## United Kingdom-Sheffield: Industrial machinery 2023/S 120-378484

**Contract notice** 

Supplies

#### Legal Basis:

#### Directive 2014/24/EU

#### Section I: Contracting authority

I.1) Name and addresses

Official name: The University of Sheffield Postal address: Arts Tower Town: Sheffield NUTS code: UKE32 Sheffield Postal code: S10 2TN Country: United Kingdom Contact person: James Noble E-mail: Internet address(es):

Main address:

#### I.3) Communication

The procurement documents are available for unrestricted and full direct access Additional information can be obtained from the abovementioned address Tenders or requests to participate must be submitted electronically

#### 1.4) Type of the contracting authority

Body governed by public law

#### I.5) Main activity

Education

#### Section II: Object

II.1) Scope of the procurement

#### II.1.1) Title:

Flue Gas/CO2 Scrubbing and Conditioning System (16 Lots) Reference number: 3808/JN

#### II.1.2) Main CPV code 42000000 Industrial machinery

#### II.1.3) Type of contract Supplies

#### II.1.4) Short description:

With co-funding from the European Regional Development Fund and BEIS, the University of Sheffield is establishing a national Translational Energy Research Centre (TERC) as an integrated multi-technology, pilot-scale R&D platform for low-carbon technologies including hydrogen, bioenergy (BE), and Carbon Capture,

scrubbed to low ppb levels to prevent poisoning of the plant catalyst. II.1.5) Estimated total value Value excluding VAT: 350 000.00 GBP II.1.6) Information about lots This contract is divided into lots: yes Tenders may be submitted for all lots Description II.2.1) Title: Flue gas probe, cathode inlet mixing valve, O2 feed in skid (a-c) Lot No: 1 II.2.2) Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses) II.2.3) Place of performance NUTS code: UKE32 Sheffield II.2.4) **Description of the procurement:** To monitor flue gas quality for excessive CO and low O2 using an in-situ probe and to bleed in air to maintain required O2 levels or to divert from flue gas supply to air in case of combustion problems, whereby the divertor valve or a combination of a divertor and bleed valve is/are sized for an air bleed of ~1-60Nm3/h) and full air bypass up to 264N/m3. II.2.5) Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents II.2.6) **Estimated value** Value excluding VAT: 8 000.00 GBP II.2.7) Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no II.2.10) Information about variants Variants will be accepted: yes II.2.11) Information about options Options: no II.2.13) Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund

Utilisation and Storage (CCUS). Site equipment includes a Molten Carbonate Fuel Cell (MCFC) which forms

This tender covers the scrubbing and conditioning of biomass boiler flue gas (as well as synthetic/semi-synthetic flue gas) to meet stringent purity requirements of the MCFC. It also covers fuel feed to the Anode side of the MCFC. S-containing impurities as well as compounds containing halogens (e.g., HCl), As, Se and P must be

part of a Bioenergy with Carbon Capture and Storage/Utilisation (BECCS) system.

- Additional information II.2.14)
- II.2) Description

II.2)

II.2.1)	Title: Flue gas filter Lot No: 2
II.2.2)	Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
II.2.3)	Place of performance NUTS code: UKE32 Sheffield
II.2.4)	<b>Description of the procurement:</b> To remove particulates, from sampled flue gas from (primarily) biomass boiler from 40mg/m3 to <65µg/m3; pressure drop should not overall exceed fan capabilities across the full gas train.
II.2.5)	Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents
II.2.6)	Estimated value Value excluding VAT: 10 000.00 GBP
II.2.7)	Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no
II.2.10)	Information about variants Variants will be accepted: yes
II.2.11)	Information about options Options: no
II.2.13)	Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund
II.2.14)	Additional information
II.2)	Description
II.2.1)	<b>Title:</b> Flue gas fan (a-c) Lot No: 3
II.2.2)	Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
II.2.3)	Place of performance NUTS code: UKE32 Sheffield
II.2.4)	<b>Description of the procurement:</b> To sample 72-264Nm3/h of flue gas (on dry basis) primarily from biomass boiler through flue gas manifold pipework (~130m, 4" SS316 pipe) and filter, to the wet scrubber and demister, and downstream equipment to

