

## What's the difference between Sir Philip Green and the GB Smart Metering Program?

BEIS (the Department for Business, Energy and Industrial Strategy) have just released their long overdue assessment of the cost of the country's smart metering program. Hidden among the figures is the amount of money that they have spent. So far, they have squandered £450 million on the project, despite the fact that not a single compliant smart meter has been installed in any house. By a strange coincidence, that's exactly the same amount as the shortfall in BHS' pension fund which occurred when Philip Green flogged off BHS.

The £450 million hole in the BHS pension fund had MPs baying for Philip Green's blood, threatening to remove his knighthood and demonising him in the press. The £450 million expenditure by BEIS on civil servants and consultants, with nothing to show for it, has elicited virtually no reaction from Parliament, yet it will end up costing the taxpayer far more.

Let me reiterate this, as it is truly shocking. Over the last six years, DECC, BEIS and Smart Energy GB have spent £450 million on consultations, developing specifications, fighting Freedom of Information requests and spinning PR stories, yet we have not had a single smart meter installed which conforms to their specifications. Isn't it time that Parliament stops fuming about super yachts and calls BEIS to account? Not least, because the latest report from BEIS shows they can't even manage simple arithmetic.

As we have come to expect from BEIS and their predecessors at DECC, the latest Impact Assessment is yet another work of fiction. Slipped out on the day that Donald Trump was elected in order to ensure minimum press coverage, it showed that merging DECC into BEIS has done nothing to bring any sense of reality to the program.

The Smart Metering saga has been running since 2007, when it was [signed off by Charles Hendry](#) and I've been documenting its sorry progress in [a number of articles](#). Essentially, it aims to install 53 million new gas and electricity meters in British homes by 2020. Half of these were expected to be installed by 2017, when there would be a project review.

In principle, smart meters are a good thing. They provide information to the grid about real-time usage. As our mix of energy generation changes and we see much more local and microgeneration that's a big benefit. The information on energy use can also be relayed to consumers to help them become more energy efficient – something that will be important as we move towards smart homes, although that won't be common for the next decade. One they've done that, a useful by-product of smart meters is that they send your energy usage directly to the supplier, removing the cost of meter reading and making it more likely that your bill will be correct. (The recent fiasco, where it was discovered that [100,000 consumers were mischarged](#) because the energy suppliers confused metric and imperial readings, shows that having an accurate number won't necessarily protect you from being mischarged.) The problem with the GB program is that the people designing the smart meters have forgotten most of these priorities. Instead, they've been designed mainly to help energy suppliers develop complicated tariffs and remotely disconnect users who haven't paid their bills. Asking energy suppliers to design smart meters is a bad idea, exemplified by a statement I heard from an executive at a Californian utility, who told an industry conference that "the best thing about smart meters is they give us more evidence to blame the customer".

Nobody involved in this program likes to say it, but in early documents, DECC make clear that the cost of smart meters would result in an increase in electricity and gas prices, [estimating an average increase of £8 - £9 in a consumer's annual energy bill](#). That increase meant that there

was no rationale for deploying smart meters. To justify their deployment, DECC decided to calculate potential energy savings which would compensate for the rise in energy costs. To achieve this, they made the decision to provide every home with an In Home Display, which would inform customers of their real-time usage, arguing that if we knew the actual costs we would consume less energy. As there was virtually no evidence to draw on, (as no other country in the world had taken this approach), this was largely fictitious. But the great thing about fiction is that you can make it up, which is what DECC did. Miraculously, their calculations predicted an overall customer saving of £14 per year, giving the green light for the project to go ahead. A previous study for DECC by an external consultancy, and a similar review more recently in Germany, suggest the opposite, but DECC has resisted all Freedom of Information requests to determine how they reached their figures. Instead they've poured £192 million into Smart Energy GB – a quango whose sole purpose is to spin this savings mantra to the public, implying that smart meters are the best thing since your last energy bill.

Along the way, the specification for these meters has become more complex, to the point where they are now the most expensive and complex ones in the world. An initial aim to put the UK at the forefront of smart metering, with expertise that could be sold to the rest of the world has disappeared, as the project has morphed to the point where we are now seen as an also-ran, weighed down with impractical requirements and ballooning costs. And consumers have still not seen a single compliant meter.

Let me stress that point. Although Smart Energy GB puts out the message that over 4 million smart meters have been deployed, not a single one of those meters meets the SMETS2 requirements developed by DECC. This was confirmed in a meeting in July, when a DECC representative categorically stated, in response to an industry question, that the SMETS2 specification was still not complete and that not a single compliant meter had been installed. What has been deployed so far will either need to be replaced or upgraded, assuming the latter is possible.

