

Home Analytics (HA) API

Documentation – Version 2.0

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1 Introduction

Energy Saving Trust is an independent organisation dedicated to promoting energy efficiency, low carbon transport and sustainable energy use. We aim to address the climate emergency and deliver the wider benefits of clean energy as we transition to net zero. We empower householders to make better choices, deliver transformative programmes for governments and support businesses with strategy, research and assurance – enabling everyone to play their part in building a sustainable future.

To this end, we have developed a housing stock database for Great Britain called Home Analytics. It includes rich property information including building attributes, energy efficiency characteristics, suitability indicators for renewable energy technologies, eligibility for grant funding, as well as estimates of vulnerability and deprivation.

The database is derived from millions of property and small area records that are drawn from a variety of trusted sources. Energy Performance Certificates (EPCs) represent the primary data source. Approximately 25% of the homes do not have an EPC on file. To help fill this data gap, Energy Saving Trust has developed a series of modelling techniques to predict values for properties with missing data. Home Analytics is therefore a combination of trusted and modelled records.

The database is designed to provide local, regional, and national government with an evidence base to inform strategy, support policy development and drive action. The data also enables businesses to assess the market potential for their products and services, improve targeting and lead qualification for their marketing campaigns, and leverage customer insight to support product development and improvement.

Under an annual data license, there are two ways to access Home Analytics data, each with their own advantages and cost/royalty implications:

1. **CSV** – the client provides specific criteria and/or geographic area(s) of interest. The data is filtered and the resulting extract is transferred to the client in CSV form.
2. **API** – the client receives a secure login and password to an HA API account that allows them to make direct calls to the database on a per-property-basis.

This documentation focuses on accessing Home Analytics data via the API.

2 API overview

This section provides a high-level functional overview of the API:

- The API is offered as a simple RESTful API
- Content is available in both XML and JSON formats
- The API is exclusively available over HTTPS
- Usage of the API is tracked
- Calls per hour to the API are limited
- The client's account must have a positive credit balance to access the API
- Successful calls to the API's `GetDataForEncryptedToken` or `GetDataForUPRN` method consume 1 credit

Endpoint information

The API is presented as a REST endpoint hosted on the addresses listed below. All endpoints are accessible over HTTPS (443) only.

Endpoint	Address
Live environment	https://ha-api.est.org.uk/v2/

API authentication

The API is protected by a unique **login** code and **client_secret** that are distributed separately to clients. This code and secret must be provided with each call to the API. If the code is not provided the API will respond with an error.

Details on how the **login** code and **client_secret** should be included with each call are contained within the instructions that follow.

Content types

The API will accept inputs to the system that have been serialised in either JSON or XML format. The desired format can be set by specifying the "Content-Type" in the request header.

To specify the format used, please specify “Content-Type” within a HTTP request header. Recommended options for “Content-Type” HTTP request headers are:

Content-Type	Description
application/json	Returns results as JSON
application/xml	Returns results as XML

By default, the response will be returned in the same format as the request. However, this can be manually specified in an “Accept” header in the HTTP request. Valid values for Accept are:

Content-Type	Description
application/json	Returns results as JSON
application/xml	Returns results as XML

Result field elements with null values are not returned and the whole element will be absent from the response. If the Content-Type is not provided, the API will default to JSON.

HTTP status codes

In addition to the information in the response body, a standard HTTP status code will also be returned.

Status code	Meaning
200 (OK)	Indicates the call was a success and the results have been returned.
400 (Bad request)	The payload was received but contained errors. These may be validation errors contained in the response.
401 (Unauthorised)	The payload was received but the authentication details were incorrect. Please check that the Client Login and Client Secret are correct.
500 (Internal server error)	An unexpected error was encountered when validating or calculating the results. If this error persists, please contact us for assistance.

Swagger interface

To assist with development, a simple Swagger UI has been provided at the following URL:

Endpoint	Address
Live environment	https://ha-api.est.org.uk/swagger/ui/index

This provides simple online documentation of the endpoint and enables test payloads to be posted to the API. It also provides example objects in JSON and XML format.

3 Data objects

This section provides definitions of the various result objects that are used by the API. These objects are referenced by the remainder of the document. Please refer to Section 4 of this document for details of how these objects are utilised.

Input objects need to be serialised as either JSON or XML. Results objects will also be serialised as either JSON or XML, as desired.

There are two methods to request data from the Home Analytics API:

1. Use *GetAddressesForPostcode* to obtain an *AddressResult* object. Then, use an item from this output with *GetDataForEncryptedToken*.
2. If the Ordnance Survey UPRN for the property is known, you can use it directly in a *GetDataForUPRN* call to obtain the *DataResult* with Home Analytics data for that property.

