



# Cam Burn Wind Farm

Craigmore Road, Coleraine, Co. Londonderry

**EIS Volume 3**

Non-Technical Summary  
August 2011



renewables © 2011





Computer-rendered photomontage of the view from the A29 looking southeast - about 1.5 kilometres from the site

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This non-technical summary (NTS) is Volume 3 of the Environmental Statement (ES) and has been prepared by TCI Renewables Ltd (TCIR) to accompany its application to the Planning Service for planning consent to construct six wind turbines, six kilometres north of Garvagh, County Londonderry.

#### Site Address:

Cam Burn Wind Farm  
Land approximately 920 m north west of 33 Craigmore Road  
Blackhill  
Coleraine  
Co. Londonderry

This NTS provides a description of the Environmental Impact Assessment (EIA) and has been produced in accordance with the *Planning (Environmental Impact Assessment) (Amendment No. 2) Regulations (Northern Ireland) 2008*.

It contains an analysis of the environmental implications of the proposal to construct, operate and decommission the wind farm. All three volumes of the ES have been submitted to the Planning Service in Belfast where they may be examined by the public during normal working hours. Copies will also be made available for purchase and viewing - see Page 23 for details.

The EIA has been prepared by members of the TCIR in-house technical and development teams with input from external specialists. The NTS is accompanied by two other volumes (1 and 2) which together form the complete Environmental Statement:

- Volume 1: Environmental Statement
- Volume 2A: General Figures
- Volume 2B: Landscape and Visual Impact Assessment Figures
- Volume 2C: Technical Appendices

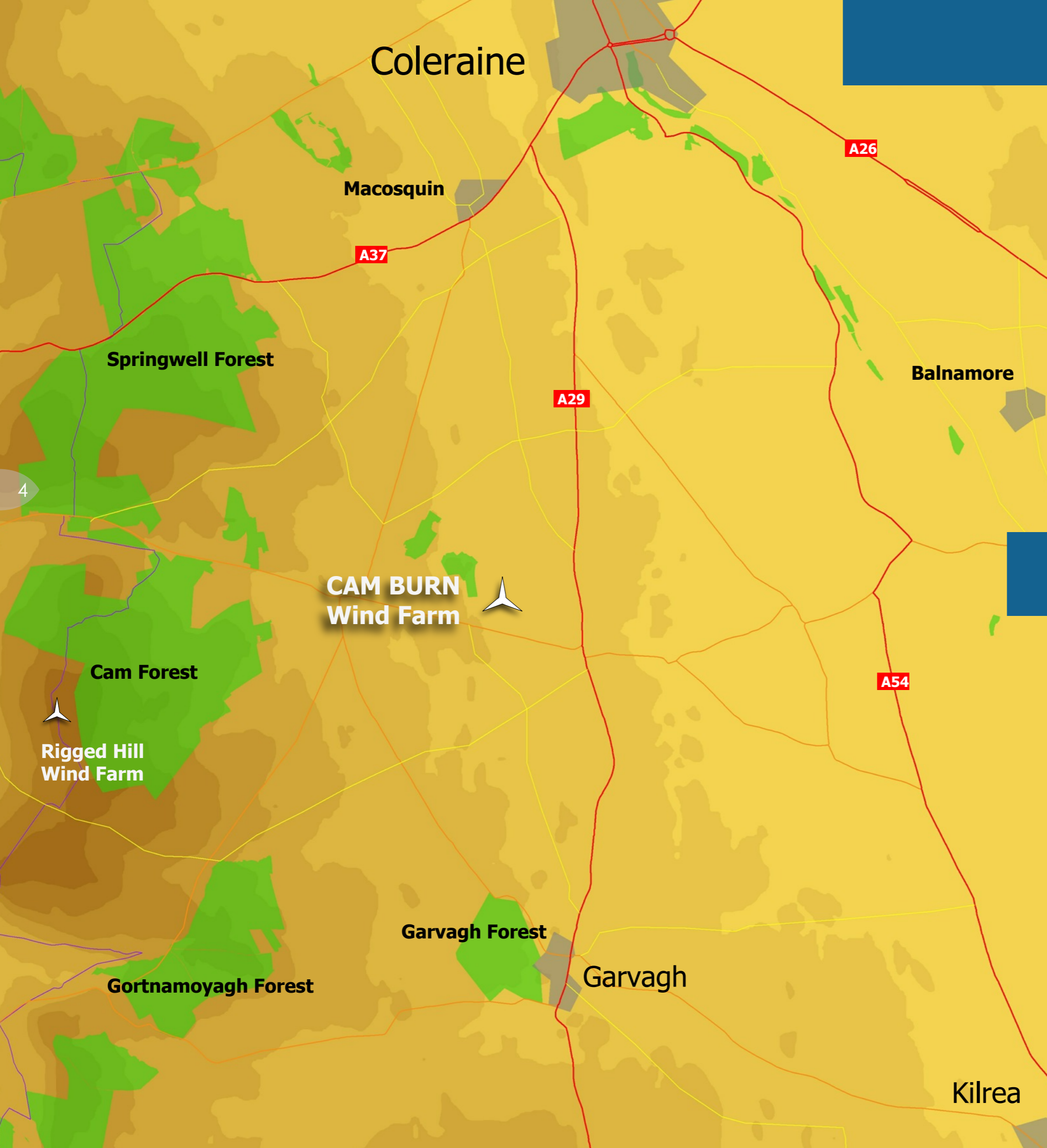
Printed copies of the non technical summary and the environmental statement can be obtained from:

TCI Renewables  
The Old Throne Hospital  
244 Whitewell Road  
Belfast BT36 7EN

A copy of the NTS can be downloaded free as a PDF file from the TCIR web site at [www.tcirenewables.com](http://www.tcirenewables.com). Printed copies of the NTS or the complete ES (including figures) can be purchased in print or CD format from TCI Renewables - see Page 23 for more details.

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## the site

The proposed development site is located between the townlands of Glencurb, Clintagh and Ballybritain approximately six kilometres north of Garvagh, County Londonderry. The closest large towns to the proposed development are Coleraine, Limavady and Ballymoney.

A belt of rounded hills and mountains extends in a roughly north south axis west of the River Bann forming the eastern extent of the Sperrins. Rigged Hill, with its wind farm, and Craiggore Mountain are located in the western part of the study area. Carn Hill and Carntogher define the southern limit of this belt to the south west of Garvagh

The site area is adjacent to the Cam Burn and is mainly agricultural in nature. The site also contains an area of commercial conifer plantation. The site will be accessed from the Craigmores Road using existing tracks where available with new tracks supplying the remainder of the site.

TCIR sought to minimise the land-take required for the development of the project by following field boundaries and contours within the landscape and utilising existing track where possible.

## the project

The proposed development consists of six wind turbines of up to 120.5 m in height, each of which will generate up to 2.3 megawatts of electricity. Other infrastructure will include underground electric cabling, a temporary site storage compound, road improvement works, a substation building, a permanent met mast, new tracks and existing track upgrades, and other ancillary site works associated with a wind farm development.

The wind turbines will incorporate a tower and three blades forming a rotor. This will be attached to a nacelle housing containing a generator and other operating equipment. The towers will be fixed to the ground on concrete foundations approximately 20 m in diameter to incorporate the tower base and foundation loading. The switch gear for the turbines will be contained either within the bases of the towers or in external kiosks situated adjacent to the towers.

Subject to the granting of planning consent and turbine procurement, it is anticipated that construction of the Cam Burn Wind Farm will take between nine to 12 months to complete. At the end of the wind farm's expected 25-year lifespan the turbines can be decommissioned and removed, with foundations broken to below ground level and the majority of the site rehabilitated. Underground electrical cables will be de-energised and removed from the site.

Northern Ireland Electricity (NIE) will be responsible for the planning application and design for the grid connection route. The turbines will generate electricity at between 400 volts & 690 volts. This will be stepped up to 33 kV using transformers installed within the bases of the towers. Underground and overhead cables will connect the wind turbines to the most suitable NIE connection point.

Operations and maintenance are the initial responsibility of the turbine supplier. After this warranty period has elapsed, a suitable company will be contracted to ensure the wind turbines are regularly maintained. The turbines will be monitored via remote internet computer links to maintain optimum efficiency.



All wind farm proposals in Northern Ireland are assessed by the Planning Service within the Department of the Environment (DOE). This planning process determines if the proposals should be assessed within the *Planning (Environmental Impact Assessment) (Amendment No.2) Regulations (Northern Ireland) 2008*.

The strategic regional planning for Northern Ireland is guided by *A Planning Strategy for Rural Northern Ireland* and other relevant planning policy documents. However, this is gradually being superseded by individual and more detailed planning policy statements.

The Department of Regional Development has published its regional development strategy for Northern Ireland, *2025 Shaping Our Future*, in which it aims to guide future development until 2025. The proposed Cam Burn Wind Farm has been developed within this strategic planning framework.

Planning Policy Statements (PPS) set out policies on land use and other planning matters and apply to the whole of Northern Ireland. They are gradually replacing the policy provisions of the *Planning Strategy for Rural Northern Ireland*. Their contents are taken into account in the preparation of development plans and are also relevant to decisions on individual planning applications.

*PPS 18: Renewable Energy* sets out the DOE's planning policy for all renewable energy developments. The project design and layout have also had due consideration of the Supplementary Planning Guidance to PPS 18, which was published in August 2010.

Northern Ireland's wind energy industry has matured and grown in response to the need to take immediate action to limit and reduce greenhouse gas emissions and the effects of climate change. The development of wind energy projects in Northern Ireland can provide considerable benefits for the environment, the economy and the sustainability of Northern Ireland's energy security.

Northern Ireland has committed to legally binding renewable energy targets of 40% renewable generation by 2020 under the Strategic Energy Framework of 2010 and onshore wind development is seen as the key driver to the successful delivery of these ambitious but realistic targets.

