Rampion 2 WIND FARM

Fact Sheet 2

Overview of Proposals

Rampion 2
WIND FARM

Contents:
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Rampion 2 in numbers

270km² sea area being explored for optimum wind farm site

Up to **3** offshore substations, depending on size of final wind farm scheme

Up to **1,200MW** installed electrical capacity to power the equivalent of over **1 million homes** and save **1.8 million tonnes** of CO_2 emissions per year

2 search areas being explored for **1** new onshore substation required to transform the power to **400kV**, to connect to the transmission grid at Bolney Substation in Twineham

Up to **116** wind turbines and foundations - no more than the operating Rampion Wind Farm

Up to **4** buried offshore export cable circuits

At least **12 horizontal direction drills**, including under Climping Beach, the River Adur, railways, major roads and a recreation ground

Wind turbines between **1.5 and 2.3 times the height** of the existing Rampion turbines

1 Landfall location at Climping Beach where the offshore cables join the onshore cables

Around **250km of subsea inter-array cables** to connect turbines to the offshore substation(s)

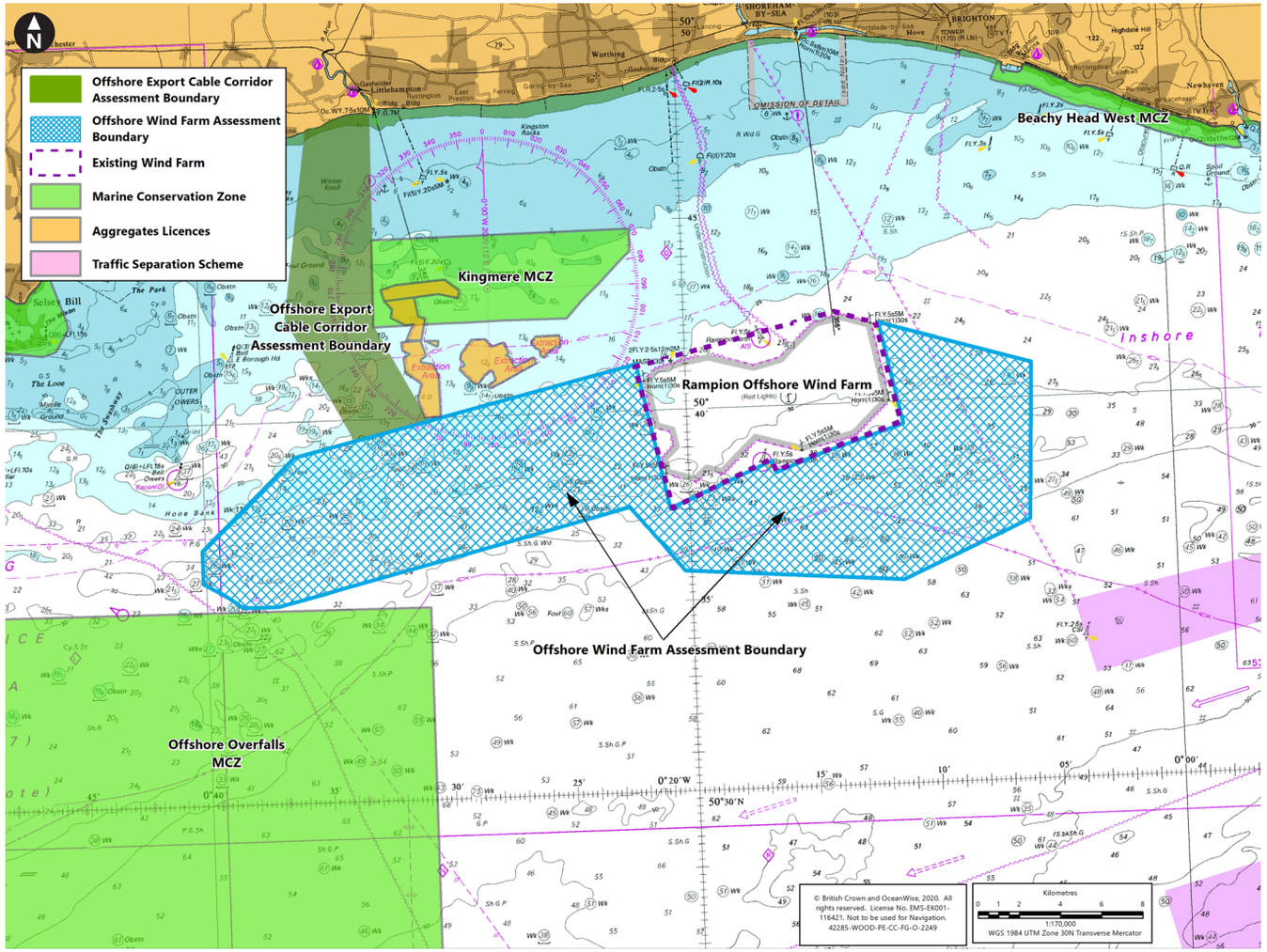
36km underground onshore cable route with 2 remaining options at Warningcamp

