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Report Commissioned by the Scottish Campaign for Nuclear  
Disarmament and the Scottish Trades Union Congress

# **CANCELLING TRIDENT**

## **THE ECONOMIC AND EMPLOYMENT CONSEQUENCES FOR SCOTLAND**

11 March 2007

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## INTRODUCTION

This report demonstrates that the replacement of Trident will cost Scotland more jobs than it will provide and that, by contrast, the funds released by Trident cancellation would create a major opportunity for productive investment in Scotland's economy.

The report has been jointly commissioned by the Scottish Campaign for Nuclear Disarmament and the Scottish Trades Union Congress and is intended as a contribution to the public debate initiated by the government's White Paper *The Future of the United Kingdom's Nuclear Deterrent* published in December 2006. The report focuses on the economic and employment consequences for Scotland of a decision not to renew Britain's nuclear missile system currently based at Faslane. It examines the types of employment that would be lost and, more positively, the steps that could be taken to ensure that these employees secured other employment that utilised their skills and contributed fully to the Scottish economy. The report also examines the costs to Scotland of replacing Trident.

The report demonstrates the inaccuracy of claims that upwards of 11,000 jobs would be lost to Scotland if Trident was not replaced. It finds that the reduction in direct, indirect and induced civilian employment across Scotland would be less than 1,800 and that this reduction would not take place until after 2022. It notes that a rescheduling of the withdrawal of the existing Trident submarines to coincide with the introduction of the new conventionally armed Astute class submarines, also to be based at Faslane, would smooth employment and minimise any redundancies. The report assumes the continuation of the Faslane Royal Navy base for non-nuclear weapons functions in line with government projections.

In terms of financial cost the report finds that Scotland will be significantly worse off if Trident is continued. The government has made clear in its White Paper that the investment costs for the new system, a minimum of £1bn a year over a fifteen year period, will *not* be at the expense of the existing Defence capabilities and will be allocated as part of the Comprehensive Spending Review. This indicates that Scotland's share of the investment cost, at £85m a year, will be at the direct expense of existing public expenditure - or the Scottish tax base - and could place at risk up to 3,000 public service jobs. Few jobs resulting from investment in Trident replacement are likely to come to Scotland.

Meanwhile the existing £1.78bn annual running costs of the Trident system are already part of the defence budget and Scotland's share, in terms of tax contribution, is approximately £153m a year. Only a portion of this currently comes back to Scotland to sustain the 1,536 direct and indirect civilian jobs and Scottish Navy personnel servicing and staffing Trident in Scotland. If Trident was not continued, this existing £153m contribution from Scotland could be released to provide alternative employment for considerably more than 1,536.

The report argues that the non-replacement of Trident represents a major opportunity for productive investment in the Scottish economy - specifically to develop technologies for energy efficiency, energy conservation and renewables in line with existing Scottish Executive commitments on carbon emissions. The report demonstrates that the types of manufacturing and research skills currently used for

Trident maintenance are very similar to those that would be required for the development and production of equipment for energy efficiency, renewable energy and energy conservation. The report argues that the Scottish Executive has a duty of care towards employees made redundant through job loss in the defence sector and proposes that a Scottish Arms Conversion Agency be established.

The report proposes that this agency be made responsible for overseeing the expenditure of the full £153m that is currently Scotland's contribution to Trident expenditure. It is proposed that this be used in three ways. £10m would be returned to the Ministry of Defence to sustain the continued employment of the approximately 300 service personnel of Scottish origin elsewhere within the armed forces. £30m would be spent directly in association with neighbouring local authorities and the social economy to create approximately 900 jobs in relevant areas. Local public services require supplementation in the areas of social services, policing, education and youth provision. Developmentally, there exist major opportunities associated with the Lower Clyde coastline, scenically one of the most attractive in Scotland. There would be significant scope for enhancing tourist amenities, transport and the general infrastructure, with long-term benefit to the local economy, once nuclear weapons have been removed.

The remaining £113 would be used for investment in the productive economy focusing on energy. This would have the potential to create many more jobs than the 300 Trident-related jobs currently using engineering and manufacturing skills and would represent a major contribution to the productive base of the Scottish economy.

The report examines, in turn, the current deployment arrangements for the Trident missile system, the costs of replacing Trident to Scotland, the direct loss of employment arising from non-renewal, the indirect and induced losses, future opportunities for alternative employment, the opportunities that exist for investment in the productive economy and the policy framework required to implement effective arms conversion. The report does not examine the wider arms conversion agenda across Britain which is addressed by the 2007 publication from the British American Security Information Council, *Oceans of Work*. However, one aspect of this document is immediately relevant. It reminds us that in 1987 Barrow trade unionists made detailed proposals for the conversion of a portion of the Barrow shipyard to the production of renewable energy systems in place of Trident construction. This very early initiative on renewable energy was rejected by the management and the government in favour of continued defence production. Employment at the Barrow yard has since fallen from 12,000 to 3,000.

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## EXECUTIVE SUMMARY

1. **Background to Trident Deployment:** nuclear-armed Polaris submarines were first based at Faslane in 1968. The agreement with the US for the supply of Trident missiles was signed in 1982. Deployment at Faslane was opposed by the STUC, COSLA, the Labour Party and the SNP.
2. **Costs of Trident Replacement to Scotland:** the annual cost to Scotland of Trident replacement is estimated as £238m (in 2007 prices - which are used throughout unless otherwise stated). This sum combines Scotland's £85m share of the £1bn annual procurement costs with its £153m a year share of the existing and continuing operating costs of Trident. The government White Paper states that the investment required for Trident replacement will not come at the expense of the conventional capabilities of the armed forces and will be allocated as part of the Comprehensive Spending Review. This indicates that the investment cost for Trident replacement will either be at the expense of other public expenditure or through additional tax. Scotland's £85m annual contribution to the £1bn a year investment costs would either result in less public services or a higher tax take. Up to 3,000 public sector jobs could be at risk. Of the current £153m annual operating costs approximately £50m comes back to Scotland in terms of wages for those maintaining Trident or the Scottish service personnel staffing Trident. If Trident were cancelled the entire £153m annual Scottish contribution to the operating costs would be available for arms conversion and developing alternative employment for these workers.
3. **Current employment infrastructure:** the maintenance infrastructure for Trident is split between the Atomic Weapons Establishment, Aldermaston (warheads), Devonport (submarine refit and reactor refuelling), the United States (missile supply and maintenance) and Faslane (logistics base, service and maintenance). The Faslane base is RN headquarters for Scotland, Northern Ireland and Northern England and also services the Swiftsure class nuclear-powered submarines, minesweepers and other surface vessels. Only 30 per cent of the civilian workforce is related to Trident. Of the total direct and indirect civilian employment dependent on Trident across Britain 9.1 per cent is currently located in Scotland
4. **Skill Profile of Trident-related jobs at Faslane and the consequences of cancellation:** 936 civilian jobs directly dependent on Trident would become redundant between 2022 and 2027. The main skill groups would be MoD police and security (400), outfitting and steel work (240), technical and supervisory mainly in shipbuilding related areas (70) and clerical (70). If, however, Trident was decommissioned early to coincide with the build up of Astute class nuclear submarines at Faslane to a total of six by 2018, and thereby avoiding the need to increase the workforce to service ten submarines between 2018 and 2022, the level of job losses could be reduced mainly to security staff between 2016 and 2018. Few Scottish manufacturing jobs are likely to be jeopardised by a decision not to build a new Trident submarine - at most 150. The number of potential Scottish job openings at risk, civilian and military, direct, indirect and induced, from Trident cancellation in 2022-2027 is estimated as 2,191. The number of civilian jobs would be 1,891.

5. ***The Local Economy: Indirect and induced employment consequences***  
 Studies of military base closure in England show an employment multiplier of 0.3 for the locality impact of full base closure. Studies of base closure in the United States show the importance of statutory government responsibility for early action to ensure local job creation. A review of the local Argyll and Bute economy indicates that its current economic performance is somewhat stronger than the Scottish average. The West Dunbartonshire economy is somewhat weaker but less exposed to any reduction in the operation of the base.
  
6. ***Scotland's future skill requirements*** The Scottish Executive estimates a need to replace 95,000 in skilled trades in engineering, manufacturing and mining over the next decade. Renewable energy and energy conservation is predicted to require a significant increase in skills cognate with those at Faslane. On the other hand, there would be a real opportunity cost to Scotland in diverting skilled workers to Trident replacement.
  
7. ***Redeployment in the public and social economy***  
 It is proposed that the 300 Scottish-originating service personnel associated with Trident be continued in conventional naval employment at a cost of £10m a year. The Scottish Executive and local authorities should be funded to absorb up to 300 of the personnel released from Faslane, in particular for the police service, at a cost of £10m. It is further proposed that the local authorities and social economy sector be funded to absorb directly another 600 direct or indirect job losses in the development of general infrastructure, tourist amenities and to develop local community-based energy generation projects. This would cost a further £20m
  
8. ***Redeployment, arms conversion and investment in the productive economy***  
 Both the Scottish Executive and the British government are committed to ambitious targets for carbon emission reduction. This will involve the use of a range of technologies for the conservation of energy, energy efficiency and the development of renewable energy. These technologies will either have to be imported, as is largely the case at present, or developed and manufactured in Scotland. It is argued that the development of relevant technologies represents the biggest opportunity for productive investment likely to be available this generation and would build on existing skills and scientific expertise. It is proposed that Government support for this opportunities be radically increased, bringing new employment to Scotland in manufacturing both for domestic and foreign markets. Further, that workers are financially supported during this process as part of a Just Transition programme.
  
9. ***Policy Implementation*** Over 40,000 Scottish defence-related jobs have been shed since 1990 without significant government intervention to ensure the provision of alternative employment. For the decommissioning of Trident it is proposed that an Arms Conversion Agency be established to oversee the creation of alternative employment. This would oversee both local redeployment programmes and the development of technologies relevant to the energy field.

# 1. BACKGROUND TO TRIDENT'S CURRENT DEPLOYMENT

## 1.1 *The Faslane Naval Base*

The Faslane Naval base was established during the Second World War and today comprises the naval base on the Gare Loch and the nuclear and conventional weapons depot at Coulport on Loch Long. The first nuclear submarine carrying nuclear-armed missiles to be based at Faslane entered service in 1968 following the purchase of the US Polaris missile under the terms of the 1962 Nassau agreement. The agreement to replace Polaris by the US Trident missile system was signed between the British and American governments in 1982. The first Vanguard class nuclear submarine carrying the new missile was launched in 1992 and was followed by three further submarines. Extensive construction work was undertaken to extend the Faslane base, excavate a bunker system and loading bay at Coulport and provide additional road infrastructure.

Faslane is the Scottish headquarters of the Royal Navy and is also the base for eight minesweepers and two Swiftsure Class conventionally armed nuclear-powered submarines - in time to be replaced by at least six Astute Class nuclear-powered submarines.

## 1.2 *The Trident missile system*

The Trident missile system has three main components:

- The submarine launch vehicle. Four nuclear-powered Vanguard type submarines built at Barrow powered by nuclear reactors manufactured at Rolls Royce, Derby. The submarines are refuelled and periodically refitted at Devonport and based and serviced at Faslane.
- The D5 Trident II missile. These are manufactured in the US and supplied and serviced from King's Bay naval base in the US.
- The nuclear warhead. Each missile carries up to 48 warheads. Most of the warheads have a yield of around 100 kt; a small number have a lower yield (the Hiroshima bomb had a 12.5kt yield). These warheads are manufactured at the Atomic Weapons Establishment at Aldermaston and Burghfield in Berkshire. They are transported to Faslane by road and stored at Coulport where they are also fitted to the missiles and loaded onto the submarines. The warheads need regular upgrading. This involves further road transport to and from AWE, Aldermaston.

## 1.3 *Previous examinations of the employment consequences of Trident*

The Conservative government's decision to replace Polaris by the Trident missile system encountered widespread opposition in Scotland. Those opposing included the Scottish Trades Union Congress, the Labour Party in Scotland, the SNP and the Convention of Scottish Local Authorities. Two separate reports were commissioned: one by Strathclyde Regional Council; the other by District Councils, the TGWU and Scottish Action for Education and Development. This second report focussed on the economic consequences of cancellation. Its first edition in 1985 queried the Conservative government's claims that thousands of construction jobs would be created locally and noted that the switch of maintenance for the Trident II missile to the US would reduce long-term employment at Faslane.<sup>1</sup> A supplementary report in

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<sup>1</sup> Alternative Employment Study Group, *Polaris and Trident: the Myths and Realities of Employment*, 1985

1988 confirmed that only 367 people living in Dumbarton District secured construction jobs.<sup>2</sup>

In 1992 the Conservative government announced that the refitting of the submarines would be shifted from Rosyth to Devonport. This halved the number of civilian jobs in Scotland, many of them high value jobs, sustained by the Trident programme.<sup>3</sup> Also in 1992 the US Trident base at the Holy Loch was closed. The consequences of the closure for the Dunoon peninsular are examined below in section 5.

#### **1.4 Cost of existing Trident deployment to the present**

Over its lifetime the cost of the present Trident system is estimated at well over £50bn. This includes £15bn for the acquisition of the system and annual costs of up to £1.78bn annually to staff, service and protect it.

#### **1.5 Timescale for the replacement of Trident**

The four Trident Vanguard class submarines were built with a 25 year life and entered service in 1993, 1995, 1996 and 1999<sup>4</sup>. The White Paper proposes that their life be extended by five years. A new class of submarine will enter service by 2024 when HMS Victorious is decommissioned. The new submarines will initially carry Trident missiles with an improved guidance system. In their later years the submarines are likely to carry a new US missile. Upgrading the existing missile will cost £250m and purchasing the new missiles will cost a further £1.5bn.<sup>5</sup> The White Paper says that during the life of the next Parliament a decision will be made on whether to refurbish or replace the nuclear warheads. It estimates that this will cost between £2 and £3bn but does not reveal the additional cost of refurbishing the manufacturing facilities at Aldermaston. In 2005 £1bn was agreed for development work at Aldermaston<sup>6</sup>. The White Paper argues that the decision on replacement needs to be taken in 2007. The Government has promised to set aside a debate in its own time at Westminster in March 2007.

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<sup>2</sup> Alternative Employment Study Group, *Future Imperfect: Trident and the Clyde*, 1988

<sup>3</sup> Local Work, *Swords into Ploughshares – Dividend or Deficit ?* No. 36, June 1992, Centre for Local Economic Strategies

<sup>4</sup> The Future of the UK's Strategic Nuclear Deterrent: the Manufacturing and Skills Base HC 59 19 December 2006

<sup>5</sup> White Paper *The Future of the United Kingdom's Nuclear Deterrent* December 2006

<sup>6</sup> House of Commons Defence Committee, *Future of the UK Strategic Nuclear Deterrent, the Strategic Context*, Eighth Report 2005-6, 20 June 2006



## 2. COSTS OF TRIDENT RENEWAL TO SCOTLAND

### 2.1 *In-service cost of the British nuclear weapons programme*

In 2005 Geoff Hoon said that the total cost of the nuclear weapons programme in 2003/04 was 3% of the Defence budget.<sup>7</sup> Since then the Ministry of Defence (MoD) has increased their estimate.

On 6 February 2007 Des Browne told the Defence Committee: “we went through an exercise recently to make sure that we were identifying as accurately as we could the costs that were associated with our nuclear weapons system and that caused us to revise information that previous governments may have put into the public domain.”<sup>8</sup>

As a result of this exercise the MoD are now saying that the annual in-service costs today are between 5 and 6 per cent of the Defence budget. They also predict that the in-service costs of the replacement system will also be 5-6 per cent of the Defence Budget. They have refused to translate this into an actual figure. However 5% of the Department Expenditure Limit for 2006/07 is £1.63 billion and 6% is £1.95 billion.<sup>9</sup> A midpoint of 5.5 per cent would be £1.78 billion.

### 2.2 *Trident replacement procurement costs*

The Government’s White Paper on the Future of the United Kingdom’s Nuclear Deterrent makes it clear that additional investment will be required to renew and replace Trident. It also says that this will not be at the expense of conventional capabilities.

