Argyll Array Wind Farm – Tiree Onshore Scenario Mapping

Socio-Economic Impacts

Report for Argyll and Bute Council

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Contents

1. Introduction

This report presents EKOS's independent analysis of the potential on-shore socio-economic impacts (positive and negative) of the proposed Argyll Array off-shore wind farm development at Tiree (the Array). The impacts will arise through the operation and maintenance (O+M) of the completed development.

This analysis builds on base information provided by the developer, Scottish Power Renewables (SPR), relevant previous research, EKOS experience of undertaking project appraisals and evaluations, and feedback from the community and businesses on Tiree.

For clarity, the onshore impacts of four scenarios have been tested:

- Scenario 1 Onshore O+M base on Tiree – an onshore base on Tiree would operate between the office, workshops, harbour and helipad. This scenario therefore has significant direct impacts occurring at the O+M base, which is assumed to be at the harbour with possible facilities at the airport.

  Onshore staffing on Tiree would mean direct impacts coupled with the need for built facilities on the island. For this scenario the harbour would need to be upgraded to accommodate workboats – this creates the potential to develop a marina on Tiree.

- Scenario 2 Offshore O+M base on a platform – an offshore platform servicing the Array would connect to a mainland port for staffing and equipment. This scenario has no or negligible direct impacts for Tiree in terms of O+M activity. Any impacts or benefits would occur wherever the O+M mainland base operates from.

  For this scenario the platform would operate similar to oil and gas developments, with O+M staff recruited nationally and transported to the Array by air or boat from the mainland. No daily contact with Tiree would be required, but fortnightly employment flights to the platform may be possible. Offshore employment opportunities will exist but will not be locally connected, and access to employment for residents of Tiree will be restricted.

- Scenario 3 Offshore O+M base on a mothership – an offshore mothership arrangement for servicing the Array would operate from a mainland port. This scenario would have an Operational Control Centre and helicopter crew based on Tiree with all other O+M activity based on the mothership. This scenario therefore has minor direct implications for Tiree in terms of O+M activity. The main impacts or benefits would occur wherever the mainland base operates from.

  For this scenario all physical O+M activity would be managed from the mothership, with daughter workboats acting as mobile platforms. O+M staff would return to the mainland operating port, based on a shift pattern. Offshore staffing would limit the impacts on Tiree to the operational control centre. Offshore employment opportunities will exist but will not be locally connected, and access to employment for residents of Tiree will be restricted.

- Scenario 4 Onshore O+M base and Mothership – an onshore O+M base would comprise office, harbour and helipad. Two motherships would use the harbour for crew changes, refuelling and supplies. This scenario is a combination of Scenarios 1 and 3 and therefore has direct impacts for Tiree in terms of the O+M base, which is assumed to be at the harbour with possible facilities at the airport.

  The Array O+M would be managed from Tiree but staff would be stationed offshore. The potential catchment for employees could include Coll (as well as the mainland) moderating the likely demands for local services and housing.

  For this scenario the harbour would need to be upgraded to accommodate workboats – this creates the potential to develop a marina on Tiree.

These four scenarios have been presented to, and discussed with the community, at consultation events on Tiree. Feedback from these events, and from direct consultation with businesses has informed the socio-economic impact appraisal, as presented in Chapter 4.

2. Socio-Economic Context

This section presents an outline socio-economic context at the Argyll and Bute Local Authority area, and at the local level for the island of Tiree. The analysis is based on official government and other data sources (which provide a range of data, but which is held at different geographic levels and covers different time periods) together with three substantial research studies:

- Tiree Community Growth Plan 2011-2016;
- Phase 2 Socio-Economic Report, Argyll Renewables Communities, SQW, November 2011; and
- Population and Epidemiology of Coll and Tiree, Sarah Griffin, 2011.

This assessment only considers the impact of the long-term operation and maintenance of the Arrray – the O+M jobs.

2.1 Argyll and Bute Council

The Argyll + Bute local authority area had a resident base of almost 90,000 people in 2010, accounting for around 1.7% of the Scottish population.

An outline review of the socio-economic context for the area shows:

- a lower proportion of working-age residents than the national average – 62.3% compared with 65.7% – reflecting that young adults in particular leave the area for further/higher education and employment;
- more residents are self-employed than the national average – 13% compared with 7.4% across Scotland;
- a lower rate of unemployment – 6.3% compared with 7.4% across Scotland;
- residents are better qualified over all qualification categories with only 9.5% having no qualifications, compared with a national average of 12.3%;
- a lower proportion of residents on out-of-work benefits – 3.4% compared with 4.0% across Scotland; and

- a greater incidence of part-time working, accounting for 36.8% of all jobs compared with a national average of 32.2%.

2.2 Tiree

There is only limited direct data available on the socio-economic make-up of Tiree. Based on data gathered from a range of sources, we have identified the following:

- the current population on Tiree is around 730 people, of whom around 58% are of working age – this is lower than both the Argyll + Bute and Scottish averages, as presented above;
- there is a high proportion of retired residents on Tiree, 27% compared to the Scottish average of 16%;
- of the working-age population:
  - 28% are in full-time employment, compared with a national average of 40%
  - 13% are in part-time employment, national average of 11%
  - 17% are self-employed, national average of 7%
  - 38% are economically inactive, national average of 35%;
- there are around 320-330 jobs on Tiree, made up of both employee and self-employed jobs – a significantly higher proportion are likely to be within the 'Hotels, Distribution and Retail' and 'Public Administration' sectors that both the local authority and national averages;
- SIMD data reports that around 8% of the population would described themselves as 'employment deprived' equating to around 35 people;
- recorded unemployment is under 2%, significantly lower than the Argyll + Bute and Scottish averages;
- there are around 520 houses on the island, of which:
  - 340 are permanently occupied homes
  - 146 are second and/or holiday homes, 30% of the total stock compared with the Argyll + Bute average of 16%
  - 36 are vacant;

- the average income for residents is around £21,000 per annum, compared with the Argyll + Bute and Scottish averages of around £26,000 per annum;

- average property prices on Coll and Tiree were £120,500 in 2010; and
- there are almost 300 crofts and 6 farms on Tiree, but data from 2004 reports that only 82 crofts were being actively farmed.