These routes return a *DataResult* object containing information about the API call and, for successful calls, Home Analytics data for that property (contained in the *PropertyData* sub-object). These objects and sub-objects are detailed below.

Result data objects

AddressResult

Return object from *GetAddressesForPostcode*.

Parameter	Description	Data type
Success	Indicates whether address data was successfully returned with "true" or "false"	Boolean
Status	Request Status. Can be: • Success = 0 • Unauthorised = 1 • BadRequest = 2 • ServerError = 3	Integer
Addresses	Collection of <i>AddressData</i> objects	Array of <i>AddressData</i>
ErrorText	Description of error if any	String

AddressData

Return sub-object containing address information.

Parameter	Description	Data type
UniqueCode	Encrypted time limited token used to request data for the chosen property.	String
Full_Address_RM	Comma separated address string for the property based on Royal Mail licenced address data	String
Full_Address_OS	Comma separated address string for the property based on Ordnance Survey licenced address data	String
Street_Name	Street name of the property using Ordnance Survey licenced address data	String
La_Code	Local authority code for the area where the property is located using Ordnance Survey licenced address data	String
La_Name	Local authority name for the area where the property is located	String

DataResult

Return object from GetDataForEncryptedToken or GetDataForUPRN.

Parameter	Description	Data type
Success	Indicates whether address data was successfully returned with "true" or "false"	Boolean
Status	Request Status. Can be: - Success = 0 - Unauthorised = 1 - BadRequest = 2 - ServerError = 3	Integer
ErrorText	Description of error if any	String
PropertyData	PropertyData object containing Home Analytics data for the chosen property	PropertyData
RemainingCredits	An indicator of the remaining credits for this API key	Integer

PropertyData

Return sub-object containing the Home Analytics data for the chosen property. Fields with different data labels for Scottish homes denoted by a “*” in the Parameter column and details given in the table below under PropertyData (Scotland).

Parameter	Description	Data type
UPRN	Unique Property Reference Number Ex: 117104506	String
UDPRN	Unique Delivery Point Reference Number Ex: 25352371	String
USRN	Unique Street Reference Number Ex: 1010048	String
LONGITUDE	Representative longitude for the property Ex: -2.65	Decimal
LATITUDE	Representative latitude for the property Ex: 51.5	Decimal
FULL_ADDRESS_RM	Comma separated address string for the property based on Royal Mail licenced address data Ex: 45 Rayleigh Drive, Leigh-on-sea, SS9 4JF	String
FULL_ADDRESS_OS	Comma separated address string for the property based on Ordnance Survey licenced address data Ex: 45 Rayleigh Drive, Leigh-on-sea, SS9 4JF	String
STREET_NAME	Street name of the property Ex: JOHN STREET	String
POSTCODE	The full postcode of the area where the property is located. Ex: SS9 4HR	String
COUNTRY	The name of the country where the property is located. Ex: England	String
LA_NAME	The name of the Local Authority where the property is located. Ex: Southend-on-Sea	String
WARD_NAME	The name of the ward where the property is located. Ex: Blenheim Park	String
LSOA_NAME	The name of the LSOA where the property is located. Ex: Southend-on-Sea 007C	String
COA_CODE	The code of the census output area where the property is located. Ex: E00079947	String

URBAN_RURAL_CLASSIFICATION *	The urban/rural classification of the area where the property is located. Categories include: • A1 - Urban major conurbation • B1 - Urban minor conurbation • C1 - Urban city and town • C2 - Urban city and town in a sparse setting • D1 - Rural town and fringe • D2 - Rural town and fringe in a sparse setting • E1 - Rural village • E2 - Rural village in a sparse setting • F1 - Rural hamlet and isolated dwellings • F2 - Rural hamlet and isolated dwellings in a sparse setting	String
LISTED_BUILDING_GRADE *	Indicates if the property is within a listed building and if so, what grade of listing it has. Categories include: • I • II* • II • Not listed	String
CONSERVATION_AREA	Indicates if the property is within a conservation area. Categories include: • In Conservation Area • Not in Conservation Area • Unknown	String
FLOOD_RISK *	Indicates the property's risk of flooding, based on its location relative to flood risk zones modelled by DEFRA. Categories include: • High • Medium • Low • Very Low • None	String
PROPERTY_TYPE	The property type. Categories include: • Detached house • Semi-detached house • Mid-terraced house • End-terraced house • Small block of flats/dwelling converted in to flats • Block of flats • Large block of flats • Flat in mixed use building	String