The White Paper gives the cost of building four new Trident submarines as between £11 and £14 billion.<sup>10</sup> In addition replacing or refurbishing the warheads would cost £2 - 3 billion. This is in addition to the running costs of AWE and the capital investment programme at AWE. A further £2 - 3 billion would be required for infrastructure developments at Faslane, Coulport and Devonport. This is in addition to infrastructure costs included within the in-service cost. The total of these procurement items would be £15-20 billion. The White Paper also says that expenditure on these items will, on average, account for 3 per cent of the Defence Budget each year from 2012 to 2027. This is equivalent to £1 billion a year for 15 years.

### 2.3 *Other cost elements*

#### *a. Atomic Weapons Establishment*

AWE has published a plan to rebuild most of the facilities at Aldermaston and Burghfield and to refurbish the remainder. In 2005 the Government announced an additional investment of £1 billion between 2005 and 2008 to sustain key skills and facilities at these sites. This is just for the first part of the development plan. Despite repeated questions from MPs the Government has refused to disclose the full costs or the timescale of the plan. An analyst working for the construction firm

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<sup>7</sup> Hansard 15 March 2005; reply by Geoff Hoon to question from Pete Wishart

<sup>8</sup> Defence Committee 6 February 2007

<sup>9</sup> 2006-07 Resource Department Expenditure Limit of £32,643 million; The Government’s Expenditure Plans 2006-07 to 2007-08, Ministry of Defence.

<sup>10</sup> White Paper *The Future of the United Kingdom’s Nuclear Deterrent* December 2006

Costain described the redevelopment of AWE as a £12 billion project over 12 years.<sup>11</sup>

The White Paper shows that combined the capital and operating costs of AWE have risen to 2.5% of the Defence Budget in 2006/07 and will peak at 3 % of the Defence Budget early in the next decade. This compares with an equivalent figure of 1.3 % in 1997/98.<sup>12</sup> Additional funding for AWE will be determined during the Comprehensive Spending Review.<sup>13</sup>

#### *b. Nuclear liabilities*

The Ministry of Defence has calculated that it has liabilities of £9.7 billion from the nuclear weapon and submarine programmes. This figure includes, amongst other items, decommissioning costs of £3.4 billion for AWE and of £2.1 billion for the military reactor at Dounreay; £1 billion for the storage of nuclear waste and a further £1 billion towards the costs of a long term nuclear waste store; £1 billion for decommissioning nuclear dockyards and £500 million for decommissioning and berthing old submarines.<sup>14</sup> A large proportion of this £9.7 billion worth of work is likely to be carried out during the next 50 years.

If new facilities are built at AWE and new submarines are produced then there will be additional long-term liabilities for decommissioning.

The total of the procurement cost plus the in-service costs from 2024 to 2054 is between £54bn and £79bn. The Liberal Democrat estimate of £76bn is within this range.<sup>15</sup> The annual costs consist of (a) in-service costs of £1.78 billion per year and (b) procurement costs of £1 billion per year for 15 years.

### **2.4 Cost to Scotland**

The cost to Scotland is taken as approximately 8.5 per cent of these totals, again a minimum figure.<sup>16</sup> The White Paper states that ‘the investment required to maintain our deterrent will not come at the expense of the conventional capabilities of our armed forces’ and that the allocation will be part of the 2007 Comprehensive Spending Review.<sup>17</sup> This indicates that the additional investment costs will have to be found from existing Treasury expenditure or from additional tax-raising. In either case there would be a net cost to Scotland of at least 8.5 per cent of the approximately £1bn a year between 2012 and 2027. As is noted in section 4.3, only a very small

<sup>11</sup> Analyst/Investor Site Visit, 8/9 November 2006, Costain.  
<http://www.costain.com/externaldocs/finance/Nuclear.pdf>

<sup>12</sup> In 1997/98 £114 million was spent on Trident warheads plus £168 million on AWE infrastructure. The total of these two figures is equivalent to 1.3 per cent of the Defence Budget. If old warhead and other activities are added the total AWE figure for 1997/98 is equivalent to 2 per cent of the Defence Budget; Strategic Defence Review July 1998, Supporting Essay 5.

<sup>13</sup> Hansard 8 January 2007, Written reply by Des Browne to questions from Nick Harvey

<sup>14</sup> Hansard 24 July 2006 reply by Des Browne to question from Paul Flynn

<sup>15</sup> Guardian, 4 November 2006 ‘For the same price Britain could either renew its nuclear arsenal or tackle climate change’ estimates a total cost of £76bn.

<sup>16</sup> 8.5 per cent represents a minimum figure and is the ratio of the Scottish population to the UK population. The tax take from Scotland is 8.3 per cent of that of the UK *excluding* North Sea Revenue. which, if included, would add at least another 2 per cent. Scottish expenditure, both devolved and non-devolved, is approximately 11.5 per cent of the UK total. The Barnett formula would make new funds coming to Scotland, such as those saved on Trident, proportionate to population ratio between Scotland and England, rather than the UK, and thus 10 per cent of the total. HM Treasury, *Funding the Scottish Parliament*, HMSO, 2004; Ross Burnside, *Scotland’s Demography and the Fresh Talent Initiative*, Scottish Parliament SPICE Briefing, 2004.

<sup>17</sup> White Paper, p., 27: 5-15

fraction of this would return to Scotland in terms of subcontract work on building Trident.

The annual operating costs of Trident at £1.78 bn would, however, continue as part of the defence budget and the proportionate cost to Scotland would also be £153 m annually. If Trident was not replaced, these resources would therefore be available for the employment of these workers in areas of direct benefit to the productivity of the Scottish economy.

In summary, therefore, the cost to Scotland of Trident renewal in terms of acquisition would be at least **£85m** a year at the *direct expense of existing public expenditure or the Scottish tax base*. Non-renewal would also *make available* from *existing* budgeted defence expenditures **£153m** a year - at least part of which could be used to fund employment alternatives in Scotland.

If, as proposed in section 4.2 below, the existing Trident programme was decommissioned between 2012 and 2017, these funds would become available from this point. Its allocation should match the types of job requiring redeployment examined in the sections 3 and 4.

For sake of clarity our proposal would be that of the £153m operating costs £10m annually is used to maintain current Scottish Royal Navy personnel in naval employment, £30m to go directly to public and social sector bodies to create local employment (section 7) and the remaining £113m a year to be available for an Arms Conversion Agency. This agency would utilise technical, manufacturing and engineering skills to promote production in the area of renewable energy as described in sections 8 and 9.

### 3. THE CURRENT TRIDENT EMPLOYMENT INFRASTRUCTURE

#### 3.1 *Employment dependent on the current Trident programme*

Estimates of the levels of staffing required to maintain the current Trident missile programme are:

##### *Aldermaston*

Atomic Weapons Establishment (AWE) employs over 4,000 people designing and building nuclear weapons at Aldermaston and Burghfield in Berkshire. The workforce is due to increase by 300 in 2007.<sup>18</sup> If plans for the site are implemented in full then the workforce will increase further.

##### *Devonport*

Trident nuclear submarines are refitted and refuelled at Devonport dockyard in Plymouth. The yard is currently refitting HMS Victorious (2007). This will be followed by refits on HMS Vigilant and then HMS Vengeance. After 2008 the number employed on Trident refits will be around 1185.<sup>19</sup> The dockyard refits both submarines and surface ships. Apart from a small number with specific nuclear skills, most of the workforce can be moved between surface ship and submarine work.

##### *Barrow*

Nuclear-powered submarines are built by BAE at Barrow in Furness in Cumbria. The current programme to build Astute requires a workforce of 2298.<sup>20</sup> There are approximately 3,000 employed at Barrow.

Nuclear Powered submarine propulsion programme (principally at Derby)  
Rolls Royce and Associates (RRA) employ 930 on the submarine programme - currently involved in building propulsion units for Astute class submarines and maintaining the Vanguard and SwiftSure vessels. The principal facilities are the fuel core manufacturing facility in Derby and the prototype reactor at HMS Vulcan in Dounreay. In 1989 there were 420 civilian and 6 service personnel employed at HMS Vulcan.<sup>21</sup> The current number is likely to be lower. There are also small numbers of RRA staff at Faslane, Devonport and Barrow. The Heavy Pressure Vessels division of Rolls Royce Naval Systems build the pressure vessels for submarines and employ 100 people. Alstrom build the steam generators. There are MoD staff working for the Nuclear Propulsion Integrated Project Team in Bristol. All of these jobs support both Trident and conventional submarine programmes.

##### *Administrative support*

150 people are employed on Trident in the Strategic Systems Integrated Project Team at Abbey Wood in Bristol. There are also civilian personnel working on Trident in the MoD building in London.

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<sup>18</sup> Memorandum from the MoD; Future of the UK's Strategic Nuclear Deterrent: the manufacturing and skills base, House of Commons Defence Committee, 19 December 2006.

<sup>19</sup> The total number required for Trident refits and decommissioning work from 2008 will be 1825. Decommissioning work requires around 640. Supplementary memorandum from DML, Defence Committee report into manufacturing and skills base, December 2006, Ev 113.

<sup>20</sup> Supplementary memorandum from BAE systems, Supplementary memorandum from DML, Defence Committee report into manufacturing and skills base, December 2006, Ev 115.

<sup>21</sup> Hansard 13 December 1989 Reply by Archie Hamilton to question from Michael Brown.

### *Sub-contractors for any new submarine*

In the case of the construction of the Astute class, about 50 per cent of the value of the contract goes to sub-contractors. These include Weir-Strachan and Henshaw who design and build tactical weapons-systems for submarines. They have a total workforce of around 500 in Bristol. McTaggart Scott build non-penetrating masts for submarines and have a total workforce of 250 near Edinburgh. Thales Optronics in Glasgow manufacture periscopes for submarines. Thales Underwater Systems manufacture sonar systems. They employ 835 people in the UK including 353 in Cheshire and over 400 in Somerset.

### *Faslane and Coulport*

The number employed at these sites is considered in detail below.

## **3.2 Functions of Faslane**

### *Trident submarines*

Faslane is the home port for Trident nuclear submarines. Normally three Trident submarines are based there while the fourth is in refit at Devonport. Between refits all maintenance work is carried out at Faslane. The base has specialist training facilities for Trident, including a missile launch simulator. Spare parts for the submarines, including navigation and guidance components, are stored on shore.

### *Conventionally-armed submarines*

Faslane has been the base for Swiftsure class nuclear-powered submarines. These are in the process of being withdrawn from service and only two now operate from the Clyde. Three new Astute class submarines are under construction at Barrow in Furness. Commitments have been made for up to four similar vessels. All of the Astute class are due to be based at Faslane.

Trafalgar class submarines are based at Devonport. They regularly visit Faslane. This is partly because there are unique facilities on the Clyde for supporting submarines, including the Noise Range at Loch Goil.

Maintenance work on Swiftsure and Astute class submarines is carried out at Faslane. The base was also recently awarded the contract for a major upgrade of the Devonport-based submarine HMS Torbay.

### *Surface ships*

In 1994 a squadron of minehunters was moved from Rosyth to Faslane.<sup>22</sup> The mix of Hunt class and Sandown class minehunters is currently changing. By March 2007 all eight Sandown Class minehunters should be based at Faslane, while the eight older Hunt class will be at Portsmouth.<sup>23</sup>

### *Exercises and visiting ships*

Faslane co-ordinates three major international exercises each year. These were known as Joint Maritime Courses and are now designated Exercise Neptune Warrior. Previous exercises have involved British and American aircraft carriers along with ships and submarines from several nations. Substantial army and air force units also take

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<sup>22</sup> Hansard 14 July 1994, statement by Malcolm Rifkind

<sup>23</sup> Hansard 26 May 2005 reply by Adam Ingram

part. The Naval part of the exercise takes place off the West coast of Scotland between Faslane and Cape Wrath.

In addition to these exercises there are other visits from warships from several nations. This has included visits from American nuclear-powered submarines.

#### *Headquarters*

In 1994 the headquarters of the Flag Officer Scotland, Northern England, Northern Ireland was moved from Pitreavie in Fife to Faslane.<sup>24</sup>

### **3.3 Functions of Coulport**

From 1968 to 1996, the main function of Coulport was the re-motoring of Polaris missiles. When Polaris was replaced by Trident this task was moved to the United States. Major overhauls of Trident missiles are carried out at Kings Bay in Georgia. As a result between 1989 and 2002 the civilian workforce at Coulport fell from 1775 to 655.<sup>25</sup>

The current functions of Coulport are:

- storage of components of the UK's nuclear weapon system;
- processing of nuclear warheads as required prior to delivery to and on return from the Fleet;
- fitting and removal of nuclear warheads to Vanguard Class submarines;
- onload and offload of Trident II D5 missiles as required, including deployment of teams to the US when missiles first embarked or returned to US;
- maintenance of all associated Strategic Weapon System equipment;
- delivery and receipt of conventional weapons to and from Vanguard, Swiftsure and Trafalgar class submarines;
- provision of security for the above; and
- provision of on and off site Emergency Response Teams.<sup>26</sup>

The conventional weapons referred to include Spearfish torpedoes and Tomahawk Cruise Missiles.

### **3.4 Babcock Naval Systems contract**

In 2002 Babcock Naval Systems were awarded a five year £400 million contract for work at Faslane and Coulport. This was extended to run until 2013 with a total value of £835 million.<sup>27</sup> Privatisation was accompanied by the loss of at least 300 jobs. Under this contract Babcock's provide:

- Engineering Support services. Managing and implementing a maintenance programme for Trident, other submarines and surface ships, plus support to visiting warships
- Waterfront Support Services - berthing and docking
- Logistics and Transport services - storage of MOD stock to the value of £350 million
- Estate Management services

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<sup>24</sup> Hansard 14 July 1994, statement by Malcolm Rifkind

<sup>25</sup> Hansard 13 December 1989, reply by Archie Hamilton

<sup>26</sup> Hansard 18 December 2006, reply by Derek Twigg

<sup>27</sup> <http://www.babcock.co.uk/index.cfm/recordid.6/operatingco/9>

- Compliance including nuclear safety
- Hotel services - accommodation and catering for Navy and civilian personnel<sup>28</sup>

The main work packages carried out at Faslane are Revalidation and Assisted Maintenance Periods (RAMPs). These utilise the shiplift and other facilities. The amount of work involved in RAMPs in 2005/06 was:

Table 1 Hours of work in submarine RAMPs 2005-6

Revalidation and Assisted Maintenance Periods	Man-hours	Period (weeks)
HMS Vigilant (Trident)	116,000	40
HMS Vengeance (Trident)	71,000	26
HMS Sceptre	97,500	40

### 3.5 Total workforce at Faslane and Coulport

#### a. Service personnel

In October 2006 there were 2,990 Navy service personnel employed at Faslane and Coulport.<sup>29</sup>

Crews of ships based at Faslane are as follows:<sup>30</sup>

Table 2 Ships and crews at Faslane

Class	Type	Number	Crew	Total
Vanguard	Trident	3	270	810
Swiftsure	Submarine	2	116	232
Sandown/Hunt	Minehunter	8	34	272
Total				1314

This suggests that there are 1676 Naval personnel employed on-shore at Faslane and Coulport. In 2002 the equivalent figure was 1732 of whom 55 were at Coulport and 1677 were at Faslane.<sup>31</sup>

The shore-based figure includes 530 Marines in the Fleet Protection Group, formerly known as Commanchio Company.<sup>32</sup> The mission of this unit is to guard Trident. The unit was previously based at HMS Condor, near Arbroath, but was relocated to Faslane. Excluding Marines, there are 1146 shore-based Naval personnel.

#### b. Civilian personnel

Katy Clark MP asked the Secretary of State how many civilian personnel were employed at Faslane and Coulport. In reply Adam Ingram MP said that there were a total of 1,750 MoD civilians. 1,080 of these were at Faslane and 670 at Coulport.<sup>33</sup> He said that in addition Babcock Naval Services employed around 1,430 across both sites.<sup>34</sup> Combining these figures gives a total civilian workforce of 3,180.

