4 CLIMATE CHANGE

4.1 The Planning Inspectorate (PINS) welcomed the proportionate approach to climate change proposed in the EIA Scoping Request (see page 11 of the EIA Scoping Request at Appendix 3.1). There are two relevant aspects to climate change, as presented in the EIA Scoping Request, and set out below.

GREENHOUSE GAS EMISSIONS

4.2 PINS stated that whilst it may not be appropriate to provide a detailed calculation in relation to the overall lifecycle of the project in terms of carbon cost / benefits, it may be useful to include some information, including references to the studies mentioned in the EIA Scoping Request.

4.3 Solar parks convert sunlight to electrical energy without producing waste or emissions. They generate direct current (DC) that is converted by the inverter hardware to alternating current (AC) that can be used by the electricity grid. Solar Parks are rated for capacity in megawatts (MW). The peak capacity of individual panels is established by measuring their performance under internationally recognised standard conditions that include temperature and wavelength of sunlight. The actual output of a system will be determined by latitude, local weather and site conditions. The proposed solar park would produce enough clean renewable electricity to power 18,755 homes per year[1]*, and provide a saving of 16,611 tonnes CO^{2}[!].

4.4 The EIA does not propose to carry out a life cycle analysis of greenhouse gas emissions associated with the development of the solar park. Such an exercise is unlikely to be of any purpose as multiple scientific studies[2][3] have shown that under normal conditions over its lifetime a solar photovoltaic system produces many times more energy (and hence greenhouse gases) than was required for its production and the pay-back time is expected to be several years.

THE SOLAR PARK'S RESILIENCE AND ADAPTATION TO CLIMATE CHANGE

4.5 The solar park would have an operational life of 35 years which is relatively short when compared to the majority of large-scale infrastructure projects such as roads and reservoirs for which EIA is

1 * Based on an annual average domestic consumption per household (Great Britain) of 3,799 kWh. Source BEIS, Regional and Local authority electricity consumption statics 2018.
! Based on 'Emissions associated with the generation of electricity at a power station (Electricity generation factors do not include transmission and distribution). Source BEIS, Greenhouse gas reporting: conversion factors 2020.

[2] Emissions from Photovoltaic Lifecycles, Fthenakis *et al*, *Environ. Sci. Technol.* 2008, 42, 6, 2168–2174
[3] Energy Balance of the Global Photvoltaic (PV) Industry – Is the PV Industry a Net Electricity Producer?, Dale & Benson, *Environ. Sci. Technol.* 2013, 47, 7, 3482–3489

required. However, the design of the solar park itself and any associated mitigation, enhancement or compensation has considered resilience to projected climate change within its operational life.

4.6 Foremost to climate change resilience for this project is the approach to flood risk. The area is not at significant flood risk from the sea at present because of the extensive flood defences along the coastline to the south. Climate change will create an increase in tidal levels and an increase in storminess is also expected. The tidal flood risk will therefore increase in the area, and the rate of increase will accelerate with time. The solar park would not contribute to flooding on site or elsewhere as rain falling on the solar panels would fall to ground. A gravel filled soakaway trench is proposed around each of the substation/ inverter structures to provide compensatory drainage for the small loss of ground available for infiltration. In order to build climate change resilience into the project, sophisticated hydraulic modelling of flood extents (provided in the Flood Consequences Assessment) shows the site remains free of flooding for the lifetime of the project for all but a higher than 1 in 1000 annual risk of flooding scenario. Mitigation to protect the infrastructure from such an event has been integrated into the design, for example by raising vulnerable infrastructure such as inverters above predicted flood elevations. The development presents a very low risk to people as it will only be accessed periodically for maintenance during the daytime and will not include sleeping accommodation.