In its fourth Assessment Report, published in 2007, The Intergovernmental Panel on Climate Change projected that global average surface temperatures could climb by between 1.4 and 5.8°C by 2100. This could trigger a rise in sea levels, which in turn would endanger coastal areas and small islands, and lead to a greater frequency and severity of extreme weather events.

The burning of coal, oil and gas for electricity generation is one of the major contributors to climate change. It is widely recognised across the UK that current and future energy policy must be focused on low-carbon and zero-emission technologies, increasing energy efficiency and massively increasing the uptake of renewable-energy technologies such as wind energy.

The UK government has set an achievable goal for renewable energy with a 15% target by 2020. An interim target of 12.5% for 2012 has also been established. In addition, the Climate Change Bill 2008 sets legally binding greenhouse gas emission targets, with the UK Government required to report progress every five years. Within Northern Ireland the Strategic Energy Framework 2010 has set renewable energy generation targets of 40% by 2020. Projects such as the one at Cam Burn are vital as they make meaningful contributions towards achievement of this goal.

Progressive wind energy policy incentives across the European Union are backed up by market stimulus packages including Renewable Obligation Certificates (ROCs) and other mechanisms, which help drive major investment into the wind industry. At present, one ROC represents one megawatt-hour (MWh) of renewable energy. Energy suppliers need ROCs to prove compliance with the set targets. This is achieved through the presentation of ROCs each year to the electricity regulator, Ofgem.

Strengthening these obligations through the Energy Bill will drive greater deployment of renewable based energy in the UK. This will increase the diversity of the UK's electricity mix, thereby improving the reliability of energy supplies and helping to lower carbon emissions from the electricity sector.

Onshore wind energy will play a vital role in helping to combat the effects of climate change and increasing the sustainability of our energy supply in Northern Ireland whilst reducing our heavy reliance on fossil fuel.



Computer-generated photomontage of the view from Drumaheglis Marina





People have many questions about wind turbines; what they sound like and how it will look when a turbine or wind farm goes up in the community. As a relatively new feature in the environment they generate a lot of public interest and debate.

A survey conducted by Millward Brown Ulster revealed that 87% of people in Northern Ireland support the deployment of wind farms to help meet the country's current and future energy needs. This overwhelming endorsement for wind energy was unveiled by Renewable UK in 2004 at the Northern Ireland launch of *Embrace the Revolution*. Support levels continue to grow as the province commits itself legally to achieving its challenging renewable energy targets of 40% by 2020.

Studies elsewhere have shown that people who live near wind farms have a more positive attitude towards them than those who live further away.

Information about the Cam Burn Wind Farm has been posted to government agencies, the local council, local community groups and key stakeholders. Anyone requiring additional information is invited to contact TCIR directly.

An information leaflet was distributed by a specialist mailing company to approximately 460 properties within a 3.5 kilometre radius of the proposed site. This gave local residents a brief overview of the project and a summary of the environmental studies which had been carried out to date.

A Public Information Day was held in the Garvagh Community Building on July 21, 2011 prior to the application being submitted to the planning service. This gave local residents the opportunity to comment on and receive further information about the proposal. Approximately 30 people attended the Information day, including four local councillors and the MLA for the area.

So far, the response to the Cam Burn Wind Farm proposal has been positive and we are confident that the level of support will grow as people learn more about the potential benefits of the project.

Wind power delivers zero-emission renewable energy. Wind farms help in securing and safeguarding Northern Ireland's energy supply system. Furthermore, they reduce our reliance on imported fossil fuels such as oil, coal and gas.

Based on figures produced by Renewable UK and The Carbon Trust, the 13.8 MW Cam Burn Wind Farm will produce around 36.05 gigawatt hours per year of renewable electricity over its expected 25 year operational life - saving around 383,000 tonnes of carbon dioxide in the process (assuming the wind farm's lifetime output is off-set against coal fired generation).

The project will involve the investment of approximately £18.75 million, of which 15% - some £2.8 million - will be within the local borough. This money will be spent on development, financing, legal arrangements, delivery, construction, materials, plant and auxiliary equipment from local companies. On-site works are expected to involve the employment of up to 30 people over a period of 9 to 12 months.

In recognition of the commitment by communities to hosting wind farms the wind industry strives to ensure that a proportion of the benefits delivered by these projects is realised within the communities that host them. As a responsible developer TCI Renewables welcomes the opportunity to work closely with the community to help deliver real and tangible benefits at a local level. Therefore, on the granting of planning consent, TCI Renewables proposes setting up a dedicated community fund with an amount of up to £1,500 per megawatt installed paid annually over the lifetime of the wind farm. The fund would be administered by an independent fund-management company in conjunction with the local community.

Income will also be generated for the Northern Ireland exchequer as each turbine installed within the Coleraine Borough Council area will be liable for the payment of rates. These are paid annually and are estimated to be worth up to £234,600 per annum for the six turbines proposed, based on a rating of £17,000 per MW installed.

The operation of the wind farm also represents an educational opportunity for schools, local community groups and the public. It will help in raising awareness of wind energy generation, energy conservation issues, sustainability and local farming diversification.





