

CIRCULAR



Circular Economy Taxonomy – Working Group Kick-off

21st of September, 2023 - 10:00-12:00 (CEST)

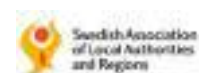
Procurers



FORUM
VIRIUM
HELSINKI



Skupnost občin Slovenije
Association of Municipalities and Towns of Slovenia



Supported by



This project has received funding from the European Union's Horizon Europe under Grant Agreement n° 101092208.

Objectives

To understand the context of the CircularPSP project

To achieve a common understanding of taxonomies and its principles in the EU

To discuss the way of collecting missing terms and data sources

To lay out the expectations for suppliers and the upcoming activities of the working group

To provide an opportunity for matchmaking for the upcoming CircularPSP tender

Contents / Agenda

1. Welcome and Introduction
2. Taxonomy Working Group (mission statement, focus and format)
3. CircularPSP Project
4. Issues for municipalities (White Paper)
5. Background Session – Taxonomy: Categories, Terms and definitions | Discussion and Q&A
6. Co-working on CE Taxonomy | Discussion and Q&A
7. Matchmaking and Follower Network

Matchmaking:

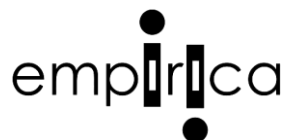
Feel free to use chat to introduce, state search, share contact details.
Please keep posts to the point.

Presenters



Georg Vogt

Head of ICT
Innovation Energy



Sten Stenbeck

Senior Advisor in
Sustainable Development



Fredric Norefjäll

Senior Project Manager in
Sustainable Development



Niklas Schmidt

Senior Project Manager in
Sustainable Development



Taxonomy Working Group

Mission statement, focus and format

Welcome and Introduction

>> **Taxonomy Working Group**

CircularPSP Project

Issues for municipalities (White Paper)

Background Session

Co-working on CE Taxonomy

Matchmaking and Follower Network



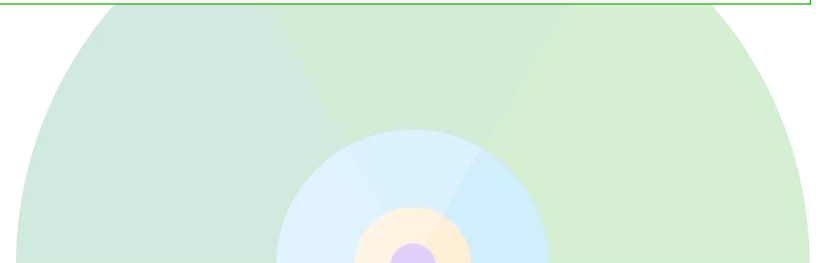
Why CE Taxonomy and open Working Group?

For now, the statement, the reasoning will follow

Most pragmatic way for a complex problem ...

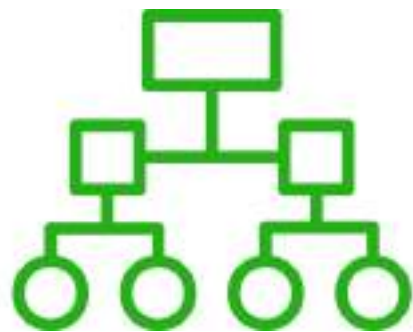
... with limited effort for individual supplier ...

... and highest probability to yield results needed.



Mission Statement

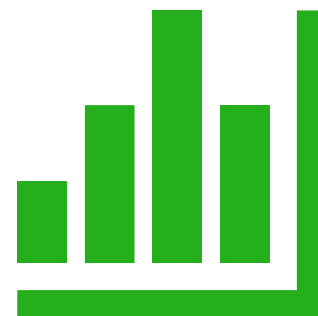
Solving universal CE Taxonomy problems together rather than duplicating effort (and complicating comparisons)



Define core terminology, to ensure clarity is improved

Taxonomy

CircularPSP: To be used



Identify a set of core data sources, to ensure all relevant areas are covered

Data sources

CircularPSP: To be used



Document a set of core data standards/protocols, to ensure solutions are well fit

Data standards

CircularPSP: To consider



Focus and format

An open working group with a living document

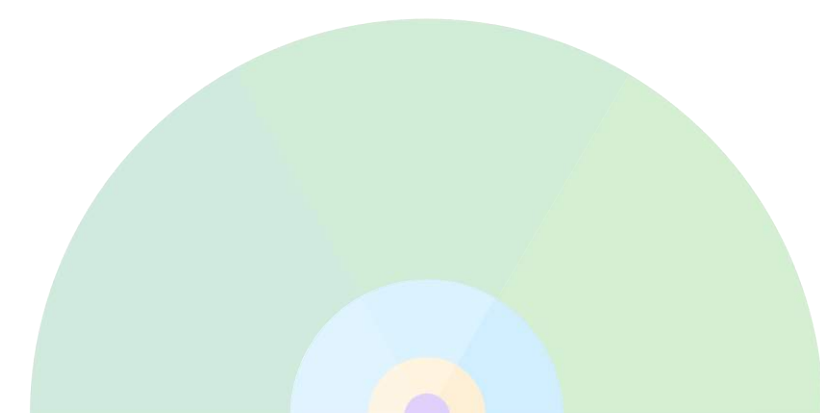
Permanent Working Group Members are the CircularPSP consortium and selected suppliers



Online living documents that evolves over time, maintained by CircularPSP consortium



Versions will trigger follow-up events (2-4 per year) to update on developments



CircularPSP project

Background on the common challenges of municipalities and the CE-solution we are seeking

Welcome and Introduction
Taxonomy Working Group
>>**CircularPSP Project**
Issues for municipalities (White Paper)
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Project

Leading Circular Cities are tackling a common challenge together

CIRCULAR



Istanbul, Turkey

Guimarães, Portugal

CircularBerlin, Germany

City Network Sweden

Helsinki, Finland

City Network Slovenia

Sandyford, Ireland

ReLondon, UK¹

Follower Network (see website)

8 Procurers – 8 Countries
45 million citizens

Representing Europe’s leading circular cities and regions

Common challenge: accelerate transition
towards a Circular Economy (CE)