Based on consultation with local business owners/managers and residents, the following presents a qualitative review of the socio-economic position on Tiree:

- there is potential for the Array to help re-balance the population profile of Tiree by attracting working age residents and retaining school leavers. It is recognised that there has been a long-term population decline which, coupled with the higher profile of older residents and ongoing migration, may decline further;
- it is recognised that Scenario 1 will generate a significant uplift in the current population base of the island, but in historic context the increased population would be roughly equivalent to that of the 1950s-60s;
- there is an opportunity to up-skill the population and encourage school pupils to aim for permanent / full-time / well paid employment positions at the Array – there is interest from Argyll College in delivering bespoke engineering training for local residents (most likely from an off-site location);
- there is interest from residents in the creation of permanent full-time employment with good career prospects and salary. Some existing employees will therefore be interested in shifting from having one or several jobs to a new position at the Array. There is also an expectation that the Array is likely to attract 'returners' to Tiree i.e. those that already have an established family connection with the island;
- a significant proportion of residents are employed on several part-time and/ or seasonal working patterns – there is therefore greater capacity/need for more employment positions outwith the peak holiday seasons (Easter/ Summer/October). There is also a higher than average incidence of informal working patterns where residents provide services to each other on a non-employment contract, and sometimes non-cash, basis;
- there does not appear to be a high level of spare capacity within the labour market that could accommodate high numbers of new jobs at the Array without having a negative impact on existing activity. If a significant

proportion of Array jobs were taken by local residents, there would be (relatively) high levels of substitution as employers have to back-fill existing low pay / part-time jobs. Some of these could be taken by existing residents who might take on more employment, but there might also be a need to attract new residents to fill these positions – it is recognised that it will be more difficult to attract new residents to part-time / low pay jobs than it would be for permanent high skills jobs at the Array;

- while the scenarios will have both positive and negative impacts on the tourist base (see the scenario assessments), it is recognised that there is potential to use the increased population of new residents as a catalyst to develop and diversify the tourism offering on the island. There will be more people living on the island, more visitors (assuming the marina proceeds) and more people movements to and from the mainland;

- feedback from the schools suggests that they are likely to be able to accommodate the forecast additional pupils so long as they are spread across the different age groups and don't all arrive in the same year. There may be a need for additional teaching staff with Scenario 1, but there are ongoing fluctuations in school rolls which has been managed in the past;

- the island's doctor is likely to be able to accommodate the forecast additional patients – there is already a need to deal with major uplifts in the population base over peak holiday seasons;

- the dentist may need to increase the time that they spend on Tiree to accommodate the forecast uplift in population associated with Scenario 1, but this is likely to be minimal;

- in retail terms, the forecast additional residents are not likely to have a significant impact on businesses as they already deal with major uplifts over peak holiday seasons. Scenario 1 will have the greatest impact and may require some additional staff and/or increase in the hours worked by existing part-time staff; and

- the Array could have a negative impact on crofting as a lifestyle choice if a significant proportion of the new jobs are taken by crofters and/or they back-fill employment positions left vacant by others. This would have a direct knock-on negative impact on land management, environment quality and diversity, which could in turn negatively impact on tourism. Many of the existing crofters on the island balance crofting with other part-time jobs.

3. Key Assumptions

In assessing the potential on-shore impacts of the proposed Array development, we have made a number of critical assumptions:

- for each option two scenarios have been considered where local residents secure either 15% or 25% of the O+M jobs;
- for each resident who secures a jobs at the Array, it is assumed that 1.25 jobs will need to be back-filled as residents substitute a number of part-time positions for one full-time position;
- each job at the Array will generate 0.15 net additional multiplier position on Tiree through business spend and supplier linkages;
- of the residents who move to Tiree to take up employment at the Array, it is assumed that 70% are single and 30% comprise adult only or adult and child families, with an average of 2.66 persons per family household;
- of the new child residents, it is assumed that 30% are pre-school, 40% are primary school age and 25% are secondary school age;
- each new household will generate 14 days visitor trips per annum – visiting friends and relatives – each of whom will spend £15 per day on Tiree, generating additional economic activity;
- new family households will be accommodated in existing houses that are refurbished (30%), new houses to be built (40%) and houses taken from the holiday/second home sector (30%);
- new single residents will be accommodated in existing houses that are refurbished (15%), new single houses to be built (10%), new shared housing units (60%) and houses taken from the holiday/second home sector (15%);
- each new household will spend an average of £100 per week on Tiree;
- while not certain, we have assumed that scenarios 1 and 4 will result in the development of a new 50 berth marina, of which 25 will be permanent berths and 25 will be visitor berths;
- the visitor berths will used at 100% capacity over a four month period and will also be used for 60 other days across the year, each berth will have an average of four people per berth, spending in total £100 per night on Tiree;

- of the new adult residents who move to Tiree (non-Array workers), 10% will establish new businesses, creating an average of 2 f/t employment positions per business;
- of the other non-Array adult residents, 65% will seek employment and 25% will be economically inactive; and
- those houses that are taken from the second/holiday homes sector will incur lost income to the island – it is assumed that each house is occupied for 15 weeks per annum by an average of four people spending £35 per day in total.

The socio-economic appraisals presented on the following pages are based on these assumptions.

