

# Sustainable Development: an introduction

BIG  
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Gaia Research  
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## Sustainable Development Capital spend projects

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# Foreword by Big Lottery Fund



“Sustainable development should be a public value for all modern 21st century organisations. The Big Lottery Fund understands the importance of balancing present need and future resources. As a funder we recognise the potential power we have to change behaviour and processes and make people think differently about this issue. We also recognise the need to practise what we preach and therefore it is as important for us to highlight the role of sustainable development for anyone who applies to the Big Lottery Fund or is in receipt of Lottery money. As an Intelligent Funder we do not want sustainable development to be about ticking boxes or to be about compliance. We want to help, support and enable the organisations we fund to put in place measures to improve sustainable developments that relate to their circumstances. We also want to demonstrate what is possible by using a case study approach to illustrate the small steps that people can take to engage in sustainable development.

BIG have commissioned the Gaia Research arm of the Gaia Group (which specialises in ecological design) to present a case for sustainable development, an area in which both organisations have worked together on in the past. We realise that not all organisations will be aware of all of the issues involved in this area but hope that the examples laid out in this document will be helpful to those currently developing capital projects.

This guide is not meant to be a detailed technical document, but we as an Intelligent Funder, aim to give groups applying for Lottery funds some background information on sustainable development alongside real life practical examples from which they can look at and learn from when putting together their own projects. It is hoped that by doing so, projects will be able to secure sustainable futures.”

**Dharmendra Kanani**  
**Director, Big Lottery Fund Scotland**  
**September 2009**

# Introduction to Gaia Research



“The Gaia Group have gained extensive practical experience at the cutting edge of sustainable design over a period spanning 25 years. Our work embraces research, design, consultation, evaluation, dissemination, training and capacity building. We have worked with many communities to deliver what we believe are exemplar projects. As a result we have a thorough understanding of both the issues surrounding sustainable design but also how to deliver it, affordably, in practice.

As an experienced researcher who thrives on real projects I have applied my research and practical experience as a trainer and advisor assisting private and public sector clients and design teams to achieve better buildings and places. I hope that you find the following breakdown and examples that we have put together helpful when considering some of the issues thrown up by sustainable development.”

**Sandy Halliday**  
**Principal, Gaia Research**  
**September 2009**

# What is Sustainable Development?

**To begin to understand the issues involved in this area we can define sustainable development as “...development which meets the needs of the present without compromising the ability of future generations to meet their own needs.”<sup>1</sup>**

To meet the challenge of sustainable development we have to enhance the quality of life for all by designing healthy buildings and environments fit for individuals and communities both now and in the future. There is already a significant amount of information available to all professions on how to design buildings that are attentive to the needs of sustainable construction, but most practice still falls far short of using even the most easily applicable principles in most projects. Opportunities that would bring real advantage should be taken at every possible turn. If they are not then the result is that buildings and the industries that supply building designers with products, materials and services are less efficient, less economical and more polluting than they might otherwise be. The positive impact on the environment and on quality of life of users and communities from addressing these issues could be immense, hence the need to provide communities and bidders with good information on what to look for.

## **The business case for Sustainable Development**

A key aspect of the history of ideas of sustainable development is that appropriate design and precautionary action can minimise future expenditure and enhance value. There are enormous benefits when considering the best ways to plan capital expenditure on buildings and infrastructure. Design, construction, fit-out and ultimate demolition must all be thought through if the best possible end product is to be delivered at the best possible cost. The impacts are direct (through material and energy consumption and the resulting



pollution) and indirect (through the pressures on energy, water, waste budgets and transport infrastructure).

The built environment can also have an impact on the physical and economic health and well being of individuals, communities and organisations. A good building can be a delight and should enhance a community or organisation, improve their quality of life and reduce their impact on their environment. Good buildings enhance peoples' ability to work and learn while increasing enjoyment and productivity. Where buildings and built environments contribute to ill health, low productivity and alienation, undermine community and create excessive financial liability, they are undesirable and unsustainable.

<sup>1</sup>United Nations. 1987. "Report of the World Commission on Environment and Development." General Assembly Resolution 42/187, 11 December 1987

The introduction of recent environmental taxes makes sustainable design an even more attractive proposition delivering real benefits and economic advantages at the outset, as well as long term benefits.