BUILT_FORM	The high-level built form for the property. Categories include: • Bungalow • Flat • House	String
FLOOR_LEVEL	The floor level of the property within the building. Categories include: • Ground floor • Mid floor • Top floor • Not Applicable	String
PROPERTY_AGE *	The property's age. Categories include: • Pre-1900 • 1900-1929 • 1930-1949 • 1950-1966 • 1967-1982 • 1983-1995 • Post-1996	String
PROPERTY_TENURE *	The property's tenure. Categories include: • Owner Occupied • Privately Rented • Housing Association • Local Authority	String
HABITABLE_ROOMS	The number of habitable rooms in the property. Categories include: • Less than three • Three • Four • Five • Six • Seven or eight • Nine or more	String
FLOOR_AREA	An estimate of the property's total floor area (m ²). A value of '-1' indicates no data. Ex: 50 m ²	String
BUILDING_HEIGHT	This is a derived value calculated as the difference between the absolute height and the absolute height minimum. A value of '-1' indicates no data. Ex: 50 m	String
MAIN_FUEL_TYPE	The primary fuel type used to heat the property. Categories include: • Mains Gas • Electricity • Biomass • Solid • LPG	String

	- Oil - No fuel	
MAIN_HEATING_SYSTEM	The main heating system used in the property. Categories include: - Boiler - Communal - Heat pump - No heating or hot water system - Room heaters - Storage heaters - Other	String
HOT_WATER_FUEL_TYPE *	The primary fuel type used to heat the hot water for the property. Categories include: - Mains Gas - Electricity - Biomass - Solid - LPG - Oil - No fuel	String
SECONDARY_FUEL_TYPE	The secondary fuel type used to heat the property. Categories include: - Mains Gas - Electricity - Biomass - Solid - LPG - Oil - No secondary system	String
BOILER_EFFICIENCY	NA	String
METER_TYPE	The type of electricity meter within the property. Categories include: - Single - Dual	String
DISTANCE_GAS_GRID	The distance from the property to the nearest property that is connected to the gas grid. A value of '-1.0' indicates no data. Ex: 53.7 m	String
ROOF_ORIENTATION	The compass point orientation of the property's roof. Categories include: - South - South-East - South-West - East - West	String
SOLAR_PV_POTENTIAL	The potential kilowatt hours (kWh) that can be generated per kilowatt peak (kWp) based	String

	on the property's roof orientation and location. A value of '-1' indicates no data. Ex: 874 kWh per kWp/year	
WALL_TYPE	The property's wall construction type. Categories include: • Cavity Construction • Solid Brick or Stone • Timber Frame • System Built	String
WALL_INSULATION	Indicates whether the property's walls are insulated. Categories include: • Insulated • Uninsulated	String
LOFT_INSULATION *	Indicates whether the property has a loft and if so, what its insulation thickness is. Categories include: • No loft • 0-50mm • 51-150mm • 150mm+	String
ROOM_IN_ROOF	Indicates whether the property has a room in roof. Categories include: • Room in roof • No room in roof	String
FLOOR_TYPE	The property's floor construction type. Categories include: • Solid • Suspended • Unheated space/other premise below	String
FLOOR_INSULATION	Indicates whether the property's floors are insulated. Categories include: • Insulated • Uninsulated	String
CYLINDER_INSULATION_TYPE	NA	String
CYLINDER_INSULATION_THICKNESS	NA	String
GLAZING_TYPE *	Indicates the main type of glazing on the property's windows. Categories include: • Single/Partial • Double (Pre-2002) • Double (Post-2002) • Triple	String
SAP_RATING_BAND	The energy efficiency (EPC) band of the property. Categories include: • A-B • C • D	String

	• E • F-G	
SAP_RATING_SCORE	Estimate of the property's SAP energy efficiency score. A value of '-1' indicates no data. Ex: 71	String
ENERGY_DEMAND	Estimate of the property's annual SAP-based primary energy consumption, including electricity, space heating and water heating. A value of '-1' indicates no data. Ex: 15,220 kWh/year	String
FUEL_BILL	Estimate of the property's annual SAP-based fuel bill. A value of '-1' indicates no data. Ex: £1,050/year	String
CO2_EMISSIONS	Estimate of the property's SAP-based CO₂ emissions. Ex: 3.61	String
ENVIRONMENTAL_IMPACT_RATING_BAND *	The environmental impact (EI) band of the property. Categories include: • A-B • C • D • E • F-G	String
ENVIRONMENTAL_IMPACT_RATING_SCORE *	Estimate of the property's environmental impact score. A value of '-1' indicates no data. Ex: 71	String
SOLAR_PV_SUITABILITY	An indicator for the presence of solar PV or the potential for this technology. Categories include: • Installed • Suitable • Not suitable • Legal/technical constraints	String
SOLAR_THERMAL_SUITABILITY	An indicator for the presence of solar thermal or the potential for this technology. Categories include: • Installed • Suitable • Not suitable • Legal/technical constraints	String
HP_READINESS	An indicator for the general readiness of a property to install a heat pump (HP). Categories include: • Existing HP or communal system • HP ready	String