<sup>28</sup> Analysts Briefing, Babcock International Group PLC, 28 September 2004

<sup>29</sup> Navy personnel employed in Argyle and Bute. Table 12, TP10, Defence Analytical Services Agency; <http://www.dasa.mod.uk/natstats/tsp10/tsp10tab12.html>

<sup>30</sup> Trident submarines have two crews, each of 135; MoD website

<sup>31</sup> Hansard 10 December 2002 Reply by Lewis Moodie to question from Angus Robertson

<sup>32</sup> en.wikipedia.org and Royal Navy website

<sup>33</sup> Hansard 9 January 2007 reply by Adam Ingram to question from Katy Clark

<sup>34</sup> Babcock's website indicates that they have a workforce of 1485 at Faslane and Coulport.

This is 517 less than the total in December 2002.<sup>35</sup> When the work at Faslane was privatized it was anticipated that there would be job losses on this scale. The workforce employed by Babcock Naval Systems has declined by around 300 since they took over in 2002.<sup>36</sup> It would appear that there may have been an additional drop of 200. However it is not clear where the tug crews, employed by Serco and the nuclear engineers, from Rolls Royce and Associates, appear in the figures given by Adam Ingram in January 2007.<sup>37</sup>

### **3.6 Scottish Enterprise study of the Clyde Bases**

EKOS carried out a study of the economic impact of Scottish naval bases for Scottish Enterprise. This is based on data from 2001/02. The study combines figures for Faslane and Coulport, as well as other smaller West Coast bases, with those for Rosyth.

The study indicates that in 2001/02 there were a total of 3,565 service personnel at the Clyde bases and Rosyth. This is 575 higher than in Argyll and Bute in October 2006.

The total number of civilian personnel at the Clyde bases and Rosyth in 2001/02 was 3,646. This is 466 higher than at Faslane/Coulport in December 2006.

The breakdown of these personnel by place of resident was as follows:

	<b>Service</b>	<b>Civilian</b>
<b>On Base</b>	43%	
Helensburgh	30%	26%
Rest Argyll & Bute	4%	4%
Dumbartonshire	9%	43%
Rest of Scotland	14%	27%

The 'Rest of Scotland' figure includes a significant number in Fife, due to the inclusion of Rosyth data. This makes the report difficult to use as a guide to employment in Faslane and Coulport.

### **3.7 Civilian Trident workforce at Faslane and Coulport**

The question of how many civilian jobs in Scotland depend on Trident is politically sensitive. As a result the replies given to questions in Westminster have not been consistent.

On 21 February 2005 Geoff Hoon said:

'The number of civilian jobs which directly rely upon the Trident programme is estimated to be 936 in Scotland, with an additional 6,640 in the rest of the United

<sup>35</sup> In 2002 the civilian workforce was 3,042 at Faslane and 655 at Coulport; Hansard 19 December 2002 reply by Lewis Moonie to question from Angus Robertson

<sup>36</sup> In 2002 1735 workers were transferred from the MoD to Babcocks.

<sup>37</sup> Derek Twigg said on 5 December that there were 2,478 contractor personnel from 177 contractors at Faslane and Coulport. Further information is needed to clarify how this figure relates to the total number of civilian personnel employed at the two sites, as disclosed in other answers from Ministers. (House of Commons Written Answers 5th December 2006)



Kingdom. The number of civilian jobs which indirectly rely upon the Trident programme is estimated to be 300 in Scotland and 5,700 for the rest of the UK.’

In December 2006 Katy Clark asked the MoD -

‘what proportion of the total working hours of all civilian personnel employed at (a) Faslane naval base and (b) RNAD Coulport is spent on work (i) exclusively related to Trident, (ii) unrelated to Trident and (iii) partly related to Trident.’

In his reply on 14 December 2006 Adam Ingram said:

“The requested information is not centrally held and could be provided only at disproportionate cost, but it is estimated that around 60 per cent. of the total working hours of civilian personnel employed at the naval base is spent on Trident related work.”

The answer in February 2005 indicates that around 30 per cent of the civilian workforce at Faslane and Coulport work on Trident, while the answer in December 2006 suggests that the figure is around 60 per cent. Between these days two Swiftsure class submarines were decommissioned. But if this was the explanation then it can be expected that the balance would return its earlier level if the new Astute class are deployed to Faslane. The wide range of functions carried out at Faslane and Coulport suggests that the figure of 60 % is exaggerated.

Following the publication of the White Paper on the Future of the UK Nuclear Deterrent, MPs from several political parties asked a number of questions on the renewal of Trident. In most cases the MoD has avoided giving meaningful replies. The 60 % figure should be seen in this context.

This report uses the figure given by Geoff Hoon in February 2005 - that is, 936 civilian jobs in Scotland rely on Trident.

### ***3.7 Proportion of the civilian jobs dependent on Trident in Scotland***

The reply given in February 2005 indicated that 12.3 per cent of the direct jobs which rely on Trident are in Scotland and the remainder in the rest of the UK. In addition the 300 indirectly dependent on Trident represents 5 per cent of the indirect total.<sup>38</sup> On this basis 9.1 per cent of the combined direct and indirect jobs are based in Scotland.

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<sup>38</sup> Hansard 21 February 2005, reply by Geoff Hoon

## 4 THE SKILL PROFILE OF JOBS DEPENDENT ON TRIDENT AT FASLANE AND COULPORT AND THE EMPLOYMENT CONSEQUENCES OF CANCELLATION

### 4.1 Profile of skills dependent on Trident at Faslane and Coulport

Of the civilian MoD personnel whose skills were listed in the parliamentary answer of 8 January 2007 (given in full under Sources on page 50) 300 would appear to be in a variety of management functions related to the overall running of the base and supporting the RN headquarters operations. These will not be significantly affected by the discontinuation of Trident. 1,550 would appear to be principally related to the servicing and security of submarines and surface ships. The breakdown is as follows:

Table 3 Skill breakdown of MoD civilian employees at Faslane/Coulport 2006

Occupational grouping	Number	Comment
Engineering and science	210	
Logistics	140	Mainly transport
Security and Health & Safety	1050	Mainly MoD Police

Of the Babcock employees the skill breakdown is

Table 4 Skill breakdown of Babcock civilian employees 2006

Occupational grouping	Number	Comment
Technical and Supervisory	300	
Clerical	300	
Manual	900	Of which 720 outfitting and 120 steel work

On 21 February 2005 Geoff Hoon said there were 936 civilian jobs in Scotland which relied on Trident in Scotland. Table 5 gives a possible skills breakdown of this figure.<sup>39</sup>

Table 5 Skills breakdown of civilian Trident jobs in Scotland (based on total of 940)

Skill Category	Number
<b>MoD Civilians</b>	
Security, Health & Safety	400
Engineering & Science	60
Logistics	30
Other	60
<b>Babcock Naval Systems</b>	
Technical & Supervisory	70
Clerical	70
Manual - outfitting	200
Manual - steel work	40
Manual - other	10
<b>Total</b>	<b>940</b>

<sup>39</sup> Based on approx 30 % but adjusted to take account of skills areas more dependent on Trident

## 4.2 Faslane workload and the timescale for the discontinuation of Trident

The scale of job losses at Faslane and Coulport will depend principally on the extent of other work which is carried out within the base. Faslane can repair and maintain both submarines and surface ships. The shiplift provides the Royal Navy with a unique capability. This can be used to repair vessels which are based elsewhere. For example a 10 month update of the Devonport-based submarine HMS Torbay will be carried out at Faslane in 2007. The base can compete with other sites for the repair of submarines and smaller warships.

The size of the workforce will also relate to the number of number of submarines or surface ships are based at Faslane. The White Paper proposes that the lifetime of the current Trident submarines be extended by five years to a total of thirty and that the submarines would then be phased out between 2022 and 2027. This would involve each submarine undergoing a substantial refit starting in 2016-2017.

If, however, a political decision was taken in 2007 that there was no strategic need to replace Trident, there would also be an option to phase out the existing Trident submarines earlier in order to coincide with the build up of six Astute class nuclear submarines to be based at Faslane. This early withdrawal would also have the advantage of eliminating the need for a costly refit of the existing Trident submarines from 2017.

The timescales supplied by the MoD for the replacement of the Swiftsure submarines and the entry into service of the Astute class at Faslane are given in Table 6. There is an additional column giving the numbers of Trident submarines at each date if they were withdrawn from service to coincide with the build up of Astute class submarines:

Table 6 Timescale for the replacement of SwiftSure by Astute class submarines<sup>40</sup>

	SwiftSure submarines	Astute submarines	Trident submarines (phased withdrawal)	Total submarines
2008	2	0	4	6
2009	1	1	4	6
2010	0	2	4	6
2011	0	2	4	6
2012	0	3	3	6
2013	0	3	3	6
2014	0	4	2	6
2015	0	4	2	6
2016	0	5	1	6
2017	0	5	1	6
2018	0	6	0	6

<sup>40</sup> Fourth Report, The Future of the UK's Strategic Nuclear Deterrent: the manufacturing and skills base HC 59, 19 December 2006, para 146 for schedule of SwiftSure replacement. Hansard 12 February 2003, The Minister of State, Ministry of Defence (Mr. Adam Ingram): I wish to make a further point about the decision that I announced last summer to base the Astute class of submarines at Faslane. That decision, which offered the most cost-effective and operationally acceptable long-term solution, will support the highly skilled and dedicated work force of the Faslane base for many years to come. '

This sequence of phased early withdrawal would mean that the number of nuclear powered submarines based at Faslane would remain constant at six - the number based there at present. This would not avoid *all* job losses. There would be a significant reduction in the numbers employed in security and a small reduction in logistical and servicing staff. But it would obviate the need for a build up of skilled maintenance personnel otherwise required to service ten nuclear powered submarines for the period 2017 to 2022 and the subsequent need to shed labour as the number reduced to six after 2022. As, under this proposal, nuclear-armed Trident submarines would continue to use the base until 2016-2017 the loss of the security and warhead associated jobs would take place from 2016.

This option would have the least impact on jobs.

In summary, if the Trident submarines are withdrawn at the dates proposed in the government White Paper and not replaced, there would be a need to find 936 alternative jobs in the skill categories in Table 4 - of which the biggest group would be security (perhaps 400), followed by outfitting and steel work (about 250), technical and supervisory in mainly shipbuilding related areas (70) and clerical (70).

#### ***4.3 Loss of jobs dependent on building a Trident replacement***

The government proposes to build the Trident replacement submarines at BAE Systems, Barrow. The reactors would be built at Rolls Royce, Derby and the steam generators by Alstom. There appear to be no major contractors located in Scotland. McTaggart Scott, with 250 employees in Edinburgh, have built non-penetrating masts for the Astute class submarines and might be expected to secure contracts for these for Trident. Thales Optronics, based in Glasgow, manufactures the periscopes for the Astute class. McTaggart Scott is highly specialised and might face difficulties - but it would have over ten years to diversify if a decision was taken not to replace. Thales Optronics would be much less vulnerable.

Cancellation would not affect the jobs at HMS Vulcan Dounreay. This is a prototype for the reactors later installed on the existing Vanguard and Astute class submarines which runs some years 'ahead' of those on the submarines in order to identify potential problems as the reactors age. Its test life is likely to end around 2012 whatever the decision on Trident.

While it is clear that there would be need to find alternative work for around 3,000 engineering workers at Barrow and up to 4,000 scientific workers at AWE Aldermaston, only a relatively small number of jobs in Scotland would be dependent on contracts for the Trident replacement - with the largest number at McTaggart Scott.<sup>41</sup> At most 150 Scottish jobs might be dependent on the construction of a Trident replacement across the fifteen year construction cycle.

#### ***4.4 Impact on the number of service personnel employed***

810 sailors are required for crews of the three Trident submarines at Faslane. The number of shore-based sailors who support Trident could be between 500 and 800. This gives a total of 1300-1600 sailors dependent on Trident.

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<sup>41</sup> Steven Schofield, *Oceans of Work: Arms Conversion Revisited*, British American Security Information Council, January 2007, addresses the issue of alternative employment for workers at Barrow.

If Trident is removed then the 530 Marines in the Fleet Protection Group would not be needed to protect nuclear weapons. However infantry-type units are currently overstretched. This unit could be allocated a new role and either return to Arbroath or remain in Faslane. The MoD is currently spending £124 million building new accommodation for 1,800 service personnel at Faslane. It is likely that other units would be relocated to Faslane to utilise this accommodation if it is not fully required.

Most of these service personnel would be recruited from outwith Scotland, some with families based at Portsmouth and Devonport. If, however, we assume that a fifth are of Scottish origin, then the jobs of around 300 Scottish service personnel should be added to the those that will require continued funding.

#### ***4.5 Estimate of Indirect employment dependent on Trident renewal***

Geoff Hoon in his Commons reply of 21 February 2005 put the indirect employment related to Trident in Scotland as 300. Such indirect employment is that dependent on making or providing materials and other inputs used in the base to service and maintain the operation of Trident as distinct from those employed in the base in this capacity (direct employment) and those gaining employment in the surrounding locality as a result of the general expenditures of those working in the base in both service and civilian capacities or producing materials or services for it (induced employment). The MoD estimate of 300 is lower than what might generally be expected in terms of indirect employment arising from defence manufacturing but would reflect the maintenance character of the work carried out at Faslane and the degree to which major refits are undertaken at Devonport.<sup>42</sup> The Scottish Enterprise 2002 study of the Clyde Bases indicates only small amounts of defence equipment and materials purchased in Scotland.<sup>43</sup> Most of these inputs would derive from across central Scotland rather than from the local economy in Argyll and Bute.

The Scottish Enterprise study, 2002, estimated that employment from supplier linkage for the Clyde Bases and Rosyth would be 461 in Argyll and Bute and Dumbartonshire, plus 806 in the rest of Scotland, giving a total of 1,267. 30 per cent of this is 380. This is 80 higher than the figure given by Geoff Hoon in February 2005. However the difference may be explained by the inclusion of Rosyth. There may also have been a reduced workload at Faslane/Coulport, reflected in the smaller service and civilian workforce.

#### ***4.6 Estimate induced employment dependent on Trident renewal***

To estimate the number of 'induced' jobs that might consequently be lost in the local economy, we have used a multiplier of 0.3, as discussed in section 5, for all Trident related civilian and Scottish service personnel at Faslane, the 300 indirect employees outside Faslane and the 150 jobs that might come to Scotland from Trident construction work. This would indicate a total of 505 induced job losses. This figure for induced job losses is probably a high one. At Faslane much of the accommodation is within the base and very substantial numbers of civilian workers are employed to maintain it and to provide catering and other facilities. These workers are included in the 936 and the estimate of 505 probably involves some double counting. This figure is roughly in line with that proposed in the 2002 Scottish Enterprise survey - net of employment outwith Faslane and Coulport and subsequent job losses.<sup>44</sup>

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<sup>42</sup> The multiplier for defence manufacturing is usually taken as 0.8

<sup>43</sup> Ekos Consultancy, *Economic Contribution of the Clyde Bases*, Scottish Enterprise, 2003, Table 3.1

<sup>44</sup> The Scottish Enterprise study based on 2002 figures uses a 0.25 multiplier rather than 0.3. Deducting the 1,500 service and civilian personnel based at Rosyth and at other Clyde bases outside Faslane/Coulport,

#### **4.7 Estimate of total direct, indirect and induced employment dependent on Trident renewal**

Our total estimate of direct, indirect and induced job losses among both civilian and Scottish service personnel is given in Table 7.

Table 7 Total direct, indirect and induced job losses among both service and civilian employee arising from cancellation

Cause	Number
Civilian servicing of Trident	936
Civilian construction of replacement	150
Service personnel from Scotland	300
Indirect employment	300
Induced employment	505
<b>Total</b>	<b>2191</b>

As noted above, the great bulk of these redundancies could be avoided if Trident was phased out earlier between 2012 and 2017. In the event of decommissioning and non replacement between 2022 and 2027, the maximum number of civilian job losses would be 1,891.

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and taking account of the 500 job reduction since 2002, the figure for induced employment used here is slightly higher than that by Ekos if we assume a one third Trident dependence as indicated by Geoff Hoon for the Faslane/Coulport base in 2005.