**B**ased on Renewable UK figures for average UK household electricity consumption of 4,700 per kilowatt-hour (kWh), the Cam Burn Wind Farm is projected to provide the equivalent annual electricity for up to 7,900 homes.

Electricity generated by the proposed development will feed into the national grid and displace conventional forms of electricity generation. Using the electricity-to-carbon dioxide conversion factors from DEFRA and the Carbon Trust we can predict the volume of carbon dioxide offset as a result of the wind farm.

Using these guidelines, the proposed development is projected to reduce annual equivalent carbon dioxide emissions by approximately 15,335 tonnes (based on offsetting coal fired generation - see footnote).

The generation costs of onshore wind power are around 3.2 p/kWh (pence per kilowatt-hour) (+/- 0.3 p/kWh), with offshore at around 5.5 p/kWh, compared to a wholesale price for electricity of around 5.0 p-8.0 p/kWh. The additional system cost, should a wind energy penetration of 20% be achieved, is estimated to be around 0.17 p/kWh according to the Sustainable Development Commission (Nov 2005).

Besides these strategic environmental benefits there will be specific direct benefits to the local economy, including,

- Jobs during the construction phase
- The purchase of local construction materials and the hire of plant and equipment
- The potential for a local maintenance contract
- The contribution to local government revenue via business rates
- Additional benefits to other areas of the local economy (hotels, retailers and other businesses) arising from the temporary concentration of labour resources.

One of the largest forms of local benefit relates to the awarding of civil engineering contracts. Local contractors in County Londonderry are well placed to tender for this work, which typically accounts for some 15% (£2.8 million) of the overall development costs.

*(Guidelines to Defra's GHG conversion factors for company reporting, DEFRA 2007. [www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf](http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf)).*



**A**ll ecological studies were carried out by Allen and Mellon Environmental Ltd, during the spring, summer and autumn of 2010 and winter of 2010/2011. Dennis Weir led the ornithological work and has over four decades of experience in ornithological surveys.

The ecological work for Cam Burn was led by Dave Allen, who undertook the client-liaison and scoping discussions with the Northern Ireland Environment Agency. Dave was also involved in the bat survey work and is one of Northern Ireland's most experienced ecologists and field naturalists since moving from England to work for the RSPB in 1979.

Will Woodrow of Woodrow Sustainable Solutions carried out the bat and otter surveys for the site. Will is a full member of the Institute of Ecology and Environmental Management and is an experienced environmental fieldworker and ecologist with a career spanning over 25 years.

## Flora and Fauna

A habitat assessment was undertaken on September 8th 2010. The habitats were classified using JNCC Phase 1 classification, which is a standard method of habitat classification for wind energy and a range of other development proposals. During the course of the Phase 1 assessment field workers also recorded any priority species encountered. Special care was taken in relation to Irish hare and marsh fritillary butterfly, since parts of the site appeared to be suitable for these species.

Three Northern Ireland priority habitat types are represented within the development area; Purple Moor-Grass Rush Pasture, Raised Bog and Hedgerows. All the important priority habitats are avoided by proposed turbines and infrastructure. The majority of the turbines are located in areas of commercial conifer plantation which are scheduled for removal by the landowner in 2013 - regardless of the wind farm project. TCIR has amended the layout to reduce the impact on any sensitive habitats, including the area along the river corridor

## Birds

Breeding-bird survey work was undertaken between May and early July 2010. The winter bird survey work was carried out between November 2010 and January 2011. During the breeding season a total of 43 species were recorded in the survey area, 23 of these are considered to have been breeding in the survey area. The breeding bird assemblage is typical of marginal agricultural land which includes hedgerows and small woodlands (conifer and broad-leaf) as well as lowland bog. Only two species of Raptor were recorded namely buzzard and sparrowhawk, The latter was only recorded on one occasion. During the winter surveys a total of 38 species were recorded on site or within the buffer zone. The only waterfowl recorded was mallard, . In summary the development is highly unlikely to affect any significant bird populations currently found on the site.

A series of mitigation and enhancement measures have been recommended for the site which if implemented could greatly decrease any potential risks to bird species in the area. The measures include the restriction of construction work to outside the bird breeding season (the period mid August to early March). Access gates to the site will be locked and access will be restricted to authorised personnel.

## Bats

A total of five surveys were made during the months May to September inclusive, comprising four post-dusk surveys and one pre-dawn survey. No potential bat roosts exist within the proposal boundary. The nearest potential roost site is the farm buildings to the east of the proposal. This area will be unaffected by the proposed infrastructure. There is therefore considered to be no potential impact on bat roosts.

Following the submission of the initial report from Woodrow Sustainable Solutions the site has undergone a minor redesign to ensure that any concerns which were raised could be alleviated during the initial design phase. These amendments together with additional mitigation measures suggested by the ecologist will ensure that the proposed wind farm will not have a detrimental impact on the bat population at the site.

## Otters

An otter-signs survey was undertaken on September 25th 2010. The banks of the river that runs from west to east through the proposed wind farm site were examined for signs of otters. Positive conclusive signs were found that the site is in regular use by otters including, spraints (otter dung), slipways into the river and runways through bank-side vegetation.