deliver 80-130-300 Nm3/h of humidified gas at 47±15mabr (max 137mbar) to the MCFC. Estimated pressure drops across the full gas train. (See also cathode gas skid regarding control) Optionally this also includes flue gas flow meter for the corresponding range, for example: Vortex, averaging pitot tube, or other. II.2.5) Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents II.2.6) Estimated value Value excluding VAT: 8 000.00 GBP II.2.7) Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no II.2.10) Information about variants Variants will be accepted: yes II.2.11) Information about options Options: no II.2.13) Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund Additional information II.2.14) II.2) Description II.2.1) Title: Wet scrubber and demister Lot No: 4 II.2.2) Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses) II.2.3) **Place of performance** NUTS code: UKE32 Sheffield II.2.4) **Description of the procurement:** To scrub: Bioenergy flue gas downstream of flue gas diverter, filter and VSD Blower or bulk CO2 from site supply to remove impurities to levels required by the MCFC; and with optional capacity to treat an additional 40Nm3/h of bulk CO2 for FT plant. II.2.5) Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents II.2.6) Estimated value Value excluding VAT: 60 000.00 GBP II.2.7) Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023

II.2.10) Information about variants Variants will be accepted: yesII.2.11) Information about options

This contract is subject to renewal: no

Options: no

#### II.2.13) Information about European Union funds

The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project:

European Regional Development Fund

#### II.2.14) Additional information

II.2) Description

II.2.1) Title: CO2 dryer

Lot No: 5

#### II.2.2) Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)

#### II.2.3) Place of performance NUTS code: UKE32 Sheffield

#### II.2.4) **Description of the procurement:**

To dry up to 80m3/h of CO2 from the Wet Scrubber + Demister down to at least -20°C dew point for downstream metering.

#### II.2.5) Award criteria

Price is not the only award criterion and all criteria are stated only in the procurement documents

### II.2.6) Estimated value

Value excluding VAT: 17 000.00 GBP

#### II.2.7) Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023

End: 31/08/2023

This contract is subject to renewal: no

- II.2.10) Information about variants Variants will be accepted: yes
- II.2.11) Information about options

Options: no

#### II.2.13) Information about European Union funds

The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project:

European Regional Development Fund

#### II.2.14) Additional information

- II.2) Description
- II.2.1) Title:

Dry scrubber Lot No: 6 II.2.2) Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses) II.2.3) Place of performance NUTS code: UKE32 Sheffield II.2.4) **Description of the procurement:** To scrub bulk CO2 from site supply to remove impurities (primarily S-containing compounds) to purity requirements of the MCFC; and with a total capacity of 80m3/h, to supply up to 40Nm3/h to the Anode and cathode gas skid + up to 40Nm3/h for FT plant. II.2.5) Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents II.2.6) **Estimated value** Value excluding VAT: 55 000.00 GBP II.2.7) Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no II.2.10) Information about variants Variants will be accepted: yes II.2.11) Information about options Options: no II.2.13) Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund II.2.14) Additional information II.2) Description II.2.1) Title: Cathode gas mixing skid Lot No: 7 II.2.2) Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses) II.2.3) Place of performance NUTS code: UKE32 Sheffield II.2.4) **Description of the procurement:** 

To meter and mix component gases: CO2, N2, CA, to generate representative flue /process gas mixtures or to modulate real flue/process gases, whereby the CO2 is fed from:

- the wet scrubber after demister and Dryer or
- the dry scrubber or

• bulk CO2 from site supply for subsequent scrubbing the wet /dry scrubber, as a standalone gas or as part of the overall synthetic/real flue/process gas mixture

The skid (within its monitoring and control capability) would also meter flue gas/air flowrate and control the flue gas VSD fan as well as the inlet probe and diverter

Optionally the skid will also incorporate an additional line for O2 flow metering and control for direct injection into the flue gas where O2 levels are too low , where the O2 will likely be supplied from onsite electrolysis. For emergency stop the skid should also have a separate fixed flow N2 supply (Flow setting TBC) from site services supply (7-8.5bar, 22mm, 10000L/min shared supply) for cathode supply train purge (covering Fuel cell module, cathode superheater, and recuperator.