## 5. CONSEQUENCES FOR THE LOCAL ECONOMY

This section examines the potential impact of Trident cancellation on the local economy. It begins by considering the experience of base reduction and closure elsewhere, then examines the characteristics of the local economy and finally assesses the issues of defence dependency for local economic development.

### 5.1. *Induced unemployment and impacts on local economies: case studies*

This section examines evidence from elsewhere in Scotland, England and the United States on the impact of military bases on local economies, the scale of induced employment that arises and the local consequences of base closure.

#### **Rosyth**

In 1990 *Options for Change* earmarked Rosyth Naval Base in Fife as a potential rationalisation or closure candidate. A study was commissioned by the then Regional Council and Enterprise Company to assess the importance of the defence industry in general and the naval base specifically to the local economy and to examine the impact of potential cutbacks on the labour market and to highlight opportunities for diversification.<sup>45</sup>

The Fife study found that the naval base accounted for 8,712 direct and indirect jobs of which 3,700 were military employees and 2,400 civilian. There was an indirect employment of 984 arising from externally produced services and materials supplied to the base and a further 'induced' employment of 1,628 arising from the general expenditure of all direct and indirect employees. The Fife study also identified firms with 10 per cent or more defence-related activity were locally or regionally based although externally owned and employed highly skilled workforces. The Fife study drew on the level of experience and skill within the defence-related workforce to point to potential opportunities for diversification. This and further follow-up work in Fife flagged up the need to move beyond laissez faire approaches to diversification and to take a more strategic and co-ordinated direction. The suggested approach from public agencies was one of central support for re-skilling and re-training, establishing regeneration area status, resource release from the MoD to foster diversification, the establishment of a diversification agency, and assistance with identifying alternative markets for local firms which had hitherto been defence-dependent.

#### **Holy Loch**

The US Naval Base on the Holy Loch was developed as a forward deployment base for the Polaris missile system in the late 1950s. At this time the US negotiated the Holy Loch site as a refit site while developing fleet ballistic missile submarines. The site had been previously used as a submarine base during the Second World War. The refit and dry dock became operational during 1961 and during the 1960s the number of personnel and the number of submarines increased. By the end of 1963 the base had reached its full complement of 10 submarines. Holy Loch continued to serve as the base for Polaris and Poseidon missiles during 1960s and 1970s. But with the development of Trident from 1980 onwards the decommissioning of Holy Loch effectively began. The existing submarines were not retrofitted and became obsolete. At the time of the 25<sup>th</sup> anniversary of the US base in 1986, the strategic arms reduction initiatives and new weapons 'platform' meant that the lifespan of the base was

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<sup>45</sup> Fife Regional Council/ Fife Enterprise, 1991; Local Work, 1992.

limited. The 2,500<sup>th</sup> patrol took place in April 1987. On 5<sup>th</sup> of February 1991 the US and UK governments simultaneously announced the closure of the base.

Then Secretary for Defence, Tom King, made a statement to the House: 'The United States Government have been considering their arrangements for the forward support of their nuclear missile submarines and for the basing of their dual capable aircraft in the United Kingdom. These are being affected in the case of the submarines by the withdrawal of the Poseidon missile submarines, which removes the need for forward support in the north-eastern Atlantic area....The United States Defence Secretary, Mr. Cheney, advised me of their proposals, which have since been discussed between us, and I can now advise...[that]...as a result of a decision to accelerate the withdrawal from service of the United States Poseidon missile submarines, the United States Navy will, by the end of this year, no longer have a requirement for its submarine support facility at Holy Loch and this facility will therefore close. The exact date of closure has yet to be determined, but is likely to be some time in 1992....Changes in the types of equipment needed to sustain our defences and to reflect the new international security situation have led to these different needs. The Government understand the reasons for these decisions, but, none the less, they will have significant local economic consequences'.<sup>46</sup>

The last refit was undertaken in November 1991 and the last Polaris sub left the Holy Loch in June 1992.

The direct impact of the US base closure is clear. In 1990 there were 2,100 US Navy personnel deployed at the Holy Loch, 7.2 per cent of the total 29,262 US military personnel stationed in the UK. By 1992 there was none.<sup>47</sup>

While it is clear that decommissioning had begun during the mid 1980s, the extent to which this was sprung upon local communities and public agencies is revealed in the comment in the preface to the local authority's Cowal Local Plan 1993 which states that the 1990 Local Plan was 'out of date before it was even adopted'<sup>48</sup> In its 'Cowal Local Plan 1993' Argyll and Bute District Council noted that: 'The loss of the American personnel and their families has adversely affected the viability of many commercial and social facilities in Dunoon'.<sup>49</sup>

The analysis of the local authority was that the US Base 'cushioned the local economy particularly in Dunoon from structural changes, such as those affecting traditional tourist resorts. Now that it is gone the local economy has been exposed as being weak, under invested and lacking in diversity.'<sup>50</sup>

Assessments of the economic impact on the local labour market undertaken at the time estimated that the closure of the base would lead to the loss of 800 jobs, four-fifths of which were attributable to indirect or induced employment. The wider social and economic impact extended to 400 homes being vacated by the US Navy and the loss of rental income from 450 tenancies, previously occupied by US personnel.

The local authority's response was to establish a multi-agency Task Force. The Development Strategy and Action Plan for Cowal produced by the Task Force in August 1991 reported on the relationship of the US naval base to the local economy, the

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<sup>46</sup> House of Commons Hansard Debates, 5 February 1991.

<sup>47</sup> House of Commons Hansard Debate 16 March 1994).

<sup>48</sup> Argyll and Bute District Council, 1995.

<sup>49</sup> Ibid., p.1

<sup>50</sup> Ibid, p.27



impact of its closure and potential strategic actions to address the dislocation resulting from military withdrawal. Based on a study previously commissioned by the Highlands and Islands Development Board, the Development Strategy estimated the number of directly employed personnel to be 2,000 including 350 civilians with an additional indirect employment contribution of around 800 jobs. In total this impact was estimated to affect around 19 per cent of the working age population of Cowal. The annual loss of income to the local economy arising from base closure was estimated at £10.5 million at 1991 prices.

The Development Strategy set an overall target of generating 900 jobs within four years and to address long-term defence dependency highlighted by the base closure. Accordingly the Development Strategy proposed a range of actions targeted on business growth, enterprise support, tourism, training and education, infrastructure, and environmental improvement.<sup>51</sup> While purporting to attempt to 'mitigate as much as possible the adverse economic and social impact of the closure of the USNB and prepare a strong platform for future economic growth', the major focus was that of tourism and improvements in the standard of accommodation and facilities for attracting visitors and also on 'encouraging a new entrepreneurial spirit in the area'.<sup>52</sup>

The Development Strategy commented directly on the problems created by the short lead-in time for the formulation of an action and development plan stating that '(t)he challenge is to organise, plan and implement and integrated programme of development within the given timescale'.<sup>53</sup>

The Development Strategy centred on diversifying the local economy by increasing private business and on improving the natural heritage of the area with a focus on small and medium sized companies and some infrastructural and leisure-related action. The main area of action was to be that of tourism with an additional consultants report commissioned specifically on this issue. There was to be a drive toward increasing bed nights by 58,000 over a three to four year period. Supporting this was a concentration on improving the natural environment. Overall, the strategy proposed a twin track to replace jobs lost through both public sector expenditure and 'levering' in private sector growth to regenerate the local area<sup>54</sup>.

The local impact of closure on the number unemployed was significant. The number of people claiming income support for 6 months or more in the surrounding electoral wards rose from 350 to 455 between July 1992 and April 1993 in contrast to the national and regional picture. This local dislocation continued for a substantial period and the number of men experiencing long-term unemployment did not return to trend until 1998.

### **Rural England**

The Rural Development Commission undertook a detailed study of the impact of the restructuring of military bases in six defence sites located in rural England.<sup>55</sup> Case studies covered Portland, Norfolk, Wiltshire, RAF Swindon, RAF Fairford, and Pendle. The findings of this study were that the indirect and direct effects of base restructuring had been minimised by several factors, in particular the level of integration of the local economy into the wider regional economy, labour and property

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<sup>51</sup> Task Force Report, 1991.

<sup>52</sup> Ibid, pp. 3 and 7.

<sup>53</sup> Ibid. pp. 6-7

<sup>54</sup> Ibid., pp. 11-12

<sup>55</sup> Rural Development Commission, *Impact of the Peace Dividend on Rural England*, 1996.

markets.<sup>56</sup> Across the case study sites the Commission examined available impact assessments and found these to be overly pessimistic. The Commission study found that the extent to which local communities were affected by restructuring depended critically on the level and type of intervention from public and private agencies. Greater success was evident where the approach taken was proactive. The key success factors highlighted by the Commission are “proactive steps taken by policy makers to promote viable alternative employment opportunities”, that in the absence of ‘policy activism’ adverse effects tend to be mitigated by long-term scale-backs and that the effects of base run-down can be “relatively small....absorbed without any major economic or social consequence....with no long-term effect on the housing market....[and that]...Wider social impacts as measured by a range of indicators also appear to have been minimal”. “The indirect and induced impacts of closures do not appear to have been especially significant and in none of the case studies are major overall negative impacts on the local economies evident”.<sup>57</sup> The report continued ‘the induced effects tend to be small in relation to the defence industry. The induced employment effects suggest a defence multiplier of 0.3 beyond the direct service and civilian personnel for bases experiencing restructuring or closure in rural areas of England.

### **US Experience**

In the United States the Base Re-alignment and Closure (BRAC) initiative provides evidence of effective conversion and re-use. BRAC is governed by legislation which details key processes for military base re-use and closure. This is overseen by a Commission supported by evidence-gathering regional hearings. Over the five rounds of BRAC between 1998 and 2005 around 380 bases have been identified for closure and 170 for realignment.

Under BRAC plans for economic renewal must come from community organizations, firms and workers. Driven by the Office for Economic Adjustment (OEA) communities must form a Local Redevelopment Authority (LRA) that represents all major groups and communities affected. The LRA's re-use plan, reflecting the community's consensus as to how a closed base should be redeveloped, serves as the blueprint for all federal property disposal and reuse decisions.

Central government has a clear role in fostering reuse by ensuring property disposal at below market value if the proposed use is for job generating economic development, fast-track environmental clean-up, access to transition support for workers and communities, economic planning grants, and the appointment of ‘transition co-ordinators’.

A number of re-use success stories can be identified and these are shown in the table below. Re-use spans a wide range of activity including industrial production, commercial usage, public and private sector services, leisure and recreation.

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<sup>56</sup> Ibid., p. 96

<sup>57</sup> Ibid., pp. 18, 32, 67, 94

Table 8 US Military Bases Re-Used to Maintain Employment 1998-2005

US BASE RE-USE SUCCESS STORIES	
Alameda Naval Air Station/Naval Aviation Depot, Alameda, CA.	Lowry Air Force Base, Denver, CO.
Bergstrom Air Force Base, Austin, TX.	Mare Island Naval Shipyard, Vallejo, CA.
Castle Air Force Base, Merced County, CA.	Mather Air Force Base, Sacramento, CA.
Chanute Air Force Base, Rantoul, IL.	Myrtle Beach Air Force Base, Myrtle Beach, SC.
Charleston Naval Base, Charleston, SC.	Norton Air Force Base, San Bernardino, CA.
England Air Force Base (AFB), Alexandria, LA.	Orlando Naval Training Center/Naval Hospital, Orlando, FL.
Fort Benjamin Harrison, Lawrence, IN.	Pease Air Force Base, Portsmouth, NH.
Fort Devens, Ayer, MA.	Philadelphia Naval Base Complex, Pennsylvania, PA.
Fort Ord, Monterey County, CA.	Sacramento Army Depot, Sacramento, CA.
Gentile Defense Electronics Supply Center, Kettering, OH.	Tooele Army Depot, Tooele, UT.
Griffiss Air Force Base, Rome, NY.	Vint Hill Farms Station, Fauquier County, VA.
Indianapolis Naval Air Warfare Center - Aircraft Division, Indianapolis, IN.	Williams Air Force Base (AFB), Mesa, AZ.
Kelly Air Force Base, San Antonio, TX.	Wurtsmith Air Force Base, Oscoda, MI.
K. I. Sawyer Air Force Base, Marquette, MI.	

In an assessment of the first four rounds of the BRAC process the General Accounting Office (GAO) reported that "the majority of the communities surrounding closed bases are faring well economically in relation to the national average and show some improvement since the time closures were beginning".

The GAO estimated that around two-thirds of the communities affected by post-1988 closures had an unemployment rate at or below the national level and that rural communities had achieved levels of success in re-use and employment generation comparable to urban areas.<sup>58</sup>

## 5.2 The Faslane Base and the Local Economy

There are difficulties associated with estimating indirect and induced employment in the defence industry. The defence industrial base covers a wide range of contractors and sub-contractors across different industrial sectors with a broad territorial spread. A significant proportion of contractors provide dual-use products and services and the extent of defence dependence varies. These difficulties are particularly relevant when attempting to project future employment. Estimates of direct, indirect and induced employment can be made on the basis of the wider re-alignment and closure experience outlined earlier and on the basis of industrial multipliers derived from analysis of input-output tables. The studies reported above suggest an induced employment multiplier effect of 0.3. This fits with economic analysis which shows

<sup>58</sup> Congressional Budget Office (1996). *Closing Military Bases: An Interim Assessment*. CBO; Dardia, M., McCarthy, K., Schoeni, R., and Vernez, G. (1996). *Defense Cutbacks: Effects on California's Communities, Firms and Workers*. RAND National Defense Research Institute; Defence Analytical Services Agency (2006). *Defence Statistics 2006*. DASA; George, P. (2006). *Assessing the Economic Impact of Ellsworth Air Force Base on Local Communities*. Black Hills Vision; Hellman, C. (2001). *New Beginnings: How Base Closures Can Improve Local Economies and Transform America's Military*. Taxpayers for Common Sense and Centre for Defense Information; White House (1999). *Economic Renewal: Community Re-use of Former Military Bases*. White House.

that one defence job is likely to result in 0.8 indirect jobs and 0.3 induced jobs.<sup>59</sup> Defence related multipliers are among lowest of all industrial multipliers primarily due to the capital-intensive nature of the industry and its very high site development costs. Using Scottish input-output tables for all industrial classifications indicates that the main elements of defence industry expenditure have multipliers which rank in the bottom one-fifth of the 123 industry groups listed.

The Government places the estimated number of civilian jobs directly dependent on Trident as 936 for Scotland and 6,640 for the rest of the United Kingdom. Indirect civilian employment dependent on Trident is placed at 300 in Scotland and 5,700 for the rest of the UK.<sup>60</sup> As the Rural Development Commission report noted, the impact of base restructuring is influenced heavily by the local integration into the labour and housing market<sup>61</sup>.

Locally the economic and labour market context can be described as relatively buoyant.<sup>62</sup> Compared to a Scottish average of 75 per cent, Argyll and Bute has 42,000 people in employment a rate of 77 per cent. Over time the rate of change in the proportion of working age people in employment has risen more rapidly in Argyll and Bute than the average change across Scotland with an increase of 13 per cent between 1999 and 2006 compared to a national increase of 5 per cent over the same period. West Dunbartonshire has an employment rate below the national average at 71 per cent although the number in employment has increased by 6 percentage points between 1999 and 2006. The local labour market in West Dunbartonshire has changed with substantial increase in part-time work and a loss of jobs among women workers. In both Argyll and Bute and West Dunbartonshire there are areas where unemployment is significantly above the national average with Dumbarton West and Kilbowie West having rates of unemployment around 10 per cent and Ardenslate and Kinloch having rates of 8 to 9 per cent.

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<sup>59</sup> K. Hartley and Hooper, 1993

<sup>60</sup> House of Commons Debates, 21<sup>st</sup> February 2005.

<sup>61</sup> Rural Development Commission, op.cit.

