan Energy fully-funded commercial rooftop PV system	7.65 p	Average cost per kWh for UK businesses x 0.75 (Average percentage of grid-based unit cost of Kingspan Energy fully-funded commercial rooftop PV system unit cost) 7.	Excludes VAT.
Total UK Business annual electricity bill if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems	£15,279,957,000	[(Total UK Business electricity consumption 2013 x 1,000,000) x Average cost per kWh for UK businesses from Kingspan Energy fully-funded commercial rooftop PV system] / 100.	Excludes VAT.
Total immediate annual saving to UK businesses if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems	£5,093,319,000	Total UK Business annual electricity bill - Total UK Business annual electricity bill if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems.	Excludes VAT.
Average annual electricity bill for Half-hourly metered UK businesses if full demand met by Kingspan Energy fully-funded commercial rooftop PV system	£82,164.14	(Average annual electricity consumption for Half-hourly metered UK businesses x Average cost per kWh for UK businesses from Kingspan Energy fully-funded commercial rooftop PV system) / 100.	Excludes VAT.
Total immediate annual saving for Half-hourly metered UK businesses if full demand met by Kingspan Energy fully-funded commercial rooftop PV system	£31,147.19	Average annual electricity bill for Half-hourly metered UK businesses - Average annual electricity bill for Half-hourly metered UK businesses if full demand met by Kingspan Energy fully-funded commercial rooftop PV system.	Excludes VAT.



**TABLE 5  
COMPARISONS**

<b>Data</b>	<b>Figure</b>	<b>Source</b>	<b>Notes</b>
UK Nominal GDP	£1,613,683,813,142	8 x 0.64	Figure obtained using World Bank USD-GBP official exchange rate for 2013.
Total immediate annual saving to UK businesses as a proportion of GDP if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems	0.32%	Total immediate annual saving to UK businesses if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems / UK Nominal GDP x 100.	-
Total UK Corporation tax receipts 2013/14	£39,274,000,000	9.	-
Total immediate annual saving to UK businesses as a proportion of total UK Corporation tax receipts if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems	12.97%	Total immediate annual saving to UK businesses if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems / Total UK Corporation tax receipts 2013/14 x 100.	-
Equivalent cut in Corporation tax rate to savings made if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems	2.72%	$(21 / 100) \times$ Total immediate annual saving to UK businesses as a proportion of total UK Corporation tax receipts if full demand met by Kingspan Energy fully-funded commercial rooftop PV systems.	Based on 2014/15 main rate of corporation tax. Excludes amended rates for 'ring-fenced' companies or small profits.



## ABOUT KINGSPAN

Kingspan Group is a global leader in high performance insulation, building fabric, and solar integrated building envelopes, delivering high efficiency, low cost & low carbon building solutions across a broad range of market sectors. Founded in the late 1960s, the Group has grown steadily to become a prominent brand within the construction industry, with an annual turnover exceeding €1.8bn (Financial Results for the Year Ended 31 December 2013). The Group comprises four divisions: Insulated Panels, Insulation, Access Floors and Environmental.

Kingspan Insulated Panels, the biggest division of the four, is the global leader in the design, development and delivery of advanced building envelope products and solutions. Its wide range of products includes Standing Seam systems; Insulated Roof & Wall Panels; Fabrications, Safety & Lighting Solutions; Controlled Environments; Insulated Door Components; Structural Products & Systems; Steel Building Solutions; Kingspan Energy Rooftop Solar PV and BENCHMARK high end Façade & Roof Systems.

Kingspan Energy is the first provider of fully-funded solar energy solutions for industrial and commercial buildings, offering businesses low carbon energy generation with no upfront capital investment. Launched in 2013, Kingspan Energy offers a range of fully integrated rooftop solar photovoltaic solutions, combined with 25 year guarantees for the Kingspan roofs and PV systems, including free monitoring and maintenance. Kingspan Energy has already created some landmark solar installations, including the UK's largest commercial rooftop PV array for Jaguar Land Rover in the Midlands, and the UK's largest rooftop PV system refurbishment on Kingspan Insulation's plant in Selby, Yorkshire.

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