### Key Sustainable Development Principles

We at Gaia believe that there is now growing awareness of the problems and costs around bad practice, which is helping boost the business case for sustainable development. Here we outline six key criteria for sustainable development. We will use these principles to gauge the priorities and success of a number of projects in the pages to follow.

#### Economic Priorities

- ▶ **Economy:** Good project management is a vital overarching aspect in delivering sustainable projects, both in the short and long term. Many aspirations are undermined by failure to manage the design process, particularly at crucial handover points where responsibilities change. This means we should always identify and manage appropriate targets, tools and benchmarks.
- ▶ **Using Resources Effectively:** Buildings should not use a disproportionate amount of resources, including money, energy, water, materials and land during construction, use or disposal; not cause unnecessary waste due to short life, poor design, inefficiency, or less than ideal construction and manufacturing procedures; and be affordable, manageable and maintainable.

#### Societal Priorities

- ▶ **Supporting Communities:** Projects should clearly identify and seek to meet the real needs, requirements and aspirations of communities and stakeholders while involving them in key decisions.
- ▶ **Creating Healthy Environments:** Projects should enhance living, leisure and work environments; and not endanger the health of the builders, users, or others, through exposure to pollutants or other toxic materials.

#### Environmental Priorities

- ▶ **Enhancing biodiversity:** Projects should not use materials from threatened species or environments and should seek to improve natural habitats where possible through appropriate planting and water use and avoidance of chemicals.
- ▶ **Minimising pollution:** Projects should create minimum dependence on polluting materials, treatments, fuels, management practices, energy and transport.

**Buildings can and should be sustainable. We will now turn our attention to four examples of best practice (three of which have been backed by the BIG Lottery Fund) to demonstrate some of the success stories, while also highlighting some of the mistakes that have also played a part in the learning curve.**

# The Hidden Gardens and Boiler House

**Project Summary:** A community building and walled garden based at the site of the former Coplawhill Tram Works in Pollokshields, Glasgow.

**Client:** NVA

**Landscape architects:** City Design Co-operative

**Architects:** Chris Stewart Architects

**Date:** Gardens 2003, Boiler House 2006

**Lottery funded:** Yes

The Hidden Gardens at the Tramway Theatre in Pollockshields were created in 2003 after receiving a grant of £340,710 from the National Lottery's Artists Work in Public Places programme. The idea was to create a space that would create common ground for the area's diverse ethnic communities and break down social inequalities.

"People's requests for a safe, clean, staffed resource meant that the idea of the gardens as merely a capital project was developed into it being a staffed community resource with an ongoing community development agenda," says Linda MacDonald, the former General Manager at the Hidden Gardens.

One of the major objectives and subsequent successes of the project is the way it has transformed the Tramway Theatre from a venue that was chiefly busy for shows in the evening to a drop in centre where people gather throughout the day.



## The Boiler House

Built two years after the Hidden Gardens, the Boiler House was made possible through a £98,000 donation from the National Lottery's Fresh Futures fund. Until then the community centre was operating out of portacabins and it had become clear that a building was needed that could operate as a classroom/meeting room for a wide variety of groups, provide a kitchen space and have office space for five workers. It was a big step up.

"Creating an environmentally sound building was an organic decision in-keeping with what had already been created in the garden," explains Linda. The design initially included straw bale construction and a sedum roof but the conflict between aspiration and budget became clear. Financial problems plagued the project. "For a period of eight months it looked as if everyday it could fail," says Linda. "It wasn't until the main structure had been erected that everyone knew there was no going back and the project would be completed."

Although many of the environmental features of the building fell by the wayside during the design and construction phase some key features were retained. As far as possible, the old walls of the original boiler house were kept and now form part of the external structure of the new building. A reclaimed gym floor has been used for flooring in the workspace and reclaimed bricks have been used to create raised planting beds.

