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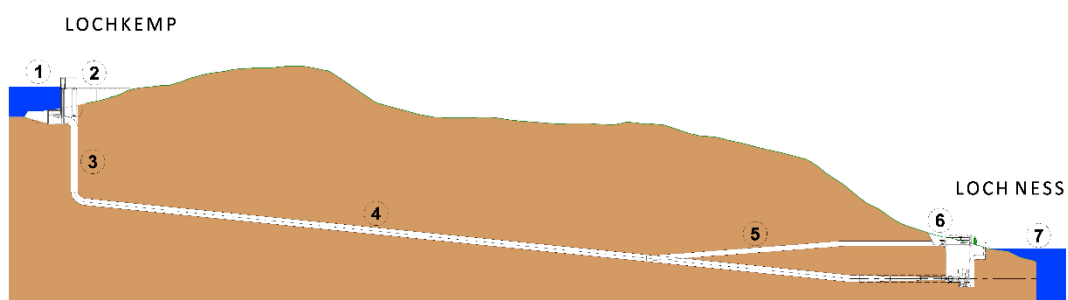
There are no Appendices associated with this Chapter.

1. Introduction

1.1 Overview

- 1.1.1 This Environmental Impact Assessment Report (EIA Report) has been prepared by ASH design + assessment Limited (ASH) and Statera Energy (UK) Limited (SEL) (“the Developer”) on behalf of Loch Kemp Storage Ltd. (the Applicant) in support of an application for consent to the Scottish Ministers under Section 36 of The Electricity Act 1989 to construct and operate a new pumped storage hydro scheme. Deemed planning permission under Section 57(2) of the Town and Country Planning Act 1997 is also sought. The Applicant is a wholly owned subsidiary of SEL for the development and construction of Loch Kemp Storage (referred to hereafter as the ‘Proposed Development’).
- 1.1.2 The Proposed Development comprises the construction and operation of a pumped storage hydro scheme with an installed capacity of up to 600 MW, utilising the existing Loch Kemp as the upper storage reservoir and Loch Ness as the lower reservoir. To allow drawdown for storage, Loch Kemp would be raised by approximately 28 m from its existing 177 m AOD elevation to approximately 205 m AOD. Four new saddle dams between 16 – 34 m high and four minor cut off dams would be constructed around Loch Kemp to form the upper reservoir.
- 1.1.3 A new powerhouse would be constructed on the shore of Loch Ness, including an integral tailrace arrangement with fish screens connecting the system to Loch Ness. The scheme would utilise an underground tunnelled waterway system to link between the intake on Loch Kemp and the powerhouse at Loch Ness, with the potential inclusion of two surge shafts (with associated access) on the hilltop between Loch Kemp and Loch Ness. The location of the Proposed Development is shown on **Volume 2, Figure 1.1: Site Location**.
- 1.1.4 The primary function of the Proposed Development would be to extract, store and release energy to or from the electricity transmission system as required to help balance supply and demand for power at a national scale. The Proposed Development would operate by transferring water between the lower reservoir (Loch Ness) and the upper reservoir (the enlarged Loch Kemp), through the tailrace tunnel, powerhouse, high pressure tunnel and headrace tunnel. **Plate 1.1: Indicative Section through Loch Kemp Storage**, illustrates how the Proposed Development would operate.

Plate 1.1: Indicative Section through Loch Kemp Storage



Key: 1. Head pond (Loch Kemp) with four new saddle dams and four minor cut off dams around its perimeter to raise the level to a maximum of +205 m AOD; 2. Intake/ outlet structure at Loch Kemp connected to the pressure tunnel; 3. Pressure shaft; 4. Headrace tunnel; 5. Main access tunnel; 6. Powerhouse, containing the turbine/pump units and associated ancillaries and balance of plant; 7. Tailrace structure on Loch Ness (+16 m AOD)

