

IEA EBC Annex 72:

Assessing life cycle related environmental impacts caused by buildings

Life cycle related environmental data and databases

Rolf Frischknecht

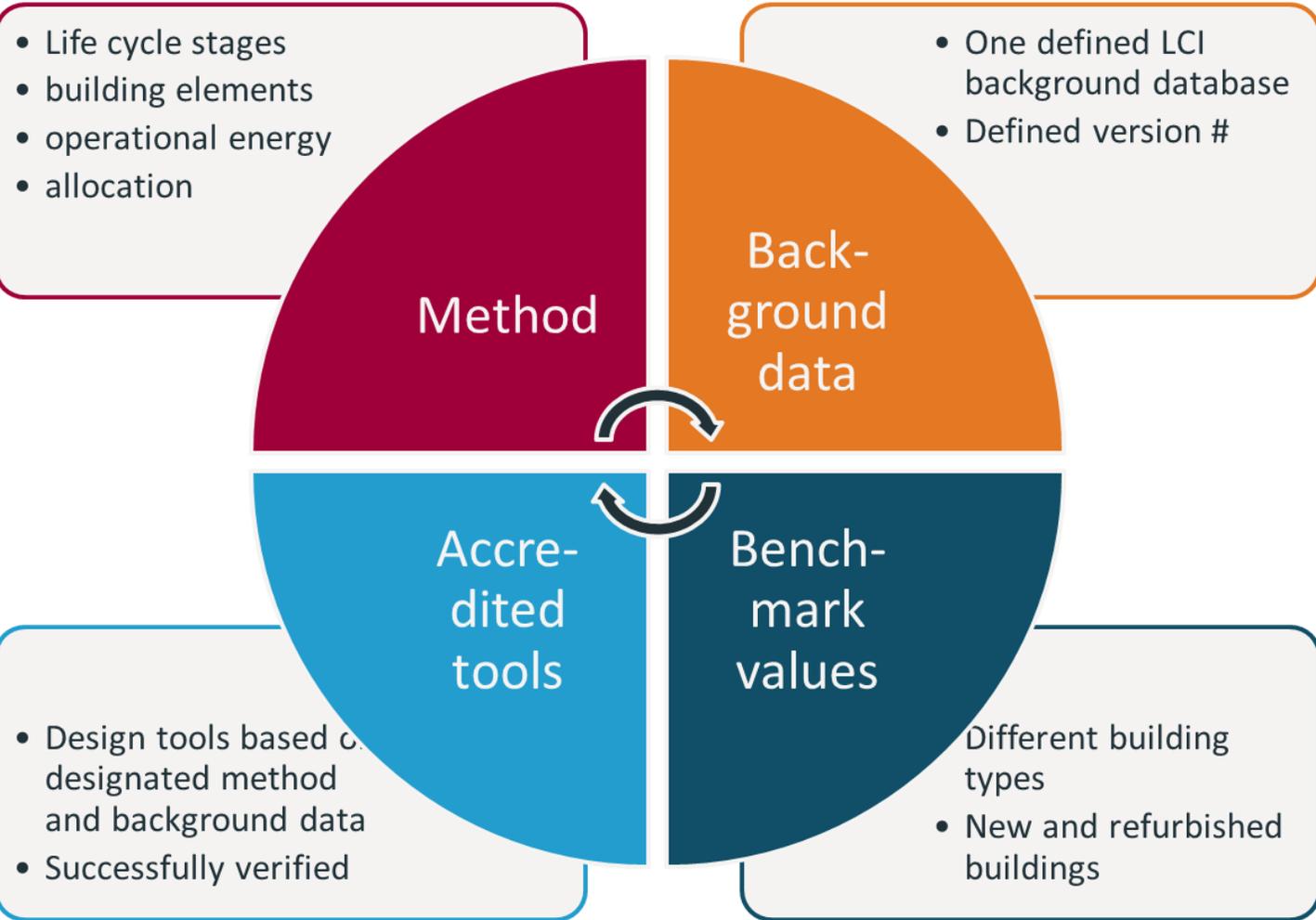
Co-leader Subtask 4, Switzerland

Final event:

SBE'22, Berlin, Germany, 21 September 2022

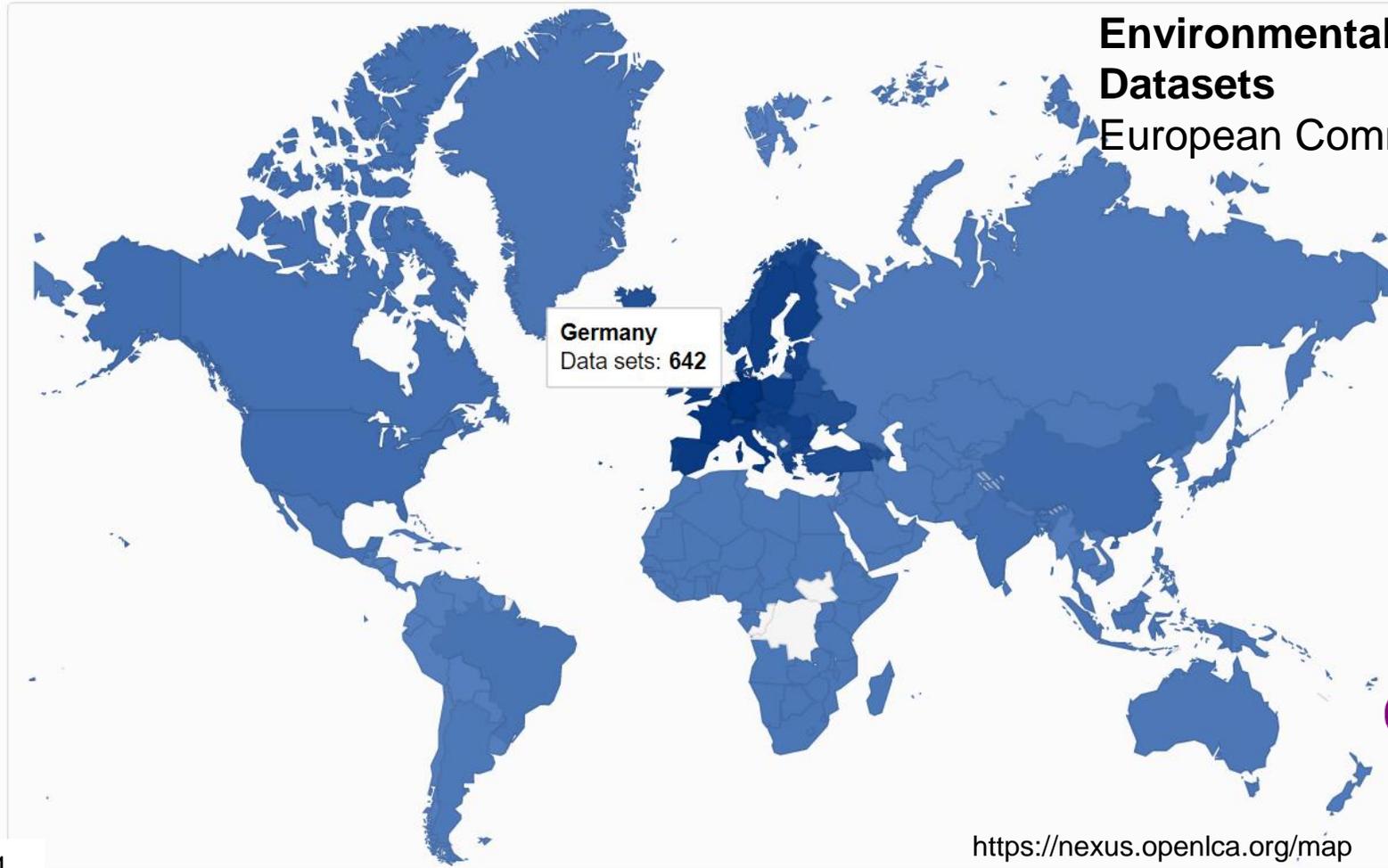
LIFE CYCLE ASSESSMENT (LCA) DATA: ANNEX 72

KEY ELEMENT OF THE TOOLBOX



LIFE CYCLE ASSESSMENT DATASETS AVAILABLE WORLDWIDE

Environmental Footprints Datasets European Commission



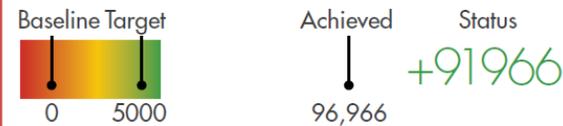
Progress on goals at end-2021

LC knowledge products (data, impact assessment factors) available and interoperable on a knowledge sharing platform.

Databases interoperable through Global LCA Data Access network (GLAD)



LCA datasets accessible



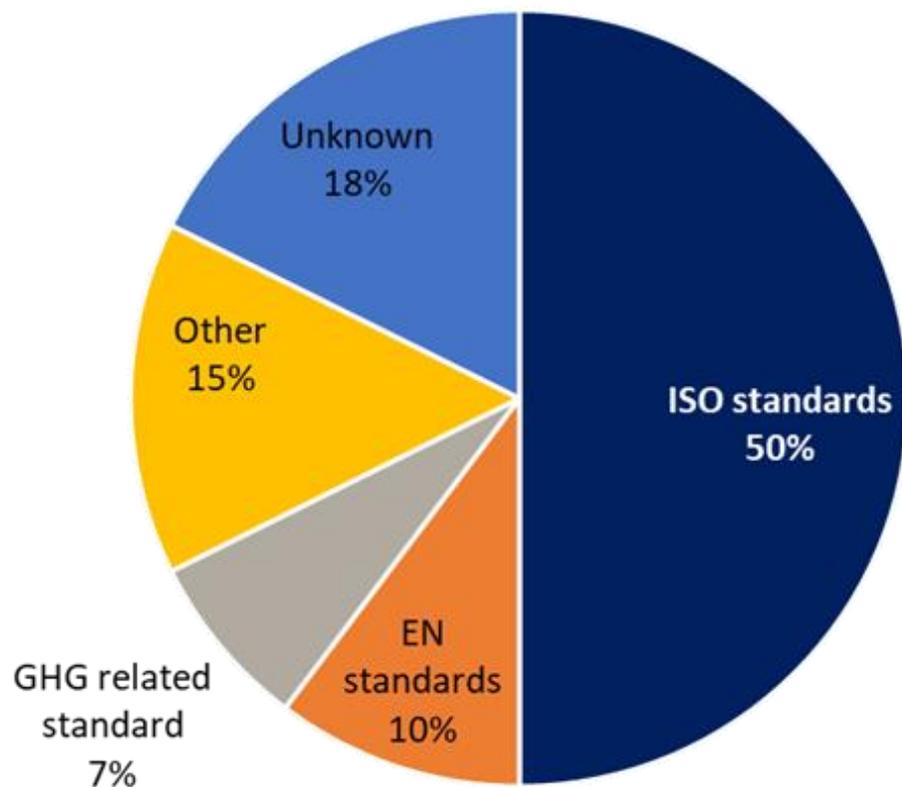
LCIA indicators available through e-platform linked through global nomenclature system



