nationalgrid

IFA2 UK Onshore Development Non-Technical Summary

May 2016

IFA2

http://www.ifa2interconnector.com/

nationalgrid

BLANK TO ENABLE DOUBLE SIDED PRINTING

Contents

BLANK TO ENABLE DOUBLE SIDED PRINTING

0. NON-TECHNICAL SUMMARY

0.1 Introduction

0.1.1 National Grid IFA2 Limited and Réseau de Transport d'Electricité (RTE) are working together to develop an electricity interconnector project, known as 'IFA2'. This project is to connect the British and French electricity networks which would enable the import and export of power between the two countries. IFA2 would be the second electrical interconnector between the UK and France. The first electrical interconnector between the two countries has been in operation since 1986 and is jointly owned by National Grid and RTE.

0.1.2 National Grid IFA2 Ltd is the company that National Grid has formed to develop and bring forward the IFA2 project. It holds an interconnector licence which was granted on 12 November 2014. RTE is a French transmission system owner and operator.

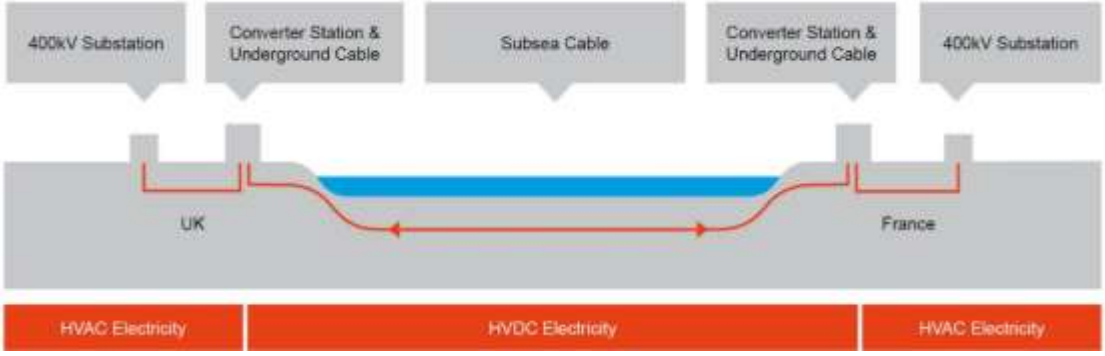
0.1.3 An electricity interconnector is a connection between electricity transmission systems of two different countries. This connection allows countries to share power and offer additional shared benefits such as:

- affordable energy supplies;
- greater energy security;
- wider economic growth; and
- a cleaner environment.

0.1.4 Typically, an electricity interconnector is made up of two converter stations – one in each country – connected by cables. A converter station switches electricity from alternating current to direct current. Direct current is used for sending electricity along the high voltage subsea cables, while alternating current is used in each country's transmission system. A substation also is needed as a point of connection to the national electricity network.

0.1.5 A diagram of the typical parts of an interconnector is shown at Inset 1.

Inset 1: Typical Parts of an Interconnector



0.1.6 The proposed IFA2 interconnector would connect the electricity systems of the UK and France using high-voltage subsea cables from Normandy in France to Fareham in Hampshire. It would transmit approximately 1 Gigawatt of power along the 240km long subsea cable between the two countries.

0.1.7 The grid connection point in France would be at the Tourbe 400kV substation in Normandy, where there is available land for a converter station adjacent to the site. In the UK the grid connection point would be a new substation at an existing National Grid site off Chilling Lane near Warsash, Hampshire. The connection substation does not form part of the application for consent to Fareham Borough Council (FBC).

0.1.8 The proposed UK converter station would be on a site at Daedalus Airfield, between the communities of Fareham, Stubbington and Lee-on-the-Solent.

0.1.9 The cables route between Normandy and Hampshire is shown in Inset 2.

Inset 2: The Cables Route

0.2 Purpose of the Document

0.2.1 The Environmental Statement (ES) presents the detailed report on the environmental effects of the Proposed Development and has been prepared to support the UK onshore planning application. A separate ES has been prepared to describe the effects of the offshore works in the UK and another ES addresses the effects of the IFA2 components in France. There also is a summary document giving an overview of the whole project.

0.2.2 This document provides a summary of the potential environmental effects of the proposed UK onshore components of IFA2 in non-technical language.

0.3 Need for the Project

0.3.1 Interconnectors provide a responsible and efficient way to addressing UK's energy carbon reduction commitments to both electricity consumers and producer. They provide a number of benefits.

Security of Supply

0.3.2 IFA2 would connect to France, which in turn connects to the wider European electricity market. It would allow supply from a wide range of electricity generation sources and provide a means to bring in extra supplies from elsewhere when not enough is generated to meet need at that time. This increases our energy security if demand rises or energy generation falls suddenly in the UK.

Affordability

0.3.3 By giving the UK access to the European electricity market, IFA2 should help create downward pressure on wholesale electricity prices. This is because the wholesale electricity price in the UK is forecast to be higher than in France for many years to come.

Sustainability

0.3.4 Interconnectors help to manage the facts that not all electricity sources can generate consistently and predictably (e.g. renewables) and that electricity cannot yet be stored efficiently on a large scale. They do this by providing a means to pass on surplus energy between countries when too much is generated at once to be used domestically. This should make a significant contribution to building a lower carbon economy both in the UK and Europe.

0.4 The Planning Process

0.4.1 National Grid IFA2 Ltd has submitted an application to FBC under the Town and Country Planning Act 1990 for its onshore components in the UK.

Scoping

0.4.2 National Grid IFA2 Ltd obtained a 'Scoping Opinion' from FBC which consulted with relevant organisations before issuing the Scoping Opinion. It set out which aspects of the environment should be assessed in the ES. The

ES has to comply with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

Consultation

0.4.3 Consultation has been held with Fareham Borough Council, Gosport Borough Council, Natural England, the Environment Agency and a number of other organisations with responsibility for aspects of the environment. There also have been two rounds of public consultation before the Environmental Statement and the application were finalised. A Consultation Report will accompany the application. The report set out what IFA2 learned during public consultation and how it has addressed messages it heard during consultation.

Planning Permission

0.4.4 FBC will take account of the information in the ES when considering whether to grant planning permission. It also will take account of what internal Council departments, external organisations and members of the public say about the application. If FBC decides to grant planning permission, it will set conditions which will need to be met by IFA2 before, during and after construction.

Other Permissions

0.4.5 IFA2 will need a Marine Licence for installing its cables in UK waters. It also will need permissions to install cables in other parts of the sea and permission to build the onshore components in France.