That's the history. Let's look at the current Impact Assessment. We've been waiting almost three years for this, as it's been delayed and delayed. Along the way, it looks as if DECC has lost its departmental slide rule, as some of the numbers don't add up.

I'll start with the equipment and installation costs. The latest information from Smart Energy GB is that the program will install 53 million meters in 30 million homes. I'll assume every home has electricity, which means that's 30 million electricity meters and 23 million gas meters. It's also 30 million communication hubs, which send the data back to the central data service, and 30 million In Home Displays. BEIS reckons these will account for a total cost of £4.442 billion. Taking their numbers and checking the calculation, this looks about right. You need to apply a 12.4% correction factor, which presumably takes in inflation, etc., but this is one sum they've done properly.

So far, so good. Now to installation costs, as a smart meter's not much use if it's just sitting on a shelf in a warehouse – it needs to be on your wall. 23 million homes need both gas and electricity meters, whilst 7 million only have electricity. BEIS estimates that if you can install both gas and electricity meters at the same time it will cost £107, whereas if you do them separately, it will cost £67 for each visit. In every other country, meters were installed by the network operator, not the utility. This means that you can replace every meter in the street at the same time, which is efficient. Here, DECC decided to let the energy suppliers do the installations. So if you get gas from British Gas and electricity from SSE you will need two

separate visits from separate installers on different days. Instead of costing £107, it will cost £134.

To calculate the installation costs, we need to know how many customers get both gas and electricity from the same supplier. BEIS doesn't mention this and I don't know, but I'll guess it's two thirds of dual-fuel households. That would mean that 15.4 million homes would get two meters installed in one visit (totalling 30.8 million meters), but the other 22.2 million meters would need individual visits. Put in the numbers and that comes to £3.135 billion. Experience show that some of these will need return visits to sort out problems, as the range of the radios can be an issue, so we'll add 5% contingency, which takes this to £3.292 billion.

In the Impact Assessment, BEIS calculate this at £2,077 billion, which is what you'd get if you only counted electricity meters. In other words, they've completely forgotten that they need to install 23 million gas meters. So £1.2 billion of costs have gone missing.

Incidentally, BEIS doesn't account for the cost to all of us in taking time off work whilst these new meters are fitted, which will involve two days off work for the 8 million people who have their electricity and smart meters fitted at different times. They consider that as good subjects we should make that sacrifice to allow our energy suppliers to raise the cost of our energy bills. It's probably easy to adopt that frame of mind when the taxpayer is paying you £450 million. I suspect you get the same sense of detachment as when you're sipping champagne on your superyacht, oblivious to the fact that your ex-employees' pensions have disappeared.

The next omission is the problem with mobile coverage, which is how the energy companies get data back from the smart meters. To achieve this, DECC split the country into three regions. In two of these, Telefonica has won a contract to connect the communications hubs which transmit meter data using GPRS. In the Northern region, Arqiva is using its proprietary Sensus Flexnet system (although we're not meant to know that, as DECC redacted the technology section of the contract – probably because they're aware it doesn't meet the EU requirement of being an "open" standard and could therefore be open to legal challenge). But let's concentrate on Telefonica.

GPRS is an old, 2G technology. Telefonica, in its former guise of Cellnet, first launched a GPRS service back in June 2000. GPRS has been the mainstay of machine to machine communications for the past quarter century, but it's not very efficient in terms of spectrum, so mobile operators around the world have been turning it off so that they can use the same spectrum for 4G LTE services – a process known as refarming. This typically lets them support around forty times the number of subscribers with the same amount of spectrum. Recent changes in ownership in the UK has seen Telefonica (known to consumers as O2), see its share of spectrum becoming less significant. BT/EE owns 45% of mobile spectrum, Vodafone 28%, Telefonica 15% and Three 12%. (Three probably has more capacity than O2, as they've never used their spectrum for 2G services.) Having such limited spectrum is a problem if you want to stay commercially viable. Telefonica (the Spanish parent company) are well aware of this and tried to sell O2 to Three last year, but that was blocked by the regulators. Their latest plan is desperately [attempting to sell O2 off to investors](#). The problem is that having a long term contract that ties up GPRS spectrum is not very attractive when you're pitching for a sale, especially as every other network is looking at discontinuing their 2G (and in many cases 3G) services in the next few years to support more users and higher bandwidths using 4G LTE.

