EXECUTIVE SUMMARY

Whether investing in an existing wind farm or developing a completely new one, owners, operators, investors, insurance companies and developers have to understand and mitigate all the risks before deciding to proceed with a project. Project risks which might affect the project’s profitability in the short, medium and long term usually originate during the initial stages of development.

Independent technical advisors such as SGS can evaluate the technical feasibility of the project through a technical due diligence during which the risks probability of occurrence and their potential impact on the project will be detected. The goal is to firstly ensure that the technical feasibility of the project is such that the investment is sound, and secondly to ensure the quality. This is accomplished by way of a thorough review of all the assets and/or the data available to reveal the potential areas of concern for the investor.

In addition to the due diligence during the development and operation phases, SGS supports the customers during the entire life cycle of the project with tender support, construction and operations monitoring, and providing technical consultancy tailored to the client’s needs.

This applies for both onshore and offshore wind farms with no geographic restriction.

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<tr>
<td>BOP</td>
<td>BALANCE OF PLANT</td>
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<td>COMPETENCE CENTRE</td>
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<td>CDM</td>
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<td>FIDIC</td>
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</tr>
<tr>
<td>ISO</td>
<td>INTERNATIONAL ORGANISATION FOR STANDARDISATION</td>
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<td>Reso</td>
<td>RENEWABLE ENERGY SUPPORT OFFICE</td>
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1.1 COMPANY PROFILE

SGS is the world’s leading inspection, verification, testing and certification company. SGS is recognised as the global benchmark for quality and integrity. With more than 70,000 employees, SGS operates a network of over 1,350 offices and laboratories around the world.

Market capitalisation of US$10 billion (SWX:SGSN).

Revenue 2011: CHF 4.8 billion.

The company, with headquarters in Geneva, was founded in 1878. This long history has assisted SGS to establish a reputation for independence, integrity, professionalism and experience. The policy of SGS is not to engage in any manufacturing, trading and financial activities which might compromise its independence and neutrality.

SGS is involved in the following business lines:
- Industrial Services
- Oil, Gas and Chemicals
- Governments and Institutions
- Minerals
- Environment
- Automotive
- Systems & Services Certification
- Agriculture
- Consumer Testing
- Life Science

SGS HAS SIGNIFICANT EXPERIENCE WITH DELIVERING EXPERTISE TO BANKS (SUCH AS WORLD BANK, EBRD, ING, BNP, CITIGROUP, WEST LB, BBVA, INVESTMINT, EIB, JBIC, ETC.).
1.2 QUALITY SYSTEM

Being the world’s leading inspection, verification, testing and certification Company, SGS is recognised as the global benchmark for quality and integrity. The SGS Group has a compliance programme, based on its Code of Integrity and Professional Conduct, to ensure that the highest standards of integrity are applied to all its activities worldwide in accordance with international best practice.

1.3 FIDIC CONDITIONS

SGS, with its worldwide network, has extensive practical experience with the FIDIC Conditions of Contract, based on various international projects. SGS highly trained experts contribute to the successful execution of engineering construction contracts worldwide in accordance with the FIDIC regulations. SGS staff has handled successful contracts under FIDIC conditions including for Rymanów Wind Farm in Poland preparing and verifying the contracts according to the yellow book.

1.4 ENVIRONMENT AND SUSTAINABILITY POLICIES

At SGS we believe it is vital to embrace sustainability as a positive challenge; a source of continuous enquiry, innovation and improvement. We contribute to environmental sustainability in many ways through our range of services. Our own business activities also impact on the environment, so one of our priorities is to continuously improve our own environmental performance. Our environmental policy encourages us to minimise our impact on the environment and the communities where we work and live. It also requires our suppliers and business partners to make similar efforts.

The ISO 14001:2004 Environmental Management Systems (EMS) certification enables our clients to demonstrate their commitment to the environment. The standard provides guidance on how to manage the environmental aspects of your business activities more effectively, while taking into consideration environmental protection, pollution prevention and socio-economic needs.
1.5 WIND ENERGY SERVICES

SGS has significant practical experience related to delivering services for power and wind energy projects. These services to lender and sponsors comprise feasibility studies, technical advice, technical and environmental due diligence and project monitoring to mention but a few.

For the particular needs of a project SGS is able to dedicate wind experts from its Renewable Energy Support Office (RESO) based in Hamburg which employs globally 120 experts.

SGS supports its clients at a local level with its global affiliates being able to mobilise rapidly additional experts in different locations, should the need arise.

SGS experts have the combined experience and detailed understanding of every aspect of the energy sector, with particular focus on renewable energy, including wind.

SGS offers solutions throughout the wind value chain to answer the critical questions.
2.1 TECHNICAL CONSULTANCY

As a market leader in inspection, verification and testing, SGS has a wide deep knowledge in several areas applicable to wind energy and a multi-disciplinary labour force located worldwide allowing SGS to tailor, and deliver efficiently all required services to meet client’s requirements from the development to the operation phases of a wind project.

SGS provides technical consultancy with its world class advisors and engineers in different areas of expertise on the technical and commercial parts of the projects.

CASE STUDY | LENDER’S ENGINEER

A development bank awarded SGS the contract to assume the Lender’s Engineer role for the construction of two wind farms in Romania.

The works started with a due diligence in February 2012 and will continue with the construction and operations monitoring of the wind farms until the end of warranty which is expected to be in 2015.

Services provided:
- Lender’s Engineer
- Technical Due Diligence
- Project Monitoring
- Operations Monitoring

2.2 FEASIBILITY STUDIES

To support the development of a wind farm project, feasibility studies are realised to allow lenders, sponsors, owners and its shareholders to assess accurately the economic feasibility of the project and to identify next steps for its implementation and risks associated with those steps.

The feasibility studies will assess the:
- Project site
- Project construction design, costs and scheduling
- Meteorological conditions
- Environmental and social impact
- Terrain and soil conditions
- Regulatory compliance
- Energy production
- Economics

CASE STUDY | FEASIBILITY STUDY & SITE ASSESSMENT

The Dakar Port Authority (DPA) has initiated a policy to reduce its energy costs. This policy is in the frame of the one initiated by the government of Senegal who launched a broad programme of energy efficiency, reducing electricity costs and promotion of renewable energy (including tax exemption as incentives).

The DPA wants to take this opportunity to explore the possibilities available to invest in clean energy and benefit funding through the Clean Development Mechanism. To this end, the Port wants SGS as consultant to conduct a study starting in 2011.

SGS will analyse the actual energy consumption and power supply scheme and study both renewable alternatives (wind and solar power supply).

Services provided:
- Consultancy services on Renewable Energy
- Energy efficiency audit of the actual assets and buildings
- Alternative renewable power (solar and wind) feasibility study
- Wind site assessment
- Solar site assessment
- Financial evaluation of the alternative renewable solutions
- CDM evaluation: Project Identification
- Technical feasibility study and procurement support for the final option
2.4 ENVIRONMENTAL AND SOCIAL IMPACT AND PERMITTING

SGS conducts environmental and social impact assessments to determine how your business activities are affecting your local community and on the wider environment. We check your compliance with regulations in place to protect the environment, verify your activities and equipment, permits and documentation.