- 1.1.5 Access during the construction and operation of the Proposed Development would utilise the existing B862 public road and Dell Estate forestry tracks (to be upgraded and extended) and would involve a new access onto the B862, and the creation of other new access tracks around the site, including a new access track to the lower reservoir works on the shore of Loch Ness. The Caledonian Canal system would also be used as far as practicable for the delivery of larger items to the lower works.
- 1.1.6 It is anticipated that the Proposed Development would house visitor facilities within the powerhouse building. However, access by the public to and from the powerhouse, would be via the quayside on Loch Ness and would be carefully controlled to restrict access to the powerhouse building only.
- 1.1.7 An Environmental Impact Assessment (“EIA”) has been undertaken for the Proposed Development in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 to assess the likely significant effects of the Proposed Development. The findings of the EIA are presented in this EIA Report, including the measures which would be taken to prevent, reduce and, where possible, offset predicted likely significant adverse effects.

1.2 Project Need

- 1.2.1 Pumped Storage Hydro (PSH) is the oldest type of large-scale energy storage and works on a very simple principle, exploiting gravitational potential energy. At times of peak electricity demand, water stored in the upper reservoir is released to the lower reservoir, flowing through a turbine. This converts the gravitational potential energy of the water into useable electrical energy. At times of low electricity demand, the excess energy on the grid can be used to pump water back to the upper reservoir and stored again until times of high demand. Therefore, in simple terms, a PSH project is effectively a big battery, connected to the electricity grid. Scotland has the UK’s highest mountains, largest inland lochs and highest rainfall. There is also an abundance of wind power that far exceeds the needs for Scotland, so this excess energy on the grid will need to be managed with PSH and other storage in the future.
- 1.2.2 The UK energy system relies on fossil fuels so that variations in supply and demand can be managed. As we transition to a net zero energy system, renewables and other zero carbon technologies, including PSH, will need to provide all the services required to ensure a secure energy system¹. Although several energy storage technology categories exist including, battery storage, mechanical storage, thermal storage, and hydrogen, many of these are yet to be developed at large scale, whilst PSH is a tried and tested technology which is already implemented at grid scale in the UK. The Draft Energy Strategy and Just Transition Plan (Scottish Government, January 2023) recognises the crucial role that pumped storage hydro has, together with other storage technologies, in Scotland's energy system.
- 1.2.3 Pumped hydro is a highly flexible method of electricity generation due to its ability to rapidly start and stop without constraint. PSH schemes add the ability to store large quantities of energy, making them one of the most flexible of all electricity storage and generation technologies.
- 1.2.4 The role which PSH has traditionally played in power network management is primarily in managing relatively short-term differences between electricity supply (generation) and demand

¹ Draft Energy Strategy and Just Transition Plan (Scottish Government, January 2023)

(consumption). This role will become more important as intermittent renewable electricity generation increases, fossil fuel generation is phased out, and electrification of the transport and heat sectors occur. It also may begin to include the management of longer-term electrical grid imbalances due, for example, to high pressure weather events in winter, when higher energy demand can occur, and low wind and solar generation is experienced.

1.2.5 In the UK, PSH is the only mature energy storage option available at grid scale to be able to respond quickly to variations in electricity demand. It has one of the highest cycle efficiencies of any energy storage process and is considered an essential solution in maintaining a flexible electricity system.²

1.2.6 The installed capacity for the Proposed Development would be up to 600 MW, with an energy storage capacity of up to almost 9 Gigawatt Hours (GWh). This alone could save up hundreds of thousands of tonnes of CO₂ emissions a year - a significant proportion of the 2.5 million tonnes of emission reductions needed by Scotland to meet its (net zero) targets.

1.3 The Applicant

1.3.1 The Applicant is a subsidiary of the Developer SEL. SEL has 1,020 MW of battery storage and flexible generation projects in operation or under construction across the UK, with a further 13 gigawatts (GW) in development, comprising a mix of pumped storage, battery storage, flexible generation and hydrogen production. SEL was created with the aim of delivering increased flexibility for the UK electricity system to assist in the transition to a low carbon economy. SEL submit that the Proposed Development would deliver energy security, lower emissions, and provide a positive economic impact for the Highlands of Scotland.