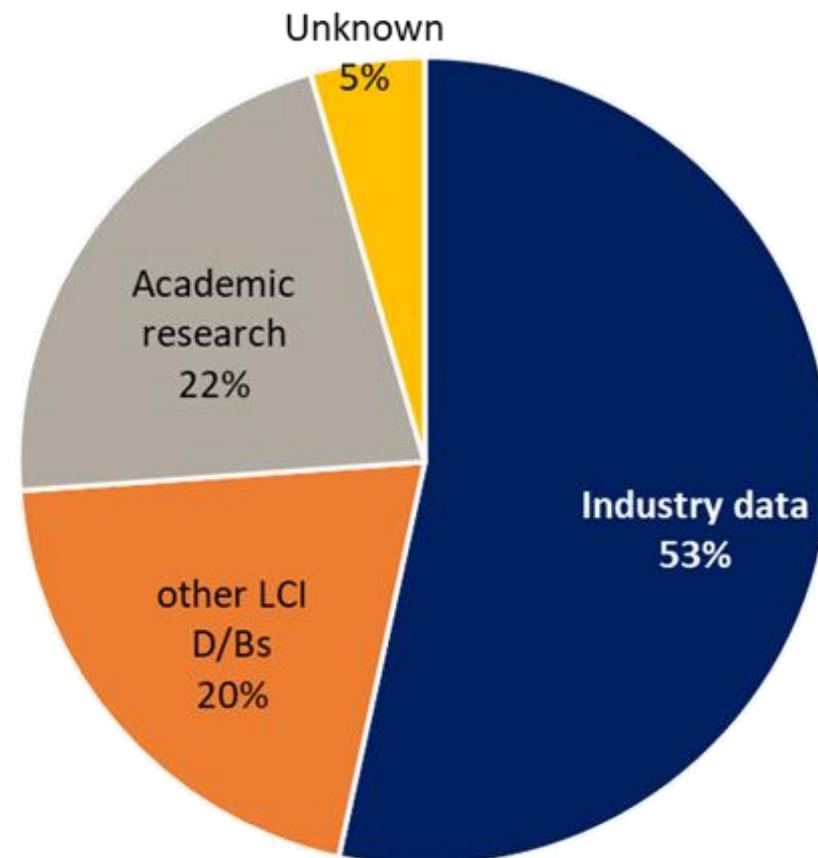
Life Cycle Initiative Progress Report 2021

SOURCES Global survey (approx. 60 online databases)

Applied standards



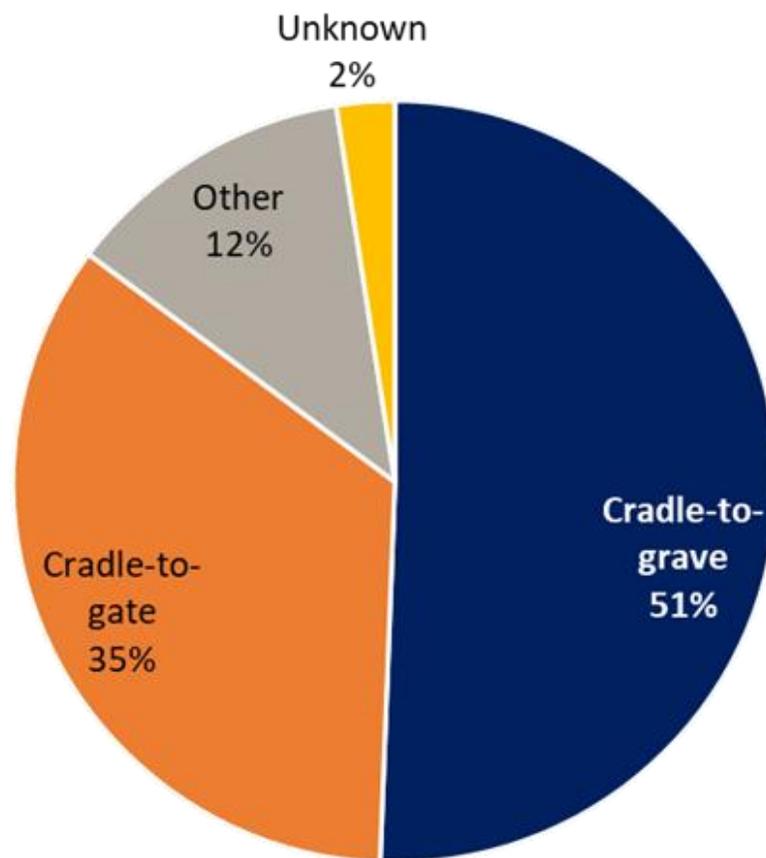
Origin of data sources



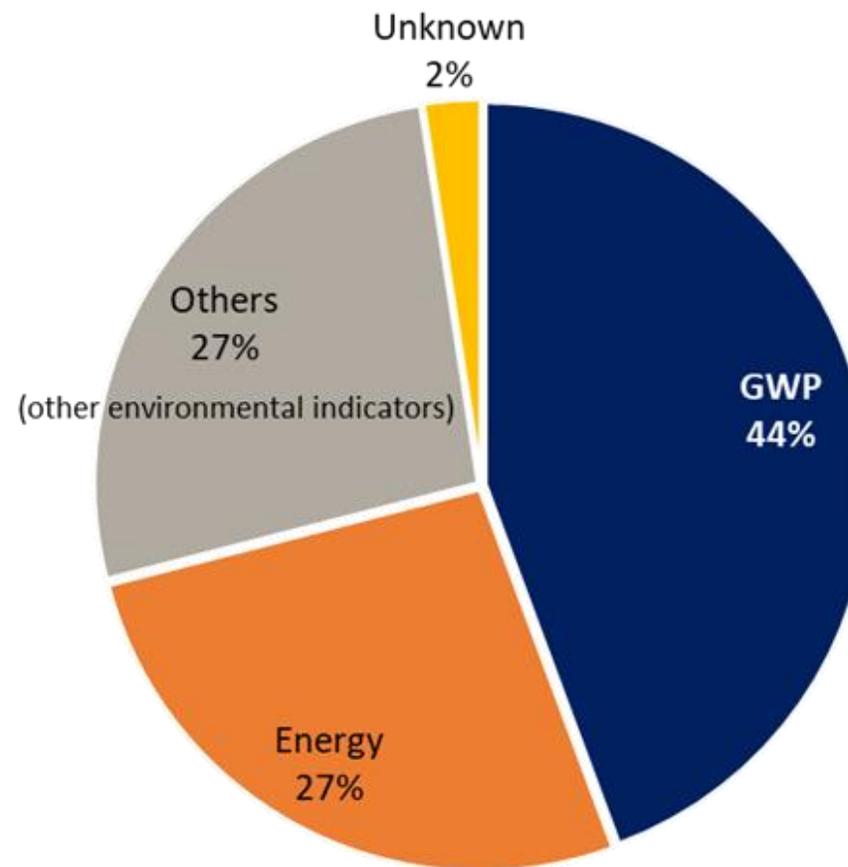
SCOPE OF LCA DATASETS

Global survey (approx. 60 online databases)