0.5 Content of the UK Onshore Environmental Statement

0.5.1 The Environmental Statement for the UK Onshore development is split into 20 chapters. Chapters 1 to 6 provide:

Chapter 1	Introduction
Chapter 2	Scoping and Consultation
Chapter 3	Approach to EIA
Chapter 4	Project Description
Chapter 5	Planning Context
Chapter 6	Alternatives

0.5.2 Chapters 7-19 of the Environmental Statement provide an assessment of the effects of the development on the environment and where necessary, mitigation measures which would minimise effects during installation,

operation and decommissioning of the project components. The Chapters are as follows:

Chapter 7	Ecology
Chapter 8	Landscape
Chapter 9	Views
Chapter 10	Historic Environment
Chapter 11	Land Use
Chapter 12	Geology and Ground Conditions
Chapter 13	Hydrology and Flood Risk
Chapter 14	Traffic and Transport
Chapter 15	Noise and Vibration
Chapter 16	Air Quality
Chapter 17	Electric and Magnetic Fields
Chapter 18	Electro-magnetic Compatibility
Chapter 19	Socio-Economics

0.5.3 Chapter 20 presents the conclusions of the ES. The ES contains Figures showing relevant maps and other illustrations and also technical appendices such as reports giving background details on some of the topics assessed.

0.5.4 The planning application, ES and other supporting documents are available to view and to comment on via Fareham Borough Council's website. Copies of the ES are available. Requests should be made to the IFA2 telephone number 0800 0194 576, by email to info@ifa2interconnector.com or in writing at the address provided below:

FAO: IFA2 Project

35 Homer Road

Solihull

B91 3QJ

0.5.5 There is a charge that applies for copies of the ES. A full paper copy of the ES excluding Technical Appendices costs £150.00.

0.6 The Proposed Development

Alternatives Considered

0.6.1 IFA2 assessed alternative sites and routes for the main components of the onshore development. A range of factors were considered when considering

the site for the converter station and the landfalls and most appropriate routes for the underground cables and subsea cables.

0.6.2 The grid connection point at Chilling is in countryside outside of any settlement and not on a strategic site for development. It would be feasible to land the subsea cables from France near Chilling and to build the converter station near to the grid connection point. Land at Daedalus airfield is a strategic site and other development is proposed there. That makes it a preferable site for the converter station as compared to Chilling.

0.6.3 Land at the north of Daedalus has allocations for large buildings and for development related to technology. Other areas of Daedalus are allocated for development of a smaller scale where a converter station would be more out of keeping.

0.6.4 There is no readily available onshore overhead line or underground cables route between Daedalus and Chilling. Using different subsea cables between the converter station at Daedalus and the grid connection point at Chilling proved feasible.

0.6.5 The consideration of alternatives concluded that the most appropriate converter station site would be in the northeast of the Daedalus site. The subsea cables from France could connect to underground cables which would run through the airfield to the converter station from a landfall at the break in development at Monks Hill Beach between Lee-on-the-Solent and Stubbington. Other underground cables could return to the landfall, run beneath the sea and make a second landfall at Chilling. From there, underground cables would run to the connection point at a new substation at Chilling.

UK Onshore Development

0.6.6 The 'onshore elements' include the parts of the IFA2 project from the Mean Low Water Springs ('low water') inland. There would be underground high voltage cables and subsea high voltage cables. High voltage direct current (HVDC) cables would run between the converter station in the UK and the converter station in France. High voltage alternating current (HVAC) cables would run between the converter station at Daedalus and the new substation at Chilling.

0.6.7 The main components of the UK Onshore Development (the Proposed Development) are set out below.

- Subsea HVDC cables between low water and the landfall at Monks Hill Beach;
- Onshore HVDC underground cables between the landfall at Monks Hill Beach and the converter station;
- A converter station in the northeast of Daedalus Airfield;

- Open space to the north of Daedalus Airfield;
- Onshore HVAC underground cables between the converter station and the landfall at Monks Hill Beach;
- Subsea HVAC cables between Monk Hills Beach and the low water;
- Subsea HVAC cables between low water and landfall at Chilling;
- Onshore HVAC underground cables between the landfall at Chilling and the new substation; and
- Fibre optic cables.

0.6.8 As explained earlier, the new substation at Chilling is not part of the UK onshore development for which IFA2 is applying for consent. The new substation will be built and operated by National Grid Electricity Transmission Plc (NGET) adjacent to its existing compound at Chilling.

0.6.9 A map showing the cable route and main components between Daedalus and Chilling is shown at Inset 3.

Figure 3: Plan showing location of Proposals Onshore

Cables Design and Installation

0.6.10 The design of the cables is based on how they will be used, rather than on appearance as they will be buried out of sight. The cables have a series of 'layers' of different materials around the metal used to conduct the electricity. These layers are electrical insulation and heat insulation. There are also protective layers for when the cables are being installed below the ground. Installation at sea means that the subsea cables need more protection than the onshore underground cables.

0.6.11 The subsea cables will be connected to the onshore underground cables at a Transition Joint Bay (TJB) below ground. There would be joints between sections of onshore underground cables. The joints would be below ground and like the TJB, the pits used will be completely backfilled once the joints are complete. The onshore underground cables can be installed by an 'open cut' or 'trenchless' method.

Open Cut

0.6.12 For open cut installation, the ground would be cleared of vegetation before a trench would be dug using a machine. Where there is any risk to existing services in the ground or where extra care is needed, the trench would be dug by hand.

0.6.13 For the onshore HVDC cables there would be two cables side by side in a trench approximately 1.5m deep and 1.5m wide.

0.6.14 For the onshore HVAC cables there would two trenches, approximately 1.5m deep and 3m wide. There would be three cables, side by side in each trench. The two trenches would be approximately 3m apart.

0.6.15 A layer of cement bound sand (CBS) would be placed in the bottom of each trench and surrounding the cables to help dissipate heat generated when the cables are in operation. Concrete slabs would be installed approximately 60cm above the top of each cable and plastic warning tape would be laid directly over the slabs. The material excavated from the trench would be used to fill in the trench. Topsoil would be replaced at the top of the trench so that on completion the soil would be similar to that before it was dug.

Trenchless Techniques

0.6.16 Trenchless cables installation would be used to avoid disturbing the surface of the ground. In trenchless techniques, a cables duct (or pipe) is installed. A draw wire would be installed in each duct to be used to pull the cables through the ducts. There are two types of trenchless installation: 'pipe-jacking' and horizontal directional drilling (HDD).

0.6.17 The main differences between the two methods are the depth and subsequent width of the installation swathe. Pipe-jacking typically is carried

out approximately 1m below ground. HDD can be much deeper. For example at Chilling HDD would install cables up to 15m deep and at Daedalus up to 25m deep. HDD typically would be used to avoid (by going under) constraints, such as beaches, whole woodlands, large rivers or internationally designated sites.