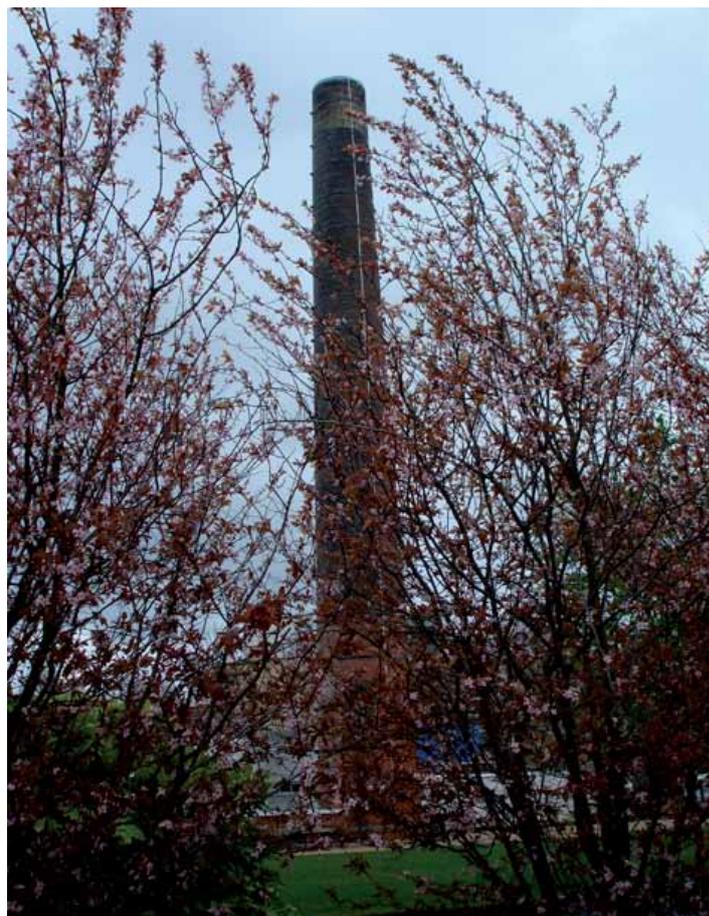
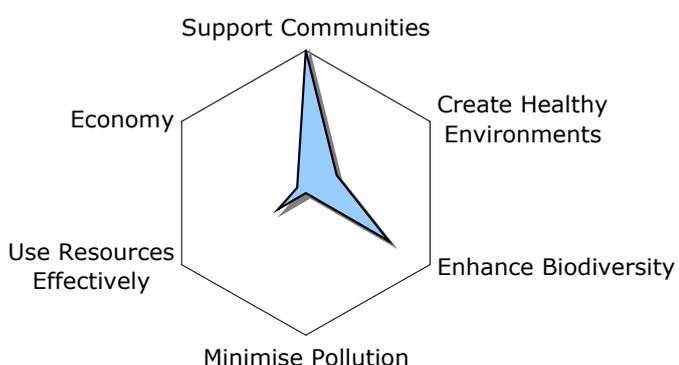
Rainwater run off from a greenhouse is captured for use

in planting beds and composters take recycled waste from the Boilerhouse and the Tramway Café for use in the Gardens. The office recycles as much as possible and office materials are from recycled sources where available. Establishing a bird feeding site has encouraged a wide variety of birds to this very urban area, including the occasional woodpecker.

The question of what they would do differently were they to go through the process again elicits a wee smile from Linda “Almost everything! We would definitely spend more time investigating the sustainable and green building options so that we were able to make an informed decision on the viability of the design options in relation to cost. We would also identify specialist builders prepared to do the work (in our case this was straw bales) rather than going out to general tender.”

**What should you consider?** Linda Macdonald offers some valuable advice to people embarking on similar projects: “Budget for a project manager, it helps to have someone on your side who knows the ropes. Get enough learning and information in to feel confident about saying ‘no’ when necessary to contract specialists such as building engineers and quantity surveyors.”

**How was Sustainable Development assessed against the six key principles?**



**Conclusions:** The Hidden Gardens and the Boiler House are excellent at what they do and are a valuable community resource, which is reflected in the high score in community support. They have also performed well in ‘Enhancing Biodiversity’. However, despite a high level of ambition, a lack of project management experience and appropriate sustainable design advice led to a number of the initial objectives being designed out which has resulted in a low overall score.

# The Scottish Seabird Centre, North Berwick

**Project Summary:** A visitor and exhibition centre serving as a community facility and giving access to the wildlife off the East Coast of North Berwick and Fife.