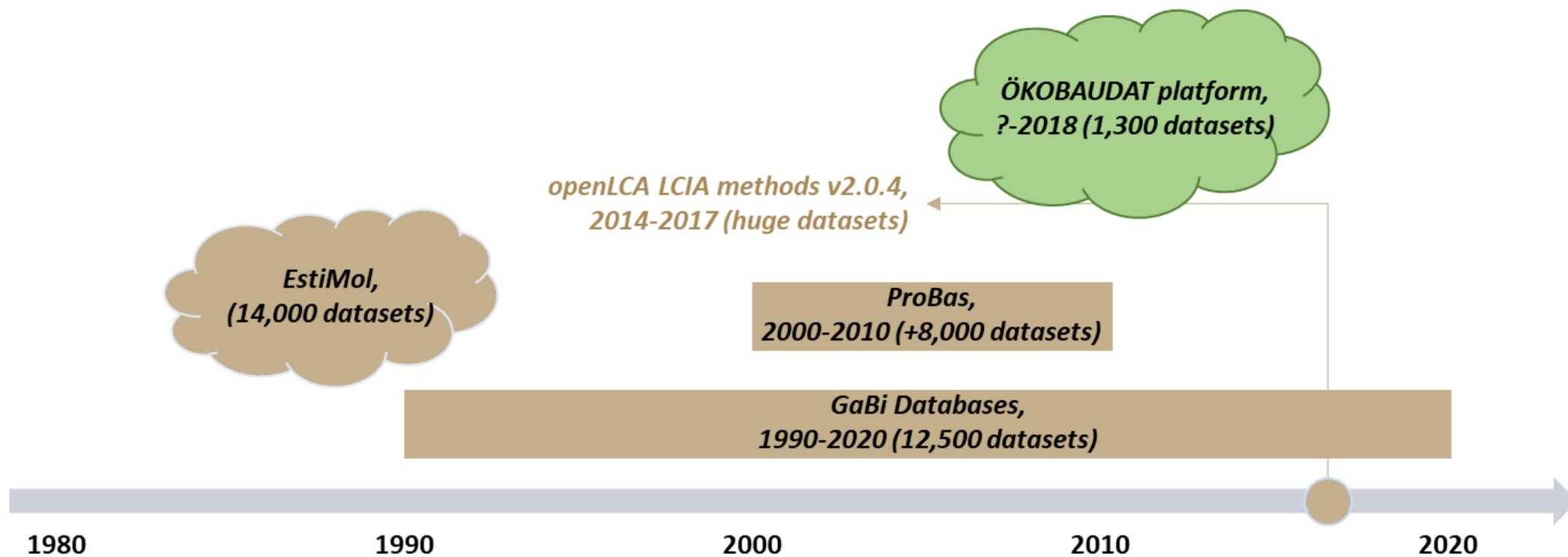
Life cycle stage



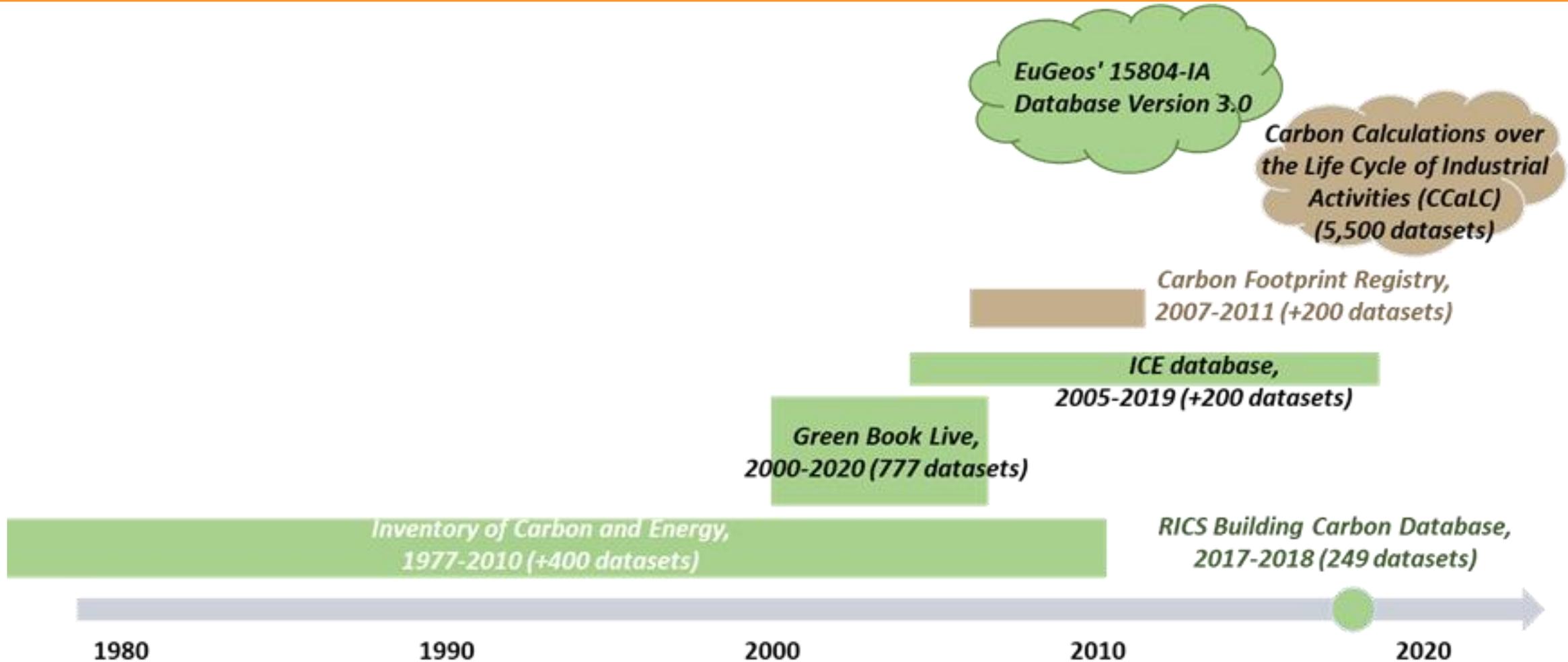
Indicators of results



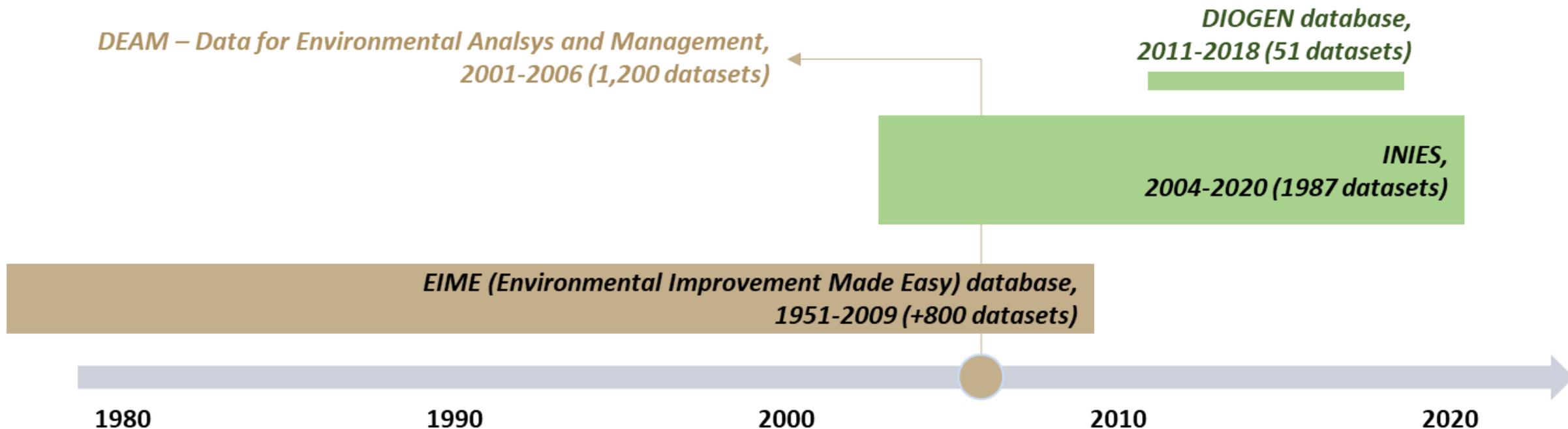
STATE OF LCA DATABASES IN GERMANY



STATE OF LCA DATABASES IN UNITED KINGDOM



STATE OF LCA DATABASES IN FRANCE



STATE OF LCA DATABASES IN FURTHER EUROPEAN COUNTRIES

*Italian National LCI Database,
Italy (Closed)*

*BEDEC - Banco BEDEC 2019, Spain
?-2020 (+10,000 datasets)*

ARVI database, Finland 2014-2016

Envimat, Czech 2011-2013

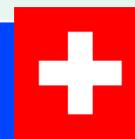
*EDIP method and tools,
Denmark 1996-2003*

