seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

INSIDE THE SMART ECONOMY

Business Perspectives








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BUSINESS INTERVIEWS WITH CLEAN TECH ENTREPRENEURS AND FINANCIERS

Report by:
Brian Motherway
Matthew Kennedy

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LISTENING TO THE INNOVATORS

There is a buzz around the smart economy. Around the world, clean technology is on the agenda for policy makers, entrepreneurs and investors. In Ireland, the smart economy plays to our strengths and is a huge opportunity. We are absolutely right to focus on building businesses that bring new products and services to Irish and global markets demanding clean, low carbon solutions.

Momentum is building. Ireland has a range of strong support measures in place, and several recent clean tech enterprise announcements show that they are delivering. Government has signaled its intent, and action is following.

This report is about listening directly to people who live this smart economy every day. What do the businesses themselves think? What is their experience? What do they feel they need to support them?

What do we mean by clean technology? It is clear how diverse the sector is – from advanced technologies coming out of academia, to traditional products and services adapting to new demands. From construction to ICT, from boilers to ocean energy devices. Equally, there are many types of business - university spin-offs, entrepreneurial start-ups, family firms. All shapes, all sizes.

It is also clear how dynamic it is. The enthusiasm and commitment of our interviewees is infectious – these are people with ideas and ambition, and they are determined to succeed.

Our job – in Government and its agencies – is to enable them to succeed. And these conversations have raised many ideas about how we can do this. It is clear we are starting from a strong position – many good supports are in place – but it is equally clear that more is required.

Certainty is a key word in these interviews – signals from Government, backed up with policies and supports, that this is a good place to do business, and that policy and regulations supports, not hinders.

Size is one element that I think we need to highlight. There is always a risk that in designing supports and policies we picture businesses that are larger and more mature than is actually the case. Most don't have time or capacity for attending many events or for filling in large funding applications. Most are in a permanent state of uncertainty about funding and are focused on customers and revenue. Most are businesses, not universities, and innovation is not the same as basic research. Financiers, not just Government, need to be in tune with these realities.

The diversity of the businesses requires a corresponding diversity of responses from Government. Many key elements are highlighted: funding, regulation, policy, advice. All are absolutely essential to give a clear signal and create positive conditions. But it's not a static thing – by definition it's innovation and change. We want a wide range of entrepreneurs and enterprises to flourish, and their needs are different. This means we will need to be able to respond fluidly and intelligently on an ongoing basis.

This puts the simple act of talking to the forefront. We need to create plenty of opportunities for companies to talk to each other, to financiers and to Government departments and agencies. We intend to do this. It sounds simple, but I see it as at the heart of creating a responsive system where connections are being made and emerging problems and needs are identified and resolved quickly.

These interviews have taught us a lot about life in clean tech enterprise, and we intend to absorb it, share it with our colleagues in Government and state agencies, and act on it. They have also shown us a dynamic and strong sector, with people whose ideas and drive are the real heart of our opportunity to succeed in the smart economy. My thanks to all the enterprises and financiers who gave of their time freely, shared their experiences, and gave us this positive message.

Dr Brian Motherway

Chief Operations Officer, SEAI

STEPS TO DELIVERING A CLEAN TECH INDUSTRY IN IRELAND: **A BUSINESS PERSPECTIVE**

To describe the global clean tech sector as dynamic is something of an understatement. It is growing strongly in terms of investment, employment and revenue, and is predicted by many to soon be one of the largest of all enterprise sectors.

This vibrancy is reflected in the rapidly growing clean tech sector in Ireland, which is made up of a varied range of players, from small innovative start-ups to large, established, high-tech companies. The companies interviewed in this report reflect the vitality and the diversity of the industry and collectively provide a valuable insight into the challenges and issues facing businesses currently trying to make their mark in clean technology enterprise.

All those interviewed believe that Ireland has an opportunity to position itself as a global leader in this sector, and that such progress could have an enormous impact on the country's future economic development. However, they also broadly agree that while this country has great potential and the necessary entrepreneurial pedigree, very real challenges still exist that could become barriers to growth if they are not addressed as a matter of urgency.

POLICY FRAMEWORK

From a strategy perspective, all companies interviewed agree that certainty and transparency around policy is critical. "There must be a line of transparency that everybody trusts," says Rita Shah, co-founder of Shabra Plastics and Packaging. Lack of clarity, she maintains, can be a significant barrier to planning and investing in research. It is a sentiment echoed by Nicholas Tierney, CEO of Green Biofuels, who believes Government must provide a clear roadmap of how EU regulations will be implemented in the coming years.

While many of the stakeholders acknowledge ongoing support from Irish state agencies, particularly Enterprise Ireland, all favour greater integration, communication and co-operation between them. "If you are looking to accelerate things you need to use the existing people, buildings and offices that are in place and just join the dots," says Conor Molloy, Managing Director of Authentic Solutions.

Several of the players emphasise the need for quality assurance and verifiable standards in an ever-expanding clean tech market. Molloy, for example, favours greater assessment of all companies providing services in the sector, as do Francis and Ciaran Ahern, founders of Active Thermal.

STIMULATING THE MARKET

As regards mechanisms for stimulating the market, James Ives, CEO of OpenHydro, calls on Government to play a greater role in supporting early stage start-ups through grant and equity support. He believes, however, that a streamlined approach to providing such support is vital. "You cannot make the process so onerous that it actually makes the funding inaccessible," he says.

Liam Relihan, founder of Resourcekraft, is more sceptical that grants can stimulate the market and cautions that they can in fact be a distraction for small companies. He feels there is probably an excess of grants at the moment and that many small companies believe their primary objective is to secure such support. "It's not," he says. "It is to get customers."

The question of funding and the role of the financial institutions are discussed by several of the interviewees, including Andrew Cullen, Head of Renewable Energy Finance, Bank of Ireland. Joe O'Carroll, Managing Director of Imperative Energy, believes the State has a role to play in ensuring the banks are allocating the €100 million fund established to support renewable energies as part of their recapitalisation.

Non-financial approaches to stimulating the market are also proposed. Conor Molloy points to the introduction, three years ago, of SEAI's business advice and mentoring programme, which he says has provided endorsement and market advantage to the companies taken on as specialist energy advisors.

Providing price certainty is another critical factor in developing the Irish clean tech market, according to many of our testimonials. Brendan Marren, co-founder of CES Energy, cites the Irish Government's feed-in tariff, announced last year, whereby electricity from a biomass CHP (combined heat and power) plant will have a set price for 15 years, as an important market driver.

The Government's target of sourcing 40% of the country's electricity needs from renewable energy by 2020 has fuelled investment interest in the wind sector, says Dr Liam Kelly, founder of Nualight. He stresses that this could be replicated in other areas if stipulations were introduced around, for example, central heating efficiency, CHP for factories of a certain size, or the inclusion of lighting in the energy metrics for buildings.

Stuart Deed, Head of Business Partnering at SSE Venture Capital, echoes this view: "Give the companies the chance to supply to Government organisations, to supply the services or goods or products or technologies into Government projects and development."

The financiers featured herein have several strong recommendations for Government concerning wind deployment. As regards specific policy, Bank of Ireland's Andrew Cullen emphasises that the modernisation of the national grid by ESB is "crucial to the development of the whole renewable sector", while Andrew Ennis, Director in NCB Ventures, expresses concerns around the process for connecting wind energy to the grid.

LEADERSHIP REQUIRED

On the issue of procurement, Liam Relihan suggests that Government needs to review its tender selection system. "We would much prefer to be receiving money for doing honest work from the Irish Government – kitting out their buildings, making them more energy efficient, and so on – than receiving grants."

The Government's opportunity to demonstrate leadership through its procurement and regulation policy is a recurring theme. Nualight's Liam Kelly believes the State should set an example of best practice by equipping its own buildings with energy-efficient systems.

The Green IFSC project, as proposed by the High Level Group on Green Enterprise, attracts comment from Bank of Ireland and NCB. "There are lots of other countries looking at this, but looking back at the IFSC, setting up these kinds of structures is something we're good at," says Will Prendergast, partner at NCB Ventures. "That is a real opportunity missed if we don't do something with it."

Greater focus on research and development, especially through industry and academic collaboration, also features highly as a means to becoming a leader in this sector. Liam Relihan stresses the need for a deeper scientific knowledge in clean tech if Ireland is to compete globally. "There are not a lot of people, relative to other countries, who really understand the nuts and bolts of energy," he explains. "Energy is a very tough area scientifically and, right now, I feel as a country we are just skimming the surface."

Greater involvement of the third-level sector, coupled with effective knowledge transfer, is necessary to maximise our strengths in this area, says Andrew Ennis: "SEAI does grant-fund specific technical studies, but the question is whether that information is being made more widely available, whether it's going back into our universities to maximise it."

LOOKING TO THE FUTURE: MAXIMISING OUR STRENGTHS

Many enterprises believe lessons can be learnt from other governments in relation to policy development and market stimulation. Joe O'Carroll of Imperative Energy points to strong leadership by Government in the UK. Elsewhere, OpenHydro's James Ives speaks specifically of the Scottish Government's vision to become a centre for renewable energy. "They are putting in tremendous policies and a lot of money, and they are forcing through sometimes unpopular initiatives, because they passionately believe that that is the future," says Ives.

In terms of best practice overseas, Brendan Marren mentions the "phenomenally efficient" Nordic countries and also refers to the Australian Government's decision to introduce an environmental rating on commercial buildings, and its policy to only rent buildings that achieve a certain standard within this rating. "That's good leadership," he says. "It was clear, concise action by the Government to introduce it and then lead by example."

There is strong consensus that Ireland has the potential to be a leader in the renewable energy revolution. Joe O'Carroll points out that Ireland has core competitive advantages in growing biomass, while Andrew Cullen emphasises that we have "arguably the best wind resource in Europe".

A strong track record in attracting multinationals and investment is a key strength, says Stuart Deed of SSE: "It means that you will quickly be able to facilitate this kind of investment, and understand how Government support or grant funding will help incentivise businesses to do this, and incentivise investors to invest in them."

Limited experience in investing in the clean tech sector may actually be an additional advantage, he adds. "You're almost starting from scratch, so you can pick the best things to do and avoid the pitfalls that have been experienced elsewhere."

Brendan Marren too is optimistic: "With the success we have had, with our Irish entrepreneurial mindset and our work ethic, and the experience we've had over the years of the boom of managing business and growth, Ireland could be a world leader in this."

There is broad consensus that the Government, academia, financiers and the private sector will need to work closely together and collaborate if we are to exploit these strengths and deliver a world-leading clean tech industry in Ireland.

Ireland has much to learn from the UK when it comes to policy on renewable energy generation and the supports necessary to develop a sustainable clean-tech sector, says Joe O'Carroll, Managing Director of **Imperative Energy**.

