

# Trident and jobs

The employment implications  
of cancelling Trident replacement



**CAMPAIGN FOR NUCLEAR DISARMAMENT**



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## Executive Summary

**I**N July 2016, MPs voted in favour of building four submarines for a new nuclear weapons system to replace the current one, Trident. But all the facts stack up against Trident – and they continue to do so, irrespective of this shameful vote. Replacing Trident, the current system, will be one of the most expensive military programmes ever undertaken at a cost of at least £205 billion once construction, maintenance and decommissioning costs are taken into account. This project serves no useful military purpose and is not even independent.

But it is also argued that the current system and its replacement provide civilian jobs, some of them highly-skilled and well paid, many in deprived areas where alternative employment of the same quality is scarce. While this is true, the extent of this job creation is tiny relative to the sums involved. In effect, they are among the most costly jobs in history.

The money saved by not replacing Trident could be used for a massive level of investment that would create many more jobs than the current or future nuclear weapons systems can provide. The sums involved are so vast that whole areas, such as the one around Barrow, where the Trident submarines are made, could be regenerated.

The skills of the current workforce would form the nuclei of a large-scale industrial investment programme. A host of industries are in need of investment, from wind and wave power, to nuclear decommissioning, to aerospace technology to marine industries and others. British industry as a whole faces chronic skills shortages which public sector-led investment can address. The money saved by not replacing Trident would provide the finances for this programme. This would amount to an industrial strategy for Britain with the existing workforce and regions at its core.

There are far more, better and well-paid jobs to be created by this type of investment than in persisting with the replacement of Trident, a militarily useless yet hugely expensive weapon.

## Introduction

Trident's replacement will cost at least £205 billion of public money. A staggering figure, particularly when we consider the nuclear weapons system has no real military value and is useless in the face of the real threats we face today, such as terrorism, climate change and cyber-attacks and could be rendered obsolete by new technology. But many try to argue that this investment is worth it because of the jobs the nuclear weapon system sustains.

People's livelihoods matter. But an objective appraisal of the jobs associated with Trident, Britain's nuclear weapons system, and its replacement will demonstrate that these are among the most costly jobs ever created. By simply re-directing a proportion of the money allocated to the Trident replacement programme to other industries, it would be possible to create many more, highly specialised and well-paid jobs. This transition programme would directly benefit those currently working on Britain's nuclear weapons. Society as a whole would benefit from the shift to more productive jobs. And of course, humanity as a whole would benefit from the reduction in the numbers of weapons of mass destruction.

This report will make that appraisal and that argument.

### Cost of Trident

CND's latest calculation of the cost of Trident replacement is £205 billion.

Manufacturing four Successor submarines	£31 billion <sup>1</sup>
Contingency fund	£10 billion <sup>2</sup>
Missile life extension programme	£350 million <sup>3</sup>
Replacement warheads	£4 billion <sup>4</sup>
Infrastructure capital costs	£4 billion <sup>5</sup>
In-service costs	£142 billion <sup>6</sup>
Conventional military forces directly assigned to support Trident	£1 billion <sup>7</sup>
Decommissioning	£13 billion <sup>8</sup>

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<b>TOTAL</b>	<b>£205 billion</b>
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## Jobs

The Ministry of Defence (MoD) argues that the 'UK's defence nuclear enterprise supports over 30,000 jobs across the UK and makes a significant contribution to the economy.' But this total includes armed services personnel as well as an estimate of the ancillary and related jobs from the outlay on nuclear weaponry.

The military personnel should be discounted from the total. It would be a decision for the government of the day whether and in what way to redeploy those services personnel into other areas if the Trident programme is not replaced.

For different reasons, the estimates of ancillary and related jobs should also be set aside for the purposes of this discussion, at least for the time being. As this report will set out, there are a number of different, highly useful and highly productive jobs that can be created by a redirection of just a fraction of the funds allocated to Trident. This number of new jobs is greater than the direct civilian Trident jobs themselves. As they too generate ancillary and related jobs, it is important to compare like with like.

CND has calculated that approximately 11,520 civilian jobs are directly dependent on Trident. It is difficult to calculate how many of these jobs would be lost in the event of Trident's replacement being cancelled as many of these jobs would be maintained on, or re-deployed to, decommissioning work.