4. Scenario Impact Analysis

This chapter presents the likely socio-economic impacts associated with the four scenarios for O+M of the Array. There is very little benchmark or evaluation evidence that can be applied to the assessment of impact, therefore we have based our appraisal on our professional judgement, as influenced by the feedback and views of local residents and businesses.

In analysing the scenarios, it is clear that there are both positive and negative relationships between different types of impacts, in particular:

- the higher the number of permanent Tiree-based O+M jobs that are created, the greater the physical and social impact that occurs i.e. through new housing development and changes in the culture/way of life on the island;
- the higher the number of permanent Tiree-based O+M jobs that are created, the greater the potential to secure professional (and highly paid) employment positions to existing residents, particularly school-leavers;
- the higher the proportion of jobs that are taken by local residents, the greater the issue of substitution i.e. more residents giving up part-time and seasonal work that will need to be back-filled by other residents. Some employment is likely to be taken by other residents (both new and existing) but there may be a long-term negative effect on some types of employment, particularly crofting which is tied to the resident's house and is unlikely to be back-filled;
- the lower the proportion of jobs that are taken by local residents, the lower the positive impact in supporting a long-term sustainable economy for Tiree i.e. there will be a greater turnover of employees who relocate to the island for a few years but ultimately move away;
- in order to maximise local employment prospects a bespoke training initiative will need to be developed and delivered for residents to ensure that they have the skills required – this is likely to be based outwith Tiree (to maximise the catchment base) and therefore require residents to live away from the island for a short period of time;

- the higher the number of new permanent residents that are attracted to live on Tiree, the greater the number of second/holiday home owners who will shift from servicing the visitor market and seek permanent tenants i.e. the higher the value of lost spend from tourists to the island;
- the higher the number of new permanent residents, the greater the number of new build houses that will be required creating competition with local residents i.e. there is already an identified housing shortfall on the island;
- the lower the number of new permanent residents that are attracted to live on Tiree, the greater the imbalance between visual and economic impacts i.e. residents will have the negative visual impact of the Array, but not the positive economic impacts associated with new jobs/residents;
- the lower the number of new permanent residents the lower the potential negative impact in relation to dilution of Gaelic culture, loss of way of life, potential increase in crime, vehicle damage to machair, etc;
- there is no evidence to suggest that the Array development will have a negative impact on tourism and fishing on Tiree, however, there is potential that some visitors might not choose to come to Tiree, meaning some lost income to the island; and
- there is some indication that crofting could be negatively impacted and therefore scope for lost income to the island as well as a major shift in the way of life, and the way the island's habitats are managed – these have potential negative effects on the attractiveness of the island, and therefore on tourism.

There is therefore no right or wrong answer in terms of the 'best' impact for Tiree, but it is important that the effects of each scenario are understood.

4.1 Scenario 1

This section presents the estimated socio-economic impacts on Tiree and the wider Argyll and Bute economy associated with Scenario 1 – giving high and low impacts depending on whether 15% or 25% of the direct Array jobs go to local residents. The assessment is made based on the assumptions outlined at Chapter 3.

Direct Array and Additional Economic Impacts

Scenario 1 assumes that there will be 150 direct O+M jobs created on the Array, of which we would estimated that between 23 (15%) and 38 (25%) will be taken by local residents, with the remainder taken by employees who will relocate to Tiree.

The new activity will generate additional employment through business supplier purchases, employee purchases, and visitor purchases. We have estimated that this new activity will generate additional employment of:

- 40 new jobs on Tiree;
- 75 new jobs in Argyll + Bute; and
- 120 new jobs in Scotland.

An increase of 190 new jobs on Tiree[1] equates to around a 60% increase in the number of jobs currently based on Tiree.

Together these direct (150) and additional (40) jobs will generate additional economic value on Tiree. The Government's preferred method of assessing economic value is through Gross Value Added (GVA) which in broad terms is a measure of the salary and profits generated.

Our assessment would suggest that around £6.6 million GVA will be generated through this additional economic activity. It is expected, however, that a high proportion of this will be spent outwith Tiree, but a significant proportion will be captured within Argyll and Bute, supporting further employment at the local authority level.

1 150 direct Array jobs, plus 40 additional jobs.

The GVA created through the direct and additional jobs at the Argyll + Bute level is estimated at £7.0 per annum and at the Scottish level of £7.5m per annum.

It is important to note that these employment and GVA impacts are not cumulative but represent the scale of impact at these different spatial levels.

Social Impacts

It is expected that a significant proportion of the employees at the Array will be new residents – between 113 (75%) and 128 (85%) of the total jobs. These new residents will comprise a mix of:

- single adults making up 70% of all new employees – between 79 and 89 people;
- adults with partners/spouses making up 30% of all new employees who bring an equal number of other adults to live on Tiree – 34-39 workers plus partners/spouses equating to 68-78 people; and
- children aged from 0-15 assuming 0.66 children per family household i.e. 34-39 x 0.66 – between 22 and 25 children.

The total new population living on Tiree is therefore 146-166 adults and 22-25 children. This equates to around a 25% increase in the current population base of Tiree, estimated at 730 people. It is likely that a significant proportion of the single adults will not make a permanent move to Tiree, but will most likely live there only during working periods, and that there will be a high level of turnover in this group.

It is likely that adults with partners/spouses (and children) will be more likely to make a permanent move to Tiree becoming integrated into the local community.

The adult population will be made up of those who work directly on the Array (13-128 people), and the spouses/partners of Array workers (34-39 people). We have assumed that these non-Array adults will be made up of:

- those who will look for employment on Tiree – 22-25 people (65%);
- those who will start (or relocate) their own business – 3-4 people (10%); and
- those who will not work (economically inactive) – 8-10 people (25%).

While individual people may change over the operating period of the Array, it is assumed that the volume of impacts described above will be permanent.

