THE GREEN ECONOMY AND WHAT THE FUTURE HOLDS

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The Green Economy and what the future holds

INTRODUCTION

As a nation we need to focus on being the best in certain areas and exploiting areas where we have a comparative advantage. Ireland has a genuine advantage in the areas of wind and tidal energy. Along with energy production, the green economy provides opportunities for a mix of technologies in the areas of energy, waste, water and transport.

WHAT IS THE GREEN ECONOMY?

The Expert Group on Future Skills Needs estimated the value of the green economy to be €3.05 billion in 2010 employing approximately 19,000 people. They anticipate that this number could rise to 29,000 by 2015 with the right supports in place. The key subsectors are:

- Renewable energy technology making use of wind, water, biomass and biofuels, geothermal and solar resources.
- Clean technologies that reduce energy consumption and emissions.
- Smart grid development.
- Waste management recovery and recycling.
- Energy management including eco construction.
- Environmental services and other green technologies.
- Green financial services.
- Low carbon transport.
- Green tourism.
- Green ICT.
- Green public procurement.

At an international level, sectors seen to have the highest growth potential are clean technology and renewable energy technology. Ireland has proven skill sets to perform in these key areas with the right training and incentives.
THE NEED FOR A GREEN ECONOMY AND SOME DRIVERS

Fuel Prices

The market in 2004 for oil was US$30 a barrel rising to US$140 a barrel in July 2008. In 2012 oil prices were in the region of US$95 a barrel. That is roughly a threefold increase in eight years – a time period which includes a global recession.

Whilst global demand may have fallen, there is no denying there is a limited supply of oil and gas which will ultimately drive up prices. Many economists argue that the cost of delivering oil and gas from some locations is not economically feasible. They argue that any process that returns less energy than is put into its extraction is not sustainable in the long term. Shale gas may be an important fuel source in the future and may plug the gaps, so to speak, in fossil fuels.

International Developments

Nuclear energy development is looking less and less likely following the disaster at Fukushima in Japan. Countries like Germany are now investing heavily in renewables as their long term strategy for energy generation and are moving away from nuclear power. Lack of nuclear development will place an even stronger demand on fossil fuels in the next ten to twenty years meaning renewable infrastructure development is paramount.

Domestic Drivers

Electricity and gas suppliers have to provide the information necessary to comply with European legislation so that European comparisons can be made on price. Energy costs in the Irish market are generally higher than the European average, especially for electricity to large scale users.

The large energy users (LEU) rebate system was introduced to ameliorate high electricity costs for large scale end users and came into effect in 2009. The LEU rebate payment was based on a windfall tax previously imposed on electricity generators to compensate for the fact that they did not have to pay for their carbon emissions. Arguably the preference of one group over smaller users of electricity, including small scale business and domestic users, was possibly in breach of State Aid rules. There were also difficulties with this system which favoured large energy users who imported energy rather than those who already had installed combined heat and power (CHP) plants on site who cannot avail of the LEU rebate and, therefore, were disadvantaged. We acted for a client who found some of its customers were in this position.

The LEU rebate system expired on the 30 September 2012 and with an increased public service obligations levy imposed on industry, the cost of energy for large scale energy users is set to increase. Clients of our firm estimate this will increase energy bills by €100,000 per annum for some entities.
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Our grid is being updated which will result in further costs for consumers in terms of public service obligations. Also, the level of VAT on fuel is higher than in many other states which consumers, unlike businesses, cannot recover. Obviously, there are social concerns for those on low incomes, but also concerns for Ireland as a place to do business. The hope is that green energy produced in Ireland will in the long term reduce fuel prices.

Green Public Procurement (GPP) is defined as a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured. The annual procurement budget of the Irish public sector is estimated at €15 billion or roughly between 10-12% of GDP. We welcome the Government’s Action Plan on GPP whereby it adopted the EU Commission’s indicative political target of 50% of GPP, i.e. 50% of public contracts/tenders in Ireland will incorporate green purchasing criteria.

Legislative Drivers

In March 2007, European leaders signed up to a binding European-wide target to source 20% of their energy needs from renewable sources by 2020. Ireland’s individual target for 2020, under the Renewables Directive, is 16%. The previous Fianna Fáil/Green Government had set the ambitious target of 40% of electricity generation to come from renewable sources by 2020.