Pipe-jacking

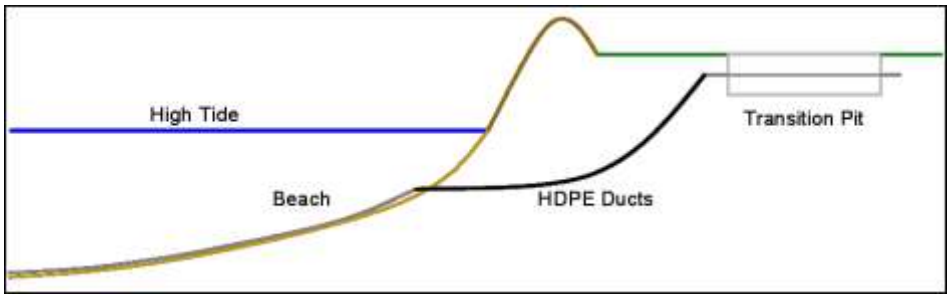
0.6.18 'Pipe jacking' is a technique where a prefabricated pipe, of equal diameter to the cable duct to be used, is pushed through the soil to allow the duct to be installed in the ground. Surplus soil (equal to the volume of the pipe) is then removed from the ground. This technique is useful to avoid disruption, for example to roads, and in this case also runways, taxiways and some environmental constraints.

Horizontal Directional Drilling (HDD)

0.6.19 HDD is a technique which uses a drilling machine, which would be placed in a specially dug pit. Drilling fluid is used and is contained in the pit. The drill can be steered. A pilot hole is drilled initially and then made larger. When the hole is large enough, the cables duct is pulled through and the cable pulled into the duct later.

0.6.20 Inset 4 4 shows a diagram of an example of a cable landfall using HDD.

Figure 4: HDD Cable Landfall Diagram (exaggerated vertical scale)



Daedalus Landfall and Cables

0.6.21 The subsea cables would be laid beneath Monks Hill Beach southwest of Daedalus Airfield. The subsea cables will be joined to onshore underground cables in an excavated pit at the Daedalus landfall referred to as a Transition Joint Bay.

0.6.22 The exact route of the cables into the Daedalus site from the landfall will be decided by the contractor who will be appointed to lay the cables. There are three options that have been looked at and each of these is considered in the topic assessments. The three options are:

Option 1: Open Cut and Pipe-jacking

0.6.23 Subsea cables would be installed using open cut across the beach to a TJB in the Monks Hill car park, approximately 40m back from the beach. The TJB would be approximately 45m long by 10m wide by 3m deep. The subsea cables would be jointed to onshore cables and then pit would be backfilled to original ground levels. From the TJB to the airfield, pipe-jacking would be used with a reception and launch pit at the southern end of the runway; the exact location of this is still to be determined.

Option 1A

0.6.24 From the TJB, the cables would be 'pipe-jacked' directly from a pit at Monks Hill car park into Daedalus Airfield. The cables would be below the seawall so that it would not be disturbed.

Option 1B

0.6.25 If a single pipe-jacking operation from the Monks Hill Beach car park into the airfield is not feasible, for two separate pipe jacking or drilling operations would take place. Land between Stubbington Lane and Monks Hill car park would be used.

Option 2: HDD and Pipe-jacking

0.6.26 Under this option, the subsea cables would be installed using Horizontal Directional Drilling (HDD) from offshore to a TJB in the land between Monks Hill Car Park and Stubbington Lane. The subsea cables would pass under the beach, Monks Hill car park and the seawall to reach the TJB.

0.6.27 From the TJB, the cables would run to the airfield in ducts installed using either HDD or pipe-jacking.

Option 3: HDD

0.6.28 Under this option, the subsea cables would be installed using HDD from offshore to the airfield. The cables would pass under the beach; Monks Hill car park; the seawall; the land south of Stubbington Way; and Stubbington Way to reach the TJB close to the edge of the airfield.

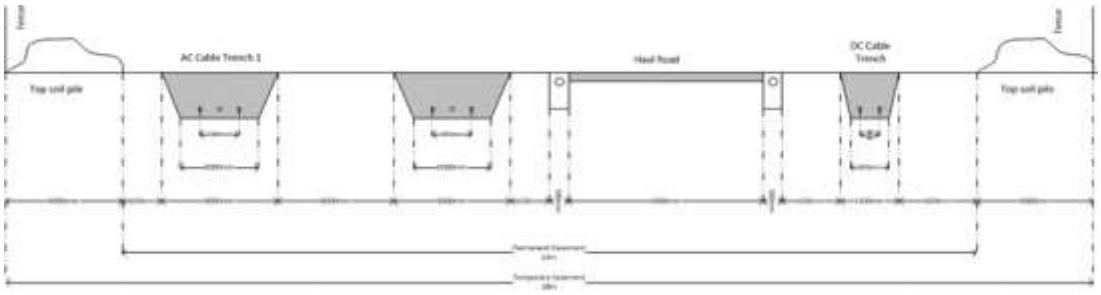
Onshore Underground Cables through Daedalus Airfield

0.6.29 From the southern end of the runway, the cables would be installed west of the runway at a distance agreed with the airfield as safe for the cables and

their installation. Once north of the runway, the cables would turn east to connect to the Converter Station

0.6.30 The HVDC and HVAC cables trenches would be quite close to each other. A typical example which is likely to be used in Daedalus Airfield, is shown in Inset 5 below.

Inset 5: Typical Likely HVDC and HVAC Cables Installation



0.6.31 For both sets of cables, where possible open cut trench installation techniques would be used although liaison with the airfield will ensure that taxiways will be kept open as needed.

HVAC Cables in the Intertidal Area at Chilling

0.6.32 The landfall near Chilling will be close to Brownwich Stream. The low cliffs are being washed away slowly by the sea. The HVAC subsea cables would be joined to the HVAC onshore underground cables in a TJB set back between 50m and 100m from the cliff edge. The installation of the HVAC subsea cables from the sea to the TJB at Chilling would be by HDD. This would minimise disturbance to the low cliffs and ensure that the cables would be safe from effects of erosion.

0.6.33 HDD would minimise disturbance of the beach which is internationally designated for its high ecological value. It also would avoid areas of seagrass which are important and protected by a byelaw.

0.6.34 The landing operation including landfall preparation and the HDD operations are expected to take approximately 26 weeks.