**Client:** The Scottish Seabird Centre

**Architect:** Simpson & Brown Architects

**Date:** 2000

**Lottery Funded:** Yes



The Scottish Seabird Centre is located in North Berwick, thirty miles east of Edinburgh. Jutting out to sea on a rocky outcrop, the centre looks towards Bass Rock, home to the world's largest single-rock gannet colony. Puffins, guillemots, shags and kittiwakes are just some of the species that make up the 300,000 seabirds which nest around the Firth of Forth. The Centre plays a key role in the conservation of this precious natural resource and through their Environment Zone provide advice and information about the challenges to our planet and its wildlife and the things we can all do to help.

"The Scottish Seabird Centre was a community project involving the local people of North Berwick, as well as visitors to the area who came to enjoy the rich wildlife on offer," explains Tom Brock, Chief Executive at the Centre. "Our environmental ethos is integral to our role as a conservational and educational charity and as such reflects a wider business strategy."

The local community were the principal force behind the building of the centre. "Before the Scottish Seabird Centre, tourism had dropped significantly in the area. There was a danger that North Berwick would become just another commuter town for Edinburgh," says Tom. "There was a strong desire to create something unique that would benefit the town but not disturb the wildlife."

The Scottish Seabird Trust was set up as an independent charity and a major funding effort began. Support came from many sources and included a £1.9 million grant from the Millennium Commission. Drawing over 250,000 visitors a year, the benefits to the local community are clear. "The centre has created 50 jobs and indirectly it supports a further 25. It boosts the economy by over £2 million annually" Tom explains. In 2008 they received the VisitScotland Tourism Business





of the Year Award in recognition of their global appeal as well as their benefit to the local community.

“At the centre we are very focused on minimising our adverse environmental impact,” says Tom. Right from the outset of the project, sustainable construction was seen as a key issue. The design of the building closely follows our sustainable development principles. Careful attention was given to materials selection to ensure a durable and healthy building and where possible materials were sourced locally. Natural finishes have been used throughout; no coatings were applied to external timber in favour of the silver grey weathered look that will mature with time.

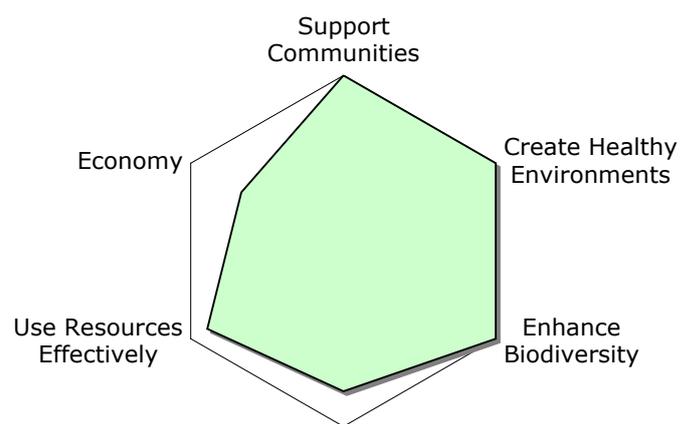
Daylight is a predominant feature in the building combined with an energy efficient lighting system. A wind turbine and photovoltaic panels have been installed on the roof of an ancillary office and educational building, but only contribute a small portion of the overall electricity demand. They would not have been cost effective without the significant external funding provided. The use of photovoltaic panels, however, is particularly appropriate on the nearby islands where they power the remote cameras and remove the need for expensive generators and regular refuelling trips.

There is also a transport initiative set up in co-ordination with First ScotRail. The Seabird Saver Offer gives visitors access to an all-inclusive money saving ticket that includes a return journey from Edinburgh to North Berwick and entrance to the Scottish Seabird Centre. “The transport initiative fits in with our environmental objective of encouraging public transport to the centre and has proved very popular with visitors,” explains Tom. It is just one part

of an overall strategy that looks at the environmental impact of the day to day running of the centre. Further measures include car sharing between staff members and the provision of cycle racks as well as extensive recycling of paper, plastic, cardboard, glass, polythene and print cartridges – a local manufacturer even makes use of waste cooking oil to make candles. Recycled goods also form part of the purchasing strategy.

