

# Isle of Arran Energy Audit

**Coordinated by**

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## 1. Executive Summary

This statement has been prepared as a result of a partnership project between a community organisation and the Arran High School Science department.

Arran is predominantly supplied with electricity from SSE although a few households have chosen to be served from green energy providers or smaller suppliers.

Many householders have dual energy sources and use oil, gas or wood as a source for heating systems.

Due to the predominance of one provider and the available tariffs, switching is not practical and also due to the lack of gas supplies, we are unable to negotiate dual source price contracts.

It is difficult to quote average costs for the island due to the variation in house styles and occupation density.

As awareness increases and costs of alternative energy sources reduce there is a growing interest in switching from the established sources to predominantly wood based systems or other renewable sources.

Transport is an area where we are significantly disadvantaged in local sourced fuel having amongst the highest fuel prices in the west of Scotland. Our elected representatives are trying to establish why this should be but at the moment we have no viable alternative. Opportunities may arise for renewable options but the relatively small volumes do not make it currently practical.

## 2. Energy Audit Introduction

As stated above this project has been organised as a joint activity between Arran Community Energy (ACE) and the Arran High School Science department.

ACE is a local charity focussed on the promotion of community awareness for energy efficiency and also to develop any community energy generating opportunities, which may be identified.

Households with school-aged children and other associated residents were circulated to gain domestic usage information. This information was tabulated and used to estimate consumption for the island.

The main electrical energy supplier was contacted to gather supply details and their information has been provided with a request to treat the data in confidence due to the commercial sensitivity of the information. Having this information was a big benefit as we were able to establish a total number for the island, which we have used in our carbon footprint calculation.

Other fuel suppliers have been approached and some of the local distributors have provided information however the main petrol and diesel supplier has not co-operated with the project. Currently there is a focus locally on the price we are paying for our fuel and this may have influenced the supplier not to provide information on the volumes supplied to the island.

Our transport providers were also contacted and we received a mixed response which is explained at the relevant section in the report.

Our local wood pellet and chip supplier has fully co-operated in our project and has expressed his support to develop alternative solutions for the domestic user.

Major users were also contacted to gather information. This has met with mixed response as all businesses are conscious of competitive advantages and many have indicated their support for the project but failed to provide any data.

The major transport links were also approached for their support. Our ferry provider provided their information with a request that this was also treated confidentially due to commercial sensitivity. They have also confirmed that they will be undertaking their own measures to reduce the impact of running their operation on the environment and have several measures to announce as they are confirmed for introduction. Our bus service provider has indicated they cannot provide any data to us. We have repeated our request to them and received the same response. This is regrettable but they are at this time introducing a new fleet of buses to the island, which are both more efficient and also passenger friendly for mobility impaired passengers.