	• Retrofit then HP • Hard to transition to HP	
TRADITIONAL_HP_SUITABILITY	An indicator for the presence of more traditional heat pump technologies (air source and ground source) or the potential for this technology. Categories include: • Installed • Suitable • Not suitable • Legal/technical constraints	String
ALTERNATIVE_HP_SUITABILITY	NA	String
BIOMASS_SUITABILITY	An indicator for the presence of biomass boilers or the potential for this technology. Categories include: • Installed • Suitable • Not suitable • Legal/technical constraints	String
IMD_DECILE	The property's 2019 Index of Multiple Deprivation (IMD) decile based on the LSOA it is located in. '1' represents the most deprived 10% of LSOAs, while '10' represents the least deprived 10%. Ex: 3	String
BENEFIT_CLAIMANT_QUARTILE	The property's benefit claimant quartile based on the COA it is located in. "1" represents a COA in the highest 25% of benefit claimants. "4" represents a COA in the lowest 25% of benefit claimants. Benefits data is sourced from the Department for Work and Pensions (DWP). The data includes the following benefits schemes: • Employment and Support Allowance • Universal Credit • Jobseekers Allowance • Disability Living Allowance • Income Support • Pension Credit Ex: 1	String
FUEL_POVERTY_PROBABILITY *	The probability that the property is in fuel poverty according to the low-income low energy efficiency (LILEE) definition for England and the 10% definition for Wales. Under the LILEE definition, a household is in fuel poverty if: • It has a SAP band of D or lower; and	String

	Its disposable income (after housing costs and energy needs) would be below the poverty line Under the 10% definition, a household is in fuel poverty if the household's fuel bill represents more than 10% of its full income. Ex: 63%	
EPC_FLAG	Whether the property has an EPC record (as of March 2024 for England & Wales and November 2023). Categories include: - Yes - No	String
EPC_LODGEMENT_DATE	The lodgement date of the property's most current EPC record (if one exists). Ex: 2022-02-12	String
EPC_RRN	NA	String

PropertyData (Scotland)

Parameter	Description	Data type
URBAN_RURAL_CLASSIFICATION *	The urban/rural classification of the area where the property is located. Categories include: 1 - Large Urban Area 2 - Other Urban Area 3 - Accessible Small Town 4 - Remote Small Town 5 - Very Remote Small Town 6 - Accessible Rural 7 - Remote Rural 8 - Very Remote Rural	String
LISTED_BUILDING_GRADE *	Indicates if the property is within a listed building and if so, what grade of listing it has. Categories include: - A - B - C - Not listed	String
FLOOD_RISK *	Not currently available in Scottish Home Analytics data	String
PROPERTY_AGE *	The property's age. Categories include: - Pre-1919 1919-1949 1950-1983 1984-1991 1992-2002 - Post-2002	String

PROPERTY_TENURE *	The property's tenure. Categories include: • Owner Occupied • Privately Rented • Social Housing	String
LOFT_INSULATION *	Indicates whether the property has a loft and if so, what its insulation thickness is. Categories include: • No loft • 0-99mm • 100-249mm • 250mm+	String
GLAZING_TYPE *	Indicates the main type of glazing on the property's windows. Categories include: • Single/Partial • Double (pre-2003) • Double (2003 onwards) • Triple	String
HOT_WATER_FUEL_TYPE *	Not currently available in Scottish Home Analytics data	String
ENVIRONMENTAL_IMPACT_RATING_BAND *	Not currently available in Scottish Home Analytics data	String
ENVIRONMENTAL_IMPACT_RATING_SCORE *	Not currently available in Scottish Home Analytics data	String
FUEL_POVERTY_PROBABILITY *	Not currently available in Scottish Home Analytics data	String

4 API process

This section provides a guide to using the API, and the steps required to successfully return Home Analytics data.

GetAddressesForPostcode method

The initial call to the API should be a search for a valid list of properties at a supplied postcode.