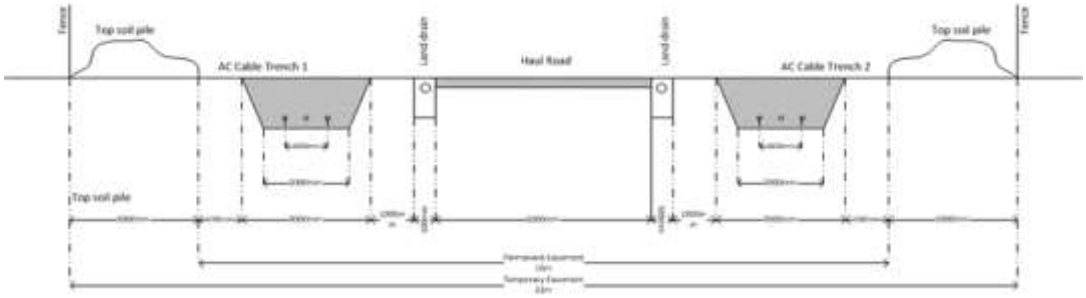
HVAC Underground Cables (between landfall and Chilling Compound)

0.6.35 The proposed new substation would be to the north of the Solent Breeze Holiday Park and next to the existing compound beneath the existing pylon.

0.6.36 From the TJB, approximately 2km of onshore cables would be required to connect to the proposed new substation at Chilling Lane. Up to two joints would be required.

0.6.37 The HVAC cables would installed by open cut. Cables would be laid in a maximum of three cables per trench. A typical example of the cables being installed in this way is shown at Inset 6.

Inset 6: Diagram of Typical HVAC Cables Installation



Converter Station Design and Construction

Converter Station Design

0.6.38 A converter station includes equipment similar to a typical electricity substation, as well as specialist equipment to convert between direct current and alternating current. A converter station typically comprises a collection of steel-framed buildings with cladding. Sometimes part of the equipment is outdoors however the IFA2 converter station will have most of the electrical equipment indoors to protect it from salty air and also to reduce noise and visual effects. The converter station site would have a secure fence around it.

0.6.39 The converter station would occupy a site approximately 120m by 205m. This would comprise a collection of buildings up to 22m high. An illustration of how the converter station may look viewed from the northeast (near Peel Common Roundabout) is shown at Figure 8.

Figure 8: How the converter station may look from near Peel Common Roundabout on the year of completion

0.6.40 The two DC Halls are where the HVDC underground cables would enter the converter station and where equipment would connect them to other

equipment. The overall footprint of each of these two linked buildings would be approximately 40m x 15m and they would be up to 22m high.

0.6.41 The Valve Hall would contain the electronic equipment which converts electricity between alternating current and direct current. The overall footprint of this building would be approximately 120m x 40m and it would be up to 22m high. There would be a Services Building between the DC Halls and the Valve Hall which would house the electricity supplies to the converter site. The service building would be approximately 40m x 15m and would be up to 10m high.

0.6.42 The AC Filters Hall would contain high voltage filtering equipment and connections to the transformers. The hall would have a footprint of approximately 60m x 50m, with a height of up to 22m. The transformers would be installed in 'pens' outside. The transformers convert the power between the Grid voltage of 400kV and the appropriate voltage to connect to the converter station's electronic equipment. The transformers will be separated into pens by concrete fire protection walls. Noise enclosures will be fitted around the transformers. Each of the four pens would have a footprint of approximately 20m x 20m, and would be approximately 10m high.

0.6.43 The AC Hall would contain more specialist equipment and the HVAC underground cables would leave the converter station from this building. The AC Hall would have a footprint of approximately 70m x 40m and would be up to 22m high.

0.6.44 There also would be a Control Room building where staff would be based and it would include their work areas and welfare facilities. Its footprint would be approximately 40m x 15m and it would be up to 15m high.

0.6.45 A Spares Building would house spare parts and components. The building needs to be large enough to hold a spare cable drum and would be approximately 40m x 20m, and up to 15m high. There also would be a separate housing for an emergency standby diesel generator.

0.6.46 A consistent approach would be used for the appearance of buildings to help to unify them into a single design.

0.6.47 The buildings would use steel frames, with low level external walls constructed with blocks and faced with engineering brick.

0.6.48 Above the blocks, a colour coated cladding system would be used. It is proposed that the majority of the cladding to the buildings will be arranged horizontally. The colour would change from a dark blue-grey on the lower parts rising to a lighter blue-grey on upper layers. This would help the buildings blend into the darker colours of the surrounding landscape and the lighter skyline above. The horizontal cladding proposed also incorporates a 'soft' graduation from one colour to the next, which in distant views would help to soften the transition between colours, and would add interest to the building facades in nearer views.

0.6.49 The horizontal arrangement of cladding and use of blue-grey colours would tie in with the colour scheme and cladding used on the Fareham Innovation Centre building, which is further to the south.

0.6.50 The cladding design also includes changes to the cladding at some points and to some buildings. This will help to 'break up' the buildings and introduce further interest.

0.6.51 The detailed design of the converter station would be undertaken by the contractor who will be employed to construct it. The detailed design would be approved by FBC.

0.6.52 There are more details about design in the Design and Access Statement submitted with the planning application.

0.6.53 The converter station would be designed for a 40 year lifespan, with control equipment and a valve expected to require replacement during that time.

0.6.54 Landscape works would be undertaken around the edge of the site to help 'tie-in' the Converter Station to the landscape setting and to screen the lower parts of the buildings. Landscaping works would include mounding and planting and would be agreed with FBC.

0.6.55 Lighting, when required, would be controlled so that it does not spill onto other areas or into the sky. The entrance, emergency exits and walkways are likely to be lit for safety reasons.

0.6.56 Car parking spaces would be provided for the staff required to monitor and maintain electrical equipment and plant at the converter station. There will be parking for visitors and maintenance staff. It is anticipated that approximately sixteen car parking spaces and two additional disabled spaces will be needed.

Converter Station Construction

0.6.57 Construction access to the converter station would be via a new access east of the site, from the B3385 Broom Way. The road would be used during construction and would continue to be required for very occasional use during operation, for example if a replacement transformer is needed. Regular, permanent access to the converter station would be via the proposed access road into the eastern part of the airfield.

Construction programme

0.6.58 Construction activities are expected to begin in 2018 so that IFA2 could begin operating in 2020.

0.6.59 Some of the first activities would be preparation for the converter station construction. These would include detailed pre-start surveys, earthworks and

engineering to make the foundations and bases of building. The main converter station construction would take place between 2019 and 2020.

0.6.60 The onshore cables installation is expected to take place over a period of approximately 12 months. It is likely to be undertaken at the same time as the main converter station construction between 2019 and 2020.

0.6.61 The onshore underground cables would be installed primarily in excavated trenches using standard techniques. Where the onshore underground cables cross obstructions "trenchless technologies" would be considered to avoid surface disturbance.