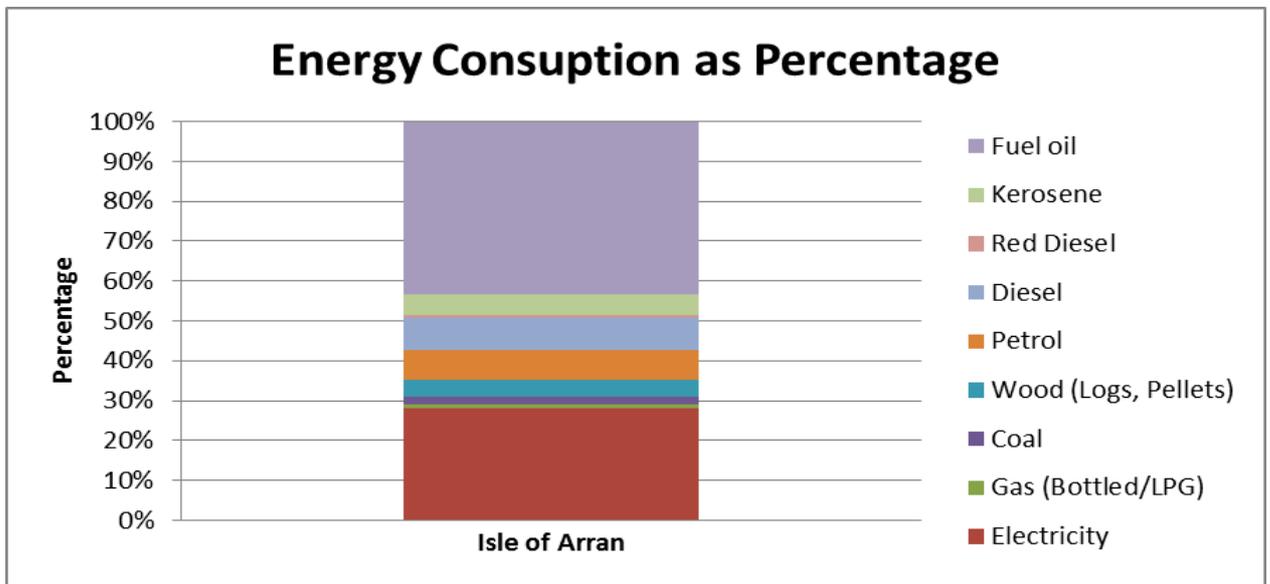
### 3. Island Energy Mix

This section covers the various fuels used and the major applications.

Major Suppliers:

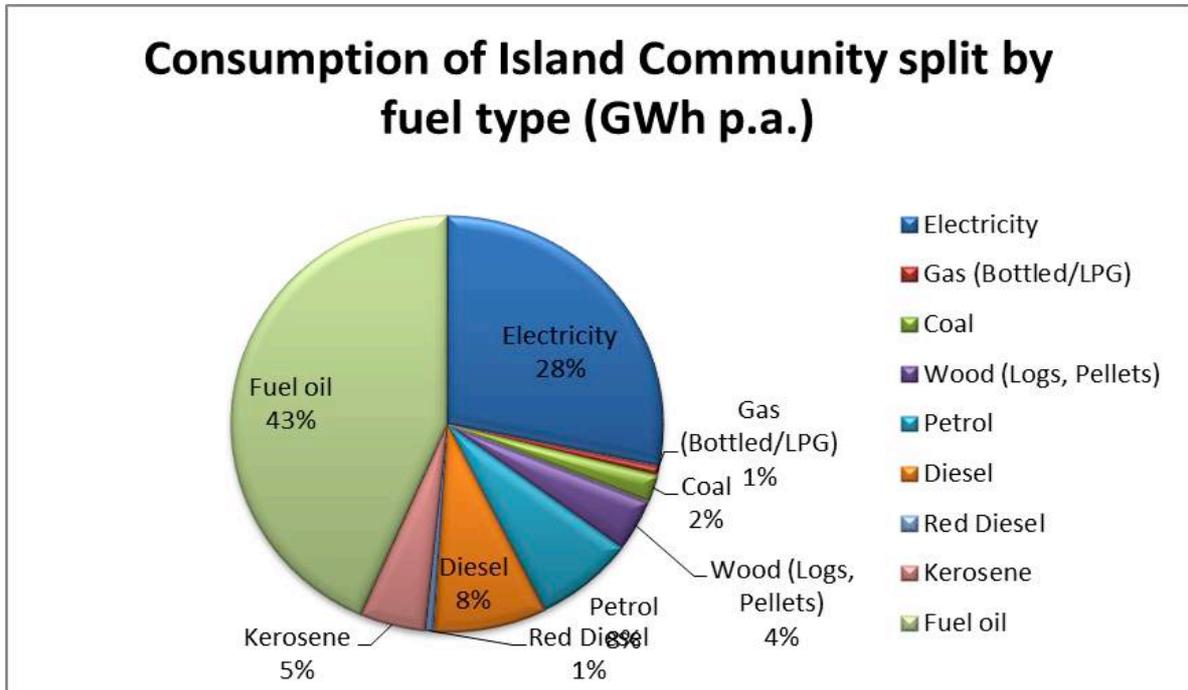
SSE	Electricity
Scottish Fuels	Petrol, Diesel and Heating oil
Arran Haulage Services	Gas and coal
Calor Gas	Gas
Arran Wood Fuels Ltd	Wood chips, Pellets, logs etc.
Caledonian MacBrayne Ltd	Ferry services.

Other small businesses also supply logs, gas and fuel to the island.