Again, the site layout has had minor adjustments on the basis of the consultant's recommendations and it is believed that by adopting these changes and by incorporating the requested mitigation measures the wind farm will not have a detrimental effect on the otter population at the site.



The landscape and visual assessments are separate but linked procedures. Landscape impacts describe changes in the physical character of the environment and how this is experienced. Visual impacts relate to the actual views and visual effects of the turbines when they are in place.

TCI Renewables commissioned RPS Planning and Environment to complete a Landscape and Visual Impact Assessment (LVIA) for the proposed Cam Burn Wind Farm. The LVIA was completed by Raymond Holbeach BSc, MLA, MLI, a Chartered Landscape Architect and Regional Director of RPS with over 20 years' experience including multiple LVIAs for wind farm projects in Northern Ireland.

To establish a thorough understanding of what the turbines will look like when built, a series of photomontages have been produced using selected locations around the site. Montages use a combination of original photographs and computer rendered images. All the images are reproduced in an A3-sized portfolio, which is a part of the overall LVIA document and which contains other map-based visual studies and models such as wire frame diagrams, zonal maps and shadow flicker graphs.

The assessments are based on guidelines published by the Landscape Institute, the Institute of Environmental Management and Assessment and Scottish National Heritage.

## Landscape Character Assessment

The starting point for the assessment was to gain a detailed appreciation of the existing landscape with reference to guidance published by the Northern Ireland Environment Agency. The assessment subdivided the landscape around the site into areas with shared or similar characteristics (character areas). Once this detailed breakdown had been completed, the effect of the proposed wind turbines on each of the character areas was assessed.

The site is located within the eastern most edge of LCA 38: Eastern Binevenagh Slopes. This area is characterised by a low rolling plateau, falling gradually from basalt uplands eastwards towards the River Bann. The agricultural lands are of poor quality pastures with patches of gleyed soils, partially infested with scrub and rushes and also gappy hedgerows and broken stone walls at field boundaries. According to NIEA the landscape is generally in poor condition, with incomplete field boundaries and many areas of partially derelict pasture.

## Visual Impact Assessment

Using computer based techniques the visual assessment identified areas from which the proposed development would be theoretically visible. These Zones of Theoretical Visibility, or ZTVs, were tested in the field.

Using turbine geometry and digital terrain data, a wire frame image of the wind farm and surrounding terrain is generated from each viewpoint using a standard proprietary software package. The wire frame model is combined with a photograph from each location to produce the final representative photomontage of what the viewer would potentially see at that vantage point.

A total of 29 viewpoints were assessed with only three viewpoints (Viewpoint 6 Craigmole Road, Viewpoint 7 Ringsend and Viewpoint 13 A29 Lay-by) showing a substantial/moderate visual impact due to the relatively short distance to the turbines from these locations.

Whether predicted levels of change in visual resource and the resultant significance of visual impacts are negative or positive will depend on the perceptions and opinions of the individual experiencing the view.

When the collective level of significance is considered, the proposal is acceptable in terms of landscape impacts and visual impacts on towns, Class A roads, Class B roads and minor roads. Overall, the proposal is considered to be acceptable in terms of significance of visual impact. The surrounding landscape and its visual resources have the ability to accommodate the changes of the type associated with this development.

Significant landscape and visual impacts occur only at close proximity to the proposed Cam Burn Wind Farm. The assessment has established that with distance there is a greatly decreased level of impact.



Tibaran Mountain



**W**ind energy is a non-polluting source of electricity generation and will therefore have no direct negative effects on the atmosphere. By displacing electricity generated through the burning of fossil fuels the wind farm would in fact make a significant positive contribution to lowering harmful gaseous emissions to the atmosphere.

If the Cam Burn Wind Farm was to be granted planning permission and the six wind turbines producing 2.3 MW each were erected as proposed, there would be a carbon saving of around 15,335 tonnes of CO<sub>2</sub> for each year of the wind farm's operation. Over the expected 25-year life of the wind farm it would displace, at current comparisons, approximately 383,366 tonnes of CO<sub>2</sub>.

According to the RenewableUK (formerly BWEA) web site, an average house uses an estimated 4,700 kilowatt hours (kWh) of electricity per year. Although statistics for Northern Ireland indicate a marginally lower electricity usage per house, the UK figure was used as the benchmark. On that basis the wind farm at Cam Burn would produce enough renewable electricity to supply the equivalent of approximately 7,900 houses.

As such, the Cam Burn Wind Farm will help improve air quality and contribute towards achieving national targets of 40% renewable electricity generation by 2020 - as outlined in the Strategic Energy Framework 2010 - by reducing carbon dioxide emissions and increasing the percentage of renewable energy generated within Northern Ireland. A higher percentage of renewable energy generation will lower Northern Ireland's reliance on imported fossil fuels needed to supply its power base for future generations.