Operation

0.6.62 The converter station would have a small workforce onsite at all times (approximately two to three persons) and be subject to infrequent inspections and maintenance visits. National Grid IFA2 Ltd would be responsible for on-going maintenance and upkeep of the converter station. This would include regular inspection of the site and equipment as well as safety checks.

0.6.63 In total, it is anticipated that up to six personnel would be onsite during normal daytime operations. From time to time during refurbishments, detailed inspections and replacement of some components, there may be larger numbers of personnel on site.

0.6.64 During operation, the cables would not need any maintenance or servicing. If a fault developed, the faulty part of the cable would need to be dug up and replaced with a new section of cable.

Decommissioning

0.6.65 The anticipated operation of the converter station and cables is approximately 25 years, possibly extending to 40 years. The useful life may be longer and would be assessed during the operation of the link.

0.6.66 Decommissioning would involve similar activities to those described above for construction. The main components would be dismantled and removed for recycling wherever possible. Disposal would be in accordance with the relevant waste disposal regulations at the time of decommissioning

Landscaping and Open Space Provision

0.6.67 The north of the Daedalus airfield, comprising the land beyond the taxiways and south of the B334 Gosport Road, currently comprises grassed areas and land in arable agriculture. There is no public access to this land. Part of this land has protection under a Fareham Borough Council planning policy (DSP12) for the provision of public open space.

0.6.68 FBC has published the Daedalus Vision document in 2015 which sets out a different proposal for land to be used as open space for the benefit of the local community.

0.6.69 The proposed converter station is adjacent Daedalus North proposed as open space in the Daedalus Vision. To assist in screening the converter station, landscaping would take the form of mounding and planting around the edges. There also would also be planting along the western edge of Broom Way up to Peel Common roundabout and along the southern edge of Gosport Road for approximately 250m. The remainder of the existing green space to the north of the proposed site would remain grassland, hedges, scattered trees and tree groups as the converter station is built. NG IFA2 Ltd has considered how its proposals would fit with the type of open space in the Daedalus Vision. The proposed converter station and proposed mitigation planting and its relationship to the open space is shown on Inset 9.

Inset 9 Proposed Converter Station Layout and Relationship to Open Space

0.6.70 The works for the Open Space would involve earth works for mounding and creating footpaths and cycleways, grassland planting and some tree planting. No soil is expected to be removed from or brought to the site.

0.6.71 The planning application includes the full extent of the Daedalus North Community Greenspace to help to make sure that it will be able to be created. The final design of the open space would be determined in consultation with landowners and other key stakeholders. IFA2 is prepared to enter into an agreement to provide part of the eastern section of the public open space and is continuing to discuss this with FBC.

0.7 Summary of Environmental Impacts

0.7.1 The assessment of environmental effects which would occur from the project considered construction, operation and decommissioning. In each case it considers direct effects (such as digging disturbing the soil) and indirect effects (such drainage affecting the soil in a nearby field). The following section summarises the predicted effects of the construction and operation of the Proposed Development on the environment.

0.7.2 Each assessment also considers effects that may arise from other parts of the proposed works (such as the cables and converter station construction together) and from other projects taking place in the area at the same time as IFA2.

0.7.3 The assessments consider the scale or magnitude of effects and also how significant the effects would be. Most effects that are identified would have a negative effect and so are 'adverse'. Positive effects are called 'beneficial'. The assessments consider mitigation that may be proposed to avoid or reduce effects. Examples of mitigation are the mounding and planting around the converter station to reduce effects on landscape and views. Other mitigation includes avoiding cables installation at Chilling in the winter months to avoid disturbing geese.

0.7.4 The effects considered after mitigation are called 'residual' effects. Short-term effects refer to a period of less than twelve months. Effects are considered to be medium term if they occur for between one and five years, and long term if they last more than five years.

Ecology

0.7.5 The assessment was undertaken by a number of experienced and qualified ecologists. Desk study looked at information on sites and records of species known in the area of the works. There are a number of onshore and offshore designations in the general area including sites designated for features of international, national and local nature conservation importance.

0.7.6 The Proposed Development involves works that would cross a mix of habitats including the coast, agricultural land and land managed by Daedalus airfield. The assessment identified several locally important ecological habitat features likely to be affected by the Proposed Development and one habitat type of county importance.

0.7.7 Field surveys and data searches revealed a number of protected and important species. The assessment found several locally important species or groups of species. It also identified bats and dormice of County Importance and wintering birds of national and international importance.

0.7.8 The works mainly would have temporary effects on ecology. These would arise from loss or adverse effects on habitats and from disturbance of wildlife from installing the underground cables. However there would be permanent habitat loss from construction of the converter station and trees could not be replanted above the underground cables.

0.7.9 Most impacts have been avoided through the design and mitigation. The use of HDD to avoid seagrass and the programming of works to avoid disturbing wintering birds are examples of mitigation. There would be locally significant effects on dormice, hedges and trees and woodland in the medium term as replacement habitats establish. There would be permanent locally significant effects on part of the cables route at Chilling because trees would be cut down and could not be replaced above the cables. Hedge planting in place of trees will provide some compensation and it may be possible to plant trees on nearby land.

0.7.10 There would be positive long term, locally important benefits to habitats and species as a result of the open green space provision on land north of the airfield. However there is some uncertainty because the details of this are not yet confirmed.

0.7.11 The assessment includes specific consideration of the effects on internationally designated sites within 20km of the proposed works. There would not be likely significant effects on any of those sites.

0.7.12 Effects on ecological receptors have been reduced wherever possible wither very few residual effects remaining and no residual effects identified at greater than local importance.

Landscape

0.7.13 The landscape assessment included desk study and refers to published studies of landscape character. Landscape architects visited the area where works are proposed on foot and by car. There are no areas where works are proposed or nearby which have designations which refer to landscape character. Land at Daedalus is designated as Strategic Gap where planning policy seeks to protect the separation of settlements.

0.7.14 The landscape generally has the character of a coastal plain. There is a strong influence of nearby towns in the area around Daedalus although there is open land, including the parts of the Daedalus site remaining in use as an airfield. There is other undeveloped land in the Alver Valley and some areas of woodland to the east of the proposed converter station site.

0.7.15 The land at and around Chilling is more rural in character. There are fields where crops are grown, grazed fields and some areas more natural in character. There is development at Solent Breezes Caravan Park and the compound containing the pylon at Chilling, although this is in an area of woodland. There are other areas of woodland in the wider area.

Daedalus Landfalls and Cables, Converter Station and Open Space

0.7.16 The installation of the Daedalus landfalls and cables would give rise to short-term minor adverse residual significance of effects on the local coastal plain landscape during the construction period.

0.7.17 The implementation of the open space in the northern part of the airfield would result in a short-term minor adverse residual significance of effects on the local coastal plain landscape.