SMART PROCUREMENT

Imperative Energy Ltd was set up in 2007 to supply renewable energy generated from biomass fuel to customers in the industrial, commercial and public sectors through purpose-designed plants located at clients' sites.

"There was a solutions gap so we came up with a business model where we would supply a complete design, build, finance and operation solution for biomass systems," explains Joe O'Carroll, the company's Managing Director. The benefit to the client is they can get carbon-neutral heat and/or power under long-term price-fixed contracts.

"Biomass systems are very good for providing consistent base load heat, but they're less effective for highly variable heat loads," he continues. "So we look for clients with a particular profile: they generally require heat on a 24/7, 365-day basis, or as close to that as possible.

Our business model is to supply people with energy rather than with a piece of technology for which they must then find fuel, service and maintenance providers."

The company expects to be profitable in the next year and ambitious targets for growth include having 200MW installed to capacity under the design, build, finance and operate model within the next five years. Around 10pc of this will be in Ireland and 90pc in the UK.

STRATEGIC APPROACH

O'Carroll admires the UK's strategic approach to growing the market.

"A lot of renewable energy technologies are being installed in the UK by Government diktat, rather than by throwing grant money at people and hoping for uptake. Indeed it is becoming the norm across Europe for all public buildings to be obliged to install renewable energy technologies."

The introduction of such a policy in Ireland would greatly boost the sector, he says.

"We reckon that about €100m a year is spent on imported oil just to heat public buildings," explains O'Carroll. "We can switch those buildings across to locally sourced biomass and so create market pull for biomass grown by Irish landowners. We've already secured the capital. We've got the technology," continues O'Carroll.

"By switching from oil to biomass energy supply contracts, the public service would continue to write a cheque for €100m every year to have their buildings

heated, but would stimulate construction activity, and market demand for biomass. They would switch from carbon emitting, imported oil to local, carbon-neutral sources of energy. We feel that kind of smart procurement on behalf of the public sector would be far more beneficial than schemes based on grant aid."

He believes greater transparency is required in Ireland in the area of consultation on policy.

O'Carroll also makes the point that the Departments with responsibility related to renewable energy need to make a clear statement of intent with regards to the future of this industry in Ireland.

"Is the desire to have an energy sector dominated by the State or is there interest in trying to create an opportunity in which SMEs like ourselves can be successful?" he asks. "Because the two things can't go hand in hand. We can't have semi-states soaking up every opportunity that's out there purely by virtue of their scale and resources while the SMEs fight for the crumbs. It is important for companies like ourselves to gain sizeable market share in our home market before we can prove ourselves in export markets."

"We're involved with the Department of Energy and Climate Change in the UK," he says. "Even the fact that they have a department with that responsibility shows how serious they are about addressing energy and climate change issues."

Return on investment for the taxpayer is more of a focus in the UK than in Ireland, claims O'Carroll. "There is a more obvious appreciation there that the public service's priority is in working for the public.

"In the UK they only support the output from renewable energy technology; they are less interested in giving out capital grants for people to buy the equipment. You get a certain number of pence for every kilowatt hour of renewable energy you produce over a 15-year period, so essentially you are incentivising companies to make sure the system operates efficiently and continues to do so."

EARLY STAGE SUPPORT

In the company's early stages it worked closely with Enterprise Ireland and O'Carroll acknowledges that agency's help in opening doors and reaching the right people. "They're very good at market intelligence and feeding that back to their clients," he says.

However, sourcing funding early on was difficult, he says. "We were coming to market with a new technology – biomass boilers – which people weren't familiar with, and a new procurement model – energy contracting - that they weren't used to. So that was a barrier we had to overcome. We did that through persistence, but it cost us a lot of money and a significant amount of time and overhead to convince people that this was an effective way to buy energy.

We would like to see the State taking leadership and driving the procurement of renewable heat."

"The banks here understood project finance in the context of wind farms, but that was it, so we spoke to European banks and decided at the end of 2008 that we needed to take on a significant equity partner to provide equity finance on which we could leverage debt funding."

Enterprise Ireland helped the company in terms of presenting its pitch to investors, and after speaking to a number of investors in the UK, the company got a €30 million equity investment from Rockfield, a deal that was finalised last August.

O'Carroll points out that the recapitalisation of the Irish banks obliged them to each set aside a €100 million fund to support renewable energies. "That was supposed to be part of the recap deal, but again there's just no visibility on where that fund resides and how to access it," he says.

"I think there is a role for the SEAI to perhaps work with the banks to ensure that a proportion of that €100 million be syndicated and allocated through an entity that maybe has some SEAI staff seconded to it to evaluate projects. This entity would then have both technical knowledge and funding to help support start up companies and projects in the Renewable Energy sector in Ireland."

Start-ups in renewable energy should, he says, make use of all the supports from Enterprise Ireland. "At the very early stage we availed of a feasibility study grant from Enterprise Ireland so we took somebody on to do analysis for us and built our business plan around that. It gave us a very strong platform to go and talk to the venture capitalists and the private equity firms," he says.

"And from day one you have to be looking at the export market. The Irish market is just not big enough to sustain companies like ours, particularly when it comes to trying to scale up."

He says that Ireland has some core competitive advantages when it comes to growing biomass. "We've got the fastest growth rate of biomass in Europe and we have a strong agricultural heritage when it comes to growing crops and taking them to market," he says. "We should be using that to our advantage and the best way of really doing that would be to maximise the use of biomass in Ireland."

"Now is the time for Ireland to seize upon this opportunity to support companies like ours in the bioenergy field, and those companies on the wave and geothermal side, so as to grow exports from Ireland."

In March 2009, **Bank of Ireland** announced the launch of a significant new €100m fund to support the financing of Irish based renewable energy projects. This was the first in a series of initiatives totalling €200m undertaken by the Bank aimed at supporting environmentally friendly projects in Ireland. We talk to Andrew Cullen, Head of Renewable Energy Finance, BOI Business Banking, about progress to date.

BANKING ON RENEWABLE ENERGY

Bank of Ireland (BOI) has been involved in Project Finance and in particular in the renewable energy sector for a number of years.

Bank of Ireland (BOI) have dedicated Project Finance lending teams in both the Business and Corporate Banking divisions. These teams have extensive experience in the debt funding of renewable energy projects, in Ireland and internationally, and have assembled a renewable energy portfolio of circa €800m including comprised of a variety of waste management, water, solar and wind energy projects.

"The Bank aims to grow its share of the Irish renewable energy market and views this sector as an area of significant potential. BOI's Renewable Energy fund is specifically earmarked for those interested in either expanding an existing project or developing a new project in the Irish renewable energy sector."

According to Andrew "The Renewable Energy fund provides long-term debt finance, with the loan term typically in the order of 15 years, plus the period for construction at the outset, where you would be looking at some 12 to 18 months."

"To date circa 40pc of the fund has been committed with the vast majority of this commitment comprising drawn funds."

When assessing a renewable energy project, there are certain factors that Cullen and his team look at to determine the viability of the project.

"The off-take of the power coming out of the project is the first thing you look at, in terms of the contractual arrangement, how much the power is being bought for and by whom. Its key that such an arrangement qualifies for Government support under the REFIT scheme which was put in place to support Irish renewable energy projects."

"Then we would look at the actual technology involved and ensure that we're happy it's a commercially proven technology with a strong track record. We'd also look at the contractual side of any technology provider, the whole area of insurance and manufacturer warranties, to ensure there's a good operation and maintenance programme there."

"If it's a technology that requires inputs to go into it such as a Combined Heat and Power (CHP) plant, then we'd be looking at the historical performance of the technology, what the input costs are on a long term basis so as we can have visibility on the long term operating costs of the project."

"The final thing you need to examine is the financial model. The bank needs to be satisfied that the project has the ability to carry the debt level that is being requested. That typically tends to be in the order of 70% -80% Loan to Cost for Irish onshore wind farms, and may be lower for other renewable energy projects depending on the project dynamics."

Due to the maturity of the wind farm industry banks have become comfortable in lending to the sector explains Cullen. "If you have a site with a strong wind regime, with suitable turbines that benefit from a reputable manufacturer's warranty and Operations & Maintenance Agreement, then greater certainty can be placed on likely revenues."

"This is why you have over 100 wind farms in Ireland. Investors have become comfortable with the business model, whereas with other renewable energy projects the technology might not be as proven, and there may not be as much price certainty surrounding the inputs. The input for wind farms is the wind, and the wind is free!" Not that Cullen doesn't see potential in those other technologies. "It is just that there are different parameters involved."

INFRASTRUCTURE IS KEY

If the Irish renewable energy sector is to thrive, Cullen believes the modernisation of the national grid by Eirgrid in the short to mid-term is critical.

"I think Eirgrid have spoken about €3.5bn of investment into the national grid, and that's crucial to the development of the whole renewable energy sector here.

"The whole grid-connection element has been problematic in terms of offering grid connections. Operators are currently finding themselves in a queuing system. That's unfortunate because it has somewhat slowed up the development of the sector in Ireland.

If we were able to award the grid connections in a more timely fashion it would certainly be a huge plus. But, until the investment goes in, the connections can't be issued as fast because the current national grid can only

accommodate a limited number of new connections.

The interconnector that is being routed between Ireland and the UK is also key," says Cullen. "The EU said it would give €110 million of loan assistance towards that project through the European Investment Bank. As our wind energy increases in terms of its capacity, and also because wind is intermittent, the interconnector would be vital in terms of exporting any excess capacity in the future."

SUPPORTING THE SECTOR

When it comes to State support, Cullen would like to see even more "joined-up thinking" among the various Government agencies such as the IDA, Enterprise Ireland, Sustainable Energy Authority of Ireland and Forfás, although he says there has been some progress on that front.

"Price support schemes have proven important as regards State support."

He points to to the Bank of Ireland Seed and Early Stage Equity Fund, which is managed by Kernel Capital and is focused on providing early stage capital to high-potential start-ups in the services, clean tech and clean technology areas, among others. The €26 million fund is supported by Enterprise Ireland and the University of Limerick Foundation.

"The fund provides equity to emerging businesses and is focused on investment bite sizes of between €100,000 and €500,000. It's a good example of the kind of joined-up thinking that's needed when it comes to funding," says Cullen.

That said, he believes that improvements could be made to Section 486B, which provides tax relief for corporate investment in certain renewable energy projects in the solar, wind, hydro or biomass technology categories. "Ironically the limitation here is that the company in question only gets tax relief at the rate of 12.5pc. This has actually hindered investment because companies are simply not attracted to it."

CLEAN TECH ISLAND

As to Ireland's future as a clean tech leader, Cullen believes the so-called Green IFSC project that has been mooted would be an exciting development.