For a detailed assessment of your environmental performance, you can benefit from our state-of-the-art laboratory and monitoring facilities. Our accredited, experienced technicians have the experience to offer innovative solutions to any challenges facing your organisation. We offer you guidance and assistance in complying with environmental regulations and in reducing your impact on the environment.

We can help you to prepare the necessary documentation for permit and license applications. We can also provide verification of your paperwork to show regulators your compliance and stakeholders your commitment to environmental protection.

Key elements included are
- Biodiversity and ecosystems (birds, bats, mammals, plankton, etc.)
- Hydrology and geological constraints
- Safety, visual and noise impact
- Shadow flicker
- Land use and tenure
- Social analysis
- Historic and cultural heritage
- Permits

Between 2008 and 2011 SGS conducted a sort of environmental and site studies for the Wallonia state in Belgium.

Services provided
- Environmental Pre-Feasibility Study
- GIS Mapping (location searching and decision support)
- Environmental Impact Assessment (birds, bats, landscape, territory setting)
2.5 ELECTRICAL DESIGN AND GRID INTERCONNECTION

SGS assesses the technical and practical considerations required for a wind power grid connection, reviews the electrical design of wind farm projects and identifies the least cost point of connection assessing the impact of the proposed power connection cable route. The assessments undertaken cover the complete range of system integration issues, including:

- Voltage profiles and quality
- Thermal and fault ratings
- Harmonic and transient performance
- Generation and transient performance

Stakeholders your commitment to environmental protection.

2.6 RISK MANAGEMENT

Through its Risk Management consultancy service, SGS offers complete Risk Management for wind farm projects. SGS risk specialists support the project management team in risk identification, risk qualification and risk handling, which entails both risk mitigation and capitalisation of opportunities. Once the necessary data has been collected, quantitative risk analyses and data simulations using specialised software are performed in an effort to predict the outcome of risk management and the results of risks, including pre- and post-risk handling, the potential impact of risk handling plans and the implications of residual risks.

The SGS Risk Management consultancy service seeks to assist project teams in their decision-making process in order to ultimately ensure that the project is executed with minimal risk impact. Specifically, SGS’s Risk Management process aims to achieve the following:

- Meet project objectives in terms of cost, schedule and performance
- Improve cost estimates by managing realistic and relevant contingencies
- Achieve identifiable schedule milestones and key performance indicators, including occupational health and safety and environmental targets
- Increase planning reliability
- Assure greater certainty in financial planning and project execution
- Manage complexity of interfaces at the project level

CASE STUDY | LENDER’S ENGINEER

Raiffeisen Bank Polska S.A. awarded SGS the contract to assume the Lender’s Engineer role for the construction of Krzecin Wind Farm in Poland. As Lender’s Engineer, SGS provides services from the development phase to the operation phase of the project.

Services provided:
- Lender’s Engineer
- Technical Due Diligence
- Project Monitoring
2.7 PROJECT EXECUTION

SGS’s Project Execution service brings together a variety of skills and expertise with the objective of aiding our clients to successfully realise the transport, installation and commissioning phases of their renewable energy projects. In an industry plagued by a lack of qualified professionals, SGS excels in bringing expert knowledge and experienced personnel to the project team to successfully and proficiently undertake such management throughout the realisation of a project.

SGS thereby ensures that our client’s projects progress from a green field site to a fully-commissioned wind farm in a safe and efficient manner while meeting cost, schedule and quality targets.

SGS delivers individual or package of services within all the activities such as procurement, engineering, environment, legal, permitting and financing for
- Tender Support
- Construction Monitoring
- Commissioning Survey

CASE STUDY | OWNER’S ENGINEER

RWE Innogy GmbH awarded in 2008 SGS the contract to assume the Owner’s Representative role during the construction in its first wind farm in Poland. Suwałki wind farm is located in the north-eastern part of Poland.

As Owner’s Engineer, SGS provides services from the development phase to the Commissioning phase of the project.

Services provided
- Tender Evaluation
- Owners Representation
- Construction Supervision
- Health, Safety, Security and Environment
- Consultancy & Special Services
- Project Monitoring

TENDER SUPPORT
- Bid Specification Preparation
- Tender Procedure
- Bidders Prequalification
- Bid Evaluation
- Contract Negotiation
- Project Planning
- Resource Planning
- Scheduling
- Contract Award

CONSTRUCTION
- Detail Engineering
- Budget Control
- Quality Plan Approval
- Design Management
- Site Management
- Schedule Control
- QA/QC
- Expediting, FAT
- HSE
- Reporting

FINAL ACCEPTANCE
- Commissioning Procedures Approval
- Trial Start-up Monitoring
- Witnessing Final Test Run
- Final Test Report Assessment
- As-built Document Review
- Handover

PROJECT TEAM MOBILISATION
- Team Mobilisation
- Expert Data Room (Document Review, Analysis of the defined Technical and Commercial Data)
- Site Reference Visit
- External Analytical Studies

SGS PROJECT EXECUTION SERVICES
2.8 OPERATIONS MONITORING

Minimising down-time is essential for ensuring the profitable operation of a wind farm. Damage must be recognised early so that appropriate measures can be promptly taken. Doing so can prevent consequential damages and allows maintenance-related shut-downs to be planned well ahead of time.

SGS will review and opine on all the maintenance and operations record documents and procedures during the operation of a wind farm and carry out end of warranty inspections to determine the current status of the wind turbine, detect and identify possible initiation of damage and to help avoid secondary damages.

To ensure that, SGS provides in-service inspections carried out in accordance with the standard guidelines in force which comprise the following activities:
- Inspection of the rotor and rotor blades
- Testing of the safety functions and devices
- Inspection of the machinery and electrical components
- Inspection of tower and foundation
- Vibration analysis of the drive train (main bearings, main gearbox and generator bearings)
- Analysis of the gear oil
- Inspection of the gearbox’s bearings by video endoscopy
- Inspection to the lightning protection system
- Inspection of the general condition of the wind turbine

CASE STUDY | END OF WARRANTY INSPECTIONS

John Deer awarded SGS to perform end of warranty inspections in two wind farms in the United States, Sunray in Texas and Brewster in Minnesota.

The services provided were:
- In-service Inspections
- Inspection of the rotor blades
- Test of the safety functions and devices
- Inspection of the machinery and electrical components
- Inspection of tower and foundation
- Inspection of the general condition of the wind turbine
- Vibration analysis of the drive train (main bearings, main gearbox and generator bearings)
- Oil analysis of the gear oil
- Video-endoscope inspection of the gearboxes
- Lightning protection
3 OFFSHORE WIND ENERGY

3.1 TECHNICAL CONSULTANCY

The offshore environment is a demanding one for wind farm projects, increasing the value of technical and commercial consultancy services in every stage and area of the project.

SGS technical knowledge in a variety of areas combined with the understanding of key financial and commercial concerns brings experience dealing with regulatory, permitting, environment, construction and operation issues which are necessary to achieve connection, operation and revenue for a wind farm.