So it's highly likely that Telefonica will look at ways of getting out of the contract by 2025 at the latest. We don't know what the exit penalties are, because in their normal black-pen fashion,

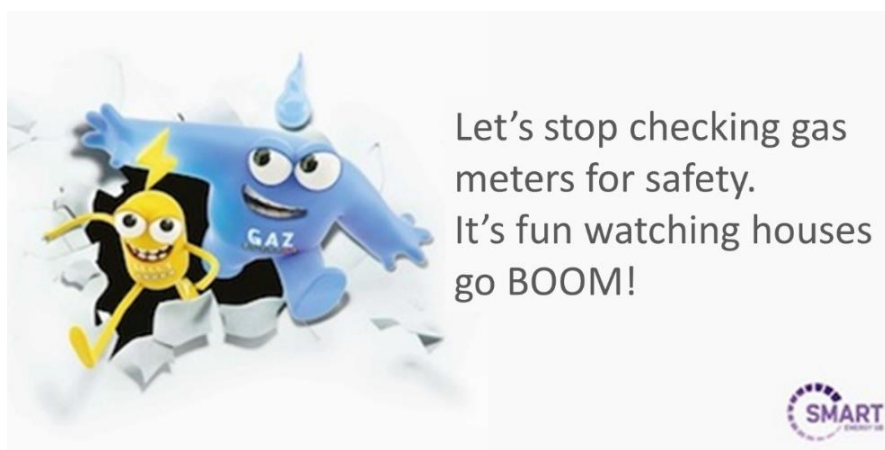
DECC have redacted them from the publicly available documents. Although given the history of Government IT contracts they're probably sufficiently low that Telefonica can happily walk away.

The problem for BEIS is that when the GPRS network is turned off, they will no longer be able to receive data from around three quarters of meters, which will revert to being very expensive dumb meters. At that point, every home in the South and Central areas will need a new comms hub fitted. The easiest approach would be to give these areas to Arqiva. In which case we're looking at approximately 22 million new hubs at £29 each, with installation costs of £69 each, giving a total of £2.11 billion of additional cost which is missing from the Impact Assessment. Installation may be a bit cheaper than for a meter, but as the comms hub is a trust centre for the home network security, there will be quite a lot to check on each installation, which will push up the time of the visit. This will happen in the lifetime of the program, probably shortly after 2020, so the cost needs to be included.

A better option would be for BEIS to cancel the contract and award the whole country to Arqiva now, or insist that the comms hubs support 4G as well as GPRS, making them future proof. But that latter option would add around £20 to the cost of each. I suspect that neither are really options for BEIS, as both would mean they'd have to publicly admit that they'd got it wrong, which would open the flood gates and expose the whole program as incompetent.

There's another fudged cost which should be examined, which is the downgrading of safety checks. Everyone involved with the smart metering program likes to point out how much will be saved by making meter readers redundant. However, this ignores the fact that part of their job is checking meter safety. That involves making sure the meter's not been tampered with, and also that it is in physically good condition. It has always been a legal requirement to check a meter every two years. With the advent of smart meters and the imminent demise of the meter reading work force, the utilities have been desperate to remove this requirement. They've been lobbying OFGEM – the industry regulator, to relax safety checks to once every five years, and OFGEM have acquiesced.

It's probably OK to relax the inspection rate for electricity meters, but I'm less sure about gas meters, especially as all of the smart gas meters are new designs. The Impact Assessment talks about categorising them as high and low risk meters, but admits that they have no idea how to work out which are high risk. I'm looking forward to hearing how Sacha Deshmukh and his [bevy of cartoon characters](#) at Smart Energy GB are going to persuade consumers of the benefit of less frequent safety checks, as that change means the likelihood of their house exploding has just doubled. In case it helps Sacha save a few millions, here's my suggestion:



That may not be good news for consumers, but it's good for the Impact Assessment, as it saves a further £690 million. Except it doesn't. Once more, BEIS's slide rule is on the blink. On page 23 of their technical annex, they state the cost of reading a high risk meter is £8.80, but by the time they've got to Table 1-3 on the following page they've lost a decimal point and reduced it to £0.88. Which means their estimated saving from getting rid of most of their meter readers is high by £380 million.