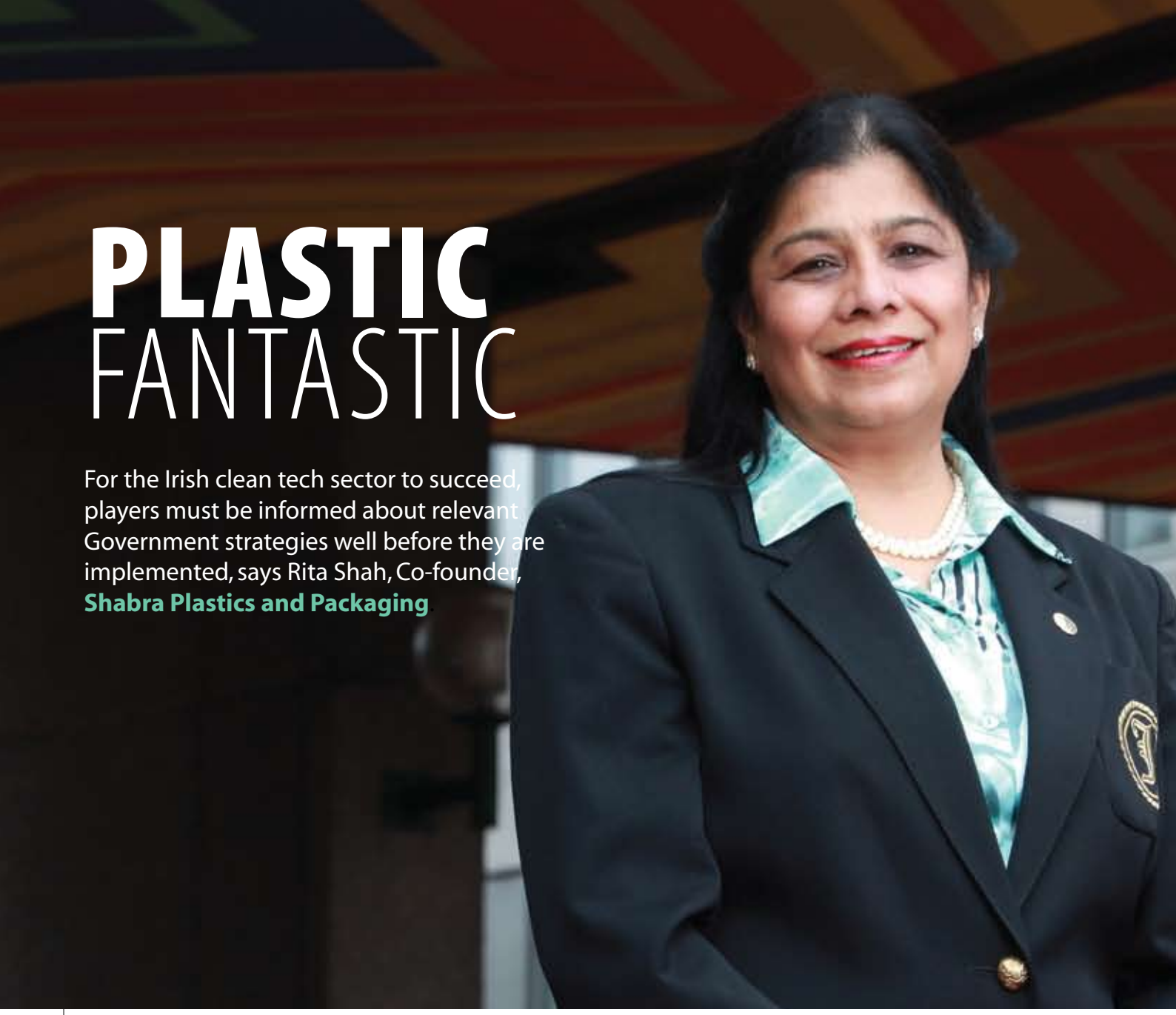
"It would be terrific if it could take off. There's a high-level working group looking at it at the moment, and the idea would be to attract into Ireland two things: one would be the administration and management of green funds; and the second would be emissions trading.

Other countries are looking at setting up something similar, but it could be a great opportunity for Ireland in terms of innovation, employment and tax revenue to the State. That would add incredible value for Ireland."

While Cullen believes the wind sector is crucial and that Ireland has "arguably the best wind resource in Europe", he also says we should be looking more at equipment-manufacturing facilities.

"We have over 100 wind farms in Ireland, and all of the equipment – the turbines, the blades, the routers – are imported from outside Ireland. It would be great if we even were able to start with micro-turbines and support the manufacture of that equipment here in Ireland, for use in Ireland – that would be a tremendous start."

The opportunity is there for Ireland, says Cullen. "We just need to walk the walk. It is an advantage that we have a Green Party environment Minister and a Green Party Minister for energy and natural resources. If we can get the pivotal pieces in place such as securing the interconnector, getting the national-grid upgrade, I think Ireland could become one of the top renewable-friendly countries in Europe."



PLASTIC FANTASTIC

For the Irish clean tech sector to succeed, players must be informed about relevant Government strategies well before they are implemented, says Rita Shah, Co-founder, **Shabra Plastics and Packaging**

Monaghan-based plastics manufacturing and recycling company Shabra was set up in 1986 by Rita Shah and Oliver Brady, who recognised that plastic was increasingly a commodity that was being used everywhere and in every way.

Initially focused on manufacturing bags and plastic packaging materials, the company began recycling plastic in the mid-Nineties. "Ireland was looking after another country's waste problem by importing recycled plastic," explains Shah. "We thought, we should be able to recycle / reprocess Ireland's own waste plastic (which was at that time going to landfill)".

In 1995, the company extended this recycling service to customers, supplying them with all their packaging needs and then collecting the used packaging waste from their premises backdoor, for recycling and reprocessing in Castleblayney, Co. Monaghan.

In the next few months it will be introducing new plastic bottle sorting facilities. "The facility we have at the moment sorts the bottles out, but you can only take out one material type at a time," says Shah. "The new sort and count facility will be able to separate all material types, efficiently and accurately in one throughput."

Because of the nature of plastic and the fact that different varieties are incompatible with one another, quality is a fundamental issue. It's something that has enabled Shabra to compete at an international level, despite the fact that materials can be sourced much cheaper in certain markets, says Shah.

"Our facilities have all the health and safety, quality and environmental standards," she says. "Everything in our manufacturing and recycling plants is done around those standards. Everyone wants a quality material, so if we can provide the quality, we can sell it."

Independent recognition of Shabra's exacting requirements includes ISO 9001 Quality, ISO 14001 Environmental and OHSAS 18002 Health and Safety accreditation. According to Shah, the company was the first in Ireland to implement ISO's Integrated Management System combining the three standards. The company has also received the Excellence Through People accreditation, reflecting its commitment to investing in its 49-strong workforce.

While the firm has picked up various awards over the years – including Forbairt Company of the Month, International Ship to Stock and Bank of Ireland Achievement Awards – Shah herself has received a number of personal accolades, including the O_2 Business Woman of the Year in 2003, the inaugural Permanent TSB Ethnic Entrepreneur of the Year in 2007 and WMB Hewlett Packard entrepreneur award in 2009.

AGENCY SUPPORT

Enterprise Ireland has been a solid partner for Shabra, says Shah. "I have to compliment them," she says. "I have to say when they come out to you, they listen very carefully, they take it back and they co-ordinate well with their expert teams. They have helped us to deliver on what we've set out to be."

As well as taking part in a recycling waste management exhibition in Birmingham in 2008 with EI – something Shah describes as a tremendous success – she and Shabra's recycling manager, Anita Smyth, recently travelled to China on a trade mission with the agency.

"It's important that you look at other models and see how you can compete," says Shah.

"In business it's about always benchmarking against other companies out there and looking at what we can do better."

Enterprise Ireland has been particularly helpful in introducing the company to potential new business and clients, says Shah. Once Shabra's current phase of development is completed she plans to talk to a number of EI managers in relevant offices around the world, with a view to setting up meetings and working out appropriate marketing strategies for different markets.

Shah believes there are opportunities for high economic growth in the clean tech sector, but she believes that the Government could be doing more to help. In particular, she says, the sector would benefit from being informed of future Government strategies and policies in this area.

"They could always say, this is where the Government thinks that it might be going," she explains. "They could work with the companies impacted by possible new legislation rather than just saying, this is it, it's going to happen. Let the public and let the manufacturers know the advantages and disadvantages of bringing in the legislation.

"There must be a line of transparency that everybody trusts," she continues. "The trouble is when people don't know." Not knowing, she maintains, can be a significant barrier to planning and investing in research. "There also needs to be very simple language – the legislation can be very hard to understand. It should be easier."

EUROPEAN OUTLOOK

Shah also believes that Government needs to look at the relative cost of doing business here in comparison to the rest of Europe.

"If we are to realistically compete for exports, the Government needs to look at the challenges and barriers to that," she points out.

Irish agencies should be doing more to encourage companies in the clean tech sector to go on trade missions and to exhibitions abroad in order to stimulate exports, she says. "Maybe they could bring role-model companies out to a European exhibition because certainly many companies can't afford to just up and go to overseas trade shows. It's up to them to take selected companies who can help market Ireland."

Part of the barrier to getting funding from banks and other sources, she says, is to do with lack of knowledge. "How do you expect a bank to finance a project, how do you convince them that the waste you're working with is going to be a bag or a roll of film? " she asks. "But if there were strategic guidelines given to banks and they had enough knowledge about clean tech they might see a niche there."

Shah believes that Ireland is one of the leaders in clean tech in Europe in terms of quality of process, innovation and research. "One disadvantage is location," she says. "People who are buying obviously have to accommodate that element of logistics, so it's vital to be competitive when we are competing with places like Germany or France and their logistical advantage."

Shah is ambitious for Shabra, and for the sector. The company's goal is to become the market leader in its sector in Europe. "The motivation is that we have to do it, it has to happen, because there's no other alternative," says Shah.

EMBRACING OPPORTUNITIES

Ireland has an opportunity to excel in the clean tech sector, but Government must give clear direction and lead by example, says Brendan Marren, Co-founder and Director of Sales of **CES Energy**.

Combined Energy Solutions (CES Energy) provides on-site sustainable energy generation solutions and energy-efficient products to corporate customers in Ireland, the UK and Australia.

Set up in 2002 they now have operations in Ireland, England, the Middle East and Austrailia.The business developed out of Marren Engineering, which was started in 1998 to supply HVAC (heating, ventilation and air conditioning) systems to the construction sector. "It did well in that market with good management, entrepreneurship and on the back of Ireland's boom," explains Brendan Marren, Director of Sales at CES Energy. "But every boom comes to an end, so you want to position yourself for the future. It was a case of taking that traditional business overseas or getting into a new and more exciting future. Energy was the area we decided to get into."

Specifically, the company focused on energy-efficient systems and renewables. Marren points out that up to 70pc of the energy used to produce electricity is currently wasted, either through unused heat or distribution loss. "Combined heat and power (CHP) captures the heat that is normally wasted," he says. "And, as we're generating at the point of use, we have no distribution losses."