1.4 Development Context

1.4.1 The Proposed Development is situated on Dell Estate, approximately 13 kilometres (km), to the northeast of Fort Augustus in the Highlands of Scotland, as shown in **Figure 1.1: Site Location**. The slopes between the upper and lower reservoir, encompass a combination of woodlands, some of which form part of the Ness Woods Special Area of Conservation (SAC), whilst the upper area consists primarily of upland moorland and managed land for game shooting.

1.4.2 The principal components of the Proposed Development would comprise:

- Dams and Upper Reservoir;
- Underground Waterway System;
- Powerhouse Platform Area and Access Tunnels;
- Powerhouse Building;
- Tailrace Area;
- Quayside and Pier;

² Scottish Renewables (2016), The Benefits of Pumped Storage Hydro to the UK.

- Cable Tunnel and Vertical Cable Shaft; and
- Access Tracks.

- 1.4.3 Most of the rock from the excavated tunnels and shafts would be removed via the shafts and tunnel portals near the powerhouse building on the shore at Loch Ness. The excavated rock from the underground works would be reused in the dams, powerhouse platform area, powerhouse building, and localised area of construction works wherever feasible.
- 1.4.4 In addition to the above, it is anticipated that there would be a need for temporary site establishment and laydown areas in the vicinity of the upper reservoir and lower reservoir works. Borrow pits would be required to provide aggregate to construct suitable access tracks and site establishment areas, in advance of tunnel spoil being available for use.
- 1.4.5 A detailed description of the Proposed Development can be found in **Chapter 3: Description of Development** of this EIA Report.

Associated Works

- 1.4.6 A grid connection, in the form of a 275 kV underground cable, is required to connect the Proposed Development to the national grid. This would be subject to a separate consenting process. The cable would be routed from the powerhouse building through the cable tunnel, resurfacing through the cable shaft, outwith the Ness Woods SAC. The cable would then be undergrounded to connect to a 275 kV switching station located to the northeast of Loch Kemp. The cable between the powerhouse and switching station, and the switching station itself are considered Associated Works to the Proposed Development and have been considered as part of the cumulative assessment within the EIA Report where relevant.
- 1.4.7 Works to complete the grid connection between the switching station and the point of connection to the National Grid, anticipated to be at the existing Foyers Substation, would also form part of a separate application by Scottish Hydro Electric Transmission plc, operating and known as Scottish and Southern Electricity Networks Transmission ("SSEN Transmission"). The route of this connection is yet to be confirmed by SSEN Transmission and as such, cannot be considered in this EIA Report.

1.5 Site Context

- 1.5.1 The Great Glen is already well established with hydro infrastructure. Loch Ness is utilised as the lower reservoir for Foyers Pumped Storage Scheme, and for the outfall at Glendoe Hydro Storage Scheme. Levishie Hydro Scheme is located in close proximity, with the outfall at Dundreggan, west of Invermoriston. The consented Red John Pumped Storage Scheme is proposed to be constructed approximately 15 km northeast of the Proposed Development near Dores, using Loch Less as the lower reservoir, and the consented Coire Glas Pumped Storage Scheme is proposed approximately 20 km southwest of the Proposed Development, using Loch Lochy as its lower reservoir (which is connected to Loch Ness via the River Oich and the Caledonian Canal).
- 1.5.2 The landscape around the Proposed Development also comprises a number of operational wind energy developments, as well as others that are either consented or in the planning process, as illustrated in **Volume 2, Figure 1.2: Site Context**.

