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HI energy news

HIGHLANDS AND ISLANDS OF SCOTLAND
HARNESSING NATURE'S POWER

Highland Business

Powers its way to success!

Rock develop Ecopower

Combined Heat & Power (CHP) unit

In a world where new products are often launched with big promises and then quickly – and sometimes embarrassingly – followed by disappointing results, one Highland company is putting its money where its mouth is.

Rock Energy, based just outside Inverness, has designed and developed a new kind of energy system – the first of its kind in the UK – that is having some dramatic results.

Rock developed its Ecopower Combined Heat & Power (CHP) unit partly out of necessity. With the national grid over one mile away, the company found it had to produce its own power and energy independently.

"We really had no choice – whatever we designed just had to work," explains Rock director Norman Jenkins.

The answer was a CHP unit controlled and monitored by sophisticated software. Fuelled by propane, the unit is proving remarkably efficient.

Not only does it provide all the electricity needs for Rock's main site, more than 1600 square metres of office space, two apartments, workshop, warehouses and a house, it also came up with an unexpected advantage.

"Anytime you generate electricity you also produce an enormous amount of heat. We designed the Ecopower unit to capture this heat so efficiently we use it for all our central heating and hot water. It's effectively a free by-product," said Norman.

As a result, the company has cut its own energy costs by 60 per cent and its CO_2 emissions by 70 per cent.

The Ecopower unit is attracting plenty of attention for potential users and the company's order book is filling up fast.

"This is green, clean energy really at its best. I think one of the huge advantages of the unit is that people can come and see for themselves how well it works.

Norman Jenkins with his Ecopower CHP unit

Many already have and there's a constant stream of enquiries for site visits," says Norman.

Looking to the future, Rock is turning its expertise in energy efficiency to the housing market.

"Our homes are among the biggest consumers of energy. We're currently looking to build and develop a number of energy efficient homes where, by design and technology, we can have houses which have significantly less impact on the environment and are great places for people to live in.

"It's early days yet and we're going through the planning process but if we're serious about cutting carbon emissions, we have to look at ways to design our houses differently," says Norman.

Virgin Atlantic. **'Fantastic potential'** of new Lewis project

Plans to generate electricity using wave power could begin here on Siadar, Lewis

Homes on Lewis could have their electricity supplied by wave power thanks to a ground-breaking project between Inverness-based Wavegen and npower renewables, one of the UK's biggest renewable energy companies.

Facing straight into Atlantic, the coastline at Siadar on Lewis's North West coast is described as having 'fantastic potential'. It is here that plans are being developed for a new wave power station which, once complete, would generate electricity for nearly one fifth of all homes on Lewis and Harris.

It's still early days for the project. Wavegen, widely recognised as world-leaders in wave energy, and npower renewables are currently carrying out a feasibility study to assess the site's suitability.

The sea bed around Siadar has been examined in more detail and the local wave resource assessed. The project has been simulated at Wavegen's test centre in Inverness to give the team an estimate of the scheme's likely energy output. Civil engineering design work is being carried out to establish the likely project costs, and some preliminary environmental assessment work has been initiated via a contract with Orkney-based Aurora Environmental.

The study is also having to address head-on the project's biggest challenge – availability of a connection to the electricity grid.

If, however, the site does prove to be suitable, the scheme would consist of building a new breakwater similar in appearance to those around much of the UK's coastline which provide harbour facilities.

The wave energy scheme would be built into this new structure and when fully operational would harness power from the Atlantic waves to generate up to four megawatts of electricity.

This would be enough to supply the annual needs of around 1,500 homes on Lewis and Harris.

David Langston, Wavegen's Business Development Manager says: "Siadar is a tremendously exciting project and, in our view, could be the gateway to the best wave resource in the UK.

"The partnership with npower renewables is hugely positive and brings together considerable experience and expertise. "If the feasibility study shows the site to be viable and the grid issues can be overcome, we're looking at a project that has huge potential for renewable energy generation and the benefit that brings to local communities."

The technology that will be used at Siadar has been developed by Wavegen. Called 'oscillating water column', the movement of waves is used to move air in and out of a chamber. The air then drives the Wells turbine to generate electricity. Wavegen is currently using this technology in its LIMPET system installed on Islay.

By offsetting the release of around 6,000 tonnes of carbon dioxide which make their way into the atmosphere each year, the project clearly has significant environmental benefits.

There are also some important community-wide benefits. The local Siadar Pier Group had been looking to redevelop the local slipway which would be incorporated in the design of the scheme.