The company now offers a complete turnkey package, from identifying the solution to operating and maintaining it. "In a lot of cases we also finance it and then sell the power to the client over an agreed period, at agreed commercial terms." Target markets include commercial buildings, the pharmaceutical, medical and healthcare sectors and data centres. Current customers include Citi, Boston Scientific, IBM, A & L Goodbody and AIB.

AUSTRALIAN MARKET

With business initially slow to take off in Ireland, the company focused on the Australian market, where legislation in this area has been progressive, says Marren.

"We now have a well-established business downunder, including offices in Melbourne and Sydney, and we have learned a lot from that market."

For natural gas fired CHP to be economically viable, there needs to be a certain difference in price between electricity and gas – known as the spark gap, Marren explains. "If that's not sufficient, the business model isn't there. In Australia they have an abundant supply of natural gas and strong legislation where buildings must be rated, with subsequent penalties and rewards. So, the model was right."

The company established a London office in 2007, although it had already been operating there for several years. Operating in three different markets, Marren is well placed to see the impact and value of quick action by Government on the industry.

"In Australia a real boost for us was the introduction of a rating on commercial buildings, which is reassessed regularly through utility bills. The government said it would not go into a building as a tenant unless it was over four and a half stars. That's good leadership. It was clear, concise action by the government to introduce it and then they lead by example."

"Another area we're heavily involved in is district heating, where you have high density residential developments with a centralised plant from which you distribute hot water into the dwellings, as opposed to individual boilers in each apartment," he continues. "We do this a lot in London, where for a number of years you could not build high density dwellings without putting in a central plant. In Ireland you still can, which is unfortunate. With a central plant you can incorporate renewables and efficiencies."

A CALL FOR CERTAINTY

Marren is calling for certainty from Government here in Ireland. "The decision-making process can take a number of years in our business. If there is not some clear direction of what Government is going to do for an extended period of time, it's very hard to make a commercial informed decision to invest."

Some good decisions have been made, he concedes.

"Biomass has been around for a very long time and has been very successful in other countries. The Irish Government came out late last year and announced a feed-in tariff, where

they would buy electricity from a biomass CHP plant at 12 cents a kwatt for 15 years. So suddenly you have a 15-year certainty, and it's quantifiable: there's a rate and there's a period. That's a good example of something positive that has been done."

Combining renewable generated energy with high efficiency such as CHP is the ultimate 'green solution'.

This year, together with our partners we will offer turnkey large scale biomass CHP project. Offering a truly turnkey solution including fuel supply, experience in building and financing large scale plants, engineering excellence and the experience to operate and maintain is a compelling offer.

However, Marren believes Ireland has already missed many opportunities when it comes to clean tech. "A lot of poor stock was built through the boom. Where clear direction is given, the onus is on the developers to follow the rules. That hasn't been the case here."

Marren is happy with the performance of the Irish agencies, having used the services of SEAI, Enterprise Ireland and IDA. "They were great from all perspectives, and they have certainly added a lot of value for us."

"We worked very closely with Enterprise Ireland in a number of ways in entering different markets like the UK, including obtaining market information and contacts. We've used their offices in London to interview people, they assisted in setting up our office there, and advised us on locations and agencies to use."

However, he believes that dealing with the agencies would be made easier for companies in the clean tech sector if there were some central contact point. "It would be great if there was a champion there to leverage off the three agencies, and understand exactly what was going on, and feedback centrally."

There is funding available, he says, but getting it is a long and difficult process. "You need to employ time and resources to apply, and that's ultimately money," he says. "It could certainly be made easier."

When it comes to best-practice countries in clean tech, Marren points to the Nordic countries, which he describes as 'phenomenally efficient', and to part of Germany, where it is not possible now to build a hospital, for example, without CHP. "We're not there yet in Ireland," he says.

While Ireland has some catching up to do, Marren believes that there is a great window of opportunity there for this country. "I think with the success we have had, with our Irish entrepreneurial mindset and our work ethic, and the experience we've had over the years of the boom of managing business and growth, Ireland could be a world leader in this.

"The opportunity is there, the window is open. I think it should be harnessed. That is what we're seeing in the UK. The Government needs to come out and lead by example, give clear direction and then go out and do it."

EFFICIENT INVESTMENTS

Through its Corporate Finance department and NCB Ventures arm, NCB has seen clean tech grow in importance when it comes to equity investment, but it still has a long way to go.

NCB is one of Ireland's largest independent securities firms, providing institutional equities, wealth management and corporate finance services to clients for over 25 years.

NCB is no stranger to the clean tech sector. Andrew Ennis is a Director in NCB's Corporate Finance Department, specialising in utilities, renewable energy and private equity fundraisings. "We have been active in the sector since 2001, long before renewable energy became fashionable," says Ennis. "We started working with Airtricity in 2001 when the industry was in its infancy. So we have grown with the industry, and have earned a lot of credibility. One of our particular strengths is in valuation of early stage ventures with development pipelines.

"We always take a long-term approach to our investees," he continues. "We raised money for Airtricity in 2002, 2003, 2004 and 2006, and then in conjunction with Credit Swiss sold half of Airtricity in 2007 and the other half in 2008. I think it demonstrates that long-term commitment we have to both individual clients and the sector in general," he says.

NCB's approach has been to focus fully on a small number of quality companies, says Ennis. "We would rather have two or three excellent companies and work with them for 10 years each, than have 20 active relationships and not be able to serve them properly."

NCB VENTURES

NCB also has a specialist ventures arm, NCB Ventures, which has some €95 million under management, and invests long-term equity capital in fast-growing private companies. It currently manages the €75 million Ulster Bank Diageo Venture Fund, which seeks to invest in growing companies across the island of Ireland.

Clean tech is just one of the sectors on which NCB Ventures focuses, along with environmental services, engineering and ICT, says Will Prendergast, Partner at NCB Ventures.

"NCB Ventures manages a number of 10-year venture capital funds, set up to invest amounts of €1–5 million into entrepreneurial Irish companies looking to become respected international players, and with good chances of high growth rates over the period that we are involved with them."

The Ulster Bank Diageo Venture Fund was launched a little over a year ago, says Prendergast. "We look at a lot of businesses, but we invest in just four to five businesses every year. Not all of those are in clean tech, but we are seeing increasing opportunities in that area, which I think will lead to more and more investment."

Ennis explains that if a proposition does not suit NCB Ventures, there may be opportunities for investment from NCB's Corporate Finance arm. "We fund projects from our private clients, we can access our own high-net-worth individuals' money, and institutional money. So when a proposition may not suit NCB Ventures, it may suit one of our clients. We would be quite active in the clean tech space, and our investment level would range between €5 million and €50 million."

There's a great appetite out there for investment among entrepreneurs, says Ennis, who questions whether many of the various State agencies bodies should not instead be looking to take equity stakes.

"There are companies that would do anything to get funding, so giving grants where equity would be freely available, you have to question the value for money for the agency."

When it comes to accessing commercial funding, Ennis believes the enterprises facing the greatest challenge are those early stage companies with very large funding requirements.

"Some of these companies, particularly in the wave and tidal area, require very significant amounts of money. The companies are pre-revenue, and many of the larger investors simply don't do pre-revenue companies. It's very hard for a venture investor to take them on when the capital amounts are so large and the time frame is so long.

Prendergast adds that there are other opportunities leveraging Ireland's expertise in ICT.

"When I see the opportunities that come to us, a lot of the clean tech can be software or systems -type investments which can be quite capital efficient, requiring less-than-€5 million to demonstrate significant progress. These businesses can create quite a lot of value. That is where I think Ireland can excel."

Ennis has an important tip for companies seeking venture capital. "Technology companies tend to be engineering-led, and sometimes they do not have enough of a finance discipline to match," he says. "They need to have a better balance. It's a common failing when companies come to see us."

IMPERATIVES FOR THE FUTURE

Prendergast and Ennis both have strong views on what Government needs to be doing to advance the clean tech sector in this country.

"I think the biggest issue relates to the Gate 3 process for connecting wind energy to the grid. It is very cumbersome and elongated," says Ennis. "We are making great progress in wind energy compared to many countries, but the Gate 3 schedule sees much of the projects being built in 2018, 2019 and 2020, and very little happening until then. This is not helping the industry, nor will it maximise job creation."

The universities need to have a greater role too, says Ennis. "We need to be involving the universities more. SEAI do grant-fund specific technical studies, but the question is whether that information is being made more widely available, whether it's going back into our universities to maximise it. It is about how we socialise that information and ensure the universities and researchers benefit from it. It comes back to value for money for the taxpayer.

"And we need also to be looking at long-term export to the UK and how Ireland can get access to UK ROCs (Renewable Obligation Certificates)," he continues. "We may be able to deliver wind energy into the UK faster and cheaper than they can build it. They should be incentivised to take our power, and offer their incentives to us."

In the longer term, Ennis says Ireland needs to have its own version of Scotland's European Marine Energy Centre (EMEC) off Orkney – a publicly financed facility for testing tidal and wave technologies. "Irish companies are currently going to Scotland to get their equipment certified. We should be doing this here."

The Government also needs to interact more with the industry, says Ennis. "Sometimes they need to dis-intermediate the State agencies so that we see people in the Department meeting directly with the companies. The Government needs to be talking to people like us, and to be seen to be in touch with what is going on. It needs to be closer to its customer."

A great example of where such collaboration can occur is in the mooted Green IFSC project, adds Prendergast. "That is an area ripe for really tight collaboration. There are lots of other countries looking at this, but looking back at the IFSC, setting up these kinds of structures is something we're good at in Ireland. That is a real opportunity missed if we don't do something with it."

Prendergast sees other opportunities in Cleantech being driven by changes at the European level. "The implementation of EU directives, such as the Landfill or WEEE Directive, are creating new European wide markets. Getting our entrepreneurs close to the changes in regulation at an early stage can give them the head start to create solutions which every European country will eventually need."

SSE Venture Capital was formed in February 2007 as the venturing arm of Scottish and Southern Energy Plc (SSE). Today, it identifies, develops and executes investments in the clean tech sector in a range of countries.

Tapping the Green Mine

Stuart Deed, Head of Business Partnering at **SSE Venture Capital**, believes that the Government must work hand in glove with the private sector if the clean tech mine is to be tapped in Ireland.

As Head of Business Partnering, Stuart Deed has overseen direct and indirect investments in a broad range of clean tech companies. He and the Ventures team are always on the lookout for strong investment opportunities in order to develop and grow SSE's portfolio of investments in companies that can provide products and services that strategically support SSE Group businesses.

"We would do this via indirect investments through capital investment in funds, and also through direct investment, partnerships and minority stakes in companies providing clean tech technologies," says Deed. "By the end of this year, we hope to be up to about £200 million sterling invested."

Having invested in companies around the world, Deed and the Ventures team are now looking at potential investees on the island of Ireland, where it has not invested to date.