3.2 FEASIBILITY STUDIES

To support the development of a wind farm project, feasibility studies are realised to allow lenders, sponsors, owners and its shareholders to assess accurately the economic feasibility of the project and to identify next steps for its implementation and risks associated with those steps.

In particular, for offshore projects, SGS will also look at the marine processes assessing all marine impacts on shipping activities and fisheries as well conduct the necessary marine surveys required for projects viability.

The feasibility studies will assess the
- Project site
- Meteorological conditions
- Environmental and social impact
- Seabed conditions
- Regulatory compliance
- Project construction design, costs and scheduling
- Energy production
- Marine surveys (warranty, hydrographical, geotechnical, etc.)
- Marine impact assessment

CASE STUDY | TECHNICAL DUE DILIGENCE

The Maguerite Fund awarded in 2011 SGS the contract to perform a technical due diligence to the Butendiek Offshore Wind Farm in Germany.

SGS conducted a full documents review to permits, contracts, wind resource measurements, energy yield calculations, wind turbine design, electrical design, substation design, foundations design, Capex, Opex, O&M procedures, project scheduling, Environmental aspects, etc.

Services provided
- Technical Due Diligence

CASE STUDY | QHSSE MANAGEMENT

The Belwind Wind Farm is located on Bligh Bank, 46 km (29 mi) from the Belgian port of Zeebrugge. Bligh Bank is the first stage of what is planned to be a 330 MW project.

SGS was awarded a contract to provide Quality, Health, Safety, Security and Environmental (QHSSE) services that included inspections and marine warranty surveys. The key objective of QHSSE Management was to optimise the revenue generated by any wind farm project over its life span, by assuring high quality standards and safe project execution during the development and realisation phase.

Services provided
- QHSSE
- Quality control for all works
- Schedule control
- Commissioning inspection
- Marine Warranty surveys
3.3 SITE & WIND RESOURCE ASSESSMENT

For offshore projects an accurate estimate of the projects future energy yield is required to support investment and financing decisions.

With the site assessment and wind resource services offered by SGS, investors, owners and developers will be sure of the site characteristics, the suitability of the chosen wind turbines including optimisation of technical and financial parameters. Defined in SGS’ approach for onshore projects the assessment covers

- Site and wind data analysis
- Wind flow modelling
- Energy yield calculations
- Uncertainty analysis
- Wind turbine assessment
- Layout optimisation

3.4 ENVIRONMENT AND SOCIAL IMPACT, AND PERMITTING

SGS conducts environmental and social impact assessments to determine how your business activities are affecting your local community and the wider environment. We also check your compliance with regulations in place to protect the environment, and verify your activities, equipment, permits and documentation.

We can help you to prepare the necessary documentation for permit and license applications. We can also provide verification of your paperwork to show regulators your compliance and stakeholders your commitment to environmental protection.

3.5 ELECTRICAL DESIGN AND GRID INTERCONNECTION

SGS provides electrical design and grid system integration analyses on a technical and economic point of view including reviewing and supporting the client on all the on-offshore electrical systems aspects, interconnection agreements and handling issues like

- Downstream reinforcement
- Electrical protection
- System control
- Interfaces and technical standards
- Harmonics
- Payment and other commercial arrangements

CASE STUDY | TECHNICAL DUE DILIGENCE

Q7 is a 120 MW offshore wind farm located furthest offshore and placed in the deepest water in Belgium started its operation beginning of 2008.

Van Oord assigned to SGS the following services

- Technical Due Diligence
- Project Supervision
- Design Review
- Document Review
- Quality Assurance/Quality Control
- Coordination of weld inspections of secondary steel in Poland
- Coordination of paint inspections in Poland and Denmark
- Supply of QC inspector to Denmark during assembly of High Voltage Off-Shore Station
- Coordination for review of Manufacturing Data Dossier of High Voltage Station
- Review of NDT test results for High Voltage Station
3.6 RISK MANAGEMENT

As in any project, including offshore renewable energy projects, SGS Risk Management consultancy service seeks to assist project teams in their decision-making process in order to ultimately ensure that the project is executed with minimal risk impact supporting the project management team in risk identification, risk qualification and risk handling, which entails both risk mitigation and capitalisation of opportunities.

This includes
- Meet project objectives in terms of cost, schedule and performance
- Improve cost estimates by managing realistic and relevant contingencies
- Achieve identifiable schedule milestones and key performance indicators, including occupational health and safety and environmental targets
- Increase planning reliability
- Assure greater certainty in financial planning and project execution manage complexity of interfaces at the project level
- Energy yield estimates based on resource assessments

3.7 QHSE

SGS UK QHSE has a strong CDM* support service to clients.

Within the wind energy sector, particularly the offshore environment, there has been an increased level of activity and subsequent rise with serious injuries and fatalities.

The early appointment of key HSE managers is essential to these projects.

Clients now have legal duties to appoint a CDM - Coordinator (CDM - C) at the development stage of the project to carry out the CDM-C prescribed duties and to support the client by managing the other duty holders such as the designer and the principal contractor. The CDM-C will execute the following deliverables for the client:
- Notification to the Health and Safety Executive F10
- Supervise and train the designers in the production of the Design Risk Register
- Review Intention to Tender (ITT) packages
- Ensure that all reports regarding Pre-Construction Information (PCI) are complete
- Review Final PCI for inclusion in the ITT packages to Principal Contractors
- Review Principal Contractors for competency
- Review the Construction Phase Plan prior to construction
- Carry out CDM training for Client project team
- Update F10 to HSE
- Formulate the Health and Safety File (HSF) for the client requirement
- Ensure that the project documentation system collects “as built” information for the HSF
- Review Decommissioning Plan for inclusion in the HSF
- Interface with the Operational and Maintenance function during installation and commissioning
- Ensure that all certification and compliance documents are with the client prior to handover of the assets


CASE STUDY | RISK MANAGEMENT

The Lincs Wind Farm, sponsored by Centrica Renewable Energy and two other joint-venture partners, is a proposed 270 MW wind farm being built 8 kilometres (5.0 mi) off Skegness on the east coast of England. The project, due to be operational in 2012 and is construction started in March 2011.

SGS is providing Risk Management services including the following:
- Risk Management procedures and guidelines
- Quantitative risk analysis
- Technical risk management reports for specific phases
- HSE management
- Loss of production risk analysis
- CAPEX risk analysis
- Contingency forecast

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- Technical risk management reports for specific phases
- HSE management
- Loss of production risk analysis
- CAPEX risk analysis
- Contingency forecast
3.8 APPLIED CONSTRUCTION, DESIGN AND MANAGEMENT REGULATIONS

APPLIED CDM-C SOLUTIONS FOR SGS CLIENTS

The level of activity in the renewables sector has taken a sudden increase since the round-three licences have been issued. That means that clients and developers must meet the challenges of working on and offshore and, in turn, they are encountering complex and onerous legislation. The situation has been made more safety critical with a sharp increase in fatalities this year within the renewables sector. As a result of the Gulf of Mexico incident with BP and the loss of life, damage to the environment and the impact on BP finances, clients are now engaging SGS solutions to complement their business risk model and making effective reductions in their risk regimes.