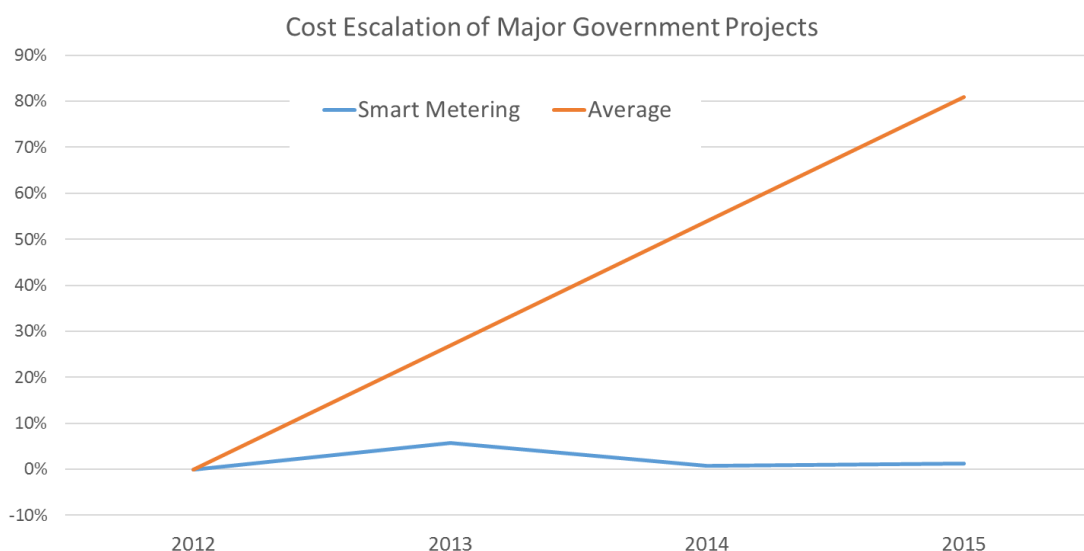
If we add up those three costs – the need for replacement comms hubs and the two arithmetical errors, we get an additional cost of £3.69 billion, taking the programme cost to £14.67 billion. These are just the obvious mistakes. I suspect there's a few billion more if you dig deeper.

Neither DECC nor BEIS like admitting that costs might have increased. In 2010, when DECC produced their first Impact assessment, the cost estimate was £10.05 billion. In 2012, it had risen to £10.45 billion. The estimates peaked at £11.47 billion in 2013, before everything went quiet for a few years, falling back to £10.98 billion in this most recent Assessment – a mere 1% increase over the project duration.

Jul 2010	Aug 2011	Apr 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Nov 2016
£10.05 bn	£10.91 bn	£10.85 bn	£11.47 bn	£10.93 bn	Not published		£10.98 bn

In January this year, the National Audit Office published a report "[Delivering major projects in government: a briefing for the Committee of Public Accounts](#)", which reviewed the state of major Government projects. It found that between 2012 and 2015, on average, project costs had escalated by 81%.

If we chart the NAO figures and the DECC / BEIS estimates, we can see what a great job DECC / BEIS have apparently achieved:



Remember that despite having spent £450 million on managing the project, we still have not seen a single, compliant smart meter installed in any British home, although the original plan anticipated having almost 21 million meters installed by the end of this year.

This appears to be a remarkable Government IT project, because there has been no cost increase over its duration. Echoing Sir Philip’s ennoblement, it’s the sort of achievement which should herald knighthoods all round at BEIS. But we know that long term projects like this don’t contain costs unless they’re being covered up. This doesn’t happen in Government IT projects – just read Richard Bacon and Christopher Hope’s [Conundrum](#) to see why. What this demonstrates is not intelligent project management, but civil service fudging.

There’s a nasty little sting in the tail of this report, which is that BEIS have stated that they’re not planning to produce any more until the deployment is complete. That’s despite the original commitment to review the deployment when half of the meters have been installed. It’s effectively saying that it’s all blind flying from this point on, which is probably civil service speak for “The shit’s about to hit the fan – we’ve got until 2018 to find another job. Let’s run away and find one of those rotating doors into the private sector.”

To be honest, these numbers have always been a fudge, ever since DECC invented the concept of consumer benefits to try and balance the books. They still seem to believe these, stating in this latest Impact Assessment that consumers will use the information on their energy consumption to reduce energy usage by 2.8% for electricity and 2% for gas. They base these figures on results from the Early Learning Project which found electricity savings were in the range of 1.6 - 2.8%, while gas savings were 0.9 – 2.1%. In other words, they picked the top of the range and then used these figures as if they were the median values.

There’s not a lot of evidence around, as no other country has given every household an In Home Display. Most trials include a degree of self-selection by users, meaning there’s a lot of selection bias. The best results are probably from a [major Dutch trial](#), which reported 0.9% savings for gas and 0.6% for electricity, but which suggested that higher savings of 3.5% might be possible. Here we see the danger of Executive Summaries. If you delve further into the Dutch report, you discover that the 3.5% figure is achieved as a result of consumers buying more efficient appliances and lightbulbs, and has nothing to do with smart meters. My guess is that most people involved in the GB smart metering program were happy to stop reading once they saw the 3.5% figure as that’s what they wanted to hear.