"There has been a shift in the approach to investment in Ireland, from a focus on bringing in large foreign direct investment by companies, towards building up local innovation and invention through the involvement of local communities, local universities and local investors. We find that the new approach of the business community in Ireland matches well with our own."

A GOOD IDEA

Deed says SSE Ventures is open-minded as to the type of company or technology that has potential. "It's one of those things – a good idea is a good idea and it really doesn't matter what sector it's in. If it's environmentally sound, if it's energy-efficient, if it reduces carbon, then we're interested in it. And that is the key thing – good ideas and an environment that supports the development of those good ideas."

The level of investment and the type of company that SSE Ventures considers is also wide ranging. "We've done everything from £25,000 to £15 million investments, from something that is just at the concept stage to businesses with multiple million pounds of turnover. As a result, if you look at our portfolio, there is a nice balance."

Deed says in general SSE Ventures looks to take a significant minority stake in its investees. "That would probably range from around 12.5pc up to 25pc. We prefer not to be a majority stakeholder because we then get into the realms of 'If we're going to put that much money into a business why don't we do it ourselves?'

IRELAND'S POTENTIAL

Deed is positive about Ireland's potential to compete in the clean tech sector.

"I think the fact that Ireland has a track record of attracting in the big companies and investment is an advantage. It means it will quickly be able to facilitate this early stage investment, and understand how government support and grant funding will help incentivise this process."

Ireland's relatively slim track record in investing in the clean tech sector can actually be an advantage too, says Deed. "Ireland is almost starting from scratch, so it can pick the best things to do and avoid the pitfalls that have been experienced elsewhere."

As regards what the State can do to encourage the sector, Deed has some advice. "Governments must provide encouragement for entrepreneurs to be entrepreneurial, provide funding to help the funders, and not get involved in the management of things but rather assist the investors to pick the winners."

"You'll often hear governments say 'We're not here to pick winners'. But I think Government can at least help investors pick winners. What is the point of encouraging investment in things that you don't think will succeed? Government needs to listen to those people who are likely to be able to assist potential winners and support them in making the right decisions. "

As regards financial support, he believes Government must take a commercial view. "There shouldn't be too many preconditions. It should be treated like an investment, that will generate a return allowing further investment in other opportunities. That way the company doesn't have to struggle with operating in a very different way just because government money is involved."

An area where he advises caution, whether it is government or the business angel community, is investing too much money too early in these ventures. "I've seen this happening, and you end up with a funding gap, the so-called 'valley of death'. This is where companies get too much money early on resulting in an overly high valuation and overly high expectations. At the next round of funding the business valuation is too high for investors and they look to other businesses. R&D monies are just that, and should not form part of the business valuation, that should come when you have a product that can go to market."

The issue of procurement has to be tackled too, says Deed. "Give the companies the chance to supply to government organisations, to supply the services or goods or products or technologies into government projects and development."

"Ireland has targets to meet just like the UK in terms of its carbon outputs, its energy efficiency and building standards, so we should be awarding contracts to companies that are offering something which has significant added value in terms of carbon reduction, energy efficiency, building quality."

Deed has been quite impressed with the agencies he has dealt with, from Forfás to Enterprise Ireland to the SEAI. "I think they are well positioned to make this investment happen, but my view would be that we all need to do a little bit of listening and a little bit of learning in order to ensure the encouragement of internal development in terms of technologies and clean tech businesses."

And who should they be listening to? "The small businesses for a start, definitely," says Deed. "Every day I'm getting new ideas from these people and it's fantastic opportunity. And they should be listening to investors like ourselves as well."

SSE Ventures has significant experience of co-venturing with, for example Scottish Enterprise, and it is this co-operation between state bodies and the private sector that is vital, says Deed.

"It has to be done together. I really believe that is a fundamental link. You have to have the Government and the private sector working very much hand in glove. Yes, we may have slightly different goals, but they will all be delivered by mutually working towards the same aim – a strong and innovative clean-tech sector."

JOINING THE DOTS

The greenest, most profitable energy is the energy you do not use. That is the credo of **Authentic Solutions**, independent energy advisors who help organisations to reduce their energy usage.

Established in 2005 by Managing Director Conor Molloy, Authentic is a young and dynamic firm of independent energy advisors specialising in resource and energy management, particularly in relation to transport.

"We would work with small to medium-sized enterprises that have a large diesel fuel and energy bill," says Molloy. "We offer them advice, training, workshops and ongoing outsourced services."

The business has its genesis in a large project Molloy was involved in 10 years ago in the UK. "I was working with a small Irish software company, with venture capital (VC) backing, and we won the largest project of its kind at the time in Europe, to improve safety for 6,500 drivers and their vehicles. One of the side effects of this project was to cut fuel usage by £1 million sterling a month."

It set Molloy thinking. When the company was later bought out, he left and started Authentic.

"We set up specifically to tackle the fact that energy saving is about changing people's behaviours, not just about the technology employed," he says.

The company's sustainability consultant is Lesley Butler, a specialist in energy management and project management, and a former Ben & Jerry's climate change ambassador. Her role involves helping SMEs to reduce their carbon footprint and carrying out energy assessments.

SUPPORT CHANNELS

Molloy initially went to Enterprise Ireland (EI) for support, having been a client over the years through his involvement in several start-ups. As achieving certification for the company as an internationally traded services entity was Molloy's priority at the time, EI pointed him in the direction of his local county enterprise board (CEB). "The CEB was spot on: focused, practical, sharp and pragmatic," he says. "So it now has a stake in the business and we're growing from there."

The one area it cannot help with, however, is exports, he says. "That's when you need to go to the likes of EI. In fact, the agency we're interacting with at the moment is InterTradeIreland and its 'Network and Getwork' programme in Northern Ireland."

When SEAI entered the SME sector three years ago, it had a significant impact on the market, says Molloy. "They had a new programme, EnergyMAP, and the SME Advice, Mentoring and Assessment [AMA] programme. That gave everybody who was associated with SEAI – ourselves and our competitors – a huge level of credibility. Every single one of the people on that panel would tell you that it has added an edge." This is an example, he says, of how the State can act to change the market by bringing certainty to an area of business.

CHALLENGES FACED

Despite this, and the fact that the business is growing at around 30–50pc each year, Molloy says that price is a significant concern for companies like his at the moment.

"I think many of us are being undercut by new companies and new individuals with no track record whatsoever other than being able to complete some paperwork," he says.

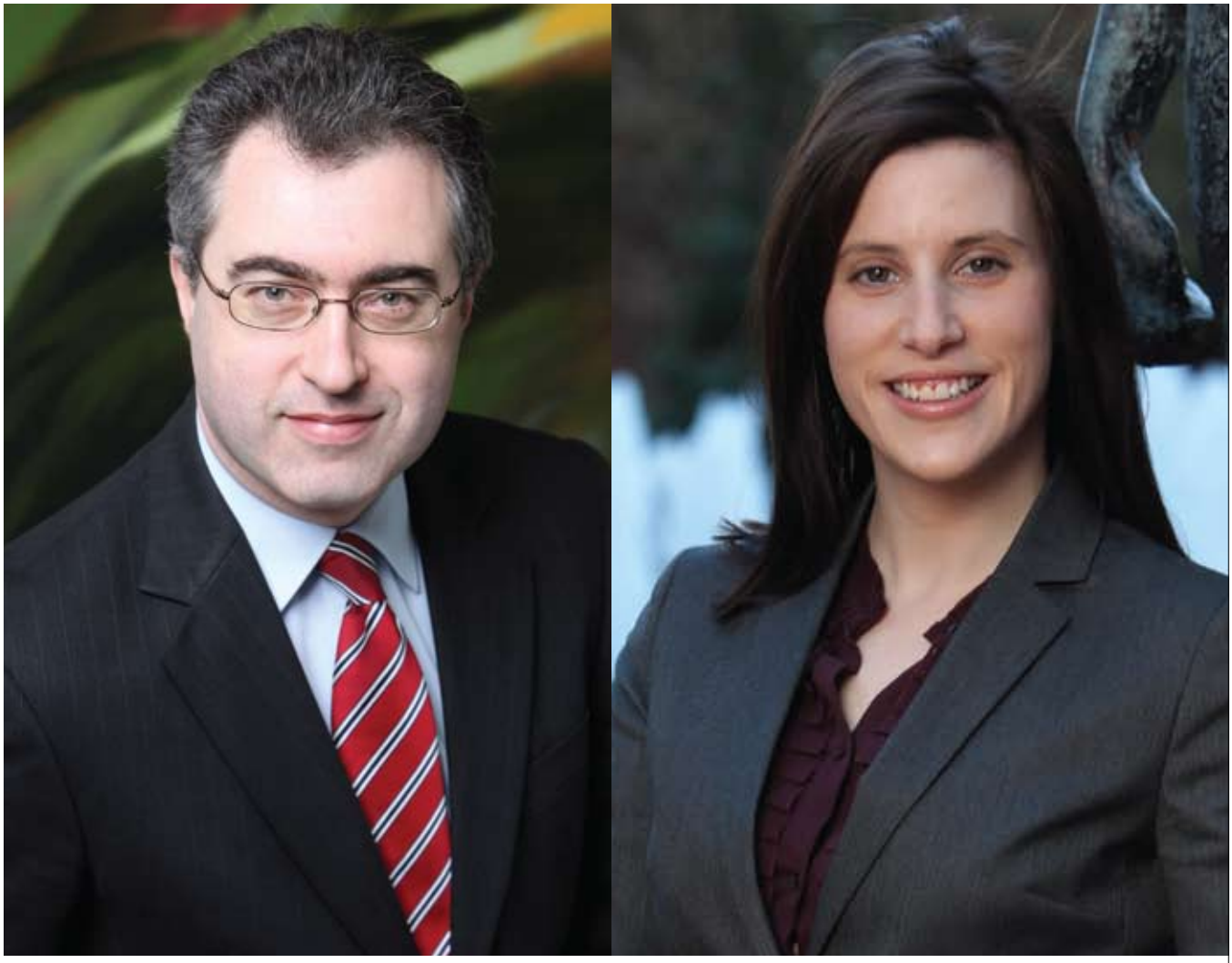
Both Molloy and Butler would favour greater evaluation of all companies that provide services in this area. "There's an exam now for individuals carrying out BER [Building Energy Rating] assessments," says Butler. "It was a good idea to actually examine people on things like their knowledge on interiors and insulation, but it could include examining their communication skills, health and safety, quality and their customer service."

As members of SEAI's panel of energy advisors and trainers, Molloy and Butler point out that they are continuously evaluated and scored, and are subject to suspension if they fall below a certain level. "Now that's a very innovative way of doing business," says Molloy.

He believes that greater interaction between different agencies operating in this space would also be beneficial for assessment purposes.

"EI would have very well developed ways of assessing a company's viability beyond its tax clearance cert. In five or 10 minutes they can tell you whether this company is worth doing business with.