€5.64 million investment in R&D

Budget spent in a 3-phase competition

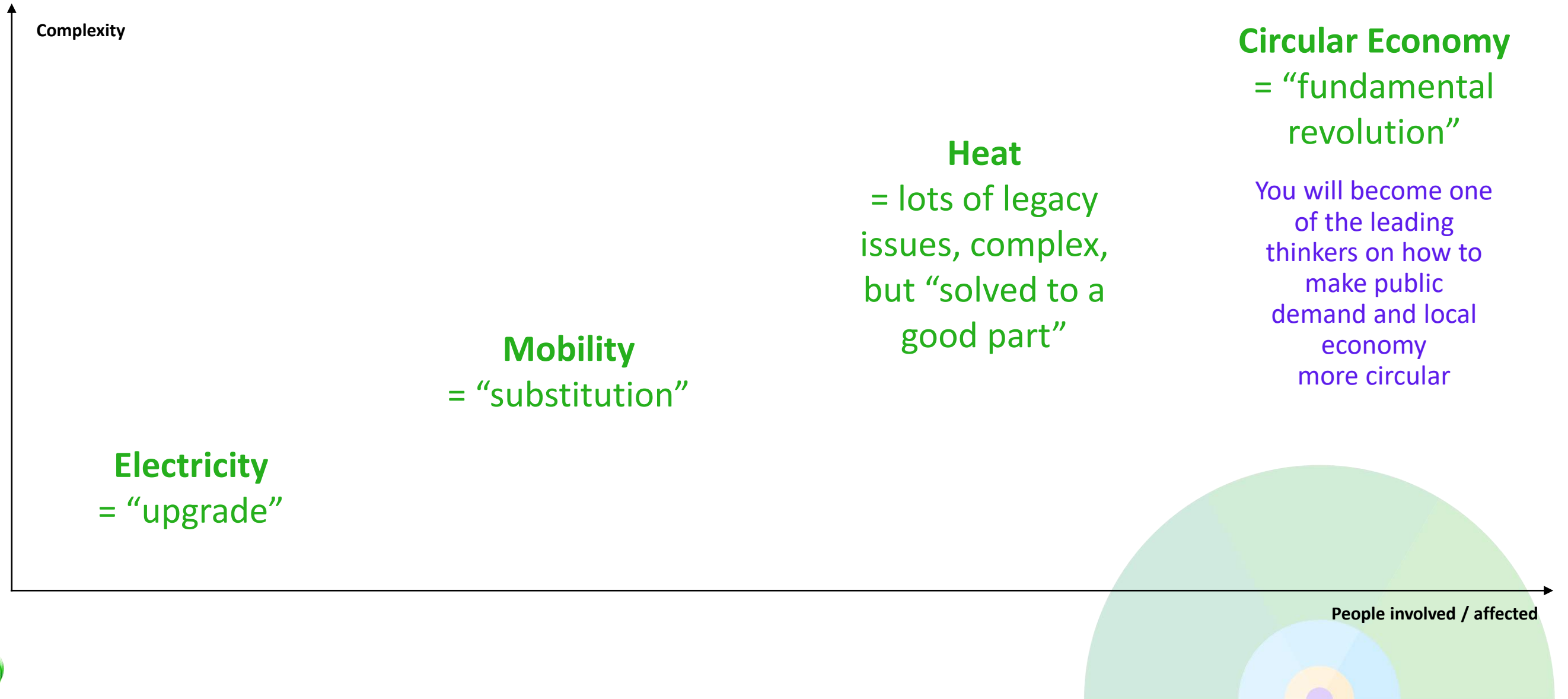


¹ Associated Partner involved in all activities



Sustainability transitions mapped

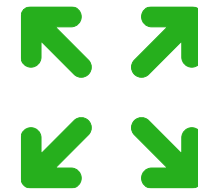
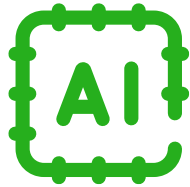
CE is the most challenging transition





The problems of transition to CE

Cities – or rather the few people who are involved with CE – are facing a complex problem



Access + Analysis
of EU-wide case
studies for
local use/data

Making CE
actionable on
city level and
for all staff

No capacity for CE
transition; no
experience in
thousands of cities
and businesses

information

operation

organisation

IDEA A platform underpinned by AI using taxonomies and NLP to support cities, civil servants and local business





3 User Groups

Our users are local but all local users are facing similar challenges

PRELIMINARY

CE EXPERTISE

USER GROUP DESCRIPTION

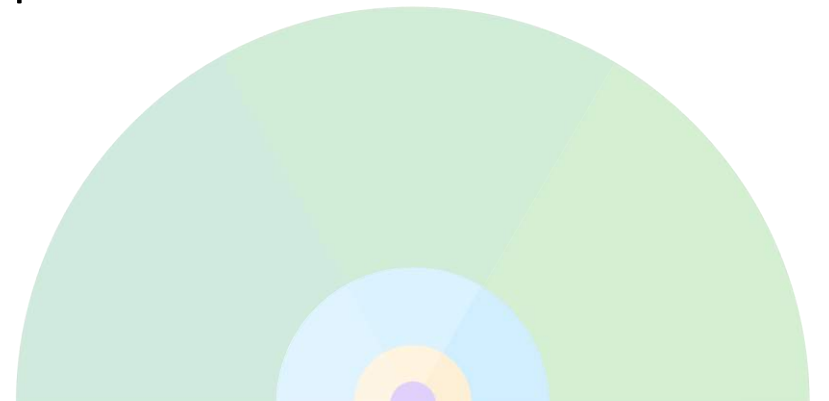
Experts

Intermediaries are individuals with systemic expertise and responsibility for circular economy across the organisation and who build capacity within departments.

Varying levels

Any municipal worker who would advance circular economy in the own department or across the entire city

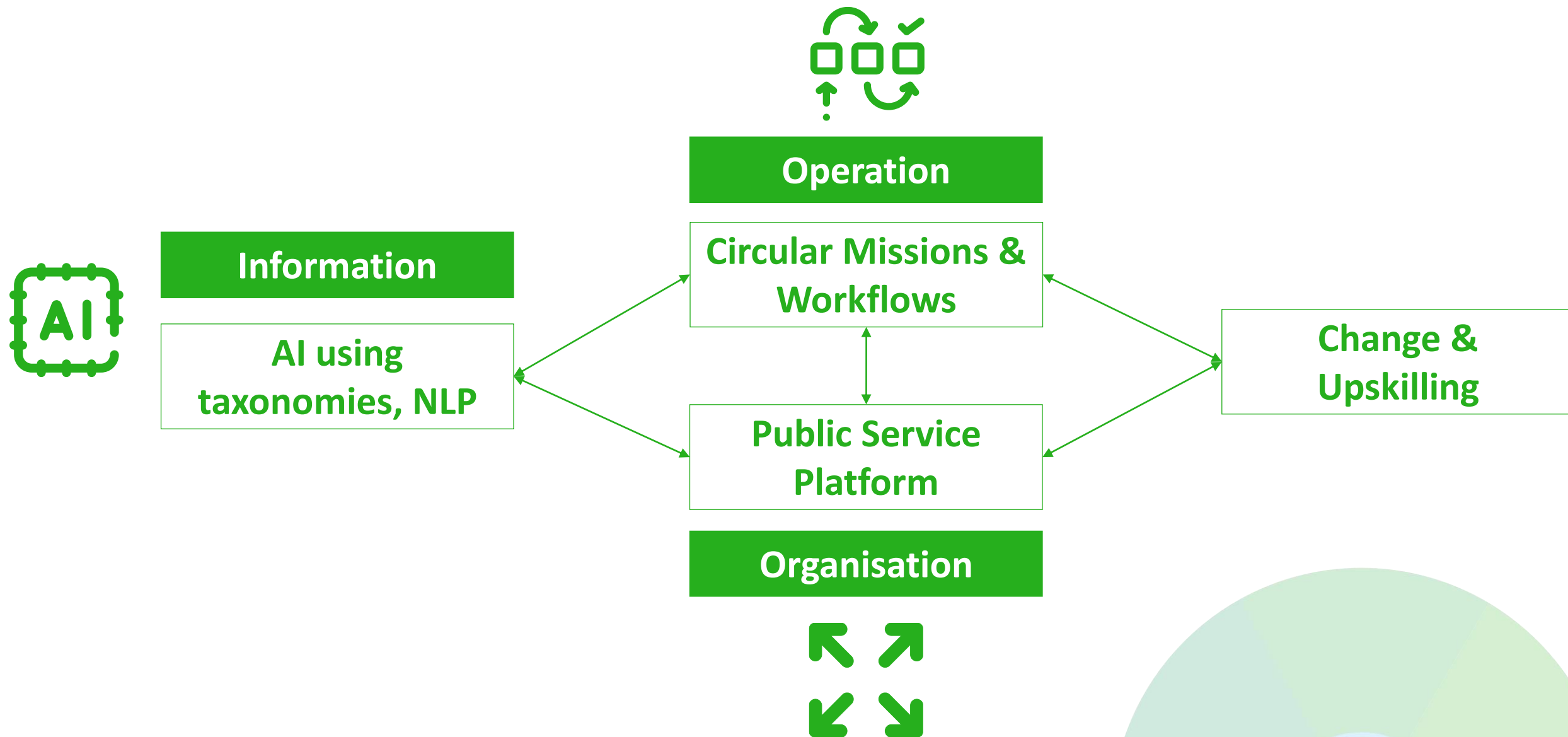
Any local business to deploy and supply the local circular economy. Users of the market platform, bidders to local procurements.