If we take the actual reductions of 0.9% and 0.6% from the Dutch study, then the BEIS figures for energy savings slump from £5.3 billion to £1.33 billion. That has a knock-on effect on Carbon savings which decrease from £1.29 billion to £320 million. Putting these together, we can compare BEIS’ Impact Assessment with Reality:

	<b>BEIS</b>	<b>Reality</b>
<b>COSTS</b>	£10.98 billion	£14.67 billion
<b>BENEFITS</b>	£16.72 billion	£11.78 billion
Net Benefit	£5.74 billion	-£2.89 billion

You could argue that the need to replace the comms hubs is speculative, but that is only £2.1 billion. If you exclude it there is still no overall consumer benefit. The other changes come purely from simple mathematical errors:

- BEIS have missed £1.2 billion of costs because they've forgotten that they need to install gas meters;
- BEIS have over-estimated the savings from reduced safety checks by £380 million because they have failed to notice they've moved a decimal place, and
- BEIS have over-estimated the potential consumer savings and linked carbon savings by £4.9 billion because they have taken maximum figures from a range and used them as median figures in their calculations.

Despite being paid £450 million, it appears that BEIS does not contain anyone capable of primary school level addition and multiplication.

All of this highlights the fact that there is no benefit to consumers in continuing the program. It is time it is stopped. To put the savings into perspective, BEIS claims that smart metering could save the average home £11 a year on their energy bill. Compare that with the value of food the average household throws away each year, [which is around £470](#). Compared to this, the savings from energy conservation are just noise. The problem is that those involved in smart metering are so blinkered that they've lost all perspective. They miss the fact that there are far more important things in everyone else's lives. All they see is the hope that by promoting conservation we can reduce energy consumption enough to stave off the power cuts that are likely to come because we haven't invested enough in new generation. But smart meters are not a magic wand. What we need is a proper, long term energy policy.

Even the energy suppliers are losing their enthusiasm for the project. British Gas has taken the plunge and installed almost 4 million smart meters. These don't meet the SMETS2 specification, and will probably need to be replaced, but it means that British Gas now has a critical mass of customers with smart meters, allowing them to use them as a marketing tool for customer acquisition, offering them the carrot of free electricity on a Saturday or Sunday. Their competitors now see massive up-front costs as they need to install tens of millions of meters by 2020. It's rather ironic that the only effect of the smart metering program so far (other than wasting £450 million) has been to increase the power of our largest utility, potentially setting it up to become a monopoly supplier. So much for the aims of increasing customer choice.

Before concluding I would like to revisit the issue of security. I first raised [this back in 2012](#), highlighting the risk of connected products and the ability to hack Internet of Things devices. The design of smart meters in Britain means that if they are hacked, power could be turned off for large chunks of the country, causing massive damage to the grid. When I questioned the sense of this design in meetings at DECC I got the reply from utilities of "why would anyone ever do that". In general, those of us who have been trying to improve the security of connected devices have the impression that we're treated as scare mongers.

Last month someone released the Mirai malware, which [infected hundreds of thousands of routers and cameras](#), launching a denial of service attack which took down many major websites. It was the first indication that this could and will continue to happen. Recent experiments have shown that [Mirai can infect an internet connected device within 98 seconds](#) of it being turned on. This latest Impact Assessment talks about "streamlining security requirements" to make it more cost effective for small energy suppliers. There is still nothing to provide confidence that anyone is taking the threat to national infrastructure seriously.

Going back to the lack of Parliamentary concern about the £450 million spent so far with not a single meter being installed, it indicates just how much successive Governments are in thrall to the energy suppliers. Despite occasional posturing, Ministers have proven to be incapable of

influencing energy prices, with the suppliers simply carrying on business as usual. Smart metering is probably seen as one of the few things that Government can impose on them, hence it's achieved the status of sacred cow, where lack of progress is covered up by falsified figures, giving MPs the impression that it is one small victory they can claim. But it's a completely hollow one which will probably end up costing consumers upwards of £20 billion by the time the final bills come in.

At the end of the day, Parliament would do well to remember the words of Ayn Rand – “We can evade reality, but we cannot evade the consequences of evading reality”. We've already wasted £450 million. Let's not waste a further £14 billion or more. It really is time to stop pouring money and effort into a smart metering deployment that is already obsolete and will deliver no benefit to energy suppliers, the grid or customers.

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You can read my previous articles about GB energy policy and the smart metering programme [here](#).

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