WINTER 2006

HI energy news

HIGHLANDS AND ISLANDS OF SCOTLAND
HARNESSING NATURE'S POWER

Climate change

Costing the Earth?

Climate change report makes sobering reading

The latest report on climate change by Sir Nicholas Stern and published just a few weeks ago made for sobering reading.

According to the former chief economist of the World Bank, the world has to act now on climate change or face devastating economic consequences. Global warming, Sir Nicholas warned, could have a disastrous effect on the world's economy, shrinking it by 20%.

Some of the key points included in his report included:

- Carbon emissions have already pushed up global temperatures by half a degree Celsius;
- Melting glaciers will increase flood risk;
- Rising sea levels could leave 200 million people permanently displaced;
- Extreme weather could reduce global gross domestic product (GDP) by up to 1%, and
- There will be more examples of extreme weather patterns.

In the midst of such massive and potentially disturbing change, it is good to be reminded of the many ordinary people doing extraordinary things to help reduce their own carbon footprints on this small, fragile and beautiful part of the planet.

That's what this Winter issue of HI-energy news is all about. These are some of their stories – we hope you'll be inspired.

And thank you too for the tremendously positive response we've had to the first issue of HI-energy News.

Our next issue is themed 'innovative new projects' - to contribute, email the HI-energy team at info@hi-energy.org.uk

HI energy

HIGHLANDS AND ISLANDS OF SCOTLAND
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HI-energy – here to help your **renewable energy business grow**

The HI-energy brand is now available for use by any organisation with an interest in renewable energy and who operates within the Highlands and Islands.

HI-energy has been developed to complement the existing corporate branding used by businesses as part of their own marketing communications. Thanks to the abundant and diverse natural resources, the Highlands and Islands of Scotland is the ideal location for renewable energy developments. The renewables sector is currently going through a growth phase in its lifecycle and the HI-energy brand provides a cohesive voice for those companies wishing to take advantage of this opportunity.

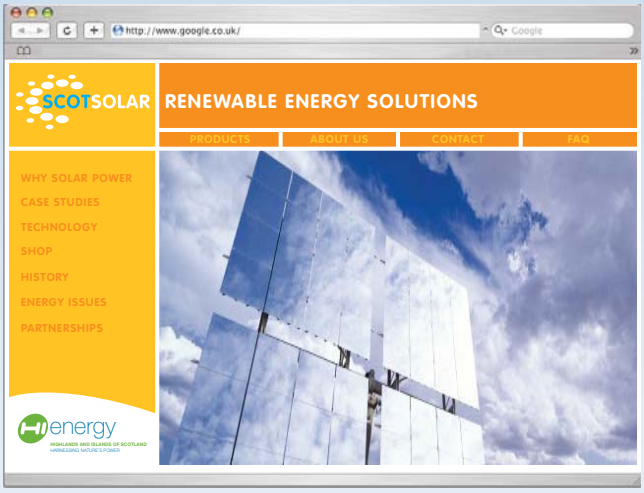
With this in mind, those companies using the brand are explicitly linked with the renewable energy sector. This linkage draws attention to the visibility of a company's knowledge, skills and capabilities with the prospect of attracting new business as a result.

HI-energy is offering one-to-one consultations to help companies integrate the brand in their existing marketing communications. In addition, the HI-energy team has also produced a DVD, highlighting the region's impressive track record in renewable energy and features news on large and small-scale projects.

Download a copy of the DVD at http://www.hi-energy.org.uk/projects-video.html and to book a brand consultation contact the HI-energy team on info@hi-energy.org.uk

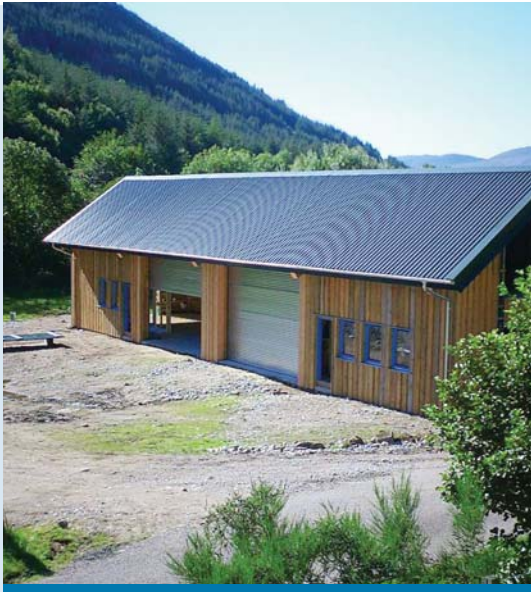
Stakeholder literature A4 brochure cover