"I think there's a very good case to be made for following some of the steps that SEAI has in place already, while equally learning from other Government agencies."



Molloy also believes that public procurement needs to be set up to better facilitate Irish SMEs. He points out that the National Public Procurement Operations Unit (NPPOU) recently issued guidance advising public procurement people against bundling of tenders. "Bundling is one of the things that keeps Irish SMEs out," he says. "There's a huge opportunity for Government to benefit here, in that if an Irish company wins a contract it pays its taxes here."

State agencies could also provide invaluable assistance to start-ups in the clean tech sector by offering objective feedback on initial technology and business ideas, he says. "Within SEAI's four walls there is more than enough expertise and experience to look at a project and go, 'Yes, that makes sense and it's worth a look at the rest of this business plan' or 'No, this is a complete waste of time'. This kind of service would greatly benefit start-ups before approaching bankers, VCs or financiers," says Molloy.

Both he and Butler stress the fact that the private sector can also help support and stimulate growth in the sector. Butler herself is testament to the ongoing environmental commitment by Ben & Jerry's: in her role as climate change ambassador, the company sponsored her for a year in developing her own company, Ecobiz.

Molloy points out that while the private sector is largely waiting for Government to provide guidance in this area, much of the activity is currently being driven by large customers, often from outside Ireland.

Butler gives the example of Walmart. "All of its suppliers have to fill in a survey to evaluate their sustainability as part of its worldwide sustainability index initiative," she says. "These kinds of initiatives are increasingly important."

And the future of the clean tech sector? One important element is that Ireland produces high-calibre graduates who are both technically capable and able to communicate openly and confidently.

Also, if it is to develop rapidly, Molloy stresses the need for greater communication between the different bodies, and greater communication about the services that are on offer. "I think if you are looking to accelerate things you need to use the existing people, buildings and offices that are in place and just join the dots," he says.

Set up three years ago, Active Thermal is a small Irish family business with its roots in the building industry but its sights firmly set on a greener future through energy efficient buildings.

ACTIVE ADAPTATION

The lot of those in the building trade is not an easy one at present, but family business **Active Thermal Building Services** had the foresight to adapt and innovate to meet the needs of the new environmental imperative. We talk to Francis and Ciaran Ahern.

Active Thermal is one of those small Irish enterprises that has cleverly adapted its skills and embraced innovation to meet the requirements of a new market.

"Basically, we're general builders that have changed with the times," says General Manager Francis Ahern. "We used to do new builds, extensions, renovations – we still do – but today we also specialise in full home heating and insulation upgrades to achieve the required energy efficiency. We describe it as bringing homes into the future."

"We'll take a 1970s house that has no insulation whatsoever, and we'll bring it up to the required standards – windows, external insulation, attic insulation, even solar panels and heat recovery units if they want them."

HOW IRELAND COMPARES

A carpenter by trade, Francis Ahern has some 35 years in the construction trade behind him. He started his own company, Bode Construction, in the late 1970s before branching out to specialise in engineering and project management.

Much of this time was spent in Europe where, he says, countries such as Germany, Austria and Switzerland are light years ahead of us when it comes to environmental

considerations within the built environment.

"Maybe it's the fact that we haven't traditionally experienced the extreme weather conditions they get on the continent – apart from this year. That said, our weather is much damper, so we badly need these kinds of innovative products here too."

According to his son Ciaran, this lag is largely due to the lack of building regulations. "In countries like Austria and Germany they've had regulations for nearly 25 years. We've only had them in place in the last few years."

Like his father, Ciaran is a certified carpenter and joiner, with a further certificate in building technology. With some 12 years in the trade, seven of which as foreman of his own construction company, he has seen the industry go through radical changes, not least in the past year or so.

"It must be the middle of last year since we last did a general building job," he says. They both agree it's the kind of work they do with the Sustainable Energy Authority of Ireland (SEAI) via the Greener Homes and Home Energy Saving schemes that is keeping the business going at the moment. "Business would be very slow if we weren't doing the work with the SEAI grant schemes," says Francis.

CHANGE NEEDED

They believe that the current grant scheme is helpful, but does not go far enough. "At the moment it might cost a customer between €6,000 and €10,000 to upgrade their windows. If there was a grant for even a percentage of that it would encourage people." says Ciaran.

The Aherns also say that the current grants should be adapted depending on the size of the house in question. "You get €4,000 for external insulation and render, but if you live in a small terrace house that might be a €7,000 job, whereas a large detached house might cost as much as €20,000, and you still get the same grant. There should be a sliding scale," says Ciaran.

Active Thermal also carries out BER assessments, but Francis points out that they were actually doing a fuller service before the BER came into being. "We used to go out and do a 12-point check list, where we'd spend a couple of hours and go through everything – heating, windows, roof, walls, and we only charged €199."

SEEKING SUPPORT

Both men are clearly passionate about the area of energy conservation, and extremely ambitious about just how far a business like Active Thermal could go.

They are frustrated with the lack of financial support available in order to make their many innovative plans a reality.

While they hope to manufacture their own products in the future, they currently import materials, for example, Webber windows from Austria. "These windows work out about 20–25pc more costly, but they are twice as good as the standard windows you can get here," says Francis.

"The problem is there's no support system for us because we're importing. One of our plans was to import the frames, and purchase the glass here from an Irish company, so we went looking for funding to help us set up a factory that would be able to do that. But no one will give us money to help. Enterprise Ireland, for example, didn't want to know if we weren't doing all the manufacturing in Ireland. And you also had to be employing a certain number of people, and we have just five full-time staff, so that was another point against us," Francis explains.

Private investors did show interest, but again only if full-scale manufacturing was set up in Ireland. "We're a small business, and we'd need to be selling an awful lot of the windows before we could do that."

The most helpful organisation they have dealt with was the Austrian Chamber of Commerce. In Ireland, they kept running into "dead ends", they say. "Either the people we spoke to didn't understand what we were doing, in which case they shouldn't be in the job, or they couldn't help. They just didn't want to know," says a clearly frustrated Francis.

He insists that for small companies with innovative ideas, the support systems are just not sufficiently flexible. So what changes would the Aherns like to see?

"The Government needs to spend more money on small enterprises. I'd say there are thousands of small projects out there, from say €4 million to €30 million, that have just been put on the shelf and left there because of lack of funding."

KNOWLEDGE IS KEY

For future success in the energy sector, Ireland needs to start looking seriously at improving our scientific knowledge in this complex area, says Liam Relihan, Co-founder of energy cost-control system developer **Resourcekraft**.

Resourcekraft develops and supplies innovative technology-driven products that help organisations reduce both their energy costs and their carbon emissions.

Limerick-based Resourcekraft was set up in 2007 by former Intel employees Liam Relihan and Frank Casey. The company's target market is large enterprises, ideally with multiple sites, both in Ireland and worldwide.

"Energy has moved from one of those costs where you will quite happily sign off the bill when it arrives to being the second highest cost after labour in many cases," explains Relihan. "People are beginning to realise that a lot of energy use is discretionary – i.e. it doesn't have to happen – and energy suppliers can be managed just like any other suppliers."

The company's long-term vision is to move much higher up what it terms the 'software value chain' for large corporations. "At the very low end of the market you are dealing with people who will sell relatively un-scaled products at very, very low prices. These might be applicable to small enterprises but they don't scale well to larger organisations. This is a sector of the market we are working to detach ourselves from as quickly as possible, to move further up into the enterprise level."

And its focus will be increasingly international.

"Ireland is an insufficient market to sustain any technology business that is concerned with the creation of intellectual property, so it is very much an international play," says Relihan.

"By the end of this year, we expect to have about 20 staff and will be growing very considerably beyond that. We are very, very ambitious."

To this end, the company is working with several universities, in particular University of Limerick, with a view to becoming involved with longer-term research. "We would hope that, by working closely with the right PhD candidates and the right university researchers, we would begin to get useful inputs at about the one-and-a-half-year mark."

Recognised as a high-potential start-up (HPSU) relatively early in its existence, Resourcekraft has worked primarily with Enterprise Ireland, which Relihan describes as tremendously helpful. "We have been very impressed by them and they have given us the right level of help at all stages."

The agency's offering around introducing clients to foreign markets has also made an impact. "They have done some research for us on the US market and we have been very pleasantly surprised at how forthcoming they have been."

The company also worked with SEAI in relation to an incubation grant.

NAVIGATING THE GRANT ROUTE

Given the range of grants available and how they impact on each other, Relihan believes some kind of personalised guide to this whole area would be very useful for start-ups. "It would be useful if you had a personalised training pack or something like that which would say 'here is the best way for you to navigate the whole grant-aid thing'. It would be useful to have an across the board view of it."

That said, he cautions against start-ups being too motivated by chasing grants.

"I feel there is probably an excess of grants at the moment, and I think a lot of small companies believe the biggest thing they need to achieve is to get grants. It's not. It's to get customers. The grants, in some cases, just distract them from what should be their main focus."

While things have been improving in the last few months, he says the ability to access non-Government capital has been appalling. "As it happens, we are currently closing our first VC round. But in 2007, 2008 and certainly 2009, the situation was very, very bleak.

"Our relationship with our bank is very good, so we have been able to get overdraft facilities and so on, but that is mainly because we have worked closely with them and built up a good relationship."

He thinks, however, that the situation is improving as regards capital being freed up for technology companies. "We did a BES [business expansion scheme] round at the end of 2008 and it was quite near to being a disaster because almost no BES funds wanted to invest in anything that did not include property. That has since freed up."

THE TENDER TRAP

Relihan and Casey both believe Government could help Irish companies by having a serious look at the tender selection system. "I know there are various European rules in place, but we find that very good Irish companies out there are often not getting selected. There appears to be no favouritism of any kind, implicitly or explicitly, towards Irish companies."

Relihan also makes the point that applying for Government tenders can be very costly. "We can put in five days of work for a really serious good-quality presentation, and then find out that the project has been cancelled and all that work is squandered – this is very exasperating," he says. "You need senior people to put together a good-quality tender response and when this happens it doesn't leave a good taste in your mouth."

"The fact is we would much prefer to be receiving money for doing honest work from the Irish Government – kitting out their buildings, making them more energy efficient, and so on – than receiving grants." Government could save 20–30pc on its energy costs in year one, says Relihan, if it was to install a product like his own at all of its buildings.

"There is a great opportunity to get good technology cheaply that will pay for itself within the year. That's an incredible business proposition."

Relihan also believes that while many start-ups want to get into energy at the moment because it is seen as the next big thing, there is little of the requisite scientific knowledge in Ireland.

"There are not a lot of people, relative to other countries, who really understand the nuts and bolts of energy. I think that is something that needs to drastically improve.

Energy is a very tough area scientifically and, right now, I feel as a country we are just skimming the surface."