**A**rchaeology consultants Gahan and Long were commissioned to assess what, if any, effects the proposed development might have on archaeology within the immediate development site and the wider surrounding area. Chris Long gained a BSc Hons in archaeology with palaeoecology in 1995 and has worked as a professional archaeologist on numerous excavations throughout Ireland. Since 1999 he has worked as a project manager and field director gaining considerable experience in providing archaeological mitigation for large-scale development sites.

A desk-top survey was undertaken to identify any known sites of archaeological importance within the development area, extending to a five-kilometer radius surrounding the wind farm. Coupled with this, a site inspection was also made to identify any previously unknown or unrecorded upstanding sites which may exist within the area of the proposed development. The information provided by these components was assessed in relation to the potential impact on archaeological remains close to the proposed development.

The desk-top survey and site inspection revealed no known sites of archaeological interest situated within the proposed development site and that there will be no direct physical impact placed upon any of the archaeological sites within the five-kilometer radius of the development.

Photomontages produced from a number of archaeological sites in the area indicate that there will be limited views of the turbines from the monuments. Topography and tree cover provide a large element of shielding. However, given the existence of a landfill site and electricity pylons in the area the introduction of the Cam Burn turbines should have no discernable effect on the setting of any of the archaeological monuments. In addition all potential impacts are reversible with the decommissioning of the turbines at the end of their operational life.

Given the archaeological activity in the surrounding environs, it is possible that previously unknown sub-surface archaeological deposits may exist within the limits of the proposed development area. During the construction works archaeological deposits may be revealed, in which case mitigating planning conditions will be adopted as a precautionary measure. These include the implementation of an archaeology programme of works and the presence of a qualified archaeologist on-site during the construction phase of the development.





## Hydrology and Drainage

The assessment of soils, existing ground conditions, hydrology, geology and hydrogeology was undertaken by McCloy Consulting, an independent environmental consultancy specialising in the water environment, with specialist knowledge of hydrological and hydrogeological assessments, sustainable drainage systems (SuDS), drainage, river modelling, and flood-risk assessment.

The proposed site location is a mix of modified grassland pasture and commercial conifer plantation. The site generally falls west to east from an elevation of approximately 100 m to 80 m over a distance of approximately 1 km. Gradients on the site are typically shallow. Each of the turbine locations adhere to the recommended 50 m water buffers. There is a minimal peat habitat presence within the site boundary.

A desk-top study and detailed site-walkover survey were conducted to determine the hydrology and geology of the area. These included consideration of ground stability issues, baseline water quality sampling, analysis of Geological Survey Northern Ireland maps and data and consultation with the British Geological Survey, the Met Office, Water Service of Northern Ireland and the GSNI.

The site lies wholly within the catchment of the Aghadowey River, a tributary of the Agivey River within the lower River Bann Basin. The site is further divided into two main sub catchments of the Aghadowey River, those being the main drainage paths which exist within the site boundary. The Cam Burn flows through the site, draining much of its northern section, before merging into a tributary stream which flows along the southern boundary of the site before turning south to discharge into the main Aghadowey River after 1.2 km. The Cam Burn River merges with the Aghadowey approximately 1 km east of the site.

Every effort will be made to ensure the amount of subsoil to be removed is kept to a minimum in order to limit the impact on geotechnical and hydrological balance of the site. Changes in ground surface for turbine hardstandings will have an impact on the hydrology of the site and may result in increased runoff of rainwater and drainage discharge. However, the implementation of a comprehensive surface water management plan (SuDS) will ensure that there is no major impact.

Surface water courses located within the development boundaries and subsequent receiving water bodies outside the site are at potential risk of quality degradation during the construction phase of the development. A SuDS system of swales, check dams and settlement ponds in series will provide a surface-water management train that will mitigate any adverse impact on the hydrology of the site and the surrounding areas. These techniques are supported by the use of other pollution-prevention measures where necessary, such as silt fences and silt mats, which stop sediment from entering the hydrological regime of the site.

The SuDS drainage methodology prepared by McCloy Consulting has been used at many wind farms throughout Northern Ireland and has proved to be extremely reliable and successful in the prevention of pollution of watercourses during project construction.

## Peat Slide Risk Assessment

Peat depths can raise stability issues on upland areas and independent specialists Whiteford Geoservices Ltd. were commissioned to determine ground conditions over the proposed site and to assess the risks associated with peat stability. John Whiteford has more than 17 years of experience in the field of earth sciences, geotechnical engineering and management.

Detailed site surveys were carried out between May 24th and June 17th 2011. The surveys involved peat probing at each turbine base in a 100 m x 100 m square. Where this was limited by existing forestry (at turbines T2, T3, T4 and T5), as much probing as possible was carried out to ensure the best, accurate representation of the existing ground conditions. Probing grids were also conducted along the routes of planned access tracks at 25 m intervals going out to 10 m either side and at other associated site infrastructure. The average peat depth encountered was 0.40 m.

The detailed report concludes that all turbines, access tracks and associated infrastructure at the proposed wind farm are ranked within the insignificant-risk category (in accordance with the designations defined by the Scottish Executive guidance - Peat Slide Hazard and Risk Assessment - Best Practice Guide for Proposed Electricity Generation Developments of December 2006) and the site presents a minimal risk of peat-slide during construction.