**What should you consider?** Tom Brock highlights the reason behind their approach: “There is a need for all Scottish businesses and ventures to consider their environmental impact and the overall sustainability of their projects. Ideally, businesses should benefit their local communities, environment and economy. It is an approach that is not lost on visitors to the centre. We find that a lot of visitors are attracted to the centre through our positive approach to the environment.”

### How was Sustainable Development assessed against the six key principles?



**Conclusions:** The Scottish Seabird Centre places the environment at the centre of its business strategy. This is reflected in the excellent performance when assessed against the six key principles. The use of experienced architects and consultants ensured the delivery of a sustainable building and a strong environmental awareness helped the centre attain a high level of sustainability in day-to-day operations.

# Ullaspool Swimming Pool, Ullapool

**Project Summary:** A community swimming pool driven by a combined bottom up and top down approach

**Client:** Ullaspool Pool

**Architect:** Gaia Architects

**Date:** 1994

**Lottery Funded:** No

This £750,000 project was the first major example of community involvement in the design, business planning and management of a project for this remote rural community in Ullapool.

“The community had wanted a swimming pool for years,” explains Paul Whitefoot, Chairman of the Board of Ullaspool Ltd, the company established to promote the project: “Our first aim was to lobby the council to build one but when it became obvious that this was not going to happen we decided to go it alone.” The community raised £10,000 which allowed the committee to commission architects to conduct a feasibility study.

The idea gained a lot of credibility after plans were put together for a reasonably sized and not over-ambitious project. Funding organisations were approached by a group of persistent locals who made their case to assist further feasibility studies with this approach proving a great success. Political support followed from a council meeting, where councillors viewed the community presentation of their prospectus and later agreed to underwrite the projected revenue deficit of £40,000 per year, with national agencies and charities following soon after.

Turning the community dream of financing and building Northwest Scotland’s first ever swimming pool required three essential and fully integrated groups of people. Firstly a strong “bottom up” group, a persistent, intelligent, energetic and innovative local committee. Second a collection of open and flexible “top down” agencies who were prepared to listen to the community and who were inspired to help. Thirdly “experienced advisers” who could understand the capital and revenue





implications of community aspirations particularly in respect of a heavily revenue dependent facility such as a swimming pool and were experienced in getting such projects from the inception to the construction stage. The dream was realised in just three years because of all three aspects coming together.

The Ullaspool community (a population of only 1,500) raised £150,000 over three years, through a range of fundraising initiatives. “There was lots of local fundraising to show community commitment,” explains Paul. “The community took a very hands-on approach. We collected cans, hosted dances and gala days, held sponsored events, made t-shirts and even ran a buy-a-tile scheme.”

Energy conservation was a focus of the design and the insulation levels (at 250mm) were twice the building regulations requirement of the time. The only disappointment was that the architect’s advice on fuel supply was not taken and, in the interests of trying to get the capital cost down, the client group went for a quick fix (and cheap to install) electrical “interruptible” tariff. This lasted only as long as cheap rates remained viable within the industry, and costs soon soared.

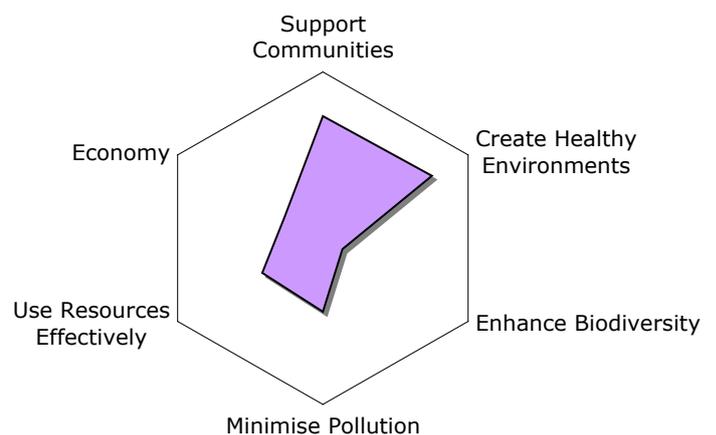
The failure to raise 100% capital funding (the total was £50,000 short) led to a revenue penalty that became an increasing burden. “It would have been good to get all capital funding in place before building. The loan was a big revenue drain for some years afterwards,” explains Paul. “The fight for a 25m pool, rather than a 20m pool, increasingly looked like it would have been better had it been lost in the interests of reducing energy and capital costs. Ullaspool eventually had to be bailed out by the Scottish Executive, to prevent bankruptcy”.