0.7.18 The converter station development would result in short-term minor adverse residual significance of effects on the local coastal plain landscape during construction. Construction effects would be limited due to the proposed converter station site's location in Daedalus Airfield, surrounded by an urban fringe landscape.

0.7.19 During construction the combined and short-term effect on the coastal plain landscape of the installation of the Daedalus landfalls and cables, the works to lay out open space and the construction of the converter station (assuming all three of these were happening at once) would be of moderate to minor adverse significance.

0.7.20 After filling in the trenches and pits and restoring the land, the operation of the cables would give rise to a residual effect of negligible significance.

0.7.21 During operation the proposed open space at Daedalus North would result in a very minor alteration to the existing features of the landscape. The open space would give rise to a negligible (beneficial) residual significance of effect on the landscape in the long-term.

0.7.22 During operation and in the short, medium and long-term the converter station would introduce large-scale buildings into the northeast part of Daedalus Airfield. The converter station development (at a maximum height of 22m) would be larger than any existing development at Daedalus. However the airfield and surrounding coastal plain already forms part of an urban fringe landscape. It contains a range of developments, including some large buildings around the periphery of the airfield. The proposed converter station would be close to mature woodland, which would help to accommodate the development in the landscape and additional mitigation proposals would extend the wooded and enclosed nature of the Alver Valley into the northeast corner of the airfield. Following establishment, this mitigation would provide effective screening of the lower parts of the buildings, reducing their influence on the wider landscape. The operation of the converter station in the

northeast part of Daedalus Airfield would give rise to a moderate to minor adverse residual significance of effect on the landscape in the long-term.

Chilling Landfall and Cables

0.7.23 The installation of the Chilling landfall and underground cables would give rise to short-term moderate adverse significance of effects on the local coastal plain landscape. After installation works are complete and the trenches and pits restored, the operation of the cables would give rise to an overall negligible residual significance of effect. A minor adverse residual significance of effect has been assessed close to a few areas where the underground cables route would result in permanent tree removal.

Effect of the Converter Station on the Strategic Gap Allocation

0.7.24 Overall, the proposed converter station development would not significantly affect separation of settlements.

Views

0.7.25 Views were assessed by landscape architects visiting the areas of works on foot and by car. Views from public places were considered along with views from residences and places where people work. There are views from public rights of way including the national cycleway 2 at Chilling and at Lee on the Solent. The views available from the areas of the proposed works relate to the landscape character. The views around Daedalus typically contain built development and much of the airfield remains open although there is construction work presently taking place.

0.7.26 Views in the Chilling area generally include aspects of the rural land including fields and woodland.

Daedalus Landfalls and Cables and Converter Station

0.7.27 There would be views of the converter station from near Peel Common roundabout, from the B3385 Broom Way at the junction with Brune Lane, from close to the proposed open space at and near the northwest corner of the airfield and from B3334 Gosport Road and semi-detached houses. There would be a moderate adverse residual significance of effect on views in the short-term.

0.7.28 A moderate adverse residual significance of effect on views in the short-term would also be experienced in views from Stubbington Lane at the western end of Marine Parade and close to the southeast end of Crofton Avenue as a result of the construction works associated with Landfall Options 1 or 2 at the coast.

0.7.29 The residual significance of effect on most views during construction at Daedalus in the short-term would be minor adverse. A smaller number of views have intervening trees and bushes or the distance from the site means that the residual significance of visual effects during construction would be negligible.

0.7.30 Following reinstatement, the Daedalus landfalls and cables would have a negligible residual significance of effect on views. On completion the open space would have a negligible residual significance of effect on views.

0.7.31 In the long-term the greatest residual significance of effect on views during the operation of the converter station would be from land near Peel Common roundabout and experienced by users of the future open space. Following 15 years' establishment of the planting to the north and east of the proposed converter station site, the significance of effect on views experienced by a small number of residents, users of the roads and adjacent footpath and cycleway, and users of the open space would be moderate to minor adverse.

0.7.32 For the majority of visual receptors at the edges of the airfield, the residual significance of effect on views as a result of the converter station development would be minor adverse. For a smaller number of other viewpoints, the effects of trees and bushes would mean that the residual significance of visual effect during operation in the long-term would be minor adverse to negligible.

Chilling Landfall and Cables

0.7.33 During cables installation the greatest effects on views would be from closest to the underground cables route on the path near Chilling landfall and from Chilling Lane, north of the cables route and from Chilling Barn. In general, there would be near and open views of works to the underground cables route affecting a large proportion of the view and the significance of effect would be moderate adverse in the short-term.

0.7.34 Views of construction work from Chilling Lane close to the underground cables route and near to the Cable Sealing End Compound, generally would be limited by the hedges and trees on each side of Chilling Lane. Views of construction work from the northeastern edge of Solent Breezes Holiday Park and the inland section of the Solent Way long distance route east of the holiday park would be more distant or the works would be partly hidden by trees, shrubs and slopes. A moderate to small proportion of the view would be affected in the short-term. The significance of effects on views would be minor adverse in the short-term.

0.7.35 A very small part of the view from Calshot Spit would be affected as a result of construction works at Chilling and the significance of effect in the short-term would be negligible.

0.7.36 In general following reinstatement, the Chilling landfall and cables would have a negligible residual significance of effect on views. In the long-term some localised minor adverse significance of effects on views would remain as a

result of the permanent removal of trees above the underground cables route.

Effect of the Converter Station on the Strategic Gap Allocation

0.7.37 Overall, the proposed converter station development would not significantly affect the role of the Strategic Gap, in relation to the visual separation between settlements.

Historic Environment

0.7.38 The assessment of potential effects on the Historic Environment included a review of available historic information. A suitably qualified archaeologist and heritage specialist also walked the route of the underground cables (including the beaches) and also the converter station site. The assessment considered known heritage assets and the potential to discover other heritage assets.

0.7.39 The most important heritage assets have a designation which is used in the planning system to protect them. There are no designated heritage assets in the proposed footprint of the works or that would be affected by the proposals.

0.7.40 Other heritage assets are known as 'non-designated'. They can be given significance levels ranging from high to negligible. There are six non-designated heritage assets within the development footprint for the Daedalus landfalls and cables, none within the development footprint for the converter station, and three non-designated heritage assets within the development footprint for the Chilling landfall and cables.

0.7.41 The non-designated heritage assets within the development footprint at Daedalus and Chilling are of negligible heritage significance. The predicted magnitude of effect is high. The significance of effects is therefore negligible. At Daedalus and Chilling there are records of 'finds' which indicate that there is a moderate to high potential for as yet unknown heritage assets with archaeological interest to be discovered. Measures are proposed to mitigate the predicted negligible effect on known heritage assets within the development footprints, and the potential for effects on as yet unknown heritage assets with archaeological interest within the development areas.