The government's 2013 update to Parliament on the Successor submarine design and build programme states that at its peak, 6,000 will be employed to work on the new boats. This includes work at the main building site at the ship yard in Barrow-in-Furness, at Rosyth Dockyard where parts are made and at the Rolls-Royce plant at Derby where the reactor cores are made. The warheads for Britain's nuclear weapons system are built, maintained and eventually decommissioned at the Atomic Weapons Establishment (AWE) in Berkshire. The warhead is designed and the parts manufactured at AWE Aldermaston, with the final assembly taking place at AWE Burghfield, along with ongoing maintenance and decommissioning. The AWE website states that they employ around 4,500 staff.<sup>14</sup> Many of these jobs would be secure for a long time should Trident not be replaced, however, as the current warheads will need to be

### Jobs dependent on Trident

Manufacturing of submarines and components	6,000 <sup>10</sup>
Building, maintaining and decommissioning warheads	4,000 <sup>11</sup>
Clyde naval base	520 <sup>12</sup>
Submarine deep maintenance and decommissioning	1,000 <sup>13</sup>
<b>TOTAL</b>	<b>11,520</b>

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decommissioned. AWE staff undertake additional work on detecting seismic signals from nuclear explosions, work that would continue should Trident's replacement be cancelled as it is crucial to international disarmament and non-proliferation efforts.

The Clyde naval base incorporates both Faslane, where the Trident submarines are based, and Coulport, where the warheads are stored. The MoD confirmed in a Freedom of Information response in 2012 that 520 civilian jobs at the base are dependent on Trident.

The Trident nuclear weapons submarines undergo major maintenance work during their lifetimes at Devonport dockyard in Plymouth. This is also where the submarines are decommissioned. According to the latest House of Commons Library briefing, 2,500 people are employed at the base. This figure refers to the entire workforce at Devonport which is responsible for servicing the

### **Ancillary or related jobs – economic background**

Any investment in an industry or economic sector will clearly create jobs in that industry. But there will also be jobs created from ancillary or related industries. This is because all outputs of any industry first require inputs. So a nuclear weapons system development factory, or, say, a new facility producing wind and wave power technology, will each require a series of inputs of both goods and services from other industries or sectors.

These inputs may be either basic or much more sophisticated. So, both plants will require heating, lighting, transport, water and waste facilities. They will require basic materials, such as steel or other metals, or they may be highly sophisticated materials such as specialised metallic alloys, bespoke machine tools, or sophisticated software, monitoring and communications systems. They will also require administration, cleaning, catering and maintenance, and so on.

All of these inputs themselves require workers to produce the goods or services. New investment in one sector will generate new ancillary or related jobs in these areas too, not just the direct jobs. But this applies to both nuclear weapons systems and other more socially useful industries.

This additional output generated, and the additional jobs created are known in economic terminology as 'multipliers', either output or employment multipliers. A recent report concluded that the defence industry had an average ranking in terms of both output and employment generated.<sup>15</sup>

It is therefore more effective for the investment redirected from Trident replacement to be allocated to sectors and industries which have either a higher output multiplier or higher employment multiplier than defence, or both.

There are a number of these sectors with higher multipliers than in the nuclear weapons industry or even than the defence industry in general. That means that investment in these other sectors is much more effective at generating economic growth or new jobs. These sectors include but are not restricted to air transport, computers and software, water transport, publishing, motor vehicles, construction, steel, and machine tools.

Trafalgar Class non-nuclear armed submarines as well as a large proportion of the Royal Navy's surface ships. As there are more ships in the Trafalgar Class than in the Vanguard Class, a reasonable estimate for Trident-related jobs is 1,000.

### **Funding jobs**

In a concrete discussion concerning the reallocation of resources it is important to get a correct sense of proportion. £205 billion in well-directed investment could provide a very large number of jobs, including highly-skilled and highly-paid ones.

Take the case of the 11,500 civilian workers currently directly employed in Trident-related work. The average annual wage for full-time employees in the UK is currently just under £25,700.<sup>16</sup> In the production industries the total average employment costs (wages, National Insurance Contributions, pensions, overtime and so on) are just under £34,400.<sup>17</sup>

It would be possible to employ 11,500 workers at an average annual cost of £34,400 for a cost of under £400 million per annum. The £205 billion allocated to Trident replacement would sustain these jobs for over 500 years, long after anyone currently in employment or their foreseeable descendants had passed away.

Put another way, every civilian worker in the Trident programme could be given a cheque for £1 million for a cost of £11.5 billion. A little more than one-twentieth of the entire cost of replacing Trident would have been used. £205 billion can be used far more effectively to create well-paid jobs than wasting it on replacing Trident.