Project scope

At this public consultation stage, the Rampion 2 project is made up of the following project elements, which are in various stages of refinement:

Offshore Wind Farm PEIR assessment boundary

The chart on the right shows the 270km^2 PEIR Assessment Boundary for the Rampion 2 Offshore Wind Farm. This does not mean that turbines will be erected everywhere across this sea area, but rather that our exploration of all the constraints will help identify the best and optimum site for a wind farm somewhere within the PEIR assessment boundary. This will be determined following consultation with statutory consultees, key stakeholders and local communities, alongside data collected and assessed from a wide range of technical and environmental surveys.



Turbine height and numbers

A 50% increase in tip height more than doubles the power output of a wind turbine and the power of offshore turbines has increased 5-fold in just 20 years. It's relatively early days in the development process and still a few years before we'll be in a position to order turbines, all of which is subject to consent. Therefore, for the purpose of our Environmental Impact Assessment, we are assessing a worst-case scenario for up 2.3 x the existing Rampion turbine height to make sure we have consent for turbines which are available in the marketplace at the time of order.

In reality, the turbines are unlikely to be more than double the height of the Rampion turbines. With an assumption that the turbines may be around 75% taller than the existing turbines, the power output per turbine would be around three times the existing Rampion turbines, hence the project could generate three times the power output of the operating Rampion project.

The wind farm will comprise up to a maximum of 116 turbines - no more than the number currently operating at Rampion. The turbines will be connected via strings of inter-array cables buried under the seabed.

Example photomontage of what Rampion 2 could look like from Beachy Head. See main PEIR document for the full set of assessed viewpoints and interpretation (Figures 16.26 to 16.65, Volume 3)

What will the turbines look like?

Many people will be interested to understand how the views would change with the addition of Rampion 2. A decision has not yet been made regarding the specific height, number or arrangement of the turbines. There are a number of constraints which will feed into the final designs that are developed, such as stakeholder engagement and consultation feedback, engineering and environmental surveys, as well as rapidly advancing technology. The turbine layout will also be optimised to maximise energy generation from the site, which may result in changes to the footprint and layout of the turbines.

As is common for all offshore wind farms, the final choice of turbines would be subject to a procurement exercise carried out after a Development Consent Order has been granted to develop the project.