#### II.2.5) Award criteria

Price is not the only award criterion and all criteria are stated only in the procurement documents

#### II.2.6) Estimated value

Value excluding VAT: 45 000.00 GBP

## II.2.7) Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no

- II.2.10) Information about variants Variants will be accepted: yes
- II.2.11) Information about options Options: no
- II.2.13) Information about European Union funds
   The procurement is related to a project and/or programme financed by European Union funds: yes
   Identification of the project:
   European Regional Development Fund
- II.2.14) Additional information
- II.2) Description
- II.2.1) Title: Cathode superheater

Lot No: 8

- II.2.2) Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
- II.2.3) Place of performance NUTS code: UKE32 Sheffield

#### II.2.4) Description of the procurement:

To accurately and controllably (ramp-rates of 5-10°C/hr, setpoint to 3 s.f.) heat-up and maintain setpoint temperatures of 80-130-300Nm3/h of humidified cathode gas (real/synthetic/modulated flue/process gas) downstream of the recuperator and humidifier, from ambient or elevated temperature when preheated by the

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	recuperator (to up to ~600°C), and to maintain the targe cathode inlet temperature setpoint of 590 $\pm$ 25°C, which may require superheater exit temperatures of 640-700°C during hot standby.
II.2.5)	Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents
II.2.6)	Estimated value Value excluding VAT: 25 000.00 GBP
II.2.7)	Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no
II.2.10)	Information about variants Variants will be accepted: yes
II.2.11)	Information about options Options: no
II.2.13)	Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund
II.2.14)	Additional information
II.2)	Description
II.2.1)	Title: Anode gas mixing skid Lot No: 9
II.2.2)	Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
II.2.3)	Place of performance NUTS code: UKE32 Sheffield
II.2.4)	Description of the procurement: To meter and mix component gases: CO2, N2, NG, H2, to generate representative fuel gas mixtures whereby the CO2 is be fed from wet or dry scrubber. Optional recycle loop from anode exhaust. Water skid: controls equipment and instrumentation should be collocated with the anode skid due to special location of equipment
II.2.5)	Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents
II.2.6)	Estimated value Value excluding VAT: 36 000.00 GBP
II.2.7)	Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no

II.2.10) Information about variants

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	Variants will be accepted: yes
II.2.11)	Information about options
	Options: no
II.2.13)	Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project:
	European Regional Development Fund
II.2.14)	Additional information
II.2)	Description
II.2.1)	Title: Anode superheater Lot No: 10
II.2.2)	Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
II.2.3)	Place of performance NUTS code: UKE32 Sheffield
II.2.4)	<b>Description of the procurement:</b> To accurately (to 3 significant figures) and controllably (ramp-rates of 5-10°C/h) heat 6-33Nm3/h fuel gas downstream of the anode humidifier, from ambient or elevated temperature (after 20kW anode humidifier to target operating temperatures of 580 ± 25°C or as high as 640-700 °C during startup or hot standby.
II.2.5)	Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents
II.2.6)	Estimated value Value excluding VAT: 20 000.00 GBP
II.2.7)	Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no
II.2.10)	Information about variants Variants will be accepted: yes
II.2.11)	Information about options Options: no
II.2.13)	Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund
II.2.14)	Additional information
II.2)	Description
II.2.1)	Title:
	Ultra-pure water (UPW) supply loop Lot No: 11
II.2.2)	Additional CPV code(s)

31161200 Gas cooling systems38000000 Laboratory, optical and precision equipments (excl. glasses)

#### II.2.3) Place of performance

NUTS code: UKE32 Sheffield

#### II.2.4) Description of the procurement:

To provide a cat-5-type ultra-pure water supply loop system with an intermediate 1000L storage for 80 L/h at 2.8 bar (TBC) of deionised water produced from ( 2 off) onsite reverse osmosis plant (with conductivity of 0.1  $\mu$ S/ cm) and provide an estimated 5.5 bar pressurised supply loop for UPW skid for the MCFC and minimum 3 other applications on site: 1) ACP; 2) Electrolyser 2; 3) HP heat exchanger test bed.