"I think there are various layers of knowledge SEAI can help the universities bring to market. They probably need to help the universities do some basic research into the deep science behind energy."

In that space where mathematics and economics meets energy, Relihan believes that there are considerable opportunities for Ireland to apply its ICT skills. "There are relatively few people focusing on this space right now". He continues, "When it comes to the energy sector in general, I don't think Ireland has any natural advantage; we just need to start working very hard, very quickly."

OCEAN'S 1

In November 2009, Irish company **OpenHydro** successfully deployed the first commercial scale in-stream tidal turbine in the Bay of Fundy in Canada. It's a testament to the future viability of tidal energy, says CEO James Ives.

Established in 2004, OpenHydro is an Irish renewable-energy technology company that designs and manufactures marine turbines for generating renewable energy from tidal streams.

Led by dynamic CEO James Ives, today OpenHydro employs over 40 people between its office in Dublin and its technical centre in Greenore, County Louth. "We are continuing to recruit in these difficult times, and that is very much based on our pipeline of opportunities," says Ives.

And that pipeline certainly looks promising. In November, OpenHydro, deployed its first commercial-scale tidal turbine on the east coast of Canada, on behalf of its client Nova Scotia Power.

"That was our first commercial relationship and, as far as we know, the first ever commercial order for a tidal turbine," says Ives.

"There are a small number of companies who have installed demonstration tidal turbines, but this is the first time a unit has been delivered for a customer."

"The last number of years have been focused on research and development, however OpenHydro is now at a turning point where we are recording our first commercial revenues".

It's not the first milestone reached. Back in 2008, OpenHydro became the first tidal-energy company to complete the connection of a tidal turbine to the UK national grid and commence electricity generation.

THE SCOTTISH EXAMPLE

OpenHydro's 250kW Open-Centre Turbine was installed at the European Marine Energy Centre (EMEC) off Orkney, Scotland, successfully demonstrating a method of safely and economically deploying turbines directly on the seabed.

"Ireland has huge potential to be at the centre of this renewables revolution, given our natural resources, but we have competition. Just across the water, the Scottish Government is also focused on becoming the centre for marine renewables. They are putting in strong policies and pricing incentives to support this because they passionately believe in the future of marine renewables" he says.

THE FUNDING ROAD

The brainchild of Donal O'Flynn, who together with Executive Chairman Brendan Gilmore secured the world rights to the Open-Centre Turbine technology in 2004, OpenHydro quickly brought Ives on board to manage the ambitious company.

OpenHydro has raised over €52 million in funding since 2005 for the commercial development of its turbines, the majority through private investors. "We are a company that has tended to do things on our own. Yes, we probably could have made more use of the support structures that are out there, but we have tended to use our own in-house skills. We have a very strong Board of Directors, and our chairman, Brendan Gilmore, is an experienced financier.

"As we have developed the size of the funding rounds have increased. We have used Davy corporate finance since 2007 to support our financing initiatives" says Ives. OpenHydro is currently in the process of its next finance round which will include some new investors.

CHALLENGES AT EARLY STAGE

"Perhaps one of the difficulties for early stage companies is closing the first funding round and engaging the support of corporate finance advisors."

Because of this, Ives does see the benefit of effective grant support to bridge this gap.

Last year, OpenHydro was one of 10 Irish ocean-energy companies to benefit from a €4.3 million investment by SEAI's Ocean Energy Development Unit (OEDU), designed to stimulate the development and deployment of ocean-energy devices that generate renewable electricity.

"It was hugely important, and greatly appreciated," says Ives. "At €2 million, it is a major grant. We have a team of 40 engineers in Greenore that are doing cutting-edge energy technology development, and the OEDU grant is supporting much of that work. It is really very valuable and, I think, a very appropriate grant."

"We have a project in France with EDF (Électricité de France), and we were recently the key case study in a well-managed Enterprise Ireland French-Irish seminar in Paris hosted by the Tánaiste. We received a lot of support from Enterprise Ireland in facilitating that, but also from their understanding of the French market. Where we have looked for support, we have benefited greatly from it. It is something we should probably do more often."

That said, Ives is firmly of the DIY school, and has little time for talk of barriers to progress. "A lot of people get put off because they feel there are barriers. Our experience is that actually starting the process, starting the journey, removes those barriers. Once people see your intent to do something positive, those barriers can be addressed."

OpenHydro now has an exciting project portfolio spanning the USA, Canada, France and the Channel Islands with utility partners including EDF and Nova Scotia Power.

GOVERNMENT POLICY

In the current climate, many companies in this sector will struggle to get investment, says Ives, and this is where the Government must step in. "It's in periods like this that Government has a bigger role to play in supporting early stage start-ups in this sector, or those trying to further develop. I think that grant and equity support will be essential.

"A streamlined approach to supporting these kind of sustainable smart technology businesses is important," he adds. "You cannot make the process so onerous that it actually makes the funding inaccessible. These businesses are at the core of future job and wealth creation."

And it is not all about funding, says Ives. "You also need stimulation on the other side to support commercialisation, such as price supports. In the early stages of the tidal industry, because many projects will be small and bespoke, the cost of energy produced will be higher, so you need a price support mechanism like in the UK. It's all about policy."

GREEN LIGHT

When it comes to developing its clean tech sector, Ireland has the advantage of being perceived internationally as a green and clean land, but more cohesive and forward-thinking Government policy would go a long way to supporting entrepreneurial efforts in this area, says **Nualight** founder Dr Liam Kelly.

Cork-based Nualight focuses on producing innovative, energy-saving illuminating refrigerated displays for the global food retail sector.

Set up in 2004, the company has been ramping up its international business for the past three years, since securing private investment and appointing a new management team to drive growth. Today, its Irish market accounts for some 20pc of overall sales, while the rest of Europe and North America each account for some 40pc of revenue.

Nualight's long-term vision is to develop a sustainable business through the provision of solid-state, as opposed to gas-based LED, lighting to the retail sector. According to Nualight founder Dr Liam Kelly, the company's current target is to grow to a €100 million turnover business within the next five years. Profitability, meanwhile, is expected by the end of 2010. "We're concentrating more on growth and market share right now, and our investors are basically funding strong growth rather than early profitability."

Funding for the business has so far come almost entirely from within Ireland, with key investors to date including the founders, as well as Fourth Level Ventures venture capital (VC) fund, the Quinn family (of Superquinn), and the ESB through its investment fund Novus Modus.

The company is currently considering an investment proposal by a UK VC. "There's a lot of interesting activity going on internationally at the moment and we need a different type of investor as we grow," explains Kelly. "What we're trying to do will probably involve additional investment and we need somebody with both the funds and the connections to help us grow internationally at the appropriate rate."

Picking the right kind of investor and looking beyond just financial support is vital for any company trying to scale up, he says.

"Never take money from an investor just for the money," he says. "Investors should add value other than money. We're always short of expertise in a small company and it's terrific to have some of the important missing areas well represented on the board."

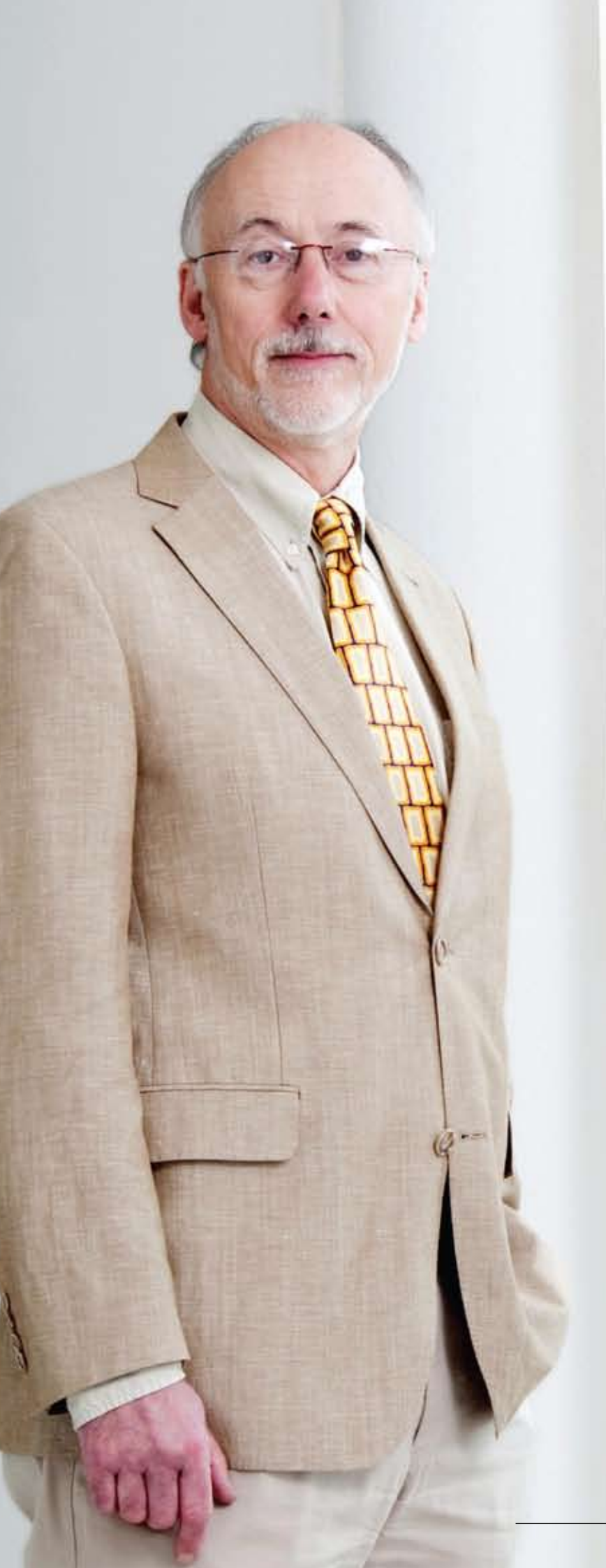
A significant case in point was the addition of non-executive chairman Eamonn Quinn, son of Feargal Quinn. "It's perfect for us to have as a non-executive chairman somebody from the retail side of the business, which is one of the pillars on which we're going to build it up."

Kelly does not believe banks to be ideal partners for early stage start-ups. "Typically they'll give you money but they want it collateralised . And usually in a small company, or one in its early stages, there is not a lot of capital against which loans can be secured, in which case they fall back on personal guarantees." The banks would not be particularly valuable for business advice either, he maintains.

He points out that it's important to pick investors where the overlap of interest is as strong as possible. He believes VCs should be brought in as late as possible.

"That's on the funding side," he says.

"Apart from that it's the fundamentals: the market must be very well understood and the products need to meet the market requirements. Sales and marketing is probably the area where Irish entrepreneurs most underestimate the development money required."



As regards State support, Nualight has worked closely with Enterprise Ireland, which has been quite helpful in its support and funding, according to Kelly. "They've provided capital investment, help with research and development support and some training through courses that have been useful for some of our employees," he says. "Their international offices can be helpful from a marketing or a market research point of view. But the quality tends to vary depending on the personnel."