The new breakwater has the potential to provide some protection as a harbour facility for small scale commercial and leisure craft. And if other offshore wave projects are developed on Lewis, Siadar could be a crucial facility for launching the necessary service vessels.

Jon Boston, Development Manager at npower renewables says: "This is an exciting time. With the current drive for low-carbon sources of energy, everyone recognises the potential of the UK's abundant marine renewable energy sources.

"A pioneering project such as this presents considerable technical and commercial challenges. Our partnership with Wavegen is second to none however in terms of experience and expertise. If together we can overcome the challenges and make Siadar a reality, it will represent a significant milestone in the development of this new and exciting industry, at the same time as bringing very tangible benefits to the local community."

Small Community with big ideas

Need inspiring with a big idea? Then try this one from award-winning Ormlie Community Association (OCA). The Caithness group is planning a Renewable Energy Park creating jobs for local people and providing an exciting visitor destination.

The park is intended to showcase the very latest in renewable energy technologies and energy saving measures. Potential sites are already being looked at.

Initial ideas for what the park might feature include a community and education centre, a retail outlet for 'eco' products and café.

Louise Smith, Renewable Energy Project Manager at OCA says: "OCA is no stranger to successful project delivery and has already won a number of awards for its work.

"Although it's early days, our conviction is that this community-led renewable energy project could prove to be of national significance.

"While our intention is for this to become a popular tourist destination this is no theme park. The local community is at the heart of this project. We held a workshop in November last year to talk through the details. This was the first of what will be a series of events to provide local people with information and hear their ideas."

If the project proves feasible the aim is to see the development come together in phases starting with a wind/hydrogen centre which will be used for both research and development and as a demonstrator.

Louise Smith of Ormlie Community Association.

There are even plans to install a filling station to support a hydrogen powered vehicle.

OCA is also exploring options for hydrogen-rich gas from anaerobic digestion and using by-products in a community food project.

Louise Smith says: "The Renewable Energy Park will combine the very best initiatives to enhance community life and provide a source of jobs, income and food."

Energy awareness is growing in profile among the Caithness Community. Louise and two colleagues, Sharon Pottinger and Alison Middlemas, recently completed the City and Guilds 'Energy Awareness' exams and have since set up an energy advice centre which has secured funding from the Scottish Community Action Research Fund (SCARF).

The centre provides free advice and information on energy efficiency for the Caithness area including home visits for people living in Thurso.

Louise says: "There are measures all of us can take to reduce the energy consumption in our homes. That's the purpose of the advice centre – to demonstrate there are things everyone can do which can make a difference."

Micro Generation – The facts

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Baffled by biomass and need to know what it's all about? Or what about solar panels – will they really save you money?

If you're feeling muddled by renewable energy technology for small scale projects but are keen to find out more, a series of simple free fact sheets from HI-energy can help.

There are five sheets covering all the current micro-generation technologies – wind, hydro, geothermal, biomass and solar.

Each technology is clearly explained – including performance in different situations – plus information on initial capital costs, average payback periods and maintenance.

There is information on how to evaluate whether a particular technology would work in your location plus where to source products, accredited suppliers and installers, planning permission issues and possible carbon offset.

An additional 3 factsheets give up-to-date information on grants for both householders and businesses, selling electricity to the national grid and renewable obligation certificates (ROCs).

HI-energy's micro-generation factsheets will be available for download from its website at **www.hi-energy.org.uk** very soon!

The entrance to Great Glen House, the new Highland HQ for Scottish Natural Heritage and thought to be the most environmentally-friendly corporate building in the UK.

SNH – leading by example

Scotland's conservation agency is working from a new headquarters hailed as one of Britain's most environmentally friendly public buildings.

Great Glen House in Inverness is packed with design features aimed at reducing its impact on the local and global environments.

Scottish Natural Heritage decided to lead by example when its HQ was relocated to the Highland capital from Edinburgh.

"SNH advocates sustainable development across all of our work, particularly where we're advising on planning proposals," said the agency's public relations manager, Calum MacFarlane.

"The procurement of a new HQ was a great opportunity to practice what we preach, set new standards in the environmental commissioning of new buildings, and share our experiences.

"It also prompted construction companies to think seriously about putting environmental considerations first."

The building makes maximum use of natural daylight, has high grade insulation and low energy lighting, and uses natural ventilation instead of air conditioning.

Solar collectors provide almost two thirds of the hot water used in the building, while floor coverings and paint were chosen for their high environmental standards.