Fuel Type	kWh p.a.	Percentage
Electricity	39,934,164.29	28.2%
Gas (Bottled/LPG)	990,000	0.7%
Coal	3,060,000	2.2%
Wood (log,Pellets)	5,709,000	4.0%
Petrol	10,575,000	7.5%
Diesel	11,840,400	8.4%
Red Diesel	915,200	0.6%
Kerosene	6,988,800	4.9%
Fuel oil	61,437,048	43.4%

## 4. Energy Supply



The major energy supplier to the island is SSE, with gas being provided in bulk or bottled form.

Wood fuel is provided by various companies, who can provide anything from logs to pellets for both residential and commercial customers.

Diesel oil for heating is provided by both island and mainland suppliers, as is fuel for cars, commercial, farming and HGV use.

We have five fuel outlets distributed around the island, providing residents and visitor's petrol and diesel.

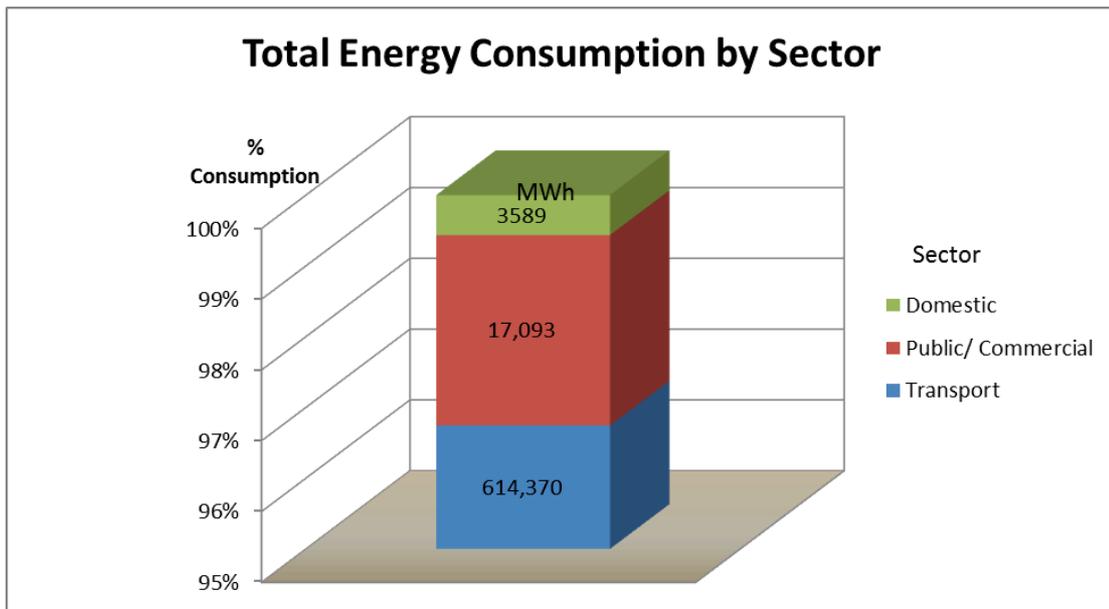
The island has also started to install several charging points for electric vehicles with one recently added at the Brodick ferry terminal.

Coal is brought on via our transport groups and we no longer have the fuel or coal delivered by sea.

Several land owners have installed small Hydro schemes and the National Trust and a dedicated Community group are also developing plans to install small schemes.

We are limited in generation of wind energy due to environmental limitations from Scottish Natural Heritage and the existence of protected wildlife areas.