<sup>62</sup> The only sources on the residence of Faslane/Coulport personnel is the 2003 Ekos report for Scottish Enterprise. This unfortunately aggregates all West of Scotland bases along with Rosyth. However, there is only a small number of employees resident in Inverclyde and the major concentrations are either in Argyll and Bute (especially Helensburgh) and West Dunbartonshire (especially Dumbarton and Alexandria)

Table 9 Changes in employment 1999 to 2006<sup>63</sup>

	West Dunbartonshire			Argyll & Bute			Scotland		
	2006 No. (000s)	Rate per cent	1999- 2006 Per cent Change	2006 No. (000s)	Rate per cent	1999- 2006 Per Cent Change	2006 No. (000s)	Rate per cent	1999- 2006 Per cent Change
<b>In employment</b>									
<b>All</b>	41	71	6	42	77	13	2,415	75	5
- full time work	32	77	-1	31	76	21	1,803	75	4
- part time work	9	23	43	10	24	-7	611	25	7
- employees	38	94	7	34	83	15	2,158	90	5
- self employed	2	6	..	7	17	3	240	10	8
<b>Males</b>	21	74	18	22	79	21	1,260	78	4
<b>Females</b>	20	68	-4%	20	75	6	1,156	72	7

The relative position of Argyll and Bute compared with national rates of claimant count unemployment is also positive with a level of 2.8 per cent locally as against 3.2 per cent for Scotland. In West Dunbartonshire the rate of unemployment is 1.2 percentage points above the national average with a relatively higher rate among men at 2.7 percentage points above the Scottish average.

Table 10 Comparison of claimant count unemployment, December 2006

	West Dunbartonshire		Argyll & Bute		Scotland	
	Level(000s)**	Rate per cent	Level(000s)**	Rate per cent	Level(000s)**	Rate per cent
<b>All People</b>	2.4	5.0	1.4	2.8	82.8	3.2
Males	1.8	7.4	1.0	3.8	62.9	4.7
Females	0.6	2.5	0.4	1.7	19.9	1.6

Trends in unemployment similarly indicate a relatively favourable position with a long-term reduction in unemployment of 3.0 percentage points in Argyll and Bute compared to a 2.2 per cent fall nationally between 1997 and 2006. Unemployment in West Dunbartonshire has declined over the decade to 2006 by around 2.7 percentage points again representing an above average reduction in the rate of unemployment.

Table 11 Change in claimant count unemployment (per cent)

	West Dunbartonshire			Argyll & Bute			Scotland		
	1997- 2006	1999- 2006	2005- 2006	1997- 2006	1999- 2006	2005- 2006	1997- 2006	1999- 2006	2005- 2006
<b>Rate</b>									
<b>All people</b>	-2.7	-1.7	0.0	-3.0	-2.1	0.1	-2.2	-1.5	0.0
Males	-4.4	-2.7	-0.1	-4.1	-2.8	0.0	-3.3	-2.1	0.0
Females	-0.7	-0.4	0.1	-1.8	-1.1	0.2	-1.0	-0.7	0.0

<sup>63</sup> Argyll and Bute Economic Profile, Scottish Executive, 2007; West Dunbartonshire Economic Profile, Scottish Executive, 2007

Average earnings in Argyll and Bute are somewhat higher than the Scottish level with the gross average being £458 weekly, which is 6.1 per cent above the national average of £432. Average earnings in West Dunbartonshire are, at £387, over 10 per cent below the national average particularly for women.

Table 12 Comparison of Earnings

	West Dunbartonshire	Per cent difference from Scotland	Argyll & Bute	Per cent difference from Scotland	Scotland
	£		£		£
Gross Average* weekly Earnings	386.7	-10.5	458.4	6.1	432
Males	460.0	-3.4	485.2	1.9	476.2
Females	342.0	-9.1	375.5	-0.2	376.2

\* median

The local industrial structure differs from the national position. In keeping with other rural areas, and given the significant role of forestry in the area, the Argyll and Bute workforce is more heavily concentrated in agriculture forestry and fishing (4 per cent of all employment compared to 2 per cent), with a lower share production industries particularly manufacturing. At the same time employment in services is higher locally than the Scottish average (85 per cent compared to 81 per cent). West Dunbartonshire has a lower share of employment in agriculture forestry and fisheries than the national average a similar, though slightly lower, proportion in production and construction industries and a higher percentage of employment in services.

Table 13 Number and proportion of employees by industry

Industrial group	West Dunbartonshire		Argyll & Bute		Scotland	
	No. (000s)	Percentage	No. (000s)	Percentage	No. (000s)	Percentage
<b>All industries</b>	<b>31.3</b>	<b>100</b>	<b>34.6</b>	<b>100%</b>	<b>2,331</b>	<b>100%</b>
Agriculture, forestry & fishing	0.1	0	1.4	4	36	2
Production & construction						
<b>Total</b>	<b>4.7</b>	<b>15</b>	<b>3.8</b>	<b>11</b>	<b>400</b>	<b>17</b>
Energy & Water	..	..	0.5	1	37	2
Manufacturing	3.2	10	1.7	5	236	10
Construction	1.4	4	1.6	5	127	5
Services						
<b>Total</b>	<b>26.5</b>	<b>85</b>	<b>29.5</b>	<b>85</b>	<b>1,895</b>	<b>81</b>
Retail & wholesale & hotels	8.0	26	9.3	27	542	23
Transport & comm.	1.1	4	1.6	5	127	5
Finance and business	5.5	18	4.7	14	419	18
"Other" Services¥	11.8	38	13.9	40	806	35

¥ Other Services includes Public Admin, Education, Health and Other Services

Trends in employment for Argyll and Bute show decline in agriculture, forestry and fishing locally, with an increase in service employment especially in finance and

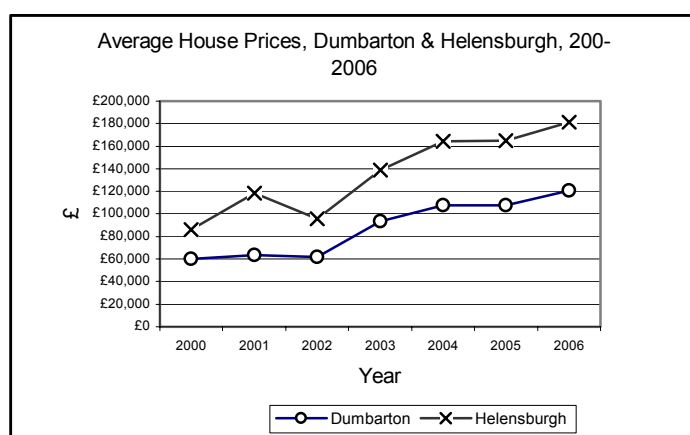
business related employment. West Dunbartonshire has seen an overall increase in the number of people in employment, particularly in the service sectors, stability in the number associated with agricultural, forestry or fishing industries but a significant loss of jobs in manufacturing.

Table 14 Number of employees in years 1997, 1999 and 2004

	West Dunbartonshire			Argyll & Bute			Scotland		
	1997 (000's)	1999 (000's)	2003 (000's)	1997 (000's)	1999 (000's)	2003 (000's)	1997 (000's)	1999 (000's)	2003 (000's)
<b>Industrial group</b>									
<b>All industries</b>	27.9	28.6	32.7	32.7	32.0	35.2	2,076	2,167	2,307
Agriculture, forestry & fishing	0.1	0.1	0.1	2.3	2.1	0.9	41	37	36
Production & construction									
<b>Total</b>	8.5	8.2	4.9	3.9	4.0	3.9	474	490	401
Energy & Water	..	..	..	0.2	0.5	0.5	42	41	37
Manufacturing	6.4	5.4	3.4	2.0	1.8	1.5	320	315	243
Construction	..	..	1.5	1.7	1.7	2.0	112	134	120
Services									
<b>Total</b>	19.3	20.3	27.7	26.5	26.0	30.3	1,562	1,640	1,870
Retail & wholesale & hotels	6.7	7.6	8.1	8.8	8.8	8.7	494	502	540
Transport & comm.	1.0	1.3	1.3	1.5	1.9	1.5	108	119	122
Finance and business	3.0	2.9	7.8	2.6	2.0	4.8	307	332	413
"Other" Services <sup>Y</sup>	8.8	8.5	10.5	13.4	13.3	15.3	653	688	794

<sup>Y</sup> Other services includes Public Admin, Education, Health and Other Services

The local property market is also relatively buoyant with house prices in Helensburgh being the third highest in Scotland. House prices in Helensburgh rose by 16 per cent between 2005 and 2006 from £156,291 to £181,269 while for Dumbarton the increase was 13 per cent from £106,967 to £120,597 relative to a Scottish increase of 12.5 per cent.<sup>64</sup>



<sup>64</sup> Bank of Scotland, Scottish House Price Index – 3<sup>rd</sup> Quarter 2006.

On balance the state of the local economy in relation to key factors identified for successfully managing the transition to alternative civil production would seem to be favourable and the local economy demonstrates considerable potential to react positively to Trident cancellation and conversion.

In addition it is the case that successive governments have overestimated the number of jobs that the Trident programme would sustain.<sup>65</sup> In 1980 estimates of total UK employment resulting from the Trident programme were 25-30,000 direct jobs together with an additional 20,000 indirect jobs based on 70 per cent of the Trident budget being spent in the UK. The 1982 decision to procure Trident II reduced the estimated share of domestic expenditure to 54 per cent. By 1985 estimates of 'peak years' had been reduced to 17,000 direct jobs and 15,000 indirect jobs. Over the 20 year lifetime of the Trident programme the House of Commons Defence Committee estimated that the total employment generation would be 9,000 direct and 7,000 indirect.<sup>66</sup>

There is also considerable evidence that larger US firms had secured a larger than expected share of contracts. The Alternative Employment Study Group contended that "while the Trident programme was a source of considerable expenditure on the Clyde and as a consequence, of various forms of short-term employment, it was not liable to be a source of new long-term employment".<sup>67</sup> This contention has been largely borne out by experience.

The 1984 Property Services Agency Environmental Impact Assessment made estimates of the local employment impact of the Trident programme and observed that in 1983 the total service and civilian personnel at the base numbered 3,300 and 3,450 that this would increase to 4,100 and 3,950 by 1994 but that by 2002, at the operational phase, total employment would be 3,800 military and 3,450 civilian. On balance the MoD and PSA estimates projected a net increase in military personnel of 500 with no impact on the number of civilians employed. The AESG contended that "these employment claims did not match the known evidence about the new operational pattern of the Trident submarines and their missiles".<sup>68</sup>

Following on from the Defence Industrial Strategy, the White Paper and the Defence Committee's inquiry into the manufacturing and skills base supporting Trident it is likely that there will be a drive toward cost containment on 'through-life support costs' across the 'supply chain' and that the responsibility for achieving this will fall to prime contractors but be borne by sub-contractors. Since the transfer of the management of the base to Babcock, employment has reduced significantly with the loss of around 500 jobs between 2002 and 2006. Babcock's defence services increased operating profit by 30 per cent from £16.8 million in 2005 to £21.8 million in 2006.<sup>69</sup> For the same period Babcock's wage bill increased by around 8 per cent.

### **5.3 The local economy and a global defence industry**

Since the early 1990s the US defence industry has seen significant consolidation and the emergence of four giant firms which dominate the defence sector. A wave of industrial takeovers between 1994 and 1997 saw around twenty major players coalesce into Lockheed Martin, Northrop Grumman, Boeing, and Raytheon. According to figures

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<sup>65</sup> Alternative Employment Study Group (1988). *Future Imperfect: Trident and the Clyde*. AESG., p 15

<sup>66</sup> House of Commons Defence Committee, 1985

<sup>67</sup> AESG, op cit. 1988, p. 20

<sup>68</sup> AESG, op.cit., pp. 21-22.

<sup>69</sup> Babcock International Group PLC (2006). *Annual Report and Accounts 2006*.



from the Stockholm International Peace Research Institute the US accounts for almost one-half of the \$1,000 billion industry.

In terms of the main global aerospace and defence companies, the market value in descending order shows the market domination of a small number of US, European and UK firms. UK defence statistics show clearly that these large contractors figure prominently in the list of organisations paid £5 million or more by the MoD in 2005/06.<sup>70</sup> Many of the largest defence suppliers to the UK government are foreign-owned or controlled and indigenous companies have a high level of investment from US contractors leading to what has been termed a ‘new transnational military-industrial complex’.<sup>71</sup>

Table 15 World Defence Supply Firms by Market Value

Company	Market Value (£million) 2004
Boeing	27,225
EADS	22,484
Lockheed Martin	18,438
Northrop Grumman	15,494
Honeywell International	13,287
Raytheon	10,507
General Dynamics	9,953
BAE Systems	9,092

In light of concern about the management of major projects and substantial cost and timescale overruns, the MoD embarked on its Smart Procurement Initiative from 2000.<sup>72</sup> This initiative centres on cost reduction through identifying industrial prime vendors who are then responsible for delivering best value in the supply chain on MoD commitments. The global dominance of a few large defence contractors presents a major obstacle to market entry for local firms unless they adhere to the requirements of cost containment within the supply chain. This regime has clear implications for working conditions given the intensification of labour associated with just-in-time, sub-contract methods of production and the weakening of the position of the workforce in relation to meeting fluctuating prime contractor demand.

#### 5.4 Argyll and Bute and defence dependency

The defence estate in the UK extends across 4,000 sites and covers an area of 366,000 hectares (1,410 square miles). By parent service the army holds 246,000 hectares, the air force almost 49,000 hectares, the navy over 43,000 hectares with an additional 30,000 hectares held centrally or for other uses. Total MoD land holdings amount to around 1 per cent of the area of the UK.

MoD landholdings in Scotland account for almost one-third of the total UK defence estate with 116,300 hectares (or 450 square miles).<sup>73</sup>

The RNAD Coulport site covers some 235 hectares on the Rosneath peninsula including reinforced concrete buildings. The Faslane site on the Gare Loch extends to an area of over 90 hectares including one of the largest shiplifts in the world measuring 185

<sup>70</sup> Defence Analytical Services Agency (2006). Defence Statistics 2006. DASA. (2006b). UK Regular Forces Distribution Across UK at October 2006 (Revised). DASA.

<sup>71</sup> Bradden, D. and Bradley, J. (2005). *What Lies Beneath? Who Owns British Defence Contractors and Does it Matter?* Defence Economics Research Unit. University of the West of England.

<sup>72</sup> Hartley, K. (2004). The UK's Major Defence Projects: A Cause for Concern. *Government Opportunities*.

<sup>73</sup> DASA 2006, op.cit.

meters in length, 50 meters in width, and 40 meters in height.<sup>74</sup> Both sites are areas of high security and are encircled by high perimeter fencing which extends beyond the footprint of the bases. Military facilities further extend into Glen Douglas and Glen Fruin. This militarised area is incongruously situated on the doorstep of the Loch Lomond and the Trossachs National Park and is home to a number of European Protected Species and UK BAP species as well as distinctive natural, historical and built environment features.

The initial Environmental Impact Assessment conceded that “some tourists might be deterred by the prominent visual impact of some of the [then] proposed structures, though equally there is the possibility that an enlarged Clyde Submarine Base and submarine activity may attract sight seers to the area” (PSA, 1984, 35). As the Alternative Employment Study Group noted, the latter part of this observation ignores the fact that “the majority of tourists are attracted to Scotland by the kind of scenery which the MoD are destroying”.<sup>75</sup>

The environmental impact goes significantly beyond this in the context of Loch Lomond and the Argyll Forest being among Scotland’s key tourism destinations.<sup>76</sup> The presence of the high security bases excludes local communities from realising fully the opportunity to capitalise on potential tourist revenue estimated at £200 million for the National Park in 2002 of which £84.5 million (42 per cent) was generated in the Loch Lomond area with an additional £18.7 million (9 per cent) generated in the Argyll Forest area.<sup>77</sup> National targets set by the Scottish Executive include an increase in revenue from tourism of 50 per cent by 2015.<sup>78</sup> Indeed the employment effect of the national park has been estimated as generating an additional 0.3 jobs for each of the 4,490 directly employed - an induced employment multiplier comparable to that of direct military employment.<sup>79</sup>

This leaves Argyll and Bute as the most defence dependent local authority area in Scotland. Of the 7,240 UK regular forces posted in Scotland across naval and army services 2,990 (41 per cent) were located in Argyll and Bute. For naval services Argyll and Bute accounts for 79 per cent of Scotland’s 3,800 personnel.<sup>80</sup>

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<sup>74</sup> Ministry of Defence (1984). *Proposed Development at the Clyde Submarine Base (Faslane and Coulport)*. MoD.; Strathclyde Regional Council (1984). *Report on the proposed Development by the Ministry of Defence at the Clyde Submarine Base (Coulport and Faslane)*. SRC.