Desired Innovations

Each domain requires digital innovation and CE expertise





CircularPSP is technology neutral

Our focus is to describe the actual problem – suppliers need to come up with technical and practical solutions

**Buyers Group structures
(very complex) problem,
expected outcome
roadmap
and award criteria**

**Suppliers
define the
solution**

**...any constellation of technologies is thinkable if it fulfils
design principles and requirements etc. ...**



A disclaimer to suppliers (if present)

This event is the start of a long-term effort which member(s) in the team need to follow / implement (but not the entire team)

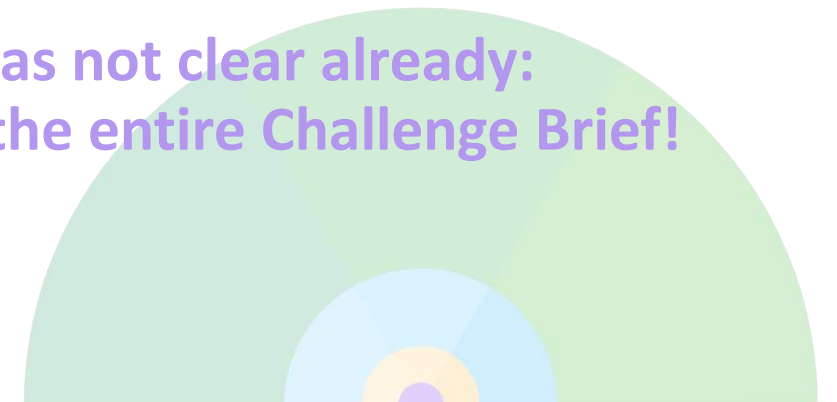


Not everybody needs to be a surgent

But you should understand enough to know what the “operation” is about

This event is a pre-operation discussion with opportunity to ask questions

**If it was not clear already:
This is not the entire Challenge Brief!**



Issues for municipalities

White paper

Welcome and Introduction
Taxonomy Working Group
CircularPSP Project
>>**Issues for municipalities (White Paper)**
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What is a circular city?

The need for common definitions, measurement data, taxonomy and standards

- The common European standardisation and interoperability framework
 - ✓ Established taxonomies and standards used within the European Union
 - ✓ The European data strategy – see <https://data.europa.eu/en>.

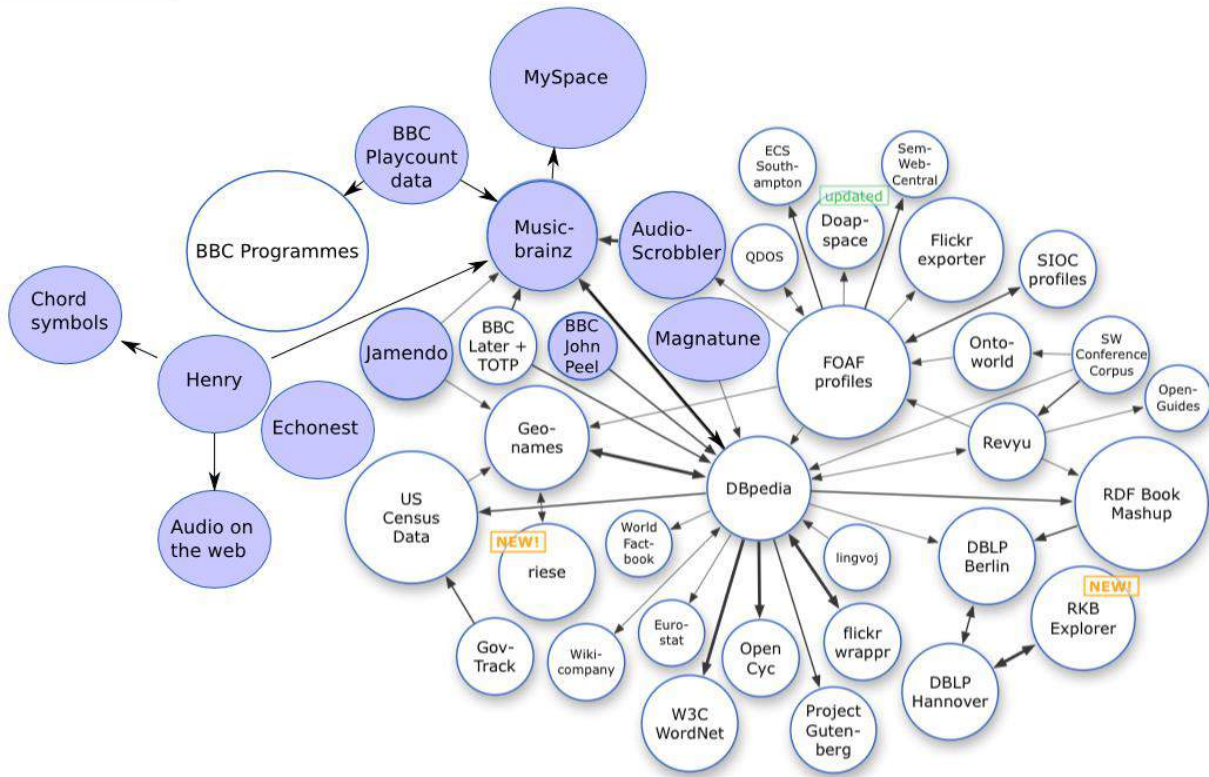
- ISO/DIS 59004 - Circular Economy – Terminology, Principles and Guidance for Implementation
- ISO/DIS 59020 - Circular economy — Measuring and assessing circularity



Open data and linked data

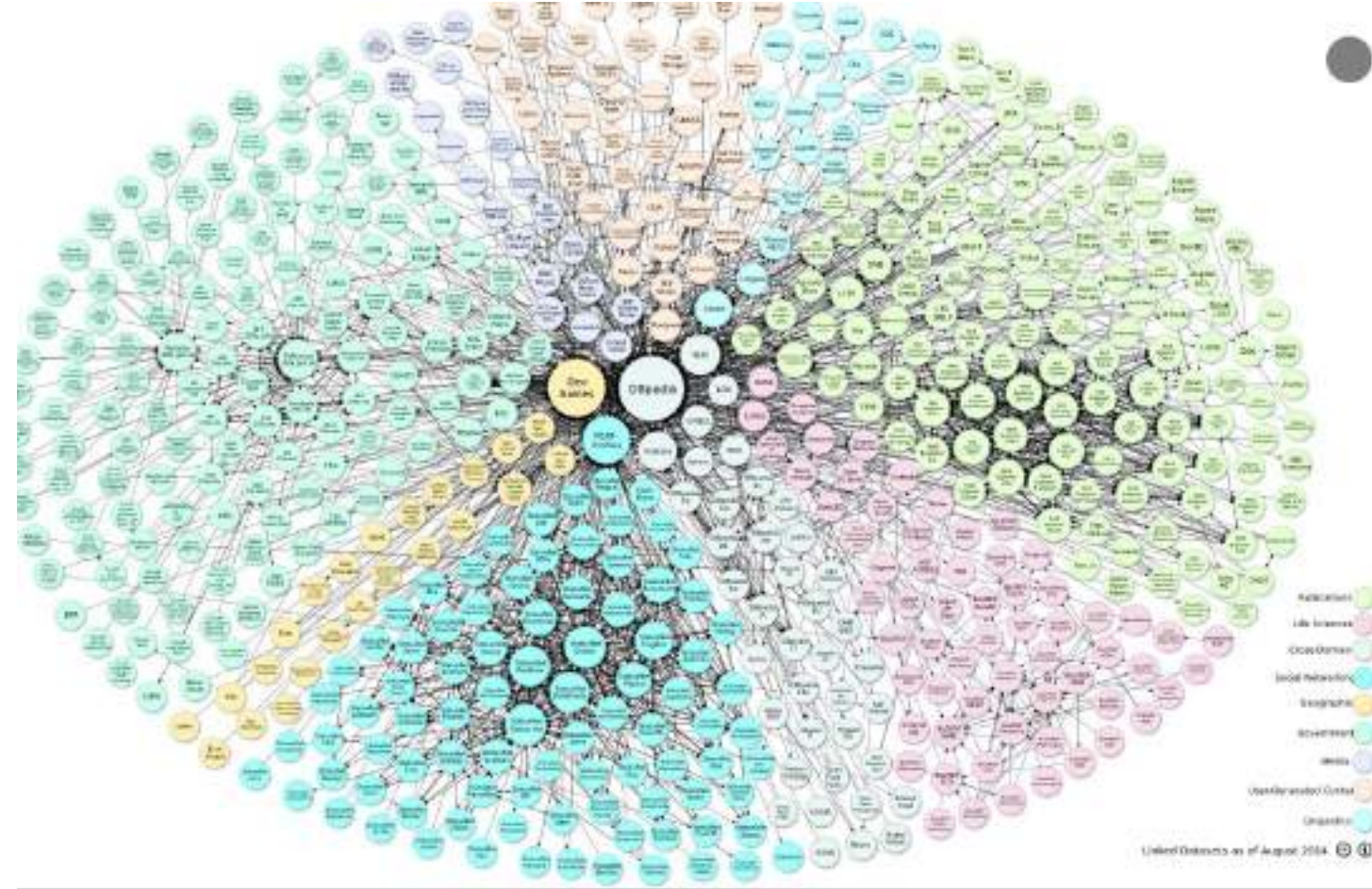
Immense amount of open data out there....