Based on our assessment of 23-30 of the Array jobs being taken up by local residents, we have estimated a knock-on effect of creating the need to back-fill between 28-47 existing jobs on Tiree as residents substitute existing employment (full/part time, permanent/temporary/seasonal) for permanent work at the Array.

A high proportion of these jobs could be taken by the 22-25 new residents (as outlined in the bullets above) who will relocate to Tiree with their partners/spouses. There would, however, be a need for existing residents to fill some of these positions. Alternatively there will be a need to attract wholly new residents (not included in this assessment) to be recruited if these jobs are to be back-filled, with no negative substitution effects for the island's economy.

Based on consultation with education and health professionals on Tiree, it is assumed that this level of impact can be accommodated within the existing service provision, with the following provisos:

- the uplift in population will have a minimal impact on local health services and new residents are likely to be fairly easily accommodated on the patient roll. The population on the island can increase by more than 500 people over peak holiday periods, many of whom will seek medical assistance.

  The impact of new residents is likely to be accommodated with no need for any increase in service provision.

- at present Tiree is served by a part-time dentist who works on the island for one week in every four.

  Whilst there is a need to provide emergency dental care for visitors to the island, the majority of dental work is pre-planned. The impact of new residents is therefore likely to require a modest increase in the existing service provision, based on a 25% uplift in population.

- Tiree provides both primary (English and Gaelic) and secondary education to residents. The current roll of the primary is 44 pupils (across both English and Gaelic units) with four teachers. The current roll of the secondary is 39 pupils with around 10 full-time equivalent positions. There is, however, significant variation in the roll with the secondary dropping from 56 to 39 over the past seven years and a further drop forecast for next year to around 30 pupils.

  The impact of 10 additional primary and 6 secondary pupils can be accommodated within the physical capacity of the school buildings, but an increase of 25% and 15% respectively on the current roll of the primary and secondary, might require a small uplift in additional teaching staff.

Housing Impacts

The effects of Scenario 1 will generate both permanent and one-off impacts on the local housing market.

In order to accommodate the new residents who will relocate to Tiree to work on the Array, there will be a need to provide new housing. Our analysis shows that depending on the proportion of jobs that are taken by local residents and therefore those that must be filled by new residents, there will be a need for 81-92 new permanent homes.

Our analysis assumes that there would be sufficient water, sewerage and power supply to meet these additional houses, but this would need to be investigated in detail at the appropriate stage.

We have assumed that these houses will be made up from the following stock:

- existing vacant and derelict houses on Tiree that will be refurbished to provide family homes – 22-25 units;
- new houses that are built to accommodate single employees, based on 3 adults per unit – 16-18 units;
- new houses that are built to accommodate families – 21-24 units; and
- existing houses that are taken from the second/holiday home sector and let as permanent residences – 22-25 units.

These impacts are assumed to be permanent and continuous.

There will also be one-off impacts within the construction sector associated with refurbishment and development to create new homes. Due to the nature of construction activities, construction jobs are based on an assessment of Man Year Equivalents (MYE). This method allows the number of people that will work on the construction activities over the build period (which will vary between full-time, part-time, permanent, temporary and contract) to be estimated as an annual equivalent post i.e. the total number of full-time workers that would be needed to complete the developments if all the construction activity was undertaken over a one year period.

Our analysis identifies that these activities would lead to the creation of around 40 MYE posts, generating one-off GVA impacts of around £1.15 million.

Tourism Impacts

Scenario 1 will generate tourism impacts for Tiree.

The extent to which positive impacts will outweigh the negative is highly dependent on the development of a new marina within the harbour – we have assumed a 50 berth marina, of which 25 berths will be exclusively for the use of visiting boats. Impacts have been estimated at:

- positive impacts will be generated through the attraction of visitors who are visiting friends/relatives on the island and also those using the visitor berths at the marina:
  - with a marina included, the impacts are estimated at around 6,250 visitor days per annum, generating £480,000 spend each year
  - without a marina the impacts are estimated at around 1,680 visitor days per annum generating £25,000 spend each year; and
- these positive impacts are offset through the negative effects of lost visitors as some holiday and second homes are removed from this sector and owners lease them as permanent residences to Array workers:
  - the impacts are estimated at around 10,000 lost visitor days per annum that would have generated around £85,000 spend each year.

Summary Impacts

Scenario 1 generates the greatest impact on Tiree, primarily through the attraction of new residents who will work at the Array.

In total our analysis identifies the following socio-economic benefits for Tiree associated with Scenario 1:

- 150 permanent jobs based on Tiree through the Array;
- 38-40 other jobs created through new business and resident spend;
- 23-38 jobs at the Array will go to local residents, leaving 28-47 jobs to be back-filled by others (assuming an average of 1.25 jobs per employed resident); and
- 22-25 new adult residents will seek employment when they relocate to Tiree, four will be self-employed and 10 will be economically inactive.

Outwith the Array, we would estimate that between 64-81 new jobs will be created/ need to be backfilled as a result of Scenario 1, but we have estimated only 22-25 new adult residents are likely to seek employment.

The analysis shows a gap of 40-50 positions that would need to be filled either by existing residents, new residents who expect to be economically inactive, or by attracting more new residents to the island. Consultation with local residents and business owners raises concerns about the capacity (and interest) of existing residents to take on these new employment opportunities.

As presented in Chapter 2, however, around 35 residents have previously described themselves as 'employment deprived'. There is no data to show whether this relates to the need for full- or part-time positions and therefore no means of assessing the employment gap that could arise.

In addition to the benefits there is also potential for negative impacts to occur, namely a large influx of new people living on the island, possible reduction in crofting activity, change in land management (potentially affecting tourism), dilution of Gaelic culture, loss of way of life, increased crime, vehicle damage to machair, etc.