THE SGS APPLIED SOLUTION FOR LICENCES

Usually, when the client applies for a licence from the Crown Estates (CE) and / or Local Authorities (LA), they will be presented with a complicated set of pro-formas that have to be submitted to CE. When populated, these forms need to illustrate the client’s specific plans and arrangements for competency with the project and their ability to satisfy the CE / LA that they will be achieved during construction. As well as taking into consideration the commercial aspects of a project or business, the plans must also show how processes minimise health and safety risks.

Most clients and developers will also be required to satisfy lending organisations that they will not flout health and safety legislation – as was the case with the World Banking Organisation who learned hard lessons from the Bhopal incident. Some developers have had to review their arrangements completely regarding the preparation of response documents because the CE and LA require that submissions are of a high standard. The client must also set the philosophy standard on the use of “best practice”.

THE SGS APPLIED SOLUTION FOR CDM REGULATIONS

Once the client has the licences, they need to engage with the project. That means that they will encounter the CDM process. Since the CDM regulations came into force in 2007, clients now have strict duties that they have to fulfil to avoid deviating from the legislation. The CDM regulations provide a convenient framework that holds every aspect of the project together regarding health and safety. It fits in well with commercial arrangements and also the CE / LA requirements; indeed the CE will ask for evidence to prove the arrangements are in place for compliance with CDM Legislation.

That means the client has to appoint a CDM-Coordinator (CDM-C) and ensure that the other duty holders are competent to carry out their work in a safe manner. Usually the CDM-C assists with competency checks.

The duty holders under the regulations are as follows
- Client
- Designer
- Principal Contractor (PC)
- CDM Coordinator (CDM-C)
- Contractor

Clients usually appoint a principal contractor and by contractual arrangement dispense with the significant risks associated with the project, as these become the responsibility of the PC. While this does not absolve the client of their own duties, it does mitigate construction liabilities somewhat.

The most significant issue for all duty holders is competency. All duty holders must check for competency and, in a real, applied situation this must be evidence based.

Because of this, clients need to prepare very detailed control documentation that addresses all existing and potential issues at the contract placement stage. The client must also ensure that adequate resources are available to complete the project and that they have allowed enough time for mobilisation.

The client must then find a way of interacting with the PC so the performance within the project is achieved and the risks are minimised and mitigated. The CDM-C usually engages with the designers to see that proper Design Risk Analysis (DRA) is carried out at the Front End Engineering Design (FEED) stage.
When complete, the DRA is submitted along with the Pre-Construction Information (PCI) so that the PC and contractors have a clear understanding of the safety aspects of design. In an applied situation the designer very often cannot completely design out significant risks. Therefore, they have to refer the risks to Operations Management for a Hazard and Operability (HAZOP) study in order to prepare safe systems of work.

When construction works start there are three aspects of the regulations that the client must consider:

1. **Documentation control**
   - Most clients now have an extranet facility or FTP site, such as 4 Projects or Think Projects (European). The CDM-C would normally have an input into the container sub-file structure.

2. **Change management**
   - The client should seek to minimise this element by ensuring that designs are highly competent and detailed with elements that are generally not experimental but tried, tested and approved. If the design needs to be altered and this involves offshore works, the cost and risks regime can be a serious consideration. Designers are encouraged at the FEED stage to use Requests For Information (RFI) and Technical Queries (TQs) to minimise any lack of clarity and achieve a good and sound design that satisfies the client’s specification.

3. **Collection of “as built” information**
   - This information is vital to the client so that proper Health and Safety Files (HSF) can be completed as required by CDM regulations. Usually, in an applied situation, the final documents are uploaded onto the extranet and collected in the CDM container. It is worth emphasising this point, because very often the “as built” and O/Ms are difficult to pursue when the PC or contractors are complete and move on. Clients must have these documents in order to transfer the assets.

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**THE SGS APPLIED SOLUTION TO PROTOTYPE TESTING AND CONTRACT COMPLEXITY**

In applied CDM work there are a number of issues that can cause problems for the duty holders. These issues are usually dealt with at the early stages of the project in the form of a CDM strategy document.

These issues include the following:

- Non-disclosure agreements (NDAs)
- Deployment of prototypes
- Complex duty holders arrangements
- Consortiums
- Sale of Assets
NDAS

On prototype projects with wind, wave and tidal devices, it may be that the client will want to deploy the device at the EMEC (Orkney) site or NaREC site (Blyth) for research and development purposes. In both cases, strict NDAs will be put in place. The difficulty with this is for the purposes of CDM at the design stage, is that designers will need to provide drawings and specifications that clearly show safety in design and mitigations that will reduce risk. This will require a detailed inspection by various individuals, including the CDM-C. Some clients are very protective about designs and it can cause a conflict of interest because all significant risks must be detailed for the manufacture, construction, operation and maintenance of the device.

DEPLOYMENT OF PROTOTYPES

Usually this will mean carrying out trials at sea or at the NaREC test centre in Blyth or other marine research establishments or universities. Either complete devices or component parts or sub-assemblies can be deployed. Where the criteria for a notifiable project are satisfied the client must appoint a CDM-C and have the project registered on the Health and Safety Executive (HSE) F10 form. This can be done interactively on an e-form online.

This experimental stage requires particular scrutiny on procedures, risk assessments and method statements (RAMS). The tests can be performed to simulate destruction or catastrophic failure and to identify extra precautions that may be required.

COMPLEX DUTY HOLDER ARRANGEMENTS

It is not unusual for the client to also be the designer and the PC. This can be accommodated by the HSE requirements and must be registered as such on the F10 form. However, if the client wants to deploy two or more PCs then strict criteria must be satisfied. These deployments can only be when there is a multi-site situation or there is no dependency on one project from the other. Part of the CDM strategy document would be to detail the various duty holder arrangements and ensure that those details are solidified in the contract arrangements.

CONSORTIUMS

With some projects there are consortium arrangements. However, the HSE is clear that an arrangement should be made within the consortiums that only one member will take on the role as client to ensure effective and clear management of the client duties. Other members of the consortium may be providing design or construction facilities. If this is the case, then they would be registered as duty holders in that capacity.

SALE OF ASSETS

Sale of the assets may have CDM implications. For example, it may be, in the case of an array, that only part of the array is sold to a third party. That means individual health and safety files will be required for the part asset. Included in this would be clear instruction for the operation and maintenance of the part asset and that a coordination and cooperation management arrangement is in place for the operation of the site in a safe manner. In this situation the CDM-C would be deployed to manage the HSF arrangements.