*CPM LCA Database,
Sweden, 1990-2010 (700 datasets)*

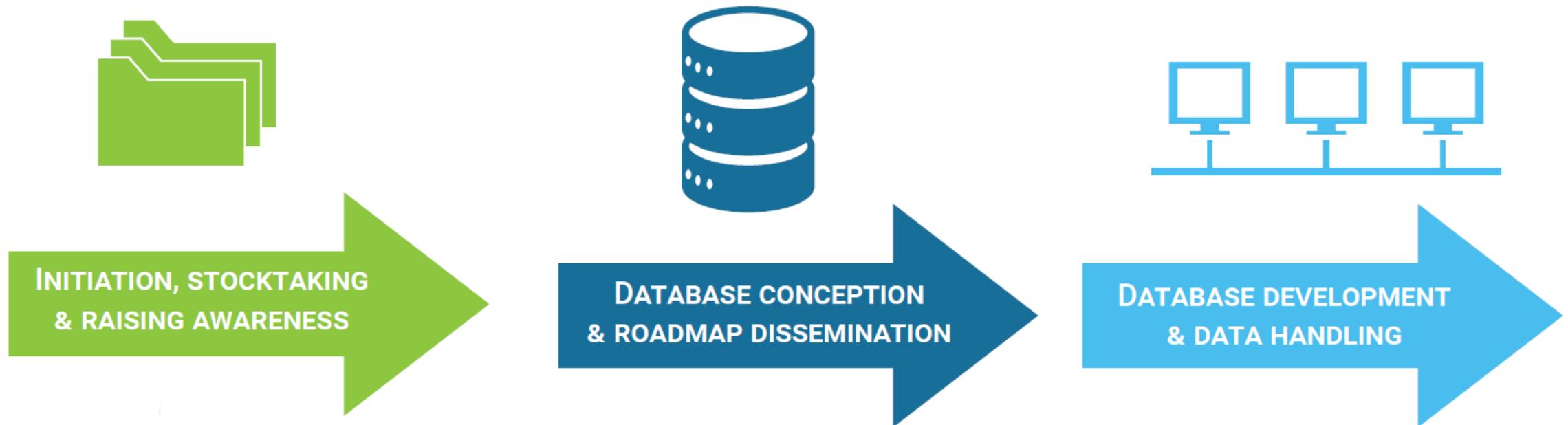


CONTENTS OF LCA DATABASES IN SELECTED EUROPEAN COUNTRIES

	Ökobaudat	KBOB recommendation 2009/1	Envimat
Geographic validity	German market	Swiss market	Czech market
LCA method	Process based LCA	Process based LCA	Process based LCA
In operation since	2013	2006	2013
Language	German, english	German, french, italian, english	Czech
Purpose	unified database for building LCAs	assess environmental impacts of buildings, prove compliance with sustainability labels, monitoring „2000-watt-society“ communities	evaluate and compare building structures
Environmental indicators covered	GHG emissions , ozone depletion, summer smog, acidification eutrophication, abiotic resource depletion	GHG emissions , total environmental impacts, primary energy	GHG emissions , ozone depletion, summer smog, acidification eutrophication, primary energy



ROADMAP FOR LCA DATABASE DEVELOPMENT



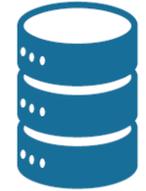
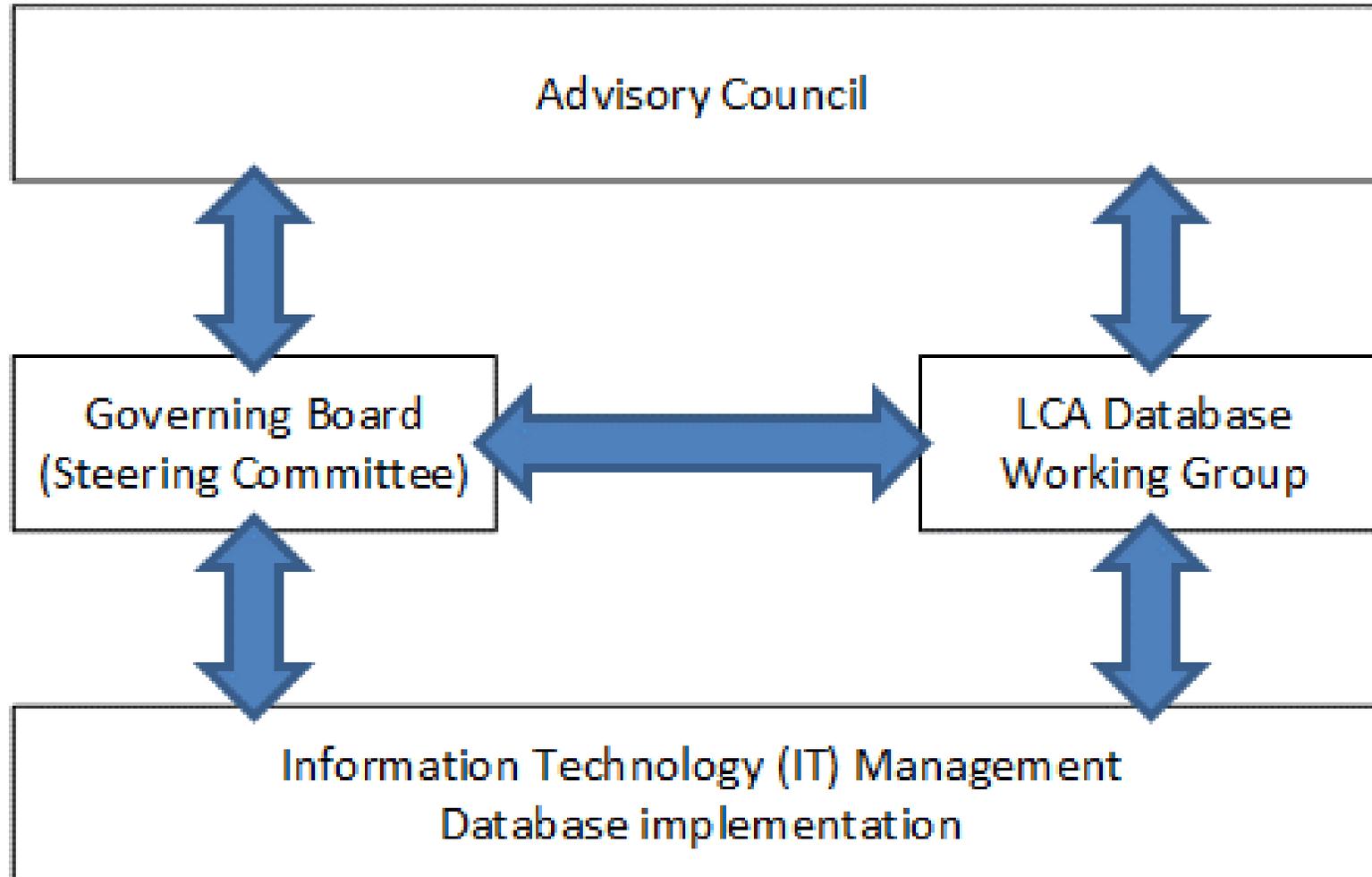
UNEP (2020)