This is because, contrary to the assertions of the MoD, Trident is not a jobs-rich programme at all. This can be illustrated by comparison. After the depths of the global recession and its impact in Britain, total employment began to recover in the third quarter of 2011. In the following four years, total employment grew by just over two million. The additional nominal investment in the economy during that period was £124 billion. It is this investment which creates those jobs.

An additional investment of £124 billion created over two million jobs.<sup>18</sup> Yet the MoD and associated nuclear weapons industry lobbyists want to claim that the £205 billion cost of Trident is good value in sustaining just 11,500 jobs.

Therefore, the question of employment does not revolve around the impossibility of finding replacement jobs for the key 11,500 workers concerned. Instead, the sum saved by not replacing Trident creates an enormous opportunity to transition existing jobs, create new employment and foster industrial regeneration.

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## **Priorities for investment and jobs**

CND has previously argued that the government should take action to ensure alternative industrial employment in those communities dependent on Trident replacement.

It is important that any jobs replacement and transition programme does not simply replicate the current levels of underdevelopment and poverty that is frequently associated with dependence on the defence industry. For example, Barrow-in-Furness remains one of the most deprived areas of England.

What is proposed here is a transformational programme of public investment which will generate additional new private investment and create many more high-skill high-wage jobs than currently exist.

## **A science park for Barrow**

Barrow can be transformed into a national centre for excellence to increase the industrial skills and training that the British economy is sorely lacking. The centre would train the wider workforce, from providing apprenticeships and doctorates to all levels in between.

The level of Gross Domestic Product (GDP) devoted to research and development (R&D) in Britain is currently 1.7%, below the Organisation for Economic Co-operation and Development (OECD) average of 2.4%.<sup>19</sup> This is a key failing and the new centre could be a vital building block in an industrial strategy for the British economy.

A link to Lancaster University would allow the ready exchange and interaction of highly skilled workers and academics, without compromising the benefits of detachment that both would enjoy. The model would be the recently sold science parks associated with Exeter University and at Granta Park, south of Cambridge.<sup>20</sup> These were valued at £87 million and £95 million respectively. Given the resources available from not replacing Trident, the ambition for Barrow can be qualitatively far greater.

The purpose of the science park would primarily be research, training and development. The public sector would establish a national facility linked both to the further and higher education systems. It would address the skills shortage in key industrial areas, which in Britain has been chronic and which many now regard as acute.<sup>21</sup> The link to Lancaster University could allow both to develop into world-class centres of engineering and other technical research and skills development. As a result, private sector investment could easily be attracted especially if granted enterprise zone status for new private investment.

Nor is it the case that the existing skills will all need to be adapted to other areas. In a report co-sponsored by the UK government, it is estimated that the marine industries' value to the UK economy – including submarine exploration – will grow from £17 billion currently to £25 billion

by 2020.<sup>22</sup> The drivers of this include trade, research, the challenges of global climate change, increased international use of naval platform facilities and even leisure.

Marine energy generation is an underdeveloped renewable energy in which Britain has significant geographical advantages. Britain also has a natural advantage in the development of offshore wind power. Barrow, linking to other sites (see below) could become a world leader in wind power research and development.

But the government report cited above is wholly unambitious, identifying only the benefits of increased co-operation with government and across industry. It does not include anything of the scale of investment included here. The potential benefits are extremely large, especially as the report estimates that global marine exports amount to £3 trillion annually.

A similar approach can be adopted in the other areas affected by not replacing Trident. Large scale investment led by the public sector can not only replace the jobs with better, higher-paid ones, there are sufficient resources to transform and regenerate whole areas and regions and to raise living standards widely.

### **Rolls-Royce Derby – nuclear decommissioning**

Jobs may already be under threat at Rolls-Royce in Derby and there has even been speculation that the government will be obliged to nationalise divisions of Rolls-Royce related to submarine defence, following a string of profit warnings from the company.<sup>23</sup>

The work taking place here currently includes the provision of pressure vessels, nuclear cores and steam raising capacity. The technology is similar to that used in civil nuclear power production but more specialised. It is R&D intensive.

As both industrialised and developing economies switch to renewable energy sources, there will be increasing demand worldwide and in Britain to decommission existing nuclear plants. This is true in any event as all nuclear plants have a fixed lifetime.