Other important pieces of legislation act as drivers, such as compliance with EU Environmental Directives and Regulations: for example, the Integrated Pollution Prevention Control, Waste Electrical and Electronic Equipment, Restriction on Hazardous Substances, Energy End User Efficiency and Energy Services, and Water Framework Directives. The strategic implementation of impending EU and international environmental legislation will play an important role in developing markets for indigenous green companies and creating first mover advantages.

State Supports

Of course a green economy does not just focus on reducing costs of fuel. It also focuses on reductions in consumption. Government grants for retrofitting premises through the Better Energy programme will also have a role to play in this regard. Green consumerism coupled with these state supports will, we believe, be a driver of the green economy.

There is also potential to use future revenues from carbon taxes and the EU Emissions Trading Systems Scheme to fund State-backed energy efficiency and green economy initiatives.

Green stimulus packages have been introduced in several other jurisdictions at government level showing the strategic importance of the green economy. The Obama administration’s American Recovery and Reinvestment Act of 2009 set aside US$38 billion for the energy sector and included US$20 billion in tax incentives. In the US clean technology only lags behind ICT and biotechnology as an investment sector.
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Renewable energy feed-in tariffs (REFITs) are one of the key supports in Ireland where a purchaser of power from certain renewables is compensated for the additional costs of purchasing renewable energy.

The availability of REFIT allows suppliers to contract with generators outside the single energy market (SEM) pool and provide a price floor in power purchase agreements (PPAs) reflecting the level of compensation available to the suppliers. These REFIT supported PPAs operate to insulate renewable generators from fluctuations in the wholesale market price.

The REFIT 1 scheme was open for applications until 31 December 2009. Under REFIT 1 a purchaser of power from certain renewables was paid a 15% balancing payment on the following references prices, onshore wind in the region of €57 per MW, biomass landfill gas in the region of €70 per MW, and hydro in the region of €72 per MW.

In 2009 the Government introduced substantial new REFITs for biomass/combined heat and power at a rate of €120 per MW; offshore wind at a rate of €140 per MW; and tidal and wave at a rate of €220 per MW.

REFIT 2 was published in 2012 and does not appear to be as generous as REFIT 1 as there does not appear to be an automatic 15% balancing payment or technology difference payment as was the case under REFIT 1. We believe that the automatic balancing payment was a key factor in generating investment in this area and its removal will be a cause for concern for future funders. Governments are looking at renewable energy subsidies to see if they are overly generous given the current austerity programmes throughout Europe.

Given that Government subsidies in Ireland are relatively low, there is also a low level of regulatory or political risk that these supports will be changed. This contrasts with solar tariffs in Spain, for example, where great uncertainty was created in its market by reducing subsidies negatively influencing investment.

Research and development tax credits, in particular for the renewables sector, which arises from eligible expenditure that can be offset against a company’s corporation tax liability, are also in place.

An accelerated capital allowances scheme for energy-efficient equipment is administered by Sustainable Energy Ireland. This targets the use of equipment, such as electric or alternative-fuel vehicles, by allowing 100% capital allowances for the first year in which expenditure is made.

There is now greater scope to support energy companies and wind farms to raise equity finance under the new Employment and Incentive Scheme which replaces the previous BES scheme. The level of investment has increased to €10million per company with a maximum investment of €2.5 million per annum. One of the key changes is that the new scheme is expected to relax the requirements as to periods of trading and provide that a green energy company is trading on application for a grid connection agreement (previously four months actual energy trading was required under BES).
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WHO ARE THE PLAYERS IN IRELAND?

There are a small number of major players in Ireland such as ESB, Bord Gáis, Bord na Mona, Endesa, Viridian, Coillte, SSE and others.

Viridian, Endesa, Vayu and Scottish and Southern Energy are active in electricity purchase and supply.

A number of subsidiaries of UK and EU parent companies, such as Dalkia and Siemens, are competing in key sectors such as environmental consultancy and energy management.