The summary impact table for Scenario 1 is presented over.

Table 1: Scenario 1 Impact Assessment

Scenario 1 Impact Assessment	15% Jobs for Locals	25% Jobs for Locals
Direct Array and Additional Economic Impacts (Annual)		
Total direct jobs (Array O+M)	150	150
Direct jobs for local residents	*(23)*	*(38)*
Direct jobs for new residents	*(127)*	*(112)*
Additional jobs – new business, resident and visitor spend	+40	+38
Total GVA generated (direct + additional jobs) per annum	£6.6m	£6.58m
Social Impacts (Permanent)		
New population on Tiree	191	169
Single adults	*(89)*	*(79)*
Family adults	*(77)*	*(68)*
Children	*(25)*	*(22)*
New adult population	166	146
Array workers	*(128)*	*(113)*
Non-Array adults – looking for work	*(25)*	*(22)*
Non-Array adults – start new business	*(4)*	*(3)*
Non-Array adults – economically inactive	*(10)*	*(8)*
Jobs to be back-filled	28	47
Housing Impacts (Permanent)		
Total homes for new residents	92	81
New homes – existing refurbished family homes	*(25)*	*(22)*
New homes – new build shared housing (3 adults per unit)	*(18)*	*(16)*
New houses – new build family homes	*(24)*	*(21)*
New houses – from second/holiday homes	*(25)*	*(22)*
Housing Construction Impacts (One-Off)		
Housing construction jobs (direct + additional jobs)	41 MYEs	36 MYEs
Total housing construction GVA generated	£1.236m	£1.091m
Tourism Impacts (Annual)		
New tourist days per annum (VFR + marina)	6,300	6,100
New tourist spend (VFR + marina)	£0.483m	£0.480m
Lost tourist days per annum (lost holiday homes)	-10,400	-9,200
Lost tourist spend (lost holiday homes)	-£0.091m	-£0.081m

Source: EKOS Economic Impact Analysis, Scenario 1, December 2011

4.2 Scenario 2

This section presents the estimated socio-economic impacts on Tiree and within the wider Argyll + Bute economy associated with Scenario 2. The assessment is made based on the assumptions outlined at Chapter 3.

Direct Array and Additional Economic Impacts

Scenario 2 assumes that there will be 150 direct O+M jobs created on the Array, but only five of which will be based on Tiree, with the remaining 145 stationed on an off-shore platform, serviced from a mainland port through workboats and a helicopter. It is assumed that 75 employees will be resident within Argyll + Bute and all 150 will be resident in Scotland.

An increase of five new jobs on Tiree will have a minimal impact, equating to around a 2% increase in the number of jobs currently based on Tiree.

Of the five jobs that will be based on Tiree, we have assumed that one will be taken by a local resident and the remaining four will be taken by new residents who will move to Tiree. These five jobs will generate around £0.2m GVA per annum.

It is expected, however, that a high proportion of this will be spent outwith Tiree, but a significant proportion will be captured within Argyll and Bute, supporting employment at the local authority level.

The new activity will generate additional employment through business supplier purchases, employee purchases, and visitor purchases. We have estimated that this new activity will generate additional employment of:

- no new jobs on Tiree;
- 25 new jobs in Argyll + Bute, generating net additional GVA of £3.3m per annum; and
- 90 new jobs in Scotland, generating net additional GVA of £7.1m per annum.

Social, Housing and Construction Impacts

The social impacts of the Array will have a very limited effect on the existing social make-up of Tiree, and that the employees resident at the Argyll + Bute and Scottish levels will either be already resident in these locations, or will be assimilated into them with very little additional social effects.

It is assumed that the four additional Array workers will be accommodated within the existing housing stock on Tiree (accommodated in housing removed from the second/holiday homes stock) with very limited impacts, and that there will be no additional housing construction activity or impacts.

As Scenario 2 does not have the potential to support the development of a new marina at the harbour, the tourism impacts will be neutral i.e. any VFR tourism spend will be offset by the removal of holiday spend.

There are therefore no additional housing, construction or tourism effects to consider with Scenario 2, but there are social effects. An important positive aspect of this scenario is that many potential negative impacts would be avoided such as helicopter flights, a reduction in crofting activity, change in land management (and the consequent potential impact on tourism), dilution of Gaelic culture, loss of way of life, crime, vehicle damage to machair, and changes to house prices/availability, etc.

Summary Impacts

Scenario 2 generates very limited impacts on Tiree. In total our analysis identifies the following socio-economic effects:

- five permanent jobs based on Tiree through the Array;
- no additional jobs created through new business and resident spend;
- one job at the Array will go to a local resident, any need to back-fill this position can be accommodated easily by other residents; and
- the four new adult employees will be made up of three single adults and one who will relocate their family – five new adults and one new child in total.

The summary impact table for Scenario 1 is presented over.

Table 2: Scenario 2 Impact Assessment

Scenario 2 Impact Assessment	
Direct Array and Additional Economic Impacts (Annual)	
Total direct jobs (Array O+M)	5
Direct jobs for local residents	*(1)*
Direct jobs for new residents	*(4)*
Additional jobs – new business, resident and visitor spend	-
Total GVA generated (direct + additional jobs) per annum	-
Social Impacts (Permanent)	
New population on Tiree	6
Single adults	*(3)*
Family adults	*(2)*
Children	*(1)*
New adult population	5
Array workers	*(4)*
Non-Array adults – looking for work	*(1)*
Non-Array adults – start new business	-
Non-Array adults – economically inactive	-
Jobs to be back-filled	1
Housing Impacts (Permanent)	
Total homes for new residents	2
New homes – existing refurbished family homes	-
New homes – new build shared housing (3 adults per unit)	*(1)*
New houses – new build family homes	-
New houses – from second/holiday homes	*(1)*
Housing Construction Impacts (One-Off)	
Housing construction jobs (direct + additional jobs)	-
Total housing construction GVA generated	-
Tourism Impacts (Annual)	
New tourist days per annum (VFR)	-
New tourist spend (VFR)	-
Lost tourist days per annum (lost holiday homes)	-
Lost tourist spend (lost holiday homes)	-

Source: EKOS Economic Impact Analysis, Scenario 2, December 2011

4.3 Scenario 3

This section presents the estimated socio-economic impacts on Tiree and the wider Argyll and Bute economy associated with Scenario 3 – giving high and low impacts depending on whether 15% or 25% of the direct Array jobs go to local residents. The assessment is made based on the assumptions outlined at Chapter 3.