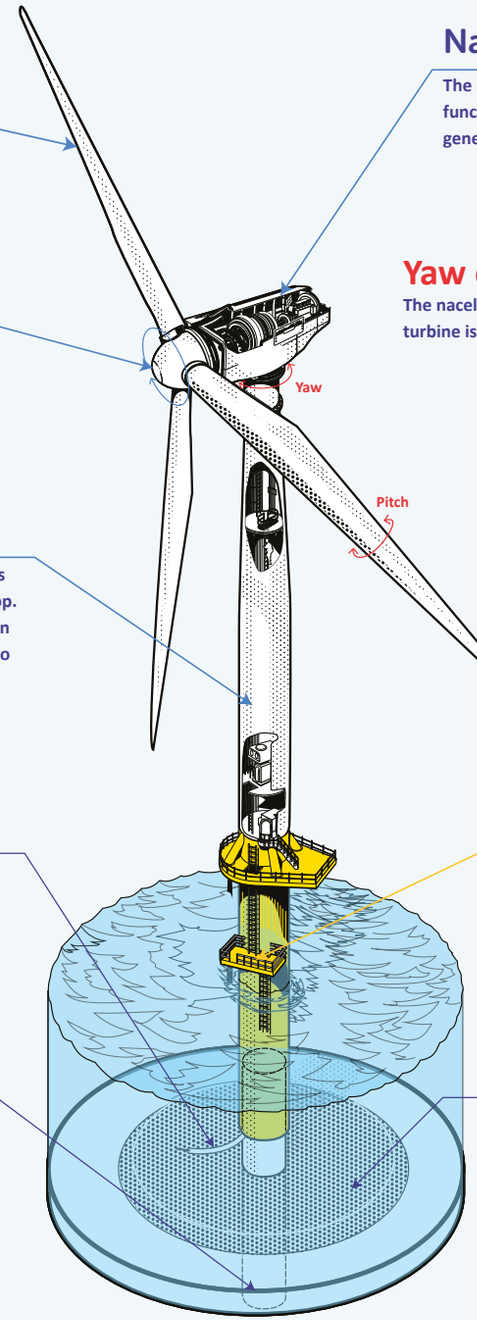
In order to assess the highest possible visual and other environmental impact, we've produced a Seascape, Landscape and Visual Impacts Assessment (SLVIA) as part of the PEIR. This preliminary assessment involved producing illustrations of the potential views, assuming the greatest number and largest size of potential turbines, as well as siting the turbines across the widest spread of the area of search and the closest to shore that they may possibly be built. Over 40 viewpoints were agreed in consultation with key stakeholders, such as the South Downs National Park Authority.

A summary of the potential visual impacts is located in the Non-Technical Summary (NTS) of the Preliminary Environmental Impact Report (PEIR). All visualisations produced to inform the preliminary assessment can be viewed in Chapter 16: Seascape, landscape and Visual of the PEIR.

Wind turbine components

Each turbine sits on a specially designed foundation fixed to the seabed.

The turbines are made up of a tower, a nacelle to house the generation equipment, and three blades connected to a hub.



Blades

The shape of the blades has been aerodynamically designed to catch the wind.

Hub

The blades are connected to the hub and the wind passing the blades forces the hub to rotate. This movement turns a shaft inside the hub, which continues into the nacelle.

Tower

The tower is made up of several sections of rolled steel and tapers towards the top. Each tower includes a lift (and a ladder in case of emergency) to take technicians to the nacelle at the top.

Connecting Cable

The electricity is transmitted along a cable from the turbine foundation down to the seabed. It then continues under the seabed to the offshore substation.

Foundation

Each steel monopile foundation is tailor made according to water depth and seabed geology but they are all huge structures, as they need to support the turbines above!

Nacelle

The nacelle sits on top of the tower acting as a fully functioning control centre. This houses the gearbox, generator and transformer.

Yaw control

The nacelle rotates around the tower so the turbine is facing the direction of the wind.

