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The data provided in this dataset are those used in the modelling performed for the paper: Pimm AJ, Cockerill TT, Gale WF. Energy system requirements of fossil-free steelmaking using hydrogen direct reduction. *J Cleaner Production* 312. 2021. <https://doi.org/10.1016/j.jclepro.2021.127665>

Each data file is detailed below:

**hydrogen\_steelmaking\_inputs.xlsx** contains technical and economic parameters related to hydrogen-based steelmaking technology. These are taken from the paper: Vogl V, Åhman M, Nilsson LJ. Assessment of hydrogen direct reduction for fossil-free steelmaking. *J Cleaner Production* 203. 2018. pp. 736-745.

**genTechCosts\_v3.xlsx** contains technical and economic parameters related to the various electricity generation and energy storage technologies included in the model, as well as projections of fuel costs and traded carbon prices. Capacity costs and O&M costs are calculated based on data provided alongside the 'BEIS Electricity Generation Costs (2020)' report by the UK Government Department for Business, Energy & Industrial Strategy (BEIS). Gas fuel costs are taken from 'BEIS Fossil Fuel Price Assumption 2019' by BEIS and converted from p/therm to GBP/MWh. Carbon intensities of CCGT+CCS and biomass+CCS (gross), and biomass fuel costs, are taken from the 'Benchmarking State-of-the-art and Next Generation Technologies' report published by BEIS and Wood / Amec Foster Wheeler in 2018.

**ninja\_wind\_country\_GB\_long-termfuture-merra-2\_corrected.csv** contains hourly wind power capacity factors for the GB long-term future wind fleet for the period 1980-2019 inclusive, developed using reanalysis based on MERRA-2 data and obtained from [www.renewables.ninja](http://www.renewables.ninja).

**ninja\_pv\_country\_GB\_merra-2\_corrected.csv** contains hourly solar power capacity factors for the GB current solar fleet for the period 1980-2019 inclusive, developed using reanalysis based on MERRA-2 data and obtained from [www.renewables.ninja](http://www.renewables.ninja).