The Government has recently established the New Economy and Recovery Authority (NewERA), initially on a non-statutory basis, within the National Treasury Management Agency. NewERA has the following principal functions:

1. corporate governance from a shareholders perspective of the following Commercial Semi-State (CSS) companies: ESB, Bord Gáis, ÉirGrid, Bord na Mona, Coillte;

2. working with Government departments to develop and implement proposals for investment in line with NewERA Programme for Government commitments in energy, water and next generation telecommunications;

3. working with the National Pensions Reserve Fund (NPRF) to bring forward proposals for investment of available resources in the NewERA initiative, each such investment to be on a commercial basis; and

4. where requested by Government, advising on, and, if appropriate, overseeing any restructuring or disposal of CSS company assets.

Some of the State assets for sale under the EU IMF deal are Bord Gáis’s energy business which will form the main part of the Government’s €3 billion disposal of State assets and companies over the next two years. The Government’s previous plan to sell off a substantial part of the ESB is not going ahead. A report commissioned by Government flagged major regulation, legal and practical difficulties. However, some of the ESB’s “non-strategic power generation capacity” will also be sold.

Another player in the market will be the Irish Infrastructure Fund. This fund has been established with the aid of NewERA as a collaboration between the National Pension Reserve Fund (NPRF), AMP Capital and Irish Life Investment Managers and will make targeted investments in new infrastructure projects in Ireland. It is seeking to raise up to €1 billion. €250 million has been received from the NPRF already. This fund is specifically targeting renewable assets and ultimately the state assets being placed for sale under the EU IMF deal. This fund recently bought a 75% stake in a portfolio of wind farms in Ireland (104 MW of capacity) from the Viridian Group. The fund is open to investors but investments will need to be in large tranches to be accepted of in excess of €100 million. Given the NPRF involvement, this could be seen as an example of a pension fund investing in long term energy assets.
The ESB Novus Modus Fund is a €200 million cleantech fund which specifically targets investment in renewable power generation (biomass, geothermal, hydro, solar, wind, waste heat recovery and waste to energy). In 2011 this fund led a €20 million investment into Irish ‘on-site’ wind energy developer, Wind Energy Direct for the development of on-site wind projects for large energy users across Ireland and the UK. In 2012 this fund participated in the €15.5 million funding round in tenKsolar a leading manufacturer of solar power generation technologies. It has also invested in Nualight (2009) – a supplier of energy efficient lighting systems for retailers, Intune Networks (2010) – an Irish developer of fast-tunable laser technology.

Brokerage houses such as NCB have been able to raise funds for certain energy development companies such as Geothermal Energy Limited, one of our clients. Mainstream has also raised funds in Ireland via NCB for its ongoing aggressive expansion plans in offshore around the UK, which is developing large scale wind farms abroad.

LESSONS FROM OUR EXPERIENCE IN THE RENEWABLES SECTOR

Wind

Our wind blows stronger for longer than in most other countries, so much so that it is estimated that the output from an onshore wind turbine in Ireland is roughly twice that of its counterpart in northern Germany. In Ireland we have a total of 2200MW of onshore wind installed. This is enough to supply electricity to approximately 1.3 million homes. Government targets are for 4,000 MW of onshore wind to be installed by 2020. It is estimated that offshore wind could provide a further 7,100 MW in the future but the take off of offshore in Ireland is low thus far. We have wave and tidal resources which will play an important role for us in the future. Between them these resources could give us well over the Government target of 40% of our energy coming from renewable resources. We are not used to the idea that this nation could be energy rich. Gas is the main fuel used in our conventional power plant, wind can help give us more security of supply.

As can be seen from the Gate 3 grid connection application process, there are a large number of entities who want to build out wind farms ranging from large scale 30-50 MW wind farms to smaller 5 MW wind farms. Almost all of this development has been onshore to date; some traditional wind farm developers feel no need to develop offshore with our relatively unpopulated Western seaboard.

