Technical Helpdesk for National LCA Databases

Training on Advanced Dataset Development and Global Network Access – GLAD Initiative: Overview and Objectives

Background on the Forum* and GLAD

- Began in 2012 as an intergovernmental forum with a focus on enabling national life cycle-based policies
- Organized by the EC and UN to facilitate development of life cycle-based policies at the national level
- Original policy focus has evolved to include a strategy to provide tangible products as outputs and specific plans to create tools and mechanisms for data sharing
- Meetings in Malaysia, USA, and Brazil

*International Forum on LCA Cooperation

GLAD: Ambition

"Deliver by 2017 an electronic system and protocol … to enable access by users to the majority of the LCA databases … meaning that the LCA datasets and other data therein can be easily accessed in an exchange format that allows using them seamlessly in LCA software, assessing 'fitness for purpose' by an end user…"

GLAD: Governance and Organization

UN Environment serves as the Secretariat of the GLAD network, with representatives from 14 governments in the Steering Committee.

Global LCA Data Access (GLAD)

- Life Cycle Assessment (LCA) data allow policy makers to develop sound sustainable consumption and production policies, and industries can base their innovation and strategic sustainability decisions on more robust information. Enhanced data accessibility and interoperability benefits the whole life cycle community and affects the way in which Life Cycle Assessment (LCA) goes mainstream.
- The “Global LCA Data Access” network (GLAD) aims to achieve better data accessibility and interoperability. The network will be comprised of independently-operated LCA databases (nodes), providing users an interface to find and access life cycle inventory datasets from different providers. GLAD will thus support life cycle assessment through easier access to data sources around the world.
- One of the main functionalities of GLAD will be the conversion function which will allow users to convert a dataset from its native format in the source database (node) into another format convenient for the user. This functionality is based on key metadata descriptors that will be required from datasets to be connected to GLAD in order to allow for interoperability between them, as well as a global mapping of elementary flows’ nomenclature.

Global LCA Data Access (GLAD)

- GLAD is a website which provides users an interface to find and access life cycle inventory datasets from different dataset providers.
- GLAD delivers two main services:
  - Find datasets (through a search component, including globally agreed metadata descriptors);
  - Use datasets (by allowing their conversion and download into the user's software, in the desired format).
- Added value of GLAD comes from:
- Massively increased access to data (benefit for data providers, as well as for users of data);
- Facilitating interoperability of data formats (with a view to gradually harmonised LCA datasets)

Global LCA Data Access (GLAD)

- In order to ensure interoperability of datasets, working groups involving global experts from governments, academia, and LCA data and software providers were established around the following areas:

I. “Network Architecture and Technology”, which defined the specifications of the IT environment required for the network;

II. “Nomenclature”, delivering a global elementary flow mapping file for Life Cycle Inventory datasets; and,

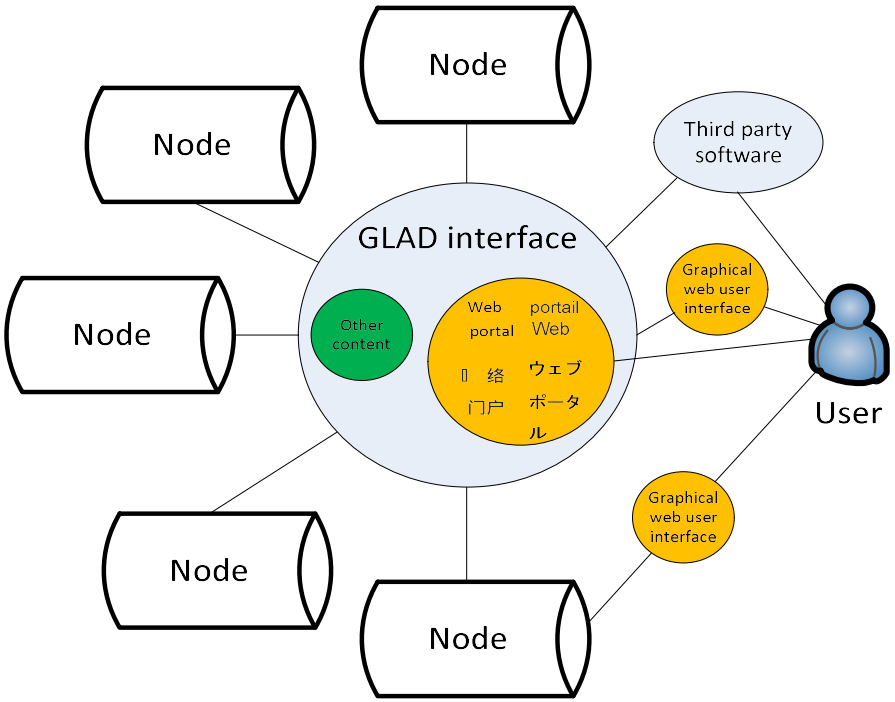
III. “Metadata descriptors”, delivering a basic list of metadata descriptors to facilitate interoperability and the assessment of "fitness for purpose" by users, as well as advanced recommendations on how interoperability and assessment of fitness for purpose can be enhanced in the future.