There are currently 437 operable civil nuclear reactors around the world with another 66 under construction.<sup>24</sup> Decommissioning is R&D intensive, and the disasters at Fukushima underline that the consequences of botched decommissioning or salvage attempts have a global impact.

Under government sponsorship and investment, Rolls-Royce Derby can be a global hub for research into nuclear decommissioning. While many countries will want to expend as much of the costs of decommissioning domestically, there is clearly a non-duplicating, specialised role for a world-leading research centre into the most comparatively cost-effective, safest methods for that decommissioning.

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Government funding would be needed for this transition, but a unique global facility sharing R&D on a commercial basis could provide a significant return on that investment. It has the capacity to be a significant earner. The precise form of ownership between the public and private sectors is less important than the investment itself. However, if this government is obliged to nationalise any division of Rolls-Royce, then the redirection of investment towards civilian nuclear decommissioning becomes that much easier.

### **AWE Aldermaston and Burghfield – a twin-track approach**

At the nuclear warhead factories at AWE Aldermaston and Burghfield, most of the jobs would be guaranteed until the end of the current Trident programme, sometime in the 2040s. There is therefore ample time to plan transition, job reallocation and, where necessary, retraining.

Unlike Barrow, Aldermaston is very far from geographically isolated, standing in the middle of the prosperous commuter belt between Newbury and Reading. Importantly, it is close to Reading University and more or less equidistant between the Universities of Southampton and Oxford.

Therefore a twin-track approach can be adopted for these facilities and the jobs they support. First, a proportion of the current jobs would be assigned to international nuclear inspection and verification work. This would allow Britain to commit more resources to international non-proliferation initiatives. Secondly, the skills base of the current workforce in areas such as engineering project management, IT, applied mathematics and physics are hugely in demand in the wider economy. They are part of the skills shortages widely identified and noted above. Therefore, these locations can form the basis for an entirely new R&D centre based around hi-tech, nuclear, and satellite technology.

Civilian satellite technology, increasingly used for mapping, weather and climate monitoring and forecasting and for telecoms, is a rapidly growing industry. According to an estimate by London Economics the employment multiplier for space technology is 3.49, which is higher than anything claimed for defence industries in general and far higher than anything claimed for the nuclear weapons sector of it.<sup>25</sup> The authors also go on to say, 'that the space economy has a more productive and higher paid regional distribution than the national average'. This means both the investment returns are greater by investing in this sector, and that there are more and better-paid jobs too.

### **Clyde, the subcontractors and other sites – the shift to renewable energy**

The government has international obligations to meet in order to reach its targets for carbon-emission reductions. Crucial to these will be the development in Britain of wind and wave power. The existing sites at the Clyde naval base and those run by the subcontractors and elsewhere can be transformed into key centres for the research, development, manufacture and maintenance of offshore wind and wave power installations.

On current settings it is expected that total investment in renewable energy sources in Britain will be an additional £42 billion from 2015 to 2020.<sup>26</sup> This may be an underestimate given the increased international pressures for more ambitious targets combined with the expiry of some of the UK's current traditional energy capacity.

In any event, these are already very substantial sums. Allocating some of the resources saved by not replacing Trident to this sector can ensure that existing jobs related to the Trident programme can be allocated to contract work long into the future for a growing renewables industry.

### **Jobs guarantee**

The projects outlined here would, if carried out, provide guaranteed jobs. This is because the project is either one where the direct beneficiary is the public sector itself, or where international obligations mean that the investment is a requirement not an option. The industrial centre for excellence at Barrow would be a public sector research and training facility (although private sector industry would clearly be the main direct beneficiary). Nuclear decommissioning is both a domestic and global phenomenon with huge stakes and funding requirements. The shift to renewable energy is an environmental imperative and a requirement of solemn international treaties. There is little or no risk that demand for these goods and services will fail to materialise.

However, it is possible to provide further reassurance in order to provide the utmost security to all those workers in the current Trident-related jobs and their communities. The saving from not replacing Trident is so vast that it would be possible to offer a jobs and pay guarantee to all existing workers: that all workers who wish to remain in location will continue to be paid their existing wages or salaries, and alternative work would be provided.

This is something that the existing Trident programme has not done and cannot do, nor will any replacement system. There have been jobs lost at the various sites over the years and total employment has fluctuated significantly. The speculation about Rolls-Royce shows that this is a continuing feature of the programme, in contrast to MoD claims about jobs security.