<sup>75</sup> AESG, 1988, p. 20.

<sup>76</sup> Loch Lomond and the Trossachs National Park (2005a). *Strategic Environmental Assessment Report*.

<sup>77</sup> Loch Lomond and the Trossachs National Park. (2005b). *State of the Park Report*. Loch Lomond and the Trossachs National Park.

<sup>78</sup> Scottish Executive (2006). *Scottish Tourism: The Next Decade - a Tourism Framework for Change*. Scottish Executive.

<sup>79</sup> Loch Lomond and the Trossachs National Park. (2005b)

<sup>80</sup> Defence Analytical Services Agency (2006b). *UK Regular Forces Distribution Across UK at October 2006 (Revised)*. DASA.

## 6. SCOTLAND'S FUTURE SKILL NEEDS

### 6.1 Projections of skills requirements

Projections of employment are difficult beyond a fairly limited time horizon. However, *Future Skills Scotland* has forecast Scotland's labour market needs forward for the next decade and these show that even in apparently declining industries, such as engineering, there will be demand for 19,000 new recruits by 2014, with a further 8,000 in mining and quarrying and 50,000 in other manufacturing sectors.<sup>81</sup> On this basis, there will be a need to replace 95,000 in skilled trade occupations. Such replacement demand arises through the need to replace those people who leave their industry's labour force either permanently or temporarily. The need to address this degree of churn and turnover will be exacerbated by the demographic effects of falling numbers of school-leavers.

Without securing new supplies of labour and encouraging more of the younger labour market cohorts to follow engineering and allied careers, Scotland will face mounting skill shortages in these areas. The types of skills, experience and talents of those employed on the Trident activities will come into increasing demand over the next two decades.

### 6.2 Specific skill needs

On the basis of existing government/industry projections it is possible to identify two specific areas. In oil and gas activity in the North Sea will increasingly be complemented by exploration around Shetland and into the Atlantic. At the same time the expanding renewable energy sector will be demanding the sorts of skills and expertise which are in short supply within the UK.

According to the UK Offshore Operators Association, 'in October 2005, OPITO/Cogent industry sector skills council were commissioned to investigate the industry's current workforce shortages or "pinch points", as these were being identified as critical for current and future developments'.<sup>82</sup> They were particularly wanting to know what impact these shortages would have and what potential solutions could be put in place. Surveys elicited specific information from over 200 companies and this demonstrated 'consistent and repeated messages of shortages exacerbated by the difficulties of bringing people into the industry, due to non-delivering recruitment drives and competitive demand from other UK projects'. They continue that: 'all sectors of our industry are experiencing skills shortages across the full spectrum of job roles i.e. riggers, scaffolders, technicians, geologists and reservoir engineers'.

These demands for suitable new recruits over the coming years to ensure that the 'remaining 27 billion barrels estimated to lie offshore are to be recovered' suggest that many of the skilled professional and technical staff released from Faslane/Coulport would be readily absorbed into the employment market in Scotland - whether off- or on-shore.

So, while recent employment forecasts for the North East of Scotland Economic Forum suggest a fall in the numbers employed in North Sea Oil and Gas sector, there are still expected to be 25,000 jobs in the energy sector locally in 2021.<sup>83</sup> As the sector now

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<sup>81</sup> *Labour Market Projections to 2014*, May 2006

<sup>82</sup> United Kingdom Oil Operators Association, 2006 (UKOOA, 7/11/2006: <http://www.ukooa.co.uk/media/view-press.cfm/411>)

<sup>83</sup> (Scottish Enterprise Grampian, Aberdeen City Council, and Aberdeenshire County Council) <http://www.researchonline.org.uk/fskills/doc/LMD239.pdf?id=1204942&location=Volume1&extension=.pdf&pageCount=1&contentType=application/pdf>).

has an ageing workforce, it confirms the need for significant recruitment over the next two decades at least.

Similarly, it is reasonable to assume that skills requirements in Scotland's renewable energy industries will rise substantially if the aspirations of all Scotland's political parties are to be met. The Scottish Executive has a target of 40% of installed capacity by 2020 (double the UK target) but manifestos for the 2007 election are likely to include higher targets for the future. Nicol Stephen MSP, Leader Scottish Liberal Democrats, recently announced his ambition for 100% of Scotland's energy to be generated from renewables supplies by 2050<sup>84</sup>.

Evidence to date, including the Forum for Renewable Energy Development in Scotland Report 'Developing Skills for Scotland's Renewable Energy Workforce' suggests that the supply of skills is not yet a problem for the sector. However, if such targets are adopted, and it is reasonable to assume that the targets will rise whatever the composition of the Executive post 2007, the employment and skills projections to date will have to be revisited. In this context, the rundown of Trident could be considered as a potential contributor to securing energy supplies and creating jobs and exports for Scotland.

Bearing mind the significant numbers of security personnel employed at Faslane in association with its nuclear weapons, it should be noted that there is also significant future demand in this sector. The estimated Security Industry Authority (SIA) licensable security population in Scotland is currently 16,300 individuals.<sup>85</sup> Estimates<sup>86</sup> of projected future job openings requiring new entrants to the jobs market suggest that over the five years between 2003 and 2008 there will be a need for 12,000 new employees to fill vacancies in the broader occupational type of 'Elementary Security Occupations'.<sup>87</sup> Nine out of twenty employees in this sector work part time in this type of job. However, applicants with police, prison officer, fire-fighter or HM Forces background have an advantage with pay rates for security officers vary depending on employer and duties. Approximate pay rates for Security Officers are in the range of £190 - £260 a week, rising to around £310 - £370. Higher earners can make around £430 a week.

In summary, the projected decline in the school age population over the next two decades will mean that existing skill shortages in areas of engineering, renewables and oil and gas technology and security will become progressively more acute by 2020.

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<sup>84</sup> <http://www.scotlibdems.org.uk/premanifesto.pdf>

<sup>85</sup> [http://www.workplacelaw.net/display.php?resource\\_id=8225](http://www.workplacelaw.net/display.php?resource_id=8225)

<sup>86</sup> <http://www.careers-scotland.org.uk/CareerInformation/Occupations/SecurityandProtectiveServices/PoliceandSecurityWork/SecurityOfficerGuard.asp>

<sup>87</sup> The six licensable sectors in Scotland are: Door Supervisor (in-house and contractors); Security Guard (contractors only); Cash & Valuables in Transit (contractors only); Public Space Surveillance CCTV (contractors only); Close Protection (contractors only); and Key Holder (contractors only)

## **7. DIRECT REDEPLOYMENT IN THE PUBLIC AND SOCIAL ECONOMY**

This section and the next examine the potential for employment creation that could be initiated following Trident cancellation. Both seek to take into account the range of occupational skills of the current workforce related to Trident. This section examines the potential for direct redeployment into the public and social economy.

### ***7.1 Redeployment of skills relevant to public and social economy sectors***

If Trident were to be decommissioned between 2012 and 2017 approximately 400 staff would require alternative employment. Most of these would be either security personnel, trained MoD police and less well trained security staff, or personnel with training in industrial and nuclear-related health and safety. As a result of the slight, five per cent, reduction in the overall operations of the base, there would also be a reduction up of to a hundred jobs in the surrounding economy, mainly in retail services, catering, transport and taxis.

If Trident was decommissioned between 2022 and 2027 there would be the need to redeploy an additional 500 direct employees of whom most would have the skills required for manufacturing employment but would include perhaps another 100 clerical and logistics staff who might be more appropriately employed in the public and social economy. There would also be approximately 300 job losses in indirect employment - although these would be geographically spread more widely throughout central Scotland.

### **7.2 Public sector employment**

Of the £153m that would be saved from Scotland's annual contribution to the existing Trident programme, it is proposed that a subvention of £10m annually (equivalent to the wages of 300 current employees) be made available to Argyll and Bute, Inverclyde and West Dunbartonshire Councils and Strathclyde Police Board to facilitate employment from 2016. A significant number of relevantly trained personnel, principally MoD police, would be available for entry to the police service.

A further £15m annually be made available to Argyll and Bute, Inverclyde and West Dunbartonshire Councils for the development of general infrastructure, transport services and tourist amenities. This would be sufficient to sustain the employment of approximately 450 employees. It would meet the general need to enhance facilities to compensate for the reduced size of the base and, more specifically, to take advantage of the opportunities for an expansion in tourism on the lower Clyde once nuclear weapons are removed.

### **7.3 Social economy employment**

It is proposed that a subvention of £5m annually be made available to the social economy organisations in the same areas.

Social economy organisations have a track record in economic regeneration which has been recognised by local authorities and by Scottish Enterprise. Local Enterprise Companies are now required to provide support to not-for-profit organisations - voluntary organisations, social enterprises, community businesses - with the proven capacity or a demonstrable potential to contribute to training and employment within their areas. Also Cooperative Development Scotland was established by the Scottish

Executive in 2005 as a subsidiary of Scottish Enterprise with a dedicated budget to promote cooperative employment in Scotland.

The social economy is a major provider of care in the community, families and children's services and social housing, and is a growing provider of community based health services. It also has an acknowledged specialist role in regeneration initiatives and vocational training and is a significant provider of environmental services, notably recycling and conservation, community transport, the arts, recreation and sports. In these latter roles it makes a major contribution to the tourism industry in many areas of Scotland. Most recently it has pioneered the community based production of alternative energy. Argyll includes the best known example of community owned production in the Gigha Renewable Energy Trust generating two gigawatts per year and producing a profit for the community of £100,000 a year. There are proposals on the Gigha model for Colonsay, Islay and Jura. Highlands and Islands Enterprise is in the process of spinning off as an independent charitable trust the HI Community Energy Trust to continue the promotion of community owned energy and advice giving on funding sources.

In the West Dunbartonshire Council area, where many of the Faslane and Coulport base employees live, the social economy currently provides 1100 jobs from a £45m annual income and an asset base estimated at £235m. In Argyll and Bute there are 1,000 organisations employing 886 people with annual turnover of £28m.

As contributors to employment diversification in the areas of Faslane and Coulport following the ending of the Trident programme, social economy organisations would expect to have access to the money saved from Trident's cancellation and available to the Scottish Executive. While many of the public service jobs provided by the social economy are core funded from public sector budgets, research has demonstrated that social economy organisations have a capacity to add significantly to public funding from dedicated charitable and other funds in a ratio of approximately £1:2.<sup>88</sup>

In recent years the Scottish Executive has committed itself to a package of policies to expand the role of social economy organisations including capacity building, the opening up of public service tendering opportunities through Best Value and procurement training, and Full Cost Recovery. The consistent implementation of these commitments by the Scottish Executive would help the social economy to contribute its full potential to economic diversification.

In summary, proposals for direct employment in the public and social sector involve annual expenditure as follows:

- £10m to local authorities for security and police equivalent to the employment of 300
- £15m to local authorities for general infrastructure, transport and tourist amenities equivalent to the employment of 450
- £5m to the social economy sector equivalent to the employment of 150.

The wage expenditure of these employees would in turn be productive of 'induced employment', using a 0.3 multiplier, for at least 300.

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<sup>88</sup> HM Treasury/Cabinet Office, *Local Area Partnerships – building public sector service partnerships*, 2006

## 8. REDEPLOYMENT, ARMS CONVERSION AND INVESTMENT IN THE PRODUCTIVE ECONOMY

This section examines the economic benefits to Scotland from investment in its productive economy. The previous section examined the potential for direct redeployment of upwards of 900 Faslane employees within the public and social economy at a cost of £30m annually. This section will consider the potential deriving from an annual investment of approximately £113m. The number of Trident-related employees with manufacturing and manual trades skills requiring redeployment would be, at maximum, 350. The job creation potential of a £113m annual spend would be far in excess of this and would therefore represent a major net gain to Scotland's economy from arms conversion.

This section will begin by detailing Scotland's overall lack of investment in research and development and suggest that particular scope exists for investment in technologies relating to energy and the reduction of carbon emissions - in line with current government priorities. It will argue that arms conversion requires to be directed and focused and notes that the success of programmes in the United States for ensuring productive re-employment in the 1990s depended early intervention at both federal and state level.

### 8.1 Scotland's research and development deficit

The Scottish Executive's January 2007 report on business research and development in Scotland reveals a serious lack of funding compared with the UK as a whole. Scotland's spending in 2005 was £584m, 0.59 per cent of GDP compared with 1.08 per cent for the UK - which is itself lower than that of leading OECD countries. The Scottish Executive report notes that 'the leading countries in terms of business R&D [in the EU] have expenditure levels more than four times higher than Scotland'.<sup>89</sup> The report also notes that this research and development in Scotland is highly concentrated in particular sectors. Almost two thirds takes place in just three sectors, pharmaceuticals, precision instruments and TV and communications equipment, and over three quarters of it is undertaken by firms owned from outwith the UK. For all other sectors of the Scottish economy the spending on research and development is very small - in total less than £200m. For the energy sector covering electricity, gas and water, and excluding petroleum products, the latest figure indicates an annual spend by business of just £0.6m, that is 0.16 per cent of the Scottish research and development total.<sup>90</sup> The UK spending on energy research and development is itself very low. The workforces of privatised utility companies have been halved over the past fifteen years and research and development has been a major casualty.<sup>91</sup>

Scotland's low spending on business research and development has been closely associated with its low levels of productivity and weak international competitiveness. Outside the externally-controlled electronics and pharmaceutical sectors Scotland's performance generally compares very poorly internationally.<sup>92</sup>

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<sup>89</sup> Scottish Executive, *Business Enterprise Research and Development Scotland 2005*, Scottish Executive, January 2007, p. 2.

<sup>90</sup> *Business Enterprise Research and Development 2005* Table 1

<sup>91</sup> Massimo Florio, *The Great Divestiture*, MIT, 2004 shows that the total UK work force in electricity fell from 150,000 to 76,000 in the decade after privatisation. Gerhard Mors, *Business Enterprise Research and Development in Scotland 2002*, Scottish Executive 2002.

<sup>92</sup> Local Futures Group, *Geography of Scotland's Knowledge Based Economy*, Scottish Enterprise, December 2004; Scottish Parliament Enterprise and Culture Committee, *Report on Business Growth: the*

## **8.2 Policy priorities for reduced carbon emission and energy efficiency**

There are five reasons for identifying energy as the main focus for new investment arising from arms conversion. First, policy at both British and Scottish level identifies the cost of energy and the security of its supply as a major challenge for the economy over the next twenty years.<sup>93</sup> Second, there is now commitment at EU, British and Scottish levels to radical reductions in levels of carbon emissions.<sup>94</sup> This commitment has been recently reinforced by the publication of the Stern Report and is likely to intensify and pose a continuing series of technological challenges.<sup>95</sup> Third, technologies in energy efficiency and renewable energy generation are themselves relatively under-developed.<sup>96</sup> Fourth, Scotland's geography gives it a uniquely favourable position in Europe for the development of renewable energy from marine and wind sources.<sup>97</sup> Finally, despite the policy priority given to energy, current levels of spending on developing energy technologies in Scotland, particularly by business, is very low by international standards.

On current projections the UK will be dependent on external sources for 75 per cent of its energy needs within fifteen years even if it meets all existing targets for renewable energy.<sup>98</sup> This will pose major problems for the Scottish economy. World energy prices are already reflecting the tightening of global demand and, additionally, Scottish businesses face energy prices themselves fifty per cent higher than those of European competitors. In March 2006 the Scottish Chambers of Commerce cited rising costs of energy and transport as the biggest problem facing small and medium enterprises.<sup>99</sup>

The additional commitments on climate change and carbon reduction will further increase price pressures. They will also compel changes across a whole range of technologies in ways that will only become clear over the next decade.