Funding

The average cost of developing 1MW of onshore wind in Ireland is estimated at €1.75 million. Therefore to meet our 2020 targets approximately €3.5 billion of investment will be required over the next eight years. In addition, ESB/Eirgrid will need to raise about €3 billion to build out the grid to support the wind energy system. Where this financing will be sourced is a cause of some concern. Typically a wind farm will require between twelve to fifteen years of operation to pay back a project finance loan. Basel III requirements mean that banks are required to hold greater long-term assets if they are to lend on a long term basis. This makes it more expensive for banks to lend on a long term basis. The market has seen terms of 5-7 years being offered by funders with the borrower bearing the risk of refinancing.
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and with a revenue lock up imposed. In the event that the borrower cannot refinance the loan then it will usually be the case that this is a default and they can be forced to sell the development by the funder, this type of loan being a hard mini perm. This puts the developer in a somewhat unenviable position and many will be reluctant to take up this risk. A soft mini perm is a loan that without default risk incentivises the lender to refinance early even through the loan may still be long term.

Banks simply are not funding enough unless there are well established players with track records such as large scale utilities or wind farm promoters who have a history of developing wind farms. Small scale wind farms are having difficulties with funding and some of our clients in that space are banking with ethical banks such as Triodos to avail of funds. Those who applied under Gate 3 with planning permission, etc. have now recently received calls from the grid operator to pay grid connection deposits and this will be the proof of whether they are going to proceed.

We believe that the market will become increasingly homogenised, with a lot of developers not proceeding to development once they have got past the planning permission stage/grid connection stage and will flip on projects to large scale utilities and other players who have the financial muscle and skill set to bring wind projects to completion. We acted in the sale of a developed 38MW wind farm to one of the larger utility companies, which was an example of such homogenisation.

We believe this is ultimately the correct route where the market favours large scale wind farm operators. This is the future, but the future will also need to support micro generation which we believe is a possible growth area linked to community based energy systems.

With regard to prices paid for wind farms, there are currently issues in the financial modelling. The SEM prices fluctuate as do wind speeds over time and even with the REFIT support system financial models may not always be as positive as they were originally expected to be. Furthermore, there is uncertainty in the market about the treatment of generators in curtailment scenarios and compensation for such curtailment.

Grid connections are still a major issue. We are conscious that Eirgrid and ESB networks are working on this, but the process is slow. This goes back to a failure by the State to invest in infrastructure, though the level of investment in recent times has increased.

Also, there should be a review of the conditions for eligibility and application under the Strategic Infrastructure Act (the Act). Under the Gate 3 process, very few applications for onshore wind meet the Act’s criteria, wind farms of over 100 MW. We would argue that there should be a lower threshold for wind farm approval under the Act, which takes matters out of the normal planning process. Also, lock in for wind turbines to planning permission is not perfect in that you must specify the type of turbines to be used at the planning application stage, which can make it difficult to change turbine suppliers at a later stage.

It is easy to be critical, but from a fledgling industry twelve years ago, the introduction of the REFIT support system and the SEM, the IWEA and all industry stakeholders deserve praise for the progress that has been made. Yet given the importance of security of energy, greater efforts need to be made on the roll out of wind farms.
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We are also seeing quite a lot of strategic investment in wind farms abroad. Mainstream is investing in a 400 MW wind farm pipeline in Chile. We have lower profile clients who have put together consortiums of investors to invest in wind farms in the USA, Portugal and Bulgaria. It appears easier to develop large scale wind farms of 100 MW or more in these jurisdictions. Indeed, part of Airtricity’s success was its offshore wind farm portfolio. Some of the promoters of wind farms in Ireland we have acted for in the past are now looking at wind farm developments in Morocco and Switzerland.

Whilst wind turbine design and manufacturing is possibly going to remain the preserve of large scale global players such as Siemens, GE, Vestas and Nordex, opportunities for Ireland primarily arise from technology driven companies which can provide more efficient and innovative mechanical and software based components for wind turbine design and manufacture (such as software systems). Indeed, one of our clients is working on improved wind turbine efficiency which if successful would be a patented technology which could be sold to these large scale players.

We do believe that there will be some solution to storing electricity in the future and we have clients who have invested in electricity storage technologies. There may well be in the future an ability to harness night-time wind energy to power electric cars during the daytime.

District Heating Schemes / Geothermal Energy

Such schemes do not necessarily have a good reputation in countries such as Russia because of inefficiency in connection with poor quality boilers and old piping and poorly insulated networks. However, technology has been improving to make them more cost efficient.