Reviewing the obstacles to growth, Kelly stresses that accessing available funding when trying to grow a company at a significant rate is a challenge. "But we've got through all of those situations so far," he says. "It just means at certain parts of this process some people spend a lot of time on the telephone."

SETTING EXAMPLES

Kelly believes the Government could set a better example by choosing to equip its buildings with energy-efficient systems.

"While various measures are in place for private householders, very little has been done to encourage Irish industry to adopt energy-efficient measures," he continues.

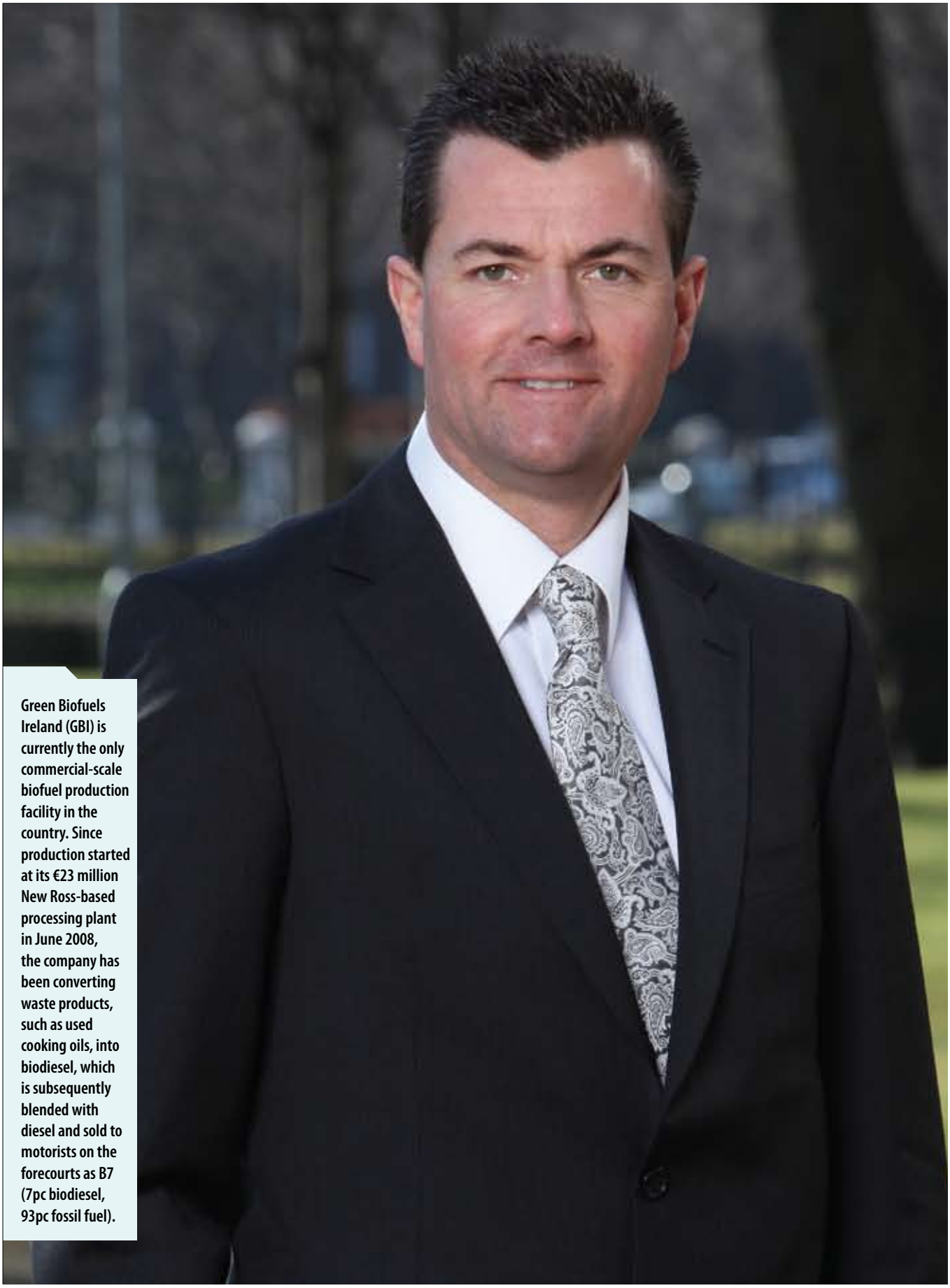
The Government's target to have 40pc of electricity coming from sustainable resources by 2020 has driven investment interest in the wind sector, says Kelly. "If they were also to say that from now on our central heating systems have to be of a certain efficiency; that factories of more than a certain size have to have combined heat and power (CHP) systems; that the energy metric for a building has to include lighting at a reduced number of watts per square metre, that might drive something similar. Right now there seems to be little momentum in that particular area.

"In North America, for example, in certain states that have high energy costs, the supply companies are providing capital rebates to our customers when they install our energy-efficient lighting systems," continues Kelly,

who points out that such refunds can reduce the standard three-year return on investment of his products by up to a year and are often incentive enough for potential customers to go ahead.

"Switzerland, meanwhile, has a regulatory initiative where all retailers have to meet certain, fairly strict, criteria in terms of the energy efficiency of their business premises," he says. "That is helping and we probably have more product deployed in Switzerland per head of population than anywhere else in Europe right now.

"There are certainly opportunities that are new, opportunities that Ireland can address," says Kelly of the clean tech sector. "Having that focus would help the agencies to more effectively direct the funds that they have available to them."



Green Biofuels Ireland (GBI) is currently the only commercial-scale biofuel production facility in the country. Since production started at its €23 million New Ross-based processing plant in June 2008, the company has been converting waste products, such as used cooking oils, into biodiesel, which is subsequently blended with diesel and sold to motorists on the forecourts as B7 (7pc biodiesel, 93pc fossil fuel).

HERE AND NOW

A lack of understanding of biofuels by investors were among the barriers faced by **Green Biofuels Ireland** when it sought initial funding back in 2004, says CEO Nicholas Tierney, who outlines the challenges still faced today.

According to the company's Managing Director, Nicholas Tierney, output from the facility reduces carbon emissions by 90,000 tonnes per annum, the equivalent of taking 24,000 cars off the road each year.

The seeds of GBI began in the early 2000s as a collaboration between Tierney's family company, Green Gen Power, and the Wexford Farmer's Co-operative Society. Tierney had previously been involved in manufacturing tallow from meat factory by-products, which was then used in animal feed. When tallow was banned in animal feed, Tierney started looking for a technology that could use that by-product to produce biodiesel.

"So, in conjunction with Teagasc, myself and our operations officer, Joe O'Byrne, travelled extensively around Europe looking at different technologies to see which would be capable of producing biodiesel meeting the EU quality standards from our particular feedstocks." says Tierney.

The result was Austrian supplier BDI's (Biodiesel International AG) multi feedstock plant, which can handle first generation biofuel like rapeseed, soya and palm oil; second generation sources such as waste products; and third generation, which includes algae and seaweed oils.

"With third generation you're looking at six or seven years away," says Tierney. "We've started an R&D project with several different companies in Ireland and abroad on the use of algae and seaweed in Ireland for biofuel. It could be five or six years before it is commercialised, but it is the next stage of biofuel development. And the fact that we have a plant in place that can cope with these new feedstocks is exciting."

The research, which is being funded under the EU's Marie Curie Industry-Academia Partnerships and Pathways (IAPP) programme, involves input from a partnership of seven universities and commercial entities in Ireland, the UK and Turkey. "We're at species selection stage where we must find the optimum growing conditions, then we need to look at the oil extraction possibilities, and trying to find a way of doing that commercially is obviously going to take a lot of time," says Tierney.

FUNDING CHALLENGE

Securing funding for the company's €23 million plant, meanwhile, was a major challenge and took significantly longer than Tierney had initially expected. "Unfortunately because of the lack of experience and knowledge in this country at the time it was difficult to generate interest in the project," says Tierney. "We did ask for assistance from all the agencies and we were turned down, as this was not an industry that they were involved in – which is strange because this is sustainable, renewable and green."

"I think the main stumbling block was just a lack of understanding, a lack of knowledge of the biofuels sector in general.

They didn't understand the concept of what it was, where you could sell it, how you could use it. Few people had never heard of biodiesel. We basically had to educate

the banks, the investors, Government bodies, and any agencies we talked to, so that was very time-consuming. We eventually went to private investors and got funding through Merrion Corporate Finance Limited and Ulster Bank Ireland Limited."

The Department of Finance and, the Department of Energy also provided support, he says. "They administered the Mineral Oil Tax Relief Scheme and we were one of the successful candidates to be awarded relief under the Scheme. Agencies and departments need to be more proactive in implementing policy, believes Tierney. He points out that it is not yet mandatory in Ireland to use biofuel. "It is across Europe, and we're one of the last to bring it in," he explains. "Our obligation went through the Dáil in January this year, and is expected come into force on 1 July, when it will become a legal obligation to use it in Ireland.

Part of the problem, says Tierney, is the fact that overall control does not lie within any one body. "It's not Enterprise Ireland, it's not SEAI, it's not the Department of Energy, it's not Finance – it's fractured between all departments. So when you need to get agreement from one, you need to get it from all Departments.

"There should really be a particular section dealing specifically with renewables, either within SEAI or Enterprise Ireland or one of these organisations, or perhaps they should all be merged into one, because there is overlap," he continues.

"What we would like to see is clarity of policy, a roadmap as to how we are going to implement EU regulations. That way we could look at expanding the plant on the basis of knowing where we are going in the future."

The company is now looking to expand the plant to meet the increased demand that will come on stream in July when the use of biofuels becomes a legal obligation, but again funding, Tierney believes, will be a challenge. "Normal sources of finance are not available; banks are closed for business at the moment, without question," he says. "We have never received grants but if there were grants available for this we would love to talk to someone about it."

Finally, Tierney maintains that there is too much hype around the future of green energy, and not enough said about what is being done today.

"Projects and companies like ourselves are not being talked about, and we're providing the green products today," he claims. "Talking about electric cars and hydrogen is all well and good, but it won't be widely available for a long, long time. It took several generations to put the service stations infrastructure into this country, so it's going to take time to put the infrastructure in place for electric and/or hydrogen cars.

"By all means educate people as to what is coming, but tell them electrics are a long way down the road. If you're talking about renewables you have got to talk about what is actually available today, and the only fuel products that are readily available today are bioethanol, a renewable substitute for petrol and biodiesel, a renewable substitute for diesel," concludes Tierney.

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Sustainable Energy Authority of Ireland
Wilton Park House
Wilton Place
Dublin 2
Ireland

T. +353 1 8082100 | info@seai.ie
F. +353 1 8082002 | www.seai.ie

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