1.6 Legislative and Statutory Context

- 1.6.1 Consent for the project is sought from Scottish Ministers under Section 36 of The Electricity Act 1989. Deemed planning permission under Section 57(2) of the Town and Country Planning Act 1997, as amended, is also sought.
- 1.6.2 The requirement to undertake an EIA for developments requiring consent under Section 36 of The Electricity Act 1989 is set out in the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as ‘the EIA Regulations’). This is discussed further in Section 1.6 of this Chapter.
- 1.6.3 Construction of the Proposed Development constitutes development in terms of section 26 of the Town and Country Planning (Scotland) Act 1997 (“the Planning Act”). Accordingly, these works require planning permission. However, section 57(2) of the Planning Act provides that on the granting of a consent under Section 36 of The Electricity Act 1989, the Scottish Ministers may direct that planning permission for that development shall be deemed to be granted. Deemed planning permission under section 57 of the Planning Act is therefore sought from the Scottish Ministers as part of the application.
- 1.6.4 Some parts of the Proposed Development are located within the Ness Woods SAC, a site of European nature conservation importance, as defined by European Council Directive 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC). The Directive was implemented in the UK by the Conservation (Natural Habitats &c) Regulations 1994, and those Regulations as amended remain in force post-Brexit. For projects requiring consent under The Electricity Act 1989, the Conservation of Habitats and Species Regulations 2017 apply. Where a plan or project is likely to have a significant effect on a European site, and that plan or project is not directly connected with or necessary to the management of the site, such sites are protected by the duties placed on competent authorities. Those duties include the requirement to make an appropriate assessment of the implications for the site in view of the site’s conservation objectives and, in general terms, to agree to the plan or project only after having ascertained that it will not affect the integrity of the site, or where adverse effects exist, there are no alternative solutions, it can be justified for IROPI and compensatory measures can be secured.
- 1.6.5 Information is provided in the standalone **Shadow Habitats Regulation Appraisal (HRA) Report** which is a supporting document to this EIA Report to assist the competent authority’s appropriate assessment of the likely significant effects of the Proposed Development on the Ness Woods SAC.

1.7 Environmental Impact Assessment

- 1.7.1 The Proposed Development is classified as Schedule 2 development under the EIA Regulations by virtue of it being classed as:

“The carrying out of development (other than development which is Schedule 1 development) to provide any of the following -

(1) a generating station

- 1.7.2 Whilst this does not automatically trigger the requirement for an application for development consent to be supported by an EIA Report, given that the Proposed Development passes through an

environmentally designated site, it was considered that an EIA Report should be prepared and submitted with the application for the necessary consent and deemed planning permission. The EIA Report provides environmental information in accordance with Schedule 4 of the EIA Regulations.

- 1.7.3 A formal request for a Scoping Opinion was made to the Scottish Ministers under Regulation 12 of the EIA Regulations in December 2021. A Scoping Report was submitted to support the request, which sought input from statutory and non-statutory consultees regarding the information to be provided within an EIA Report to accompany a Section 36 application under the Electricity Act 1989. A Scoping Opinion was received from the Scottish Ministers on 21st October 2022.
- 1.7.4 A copy of the Scoping Opinion is included in **Volume 4, Appendix 5.1**. A matrix detailing where the key issues raised in the Scoping Opinion have been addressed within the EIA Report is included in **Volume 4, Appendix 5.2: Scoping Matrix**.

1.8 EIA Report

1.8.1 The EIA Report comprises the following volumes:

- Volume 1: Main Report
- Volume 2: Figures
- Volume 3a: Visualisations to NatureScot Guidance;
- Volume 3b: Visualisations to The Highland Council Guidance;
- Volume 4: Technical Appendices.

1.8.2 **Volume 1** of the EIA Report (this document) describes the project and the legal and policy framework within which the application will be determined. Details of how the design has evolved, is also included. The volume also includes the individual assessments undertaken under each of the specialist environmental topics identified, providing an assessment of the likely significant effects of the Proposed Development.