Materials from the building previously on the site were reused wherever possible and, for the first time on a site in Scotland, the construction teams had to separate all waste for recycling.

A SUDS (Sustainable Urban Drainage System) pond removes pollution from drain water, and was carefully designed to provide a good habitat for wildlife.

The library roof has been planted with sedums - low-growing, low maintenance succulent plants that form a 'living carpet' providing a home for insects, plants and birds.

All in all, the SNH HQ was awarded the highest ever rating under a special environmental assessment system for UK buildings.

"The building is impressive architecturally and many staff, including myself, take pride in telling people about its sustainable features and in showing visitors around," Calum said.

"Great Glen House is believed to be the most environmentally friendly corporate building in the UK.

"We hope that in sharing the experience of its design and construction, that other organisations will be able to benefit from this and adopt at least some of the standards set by our new HQ."

So what's the building like to work in?

"One of the features I particularly like is the temperature," Calum said. "Not only is it just right for working, but it's constant throughout the building.

"The amount of natural light is also a huge plus, particularly in winter, and the natural ventilation is more comfortable than conventional air conditioning.

"Another important aspect of working in Great Glen House is that some of the approaches taken here can be adopted at home."

As an example, staff use recycling points and compost bins instead of having bins at their desks.

"That's prompted us all to think about our waste and where to put it," he added.

Community energy scheme scoops national award

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A community heating project providing energy-efficient homes for local people has been honoured in the Green Energy Awards.

The West Highland Housing Association's biomass project at Glenshellach, Oban scooped Best Renewable Project in the national awards ceremony which celebrates the best of Scottish renewable energy.

The Glenshellach development consists of 90 homes all fuelled by a state of the art, 600kW Danish biomass heating system and is the largest biomass heating system in the UK.

The system uses wood waste from tree felling and milling in Argyll. West Highland Housing Association has negotiated with the system's operators Vital Energi to ensure a good deal for local residents on both heating and hot water.

A special pre-payment system has been set up enabling residents to buy heat credit from a local filling station to help spread the cost of payments.

The scheme has been described as a 'landmark project', combining economic and environmental benefits for local people and Oban's wider community.

The new timber Forestry Commission building at Smithton, Inverness.

Showcase green office could be catalyst for future design

Just a couple of miles from SNH's new headquarters you can find yet more evidence of sustainable, commercial buildings which are pointing the way to how low carbon, energy efficient offices can – and many would argue – should be built.

The Foresty Commission Scotland's Inverness office, which opened at the end of January, is one of the largest new timber buildings in the UK.

It's an outstanding example of not only first-class design but demonstrates that much of what this region needs to create such buildings lies right on our doorstep.

The vast majority of the certified timber used in the construction was sourced locally from the Commission's own forests and private estates.

Douglas Fir, used for the main structure of the building, came from Port Clair near Fort Augustus; the Scots Pine used on the dark, exterior cladding is from Culbin Forest near Nairn. Forests at Plodda provided the Larch used both on the outside of the building and inside for handrails and fabric while oak from the Dochfour Estate has been used for the stairs and floor.

"This really is a showcase building that oozes with quality," says Diana McGowan, press officer at Forestry Commission Scotland.

"Every component of the building's structure and fabric is green-book A rated. It boasts a wealth of environmental credentials which also make it one of the greenest commercial buildings in the country."

The new office is in Smithton on the outskirts of Inverness and is home to 29 staff with additional work space for visiting Commission personnel. It was designed by Inverness-based HRI architects in association with Hurd Rolland of Fife.

Inside and out, the building is packed with features to minimise energy consumption. Sensors detect when the building requires lighting and switches them off when appropriate.

A woodfuel boiler heats the building while a 6,000 litre underground storage tank takes rainwater from the roof and returns it to the toilet cisterns to prevent excessive water waste.

And there are more sensors on the roof to help regulate the building's temperature.

Car park kerbing uses locally grown Larch and the stone paving is Caithness Flag which avoids the use of traditional concrete.

Calum MacDonald, Forestry Commissioner and Chairman of the Forestry Commission Scotland National Committee summed up the organisation's hopes for its new base.

"This office is a showcase of how home-grown timber from sustainable sources and creative design can be used to construct an environmentally friendly, energy efficient building which has a low carbon impact.

"I hope it will inspire and encourage the timber and building industries to think even more positively about the use of timber for construction and provide a welcome catalyst for other, similar projects to follow."

New UHI project gives hands on experience

A pilot project designed to give students hands-on experience of the renewables industry has been launched as part of the University of the Highlands & Islands (UHI) graduate placement scheme.