THE SGS APPLIED SOLUTION TO MAKING CLIENTS LEGAL DUTIES COMPLIANT

‘Making legal duties compliant’ refers to the key legislative framework within which the project will be developed and operated. The list on the next page – which is not exhaustive – shows where SGS will put in place the procedures to make the client legal duty compliant.
| **HEALTH & SAFETY AT WORK ETC. ACT 1974** | Check all operations are compliant. Toolbox talks and induction carried out at site and recorded. | Audit |
| **MANAGEMENT OF HEALTH & SAFETY AT WORK REGULATIONS 1999** | Check all operations are compliant. HSE Plan in place by PC and has been audited and signed off and available on site. | Audit all activities as they come on plan pre-construction and sign off prior to commencement of works. |
| **THE ELECTRICITY AT WORK REGULATIONS** | Current site supply to be identified. | Audit and Inspection by the PC HSE manager |
| **WORKPLACE (HEALTH, SAFETY & WELFARE) REGULATIONS 1992** | Welfare facility on site to be inspected by and fit-for-purpose checked | Regular Audit and inspection |
| **REPORTING OF INJURIES, DISEASE AND DANGEROUS OCCURRENCES (RIDDOR) REGULATIONS 1995** | Reporting system to be in place and compliant, if required. In addition, near hit cards available to all operatives. | To be regularly monitored and details report back to H&S Committee meetings. Also daily meetings and monthly reports. |
| **PROVISION & USE OF WORK EQUIPMENT (PUWER) REGULATIONS 1998** | All contractors to review monitor and test equipment and provide compliance certificates. | Subject to audit Company requirement to identify all work related owned equipment. On-site equipment to be reviewed and inspected. |
| **DIVING AT WORK REGULATIONS 1997** | Diving Plans must be in place prior to all diving activities. Emphasis on supervision, and independent assessment. | Audit and Review |
| **MCA CODE FOR WORK VESSELS** | All vessels must be compliant within the code for the activities for which they may be deployed. | Audit and Review |
| **CORPORATE MANSlaughter ACT 2008; CORP. HOMICIDE ACT 2007** | Companies need to take obligations regarding H&S law seriously. Managements systems should be kept under review. | Audit and Review Management systems |
| **CDM REGULATIONS 2007** | Register project on F10, duty holders clearly defined and CDM strategy in place. | Appoint CDM-C |
3.9 PROJECT CERTIFICATION

Project Certification is the ultimate process to assure the required Quality of the Offshore Renewable Energy Project throughout the project life cycle. Based on the German Federal Maritime and Hydrographical Agency (Bundesamt für Seeschifffahrt und Hydrographie – BSH) standards ref. [4] and ref. [5], this procedure verifies that the project complies with the project specification and other requirements defined by the proponent monitoring the project development, construction and operation phases.

The Project Certification process is divided in phases and covers the wind turbine, the support structure and the offshore substation, cables and J-tube.

### CASE STUDY | PROJECT CERTIFICATION

Global Tech I is one of the first commercial offshore wind farms in the German North Sea. With a total of 400 MW of power installation Global Tech I was awarded as the “Wind Deal of the Year 2011” by the renowned magazine Project Finance International.

SGS was assigned to undertake the project certification under the BSH standards from Phase II up to phase V. The works started in 2009 and still ongoing.
4 THE TEAM

4.1 KEY WIND TEAM MEMBERS

SGS is able to dedicate wind experts from its Power and Utilities Team based around the world which employs globally 120 experts. SGS supports its clients at a local level with its global affiliates being able to mobilise rapidly additional experts in different locations, should the need arise.

SGS experts have the combined experience and detailed understanding of every aspect of the wind sector.