## 5. Total Energy Consumption



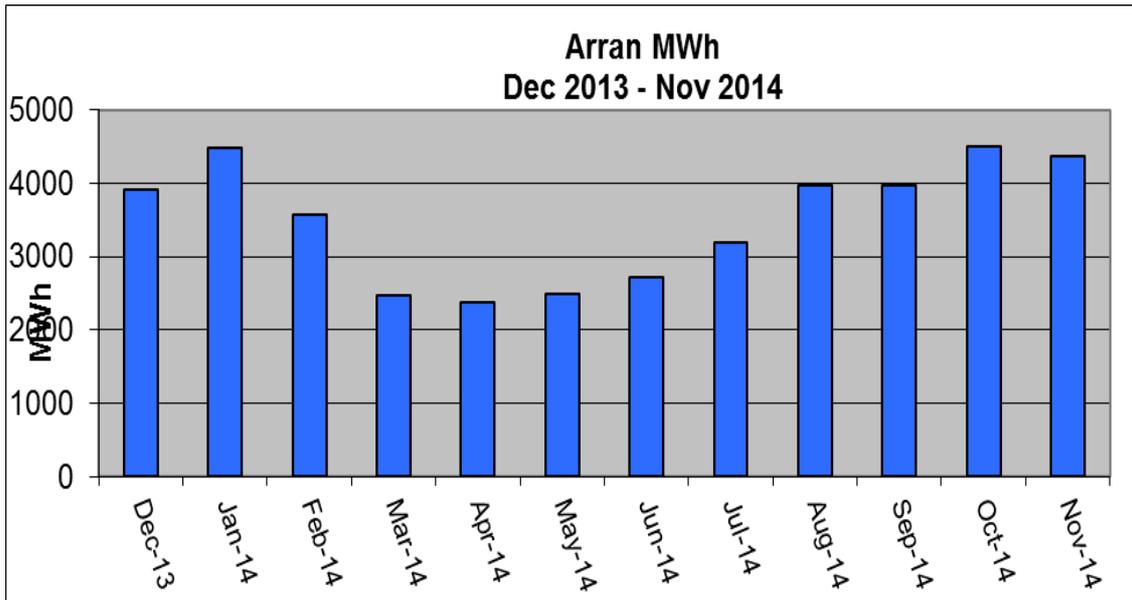
Major stakeholders for each sector include the following:

**Domestic:** Private and public owned properties. Also included in the sector is an estimate of the usage attributable to second homes.

**Public / Commercial:** This sector includes our local authority property and also several commercial businesses such as the Distillery, Brewery, and several hotels and other manufacturing establishments.