This method is located at: `{APIUrl}/GetAddressesForPostcode`. Include the following parameters in the query string:

Parameter	Description	Data type
client_secret	String supplied separately from this document	String
login	Guid supplied separately from this document	String
postcode	Full valid postcode for the area licenced by the client. Please format with a single space character between postcode incode and outcode.	String

Returns AddressResult object.

GetDataForEncryptedToken method

Following a successful call to the GetAddressForPostcode method, the client may make a request for Home Analytics data for their chosen property by supplying the 'uniqueCode' time limited encrypted token together with a valid login and client_secret to the GetDataForEncryptedToken method.

This method is located at: `{APIUrl}/GetDataForEncryptedToken`. Include the following parameters in the query string:

Parameter	Description	Data type
client_secret	String supplied separately from this document	String
login	Guid supplied separately from this document	String
uniqueCode	Encrypted time limited token from the AddressData object of the chosen property	String

Returns DataResult object

GetDataForUPRN method

The client may make a request for Home Analytics data for their chosen property by supplying the Ordnance Survey UPRN together with a valid login and client_secret to the GetDataForUPRN method.

This method is located at: `{APIUrl}/GetDataForUPRN`. Include the following parameters in the query string:

Parameter	Description	Data type
client_secret	String supplied separately from this document	String
login	Guid supplied separately from this document	String
uprn	Ordnance Survey UPRN for the chosen property	String

Returns DataResult object

5 Third party terms

The Home Analytics API contains data from a variety of open sources. The providers of this data require that all end users abide by their terms and conditions. As a reference, we've provided links to the terms for each data source, many of which, fall under the Open Government License.

Department for Levelling Up, Housing and Communities (DLUHC) – EPCs

<https://epc.opendatacommunities.org/docs/copyright>

Department for Levelling Up, Housing and Communities (DLUHC) – IMD

<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

HM Land Registry – Price paid dataset

<https://www.gov.uk/government/statistical-data-sets/price-paid-data-downloads#using-or-publishing-our-price-paid-data>

Historic England – Listed buildings

<https://services.historicengland.org.uk/NMRDataDownload/OpenPages/OSOpenDataLicenceAgreement.aspx?dataset=Listed%20Buildings.zip>

Xoserve – Off-gas postcodes

<https://www.xoserve.com/media/2687/off-gas-postcodes-v2.xlsx> (T&Cs in Excel file)

Office for National Statistics (ONS) – Census

<https://www.ons.gov.uk/help/termsandconditions>

Department for Work and Pensions (DWP) – Benefit claimants

<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Department for Energy Security and Net Zero (DESNZ) – Fuel poverty

<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Met Office – Wind speed

<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

6 Third party royalties

Ordnance Survey (OS)

Some variables within the Home Analytics database are sourced directly or derived from Ordnance Survey products. For organisations that are not part of the Public Sector Geospatial Agreement (PSGA) or do not have a license for the following OS products, royalties will occur.

There are three types of royalties which are charged on an annual basis, per successful call to the API:

- **AddressBase Plus** – any field sourced directly from AddressBase Plus incurs a royalty of £0.01/record.
- **Derived** – any field derived from data contained within AddressBase Plus or MasterMap Topography Layer incurs a royalty of £0.02/record.
- **MasterMap Topography Layer** – any field sourced directly from MasterMap Topography Layer incurs a royalty of £0.04/record.

All successful API calls are charged a minimum royalty of £0.01 for the use of AddressBase Plus. For users that require access to derived data or MasterMap fields, the royalty fee increases. To help streamline the reporting process, all API clients are assigned to one of the following OS royalty tiers:

OS Tier	Description	Royalty (per call)
1	Includes all HA API variables with the following exclusions: • Property type • Roof orientation • Solar PV potential • Building height	£0.01
2	Includes all HA API variables with the exclusions of building height.	£0.03
3	Includes all HA API variables.	£0.05

These tiers may be modified over time to respond to changing business requirements.

Example

For example, this is how the OS royalties would be calculated if a client had 3,000 successful API calls in a year:

- OS tier 1 – $3,000 * £0.01 = £30$
- OS tier 2 – $3,000 * £0.03 = £90$
- OS tier 3 – $3,000 * £0.05 = £150$

Royal Mail

Address information used within the Home Analytics API is sourced from the Royal Mail Postal Address File (PAF). For organisations that do not have a Royal Mail Public Sector License, royalties for this dataset are incurred as part of accessing the API database. The annual royalty is £95/user in the client organisation with direct access to the API key.