0.7.42 When it is built and operating, the converter station at Daedalus would continue to have an adverse effect a group of hangars dating to the 1930s' expansion of Daedalus airfield. These are not within the development footprint and would not be directly affected. However they are of moderate heritage significance and the airfield, including the converter station site, is part of their setting. The magnitude of effect would be low adverse and the significance of effect would be low adverse. The effect would be long-term, occurring whilst the converter station is present.

0.7.43 Mitigation is proposed which would be monitoring topsoil stripping and recording and reporting of results. This would be overseen by an archaeologist working to an agreed scheme of work.

0.7.44 The residual significance of effect following mitigation would be neutral.

Land Use

0.7.45 The assessment considers the potential effects of the Proposed Development, including the converter station site, HVDC cable routes and HVAC cable routes on land use where this has not been considered elsewhere in the ES. It has considered the potential of the Proposed Development to affect existing land use and the ability to deliver specific land use changes identified in the local plan.

0.7.46 The majority of the land uses affected by the Proposed Development are considered in other assessments in the ES.

0.7.47 The cables installation would give rise to negligible effects on agricultural land use reducing to no effect on existing land uses and land practices after installation is complete and the land would be restored.

0.7.48 The converter station would mean permanent effects on 3.5 hectares of land on the converter station site. If this land was still in agricultural use there would be a moderate significance of effect on agricultural land. However the aspirations for this piece of land are for it to be developed for open space and employment.

0.7.49 Existing land use was taken into account in developing the project proposals with the majority of mitigation embedded into the project design. No additional mitigation is proposed however predicted effects would be minimised through the implementation of a Construction Environmental Management Plan.

Geology and Ground Conditions

0.7.50 The assessment involved study of existing records regarding land, geology and former uses of land. A suitably qualified specialist also visited each of the areas of proposed works.

0.7.51 A number of potentially former and current land uses that could give rise to contamination were identified at the proposed Daedalus site. These relate to its use as an airfield and for other uses. There are no present or historic land uses at Chilling.

0.7.52 Potential effects of moderate adverse significance were identified to construction workers for the construction phase of the Proposed Development, however, these can be mitigated using appropriate health and safety measures.

0.7.53 Potential effects of moderate adverse significance also were identified to soils during construction phase. These could arise by soils or water passing from one place to another or by moving soils. Again, these effects can be mitigated through ground investigation and then use of barriers if they are needed.

0.7.54 No significant impacts were identified to groundwater resources, adjacent land users or environmentally sensitive sites during construction.

0.7.55 There would not be any significant impacts on geology and ground conditions during operation of IFA2.

Hydrology and Flood Risk

0.7.56 The assessment has considered the impact on the Proposed Development from all sources of flooding. It also has considered the effects of the Proposed Development on local water resources and on flood risk that could arise due to an increase in surface water runoff or potential loss of land in the floodplain. It has considered also the effects of the Proposed Development on water quality local to where works will take place. Potential effects on water quality have been considered referring to the Water Framework Directive (WFD) which sets out the status of water bodies.

0.7.57 The assessment has involved study of existing information and also site visits by a suitably qualified water specialist.

0.7.58 Potential effects on flooding could occur if the cables disturbed the sea defences at Monks Hill Beach. This will be avoided by using a trenchless technique.

0.7.59 The existing site of the converter station is presently ‘greenfield’. When it is developed, there would be quicker run-off of rainwater that could increase flood risk. This would be avoided by the design of an appropriate drainage system for the converter station.

0.7.60 Potential effects on water quality could occur as a result of disturbance in the sea (between low water and high water), particularly if open-cut methods are employed. The cables installation works are not predicted to cause a decline in the current WFD status of the Solent or prevent it achieving future status goals.

0.7.61 Potential effects on water include silty water runoff and accidental spillages of polluting substances such as oil and cement. These would be prevented by the use of standard measures for pollution prevention and control. No effects on water quality are predicted.

0.7.62 No additional mitigation is required.

Transport

0.7.63 The transport assessment has considered the effects of construction traffic on local road users and others that may be affected. The assessment has been undertaken by experienced and qualified transport planners and has used information on traffic from FBC.

0.7.64 The forecast construction traffic generated by the Proposed Development will be low in comparison to the existing and forecast background traffic and will be temporary in duration.

0.7.65 The IFA2 anticipated construction traffic numbers have been compared with the forecast 2019 traffic flows. This indicates that the overall traffic growth will be less than 10% and that the HGV traffic increases are less than 30%. The forecast effects would be negligible.

0.7.66 A formal assessment of the capacity, delay and queueing at the new construction vehicle access on Broom Way has been undertaken. It indicates that there will be no material effects on the operation or safety of the north and southbound traffic flows on Broom Way resulting from the construction traffic.

0.7.67 In conclusion, the assessment undertaken within this ES identifies negligible effects resulting from the traffic generated in either the construction or decommissioning phases of the Proposed Development.

Noise and Vibration

0.7.68 The noise assessment has been undertaken by noise specialists. They have visited the sites of proposed works and also taken noise measurements locally. There is potential for noise and vibration effects arising from the construction works and also noise from the operation of the converter station. There would not be any noise or any vibration from operation of the underground cables.

0.7.69 The noise assessment considers ‘receptors’ and their sensitivity.

0.7.70 The assessment indicates that noise due to underground cable construction at Daedalus and Chilling may lead to moderate adverse effects at the nearest noise sensitive receptors. The effects are expected to be reduced to a low level by using best practical means and appropriate noise mitigation. There would be negligible vibration effects from cables installation.

0.7.71 Construction of the converter station would lead to negligible construction noise and vibration effects.

0.7.72 Construction traffic noise and vibration effects also are expected to be negligible.

0.7.73 The assessment concludes concluded that the effect of noise from the operation of the converter station would be of minor adverse significance. This would be secured by a planning condition if permission is granted.

0.7.74 Operational vibration effects from the converter station have been considered. The assessment indicates that the operational vibration effects are expected to be negligible.

0.7.75 With regards to noise and vibration, the effects of decommissioning are expected to be similar to those for construction.

Air Quality

0.7.76 The assessment of air quality has considered available records of air quality and the potential for activities to affect air quality. The assessment has been undertaken by air quality specialists. Records of air quality by FBC and Gosport Borough Council have been considered and the specialists have visited the proposed works areas.

0.7.77 The proposed works areas are not near any areas where local planning authorities manage air quality because of concerns.

