# Template to align Terms of References of projects to the U4RIA data and modelling transparency and management goals

# Introduction

This document has been prepared by the Secretariat of the [Roundtable Initiative on Strategic Energy Planning](https://energyeconomicgrowth.org/content/roundtable-initiative-strategic-energy-planning), in discussion with the UK FCDO funded programmes Energy and Economic Growth (EEG) and Climate Compatible Growth (CCG), and the OpTIMUS Community of Practice.

The purpose of this document is to provide donors, international organisations, development partners, and whoever else is going to commission activities involving strategic energy planning and modelling support to developing countries with a **practical way to embed sound data and modelling transparency and management practices**.

Below is an initial template that can be customised and finally included in the Terms of Reference of energy planning and modelling assignments to **align the data, metadata and models produced and treated with the principles of Ubuntu, Retrievability, Repeatability, Reconstructability, Interoperability and Auditability (U4RIA)**.

The different sections of the template refer to each of the U4RIA goals with the following specific objectives:

* **Ubuntu (community engagement):** knowledge and/or capacity about the data is left behind;
* **Retrievability:** the data are easily retrievable and openly accessible;
* **Repeatability:** the key features of the data, model, and modelling process are known;
* **Reusability:** the data are built on previous relevant modelling efforts, and are reusable by future modelling efforts;
* **Reconstructability:** the process to obtain the data can be reconstructed by a third party;
* **Interoperability:** output data can be compared and utilised using other models;
* **Auditability:** third parties are able to audit the data.

**The template below has to be understood as an initial suggestion only** and users will likely need to further tailor it to their project’s circumstances and key aspects.

The document contains footnotes with some editor’s comments that should be deleted before the document is included in Terms of References.

For any questions or further information, please contact [eeg@opml.co.uk](mailto:eeg@opml.co.uk).

# ANNEX X. SPECIAL REQUIREMENTS FOR DATA, METADATA AND MODELS

## Property and Confidentiality of Data and Modelling Outputs

Data collected and deliverables produced under this TOR – including metadata, intermediate data and data collection and analysis methodologies – are the property of [“PROJECT OWNER”][[1]](#footnote-1) and considered confidential information. The Consultant or vendor will protect the confidentiality of establishments and individuals participating in the provision of data or information at all stages. Exception to such protection of confidentiality is at the sole determination of [“PROJECT OWNER”], provided such an exception is allowed under applicable national laws. The Consultant or vendor will ensure that no data or related documentation collected or compiled under these TORs are distributed for commercial or non-commercial purposes to third parties, nor will they be used by the Consultant, firm, its staff or sub-contractors for purposes other than those expressly stated in these TORs, without the prior written approval of the [“PROJECT OWNER”].

**Compliance with the U4RIA data and modelling principles**

[“PROJECT OWNER”] has been part of the process to define a set of principles to promote the robust, accessible and transparent delivery of energy modelling for policy support. Therefore, **all data collected and deliverables produced under this TOR must** **comply with the principles of Ubuntu, Retrievability, Repeatability, Reconstructability, Interoperability and Auditability (U4RIA)**, as illustrated below.

***Ubuntu (Community Engagement)[[2]](#footnote-2)***

Under the provision of this TOR, the Consultant agrees, to the extent specifically agreed with [“PROJECT OWNER”], **to** **engage with the national and international energy planning and modelling community** **about the outputs and methodology produced under this TOR in one or more of the following ways:**

* **Peer review:** The output data and methodology used are reviewed by a group of national and international experts. Indication of the peer reviewers’ names and the peer review process (including the comments received) must be documented and submitted to [“PROJECT OWNER”].
* **Presentation of final deliverables:** The output data and methodology used are presented to a list of relevant national and international stakeholders agreed with [“PROJECT OWNER”].
* **Internal capacity building:** The Consultant builds the capacity of the main governmental end-users in order to transfer the knowledge and ownership of the output data and methodology used. This should also involve regular interaction with the main end-users throughout the modelling process.
* **External capacity building:** The Consultant builds the capacity of a list of relevant national and international stakeholders agreed with [“PROJECT OWNER”], in order to transfer the knowledge and ownership of the output data and methodology used.

***Retrievability***

**In accordance with the “**[**Key principles for improving the support to strategic energy planning in developing and emerging economies**](https://energyeconomicgrowth.org/index.php/publication/key-principles-improving-support-strategic-energy-planning-developing-and-emerging)**”, [“PROJECT OWNER”]** **intends to make all data and other deliverables produced under these TOR publicly available,** unless [“PROJECT OWNER”] believes that the public dissemination of the data will violate confidential information.[[3]](#footnote-3)

In particular, [“PROJECT OWNER”] intends to upload all data and other deliverables produced under these TOR on the following open access platforms and websites:

* [LIST OF WEBSITES AND PLATFORMS]

The Consultant will provide advice to [“PROJECT OWNER”] on options for uploading all data and other deliverables produced under this TOR.