ROADMAP FOR LCA DATABASE DEVELOPMENT

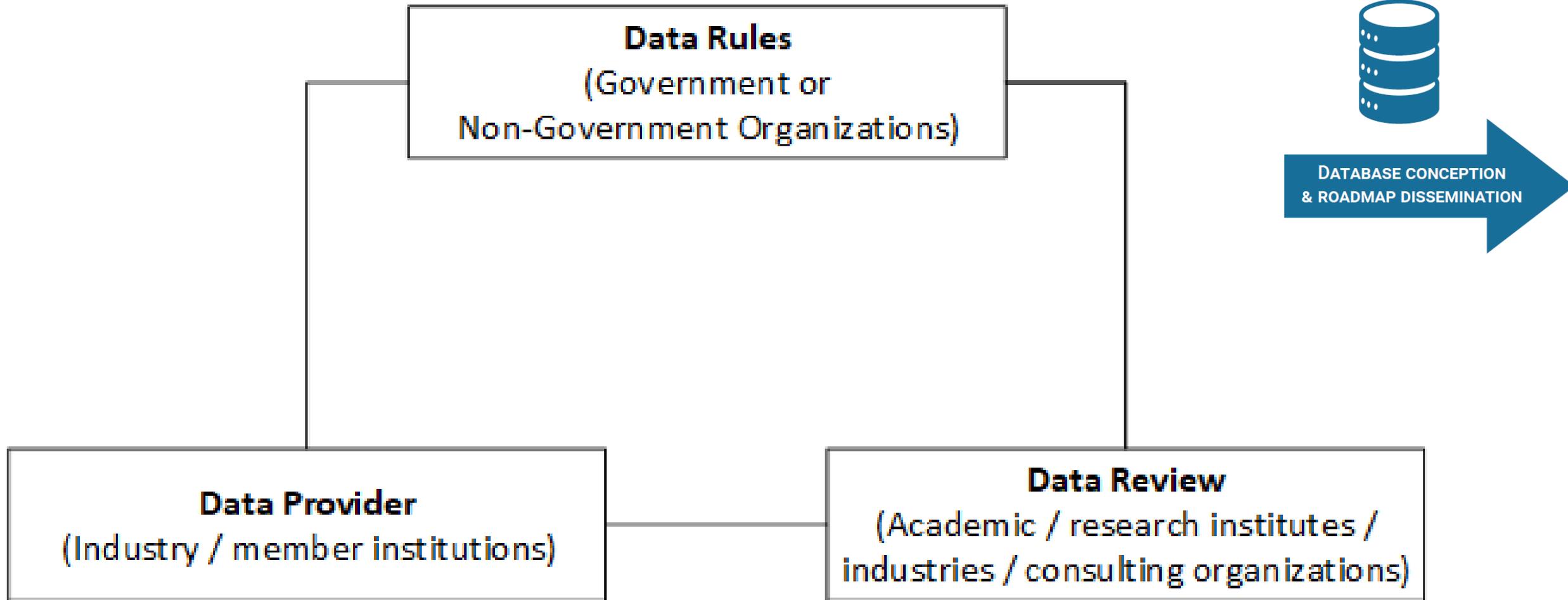
- Vision and goals
- Governance and management
- Funds and financing
- Human resources
- Database hosting
- Data needs and availability
- Data quality requirement and overview
- Data format and interoperability of the datasets
- LCA application in policy making



GOVERNANCE STRUCTURE FOR LCA DATABASE DEVELOPMENT



ROLES AND RESPONSIBILITIES OF MAIN STAKEHOLDERS



Data quality parameters

- Data quality parameters
- Time period of data collection
- Representativeness
- Background data



Core aspects

- Declared and functional unit
- Allocation (multi-output processes / recycling)
- Cut-off rules
- Emission certificates
- Biogenic carbon
- Carbon offsets, carbon storage and delayed emissions
- Natural carbonation
- Electricity mix applied in material production and product manufacture
- Packaging
- Transport distances (default)
- Waste management practices (default)
- Production waste and waste on construction site