EARLY DAYS OPEN DATA MAP



► By Tungsten Tide - Own work, CC BY-SA 4.0,
<https://commons.wikimedia.org/w/index.php?curid=36940942>

IN AUGUST 2014



By Max Schmachtenberg, Christian Bizer, Anja Jentzsch and Richard Cyganiak - <http://lod-cloud.net/>, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=36956792>



Open data and linked data

Immense amount of open data out there on the web

OPEN AND LINKED DATA

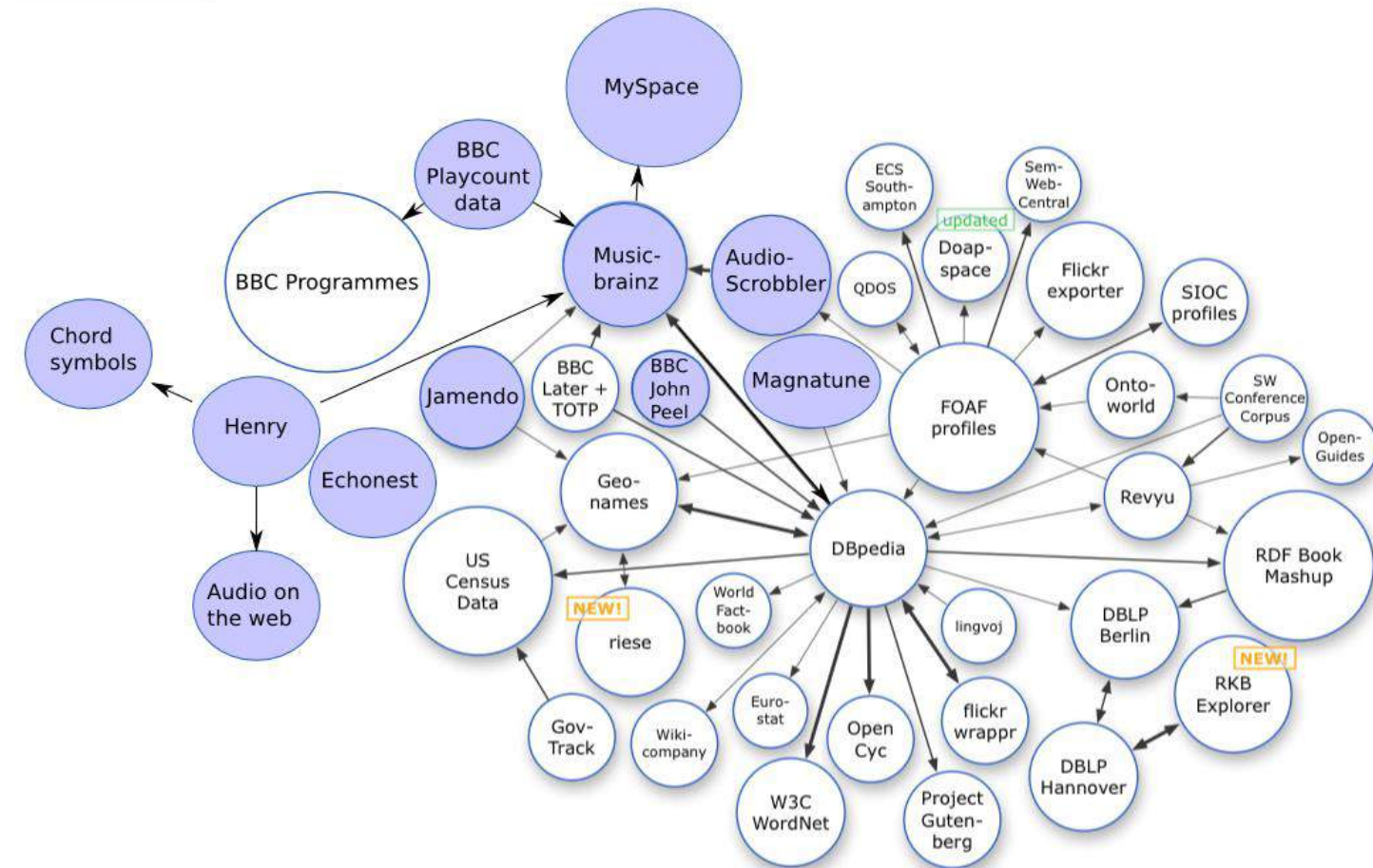
- ▶ Data openly accessible, exploitable, editable and shared by anyone for any purpose.
- ▶ One of the most important forms of open data is open government data (OGD)
- ▶ EU Open Data Portal gives access to open data from the EU institutions, agencies and other bodies and
- ▶ European Data Portal that provides datasets from local, regional and national public bodies across Europe
- ▶ In terms of content, the dataset spans most areas, for example, authority data, biomedicine, media, geographic information, etc.

Examples of datasets

- ▶ DBpedia – extracted data from Wikipedia; 3.4 M concepts
- ▶ GeoNames – provides RDF descriptions of more than 7,500,000 geogr. Info
- ▶ Data about emissions and circularity through the EU Taxonomies

Harvest of data

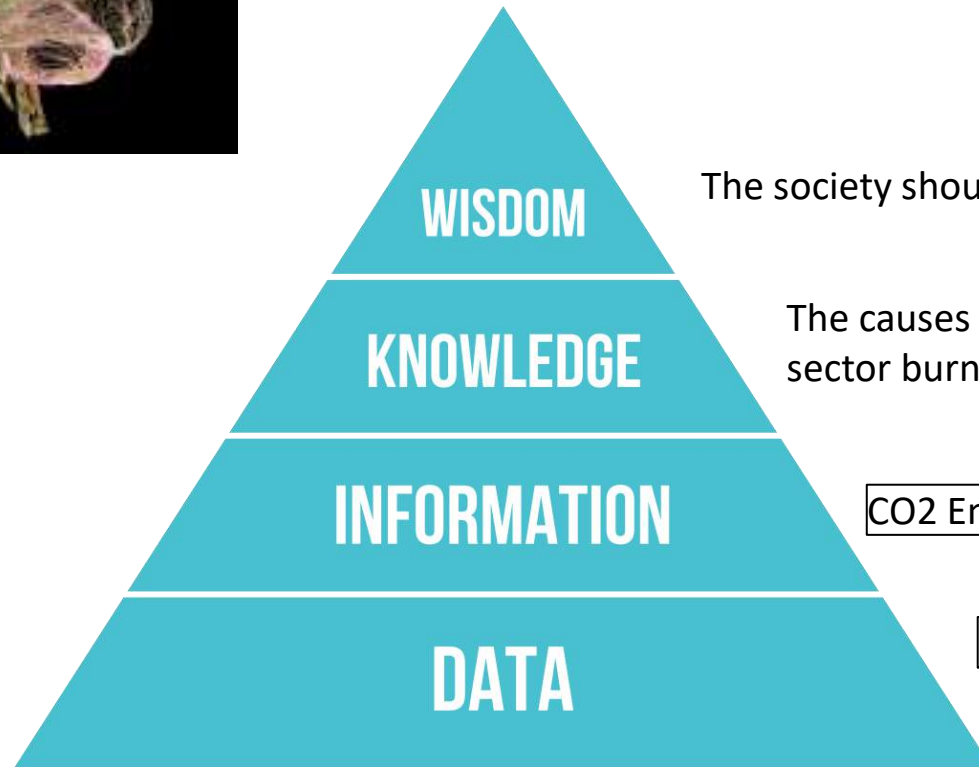
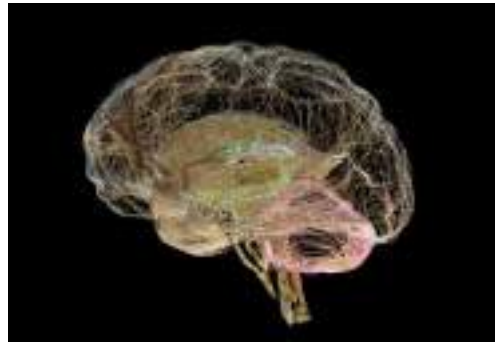
- ▶ It is possible to harvest the data and combine data from different datasets to fit your purpose through APIs



- ▶ By Tungsten Tide - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=36940942>

What is data, information and knowledge?