Direct Array and Additional Economic Impacts

Scenario 3 assumes that there will be 150 direct O+M jobs created on the Array, but only 25 of which will be based on Tiree, with the remaining 125 stationed on an off-shore platform, serviced from a mainland port through workboats and a helicopter. It is assumed that 85 employees will be resident within Argyll + Bute and all 150 will be resident in Scotland.

An increase of 25 new jobs on Tiree will have a small impact, equating to around a 4% increase in the number of jobs currently based on Tiree. Of the 25 jobs, we have estimated that between 4 (15%) and 6 (25%) will be taken by local residents, with the remainder taken by employees who will relocate to Tiree.

The new activity will generate additional employment through business supplier purchases, employee purchases, and visitor purchases. We have estimated that this new activity will generate additional employment of:

- 4 new jobs on Tiree, generating additional GVA of £1.075m per annum;
- 29 new jobs in Argyll + Bute, £3.8m GVA per annum; and
- 94 new jobs in Scotland, £7.2m GVA per annum.

It is important to note that these employment and GVA impacts are not cumulative but represent the scale of impact at these individual spatial levels.

Social Impacts

It is expected that a significant proportion of the employees at the Array will be new residents – between 19 (75%) and 21 (85%) of the total jobs. These new residents will comprise a mix of:

- single adults making up 70% of all new employees – between 13-15 people;
- adults with partners/spouses making up 30% of all new employees who bring an equal number of other adults to live on Tiree – 6 workers plus partners/spouses equating to 12 people; and
- children aged from 0-15 assuming 0.66 children per family household i.e. 6 x 0.66 = 4 children.

The total new population living on Tiree is therefore 25-27 adults and 4 children. This equates to around a 4% increase in the current population base of Tiree, estimated at 730 people. It is likely that a significant proportion of the single adults will not make a permanent move to Tiree, but will most likely live there only during working periods, and that there will be a high level of turnover in this group.

It is likely that adults with partners/spouses (and children) will be more likely to make a permanent move to Tiree becoming more integrated into the local community.

The adult population will be made up of those who work directly on the Array (19-21 people), and the spouses/partners of Array workers (6 people). We have assumed that these non-Array adults will be made up of:

- those who will look for employment on Tiree – 4 people;
- those who will start (or relocate) their own business – 1 person; and
- those who will not work (economically inactive) – 1person.

While individual people may change over the operating period of the Array, it is assumed that the volume of impacts described above will be permanent.

Based on consultation with education and health professionals on Tiree, it is assumed that this level of impact can be accommodated within the existing service provision with no adverse impacts.

Based on our assessment of 4-6 of the new Array jobs being taken by local residents, we would estimate a minimal knock-on effect of the need to back-fill existing jobs, estimated at 5-8 jobs. We would estimate that there is sufficient capacity within the existing labour market to provide this level of cover i.e. 4 new residents looking for work plus existing residents looking for (additional) work.

An important positive aspect of this scenario is that many potential negative impacts would be avoided (and/or significantly reduced) such as helicopter flights, a reduction in crofting activity, change in land management (and the consequent potential impact on tourism), dilution of Gaelic culture, loss of way of life, crime, vehicle damage to machair, and changes to house prices/availability, etc.

Housing Impacts

The effects of Scenario 3 will generate both permanent and one-off impacts on the local housing market.

In order to accommodate the new residents who will relocate to Tiree to work on the Array, there will be a need to provide new housing. Our analysis shows that depending on the proportion of jobs that are taken by local residents and therefore those that must be filled by new residents, there will be a need for around 15 new permanent homes.

We have assumed that these houses will be made up from the following stock:

- existing vacant and derelict houses on Tiree that will be refurbished to provide family homes – 4 units;
- new houses that are built to accommodate single employees, based on 3 adults per unit – 3 units;
- new houses that are built to accommodate families – 4 units; and
- existing houses that are taken from the second/holiday home sector and let as permanent residences – 4 units.

These impacts are assumed to be permanent and continuous.

There will also be one-off impacts within the construction sector associated with refurbishment and development to create new homes. Due to the nature of construction activities, construction jobs are based on an assessment of Man Year Equivalents (MYE). This method allows the number of people that will work on the construction activities over the build period (which will vary between full-time, part-time, permanent, temporary and contract) to be estimated as an annual equivalent post i.e. the total number of full-time workers that would be needed to complete the developments if all the construction activity was undertaken over a one year period.

Our analysis identifies that these activities would lead to the creation of around 7 MYE posts, generating one-off GVA impacts of around £0.19 million.

Tourism Impacts

As Scenario 3 does not have the potential to support the development of a new marina at the harbour, the tourism impacts will be neutral i.e. any VFR tourism spend will be offset by the removal of holiday spend.

Summary Impacts

Scenario 3 generates the some impact on Tiree, primarily through the attraction of new residents who will work at the Array.