<table>
<thead>
<tr>
<th>Name</th>
<th>Experience/Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROBERT SPEHT</td>
<td>Over 15 years of experience in the renewable energy sector, specialising in wind power</td>
</tr>
<tr>
<td></td>
<td>Lender's engineer due diligence for onshore and offshore wind projects</td>
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<tr>
<td></td>
<td>Analysis of renewable energy technologies</td>
</tr>
<tr>
<td></td>
<td>Advice to clients on risks and rewards associated with renewable energy sources and potential income streams</td>
</tr>
<tr>
<td></td>
<td>MSc Renewable Energy Systems Technology, University of Loughborough, 1998; BEng Mechanical Engineering with German, University of Wales, Swansea, 1997</td>
</tr>
<tr>
<td>JULIO LARA MARTINEZ</td>
<td>Industrial Engineer/Project Director with 23 years experience</td>
</tr>
<tr>
<td></td>
<td>Technical Due Diligence to lenders and equity investors, technical assistance to developers and sponsors</td>
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<tr>
<td></td>
<td>Project management and management of teams for consultancy assignments, feasibility studies, design studies, cost control, planning control &amp; quality supervision</td>
</tr>
<tr>
<td></td>
<td>Industrial Engineer (Mechanical specialty), Superior Technical School of Industrial Engineering Polytechnic University of Madrid, Master in Construction Companies &amp; Real Estate</td>
</tr>
<tr>
<td>JOSE ANTONIO IRAUNDEGUI ECHEVERRIA</td>
<td>Industrial Project Manager with over 30 years experience</td>
</tr>
<tr>
<td></td>
<td>Skilled in full management of internation industrial projects</td>
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<td></td>
<td>Technical assistance and quality consultancy to clients</td>
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<td></td>
<td>Fabrication inspection and supplier evaluation (quality audits)</td>
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<tr>
<td></td>
<td>Master in Environmental Engineering (EDI), 1987, Master in Total Quality Management (TQM) (Madrid Polytechnic University), 1989, Six Sigma Black Belt, 2003</td>
</tr>
<tr>
<td>NICOLAE DAMIAN</td>
<td>Energy Power Engineer</td>
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<td></td>
<td>Project Manager/Supervisor on power engineering projects</td>
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<td></td>
<td>Experience in various areas of electrical installation, execution and supervision</td>
</tr>
<tr>
<td>SANTIAGO MAZZUCHELLI</td>
<td>18 years professional experience</td>
</tr>
<tr>
<td></td>
<td>Financial due diligence to lenders and equity investors, financial assistance to developers and sponsors</td>
</tr>
<tr>
<td></td>
<td>Tender Documentation, bid preparation and negotiation</td>
</tr>
<tr>
<td></td>
<td>Project management and management of teams in Renewables, utilities, transport, real estate &amp; telecoms sectors.</td>
</tr>
<tr>
<td>RICHARD LORD</td>
<td>Over 20 years experience in the renewable (Wind) industry</td>
</tr>
<tr>
<td></td>
<td>Site selection, land owner options &amp; leases and site permitting for wind farm developers</td>
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<tr>
<td></td>
<td>Project development of wind farms</td>
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<tr>
<td></td>
<td>Wind farm management</td>
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<tr>
<td></td>
<td>BSc (Hons) Mechanical Engineering, Nottingham University 1966, MBA, Cranfield School of Management 1980</td>
</tr>
<tr>
<td>GABRIEL GHEORGHIU</td>
<td>Architect with over 25 years experience</td>
</tr>
<tr>
<td></td>
<td>Consultancy &amp; site supervision of projects</td>
</tr>
<tr>
<td></td>
<td>Technical evaluation and due diligence of projects</td>
</tr>
<tr>
<td></td>
<td>Technical due diligence and inspection of wind farm projects</td>
</tr>
<tr>
<td></td>
<td>Architect Bachelor Degree, Bucharest Institute of Architecture</td>
</tr>
<tr>
<td>THOMAS MEYER</td>
<td>Over 16 years of experience in project and programme management. Global Operations Manager for the Project Finance Services of SGS</td>
</tr>
<tr>
<td></td>
<td>Project finance: project screening and assessment, economic and financial modeling, technical and economic due diligence. Technical assistance to governments, utilities and developers, Policy dialogue</td>
</tr>
<tr>
<td></td>
<td>Project management: management of teams for consultancy assignments, feasibility studies, design studies, work supervision</td>
</tr>
<tr>
<td></td>
<td>Procurement of goods, works and services: tender documentation preparation, bid analysis and contract negotiation</td>
</tr>
<tr>
<td></td>
<td>Sectors: power, energy, water &amp; wastewater: utilities</td>
</tr>
<tr>
<td></td>
<td>Graduate Civil Engineer, Ecole Polytechnique Federale de Lausanne, Switzerland</td>
</tr>
<tr>
<td></td>
<td>Master of Science (MSc) in Civil and Environmental Engineering (Project Finance and Geotechnical Engineering), Massachusetts Institute of Technology (MIT), USA</td>
</tr>
<tr>
<td>AXEL SCHWEIGHARDT</td>
<td>Over 11 years of experience in wind farms design, wind turbines technology; procurement and O&amp;M. Technical due diligence and project management. Quality control of services including maintenance and repair. Evaluation of investment data. End of warranty survey, damage and root cause analysis, performance and assistance in vibration measurements of mechanical and electrical components, wind turbine inspections and final acceptance</td>
</tr>
<tr>
<td></td>
<td>Degree at the Hamburg University of Applied Science (FH) Hamburg Environmental Engineering</td>
</tr>
<tr>
<td>OLAF ROBENEK</td>
<td>Senior Wind Turbine Inspector. Team leader of SGS Germany for In-Service Inspections On-Offshore</td>
</tr>
<tr>
<td></td>
<td>Technical due diligence, Inspections on-site, End-of-warranty inspections, condition monitoring, blades, tower and Machinery inspections (mechanical and electrical), Evaluation of data and measurements as well as reporting, rope access technique (IRATA level 3); video-endoscope, offline vibration measurement of drive train and thermography of electrical components</td>
</tr>
<tr>
<td></td>
<td>Mechanical Engineering at the University of Applied Science Lubeck, Germany</td>
</tr>
<tr>
<td>STUART HERBERT</td>
<td>Manager UK Renewable Energy – SGS UK</td>
</tr>
<tr>
<td></td>
<td>A former Royal Naval Officer, Rank Lieutenant RN with an exceptional depth and breadth of technical expertise spanning on-offshore wind, marine and solar renewable technology</td>
</tr>
<tr>
<td></td>
<td>Business development, due diligence, project management, technical evaluation and research to assess technical feasibility, practicality of development, commercial viability/profitability and market need</td>
</tr>
<tr>
<td></td>
<td>Edinburgh University studied MSc Advanced Processing</td>
</tr>
<tr>
<td></td>
<td>Post Graduate Course – Aerodynamics/Transmission and drivetrain (Electrical Generation)</td>
</tr>
<tr>
<td></td>
<td>B.Eng (Hons) – Electrical, Mechanical Engineering and Aerodynamics</td>
</tr>
<tr>
<td>LEONARDO FURTADO</td>
<td>Risk Analysis Expert</td>
</tr>
<tr>
<td></td>
<td>Project management and project risk management with experience in offshore wind farm projects and a very good understanding of Project Risks, Critical Path, Float, “S” Progress Curves, Project Cash Flow, Schedules, WIP (Work in Progress), KPIs for Projects and Business Units, Facilitated Risk Sessions, Currency Risk Exposure and Project Risk Mitigation Plans being part of his day-by-day vocabulary, Optimisation, Budget &amp; Forecasting, Financial Valuations, Consolidation of Financial &amp; Risks Data</td>
</tr>
<tr>
<td></td>
<td>BA Business Administration and Finance,FGV Sao Paulo, Brazil</td>
</tr>
<tr>
<td></td>
<td>BSc – Civil Engineering, UPG, Goiania, Brazil</td>
</tr>
<tr>
<td></td>
<td>MSc Decision Sciences, London School of Economics (LSE)</td>
</tr>
</tbody>
</table>
ALBERT LAW
- Risk Analysis Expert
- Risk analysis and management, Project management, Verification of component failure data, Probabilistic Safety Analysis (and RiskSpectrum PSA software), Fault Tree and Event Tree Development/Analysis, Reliability Data Derivation, Bayesian Analysis (and RDAT Plus software)
- MEng Aeronautical Engineering – First Class Honors. Awarded the Aeronautics, C.F. Rae Griffin 'Outstanding MEng Project' Prize Award

DANCHO BOZHILOV
- Senior Electrical Engineer
- Technical due diligence, project finance structure, working with the finance community, private equity, banks and other institution, dealing with energy legislation, regulation. Bank subsidy and financial initiative schemes
- Support to electrical design activities including design calculations for offshore wind farms, cabling design, power quality assessments and Grid code assessments
- Specification of major electrical components for offshore wind farms, including Transformers, reactive compensation equipment, and analysis of the turbine electrical performance
- Preparation of technical specifications and design verifications for electrical equipment, technical bid evaluations, preparation of installation Method Statements in conjunction with equipment and client specifications and health and safety requirements, for the site works
- Wind turbine inspections, O&M management, calculation of energy losses within the distribution system and deep knowledge of Software and Data, SCADA systems, subsea cable specification and installation methodology and connection to the National Electrical Grid

NICULAE ANDREI
- Over 26 years of experience in Construction management, Quality and production management. Strong experience in product certification and local regulations. SGS Project Manager/Supervisor for construction including wind farms. Technical Due Diligence, Project Management, regulatory compliance and procurement
- Bucharest Polytechnic Institute, Chemistry – Silicate compounds/Construction Project Management

JULIA SCHAEFER
- Technical due diligence, Project management. Specialist in renewable energy projects with a good understanding of renewable energy technologies and offshore projects, including with an understanding of energy economics and national energy policies
- Experience in wind farm projects for lenders, investors, governmental organizations and project developers in wind and solar due diligences, construction monitoring assignments and technical advice services with a focus in eastern European countries
- Diploma as Industrial engineer (with specialisation on energy and environmental management), University of Flensburg, Germany

CHRISTIAN NÜBOLD
- Head of Department, Technical Office Wind Energy (TDW)
- Experience in project management, project certification for offshore wind farms and procurement
- Civil/Structural Engineering at the Technical University of Braunschweig (TUBS) with specialisation in Hydromechanics and Coastal Engineering, Hydraulics Engineering, Soil Mechanics/Foundation Engineering

ANDREW BEATTIE
- Over 10 years of experience within the wind energy business
- Site Assessment Expert with project management skills and experience in on/offshore projects
- Technical due diligence, energy yield calculation, analysis of power curve performance, site suitability, site design, layout optimisation, feasibility studies, GIS, O&M
- Master of Science (MSc) in Renewable Energy Systems Technology from Loughborough University, UK
- Bachelor of Science in Environmental Science and Policy from Liverpool John Moores University, UK