Stakeholder literature third A4 leaflet



Stakeholder web site

In the bleak mid winter. The Chillwind team get ready to install a wind monitoring system at Druim and Arkaig.



The only way is up. Chillwind's new purpose-built offices in Glenelg.

Chillwind – a business for all seasons

It was bound to be challenging job at the best of times. Winds at 120mph and some of the harshest winter weather the Highlands have to offer.

But for the team from Chillwind, it's all in a days work. The Glenelg-based company, which specialises in wind monitoring systems, is well-used to working in some of the toughest terrains in Britain.

"Our teams of engineers are getting pretty used to working in often horrendous weather conditions.

"One of the most memorable was when our team of engineers were installing two 50m masts above the Blackwater reservoir in the Mamores," recalls Operations Manager Richard Tarves.

"Despite being battered by winds over 100mph and enduring severe ice loading, the systems are still working perfectly and are due to be decommissioned soon."

Chillwind is proving itself to be a company for all seasons. Turnover has doubled in the past five years and this month it moves in to new purpose-built offices.

"Our new site will give us a workshop for wiring and testing anemometry equipment and a base from which to diversify into other areas," says Richard.

"We're aiming to practice what we preach by constructing the new building in an ecologically sound way. The timber frame and cladding are from locally grown Douglas Fir, insulation is made of hemp, hot water for underfloor heating comes from a solar panel and we've used water-based eco-paints and finishes throughout.

We hope to be there in time for a celebratory party at Christmas!"

Chillwind began in 1991 and has installed and commissioned more than 1000 wind monitoring systems around the world – its most remote piece of equipment can be found 17,000 ft above sea level in the Argentinian Andes.

Its clients include most of the major UK windfarm developers and electricity utilities. Last year it scooped Best New Innovation at the Green Energy Awards for its mobile SODAR system which monitors wind flows at up to 140m height without the need for a mast.

The company is confident about the future and is focusing on two key areas for growth.

"On the wind monitoring side, we expect demand for taller monitoring towers will increase. In anticipation of this, we've pioneered the first 80m tilt-up anemometer tower in the UK and have now tested the design in Britain and the harsher environments of Sweden and Norway," says Richard.

"The second growth area will be diversification into the supply and installation of small scale renewables for homes, businesses, farms and community projects.

"We also believe it's vital that children are well informed about the challenges for energy supply brought about by climate change. To this end we're helping the local primary school take part in the Royal Meteorological Society's Metlink project.

"We'll be installing a weather station which the children will monitor and collect data from. This will be fed into the Metlink database and used to gain a better understanding of climate patterns."

Highlanders – **doing it for themselves**

Expectations of the region's renewable energy sector are high – and with good reason. The scope and range of technologies being developed are taking even the most optimistic forecasters by surprise.

But how are these technologies working in practice? And how do the people using them rate their performance? HI-energy News talks to two enterprising Highlanders to hear their experiences.

Ian Sinclair is happy to admit that, when it comes to renewable energy, there's plenty of scope for trial and error.

Long before renewable technologies started making headlines, Ian, director of MBS consultants in Thurso, had been experimenting with different systems.

"My interest in renewables began in 1980 when I installed a 5kW wind generator to heat my house. I ran it for about 10 years but it was a pretty primitive machine and practically uncontrollable in high winds!

"However, it did work and I've been trying out energy systems ever since with varying degrees of success."

Ian's latest projects are proving particularly satisfying. His home is currently being heated with woodchip from Dunrobin Sawmill in Golspie.