Noise is created by wind turbines as they rotate. The principle sources of noise are the turbine blades passing through the air and to a lesser extent the internal machinery such as the generator. Modern wind turbine blades are designed to minimise noise and the nacelle which houses the mechanical equipment at the top of the tower is sound insulated. Today's turbines are so quiet that it is possible to carry out a normal conversation while standing at the base of a tower.

The potential noise effects have been assessed in accordance with the accepted methodology as set out in government planning guidance. A background noise survey was carried out by environment engineers White Young Green between June 9th and June 17th 2011 at the two nearest residential properties around the site boundary.

Predictions of worst-case noise level were carried out based on the proposed site layout and the maximum warranted noise level emitted by turbines of the type proposed. The predicted noise levels were then compared with the noise limits defined in the guidance document, ETSU-R-97, over a wide range of wind speeds. The assessment concluded that noise emitted by the wind turbines will comply with the defined quiet noise limits during the day and the 43 dB fixed night time limit. Thus ensuring the protection of the external amenity during the daytime and the prevention of sleep disturbance during the night time.

Noise from construction activities will be within normal guidelines and have a minimal affect. Increased traffic noise will be experienced for the days of pouring of the concrete turbine foundations and construction of the access tracks.

It is anticipated that local opinion will reflect the attitudes held by the participants of the surveys to wind farms undertaken in the UK between 1992 and 2010, with the majority of local people supporting wind energy developments in Northern Ireland.

The results of surveys in the UK show that visitors to an area are unlikely to be put off by the presence of a wind farm and that while people can be concerned at proposals for wind turbines in their area, these fears are generally eased when the development becomes operational.

In May 2006 RenewableUK released a report, The Impact of Wind Farms on the Tourist Industry in the UK. It revealed that visitor numbers in popular tourist areas with wind farms increased in Northern Ireland in 2001-2004 from 1.68 million to over 2 million. During this period 10 wind farms were operational, indicating that wind turbines are not having a detrimental effect on tourism. To date there has been no published evidence that indicates wind farms have a negative effect on tourism. The Altahullion wind farm north of Dungiven in Co. Londonderry has a dedicated tourist turbine, which is signposted from the main A6 Dungiven-to-Derry road by the Northern Ireland Tourist Board (NITB) using brown tourist signage. Walking on a dedicated pathway, members of the public can see the turbine structure as well as watch and hear it operating for themselves at close quarters.

The effects on tourism from the Cam Burn Wind Farm are difficult to quantify. However, TCIR considers that the six turbines at Cam Burn will not make a significant difference to the attitudes of tourists in the area, in fact, turbines may help stimulate the local economy through increased spending and visitor numbers from people wishing to observe an operational wind farm in the region.

## 18 shadow flicker and residential amenity

Shadow flicker occurs when a particular combination of weather conditions arise at specific locations at particular times of the day and year - usually when the sun is low in a clear sky and shines on a building or location from behind a turning rotor. The shadow of the turbine blades appears to flick on and off as the turbine rotates - especially if the shadow passes a window, doorway or narrow space

By computing data on the geometry, location and latitude of the turbines and nearby properties the WindFarm software programme can calculate the extent and duration of the potential effects of shadow flicker. There are no properties located within 10-rotor diameters (or 710 m in this case) of any of the turbines at the Cam Burn site and there are no properties located within the potential shadow flicker zone.

The effects on residential amenity can occur when wind turbines potentially disturb the quiet enjoyment of nearby residential dwellings. Under PPS 18 Planning Policy Best Practice Guidance the Department will generally apply a separation distance of 10-times rotor diameter to occupied properties (with a minimum distance of not less than 500 m).

The Cam Burn Wind Farm is in an area with few residential properties, there are no occupied dwellings less than 710 m from any of the proposed turbines.

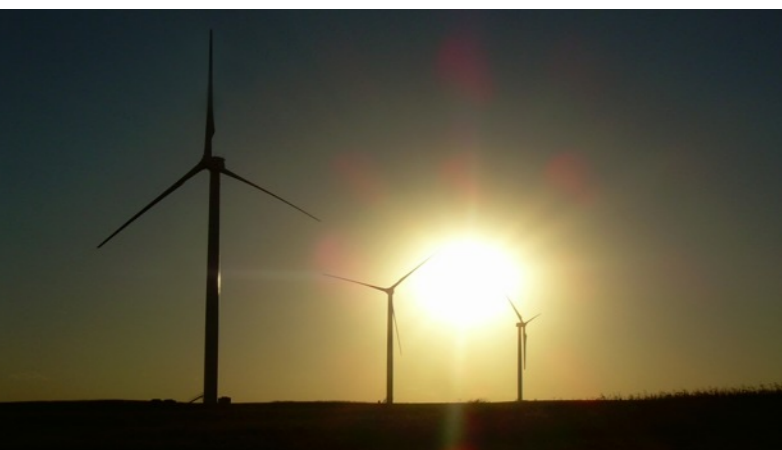
## 19 transport & haulage

The Environmental Statement provides a detailed description of the route to be followed from the chosen port facility at Derry to the Cam Burn site, including traffic-management procedures required for local roads. It also details the breakdown and schedule of the number and size of vehicles associated with the construction, operation and decommissioning phases of the development.