How the brain and AI works



The society should.....etc.

The causes of CO2 emissions are i.e from the energy sector burning fossil fuels...etc .which impaci....etc

CO2 Emissions in Sweden is 8 tons CO2/capita 2022

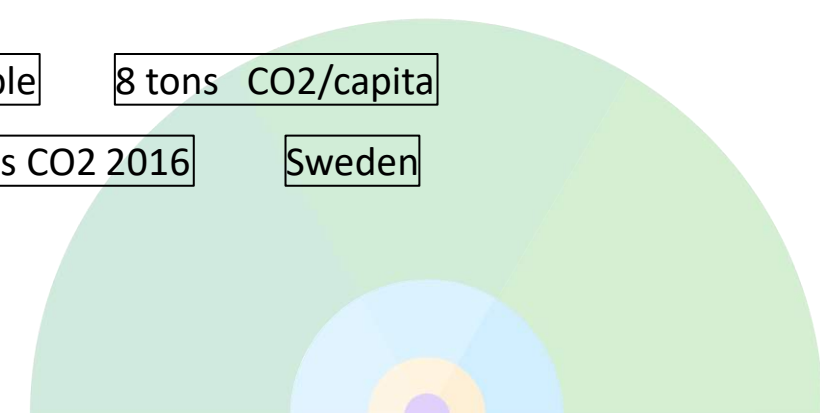
10.2 million people

8 tons CO2/capita

44,694,415 tons CO2 2016

Sweden

By Longlivetheux - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=37705247>



You can get new knowledge from new combinations of data

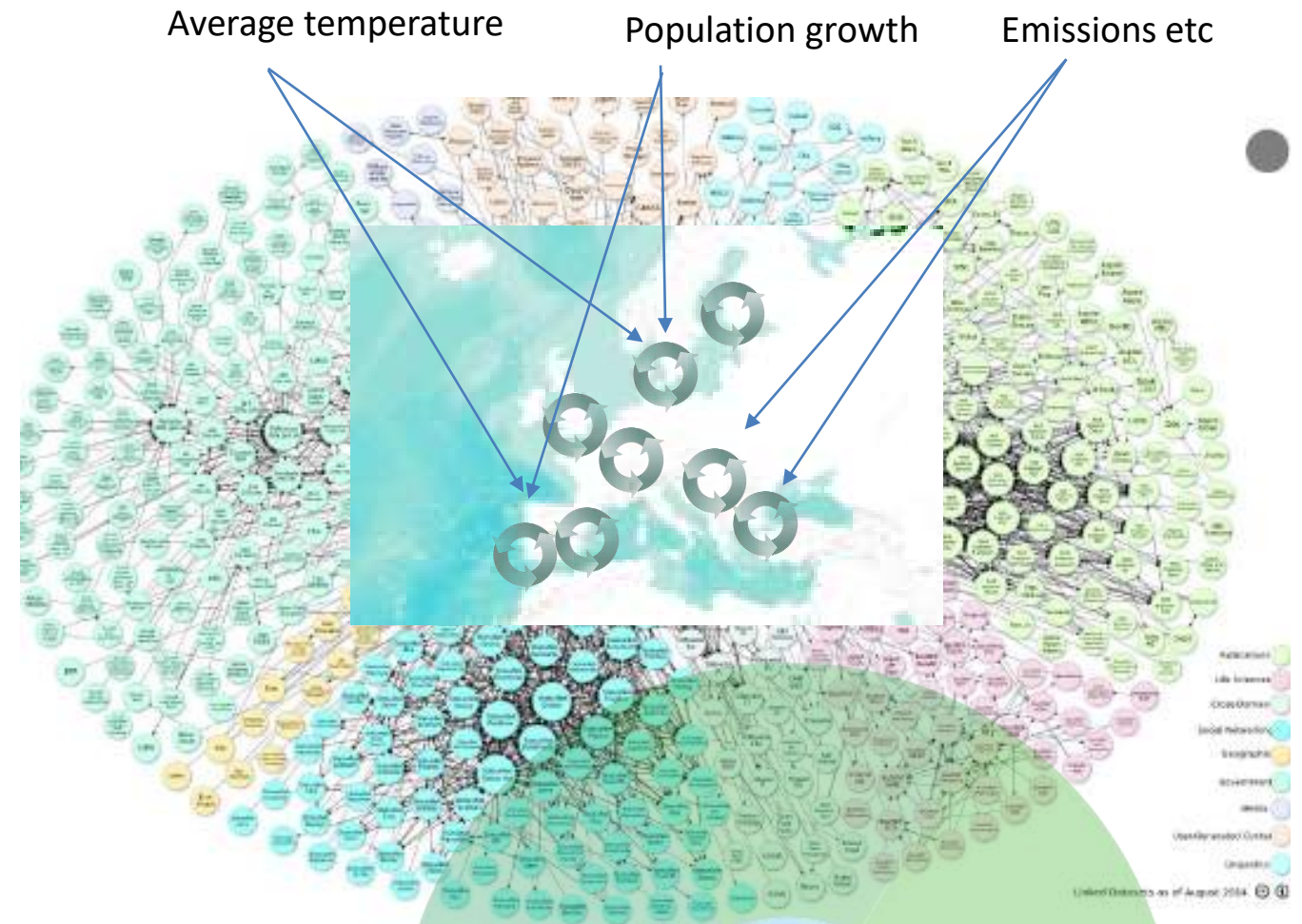
➤ Interoperability of data

Data should be:

- findable
- accessible
- interoperable
- reusable
- machine actionable

For analysis Data is

- **standardised and documented in the form of taxonomies**



Materials Management

Circularity

Waste Management

Wisdom

Wisdom

Wisdom

Knowledge based on processing information

Knowledge based on processing information

Knowledge based on processing information

Information related to issue 1

Information related to issue B

Information related to issue Z

Data collected and structured for information need on issue 1, 2, 3

Data collected and structured for information need on issue A, B, C

Data collected and structured for information need on issue X, Y, Z

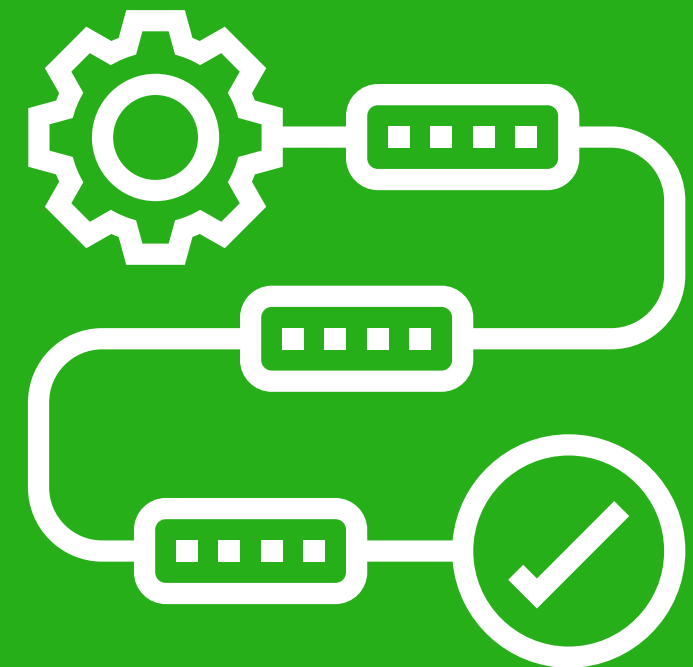
Open data



Background session

Taxonomy: Categories, Terms and definitions
An educational intro into what this means.