"This is an outstanding success," says Ian. "The boiler is rated at 30kW and heats my own house and another house next door which I use as an office. We're saving around £1000 a year on our old LPG system."

On the roof of Ian's office he's installed a solar water heater. It's been there for 20 years and is still working well.

He's also designed a wind and solar system – which he cheerfully describes as a 'hybrid' – which generates enough power for outside lighting and his pond pump.

And if this enterprising list wasn't impressive enough, Ian's got a few more experimental projects on the go.

"I'm carrying out trials with a solar roof designed by Professor Kerr Macgregor of Napier University. It involves using the roof of our workshop which is made of insulated metal sheets sheets. We've painted it black and added some rubber tubing and polycarbonate sheets. This will gives us a 30 square metre area of solar collector. It's early days but things are looking promising."

With support from New Deal and a graduate placement scheme run by North Highland College Environmental Research Unit, Ian is gradually pulling together a small, skilled team to focus on developing further new technologies.

Ian Sinclair and his woodchip burner. He describes it as 'an outstanding success.'

Over the coming weeks, the team will be exploring the possibilities for an electric vehicle conversion. The plan is to take a small car and covert it to run on batteries.

Ian says: "It should have a range of 40 miles at 40 mph which would be good enough for a second car doing the shopping run."

HI-energy Business Directory

The HI-energy business directory has been developed to improve access to supply chain opportunities within the renewables sector.

To promote your services you can include your key facilities, business activity and the sub-sector you operate in.

To be included on the directory please click here and fill the appropriate form.
http://www.hi-energy.org.uk/businessdirectory.html

Power from **the earth**

Bill and Brenda Martin and their thermal heat pump, which they hope will half their electricity bill.

For Bill and Brenda Martin from Fortrose, the decision to look seriously at micro-renewables was motivated by two things.

Firstly, the couple were keen to reduce their own carbon emissions. Secondly, they wanted to cut the cost of their heating bills.

“We’re both retired and are living on a tighter budget so cost was bound to be a factor but the priority was and still is environmental,” says Bill.

The couple opted for a thermal heat pump from Ice Heating. Based in Stirling they specialise in renewable energy heating systems including ground source heat pumps.

Ground source heating utilises the natural solar heat stored in the earth and, according to latest research, up to 70% of heating energy for domestic homes could be obtained this way.

The Martins looked at a number of options before deciding on the ground source system for their three bedroom home.

“It was important to know how the system would perform and Ice Heating was able to produce case studies spanning the past two years showing actual costs for a variety of different buildings.

“The system cost us around £9000 which obviously is a pretty major outlay, even with a 30% grant. However, we took the view that we had to look at this as a long-term investment.”

The Martins moved into their current home in August. Their previous house benefited from under floor heating and solar panels but their new home, with its Baxi fire, back boiler and two radiators, looked like being a hungry energy consumer.

Although it is probably still too early to judge just how efficiently the Martin’s thermal heat pump is performing, Bill is upbeat: “We were keen to contribute environmentally and this fitted well with the economic benefits.

“And while you need electricity to run the pump, it consistently produces heat for our under floor heating on the ground floor, three radiators upstairs and two bathroom towel rails.

“You obviously need to be something of an optimist to make an investment like this and I hope the estimate of energy costs of 50% of oil will prove correct.

“But we also benefit from the fact that there is no scheduled servicing, 25 years expected lifetime, no loss of efficiency – unlike fossil fuel boilers - no fuel tank or flue and a couple of hundred tonnes less in CO2 emissions!”

Cutting through 100m of finished tunnel per week, Eliza Jane gets into her stride

Eliza Jane gets into her stride

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Remember Eliza Jane - the mighty tunnel boring machine helping power into the hills above Loch Ness in what is currently Scotland’s biggest civil engineering project?

In the weeks since the last issue of HI-energy News Eliza Jane has been put through her paces and has almost doubled the length of the tailrace tunnel cutting through an impressive 100 metres of finished tunnel a week.

Elsewhere in the Glendoe project things are also moving on apace. Drilling and blasting of the access tunnel is well on target with more than half of the 1200 metre tunnel now excavated.

The next stage is to then start carving out the power station cavern 250 metres below ground level to house the giant turbine and generator.