1.8.3 **Volume 1** of the EIA Report includes the following Chapters:

- Chapter 1: Introduction
- Chapter 2: Site Selection and Design Evolution
- Chapter 3: Description of Development
- Chapter 4: EIA Process and Methodology
- Chapter 5: Scoping and Consultation
- Chapter 6: Planning
- Chapter 7: Water Management
- Chapter 8: Landscape and Visual Impact Assessment
- Chapter 9: Land Use and Recreation
- Chapter 10: Terrestrial Ecology
- Chapter 11: Ornithology

- Chapter 12: Aquatic Ecology
 - Chapter 13: Fish
 - Chapter 14: Geology, Soils and Water
 - Chapter 15: Cultural Heritage
 - Chapter 16: Traffic, Access and Transport
 - Chapter 17: Noise and Vibration
 - Chapter 18: Air Quality
 - Chapter 19: Forestry
 - Chapter 20: Socio-economics and Tourism
- 1.8.4 **Volume 2** includes all accompanying figures referred to in **Volume 1: Main Report**, with figure numbering corresponding to the chapter numbers e.g. Figure 1.1, 2.1 etc.
- 1.8.5 **Volumes 3a** and **3b** include visualisations of the Proposed Development according to NatureScot (NS) Standards³ and The Highland Council (THC) Standards⁴ respectively.
- 1.8.6 **Volume 4** comprises supporting appendices to **Volume 1** of the EIA Report. Appendices include a Design and Sustainability Statement (**Volume 4, Appendix 3.1**), a Schedule of Mitigation (**Volume 4, Appendix 3.2**), and further detailed reporting or information to support the EIA Report and technical assessments contained therein.
- Supporting Documents**
- 1.8.7 A **Non-Technical Summary** (NTS) is included with the application to summarise the findings of the EIA Report in non-technical language.
- 1.8.8 A **Planning Statement** is included with the application, considering the acceptability of the Proposed Development in the context of existing and emerging planning policies.
- 1.8.9 A **Shadow HRA** has been undertaken for the Ness Woods SAC and other internationally designated sites in the vicinity of the Proposed Development and is included with the application. This Shadow HRA has been included to assist the competent authority's appropriate assessment of the likely significant effects of the Proposed Development on these designated sites.
- 1.8.10 The **Shadow HRA** determines that adverse effects on the integrity of the Ness Woods SAC cannot be ruled out, with residual effects likely to result in undermining conservation objectives for the SAC's two woodland qualifying features. Therefore, a **Derogation Report**, which includes a Compensatory Measures Package for the Ness Woods SAC, is included with the application, to assist the competent authority in their decision on whether the Proposed Development can be justified for IROPI, and whether compensatory measures can be secured.

³ Scottish Natural Heritage (2017) Visual Representations of Wind Farms. Version 2.2. Available at: <https://www.nature.scot/doc/visual-representation-wind-farm-guidance>

⁴ The Highland Council (2016) Visualisation Standards for Wind Energy Developments. Available at: https://www.highland.gov.uk/downloads/file/12880/visualisation_standards_for_wind_energy_developments

1.9 Notifications

- 1.9.1 In accordance with the Electricity (Applications for Consent) Regulations 1990, and Regulation 14 of the EIA Regulations, the application and this EIA Report will be advertised in the Scotsman, the Press and Journal and the Inverness Courier. Adverts will also be placed in the Edinburgh Gazette. The advert will describe the application, state where hard copies of the EIA Report are located, state a date by which any persons can make representations to the Scottish Ministers in relation to the application, and the address to where representations are to be sent.
- 1.9.2 In accordance with Regulation 18 of the EIA regulations, copies of the EIA Report will be available to the public to view on the application at website at: <https://www.lochkempstorage.co.uk/>.
- 1.9.3 Hard copies of the EIA Report will also be available to view at the following locations:
- Fort Augustus Village Hall, Fort Augustus, PH 23 4DG;
 - The Wildside Centre, Whitebridge, Stratherick, IV2 6YP; and
 - The Highland Council Headquarters, Inverness, IV3 5PB.
- 1.9.4 Additional copies of the EIA Report may be obtained from Loch Kemp Storage at a charge of £30 on a USB drive or £500 per hard copy. Copies of a short Non-Technical Summary are available free of charge. Enquiries can be made via the project email at: contact@lochkempstorage.co.uk