It may well be that individual power generation units at each home are the most efficient in terms of cost, however, the use of renewables to power individual homes is not efficient in terms of size and scale. For example, bio mass woodchips are not that easy to get into domestic city houses. Accordingly, to use such renewable products to provide heating, large scale CHP (combined heat and power) plants will be necessary to heat and provide hot water to a cluster of homes. We believe that district heating schemes have a key role to play in the Green economy.

Waste to energy technology can provide an excellent source of heat for district heating systems. Completion of Ireland’s first incineration plant, operated by Indaver was completed at Duleek, Co. Meath in 2011 and has opened. It will process 200,000 tonnes of waste annually, generating enough heat to power 20,000 homes. Indaver is also proposing to build a facility in Ringaskiddy, Co. Cork consisting of two waste to energy facilities of 22MW and 50MW each) and a waste transfer station although this has initially been refused planning permission.

There is also a proposed waste to energy facility being planned for Poolbeg in Dublin. This waste to energy plant if ever built will be capable of processing 600,000 tonnes of waste per year or enough heat for 60,000 homes. It is proposed that a district heating system will be constructed in tandem with this facility which would initially be based in the Dublin
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Docklands, with the Poolbeg facility as the main heat source. This system could be expanded with the potential to serve the whole city area at some time in the future.

Another source of heat for district heating systems is geothermal energy. We have worked with Geothermal Energy Limited on deep geothermal energy. This is using water heated from approximately two kilometres down to provide heating. Simply put, one puts down a pipe, brings up the water, extracts the heat and re-injects the water. Geothermal Energy is one of the first in the UK and Ireland to be bringing this model to market and we believe it will have a key role to play in the overall mix of renewables in the green economy.

Other clients have been active in district heating schemes, especially, for example, in large scale apartment developments. The financial model in these situations usually work on the basis that the apartment blocks are fully occupied. The contracts themselves are novel and we have built up considerable expertise in the drafting of operation and maintenance contracts for district heating schemes and the relevant end-user agreements for district heating networks. When putting these systems in place there are many data protection and consumer protection law issues that also need to be considered.

Marine Wave and Tidal Energy

Large incentives for wave and tidal energy in terms of REFIT support and grants were announced in 2009 (€220 per MWh for fifteen years which is significantly higher than for wind and about €5 million in grants). Obviously, if the prototypes can be made to work, Ireland with its large offshore coast line would be a key beneficiary of this power. The National Renewable Energy Action Plan forecasts that commercially viable devices must be available in order to reach 75MW by 2020. The Irish company, Open Hydro, into which Bord Gáis Eireann and French defence contractor DCNS have invested, is considered ahead of the race in the area of tidal technology. Unfortunately, another Irish company, Wavebob, involved in wave energy technology has had to close down due to lack of funding. There is competition in these areas from Scottish and Portuguese companies. We believe it is vital that we get there first to commercialisation because, if not, funding will flow to another country which was the first to commercialise the technology. The advantage of being first to market is the opportunity to get a share of the manufacturing market for such equipment, something we have not being able to do to date for wind turbines.

Getting the Power Purchase Contract Right

Nowadays, instead of having one choice, commercial and industrial consumers of electricity face an increasing array of power purchase possibilities. With this increase in availability comes increased scope for negotiation.

Whilst large consumers of energy may consider novel ways of acquiring power, such as installing their own combined heat and power plants or purchasing or availing of a district heating system, they may still need to purchase electricity from a third party provider.

Since 2005 all electricity customers have been entitled to switch electricity supplier. This can be done through the Change of Supplier process handled directly between ESB Networks and the relevant electricity suppliers without disruption and at no direct cost to customers.
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Each contract is likely to be slightly different, and each consumer will have different concerns. However, the following fundamental principles must be borne in mind:

1. The price being paid for the supply must be fully understood.

2. As with every commercial contract, the consumer must be fully aware of the practical implications of each clause.

The greater the demand for electricity of the consumer the stronger it will be in trying to renegotiate standard terms.

Traditional Energy

Oil distribution and supply companies are still valuable businesses though deriving profits from volumes at low margins. They tend to have a very good distribution structure which could be used for the distribution of biofuels and biomass and indeed electric car charging stations. It may well be that their strategic view is that green energy infrastructure, such as electric cars, will have a longer lead in time than expected and developing the relevant infrastructure is not yet necessary.