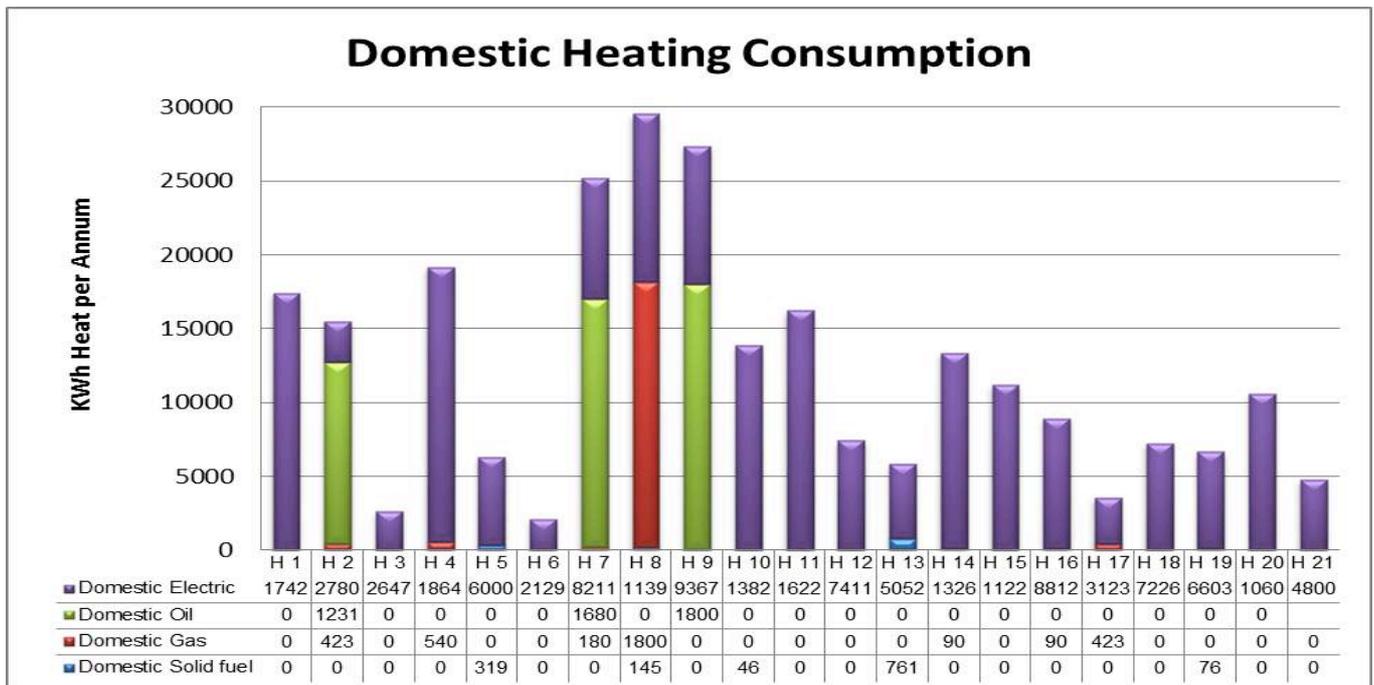
## 6. Electrical Energy Consumption

Our major electrical supplier having provided a monthly trend power chart provided to the island, we have charted the volumes between December 2013 and November 2014.



## 7. Domestic consumption

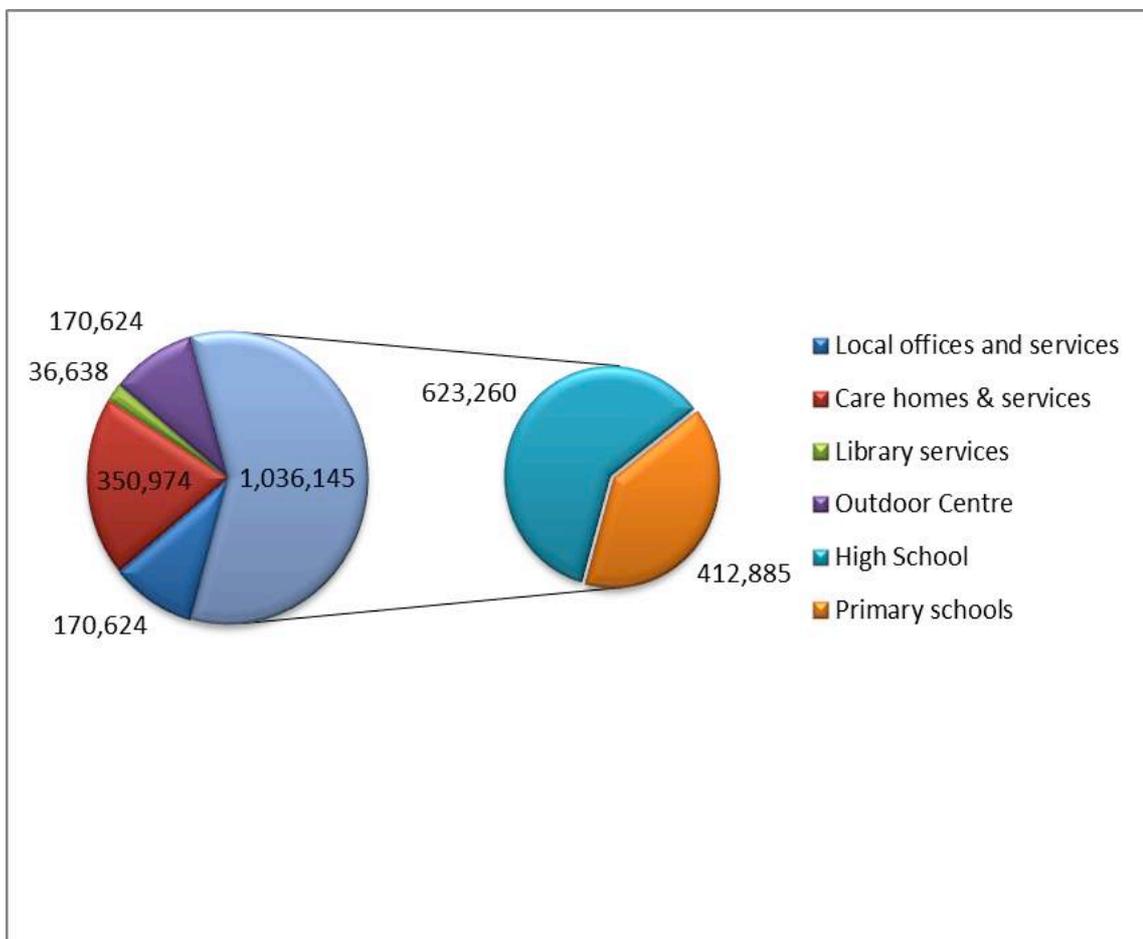
Mix	Est. No
Detached homes 50%	1080
Semi-detached 20%	432
Mid Terrace 15%	324
End Terrace 15%	275