JIM GREEN
- Over 41 years of experience in Health and Safety. Over 16 years experience of consultancy
- Global EHSE Manager with a successful track record of Health & Safety Management
- High qualified special in Quality, Health, Safety and Environment (QSHE) and in Construction, Design and Management (CDM) for mechanical , civil and electrical works
- Extensive experience in working renewable projects including onshore and offshore wind projects as advisor, CDM coordinator, H&S manager
- MBA University of Glasgow, UK
- DMS Glasgow Collect of Technology, UK

STEVEN BRUCE
- Over 25 years of experience in service and inspections including within wind energy
- Technical due diligence, In-service inspections, end-of-warranty inspections
- Technical due diligence, In-service inspections, end-of-warranty inspections
- Wind turbine inspector with extensive experience working on several wind turbine types including, fault finding, repair, reporting and liaison with relevant agencies to ensure the safe and profitable running of sites, monitoring performance of sites, tracking of downtime and maintenance issues, brake inspection, overhaul and repair, Type 2 and 3 services, fault list work, generator inspection and service, lift inspection, gearbox inspection, all mechanical, hydraulic and hub works, mantray and blades inspections

MICHAEL MCGUENIE
- Over 16 years of experience in service and inspections for the industry
- Technical due diligence, In-service inspections, end-of-warranty inspections
- Wind turbine inspector experienced in statutory inspection of wind turbine lifting equipment/ hoists/ safety equipment and authorized to carry out inspections in accordance with LOLER and PUWER regulations. Fully certified to conduct wind turbine inspections to all European standards including rope access technique to RIATA, Endoscopic inspections, Blade inspections (rope access or MEWP), Structural Inspection, Thermography, LOLER inspections
- ONC Electronic Engineering, UK

MARIUSZ PRACOWNIK
- Over 7 years of experience in construction including within wind energy
- Project Management, technical due diligence, EPC works
- Head of the wind energy section at SGS Poland. Experienced Project Manager working in wind farms construction, acting as owner’s engineer, providing tender support for developers and working in technical due diligences for lenders
- Master of Science Geodesy and Real Estate Valuation, University of Warmia and Mazury in Olsztyn, Poland
- Postgraduate specialization in wind farms, The technical Science University of Bydgoszcz, Poland

MAREK KIERSNOWSKI
- Over 35 years of experience providing inspections in the industry including within wind energy
- High qualified inspector specialized in NDT and Quality Assurance and Control with extensive experience in wind farm projects including construction supervision, expediting, QA/QC inspections, acceptance tests, welding and mechanical works supervision and technical due diligence
- MS Mechanical Engineering, Warsaw University of Technology, Warsaw, Poland

MICHAL ZYGADLO
- Experienced mechanical engineer working within the wind energy
- Project management, site management, construction supervision, commissioning survey, inspections, and quality control
- MEng Studies in quality engineering and road traffic engineering. Technical University of Szczenie, Poland

PAULO MENDES
- Over 10 years of experience within the aerospace and wind energy sectors
- Global Support Manager for the renewable energy business
- Project management, technical due diligence, procurement management
- MEng Aeronautical Engineering, Universidade da Beira Interior, Portugal
- Post graduation, Renewable Energy Physics, Universidade de Aveiro, Portugal

THOMAS LOUIS
- Over 25 years of experience in the power generation industry and the financial services sector of which 15 years in renewables, with a focus on grid-connected solar power, both PV and CSP
- Advised investors, lenders, insurers, manufacturers, utilities and professional services firms on the technical, commercial, legal and regulatory aspects of renewable power generation.
- Diploma (1988) and Doctorate in physics (1990) on matters of renewable power generation at Fraunhofer Institute for Solar Energy Systems, Freiburg (b. Germany)
- Graduate education (BBA, 1995) and executive development from IMD Lausanne (2003)
- Certified European Excellence Assessor (2005) and Lean Six Sigma Black Belt (1994)
## A SELECTED WIND PROJECTS

