

## Small Nuclear Reactors Are a 1950s Mirage Come Back to Haunt Us

The government is due to announce a £250 million support package for 'small modular reactors' this week, just as the price of wind and solar power contracts fall 10% below UK wholesale prices. OLIVER TICKELL argues that the Britain's 'civilian' nuclear power expenditure is actually a camouflaged subsidy to the UK's Trident nuclear missile system.

By [Oliver Tickell](#)

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*Featured image: HMS Ambush sails into HM Clyde in September 2012 to begin sea trials. (c) Defence Images*

*It's easy to see why Rolls Royce and other companies in the nuclear engineering business are pushing the UK government finance the development a new generation of 'small modular reactors' or SMRs. Whether the project succeeds or fails, there are juicy profits to be had for them at taxpayers expense.*

Rather harder to understand is why the government should see the slightest merit in the idea.

According to [a recent report by Rolls-Royce](#) and its partners in the 'SMR Consortium' (SMRC), a UK SMR program could create 40,000 skilled jobs, contribute £100 billion (\$132 billion) to the economy and open up a potential £400 billion global export market.

Nuclear Industries Association chairman Lord (John) Hutton claims in the foreword that a UK SMR programme could "help the UK become a vibrant, world-leading nuclear nation." He asserts his belief that "it is fundamental for the UK to meet its 2050 decarbonisation targets and will deliver secure, reliable and affordable electricity for generations to come."

The SMRC report envisages an approximate doubling of the UK's 9.5 GW existing nuclear capacity by 2030, then another doubling by 2050 to around 40GW. That implies that come 2050, SMRs would be delivering some 30GW - the output of 100 300MW units scattered around the UK.

There are just two problems with the rosy scenario. First, the techno-optimism that oozes from every page is a fantasy. Nuclear power stations have got bigger to achieve economies of scale: it's much cheaper to build a single 1.2GW unit than four 300MW units, or a dozen 100MW units.

As an illustration of the principle, take a look at the wind power industry. One of the main reasons why offshore wind has come down so much in cost is the [move to ever-larger wind turbines](#). A single new 8MW turbine may now be bigger than an entire wind farm of 20 years ago.

## **This story goes all the way back to the 1950s ...**

But first we must realise - there is nothing new about SMRs! They have been powering submarines and aircraft carriers ever since the since [USS Nautilus](#) was launched in 1955, over 60 years ago. And the world's first purely civilian nuclear plant, at [Shippingport](#) in the USA, a 60MW SMR, went live in 1957. While civilian reactors got bigger, many hundreds of SMRs have been built and deployed for naval use.

Now if there really are huge cost savings to be achieved from the mass production of SMRs, how come they have not already been achieved? What is that that generations of super-smart nuclear engineers have missed? Industry claims of less complex financing and 'process engineering' may ring a little hollow, but - for the sake of argument - let's accept that all the claimed cost reductions can be achieved. On the SMRC's projections,

"The levelised cost of electricity (LCOE) generated by a FOAK [first of a kind] UK SMR power station is forecast under £75 per MWh and this reduces to a forecast £65 per MWh by station number five. In the medium term the target is even lower at £60 per MWh."

This is a good bit cheaper than the inflation-proof £92.50 / MWh (in 2013 money) the government has promised to pay for Hinkley C's power for 35 years following the plant's opening. But it's a lot higher than [current wholesale power prices](#) of around £42 / MWh.

## **The ever shrinking cost of renewable energy**

Last month the [price of offshore wind power](#) reached a new low of [£57.50 per MWh](#) in an auction for contracts, guaranteed for just 15 years. Onshore wind is even [cheaper](#): contracts awarded in Germany in May reached another [new low of €42.80 / MWh](#) (£38.24) - less than current UK wholesale power prices. And Germany's latest solar auction, a few days ago, [delivered bids](#) as low as €42.90 per MWh. Both these technologies appear viable with no subsidy at all.

The cost of solar PV panels continues its precipitous decline. Recent figures show the [cost of panels in the Netherlands](#) declining at 11% per year, or 50% every five years. The trend may continue for a long time to come.

Extrapolate these declining renewable cost trends to 2030, and we can expect solar power to cost around £10 per MWh, with wind at £20-30 per MWh. By 2050, wind power costs will surely have halved again, with solar around £1 per MWh. So what will be the use of nuclear power at £60-75 per MWh?

Of course there will be costs in integrating large volumes of variable, non-despatchable power supply into the grid. It will mean using 'dynamic demand' or 'smart grid' technologies, energy storage in giant batteries and hydropower stations, large scale power-to-gas and power-to-liquid-fuel conversion (in turn displacing fossil fuels from transport) ... and the base cost of power will be astonishingly low by current standards, not just in the UK but all over the world.

So Lord Hutton's hyperbolic claims are wholly erroneous. Nuclear power will be utterly irrelevant in meeting decarbonisation targets. There is no £400 billion export market. Who would want SMRs in 2050, when their power will be 50-100 times more expensive than

solar?

### The 'nuclear deterrent'

We now know (thanks to [Andy Stirling and Philip Johnstone](#) of Sussex University) that the government wants to use civilian nuclear programme to generate expertise, technology, [for military use](#), especially reactors for Trident nuclear submarines. What better way than to pour billions of pounds into SMRs under the pretence that the technology is for civilian use?

Actually Lord Hutton himself gave the game away when he wrote: "A UK SMR programme would support all 10 'pillars' of the Government's Industrial Strategy and assist in sustaining the skills required for the Royal Navy's submarine programme."

More recently, on 10th October, defence procurement minister [Harriet Baldwin MP](#) [replied](#) to a question by Caroline Lucas MP that,

"[i]n all discussions it is fully understood that civil and defence sectors must work together to make sure resource is prioritised appropriately for the protection and prosperity of the United Kingdom."

But there are signs that BEIS **Secretary Greg Clarke** may be getting tired of subsidising the UK's nuclear missiles. In 2015 former Chancellor George Osborne announced a [£250 million](#) SMR competition for the most promising ideas. The outcomewas to be published last autumn. it wasn't. By May 2017, the nuclear industry and its [backers in the House of Lords were panicking](#). Then the SMRCs report '[UK SMR: A National Endeavour](#)' was issued this 20th September in a desperate attempt to ginger up the process. It has failed - so far.

Could a sudden fit of common sense, logical thinking and sound economics have come across senior UK ministers? Probably not. The *Telegraph* [reports today](#) that BEIS is to publish the competitions 'results' in a study this week, announcing Rolls Royce and its SMRC partners as the winners. "*We are currently considering next steps for the SMR programme and we will communicate these in due course*", a BEIS spokesman said.

**Oliver Tickell** is contributing editor at *Resurgence & Ecologist* magazine and a former editor of *The Ecologist*.

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