## 8. Public and Commercial consumption

### Local Authority consumption

Local Offices and services	10%	Care Homes and Services	20%
Library Services	2%	Outdoor Centre	10%
High School	35%	Primary Schools	23%



## 9. Industrial Consumption

Farming	79,729 kWh
Forestry	692,500 kWh
Public transport	Declined to submit numbers based on commercial

	sensitivity.
Ferry services	61,437,048 kWh
Hotels (split 59% biomass, 30% electricity and 11% Gas)	1,472,727 kWh
Taxi	788 kWh
Super market	394,678 kWh

## Transport consumption

Due to the low response from our transport providers this is a limited area.

The largest consumer is the ferry service, which provides a service from Brodick and Lochranza to mainland ports. This service is not a set schedule over the year. The main route for visitors has a second boat provided from May until October. Our service from the north reduces in winter to a daily service so monthly averages are not appropriate.

We have a fleet of 12 buses serving the island and they cover all public transport needs.

The island has only one taxi operator and several private hire operators.

There are several large haulage services handling freight to and from the island and also commercial construction services. The major freight operator also has a significant coverage on the mainland and could not separate the fuel use. Our major construction operator also provides a fuel outlet and again cannot separate fuel usage.

## 10. Cost data and expenditure

Costs for the island vary depending on the tariff and source.

As mentioned earlier **our petrol, diesel and fuel costs are amongst the highest in Scotland** and do not appear to be linked to mainland costs. Although we are included in the government's island discount scheme, we do not see the benefit at point of purchase.

The major users have also not provided costs due to commercial sensitivity and the fact that they also source much of their fuel from non-island sources.

Only one store has provided costs.

## **11. Assessment of the potential for fuel switching**

The island has a good range of options, which are opening up for us to integrate more renewable generated energy products.

As mentioned earlier, our wood fuel supplier also provides design and installation services and is addressing needs of both domestic and commercial applications.

We are following up a new opportunity for small commercial and business application of Hydro energy applicable to more remote premises.

ACE is also speaking to various groups to help improve the thermal efficiency of homes on the island.

Our initial focus will be on home and business but the more we can establish capability for charging stations, the more we would like to start to drive personal transport towards converting to a more friendly system.

## **12. Island Community/Island background**

### **Infrastructure**

- Our road network extends to approximately 56 miles and circles the coast line with two short sections across the island. As with other road networks we have a constant need for repair and upgrade and North Ayrshire Council commit a substantial portion of their road maintenance budget to the island. With the projected increase in traffic from the introduction of RET the road network will come under increased pressure.
- We have a variety of housing stock on the island and approx. 2900 homes with 60% in private ownership, approx. 27% are classified as second homes with approx. 10% social renting.
- Recent trends have driven a significant portion of this stock to accommodate second homes and holiday letting businesses which has impacted costs and availability for local families.

- There have been recent additions to the public housing stock provided by the local authority or with partnerships between them and housing associations.
- The preference from residents tends to be for detached or individual styled homes but the cost of land and local planning regulations influences how this can be achieved.

### Education

- The island is fortunate to have seven village primary schools and one High School which has a high achievement record and was recently replaced under a PPP with a fine building which is managed by MITIE incorporating all facilities required for our young residents and also local theatre and sports facilities.
- We also have a local authority outdoor education centre which is part of the local authority education group and has superb facilities for education on all outdoor interest both on land and water.
- Due to the island's geology we are also a regular destination for university studies covering geology and other environmental topics.

Arran's attainment rate for S4 and S5 levels are higher than for most North Ayrshire intermediate areas and results for the percentage of S5 with 5 awards at SCQF level 5 and above for 2010/11 ranked Arran 9<sup>th</sup> out of 38 intermediate zones placing Arran in the upper quartile for this indicator.

## 13. Island Demographics and Population

### Overview:

- Arran is the largest island in the firth of Clyde.
- With an area of 432 km<sup>2</sup>, it is the seventh largest Scottish Island and has a population of just over 5000 residents.
- We are connected to the mainland facilities by two ferry routes provided by CalMac, which is a Scottish Government subsidised service provider.