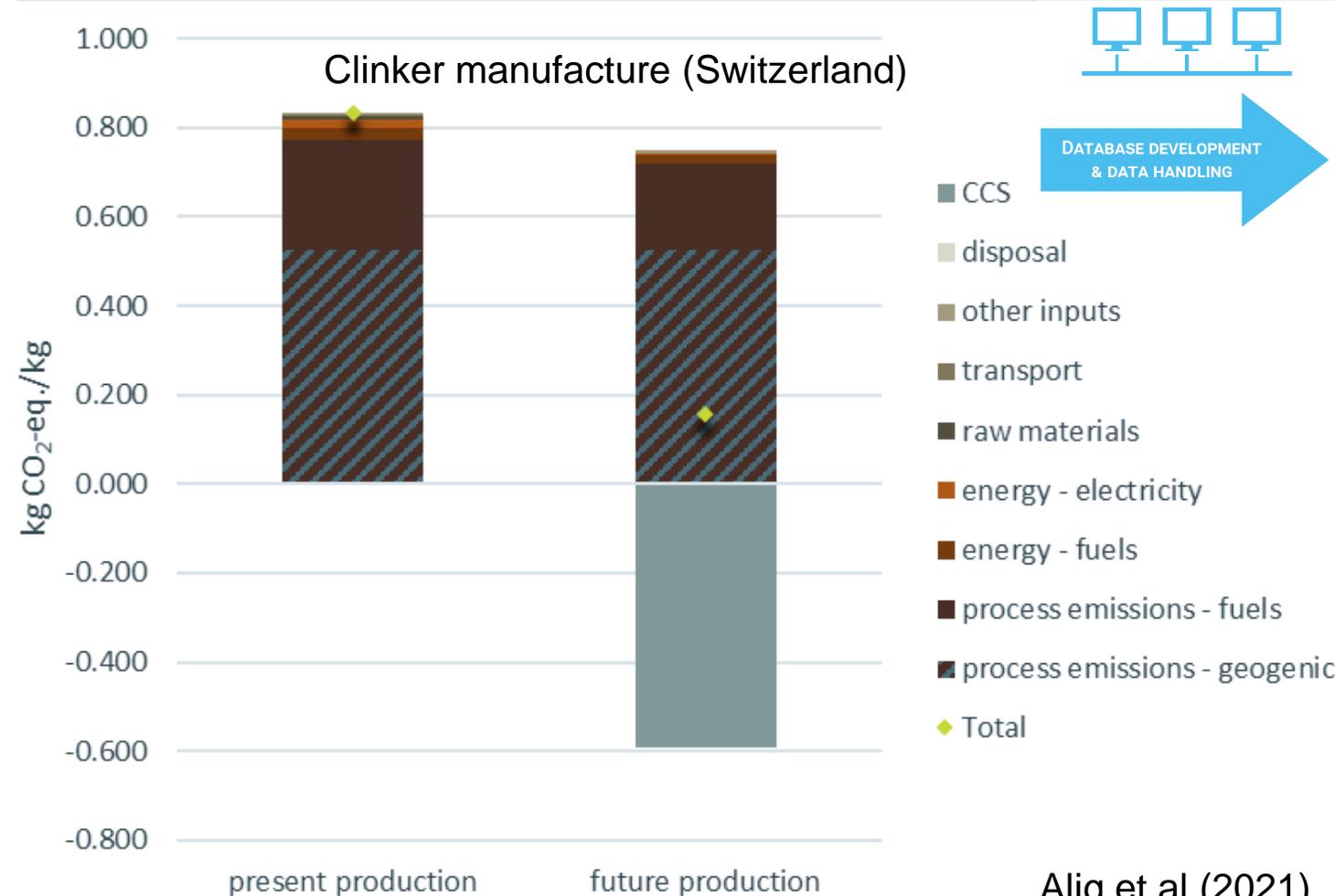


DATABASE DEVELOPMENT
& DATA HANDLING

LCA data on future material production

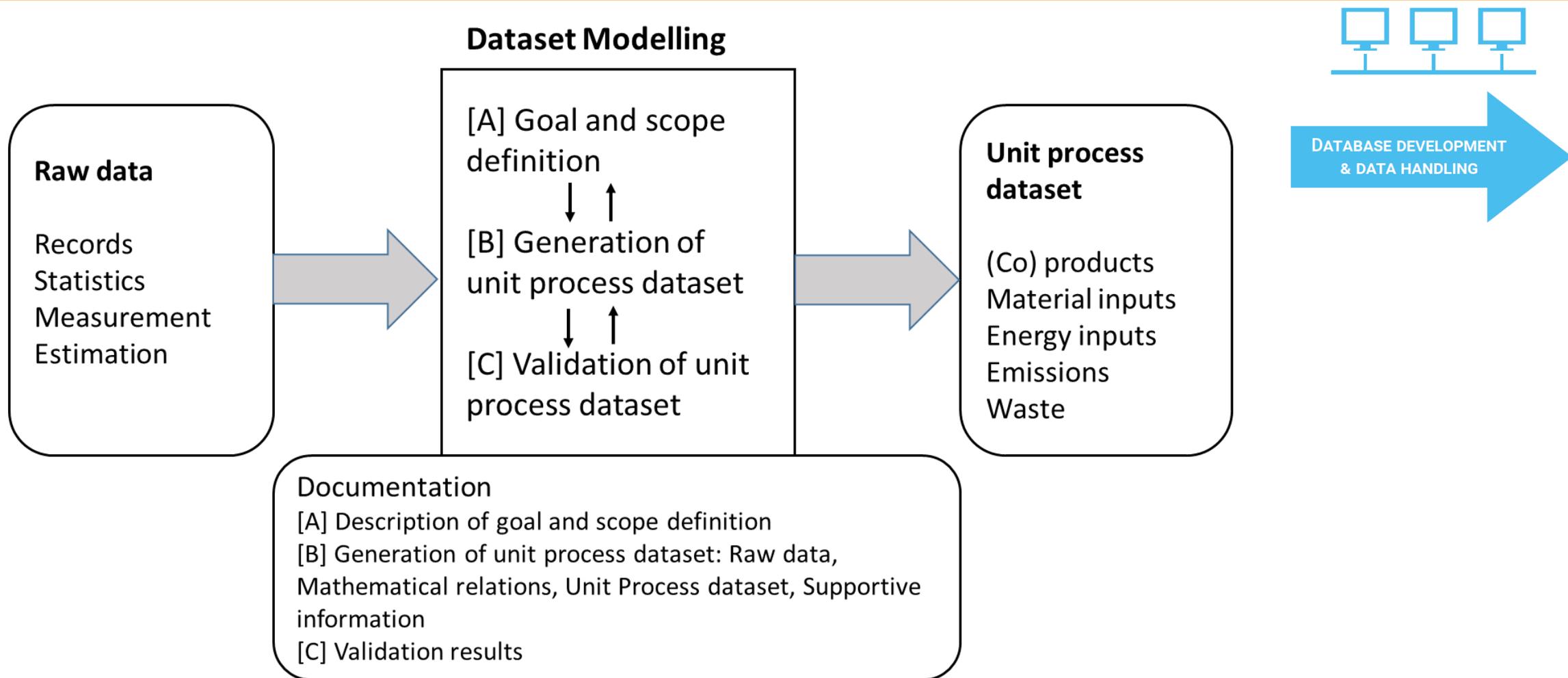
- Data and information on GHG-emissions and environmental impacts of future construction material production
- Establish LCA data on future
 - Production of construction materials
 - Supply of energy (electricity & fuels)
 - Supply of transport services (lorry, train & ship)
- preferably compliant with the Paris Agreement 2015 (and the 1.5°C goal)
- Contribution of construction materials industry

Use responsibly and cautiously



Alig et al (2021)

FROM RAW DATA COLLECTION TO UNIT PROCESS DATASETS



- Countries lacking a life cycle assessment (LCA) database for the construction sector are invited and encouraged to get started as soon as possible
- The LCA database should cover
 - construction materials (both generic and company specific),
 - building technologies (such as ventilation and photovoltaic systems),
 - energy supply,
 - transport services and
 - waste management services
- It should cover life cycle related **greenhouse gas emissions** as well as other **main environmental challenges** such as fine particles and biodiversity losses
- Extensive **documentation, independent review** and **full data transparency** are considered main features, which help ensure appropriate data quality



A big “Thank you” to ...



Sivakumar
Palaniappan, IN



Chang-U Chae, KR



and the
ANNEX 72 TEAM

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