By 2020 all Member States are required under EU Directive 2009/28/EC to achieve a target of 10% in renewable energy in transport and to meet the binding EU recognised sustainability requirements under the European Union Biofuel Sustainability Criteria (EUBSC).

One key way of achieving this target is through the National Biofuels Obligation (NBO). The NBO was introduced in July 2010 and is a scheme designed to conform with the EUBSC, which obligates companies that sell road transport fuels to have an average of 4% of biofuels in their annual fuel sales. The end result has seen an increase in the biofuel market in Ireland and in 2011 there was in excess of 200 million litres of biofuel in the Irish market.

Shale Gas

Shale gas has become an increasingly important source of gas in recent years, particularly in the US. Shale gas exploration has now spread to Ireland with exploration options having being granted in February 2011 to Tamboran Resources PTY Ltd and the Lough Allen Natural Gas Company Ltd in the Lough Allen Basin in the northwest of the country and also to Energi Oil Plc in the Clare Basin. It is believed that the Lough Allen Basin alone may contain up to 9.4 trillion cubic square feet of shale gas or the energy equivalent of 1.5 billion barrels of oil which is approximately twenty-nine times Ireland’s current annual demand of oil.

The extraction of shale gas often utilises hydraulic fracturing or as it is more commonly known “fracking”. This system of extraction refers to the procedure of creating fractures in rock formations by injecting fluid at high pressure into cracks to force them further open. The
larger fissures allow more oil and gas to flow out of the formation whereby it can be collected.

Fracking is not without its opponents and it is claimed that the fluids injected into the rock formations can result in contamination of ground water supplies. In 2011 the EPA were instructed to carry out preliminary research on the possible environmental impacts of fracking and a more comprehensive review is expected to be commissioned shortly and the results of this will set the standard as to whether fracking will be utilised in this country. If fracking is to occur, the legislative regime will need to be reviewed to deal with the relevant issues arising as the traditional oil and gas legislation for licensing and extraction of oil and gas was not drafted with fracking in mind.

KEY AREAS FOR GROWTH

Key areas for growth of the green economy in Ireland highlighted in the Government's 2012 Action Plan for Jobs under the heading Green Energy and in the DCENR's Strategy for Renewable Energy 2012-2020 are as follows.

1. **Renewable Energy**: The development of wind, bio energy, wave and tidal power.

   The Government has provided large incentives for wave and tidal energy in terms of REFITs. Obviously, if the prototypes can be made to work, Ireland with its large offshore coast line would be a key beneficiary of this power and we believe that this will be a growth area. The current government’s programme for Government set out an interim target of 75 MW of ocean energy connected by 2012 but this has clearly not happened. More positively, Tidal Ventures, a joint venture between OpenHydro and Bord Gais Energy, are set to manufacture a 100MW tidal generator at Torr Head, Antrim with an expected completion date of 2020.

   The East-West Interconnector is a high-voltage direct current submarine and sub-soil power project for connecting the UK and Irish electricity markets. The project was completed in 2012 at a cost of €600 million and was operational as of 1 October 2012 with a 500MW capacity. It will increase competition and security of supply and better use the capacity of wind energy and thus reduce the need for constraint and curtailment of wind suppliers. Irish renewable generators will benefit from the interconnection as it will increase their available market and make it more economically advantageous to construct more large scale renewable generation. Indeed a European grid will be the ultimate aim with solar power from Spain to wind from Ireland and hydro from Scandinavia. We believe that further interconnectors between the UK and Ireland should be developed for further energy collaboration between Ireland and the UK in the future and believe that it represents a significant export opportunity for indigenous wind power generators. Indeed, Element Power is proposing forty new wind turbines in the Midlands which could supply 3,000 megawatts of electricity to the UK via a pair of dedicated under sea cables.

2. **Efficient Energy Use and Management**: Implement energy efficiency standards, to drive savings. Smart Metering is something we believe will be developed and will create a lot of opportunities. Also the Government has committed to invest €76m in
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the Better Homes Scheme in 2012 supporting at least 4,800 jobs in the retrofitting of homes.

3. **Waste Management:** Extending waste management recovery and recycling. A regulatory structure of waste management needs to be implemented. Ireland needs to move from a regional approach to waste management to a national model.