Pitch control

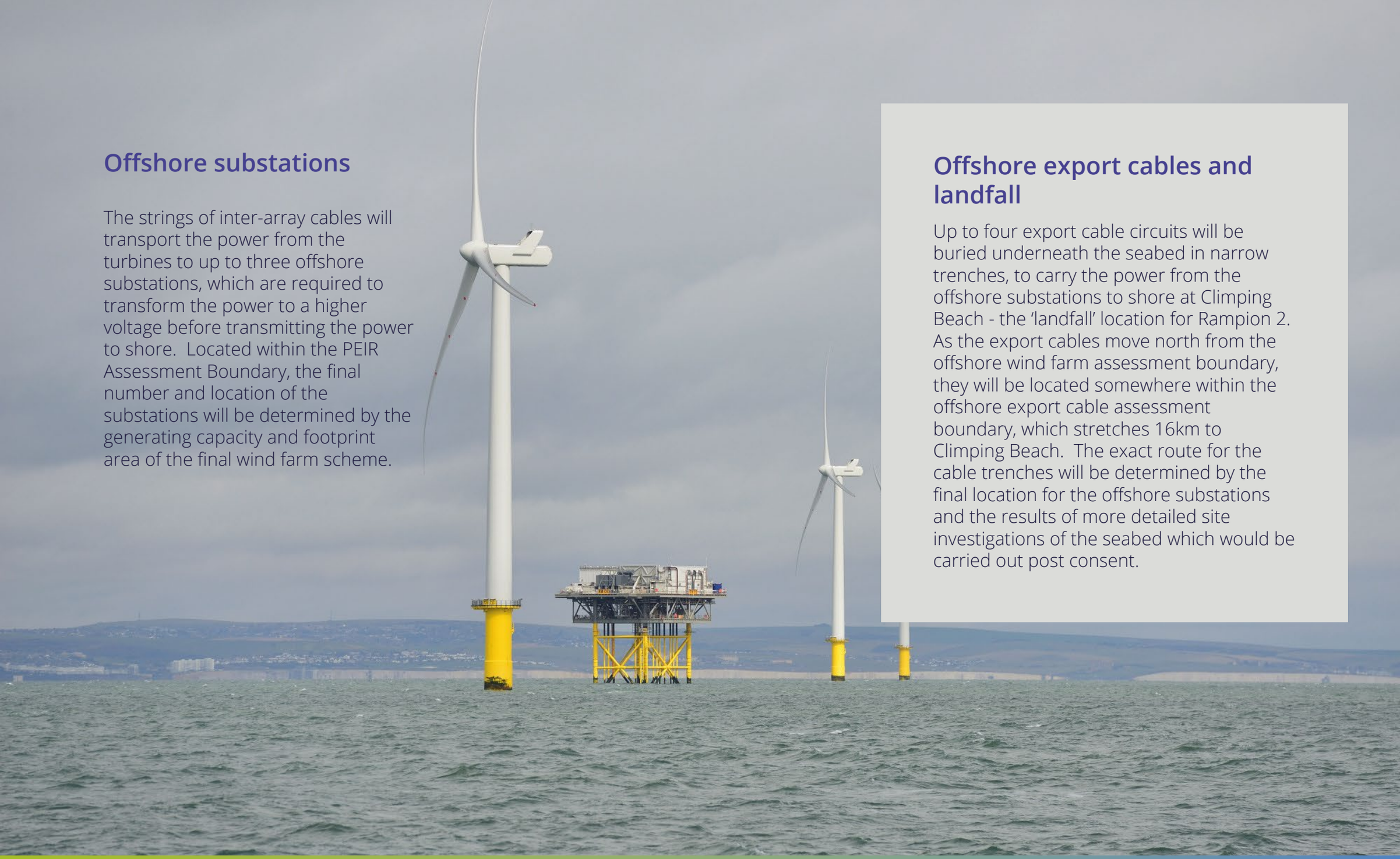
The blades pitch (or twist) to change their profile against the prevailing wind. This is used to maximise the efficiency of power generation depending on the wind speed.

Transition Piece

The turbine is connected to a transition piece and provides a platform (20m above high tide) and ladders to give technicians access to the turbines.

Scour Protection

Scour protection is necessary in turbine locations where the seabed is very soft. Hard rocks are placed around the turbine foundation to protect it from erosion caused by tidal flow and currents passing around the foundation bases.



Offshore substations

The strings of inter-array cables will transport the power from the turbines to up to three offshore substations, which are required to transform the power to a higher voltage before transmitting the power to shore. Located within the PEIR Assessment Boundary, the final number and location of the substations will be determined by the generating capacity and footprint area of the final wind farm scheme.