## **8.3 The Scottish commitment to investment in energy efficiency**

The Scottish Executive is pledged to maximising energy efficiency and energy conservation and has repeatedly stated its commitment to renewable energy. It has gone further than the UK government in taking steps to promote marine energy with the specific aim of nurturing the skills base for a Scottish-based marine energy industry. The UK-wide support mechanism for renewable energy, the Renewables Obligation, legislates for 15 per cent of electricity supply from renewables by 2015. There is also a firm target for 20 per cent by 2020. The government is consulting on modifying the Renewables Obligation so that it provides enhanced support for currently more expensive marine and other technologies.

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*Next Ten Years*, 2006, paras. 34-56. Amicus, *The Manufacturing Agenda*, 2004 demands a radical increase in all forms of R&D to 2.5 per cent of GDP.

<sup>93</sup> *The Energy Review 2002*, Cabinet Office Performance and Innovation Unit; The Energy White Paper: *Creating a Low Carbon Economy*, HMSO, 2003.

<sup>94</sup> EU Commission, *A European Strategy for Sustainable, Competitive and Secure Energy*, March 2006; HMSO, *Climate Change Programme*, March 2006; Scottish Executive, *Changing Our Ways* March 2006 and *Response to the UK Energy Review* June 2006

<sup>95</sup> Stern Report [www.hm-treasury.gov.uk/independent-review/stern\\_review\\_economics\\_climate\\_change/ster-review-report.cfm](http://www.hm-treasury.gov.uk/independent-review/stern_review_economics_climate_change/ster-review-report.cfm)

<sup>96</sup> International Energy Agency, *Renewables in Global Energy Supply*, January 2007

<sup>97</sup> Scottish Executive, *Response*, 2006 reports Scotland as having a quarter of the European potential; Scottish Enterprise, *Marine Renewables*, 2006, section 2.1

<sup>98</sup> The Energy White Paper: *Creating a Low Carbon Economy*, HMSO, 2003.

<sup>99</sup> Scottish Chamber of Commerce, *Quarterly Business Survey*, March 2006.



The Scottish Executive target is for 40 per cent of Scottish electricity capacity from renewables by 2020. Recent ministerial statements suggest that this is seen as a stepping stone rather than a ceiling. Keen to take early steps on wave and tidal technologies, the Scottish Executive is also currently legislating for a Marine Support Obligation (MSO) which will provide targeted income in advance of any UK legislation. Additional R&D finance, and support for the wave and tidal test centre at Orkney, demonstrates the level of commitment from Scotland. Foreign developers already regard Scotland as a target market for their technologies. One Scottish based firm Ocean Powered Delivery, the manufacturer of Pelamis, has recently stated that the prospect of the MSO was crucial in a recent equity injection into the company.

In terms of manufacturing, the Scottish Executive has set an objective of 'establishing Scotland as a leading location for the development of renewable energy technology' and made energy the focus of one of the three recently established Intermediate Technology Institutes (ITI). The ITI Energy has funding of £15m a year to collaborate with academic institutions in research on maturing oil and gas assets, low cost renewables, energy storage, hydrogen technologies and future distribution networks.

The ITI Energy's technological focus is broadly in line with the recent projections of the International Energy Agency. The 2007 IEA report identifies three generations of renewable technologies. The most mature is hydro-power and biomass combustion. The second, now reaching maturity after three decades of research and development, is solar heating, wind power, modern forms of bio-energy and photovoltaics. The third generation is still under development and includes concentrating solar power, ocean energy, enhanced geo-thermal systems and integrated bio-energy systems.<sup>100</sup> Scottish Enterprise's 2006 document on marine renewables identifies the geographical advantages offered by Scotland for ocean based energy and outlines the commercial opportunities offered by the development and application of marine technology.

However, as has already been noted, Britain has an extremely poor record internationally for investment in energy. Figures from the International Energy Agency show that, although Britain doubled its level of investment in energy research and development between 2002 and 2005, it still remained much lower than that of comparable countries. In 2005 total spending on all forms of energy R&D by state agencies, higher education and business amounted to \$129m. The comparable spend in Germany was \$513, France \$523 (2002 figure), the United States \$3,017 and Japan \$3,905.

In other countries government at both central and local level has also played a far more active part in both the commissioning and funding of research and in developing integrated programmes for the adoption and implementation of new energy technologies.<sup>101</sup> In Germany and a number of the Scandinavian countries governments funded large-scale schemes for photovoltaic cladding, combined heat and power plants and the use of wind power. In Japan there was a very major government commitment to the introduction of solar energy use. In Britain, on the other hand, this period coincided with the privatisation of energy utilities and a steep decline in expenditures on both maintenance and research - as highlighted by the House of

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<sup>100</sup> International Energy Agency, *Renewables in Global Energy Supply*, 2007, p. 8.

<sup>101</sup> Danyel Reiche and Mische Beckberger, 'Policy differences in the Promotion of Renewable Energies'. *Energy Policy*, Vol. 32/7, 2004, pp. 843-849; Catherine Mitchell and Peter Connor, 'Renewable Energy Policy in the UK, 1990-2003', *Energy Policy*, Vol. 32/7, November 2004, pp. 1935-47 criticise UK government policy for opportunism, lack of clarity, failing to promote diversity and assisting only large established companies.

Commons Select Committee on Trade and Industry in 2004.<sup>102</sup> The attempt to use market-based incentives such as the Renewables Obligation has also proved problematic. The Scottish Parliament's Enterprise Committee report in 2004 concluded that it had served to stifle the development of newer forms of technology in Scotland as power utilities bought in the cheapest proven technology, wind turbines, almost all manufactured outside Scotland.<sup>103</sup> This remains a problem currently and the Scottish Executive's 2006 response to the Energy Review itself outlines some of the changes needed in policy at UK level.<sup>104</sup>

It is in this context that it is argued that the most effective contribution to the productivity of the Scottish economy would be to focus the bulk of the saving from current Trident expenditure, £113m annually, on energy efficiency, clean energy and the development of renewable technologies. This would bring Scottish expenditure into line with that of comparable economies. Without it, it seems unlikely that Scotland would be able to achieve the objective of becoming a 'leading location' for renewable technologies and energy efficiency. It is also quite clear from the previous analysis that government spending on this area of the productive economy would not be duplicating existing private sector investment. On the contrary, the energy industry in Britain has been subject to extremely uneven development and would be a prime example of the displacement cost of Britain's very heavy military expenditure in areas of new and developing technologies.<sup>105</sup>

This case is also argued in a submission to this research from SERA Scotland, the Labour Party environmental pressure group.

#### **8.4 Forum for Renewable Energy Development in Scotland**

In 2004 *Harnessing Scotland's Renewable Energy Potential* was written for the Forum for Renewable Energy Development in Scotland.<sup>106</sup> The report assessed the potential for developing wave and tidal energy in Scotland and an action plan for developing that potential.

The report states as one of its conclusions that '7,000 direct jobs could be created in a diverse marine industry in Scotland' supported by sustained research, development and skills bases.

The report goes on to emphasise the need to create market pull and reduce financial risk. It is recommended that both the Scottish Executive and the UK government 'give a clear and early commitment to work together to determine the most efficient method and level of financial support that can be provided'. It is further argued that a supportive planning and regulatory framework must be developed, a route provided

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<sup>102</sup> House Commons Select Committee on Trade and Industry, Third Report of Session 2003-04, Resilience of the National Electricity Network, 2 March 2004, p. 8

<sup>103</sup> Enterprise and Culture Committee Sixth Report, June 2004, Renewable Energy in Scotland, para 61.

<sup>104</sup> BP and Scottish and Southern Energy announced in February that they were shelving plans for the first major carbon capture plant in the world, planned for Peterhead in association with the Miller oil field, as a result of the current electricity tariff (*Financial Times* 9 February 2007)

<sup>105</sup> Ron Smith, in summing up the main economic consequences of military expenditure, notes that there is a general consensus that the main cost is in the displacement effect on potential productive investment. Gleditsch, Nils et al. (ed) *Making Peace Pay: a Bibliography on Disarmament and Conversion with contributions from Michael Brzoscka and Ron P Smith*, International Peace Research Institute, Uppsala University, 2000

<sup>106</sup> *Harnessing Scotland's Marine Energy Potential* Executive Summary 2004  
[www.scotland.gov.uk/publications/2004/08/19742/41047](http://www.scotland.gov.uk/publications/2004/08/19742/41047)

to the market and work done with the regulator to ensure there is not infrastructure discrimination against emerging industries such as marine. The Scottish Renewables Forum is giving its backing to an industry-led Marine Energy Network.

There are currently over a dozen firms manufacturing equipment for renewable energy systems. These include wind turbines as well as hubs, towers, gearing and blades and turbine covers, energy efficient heating and lighting controls, condensing boilers, wood pellet burners, underfloor heating and solar water heating. In most cases imported equipment is used for heat pumps, photovoltaic panels, biofuel technology and small scale hydro and energy efficiency. On the other hand, Scottish-based Ocean Power Delivery has developed a viable technology for wave power generation and has already secured one major overseas order for its Pelamis system as well as government funding for a large-scale pilot in Orkney that will be linked to the grid.

### **8.5 Just Transition and Arms Conversion**

When workers are displaced through shifts in government policy, they and their communities should be supported in the period of flux. The clear lesson deriving from the examination of United States experience in the 1990s in Section 5 is that early pre-planning by government at central and local level can ensure the creation of more jobs than those displaced.

There is a clear precedent for this support in the Just Transition programme for the shift in environmental policy as it affects workers. The Trade Union Sustainable Development Advisory Committee - a UK wide group - has acknowledged the need for support for workers in the shift from landfill to recycling. 'The changes needed to secure a more sustainable approach to waste will impact upon working people and it is essential for the Government to ensure that the social and economic consequences are mitigated. **It is vital that workforce skills are developed to support a just and fair transition to sustainable jobs.**'<sup>107</sup> The authors of this report argue that this is equally valid for arms conversion as it is for environmental change. We propose that arrangements could be made whereby defence workers were supported on conserved salaries for a period of re-skilling with further financial support for relocation where relevant. Funds for this would be available from savings on the current Trident expenditure were Trident to be cancelled.

The product cycle for renewable energy production would seem to lend itself to a managed transition from Trident. Scottish Enterprise's 2005 review of the opportunities for the development of marine energy technology identified a 25 year product development cycle. The cycle for wave and tidal energy show key stages and timescales as follows: planning and feasibility (6 months); licensing and design (year 1 to 1.5); manufacture (years 2 to 2.5); testing and certification (year 3); installation (year 4); operation and maintenance (years 4 to 25); and decommissioning (from year 25).<sup>108</sup> Many of the skills currently used to maintain Trident would be directly relevant to renewables. The Lower Clyde also offers appropriate deep-water harbours for construction and a relevant industrial infrastructure. These can be found at Port Glasgow and Greenock as well as Coulport.

It is, however, important to stress that that the range of technologies with developmental potential are not confined to marine renewables.

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<sup>107</sup> TUSDAC report [www.defra.gov.uk/Environment/tusdac/reports/piu-waste/04.htm](http://www.defra.gov.uk/Environment/tusdac/reports/piu-waste/04.htm)

<sup>108</sup> Scottish Enterprise (2005). *Marine Renewable (Wave and Tidal) Opportunity Review*. Scottish Enterprise.

One technology of key relevance for Scotland, given the size of its coal reserves, is Clean Coal Technology and Carbon Capture and Storage. The Clean Coal Task Force has put forward a powerful case, based on security of supply and long term sustainability, for government investment and regulatory support.<sup>109</sup> Current technologies can already cut carbon emissions to one tenth of the level produced by working coal-fired power stations. There is also a potential time period for investment that coincides with Trident decommissioning - as existing power stations are taken out of operation under EU regulations during the next decade.

Other potential technologies would include:

- Carbon capture as applied to gas generation
- concentrating solar power
- enhanced geo-thermal systems
- integrated bio-energy systems

There will also be major requirements in the near future for investment in efficient energy technologies including micro-generation and combined heat and power systems and in energy conservation. Edinburgh City Council is already committed to developing small scale generation systems. The Scottish Communities and Householders Renewable Initiative was heavily oversubscribed in 2006.

### **8.6 Export Opportunities**

Scotland has the expertise in university departments and the potential skills base for transfer to the renewables industry to develop strong export markets. The First Minister Jack McConnell announced in January 2007 that there would be more science courses in schools at all levels and science and engineering courses at colleges and universities.

There has been recent agreement on a new partnership with the World Economic Forum and the World Business Council on sustainable development for an international framework with an aim of leveraging both private and public contributions with a \$20 billion fund to increase energy efficiency and investment in low carbon technologies. In China the government announced in 2006 the decision to build five eco-cities. Construction of the first, Dongtang, has already begun. All will require inputs of skilled work and scientific knowledge in technologies for energy saving and renewables.

Gordon Brown, Chancellor of the Exchequer, said at the time of the announcement, 'Building a low carbon economy means new markets, jobs and exports from environmental technologies and products. By 2010 the global environmental market could be worth almost \$700 billion. I am determined that Britain leads the development of this market and today I established a new Commission to make

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<sup>109</sup> Clean Coal task Force, A Framework for Clean Coal in Britain, Trade Unions' Sustainable Development Advisory Committee, June 2006 <http://www.tuc.org.uk/extras/coal.doc>

detailed proposals on securing what could be at least 100.000 more jobs over the next ten years' (9 November 2006).

## **8.7 Conclusion**

The issues of critical mass and economies of scale are paramount in any new industry whether mobile phones, computers, new fuel sources such as ethanol or renewables technology. The current level of R&D spending by government and business in Britain does not meet this. The addition of £113m annually in Scotland would very significantly increase a current annual spend of approximately £30m.

We have already itemised the reasons for proposing the area of energy efficiency, energy conservation, clean energy technologies and renewables as the main focus for the work of an Arms Conversion Agency. Although examples have been given to show the current potential for development, it should be stressed that they are essentially illustrative. Energy technologies are advancing quickly and funding for an Arms Conversion Agency would only become available as Trident is phased out in some years to come.

What can be concluded, however, is that energy will remain an area of critical potential for Scotland. This is because of the centrality of energy efficiency and carbon reduction as an area of policy commitment both in Britain and internationally and because of Scotland's particular geographical advantages. In terms of the use of improved technologies for wind and marine power, carbon capture and clean coal, Scotland possesses one of the strongest production bases in Europe. The required equipment could either be made in Scotland or be imported, and, while Scotland possesses a track record of research and development, the required level of investment has so far been largely lacking. For these reasons energy would seem to be the economically most beneficial area of focus for the Trident peace dividend.

In terms of employment we have already noted that an annual spend of £113m would generate jobs far in excess of those required for 300 redundant Trident workers at Faslane with relevant manufacturing and scientific skills. As we are dealing with productive workers, their output would additionally have a market value and thereby in time generate replacement income of at least £113 annually. The significance of the area of energy efficiency, energy conservation and renewables is therefore its potential for a wider regeneration within Scotland's productive economy.

## 9. POLICY IMPLEMENTATION

### 9.1 *The need for agencies to oversee employment conversion*

If a decision is taken not to renew the Trident missile system, it will be essential to establish structures at an early stage which will be responsible for the implementation of the alternative employment policy initiatives outlined in earlier sections. The lack of such structures currently represents a major weakness of the government's duty of care to those employed in the defence industry.

Since 1990 over 40,000 defence-related jobs have been lost in Scotland<sup>110</sup>. Despite the magnitude of these job losses, there has been little or no systematic overall planning for the re-employment of these very high level research and manufacturing skills<sup>111</sup>. The incoming Labour government in 1997 was committed to the establishment of an agency for arms diversification. But no programme for employment provision resulted. The Defence Diversification Agency established in 1998 was concerned with technologies and not skills. It was located within the Ministry of Defence's Defence Evaluation Research Agency (DERA) and, when DERA was privatised, reallocated to the MoD itself. It is currently headquartered at RAF Farnborough. The DDA has been solely concerned with utilising technologies originally developed in the defence sector elsewhere in industry and, as much defence R&D is now privatised, the scope for commercial use by other firms has become correspondingly limited.