Principles and Rules Adopted

- **Network should be open.** Data should be accessible and extendable to all interested users and the network should include data from a variety of sources in different formats, as long as those formats meet some common minimum requirements.
- Direct **access is required to the metadata** allowing the assessment of fitness for purpose by the user, whereas access to the datasets themselves may be subject to restrictions (e.g. available for a fee, or only for authorized and registered users);
  - Any restrictions of access to parts of the network must be transparent.
- **Inclusiveness:** All nodes willing to join (private and public) can join, if they agree with the partnership agreement
  - Datasets need to meet minimum requirements for interoperability (defined in terms of flow nomenclature and metadata descriptors).
  - Requirements for the nodes themselves are also defined by the Network's Steering Committee (or governing body), and the requirements are the same for all nodes
- All **nodes abide to the same rules** (no special rules for commercial nodes)
- Nodes are **encouraged to provide transparent data**.
- Provided **data must be correct** (no QA on the network)

Network Architecture

Potential future structure of GLAD



Central, multi-lingual, user interface**, enabling access to **nodes worldwide**, ensuring **interoperability** through agreed **nomenclature** and **metadata descriptors

Expected operation of the Network - Nodes

- From the **NODES' point of view**, the operation would be as follows:
- **Nodes decide to become accessible** through Global LCA Data Access (all or part of datasets)
- **Automated test of compliance** with requirements -
  - Nomenclature
  - Metadata
- Node signs up to the rules of Global LCA Data Access / Partnership agreement
- Node adapts connection/access of its datasets metadata from the central interface API
- **Connection made with Node** through API (Application Programming Interface)
- Whenever datasets are searched in Global LCA Data Access, compliant (interoperable) **datasets in the node are included in the search, and the list of datasets fitting the search criteria are returned with access to their metadata**
- **Node communicates clearly the licensing terms** of the data stored within it

Role: Node Operator

- **Node signs up** to the rules of Global LCA Data Access Network
- **Node adopts connection/access** of metadata for its datasets using the central interface API
- **Connection made with Node** through API (Application Programming Interface)
- **Nodes become accessible** through Global LCA Data Access (all or part of datasets) when approved and fully conforming
- **Automated test of compliance** with requirements is done – covering Nomenclature and Metadata

Expected operation of the Network - Users

- From the **USERS' point of view**, the operation would be as follows:
  - The **user identifies a need for specific datasets and contacts the central interface**
  - The central interface helps **user identify the list of available datasets in the network's nodes that comply with search criteria** (informed by metadata requirements)
- **Such datasets would be stored in their respective nodes not in GLAD**
- The user can then decide, with his/her own responsibility, the best dataset, pay for it if required, and import into the LCA software with the required exchange format to enable seamless use in the software. **The network will not be responsible for any consequences resulting from users' decisions**.

Format and Nomenclature Functionality

- GLAD will facilitate on-demand conversion of the datasets formats including the fields that are listed as basic metadata (the ones being used as search filters) AND nomenclature.
- Instructions on how new formats and mapping files can be created and added to this functionality will be provided to enable data providers and users to expand the conversion accuracy and reduce limitations.
- Provide access to all datasets directly via the registered nodes. These datasets will be in formats as provided by the nodes (not modified by GLAD) and meet minimum GLAD requirements. -
- In addition to its own conversion functionality, GLAD will point users to external tools and services that they can use to perform format, metadata and elementary flow conversion for datasets; provide reference to instructions and mapping files for these tools; and may provide tutorials demonstrating how to use them.

Meta-indicators

UN Environment GLAD WG 3 metadata descriptors, task 3, final draft report, June 2017

		Goal	Value & representation	Conformance
ID	Process name		0a	
	Process type		0b	
gvc Descriptors	Time	Ia	IVa	IIa
	Geography	Ib	IVb	IIb
	Technology	Ic	IVc	IIc
	Model completeness	Id	IVf	IId
	Sample representativeness	Ie	IVg	IIe
	LCA nomenclature systems		IVd	
	LCIA methods	If	IVe	
Modeling	LCI modeling type		IVh	
	System boundaries		IVi	
	Multifunctional processes		IVj	
	Biogenic carbon		IVk	
	Land use		IVl	
	Wastes and end-of-life		IVm	
	Water		IVn	
	Infrastructure/capital goods		IVo	
	Long-term emissions		IVp	
	Temporary carbon storage		IVq	
Sampling	Sample approach	Ig		
	Reliability of the sources used		IIIa	
Calculation	Aggregation type if any		VIa	
QA	Data set review performed		Va	
	Type of data set review		Vb	
	Quality assurance performed		Vc	
	Reviewing person(s)		Vd	
Administrative	Copyright protected data set?		VIIa	
	Copyright holder		VIIb	
	Free data set or for purchase?		VIIc	
	Data set license		VIId	
	Data set contact		VIIe	

Descriptor element supported in / provided by

GLAD	ILCD	ILCD & EcoSpold02	EcoSpold02	not applicable	not foreseen	(ILCD)	(ILCD & EcoSpold02)	(EcoSpold02)

Meta-data acquisition

Meta-data –pre-requisites and criteria…

- Registered Nodes need to be available online, or at least **post the metadata values of their datasets online and offer access to metadata descriptors for free.**
- **Avoid requiring dataset providers to modify their datasets** to be added to GLAD (i.e. nodes that provide or overfulfill the agreed metadata descriptors should be searchable right away without needing to update their datasets).
- The agreed metadata descriptors shall be a cut-set of broadly **existing and already defined metadata descriptors** and not requesting individual wishes or new concepts or ideas of single (new) approaches

Interoperability Key: Meta-indicators

- Metadata descriptors are the basis for searching, filtering and sorting across registered nodes. The metadata descriptors defined by GLAD as the minimum set of descriptors to ensure interoperability have been defined.
- For reference, they include fields such as the following (still to be updated on final version approval):
  - Process name (e.g. leather tanning, chrome-based)
  - Process type (e.g. aggregated process; unit process)
  - Represented Time (e.g. 2005 data)
  - Represented Geography (e.g. Italy)
  - LCA nomenclature system(s) supported by the dataset (e.g. ILCD reference flow list, ILCD 1.1 from May 2015, ILCD flowlist February 2017)
  - etc.