<table>
<thead>
<tr>
<th>CLIENT PROJECT</th>
<th>POWER (MW)</th>
<th>LOCATION</th>
<th>YEAR</th>
<th>SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEVELOPMENT BANK Two Onshore Wind Farms</td>
<td>70</td>
<td>Romania</td>
<td>2012–2014</td>
<td>Lender’s engineer; Technical due diligence, Construction monitoring, Operations monitoring</td>
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<tr>
<td>RAFFEISEN BANK POLSKA S.A. Kozceh Onshore Wind Farm</td>
<td>14</td>
<td>Poland</td>
<td>2008</td>
<td>Lender’s engineer, Technical due diligence, Construction supervision</td>
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<tr>
<td>CENTRICA RENEWABLE ENERGY Lincs Offshore Wind Farm</td>
<td>270</td>
<td>UK</td>
<td>2010–2017</td>
<td>Risk management (ongoing); HSE Management</td>
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<tr>
<td>WEST LANDES BANK Onshore Wind Farm</td>
<td>252</td>
<td>Germany</td>
<td>2003–2004</td>
<td>Lender’s engineer, Technical due diligence</td>
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<tr>
<td>INVEKREDIT Onshore Wind Farms</td>
<td>320</td>
<td>Germany</td>
<td>2011</td>
<td>Technical due diligence</td>
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<tr>
<td>MAGUERITE FUND Buntehde Offshore Wind Farm</td>
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<tr>
<td>ING GROUP Waarpolder Wind Farm (19 wind turbines)</td>
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<tr>
<td>CEZ ROMANIA Onshore Wind Farm</td>
<td>252</td>
<td>Romania</td>
<td>2009–2010</td>
<td>Technical due diligence and inspections</td>
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<tr>
<td>PEP – POLISH ENERGY PARTNERS Puck, Suwalki, Tytowo, Modlihowe and Lukaszow Onshore Wind Farms</td>
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<tr>
<td>OCH ZIFF MANAGEMENT LTD</td>
<td>5</td>
<td>Germany</td>
<td>2007</td>
<td>BMW wind turbines technical due diligence, assessment of reliability, maintenance, consequence analysis, cost benefit analyses</td>
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<tr>
<td>VAN OORD BV Q7 offshore windfarm</td>
<td>120</td>
<td>Netherlands</td>
<td>2006–2007</td>
<td>Technical due diligence, Design assessment, Construction supervision, Coating and corrosion inspection, NDT inspections</td>
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<tr>
<td>BELWIND OFFSHORE</td>
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<td>EKO ENERGY SP. ZOO. Kobylinica Offshore Wind Farm</td>
<td>41.4</td>
<td>Poland</td>
<td>2010–2011</td>
<td>Owner’s engineer, construction supervision</td>
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<tr>
<td>VATENFALL Kriegers Flak Offshore Wind Farm</td>
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<td>WE ENERGIES Blue Sky Green Field Offshore Wind Farm</td>
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<tr>
<td>PLAMEBECK EMIRATES Gode Wind II Offshore Wind Farm</td>
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<td>ENBW ENERGIE 4 Offshore Wind Farms</td>
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<td>PROKON NORD ENERGIE Cote d’Albatre &amp; MEG Offshore Wind Farms</td>
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<td>ACCIONA WIND POWER Tatanka Offshore Wind Farm</td>
<td>180</td>
<td>USA</td>
<td>2007</td>
<td>Technical due diligence, Owners representation, Final inspection, Commissioning and startup survey</td>
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<tr>
<td>VENDATA GROUP Samana Offshore Wind Farm</td>
<td>38.4</td>
<td>India</td>
<td>2007</td>
<td>Construction supervision</td>
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<tr>
<td>ENOVA Delta II Offshore Wind Farm</td>
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<tr>
<td>LCO NATURE C/O EVELOP GERMANY Albatros &amp; OWP West Offshore Wind Farms</td>
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<tr>
<td>RWE Rhyl Flat and other Offshore Wind Farms</td>
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<tr>
<td>ENEL Offshore Wind Farms</td>
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<tr>
<td>TRIANEL Borkum West II</td>
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</tr>
<tr>
<td>CLIENT PROJECT</td>
<td>POWER (MW)</td>
<td>LOCATION</td>
<td>YEAR</td>
<td>SERVICES</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
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<td>---------------------------------</td>
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<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>TAI - POWER</td>
<td>-----</td>
<td>Taiwan Vietnam Denmark</td>
<td>2005-2007</td>
<td>Construction supervision, Final acceptance inspection, Manufacturing inspections (visual and NDT)</td>
</tr>
<tr>
<td>NORTHERN ENERGY</td>
<td>-----</td>
<td>Germany</td>
<td>2009</td>
<td>Project certification</td>
</tr>
<tr>
<td>GLOBAL TECH I OFFSHORE WIND GMB</td>
<td>-----</td>
<td>Germany</td>
<td>2009</td>
<td>Project certification</td>
</tr>
<tr>
<td>ELSAM</td>
<td>-----</td>
<td>Belgium</td>
<td>2004-2006</td>
<td>Failure analysis, Coating inspection (monopile, transition pieces, towers, boat landings and platform)</td>
</tr>
<tr>
<td>GRUPO ENERSIS</td>
<td>-----</td>
<td>Portugal</td>
<td>2004</td>
<td>Construction supervision</td>
</tr>
<tr>
<td>RWE</td>
<td>-----</td>
<td>Italy</td>
<td>2009</td>
<td>QA/QC management and inspection</td>
</tr>
<tr>
<td>SENTER NOVEM</td>
<td>-----</td>
<td>Netherlands</td>
<td>2009</td>
<td>Manufacturing inspections</td>
</tr>
<tr>
<td>GES – GLOBAL ENERGY SERVICES</td>
<td>-----</td>
<td>USA</td>
<td>2007</td>
<td>Construction supervision</td>
</tr>
<tr>
<td>PORT OF DAKAR</td>
<td>-----</td>
<td>Senegal</td>
<td>2012</td>
<td>Consultancy services on Renewable Energy, Energy efficiency audit of the actual assets and buildings, Alternative renewable power (solar and wind) feasibility study, Wind site assessment, Solar site assessment, Financial evaluation of the alternative renewable solutions, CDM evaluation: Project identification (handled by EDEN), Technical feasibility study and procurement support</td>
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<tr>
<td>EDISON MISSION ENERGY</td>
<td>-----</td>
<td>USA</td>
<td>2008</td>
<td>Construction supervision, Final acceptance inspections, Commissioning survey</td>
</tr>
<tr>
<td>VAN OORD DREDGING</td>
<td>-----</td>
<td>Belgium Netherlands</td>
<td>2006</td>
<td>Construction supervision, Design verification, NDT inspections, Coating inspections, QA/QC management and inspections</td>
</tr>
<tr>
<td>EDP RENOVÁVEIS</td>
<td>-----</td>
<td>Spain</td>
<td>2009</td>
<td>HSE management</td>
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<tr>
<td>ACCIONA WIND POWER</td>
<td>180</td>
<td>USA</td>
<td>2007</td>
<td>Health &amp; Safety consultancy, Inspections to verify compliance with OSHA regulations</td>
</tr>
<tr>
<td>VESTAS</td>
<td>-----</td>
<td>China, Spain, Germany</td>
<td>2006-2010</td>
<td>HSE management and inspection, NDT inspections, Manufacturing supervision, Construction supervision</td>
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<tr>
<td>SINOLEV WINDTEC</td>
<td>-----</td>
<td>China</td>
<td>2007-2011</td>
<td>QA inspections, NDT and welding supervision, dimensional check for towers</td>
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<tr>
<td>REPOWER</td>
<td>-----</td>
<td>Germany, Italy, China</td>
<td>2007-2010</td>
<td>QA inspections, Construction supervision, H&amp;S coordination</td>
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<tr>
<td>VESTAS</td>
<td>-----</td>
<td>Belgium</td>
<td>2004-2005</td>
<td>Failure analysis, Coating inspections, Technical assistance for repairs</td>
</tr>
<tr>
<td>WINWIND POWER</td>
<td>-----</td>
<td>India, Germany</td>
<td>2008-2010</td>
<td>Tower assembly inspection, Foundations design verification</td>
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<tr>
<td>NORDEX</td>
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<td>China</td>
<td>2006-2010</td>
<td>QA inspections, Dimensional checks, Foundation supervision</td>
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<tr>
<td>NN</td>
<td>-----</td>
<td>Germany</td>
<td>2008-2010</td>
<td>In-Service inspections, NDT to blades</td>
</tr>
<tr>
<td>GENERAL ELECTRIC</td>
<td>-----</td>
<td>Portugal, Spain</td>
<td>2004-2005</td>
<td>Construction supervision, H&amp;S coordination</td>
</tr>
<tr>
<td>GAMESA</td>
<td>-----</td>
<td>USA, Spain, China</td>
<td>2004-2007</td>
<td>Construction supervision, Material testing, Manufacturing supervision</td>
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<tr>
<td>NORDEX</td>
<td>-----</td>
<td>China, Germany, Portugal, Denmark, Spain</td>
<td>2001-2010</td>
<td>Owner’s representative, Supplier audits, Expediting, Assembly supervision, NDT, QA inspections, Final acceptance inspections</td>
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<td>ENERCON</td>
<td>-----</td>
<td>Belgium</td>
<td>2000-2005</td>
<td>Safety coordination, Final acceptance inspection</td>
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<td>SIEMENS</td>
<td>-----</td>
<td>Germany</td>
<td>2003-2007</td>
<td>NDT inspections (towers)</td>
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<tr>
<td>MADE TECNOLOGIAS</td>
<td>-----</td>
<td>Spain</td>
<td>2004-2005</td>
<td>Construction supervision, H&amp;S coordination, Supplier audits, QA inspections, Expediting</td>
</tr>
</tbody>
</table>

SGS IS THE WORLD’S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.