The non-renewal of Trident provides a major opportunity for tackling the issue of arms conversion in terms of employment and skills. This is not just of importance for the relatively small number of workers who will lose employment as a result of the reduced role of the Faslane base but for the much greater numbers already made redundant and those who are likely to lose their employment as a result of the current disinvestment as defence contractors relocate capacity to the USA<sup>112</sup>. The Scottish Executive should commit to a Just Transition programme for defence workers if they lose their jobs due to shifts in public policy.

### 9.2 *Options and Implementation*

As detailed in section 4.3 above, there are two options for the decommissioning of Trident. The system could be phased out early and synchronised with the arrival in service of the Astute class submarines. The other option is to adopt the same timetable as the White Paper with Trident retained in service till 2022-2027. The first option would smooth employment levels at Faslane and save the most in terms of resources. It is this option we recommend here.

The first option would require the provision of alternative employment between 2016 and 2017. The second would require the provision of somewhat a somewhat greater amount of additional employment between 2022 and 2027.

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<sup>110</sup> Ian Goudie, 'Employment Consequences of a Ban on Arms Exports, Campaign against the Arms Trade', 2002. 28,000 have been lost in Strathclyde, 10,00 in Fife and 10,000 in the Lothians

<sup>111</sup> Strathclyde Defence Industries Working Group, *Redundant Defence Workers Survey*, 1996; Local Work, Swords into Ploughshares – Dividend or Deficit? No. 36, June 1992, Centre for Local Economic Strategies; Arms Conversion Project, Diversification 95, Glasgow City Council 1995.

<sup>112</sup> Richard Leonard, 'The Scottish Economy and the Economics of Dependency', *Star Wars*, Scottish CND, 2004, examines the disinvestment by BAE Systems and Rolls Royce matched by their purchase of production facilities in the USA – a condition for US DoD contracts. In 2005 BAE Systems drew more of its profit income from the US government than the British.

### **9.3 Implementing policy to ensure effective re-deployment**

#### **a) A Scottish Arms Conversion Agency**

This should be established immediately as an agency of the Scottish Executive, responsible to the Scottish Parliament, and funded by a portion of the Trident renewal expenditure that would have been raised from Scotland in UK taxes from 2007. Its remit would be to oversee and assist the redeployment of jobs from the defence industry in Scotland by actively promoting the development of industrial sectors utilising the same skills. It would be funded to research, develop, apply and produce technologies required for the creation of new jobs. These areas would include, among others, maximising the efficiency of renewable energy production in line with existing Scottish Executive goals and doing so to maximise the long-term employment of the scientific and construction skills such as those currently used for Trident maintenance, as outlined in section 4, as well as those already made redundant by the defence industry. It would work with, and appropriately fund, existing university-based renewable energy projects and those companies based in Scotland that are developing existing technologies. It would also have the freedom to develop the production of technologies *not* currently manufactured in Scotland. It should conduct a skills audit to identify future skills needed for sustainable jobs and promote courses and life long learning appropriately.

#### **b) A Lower Clyde Defence Skills Employment Office**

This would identify and manage the changing employment requirements of the Faslane base and maximise the employment of existing skills of those living within the Lower Clyde population. It would be supervised by a board representing Careers Scotland, JobCentre Plus, the STUC and relevant trade unions represented at Faslane, Flag Officer Scotland Command, the Scottish Arms Conversion Agency, local authorities and a representative of the social economy sector.

#### **c) North Clyde Lochs Development Partnership**

This would have a remit for developing the potential on the North Clyde lochs for residential development and tourism once the nuclear missile footprint has been removed and the scale of the Faslane/Coulport base complex reduced. The agency should be accountable to the Scottish Parliament and a board representing the relevant local authorities, local community councils, the Flag Officer Scottish Command, Scottish Natural Heritage, the Scottish Tourist Board, Scottish Enterprise, the social economy sector, Cooperative Development Scotland and the Nuclear Decommissioning Authority. It should be established four years before Faslane is no longer in use as a base for nuclear weapons - whether this is in 2016 or 2026. Funding would be required to underwrite the provision of infrastructure - particularly in terms of roads, the opening of the coastline for tourist access, the creation of moorings, the improvement of public transport and any necessary nuclear decontamination. The current proposal for creating a National Marine Park incorporating the South Argyll coastline makes this development particularly relevant.

### **9.4 Funding**

The savings to Scotland of non-renewing Trident have been detailed in section 3.2 above. In so far as the non-Trident usage of the £153m that would become available would be largely in areas of public expenditure not reserved to Westminster, it would be for the Scottish Parliament to decide on allocation. Given the priority currently

given by the Scottish Executive both to renewable energy and economic development, it would be reasonable to assume that £113m could be allocated to a Scottish arms conversion agency and £30m to area-directed redevelopment in neighbouring local authorities and the North Clyde Lochs. £10m would be retained by the Ministry of Defence to continue the employment of service personnel.



## 10. CONCLUSION

It has been widely claimed that Scotland would suffer economically as a result of job losses if Trident replacement does not proceed<sup>113</sup>. This report demonstrates the opposite to be the case.

If a decision is taken to replace the existing Trident system, the White Paper states that the investment costs of the replacement should not be at the expense of funding for existing conventional forces. These costs will at minimum be £1bn annually spread over fifteen to twenty years. This expenditure will have to be raised from either the general Treasury budget or new taxes. Scotland's contribution would be approximately £85m a year, the equivalent of 3,000 public sector jobs. Very little of this will come back to Scotland in employment in building the replacement. In terms of the continuing £1.78bn Scottish contribution to the *existing* operational costs of running Trident, already budgeted within existing defence expenditure, approximately 1,800 civilian jobs are directly or indirectly maintained in Scotland along with approximately 300 Scottish service personnel. As this is existing and committed expenditure, it would be available to fund alternative employment and could provide for considerably more than these jobs were Trident to be cancelled.

Overall, therefore, Scotland would economically be a net loser from any decision to replace Trident. There would be serious consequences for its public services and for employment over a prolonged period of time. On the other hand, cancellation would make available, as Scotland's proportionate share of current operating cost, considerably more resources than are currently received for spending on Trident in Scotland. This money could provide the basis for sustaining long-term employment growth.

The main conclusion of this report is therefore that the cancellation of Trident represents a key opportunity for new productive investment in the Scottish economy. It is proposed that in line with current Scottish Executive commitments on carbon emissions, the bulk of this investment should be in the development of technologies for energy efficiency, renewables and energy conservation. Such investment would utilise many of the skills currently used to service and maintain Trident submarines.

However, for such a programme to be successful, the Scottish Executive would need to intervene proactively. Over the past fifteen years over 40,000 jobs in defence maintenance and manufacturing have been shed in Scotland and a number of military bases closed. In contrast to the United States, the government has not taken any direct responsibility for managing this change or ensuring that no economic damage results to the wider locality. In the US plans typically start five years before the closure of a base with the objective of using public funds to create at least as many new jobs as previously existed in the defence sector. In some cases completely new publicly owned facilities are constructed such as a civilian airport or a university campus.

To ensure that a similar level of public responsibility is taken in Scotland, the Scottish Executive needs to commit to a Just Transition for defence sector workers. This report proposes the creation of a Scottish Arms Conversion Agency to oversee the

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<sup>113</sup> Scottish Parliament' Report, Debate on Trident Renewal, 21 December 2006, Jackie Baillie, MSP West Dunbartonshire: '11,000 P45s would be issued to hard-working people in my area and to thousands more throughout Scotland' if a decision were taken not to renew Trident.. Such claims have frequently been repeated in the press.

development of alternative employment and facilities. This report argues that the main focus of the agency should be technological development in the area of energy. The agency would also oversee locally accountable initiatives to ensure that maximum opportunity is taken to redevelop the economy of the Lower Clyde and utilise the new possibilities that would exist for opening up the coastline of the Gare Loch and Loch Long once nuclear weapons have been removed.

## **Acknowledgements**

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## SOURCES

### 1. Employment and Skills at Faslane

#### a) Babcock Naval Services website

This claims that the firm has 1485 employees directly employed at Faslane and Coulport plus 214 RN personnel and 51 MoD personnel seconded to Babcock. The contract covers the management of all submarine and surface ship maintenance and supplies key ancillary services including logistics, facilities management and the provision of hotel accommodation for sailors.

The skill breakdown for the 1485 personnel is approximately

300 technical and supervisory

300 clerical

900 manual of which 720 outfitting (electrical, plumbing, fitting) and 180 steel work

#### b) Parliamentary answer 8 January 2007

**Hansard 8 January 2007 Ms Katy Clark:** To ask the Secretary of State for Defence what the main skill groups are of civilian personnel employed at (a) Faslane naval base and (b) RNAD Coulport; and how many are employed in each of these skill groups. [105553] **Mr. Ingram:** Individual defence installations do not routinely publish personnel data, as different organisations and agencies are responsible for the same location or site. Figures for the posted location of Ministry of Defence civilian personnel are regularly produced at local authority level, using centrally held data. Estimates below this level are not routinely produced. Ministry of Defence civilian personnel are grouped into job families by broad skill sets and our best estimate of the numbers employed in those job families at HM Naval Base (HMNB) Clyde's Faslane and RNAD Coulport sites is shown as follows, in full-time equivalent terms.

These figures do not include the workforce of Babcock Naval Services, the commercial partner of HMNB Clyde, who employ additional civilian personnel spread across both sites. Estimates provided by Babcock Naval Services put the total of these personnel at around 1,430.

	<i>Faslane</i>	<i>Coulport</i>
Business Management and Improvement	20	10
Communications and Media	10	—
Commercial	10	—
Corporate Support	90	30
Engineering and Science	100	110
Estates	20	—
Health Professionals	10	—
Human Resources	20	—
Information	40	*
Logistics	100	40
Procurement	*	—
Programme and Project Management	60	10
Resource Management	20	—
Security, Health and Safety	570	480
Training and Education	20	—
Other	*	*
<b>Total</b>	<b>1,080</b>	<b>670</b>
<b>Notes:</b> 1. Full-time Equivalency totals that take account of the hours worked by each part-time employee, and will not be consistent with a headcount. 2. Numbers are rounded to the nearest 10, with figures of 5 or below denoted by *. 3. Due to the rounding methods used, totals may not always equal the sum of the parts.		

When rounding to the nearest 10, numbers ending in 5 have been rounded to the nearest multiple of 20 to prevent systematic bias	
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## 2. Publications

Alternative Employment Study Group, *Polaris and Trident: the Myths and Realities of Employment*, 1985; and *Future Imperfect: Trident and the Clyde*, 1988

Argyll and Bute District Council, *Cowal Local Plan* 30 October 1995

Arms Conversion Project, *The Need for Defence Diversification: the Report of the Diversification Day Conference*, Manchester June 1994, published by Glasgow City Council on behalf of Nuclear Free Local Authorities

Arms Conversion Project, *Diversification 95*, Glasgow City Council 1995

Bradden, D. and Bradley, J. (2005). *What Lies Beneath? Who Owns British Defence Contractors and Does it Matter?*. Defence Economic Research Unit. University of the West of England.

Campaign for Nuclear Disarmament (2006). *No Trident Replacement: No New Nuclear Weapons, No New Nuclear Arms Race*. CND. (2006b). *Safer Britain, Safer World: The Decision not to Replace Trident. Alternative White Paper*. CND.

Chalmers, M. and Walker, W. (2002). 'The United Kingdom, Nuclear Weapons, and the Scottish Question', *The Nonproliferation Review*, Spring.

Clark, C. (2003). 'Are we Wasting the Peace Dividend?'. *Town and Country Planning*, June 2003: 150-154.

Cowal Task Force, *Development Strategy and Action Plan for Cowal*, August 1991

Dardia, M., McCarthy, K., Schoeni, R., and Vernez, G. (1996). *Defense Cutbacks: Effects on California's Communities, Firms and Workers*. RAND National Defense Research Institute.

Defence Analytical Services Agency (2006). *Defence Statistics 2006*. DASA.; (2006b). *UK Regular Forces Distribution Across UK at October 2006 (Revised)*. DASA.

Gleditsch, Nils et al. (ed) *Making Peace Pay: a Bibliography on Disarmament and Conversion with contributions from Michael Brzoscka and Ron P Smith*, International Peace Research Institute, Uppsala University, 2000

Hartley, K (2002) *Defence Policy: A Triumph of Hope over Experience? Local Economy*.(2002). *Defence Economics and the Industrial Base*. Centre for Defence Economics. University of York.

Hartley, K 2003). *Naval Shipbuilding in the UK and Europe: A Case for Industrial Consolidation. Janes Naval*.

Hartley, K (2004). *The UK's Major Defence Projects: A Cause for Concern. Government Opportunities*.

Hartley, K. (2006) *The Defence Industrial Strategy: An Economists View. Government Opportunities*;

Hartley, K. (2006b) 'The Economics of UK Nuclear Weapons Policy', *International Affairs*, (Chatham House), 82,4, 2006

.

- Hartley, K and Hooper, N. (1992). *The Economics of Disarmament: Some Guidelines for Public Policy*. UNIDIR
- Hartley, K. and Hooper N.(1995). Value of UK Defence Industry to UK Economy. DTI.
- House of Commons 2000. *Defence Statistics 2000*.
- House of Commons (2006). *The Future of the British Nuclear Deterrent*. Research Paper 06/53.
- House of Commons Defence Committee, Future of the UK Strategic Nuclear Deterrent, the Strategic Context, Eighth Report 2005-6, 20 June 2006
- House of Commons Defence Committee, *UK's Strategic Nuclear Deterrent: Manufacturing and Skills Base*, December 2006
- HMSO, *The Future of the United Kingdom's Nuclear Deterrent* Cm 6994 December 2006
- International Energy Agency, *Renewables in Global Energy Supply*, 2007
- Jamison, Brian, *Britannia's Sceptre: Scotland and the Trident System*, Argyll Publishing, 2006
- Local Work, *Swords into Ploughshares - Dividend or Deficit ?* No. 36, June 1992, Centre for Local Economic Strategies (study of Fife and Rosyth)
- Loch Lomond and the Trossachs National Park (2005a). *Strategic Environmental Assessment Report*. Loch Lomond and the Trossachs National Park.  
 (2005b). *State of the Park Report*. Loch Lomond and the Trossachs National Park.  
 (2006). *Loch Lomond and the Trossachs National Park: National Park Plan*. Loch Lomond and the Trossachs National Park.
- Milne, T., Beach, H., Finney, J.L., Pease, R.S., Rotblat, J. (2002). *An End to UK Nuclear Weapons*. British Pugwash Group.
- Ministry of Defence (1984). *Proposed Development at the Clyde Submarine Base (Faslane and Coulport)*. MoD.
- O'Connell, James, 'Decisions over the Future of British Nuclear Weapons', paper presented to parliament, December 2006, British American Security Information Council.
- Parliamentary Office of Science and Technology, *Conversion and Diversion of Defence Technology and Manufacturing*, October 1992
- Ritchie, N. (2006). *Replacing Trident: Who Will Make the Decision and How?* Oxford research Group.
- Rural Development Commission, *Impact of the Peace Dividend on Rural England*, Economists Advisory Group Ltd, 1996.
- Schofield, Steven, *The UK Defence Industrial Strategy and Alternative Approaches* BASIC papers, No. 50, March 2006
- Schofield, Steven, *Oceans of Work: Arms Conversion Revisited*, British American Security Information Council, January 2007.
- Scottish CND, *Submission to the Strategic Defence Review*, 27 June 1997
- Scottish Parliament, Employment Losses, 28 March 2002: First Ministers Questions

Scottish Enterprise, *Marine Renewables*, 2006

Scottish Enterprise, *Economic Contribution of the Royal Navy's Clyde Bases*, Ekos Consultancy, 2003

Scottish Executive, *Response to the UK Energy Review*, 2006

Scottish Executive (2006). *Scottish Tourism: The Next Decade - a Tourism Framework for Change*. Scottish Executive.

Strathclyde Regional Council (1984). *Report on the proposed Development by the Ministry of Defence at the Clyde Submarine Base (Coulport and Faslane)*. SRC.

Strathclyde Defence Industries Working Group, *Redundant Defence Workers Survey*, 1996

White House (1999). *Economic Renewal: Community Re-use of Former Military Bases*. White House.