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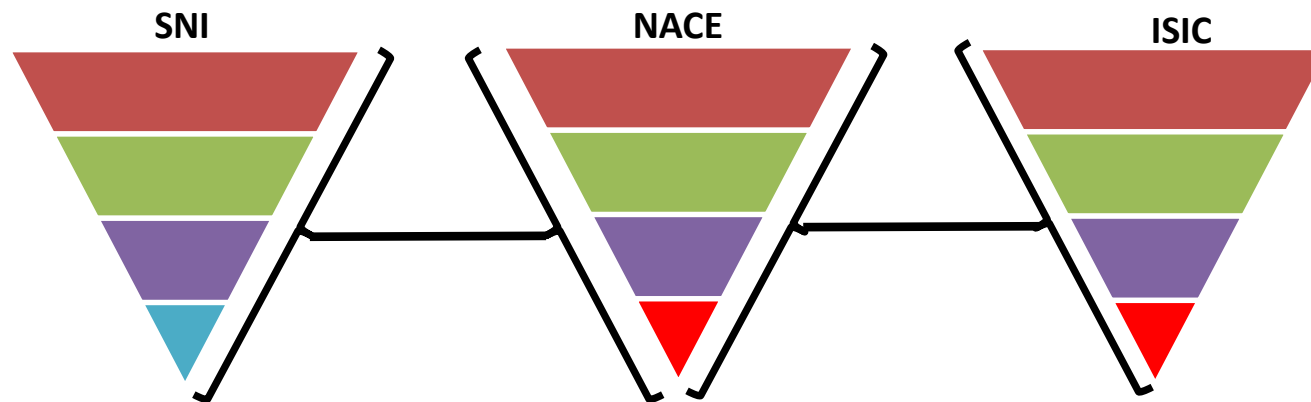


Taxonomies

Examples of Taxonomies

NACE AND ISIC INTEROPERABILITY

- ▶ **NACE** - standard European nomenclature of productive economic activities.
 - break down the universe of economic activities
 - codes can be associated with a statistical unit carrying out the activity it designates
- ▶ **ISIC** – International Standard Industrial Classification of All Economic Activities
- ▶ National level codes – in Sweden: “SNI”



List of NACE Codes

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[A - Section A Agriculture, Hunting and Forestry](#)

[A.1 - Agriculture, hunting and related service activities](#)

[A.1.10 - Growing of crops: market gardening; horticulture](#)

[A.1.11 - Growing of cereals and other crops n.e.c.](#)

[A.1.12 - Growing of vegetables, horticultural specialities and nursery products](#)

[A.1.13 - Growing of fruit, nuts, beverage and spice crops](#)

[A.1.20 - Farming of animals](#)

[A.1.21 - Farming of cattle, dairy farming](#)

[A.1.22 - Farming of sheep, goats, horses, asses, mules and hinnies](#)

[A.1.23 - Farming of swine](#)

[A.1.24 - Farming of poultry](#)

[A.1.25 - Other farming of animals](#)

[A.1.30 - Growing of crops combined with farming of animals \(mixed farming\)](#)

[A.1.40 - Agricultural and animal husbandry service activities, except veterinary act](#)

[A.1.41 - Agricultural service activities](#)

[A.1.42 - Animal husbandry service activities, except veterinary activities](#)

[A.1.50 - Hunting, trapping and game propagation including related service activities](#)

[A.2 - Forestry, logging and related services activities](#)

[A.2.1 - Forestry and logging](#)

[A.2.2 - Forestry and logging related service activities](#)

[B - Section B Fishing](#)

[B.5 - Fishing, operation of fish hatcheries and fish farms + service activities](#)

[B.5.1 - Fishing](#)

[B.5.2 - Operation of fish hatcheries and fish farms](#)

[B.5.3 - Service activities incidental to fishing](#)

[C - Section C Mining and quarrying](#)

[CA - SubSection CA Mining and quarrying of energy producing materials](#)



The EU Taxonomy

Interoperability of financial and "green" data

- ▶ A regulation describing a framework to classify "green" or "sustainable" economic activities executed in the EU.
- ▶ Enables open data from entities within EU
- ▶ Objectives
 1. Climate change mitigation
 2. Climate change adaptation
 3. Sustainable use and protection of water and marine resources
 4. Transition to a circular economy
 5. Pollution prevention and control
 6. Protection and restoration of biodiversity and ecosystems

NACE	Sector	Activity number	Activity	Contribution type	Description
A2	Forestry	1.1	Afforestation		Establishment of new forests
A2	Forestry	1.2	Rehabilitation and restoration of forests, including reforestation and natural forest regeneration		Rehabilitation and restoration of forests, including reforestation and natural forest regeneration
A2	Forestry	1.3	Forest management		Forest management
A2	Forestry	1.4	Conservation forestry		Conservation forestry
	Environmental protection	2.1	Restoration of wetlands		Restoration of wetlands
C25, C27, C28	Manufacturing	3.1	Manufacture of renewable energy technologies	Enabling	Manufacture of renewable energy technologies
C25, C27, C28	Manufacturing	3.2	Manufacture of equipment for the production and use of renewable energy technologies	Enabling	Manufacture of equipment for the production and use of renewable energy technologies
C29.1, C30.1, C30.2, C31	Manufacturing	3.3	Manufacture of low carbon technologies for transport	Enabling	Manufacture of low carbon technologies for transport
C27.2, E38.32	Manufacturing	3.4	Manufacture of batteries	Enabling	Manufacture of batteries
C16.23, C23.11, C23.20,	Manufacturing	3.5	Manufacture of energy efficiency equipment for buildings	Enabling	Manufacture of energy efficiency equipment for buildings
C22, C25, C26, C27, C28	Manufacturing	3.6	Manufacture of other low carbon technologies	Enabling	Manufacture of other low carbon technologies
C23.51	Manufacturing	3.7	Manufacture of cement	Transitional	Manufacture of cement
C24.42, C24.53	Manufacturing	3.8	Manufacture of aluminium	Transitional	Manufacture of aluminium
C24.10, C24.20, C24.31,	Manufacturing	3.9	Manufacture of iron and steel	Transitional	Manufacture of iron and steel
C20.11	Manufacturing	3.10	Manufacture of hydrogen		Manufacture of hydrogen
C20.13	Manufacturing	3.11	Manufacture of carbon black	Transitional	Manufacture of carbon black
C20.13	Manufacturing	3.12	Manufacture of soda ash	Transitional	Manufacture of soda ash
C20.13	Manufacturing	3.13	Manufacture of chlorine	Transitional	Manufacture of chlorine
C20.14	Manufacturing	3.14	Manufacture of organic basic chemicals	Transitional	Manufacture of organic basic chemicals
C20.15	Manufacturing	3.15	Manufacture of anhydrous ammonia		Manufacture of anhydrous ammonia
C20.15	Manufacturing	3.16	Manufacture of nitric acid	Transitional	Manufacture of nitric acid
C20.16	Manufacturing	3.17	Manufacture of plastics in primary form	Transitional	Manufacture of plastics in primary form
D35.11, F42.22	Energy	4.1	Electricity generation using solar photovoltaic technology		Electricity generation using solar photovoltaic technology
D35.11, F42.22	Energy	4.2	Electricity generation using concentrated solar power (CSP) technology		Electricity generation using concentrated solar power (CSP) technology
D35.11, F42.22	Energy	4.3	Electricity generation from wind power		Electricity generation from wind power
D35.11, F42.22	Energy	4.4	Electricity generation from ocean energy technologies		Electricity generation from ocean energy technologies
D35.11, F42.22	Energy	4.5	Electricity generation from hydropower		Electricity generation from hydropower
D35.11, F42.22	Energy	4.6	Electricity generation from geothermal energy		Electricity generation from geothermal energy
D35.11, F42.22	Energy	4.7	Electricity generation from renewable non-fossil gaseous and liquid fuels		Electricity generation from renewable non-fossil gaseous and liquid fuels
D35.11	Energy	4.8	Electricity generation from bioenergy		Electricity generation from bioenergy
D35.12, D35.13	Energy	4.9	Transmission and distribution of electricity	Enabling	Transmission and distribution of electricity
	Energy	4.10	Storage of electricity	Enabling	Storage of electricity
	Energy	4.11	Storage of thermal energy	Enabling	Storage of thermal energy
	Energy	4.12	Storage of hydrogen	Enabling	Storage of hydrogen
D35.21	Energy	4.13	Manufacture of biogas and biofuels for use in transport and of bioliquids		Manufacture of biogas and biofuels for use in transport and of bioliquids
D35.22, F42.21, H49.50	Energy	4.14	Transmission and distribution networks for renewable and low-carbon gases		Transmission and distribution networks for renewable and low-carbon gases
D35.30	Energy	4.15	District heating/cooling distribution		District heating/cooling distribution
D35.30, F43.22	Energy	4.16	Installation and operation of electric heat pumps		Installation and operation of electric heat pumps
D35.11, D35.20	Energy	4.17	Cogeneration of heat/cool and power from solar energy		Cogeneration of heat/cool and power from solar energy