The effect of increased construction traffic on the local road network has also been assessed. It is acknowledged that during the this phase there will be a temporary increase in traffic flows due to vehicles carrying turbine components and building materials.

A relatively small number of oversized loads will be required to carry the long blades, towers and heavy turbine components to the site. Once these are delivered and installed, traffic entering the site will be substantially reduced, with maintenance vehicles visiting the site only intermittently. The haulage route and traffic assessment report concluded that the local transport network will be able to absorb the additional traffic movements associated with the construction of the wind farm. Adjustments are only required at the site entrance and for widening or construction of onsite tracks.

Any transport mitigation measures proposed by DRD Roads Service will be agreed and implemented prior to any haulage taking place. TCIR, in cooperation with haulage contractors for turbine components, stone and concrete, will utilise any DRD Roads Service approved traffic-management plan to minimise impacts on local roads and traffic to ensure the safety of all road users.





**W**ind turbines, as with any large structures, have the potential to interfere with electromagnetic signals, such as television, civil and military aviation activities, communication, microwave links and radar. The turbine construction phase must include provisions for safeguarding existing aviation and ground based infrastructure.

TCIR has consulted extensively with public and private operators to establish the electromagnetic environment within and around the Cam Burn site. Each turbine site has been carefully selected to avoid the possibility of interference with any radio broadcast communication equipment.

If any television reception problems do occur once the turbines are operational, then remediation measures can be taken. These may include the restoration (or even improvement) of TV reception by the redirection or replacement of domestic TV aerials or the installation of digital TV facilities.

### Aviation

Belfast International Airport, George Best Belfast City Airport, City of Derry Airport, Civil Aviation Authority and the Ministry of Defence were consulted in relation to the wind farm proposal. No objections were raised.

**T**here are a number of potential hazards and risks that might be associated with the construction and operation of any wind farm. However, all statutory health and safety requirements and planning conditions will be adhered to during the construction phase of the project.

All hazardous areas will be fenced off and unattended machinery will be stored on site within an enclosed compound and immobilised to prevent unauthorised use. Any potentially hazardous materials will be managed in accordance with The Environmental Protection (Duty of Care) Regulations 1991. In addition, temporary construction safety signs will be erected and placed in the most appropriate locations.

The lands on which the wind turbines will be sited are privately owned and there will be no unauthorised access to the wind farm site during the construction phase. Public health and safety measures will be confined to working personnel and landowner at this time.

The turbine towers will be locked at all times, except when attended by authorised maintenance personnel.

The turbine models being considered for this site will operate automatically and have sensors to detect any voltage irregularities or unsafe operation during periods of severe winds. Should a technical fault be diagnosed via a computer control system, the individual turbine or wind farm will shut down.

No negative impacts have been identified regarding public health and safety issues and as a result, no mitigation measures are considered necessary other than the implementation of all relevant standard health and safety legislation and by regulating public access.

### Decommissioning

At the end of their operational life, it is proposed that the turbines will be removed. The upper sections of the turbine foundations will be taken away and the voids will be backfilled with appropriate material, the topsoil replaced and the area re-seeded.

Tracks that are to be utilised by the landowner will be left in-situ, otherwise these will be covered by topsoil and re-seeded. At least six months prior to decommissioning works a decommissioning method statement will be prepared for agreement with the Planning Service.





This non technical summary has outlined the findings of the Environmental Impact Assessment for the proposed six-turbine, 13.8 MW Cam Burn Wind Farm development. Full details are set out in the Environmental Statement and accompanying technical appendices.

The Cam Burn site was selected for its excellent wind resource, suitable topography, noise compliance, sparse residential population in proximity to the proposal and accessibility with due regard to challenging planning constraints.

The EIA has demonstrated that any potential adverse effects of the wind farm can be managed and mitigated and that there will be lasting social, economic and environmental benefits arising from this wind energy development.

While the wind farm will have some minor residual effects on the local environment, most of these have been addressed, where possible, through mitigation measures, good management and appropriate construction techniques. The primary residual effect is predicted to be the visual change within the Eastern Binevenagh Slopes Landscape Character Area.

The wind farm will also contribute to a reduction in greenhouse gases produced through fossil-fuel generation and it will potentially provide over 36.05 GWh of stable, secure energy for the region every year. It will also help diversify and sustain the rural economy of the area through farmland diversification, construction, operation and maintenance activities.

It is the view of TCIR that from the detailed evidence gathered in the EIA process, the proposed wind farm at Cam Burn is a justifiable and environmentally-sustainable development which should be granted planning permission.

All three volumes of The Environmental Statement can be purchased from the TCI Renewables office:

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(By appointment only)		(By appointment only)		



Computer-generated rendered image of the view from Lisnamuck Road The turbines are 3.0 kilometres away





Intelligent**Solutions**



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