The MCFC supply shall also include an additional polishing stage for continuous operation with standby capacity and quality monitoring to provide up to 45L/hr with conductivity of 0.05-0.06  $\mu$ S/cm. The polished UPW supply is required for the cathode steam generator or direct water injection into the recuperator and anode fuel humidifier. It is optional for filling the cathode and anode water seals.

#### II.2.5) Award criteria

Price is not the only award criterion and all criteria are stated only in the procurement documents

#### II.2.6) Estimated value

Value excluding VAT: 10 000.00 GBP

#### II.2.7) Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023

This contract is subject to renewal: no

#### II.2.10) Information about variants Variants will be accepted: yes

II.2.11) Information about options Options: no

# II.2.13) Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund

- II.2.14) Additional information
- II.2) Description
- II.2.1) **Title:**

Ultra-pure water (UPW) skid Lot No: 12

- II.2.2) Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
- II.2.3) Place of performance NUTS code: UKE32 Sheffield
- II.2.4) Description of the procurement:

	To control the flow of ultra-pure water (UPW) from UPW supply loop to: a. cathode and anode water seals,. b. cathode steam generator for flue gas humidification with expected supply of 2-29kg/h c. cathode-anode heat exchanger, for flue gas humidification with expected supply of 2-29kg/h d. Anode humidifier for fuel gas humidification with expected supply of 1-14kg/h Whereby a) and b) are controlled by level and c) and d) require accurate water metering.
II.2.5)	Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents
II.2.6)	Estimated value Value excluding VAT: 8 000.00 GBP
II.2.7)	Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no
II.2.10)	Information about variants Variants will be accepted: yes
II.2.11)	Information about options Options: no
II.2.13)	Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund
II.2.14)	Additional information
II.2)	Description
II.2.1)	Title: Anode water seal Lot No: 13
II.2.2)	Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
II.2.3)	Place of performance NUTS code: UKE32 Sheffield
II.2.4)	<b>Description of the procurement:</b> To provide system overpressure protection to protect the MCFC module and incorporating a level adjusting tank for pressure balancing with Cathode exhaust stream.
II.2.5)	Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents
II.2.6)	Estimated value Value excluding VAT: 8 000.00 GBP
II.2.7)	Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no

II.2.10) Information about variants Variants will be accepted: yes II.2.11) Information about options Options: no II.2.13) Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund II.2.14) Additional information II.2) Description II.2.1) Title: MCC Lot No: 14 II.2.2) Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses) II.2.3) Place of performance NUTS code: UKE32 Sheffield II.2.4) **Description of the procurement:** Motor control centre to provide power management and switching for all relevant BOP plant components included above and in the overall process schematic outlined in Figure 1 (excluding the MCFC module), broadly: By the MCFC - (SCR) controlled power supply to Anode superheater - (SCR) controlled power supply to Cathode superheater. - (SCR) controlled power supply to Anode humidifier /vaporiser (18.2kW in 4 x 230V single phase heaters) - (SCR) controlled power to Cathode steam generator. - Natural gas compressor - Equipment and instrumentation power across the system. - Power management for the main supply (630A) and connection of 30kW regenerative load cell to the grid - PLC power Externally by FGD (potentially as a separate panel) - FAN (VSD) - Wet scrubber system - Dry scrubber system (potentially booster) - UPW circulation loop, and - any equipment and instrumentation power associated with the above or the Cathode skid - PLC power (if required for FGD) II.2.5) Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents II.2.6) Estimated value Value excluding VAT: 30 000.00 GBP II.2.7) Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023