4. **Water Services:** Water services cost over €1.2 billion to run in 2010. With revenue of just over €200 million from non-domestic charges, the balance of around €1 billion is largely State-funded. The Government decided in December 2011 to establish an independent state owned company Irish Water (within the Bord Gáis Group to leverage existing expertise of Bord Gáis) to take over the provision and supply of water from local authorities. The move of water sector functions from local authorities to a semi-State company will include the introduction of domestic water charges. The introduction of volumetric water charges will provide households with an important incentive to reduce their consumption of water. International experience suggests the introduction of water meters can achieve a reduction in consumption of at least 10%. However, it appears that only 15% of households will have the necessary meters in place by 2015. Future funding requirements will be determined by the level of charges and the extent to which Irish Water will be able to access financial markets to fund its investment programmes. Irish Water will acquire statutory responsibility for water services in mid 2013 and local authorities will be agents of Irish Water for a period with Irish Water taking over their operations on a phased basis from January 2015. There will be a large scope for partnership with private entities going forward to collaborate with Irish Water on all aspect of water services and this could be a long term growth area.

5. **Deliver Green Zones and a Green IFSC:** Developing a Green IFSC presents an immediate opportunity. Potential exists for a Green IFSC cluster and green investment vehicles, such as investment conservation energy companies, banks and VCs, carbon trading in associated and professional services, etc. A sub-group of the IFSC banking and treasury group has already been set up to review this sector. The carbon offset market is likely to grow with an estimate of global carbon trading volumes of €2 trillion by 2020; this gives Ireland an opportunity to get a foothold in the carbon trading market. The report recommends the speedy implementation of EU Directive 2009/29/EC which allows installations in the EU Emissions Trading Scheme (ETS) below 25,000 tonne per annum to opt out of EU ETS and join a secondary domestic offset market. We believe having such a hub should support other areas of the green economy in Ireland.

6. **Create world class research centres:** Managing energy requires a combination of ICT hardware and software which are areas of existing strength in Ireland. Smart meters, which are still in an early stage of development, should drive energy savings.

7. **Remove hurdles to the development of the green economy:** Remove regulatory and planning barriers delaying implementation of green energy projects.
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8. **Green procurement:** Implement green procurement across government departments that will drive growth in the green economy.

**SOME TIPS FOR THOSE INVESTING IN GREEN TECHNOLOGIES**

Be extremely careful that you understand the technology.

Be extremely careful as to pricing. The Energy Market is complex and investment strategies must be made on a long term basis. A good understanding of how the SEM pool works as to pricing, state supports, etc., is necessary. Investors need to be aware that energy prices fluctuate and go down as well as up.

There are difficulties for new entrants to the market to get funding, even with a viable project. Having acted in investments in a large number of start up energy companies, we feel that some of the investment valuations might be on the high side.

Do not forget management. We have worked with a number of wind farm developers over time many of which have equal abilities as engineers, etc., but those who lead the pack have good management and decision making skills and are able to deal with the negotiation procedures required throughout the funding process and contractual phase.

Get good advice onboard. There are a number of energy consultants out there and one only has to go through the market to establish who the competent players are. In any project getting such advisors onboard is a good idea.

**CONCLUSIONS**

There are environmental, supply issues and legislative policies driving the green economy.

There is a need for more proactive legislation to assist the development of a green economy in particular as to planning and land ownership issues.

To really drive the green economy and if we are to take it seriously a cross governmental departmental unit should be given the power to drive through the necessary legislative changes to allow for the overall mix of a green economy effectively working together.

We see wind as a proven resource. If tidal and wave power can be harnessed, then we have a guaranteed continuous supply which unfortunately wind cannot provide us with.

We believe the government needs to continue to develop our grid infrastructure, in particular, to connect into the European grid.

We see an appetite for investment, but bank funding is hard to get.

We see opportunities for growth in ICT for efficient use of energy and systems to operate green energy, water monitoring and use and recycling of waste - Ireland could be a market leader here.

We welcome the development of a Green IFSC.
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We believe investors need to be wary as to pricing and carefully choose which technologies they support.

For more information please feel free to contact Philip Daly at pdaly@lkshields.ie or by telephone on +353 1 661 0866.

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