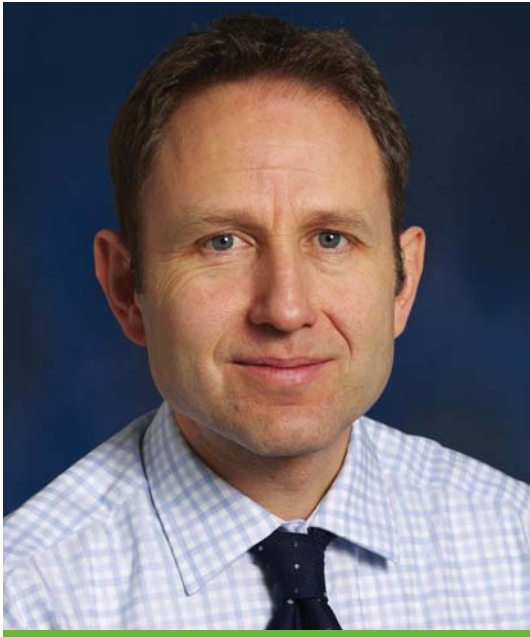
Meanwhile at the other end of the project, work is underway on the 7km aqueduct tunnel - due for completion in Spring 2008 - which will be used to feed water into the reservoir.

Excavation down to the foundation rock, located approximately a third of the length of the 1000 metre dam, is also making good progress.

And later this month staff working on the dam and aqueduct tunnel sections of the Glendoe scheme move into a specially-built camp.

Transforming **communities**

Launched in 2004, the Highlands and Islands Community Energy Company's (HICEC) purpose is supporting communities to be able to generate and use renewable energy for their long term, collective benefit. Here, Chief Executive Nicholas Gubbins talks about HICEC'S plans for the future, what inspires him and why renewable energy is an exciting business to be involved in.



Nicholas Gubbins - Chief Executive of Highlands and Islands Community Energy Company (HICEC).

Q: There are plans for HICEC to become a fully independent company in 2007. What's brought that about?

A: Currently we are a HIE subsidiary (HIE is our sole member). However, it's our intention that we shall widen our membership and become independent next year - this was always part of the plan in setting up HICEC. We want to do this to bring in the enthusiasm and expertise at community level on renewable energy development; and because we believe that being a 'community-owned' body will increase our credibility and reach at community level.

Q: What will these changes mean in practice?

A: It will mean that we will have a majority on our board of people elected from non-profit distributing community organisations. It will also mean that we will be better able to represent the views of our members on key issues. We are also hoping to secure charitable status, which should make it easier for us to access funds from private and benevolent sources.

Q: Describe a typical day for you - if there is such a thing?

A: I don't really have many typical days. But the sorts of things I regularly do on a daily basis include discussing community energy projects with staff and if they are eligible for our support, when they will they take place and how much can we contribute. Then I may be giving a presentation.

Last week it was to one of the Highland Council's committees, this week, Highland Forestry Forum, next week Scottish Parliament Rural Affairs Group. We've just appointed some new staff, a number of whom are recent graduates, so I've been involved in a good deal of 'induction' activity recently. Today we've had our board meeting, with all our directors and staff, where decisions have been taken to provide support for various projects along with other decisions on the development of our work.

Q: Is there one project HICEC has been involved in during the past year which has particularly inspired you and why?

A: There are lots of projects that have inspired me or, more accurately, the dedication and commitment of our community clients who have been developing them. So, from the wind turbine project on Tiree to the wind to heat projects in Shetland, to the biomass district heating project in Aviemore - to the PURE Energy Centre on Unst - these are all inspiring!

Q: HICEC is very much a regional initiative. Do you imagine this being replicated by communities in other parts of Scotland?

A: There's nothing quite like us in the rest of Scotland. We are part of the HIE-led consortium that was successful in winning the contract to deliver advice on the Big Lottery's Growing Community Assets programme across the whole of Scotland - so we are expanding our operation outwith the HIE area.

Q: Renewable energy is often described as a key industry sector for the Highlands and Islands. How do you see this sector growing over the next five years?