Offshore export cables and landfall

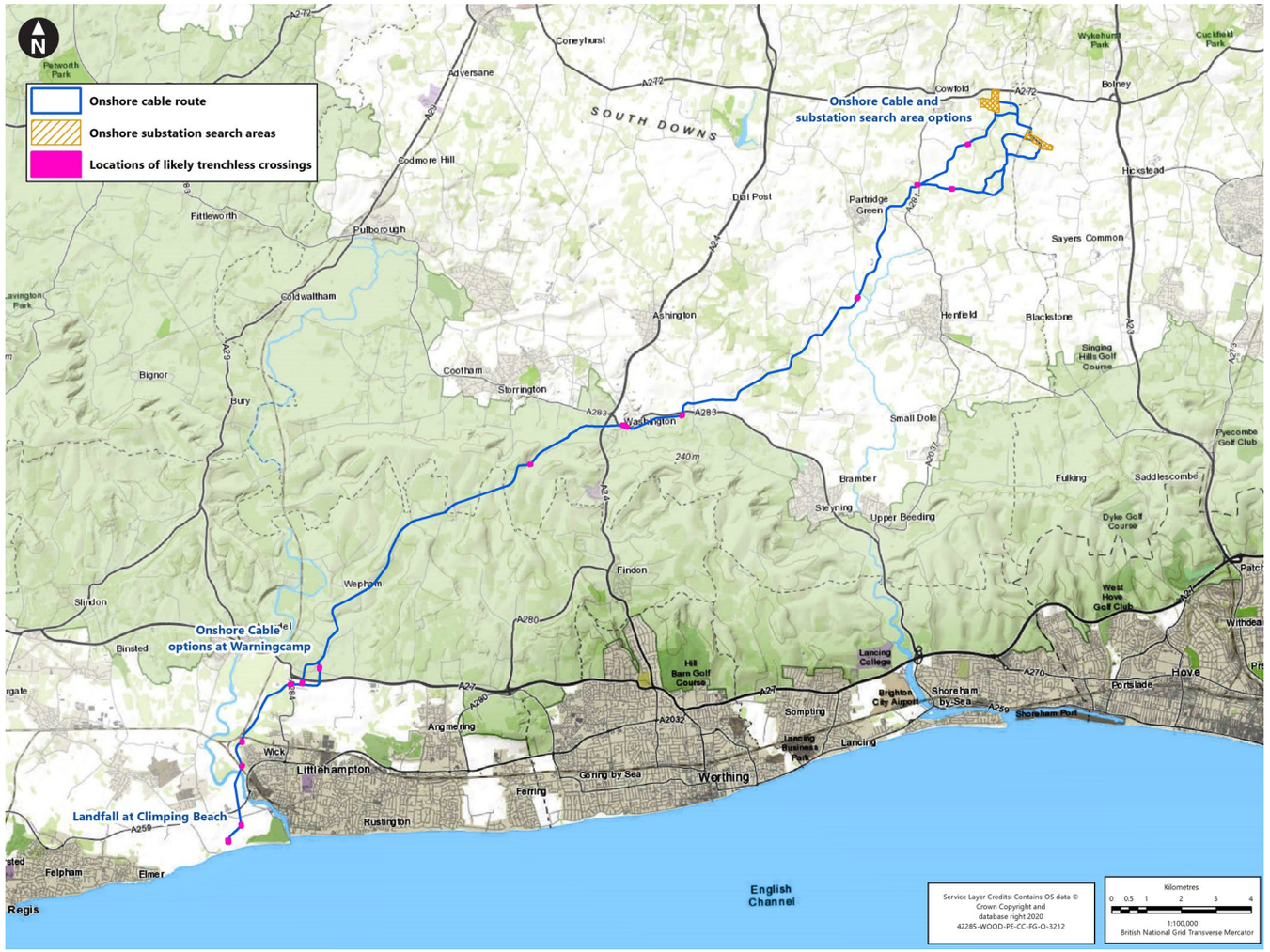
Up to four export cable circuits will be buried underneath the seabed in narrow trenches, to carry the power from the offshore substations to shore at Climping Beach - the 'landfall' location for Rampion 2. As the export cables move north from the offshore wind farm assessment boundary, they will be located somewhere within the offshore export cable assessment boundary, which stretches 16km to Climping Beach. The exact route for the cable trenches will be determined by the final location for the offshore substations and the results of more detailed site investigations of the seabed which would be carried out post consent.

Underground onshore cable route

Following a series of technical and environment surveys, and consultation with key stakeholders and local communities, the least impact onshore cable route has been identified, to take the power around 36km from landfall to the connection point at National Grid's Bolney Substation in Twineham. Two cable route options remain undetermined at Warningcamp, which form part of this consultation.

Construction methodologies

The cable route will be undergrounded for the entirety of the route using a trench and ducting methodology. However, horizontal directional drills (HDDs) will be used to tunnel underneath Climping Beach, the River Arun, the railway and major roads to reduce environmental impacts and keep traffic and trains running during construction.



Onshore substation search areas

Two potential onshore substation locations and associated cable route options are being explored to find the least impact site. The onshore substation is required to step up the power to a high voltage (400 kilovolts) in order to connect the power to the national transmission grid at Bolney Substation in Twineham.

Onshore substation site requirements

The selected site will need to include an area to host the permanent substation equipment, as well as construction compounds, accesses and laydown areas, in addition to areas for mitigation landscaping and planting to screen the development.

*See Fact Sheet 4 '**How the draft proposals were developed**' to explore what has changed and evolved since the first consultation in January / February.*