Climate mitigation

Climate adaptation



DCAT facilitates interoperability between taxonomies

The format for taxonomies to inter-connect

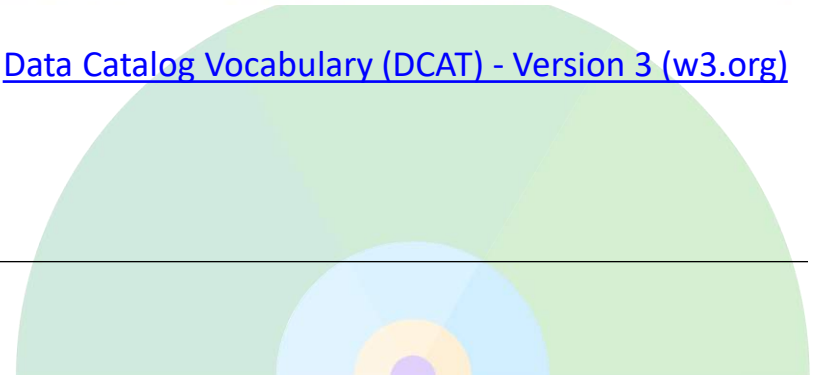
- ▶ DCAT is a vocabulary for publishing data catalogs on the Web using RDF computer language
- ▶ RDF - language for databases, able to retrieve and manipulate data stored in Resource Description Framework (RDF) format.
- ▶ DCAT provides datasets and data services to be described and included in a catalog.
- ▶ Facilitates the consumption and aggregation of metadata from multiple catalogs, which can:
 - 1.allow federated search for datasets across catalogs in multiple sites
 - 2.increase the discoverability of datasets and data services
- ▶ Data from different countries can be combined (DCAT-AP-SE and DCAT-AP-GE) as well as non-overlapping thematic areas i.e. NACE-CPV

EXAMPLE 1

```
ex:catalog
  a dcat:Catalog ;
  dcterms:title "Imaginary Catalog"@en ;
  dcterms:title "Catálogo imaginario"@es ;
  rdfs:label "Imaginary Catalog"@en ;
  rdfs:label "Catálogo imaginario"@es ;
  foaf:homepage <http://dcat.example.org/catalog> ;
  dcterms:publisher ex:transparency-office ;
  dcterms:language <http://id.loc.gov/vocabulary/iso639-1/en> ;
  dcat:dataset ex:dataset-001 , ex:dataset-002 , ex:dataset-003
  .
```

The publisher of the catalog has the relative IRI `ex:transparency-office`.

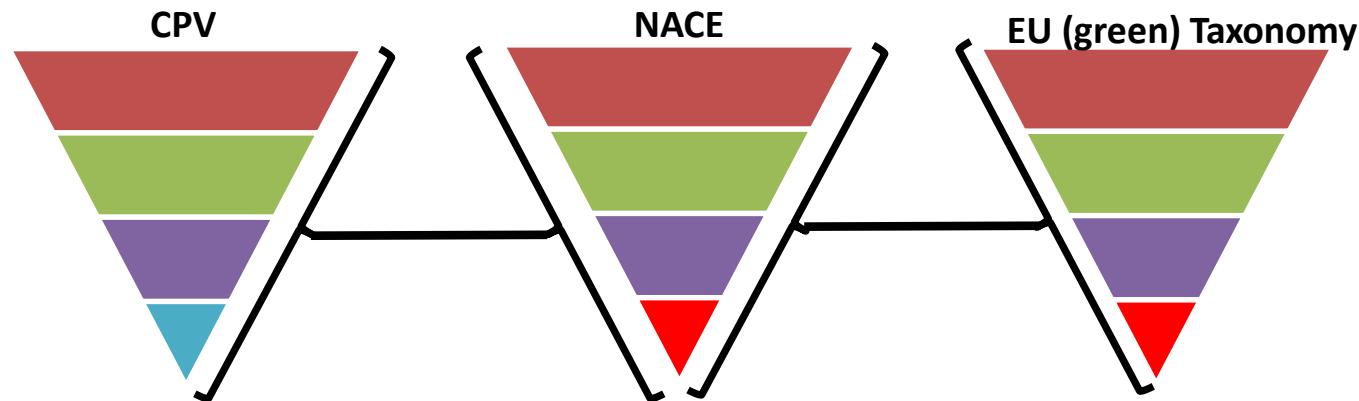
[Data Catalog Vocabulary \(DCAT\) - Version 3 \(w3.org\)](http://www.w3.org/2019/02/dcat-vocab/)



The EU Public Procurement Taxonomy

The CPV codes

- ▶ The CPV consists of a main vocabulary for defining the subject of a contract, and a supplementary vocabulary for adding further qualitative information.
- ▶ Is based on a tree structure comprising codes of up to 9 digits associated with a wording that describes the type of supplies, works or services forming the subject of the contract.
 - The first two digits identify the divisions (XX000000-Y);
 - The first three digits identify the groups (XXX00000-Y);
 - The first four digits identify the classes (XXXX0000-Y);
 - The first five digits identify the categories (XXXXX000-Y);
- ▶ Thanks to the DCAT standard it is possible to combine data from the different taxonomies



CODE	EN
03000000-1	Agricultural, farming, fishing, forestry and related products
03100000-2	Agricultural and horticultural products
03110000-5	Crops, products of market gardening and horticulture
03111000-2	Seeds
03111100-3	Soya beans
03111200-4	Peanuts
03111300-5	Sunflower seeds
03111400-6	Cotton seeds
03111500-7	Sesame seeds
03111600-8	Mustard seeds
03111700-9	Vegetable seeds
03111800-0	Fruit seeds
03111900-1	Flower seeds
03112000-9	Unmanufactured tobacco
03113000-6	Plants used for sugar manufacturing
03113100-7	Sugar beet
03113200-8	Sugar cane
03114000-3	Straw and forage
03114100-4	Straw
03114200-5	Forage
03115000-0	Raw vegetable materials
03115100-1	Raw vegetable materials used in textile production
03115110-4	Cotton
03115120-7	Jute
03115130-0	Flax
03116000-7	Natural rubber and latex, and associated products
03116100-8	Natural rubber
03116200-9	Natural latex
03116300-0	Latex products
03117000-4	Plants used in specific fields
03117100-5	Plants used in perfumery or pharmacy, or for insecticidal or similar purposes
03117110-8	Plants used in perfumery
03117120-1	Plants used in pharmacy
03117130-4	Plants used for insecticidal purposes
03117140-7	Plants used for fungicidal or similar purposes
03117200-6	Seeds of plants used in specific fields
03120000-8	Horticultural and nursery products
03121000-5	Horticultural products
03121100-6	Live plants, bulbs, roots, cuttings and slips
03121200-7	Cut flowers
03121210-0	Floral arrangements
03130000-1	Beverage and spice crops
03131000-8	Beverage crops
03131100-9	Coffee beans
03131200-0	Tea bushes
03131300-1	Mate