In reality, this guarantee is unlikely to be invoked given the growth potential of the new projects and industries and if reasonable policies are put in place. But, as previously noted, there are more than sufficient funds to offer that guarantee using only a fraction of the funds saved by not replacing Trident. However, if the policies outlined were adopted they would lead to a transformation of the areas concerned, providing many more than the number of current jobs and including highly skilled and highly paid posts.

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- <sup>1</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/478933/52309\\_Cm\\_9161\\_NSS\\_SD\\_Review\\_web\\_only.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/478933/52309_Cm_9161_NSS_SD_Review_web_only.pdf)
  - <sup>2</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/478933/52309\\_Cm\\_9161\\_NSS\\_SD\\_Review\\_web\\_only.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/478933/52309_Cm_9161_NSS_SD_Review_web_only.pdf)
  - <sup>3</sup> As stated by the government in its 2006 White Paper on the future of Britain's nuclear weapons: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/27378/DefenceWhitePaper2006\\_Cm\\_6994.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/27378/DefenceWhitePaper2006_Cm_6994.pdf). Confirmed by the secretary of State for Defence in November 2015 and taking into account inflation <http://www.theyworkforyou.com/wrans/?id=2015-11-13.16101.h&s=missile+extension#g16101.r0>
  - <sup>4</sup> As stated by the government in its 2006 White Paper on the future of Britain's nuclear weapons: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/27378/DefenceWhitePaper2006\\_Cm\\_6994.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/27378/DefenceWhitePaper2006_Cm_6994.pdf)
  - <sup>5</sup> As stated by the government in its 2006 White Paper on the future of Britain's nuclear weapons: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/27378/DefenceWhitePaper2006\\_Cm\\_6994.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/27378/DefenceWhitePaper2006_Cm_6994.pdf)
  - <sup>6</sup> As calculated by Crispin Blunt MP, Chair of Parliament's Foreign Affairs Committee <http://uk.reuters.com/article/uk-britain-defence-trident-exclusive-idUKKCNOSJOER20151025>
  - <sup>7</sup> Based on the government's estimate in HC Deb 8 March 2007, c2130W, taking into account inflation <http://www.publications.parliament.uk/pa/cm200607/cmhansrd/cm070308/text/70308w0007.htm>
  - <sup>8</sup> Based on the government's 2006 estimate for decommissioning Polaris, our previous nuclear weapons system, taking into account inflation: <http://www.publications.parliament.uk/pa/cm200506/cmhansrd/vo060724/text/60724w1879.htm>
  - <sup>9</sup> Parliament, written questions: Trident submarines, employment written questions - 23884 <http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2016-01-25/23884>
  - <sup>10</sup> 'The United Kingdom's future nuclear deterrent: 2013 update to Parliament', Ministry of Defence document, 16 December 2013 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/266321/UK\\_future\\_Nuc\\_Deter2013.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/266321/UK_future_Nuc_Deter2013.pdf)
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  - <sup>12</sup> Freedom of Information request, 22 October 2012 <http://www.channel4.com/media/c4-news/pdf/trident.pdf>
  - <sup>13</sup> 'Replacing the UK's Nuclear Deterrent', House of Commons Library briefing, 1 March 2016 <http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7353#fullreport>.
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  - <sup>17</sup> ONS, Annual Business Survey, November 2015 <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tc%3A77-387456>
  - <sup>18</sup> Calculated from ONS labour market report and national accounts data.
  - <sup>19</sup> Source: OECD statistics <https://data.oecd.org/gross-domestic-spending-on-r-d.htm>
  - <sup>20</sup> *Financial Times*, Investors warm to science parks, January 11 2016, <http://www.ft.com/cms/s/0/3131b416-b60d-11e5-b147-e5e5bba42e51.html#axzz3z81owvKB>
  - <sup>21</sup> *The Independent*, UK needs over one million new engineers and technicians, says Royal Academy of Engineering <http://www.independent.co.uk/news/uk/home-news/uk-needs-over-one-million-new-engineers-and-technicians-says-royal-academy-of-engineering-10334994.html>
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  - <sup>24</sup> World Nuclear Association website <http://www.world-nuclear.org/nuclear-basics/global-number-of-nuclear-reactors.aspx>
  - <sup>25</sup> London Economics, The case for space 2015, <http://www.ukspace.org/wp-content/uploads/2015/07/LE-Case-for-Space-2015-Executive-Summary.pdf>
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