In total our analysis identifies the following socio-economic benefits for Tiree associated with Scenario 3:

- 25 permanent jobs based on Tiree through the Array;
- 4 other jobs created through new business and resident spend;
- 4-6 jobs at the Array will go to local residents, leaving 5-8 jobs to be back-filled by others (assuming an average of 1.25 jobs per employed resident); and
- 4 new adult residents will seek employment when they relocate to Tiree, 1 will be self-employed and 1 will be economically inactive.

It is assumed that these new non-Array residents can be assimilated into the local employment base with no, or very limited, impact.

Outwith the Array, we would estimate that between 9-12 new jobs will be created on Tiree as a result of Scenario 3, but only 4 new adult residents who are likely to seek employment. It is assumed that these other positions can be filled by existing residents taking on new/additional jobs.

The summary impact table for Scenario 3 is presented over.

Table 3: Scenario 3 Impact Assessment

Scenario 3 Impact Assessment	15% Jobs for Locals	25% Jobs for Locals
Direct Array and Additional Economic Impacts (Annual)		
Total direct jobs (Array O+M)	25	25
Direct jobs for local residents	*(4)*	*(6)*
Direct jobs for new residents	*(21)*	*(19)*
Additional jobs – new business, resident and visitor spend	+4	+4
Total GVA generated (direct + additional jobs) per annum	£1.075m	£1.072m
Social Impacts (Permanent)		
New population on Tiree	32	28
Single adults	*(15)*	*(13)*
Family adults	*(13)*	*(11)*
Children	*(4)*	*(4)*
New adult population	28	24
Array workers	*(21)*	*(19)*
Non-Array adults – looking for work	*(4)*	*(4)*
Non-Array adults – start new business	*(1)*	*(1)*
Non-Array adults – economically inactive	*(2)*	*(1)*
Jobs to be back-filled	5	8
Housing Impacts (Permanent)		
Total homes for new residents	15	15
New homes – existing refurbished family homes	*(4)*	*(4)*
New homes – new build shared housing (3 adults per unit)	*(3)*	*(3)*
New houses – new build family homes	*(4)*	*(4)*
New houses – from second/holiday homes	*(4)*	*(4)*
Housing Construction Impacts (One-Off)		
Housing construction jobs (direct + additional jobs)	7 MYEs	6 MYEs
Total housing construction GVA generated	£0.206m	£0.182m
Tourism Impacts (Annual)		
New tourist days per annum (VFR)	300	260
New tourist spend (VFR)	£4,500	£4,000
Lost tourist days per annum (lost holiday homes)	-1,700	-1,500
Lost tourist spend (lost holiday homes)	-£15,000	-£13,500

Source: EKOS Economic Impact Analysis, Scenario 3, December 2011

4.4 Scenario 4

This section presents the estimated socio-economic impacts on Tiree and the wider Argyll and Bute economy associated with Scenario 4 – giving high and low impacts depending on whether 15% or 25% of the direct Array jobs go to local residents. The assessment is made based on the assumptions outlined at Chapter 3.

Direct Array and Additional Economic Impacts

Scenario 4 assumes that there will be 150 direct O+M jobs created on the Array, 60 of which will be based on Tiree, with the remaining 90 stationed on an off-shore mothership, serviced from a mainland port through workboats and a helicopter. It is assumed that 100 employees will be resident within Argyll + Bute and all 150 will be resident in Scotland.

An increase of 60 new jobs on Tiree will have a large impact, equating to around a 20% increase in the number of jobs currently based on Tiree. Of the 60 jobs, we have estimated that between 9 (15%) and 15 (25%) will be taken by local residents, with the remainder taken by employees who will relocate to Tiree.

The new activity will generate additional employment through business supplier purchases, employee purchases, and visitor purchases. We have estimated that this new activity will generate additional employment of:

- 23-24 new jobs on Tiree, generating additional GVA of £2.7m per annum;
- 50 new jobs in Argyll + Bute, £4.6m GVA per annum; and
- 110 new jobs in Scotland, £7.3m GVA per annum.

It is important to note that these employment and GVA impacts are not cumulative but represent the scale of impact at these individual spatial levels.

Social Impacts

It is expected that a significant proportion of the employees at the Array will be new residents – between 45 (75%) and 51 (85%) of the total jobs. These new residents will comprise a mix of:

- single adults making up 70% of all new employees – between 32 and 36 people;
- adults with partners/spouses making up 30% of all new employees who bring an equal number of other adults to live on Tiree – 13-15 workers plus partners/spouses equating to between 26 and 30 people; and
- children aged from 0-15 assuming 0.66 children per family household – i.e. 13-15 x 0.66 = 9-10 children.

The total new population living on Tiree is therefore 58-66 adults and 9-10 children. This equates to around a 20% increase in the current population base of Tiree, estimated at 730 people. It is likely that a significant proportion of the single adults will not make a permanent move to Tiree, but will most likely live there only during working periods, and that there will be a high level of turnover in this group.

It is likely that adults with partners/spouses (and children) will be more likely to make a permanent move to Tiree becoming more integrated into the local community.

The adult population will be made up of those who work directly on the Array (45-51 people), and the spouses/partners of Array workers (14-15 people). We have assumed that these non-Array adults will be made up of:

- those who will look for employment on Tiree – 9-10 people;
- those who will start (or relocate) their own business – 2 people; and
- those who will not work (economically inactive) – 3 people.

While individual people may change over the operating period of the Array, it is assumed that the volume of impacts described above will be permanent.

Based on consultation with education and health professionals on Tiree, it is assumed that this level of impact can be accommodated within the existing service provision.

Based on our assessment of 9-15 of the new Array jobs being taken by local residents, we would estimate a knock-on effect of the need to back-fill existing jobs (11-19 jobs) as residents substitute other employment for jobs at the Array. We would estimate that there is likely to be sufficient capacity within the existing labour market to provide this level of cover i.e. 10 new residents looking for work plus existing residents looking for new (additional) work.