The project is now thriving and has given young people something to do, as was part of the original set of objectives. “The success of the project instilled a sense of pride in the local community,” says Paul. However, it

underlines the need for seeing community projects as a process over years and not just up to the achievement of the building, which may be the end of one cycle of the process – but is, after all, merely the beginning of what all the effort sought to provide.

**What should you consider?** Paul Whitefoot offers rational advice to people embarking on similar projects: “Were we to go through the process again, we’d definitely look at energy use very carefully and get a good manager in place from day one. The heating has been changed twice, once to oil and then to woodchip. If you have a vision keep plugging away and get the community and the local bigwigs on side. Don’t let local politics get in the way of the strategy and vision and most importantly of all, make it fun!”

### How was Sustainable Development assessed against the six key principles?



**Conclusions:** The Ullaspool community were heavily involved in the procurement of Ullaspool Swimming Pool. The project performs well supporting communities and creating a healthy environment but failed to adopt measures that ensured effective use of resources and minimised pollution. In particular, greater attention to resource use would have avoided some of the problems that have faced the project over the intervening years. The poor performance in ‘Economy’ can be largely attributed to the absence of certain assessment methods at the time of construction.

# The Gigha Windmills

**Project summary:** An island community have created jobs and revenue from their own wind farm and are now looking to expand their portfolio with other renewable projects.

**Client:** The Gigha Renewable Energy Trust

**Architects:** Alan Hobbett, Steve Watson and Colin Anderson.

**Date:** 2007

**Lottery Funded:** Yes

In 2001 the Gigha Community Heritage Trust (GCHT) was formed after the 98 residents of the island community voted to try and buy the island from private owners. The Trust purchased the land in 2002, with the help of funding bodies including a £3.5 million grant from the Scottish Land Fund.

The funding agreement obliged that £1 million of the grant was to be repaid within two years, no mean feat for a small community. Interestingly up until that

time there had been no incentive to make the island a thriving commercial environment.

The new owners were aware they had to make the island work financially and set about putting together a business development programme. Gigha Renewable Energy was set up with a mind to making the most of the natural assets available as well as generating money to help make the island a going concern financially. From the outset it was obvious that selling was not an option, "We bought this island for our children, if we sell everything there will be nothing left" says Andrew Clements head of the Gigha Renewable Energy. A five-year development programme was established involving the regeneration of housing on the island and of course a wind farm.

From the business strategy it became clear that there would be substantial financial benefit from harnessing the strong winds on the island. The process of agreeing,



funding, procuring and commissioning the turbines was anything but simple. A steering committee was formed comprising two pro, two anti and two undecided members. A series of financial appraisals proved beyond doubt that the wind turbines would be an invaluable part of the community regeneration and ultimately all six members voted for the project to go ahead, despite one of the original objectors being one of the few that would suffer any form of regular visual impact. "At the first meeting the locals were not keen," says Andrew. "But after much political lobbying their minds were changed. Once a package was put together and turbines had been sourced there was 100% backing from the community."

Despite concerns about the impact of this project local people responded with an open agenda where decisions were principally taken based on whether they were in the community interest. "There was a sense of community ownership from day one," says Andrew. "When the turbines arrived the community washed them down to get rid of the road grime."