***Repeatability***

Essential metadata describing, *inter alia*, data in and out, model generators, model generated, processes followed, ‘storage’ of that information and related meta-information should be provided for all data products. Core metadata requirements for each data product are:

* Names and contacts of the authors/consultants and lead institution
* Problem or policy issue analysed
* Type of modelling framework (e.g. accounting, optimisation, simulation, etc.)
* Version of the software considered
* Available code base / instance of both the:
  + Software i.e. model generators (e.g. MAED, LEAP, OSeMOSYS, MESSAGE, MARKAL, MAPS, etc.) and
  + the country-specific model ‘generated’ and ‘calibrated’
* Input data (plus related meta-information) to the model, scenario assumptions and the outputs obtained
* Techno-economic information and degree of detail of the energy system structure represented in the model (what components/technologies included and how they are interlinked)
* System boundaries and restrictions (technical, environmental, social) applied and why
* If applicable, policies evaluated, results interpreted, and policies formulated based on the results
* Sensitivity and uncertainty analyses carried out.

***Reusability***

It is important that the modelling outputs from this assignment build on previous relevant modelling efforts. In this regard,

* on the one hand, [“PROJECT OWNER”] commits to share with the Consultant any relevant material in its knowledge and facilitate the Consultant’s retrieval of previous relevant modelling outputs;
* on the other hand, the Consultant must document its efforts to retrieve and build on relevant modelling outputs, including by submitting a list of stakeholders contacted and data / material received.

In addition, the data and deliverables produced under this TOR should be provided in formats that allow as much as possible to be the basis for future modelling efforts. Therefore, data should be provided to [“PROJECT OWNER”] in at least one machine-readable, non-proprietary open file format that complies with the Open Definition. Tabular formats such as CSV and tab-delimited text, or geospatial formats such as Shapefile or GeoJSON satisfy this requirement. Excel, STATA, or other proprietary data formats may optionally be used in addition to at least one open format. PDF and Word are not acceptable formats for data.

Data should be provided according to recognized standards and encodings whenever possible. Data standards are available for many types of data; for instance, GTFS for transport data, or DDI for microdata. The Open Geospatial Consortium documents standards for a broad range of applications and disciplines.

***Reconstructability***

The Consultant should provide a clear description of the workflows to move from the modelling input to the output data, so that the process to obtain the output can be reconstructed by a third party. As a minimum, this will include:

* Reference(s) of the original input data, e.g. source name and author, publication date etc. – or no reference, i.e. the value is an assumption from the modeller
* Level of manipulation (e.g. single value from one source, calculation from multiple values from one source, calculation from multiple values from multiple sources)
* Type of manipulation (e.g. average, mean, straight interpolation etc.)
* Time series included, i.e. details of the years the final value refers to
* Further comments (including description of assumptions involved).

***Interoperability***

The modelling output data from this assignment should be delivered in a form that is conducive for their utilisation by other models with minimal manipulation. To achieve acceptable levels of interoperability, as a minimum, the Consultant commits to:

* Submit well documented or annotated copies of base data to be appropriately stored by [“PROJECT OWNER”]
* Ensure it is on accessible media
* Ensure that the required model version can be downloaded
* Made the data compliant with the Standard Interchange Formats [NAME AND LINK / REFERENCE OF THE SPECIFIC STANDARD INTERCHANGE FORMAT].

***Auditability***

It is important that all the previous U4RI principles are followed, so that a successful audit of the data and deliverables produced under this TOR can be carried out. [“PROJECT OWNER”] reserves the right to include the compliance to the U4RIA principles as described in this Annex in an official audit and link the full or partial release of funding under this contract to the audit’s outcomes.

1. **Editor’s comment:** Please change everywhere in the document the reference to “[“PROJECT OWNER”]” with the appropriate wording of the project outputs’ “owner”, according to your organisation and project’s needs. Depending on the specificities of the case, this may be the Donor / Development Partner (e.g. UK FCDO, IRENA), the main government partner (Ministry of Energy), a third party or even a combination of those option. [↑](#footnote-ref-1)
2. **Editor’s comments:** 1) Peer review, presentation of the final deliverables and internal capacity building should be the minimum requirements to be U4RIA compliant. External capacity building, particularly of local academia, is highly encouraged, but not mandatory. 2) The text in the main body of the TOR will have to include specific activities of stakeholder engagement / research uptake that reflect these “Ubuntu” points. [↑](#footnote-ref-2)
3. **Editor’s comment:** Your legal department should consider tailoring this part according to the specific circumstances. [↑](#footnote-ref-3)