The main route is from Ardrossan in North Ayrshire across to Brodick, which is the main commercial centre for the island and is the location for the major commercial developments. This route has one permanent vessel, which is a roll on roll off car and passenger vessel which can accommodate approx. 110 cars and 1000 passengers. It operates daily with an average of 5 return journeys per day. In summer this is supplemented by a second smaller vessel

which covers the period from May to October. For 2013 the carrying numbers on this route were: Passengers 706.1k, Cars 130.4k, HGV 11.8k and Coaches 633

- Our population numbers have been reducing slightly over recent years and we currently have approx. 5300 permanent residents.
- We experienced a decline in number of residents aged 0-15yrs between 2001 and 2011.
- Arran has an older age profile than the mainland. The proportion of residents aged 65 years and over is approximately 27% compared with a North Ayrshire rate of 19%.
- Our Life expectancy is ranked fifth highest out of 38 intermediate zones for male life expectancy at 77.8 years and female at 82.1 years.
- In terms of household income all seven of our datazone's are ranked between the 49<sup>th</sup> and 82<sup>nd</sup> decile of the SIMD income domain.
- During the summer period our population can increase approx. 3 fold due to second home owners and tourist visitors boosting the numbers. This has an impact on the energy demands for both electricity and also other fuels.
- Household income data from 2008 shows a median of £24,265 per year and average house prices of £221k.
- In North Ayrshire Council the island is represented by four elected local authority officers only one of whom is resident on the island.
- We also have an active Community Council with representation from the main villages.
- A separate Community Energy group has also been established to promote and develop understanding and the generation of renewable energy. It is also promoting awareness and savings opportunities for householders and businesses.
- Our voluntary sector is very vibrant and the local "Arran Community and Voluntary Sector" (ACVS) has over two hundred different groups registered.
- We also have an active Elderly Forum which is linked to the Scottish network and also AGE Scotland organisation.
- Arts and crafts and creative skills groups abound and they have exhibitions and open days to promote the skills.
- Several groups have also been established to promote the recycling and re-use of the land and materials. We have a small group promoting community land care and woodland management.

## 14. Local Economy

- Tourism has replaced farming as our main “industry” and this is expected to continue with the reduction in ferry fares being a major factor in this change.
- The proportion of self-employed service providers such as Joiners, Electricians and other tradesmen is higher than the mainland.
- Our hotel and tourism related caterers manage their staffing needs by utilising both local and part time resources.
- North Ayrshire Council are major employers ranging from Social Care for the ageing population to Roads, Refuse and Cemeteries. We also have a central library and a mobile van which tours the island.
- Several food manufacturers are major employers and energy users.
- Our local farmers association also holds an annual event which is well supported by both island and mainland visitors.
- The various villages have local associations who maintain the halls and also organise local gala’s and events with the largest being the Brodick Highland Games which attracts over 3500 visitors to the day.
- We also have a strong forestry presence on the island. Much of the planted hill areas are reaching maturity over the next 15 – 20 years; the removal of the logs from these plantations is likely to have a large impact on the condition of the road network and the landscape. Also a private sawmill which will be a significant energy user.

Arran has an unemployment claimant rate of 1.4% compared with a North Ayrshire rate of 6.5%.



## 16. Appendix 2: Photographs



Ferry to Arran



Brodick from the ferry



Lamlash village



Lochranza village



Lochranza distillery



Arran Outdoor centre



Blackwaterfoot

Further views of Arran are available by clicking [here](#)

## **17. Appendix: Contact database**

The authors appreciate the support from the following sources:

### **Local authority**

- North Ayrshire council
- Arran High School staff and pupils
- Arran Local office staff
- Elected officers: Cllr John Bruce

### **Community organisations**

- Arran Community Council
- Arran Community and Voluntary Services

### **Commercial contacts and stakeholders**

- SSE power supplies
- CalMac
- Arran Haulage
- Arran Energy
- Scot Fuels
- Campbell fuel services
- Andrew Gray fuels
- Calor
- Stagecoach
- C Murchie and sons
- National Trust - Brodick Castle
- Scottish Forestry Commission
- Arran Distillery
- Kinloch Hotel
- Auchrannie hotel and resort
- Co-op store manager
- John Thomson Construction Ltd
- George Lammie – garages and taxi services
- Blackwaterfoot Garage