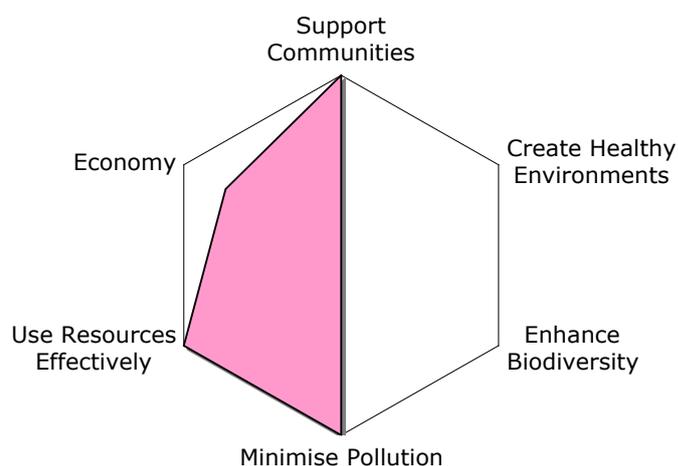
Gigha Renewable Energy was set up with the aim of increasing community ownership of assets and to promote financial, social and environmental sustainability on the island. It is part owned by GCHT and Highlands and Islands Enterprise with GCHT maintaining a controlling share. "At the start of 2008 £80,000 of shares were held by HIE but we have since managed to buy all of these back" explains Andrew. In 2004 Gigha Renewable Energy installed three pre-commissioned 225 kW wind turbines at a cost of £440,000. The turbines were purchased second-hand, at a reduced rate, from a wind site that was upgrading to larger turbines. The turbines still had an expected operational life of eight years on purchase, although they are likely to run for much longer.

Combined annual output for the turbines is around 2.1 GWh per year, which is the equivalent of two thirds of the islands energy requirements. The trust has entered into an energy supply contract with Green Energy and

the island is now a net exporter of electricity. A capital sinking fund has been set up to provide money to replace the turbines at the end of their useful life cycle as well as to protect against contingencies. Last year, the turbines provided the trust with a net income of £150,000. Gigha is now looking into further renewable generation projects in order to move one step closer to self-sustainability.

**What should you consider?** Andrew Clements says: "Get the right advice and go to other communities and see what they are doing. Since the community buyout the population of Gigha has risen from 98 to 170, helping to secure the long-term future of the community. Now fishermen returning with a poor catch can see the wind turbines revolving and know that they are making money for the community."

### How was Sustainable Development assessed against the six key principles?



**Conclusions:** The wind turbine project at Gigha performs well in all of the relevant key principles. The community were quick to point out that without the turbines, community ownership at Gigha would not be sustainable. The only area for improvement would be in the management of the process through the use of appraisal tools.

# For further information

## **Big Lottery Fund**

<http://www.biglotteryfund.org.uk>  
[http://www.biglotteryfund.org.uk/sustainable\\_development\\_web\\_resource.pdf](http://www.biglotteryfund.org.uk/sustainable_development_web_resource.pdf)

## **Hidden Gardens**

<http://www.thehiddengardens.org.uk>

## **The Scottish Seabird Centre**

<http://www.seabird.org>

## **The Isle of Gigha Heritage Trust**

<http://www.gigha.org.uk/>

## **Lochbroom Leisure and Ullaspool**

<http://www.lochbroomleisure.co.uk/pool.htm>

## **Forward Scotland**

<http://www.forward-scotland.org.uk>

## **The Scottish Government – Sustainable Development**

<http://www.scotland.gov.uk/Topics/SustainableDevelopment>

## **Sustainable Tourism**

<http://www.greentourism.org.uk/>

## **Energy Saving Trust**

<http://www.energysavingtrust.org.uk/>

## **Scottish Ecological Design Association**

<http://www.seda2.org/>

## **Sustrans**

<http://www.sustrans.org.uk/>

## **Centre for Alternative Technology**

<http://www.cat.org.uk>

## **Useful Publications**

Architecture for Humanity (ed.) (2006) **Design Like You Give a Damn** Thames & Hudson

Carson, R. (1962) **Silent Spring** Houghton Mifflin

Diamond, J. (2006) **Collapse– How Societies Choose to Fail or Survive** Penguin

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Halliday S.P (2007) **Green Guide to the Architect's Job Book – 2nd Edition** RIBA Publications

Keating, M. (1993) **Agenda for Change Centre for Our Common Future**

Liddell H., (2008) **Ecominimalism** – RIBA Publications

Meadows, D., Meadows, D. and Randers, J. (1992) **Beyond the Limits** Earthscan

Schumacher, E. F. (1973) **Small is Beautiful: A study of economics as if people mattered** Blond Briggs

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