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	This contract is subject to renewal: no
II.2.10)	Information about variants Variants will be accepted: yes
II.2.11)	Information about options Options: no
II.2.13)	Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund
II.2.14)	Additional information
II.2)	Description
II.2.1)	Title: MCFC module instrument PLC logger Lot No: 15
II.2.2)	Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
II.2.3)	Place of performance NUTS code: UKE32 Sheffield
II.2.4)	<b>Description of the procurement:</b> Optionally electrically isolated module controller to take voltage, temperature, and pressure readings from the MCFC to enable controls integration with gas supply system. (Note BOP controller is excluded)
II.2.5)	Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents
II.2.6)	Estimated value Value excluding VAT: 8 000.00 GBP
II.2.7)	Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no
II.2.10)	Information about variants Variants will be accepted: yes
II.2.11)	Information about options Options: no
II.2.13)	Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund
II.2.14)	Additional information
II.2)	Description
II.2.1)	Title:

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	Controls manifold Lot No: 16
II.2.2)	Additional CPV code(s) 31161200 Gas cooling systems 38000000 Laboratory, optical and precision equipments (excl. glasses)
II.2.3)	Place of performance NUTS code: UKE32 Sheffield
II.2.4)	<b>Description of the procurement:</b> Instrument air manifold block with in-build solenoids for control of air supply to instruments: pneumatic isolation, 3 way and control valves.
II.2.5)	Award criteria Price is not the only award criterion and all criteria are stated only in the procurement documents
II.2.6)	Estimated value Value excluding VAT: 2 000.00 GBP
II.2.7)	Duration of the contract, framework agreement or dynamic purchasing system Start: 30/08/2023 End: 31/08/2023 This contract is subject to renewal: no
II.2.10)	Information about variants Variants will be accepted: yes
II.2.11)	Information about options Options: no
II.2.13)	Information about European Union funds The procurement is related to a project and/or programme financed by European Union funds: yes Identification of the project: European Regional Development Fund
II.2.14)	Additional information
	III: Legal, economic, financial and technical information
III.1)	Conditions for participation
III.1.2)	Economic and financial standing Selection criteria as stated in the procurement documents
III.1.3)	Technical and professional ability Selection criteria as stated in the procurement documents
Section IV.1)	IV: Procedure Description
IV.1.1)	Type of procedure Open procedure
IV.1.3)	Information about a framework agreement or a dynamic purchasing system
IV.1.8)	Information about the Government Procurement Agreement (GPA) The procurement is covered by the Government Procurement Agreement: yes
IV.2)	Administrative information
IV.2.2)	Time limit for receipt of tenders or requests to participate Date: 25/07/2023
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Local time: 12:00

- IV.2.3) Estimated date of dispatch of invitations to tender or to participate to selected candidates
- IV.2.4) Languages in which tenders or requests to participate may be submitted: English
- IV.2.6) Minimum time frame during which the tenderer must maintain the tender Duration in months: 4 (from the date stated for receipt of tender)
- IV.2.7) Conditions for opening of tenders Date: 25/07/2023 Local time: 12:00

#### Section VI: Complementary information

- VI.1) Information about recurrence This is a recurrent procurement: no
- VI.2) Information about electronic workflows Electronic ordering will be used Electronic invoicing will be accepted Electronic payment will be used
- VI.3) Additional information:
- VI.4) Procedures for review

#### VI.4.1) Review body

Official name: The University of Sheffield Postal address: Arts Tower Town: Sheffield Postal code: S10 2TN Country: United Kingdom E-mail:

## VI.4.4) Service from which information about the review procedure may be obtained Official name: The University of Sheffield Postal address: Arts Tower Town: Sheffield Postal code: S10 2TN Country: United Kingdom E-mail:

VI.5) Date of dispatch of this notice: 21/06/2023