Housing Impacts

The effects of Scenario 4 will generate both permanent and one-off impacts on the local housing market.

In order to accommodate the new residents who will relocate to Tiree to work on the Array, there will be a need to provide new housing. Our analysis shows that depending on the proportion of jobs that are taken by local residents and therefore those that must be filled by new residents, there will be a need for 32-37 new permanent homes.

Our analysis assumes that there would be sufficient water, sewerage and power supply to meet these additional houses, but this would need to be investigated in detail at the appropriate stage.

We have assumed that these houses will be made up from the following stock:

- existing vacant and derelict houses on Tiree that will be refurbished to provide family homes – 9-10 units;
- new houses that are built to accommodate single employees, based on 3 adults per unit – 6-7 units;
- new houses that are built to accommodate families – 8-10 units; and
- existing houses that are taken from the second/holiday home sector and let as permanent residences – 9-10 units.

These impacts are assumed to be permanent and continuous.

There will also be one-off impacts within the construction sector associated with refurbishment and development to create new homes. Due to the nature of construction activities, construction jobs are based on an assessment of Man Year Equivalents (MYE). This method allows the number of people that will work on the construction activities over the build period (which will vary between full-time, part-time, permanent, temporary and contract) to be estimated as an annual equivalent post i.e. the total number of full-time workers that would be needed to complete the developments if all the construction activity was undertaken over a one year period.

Our analysis identifies that these activities would lead to the creation of around 15 MYE posts, generating one-off GVA impacts of around £0.46 million.

Tourism Impacts

Scenario 4 will generate tourism impacts for Tiree.

The extent to which positive impacts will outweigh the negative is highly dependent on the development of a new marina within the harbour – we have assumed a 50 berth marina, of which 25 berths will be exclusively for the use of visiting boats. Impacts have been estimated at:

- positive impacts will be generated through the attraction of visitors who are visiting friends/relatives on the island and also those using the visitor berths at the marina:
  - with a marina included, the impacts are estimated at around 5,200 visitor days per annum, generating £465,000 spend each year
  - without a marina the impacts are estimated at around 650 visitor days per annum generating £10,000 spend each year; and
- these positive impacts are offset through the negative effects of lost visitors as some holiday and second homes are removed from this sector and owners lease them as permanent residences to Array workers:
  - the impacts are estimated at around 4,000 lost visitor days per annum that would have generated around £35,000 spend each year.

Summary Impacts

Scenario 4 generates the greatest impact on Tiree, primarily through the attraction of new residents who will work at the Array.

In total our analysis identifies the following socio-economic benefits for Tiree associated with Scenario 1:

- 60 permanent jobs based on Tiree through the Array;
- 24 other jobs created through new business and resident spend;
- 9-15 jobs at the Array will go to local residents, leaving 11-19 jobs to be back-filled by others (assuming an average of 1.25 jobs per employed resident); and
- 10 new adult residents will seek employment when they relocate to Tiree, 2 will be self-employed and 3 will be economically inactive.

Outwith the Array, we would estimate that between 35-42 new jobs will be created on Tiree as a result of Scenario 4, but only 10 new adult residents who are likely to seek employment.

The analysis shows a gap of 24-32 positions that would need to be filled either by existing residents, new residents who expect to be economically inactive, or by attracting more new residents to the island. Consultation with local residents and business owners raises concerns about the capacity (and interest) of existing residents to take on these new employment opportunities.

As presented in Chapter 2, however, around 35 residents have previously described themselves as ‘employment deprived’. There is no data to show whether this relates to the need for full- or part-time positions and therefore no means of assessing the employment gap that could arise.

In addition to the benefits there is also potential for negative impacts to occur, namely a large influx of new people living on the island, possible reduction in crofting activity, change in land management (potentially affecting tourism), dilution of Gaelic culture, loss of way of life, increased crime, vehicle damage to machair, etc.

The summary impact table for Scenario 4 is presented over.

Table 4: Scenario 4 Impact Assessment

Scenario 4 Impact Assessment	15% Jobs for Locals	25% Jobs for Locals
Direct Array and Additional Economic Impacts (Annual)		
Total direct jobs (Array O+M)	60	60
Direct jobs for local residents	*(9)*	*(15)*
Direct jobs for new residents	*(51)*	*(45)*
Additional jobs – new business, resident and visitor spend	+24	+23
Total GVA generated (direct + additional jobs) per annum	£2.7m	£2.7m
Social Impacts (Permanent)		
New population on Tiree	76	67
Single adults	*(36)*	*(31)*
Family adults	*(30)*	*(27)*
Children	*(10)*	*(9)*
New adult population	66	58
Array workers	*(51)*	*(45)*
Non-Array adults – looking for work	*(10)*	*(9)*
Non-Array adults – start new business	*(1)*	*(1)*
Non-Array adults – economically inactive	*(4)*	*(3)*
New jobs to be back-filled	11	19
Housing Impacts (Permanent)		
Total homes for new residents	37	32
New homes – existing refurbished family homes	*(10)*	*(9*
New homes – new build shared housing (3 adults per unit)	*(7)*	*(6)*
New houses – new build family homes	*(10)*	*(8)*
New houses – from second/holiday homes	*(10)*	*(9)*
Housing Construction Impacts (One-Off)		
Housing construction jobs (direct + additional jobs)	16 MYEs	14 MYEs
Total housing construction GVA generated	£0.494m	£0.436m
Tourism Impacts (Annual)		
New tourist days per annum (VFR + marina)	5,300	5,200
New tourist spend (VFR + marina)	£0.467m	£0.466m
Lost tourist days per annum (lost holiday homes)	-4,200	-3,700
Lost tourist spend (lost holiday homes)	-£36,000	-£32,000

Source: EKOS Economic Impact Analysis, Scenario 4, December 2011