0.7.78 There is potential for dust and for particles to arise and affect air quality from construction activities including from construction traffic. Dust and particles may arise during excavations for the cables and earthworks on the converter station site and when laying out the open space. Mitigation measures to reduce these effects include 'damping down' areas where there is potential for dust and ensuring that loads in lorries are covered. A low speed limit on construction sites also minimises the amount of dust disturbed. These and other standard measures to reduce risk of dust would be used. There would not be significant effects from dust on air quality.

0.7.79 The forecast increase in traffic for construction is low, as set out in the transport assessment. There would not be significant effects from construction traffic on air quality.

0.7.80 During operation, there would not be any effects on air quality from the operation of the converter station and cables.

Electric and Magnetic Fields

0.7.81 An Electric and Magnetic Fields (EMFs) assessment has been carried out by very experienced specialists at National Grid.

0.7.82 Electric and magnetic fields (EMFs) are an essential part of the physical world. EMFs occur naturally in the body in association with nerve and muscle activity allowing these functions to happen. Humans also experience the natural static magnetic field of the Earth (to which a magnetic compass responds) and natural static electric fields in the atmosphere.

0.7.83 Modern technology and the wider use of electricity and electrical devices have inevitably introduced changes to the naturally occurring EMF patterns. High voltage power-transmission equipment, along with all other uses of electricity, is a source of EMFs. These EMFs have the same frequency as the voltages

and currents that produce them. For the alternating current (AC) elements of the Proposed Development, the frequency is primarily 50 hertz (Hz) and these fields are described as power-frequency or extremely-low-frequency (ELF) alternating EMFs. For the DC elements, the frequency is zero hertz. Both the AC and DC fields exist in addition to the Earth's steady natural fields.

0.7.84 Electric and magnetic fields at much higher frequencies than those generated by the electricity transmission system can be generated by other devices, for example, radio, television transmissions and microwaves.

0.7.85 The Government sets limits on exposure to EMFs to protect against known, direct effects.

0.7.86 There would be no EMFs generated during construction and decommissioning of any equipment. EMFs can only arise when the equipment is in use.

0.7.87 The earthed metallic shield around the subsea and onshore underground cables means that they produce no external electric field. There would be a magnetic field outside the cables. The magnetic field drops rapidly with distance from the cables. For both the DC and the AC cables, the maximum field produced is less than the relevant exposure limit and there would be no significant adverse effects.

0.7.88 The converter station contains AC and DC equipment and there will be EMFs arising from its operation. The design of the converter station, with all the equipment enclosed, ensures that negligible electric fields would be produced outside the buildings. If some equipment was outdoors, it would be surrounded by a perimeter fence that would ensure that electric fields outside the fence were very low and certainly compliant with the exposure limits.

0.7.89 The nature of the equipment in the converter station means that magnetic fields drop rapidly with distance. Outside the buildings, they will be well below the exposure limits. The magnetic fields in the vicinity of the converter station would be dominated by the cables entering and leaving, not by the equipment inside. The converter station is therefore assessed as having no adverse effects.

Electro-magnetic Compatibility

0.7.90 In addition to considering the possible effects on human health from electric and magnetic fields, the assessment considered the possibility of the operation of IFA2 interfering with electronic equipment. This is referred to as electromagnetic compatibility (EMC).

0.7.91 There is a European Directive requiring that equipment, including the types of equipment to be installed for IFA2, does not interfere with operation of other equipment including communications. National Grid and other operators have extensive experience in complying with guidance ensuring that electrical equipment operates without interference.

0.7.92 The assessment demonstrates that no interference is anticipated with communications or other equipment.

0.7.93 Some equipment or operations on the Daedalus airfield site, may be unusually sensitive to EMC emitted by the cables during operation. However, National Grid would work with the operators of the airfield to identify any likely problems and if necessary, solutions. The contractor who will finalise the design and build the converter station will be required to ensure that their equipment does not interfere with existing airfield equipment and shall provide reports to satisfy that the operational airfield is of no risk of interference

0.7.94 The magnetic field directly above and very close to the underground cables could affect the magnetic compasses of aeroplanes in a small area of the runway. This would be a potential issue of concern only when checks would be undertaken. Other areas of the runway would be available for the checks. The residual effects of the Proposed Development would be minor adverse.

Socio Economics

0.7.95 The assessment has examined the likely significant effects of the Proposed Development on socio-economic conditions. It was undertaken by specialists using recent information to gain an understanding of the local area and also involved a site visit.

0.7.96 The assessment considered the Proposed Development and the options within it, looking at construction and operation, and effects across five assessment topics. No major impacts on the socio-economic conditions were identified although some mitigation measures were set out to ensure the risk of adverse consequences were reduced.

0.7.97 The proposed Daedalus landfall would result in temporary beach closure, potentially limiting some use for recreation. The planned closure of part of the beach and car park could last up to two months. Installing cables would cause some temporary disconnection of rights of way. This would have some level of disturbance in the local area affecting local communities and businesses, particularly if it occurs during peak holiday season. However, this is only expected to affect a small area of the extensive beach resource and the effect will be temporary and reversible.

0.7.98 The underground cables would cross the Daedalus Airfield, running parallel to the runway. The assessment of Electro-magnetic Compatibility (EMC) has concluded that there would be no effect on day to day operations of the airfield. A wind assessment prepared for the project states that there should be no noticeable operational effect on use of the active runway. It is not likely that there would be an impact on the operation of the airfield.

0.7.99 The Proposed Development includes a large area of new community green space to the north of the Converter Station. Bringing this forward for the area would be a benefit to local socio-economics.

0.8 Cumulative Effects

0.8.1 The assessments carried out have considered whether effects are likely that will result from the Proposed Development with other proposals in the area. In most assessments, no likely significant effects are anticipated.

0.8.2 The landscape assessment indicates that there would be no greater than moderate adverse effects. The assessment of effects on views shows that the converter station would make a small contribution to the appearance of overall development in the area if all the other possible developments also were built. The noise assessment shows that minor adverse cumulative effects are anticipated from construction and operation of all new developments when considered together.

0.9 Summary and Conclusion

0.9.1 The construction of IFA2 is in accordance with European Union and UK policy to increase transmission capacity between countries and to ensure robust electricity supplies.

0.9.2 IFA2 would allow the bi-directional transfer of electrical power between the UK and France via subsea cables. This would connect to the wider European electricity market. It would increase our energy security if demand rises or energy generation falls suddenly in the UK and should help create downward pressure on wholesale electricity prices. It should make a significant contribution to building a lower carbon economy both in the UK and Europe.

0.9.3 The Environmental Statement sets out the anticipated environmental effects of the Proposed Development and identifies appropriate mitigation measures to address environmental effects where appropriate.

BLANK TO ENABLE DOUBLE SIDED PRINTING