A: I think it will grow beyond our expectations - probably in ways we cannot easily predict. We will see many more community-based projects and this will greatly raise awareness of what can be done. We will begin to see 'off grid' and decentralised projects emerging - where power is generated and used locally. We will also see a rapid increase in biomass heating schemes. Anyway - that's my guess!

Q: There are some tremendously enterprising renewable energy projects happening in the region. Are there any particular technologies that have caught your imagination?

Wind2Heat where the electricity from small wind turbines goes directly into storage heating so the building warms up when the wind blows, rather than cooling down is particularly simple and elegant. We've been involved with around 25 of these and the approach is constantly being refined.

Q: And your hopes for the future of HICEC?

A: We want to be able to develop as a respected social enterprise, providing independent, free advice and support at community level. We need to make the whole business of creating sustainable energy solutions a lot easier than it currently is - and I would like HICEC, with its community members, to be at the leading edge of this movement.

New Energy System goes UK-wide

It's been quite a year for Ullapool-based Invisible Heating Systems (IHS). A move into larger, purpose-built offices and design centre in February was quickly followed by the launch of its widely-acclaimed new road energy system.

"UK interest in the Road Energy System has been quite incredible," says director Liz Stewart.

"We're already installing a number of systems in Ireland and there's been massive interest from elsewhere including airports and city centre car parks. And, of course, we've already installed it at our own design centre which was a first for the UK.

"This year has been very good for us. We've also just heard we've been short listed for the best renewable innovation award in the Scottish Renewables Forum's Green Awards."

The company was started 11 years ago by Liz Stewart and her partner Henk Verweijmeren. The couple cut their teeth in the renewables industry while living in Holland. Much of what they learnt there has been vital to the success of the business here in the Highlands.

"We began by purchasing underfloor heating systems from Holland where they'd been very successful," says Liz.

"We adapted them to suit building methods over here. The road energy system was another technology we discovered in Holland where it's been used for a number of years in homes, businesses, industrial estates and airport runways.

"It also has a number of other applications including the heating and cooling of sports fields, cold crop cultivation, greenhouses and biological soil sanitation."

Today, IHS provides jobs for 25 local people, has recently opened a new office in the Midlands and serves customers throughout the UK and Europe.

Its vision of being a one-stop shop for integrated renewable energy systems is refreshingly simple and – judging by the company's current order book – a commercial success.

The IHS package includes the design and supply of underfloor and wall heating and cooling, ground source heat pumps, solar panel and, shortly, wind turbines.

It also holds regular one-day courses for architects, consultants, the trade and self-builders giving them 'hands-on' experience of each system and how to they work.

And as an important business for both the region and its home base at Ullapool, IHS is currently waiting to hear if it's got planning permission to build six, energy-efficient low-cost homes in the town centre.

"This project arose because it was quickly becoming clear that, for our own staff, there was a real lack of quality, affordable housing in the area. That's why we decided to build our own.

"With the current trend towards environmentally friendly, renewable clean energy sources, we're convinced the way forward is with a mix of micro-renewables and that's where our business focus lies," says Liz.

www.invisibleheating.co.uk

Hidden power – inside the RES

Invisible Heating's Road Energy System™ or RES, is a clever but simple piece of technology with, potentially, massive energy saving benefits. The best way to think of the system is like a giant solar panel installed within the road, not on a roof.

The RES takes advantage of the excellent heat absorption capacity of black tarmac and asphalt and converts that into energy via a network of pipes. The pipes are installed in a grid laid on the base layer of the tarmac then overlaid with a special modified bitumen surface.

If conditions are correct the heat can be stored in the ground which can be tapped into as and when required. The excess is absorbed during summer and pumped into heating systems and roads in the winter. During summer, cold water can be pumped into roads and heating systems acting as a coolant.

The benefits are pretty impressive too:

- Carbon emissions are cut by up to 50%
- Roads are kept ice free in winter
- Roads are cooled down in summer
- The life expectancy of tarmac is prolonged
- Resurfacing costs halved
- Savings on anti-ice measures and reduced traffic jams

Fit the RES on a typical airport runway and that could provide heat for up to 2,500 homes.

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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