Renewables is widely recognised as an important growth sector for the region. The purpose of the project is to boost the economic prosperity of the area by developing the skills and experience of talented young people.

Eight UHI students are taking part in the scheme and have found placements in companies including the PURE project on Shetland and in energy consultancy firms including ITI Energy and MBS.

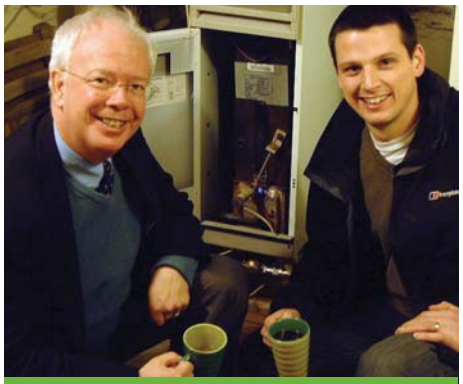
UHI is also embarking on a new programme to support students studying for an MSc. The university is ploughing extra resources into strengthening its network of academic supervisors.

Regular access to supervisors is a key component of an MSc programme. The programme will increase the pool of supervisors and up-skill them to potentially take on more senior positions, such as Director of Studies, in UHI.

To date, 13 students all doing postgraduate research within the renewables industry are benefiting from the project.

The programme is jointly funded by ESF, UHI academic partners, HIE and HIPP.

Where there's **muck...**



Colin Risbridger and Jim Wallace MSP enjoy a mid morning brew boiled with electricity from biogas.

Two Orkney businessmen, Colin Risbridger and Sam Harcus, have designed and built the islands' first, fully-operational anaerobic digestion plant proving there's some truth in the old saying 'where there's muck, there's brass'.

Colin, trading as C Ris Energy, designed the new system with support from Orkney Enterprise and Orkney Islands Council. Sam and Colin are upbeat about the system's potential for converting farm waste into energy.

To commercialise the technology, Sam and Colin launched Heat and Power Ltd at the start of this year. With a wealth of engineering and renewable energy experience between them, their specially-designed digester has already been installed at Tuquoy Farm on Westray with impressive results.

Tammo Pottinger, owner of Tuquoy Farm says: "We're delighted with the biogas. We now look forward to operating the farm on renewable energy well into the future."

"Agriculture can produce not just food but also energy. With slurry we're turning a potential problem into an asset, which is always exciting, but the potential extra benefits of using grass as an energy crop are massive. And let's face it, there's a lot of grass on Orkney and a lot of cows!" says Colin.

Anaerobic digestion is a natural process, which enables farm waste – in this case cow slurry – to be converted either into gas for transport, or for burning directly for heat and power.

Later this year, the pair plans to build a further farm-based digester fuelled by grass, selling the electricity back to the national grid.

Colin is also leading a research project with the Environmental Research Institute in Thurso on the fertiliser benefits of the solid residue left over from the digestion process.

Dr Simon Thain of the Institute says: "I'm delighted to be taking part in such an exciting renewable energy project thanks to the support of European and local funding agencies. We hope our research with Colin will show how digestion can provide a useful organic fertiliser while also producing energy.

"This is a great example of how scientists and industry can work closely together to address our need for renewable energy options."

To learn more about Heat and Power's anaerobic digestion plant visit its website at **www.heatandpower.ltd.uk**

All-Energy to be a show to remember

All-Energy, the UK's biggest renewable energy show, is two months away with organisers promising an event to remember.

Bookings for the 2 day event which takes place on 23/24 May in Aberdeen are already up on last year with an impressive international exhibitor list including Austria, Norway and Denmark.

There's plenty of home-grown talent too with a large presence from the Highlands and Islands including Invisible Heating, Chillwind, the European Marine Energy Centre (EMEC) and the North of Scotland Industry Group.

This year's show plays host to the first H207 conference bringing together groups from the USA and Europe who will be getting down to business to agree ways to make the hydrogen/fuel cell economy a reality.

All-Energy is now in its seventh year. As well as 14 sessions on a vast range of renewable energy subjects including on and offshore wind, bioenergy, community schemes, wave, tidal, finance and skills there are new events this year such as clinics on how to reduce a company's carbon footprint, technical workshops on aviation and a session designed specifically for the farming community.

Attendance at the conference is free and you can register online at **www.all-energy.co.uk**

www.hi-energy.org.uk

If you require further information, please contact the renewable energy team at Highlands and Islands Enterprise
Tel: **01463 244350** Email: **info@hi-energy.org.uk**

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