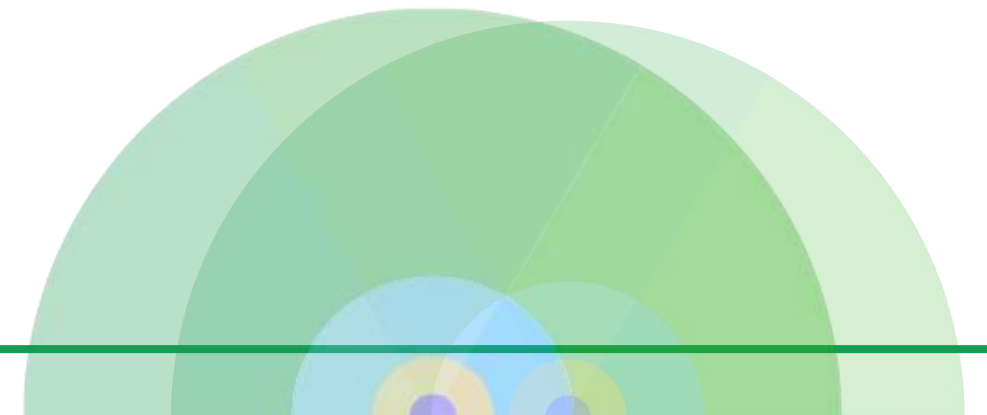
Taxonomies - Summary

- a set of classes of concepts that are organised in a hierarchy,
- usually depicted as a table of content or an organogram
- The further down for more specific words (the number of shared features decreases)
- Upper classes possess all the features of the lower classes
- data that can be turned into information are made available with their relationships to other data in the taxonomy.
- Organising data in such a hierarchy makes it easier use, reuse, analyse etc.

One of the most known Taxonomy in history is the Linneaus taxonomy of biological classification of animals and plants.

Taxonomies are a cornerstone for how data is organised and processed.

- All data crucially has a hierarchy.
- by following common principles with an ever-increasing amount of data sources → create tangible value.
- principles for how data can be combined is as important.



The importance of AI for CircularPSP

To use taxonomies and standards for open linked data

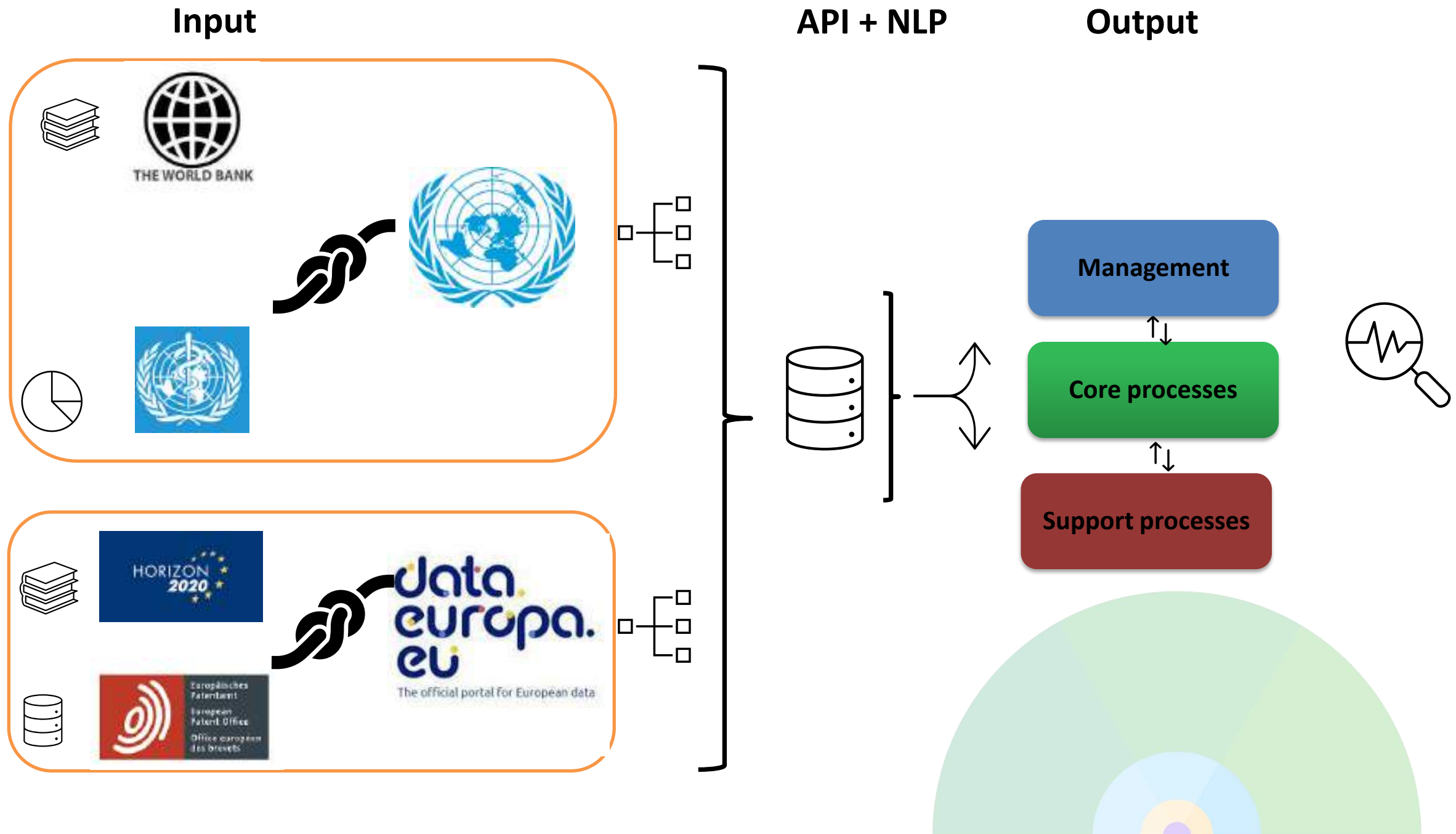
To build Circular knowledge and wisdom

To support workflows



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Example of linking data



Q&A

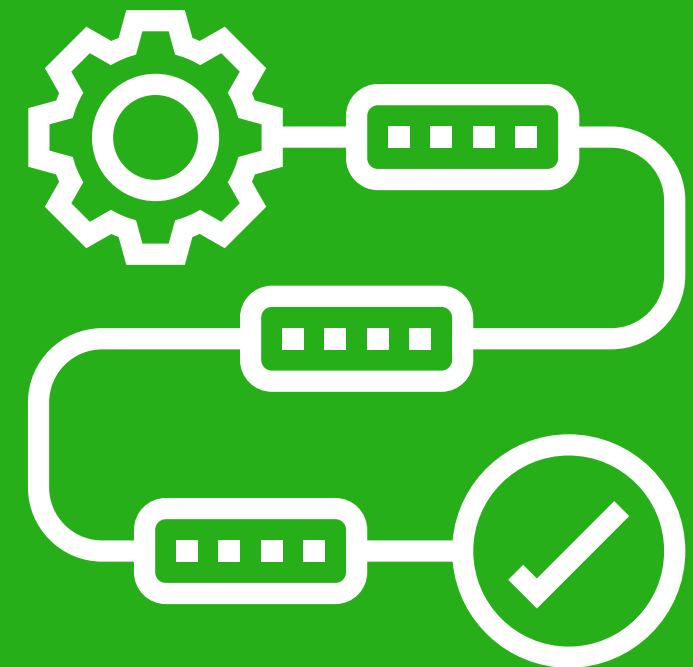
Welcome and Introduction
Taxonomy Working Group
CircularPSP Project
Issues for municipalities (White Paper)
>>**Background Session**
Co-working on CE Taxonomy
Matchmaking and Follower Network



Co-working on CE Taxonomy

Living documents to be co-edited

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What do we aim to achieve (here)?

We have to set a scope for this working group / project

**Identify what terms,
data sources are of
importance for
municipalities
(i.e. municipal
workers)**

–
**Clarify whether or not
terms/sources are
already defined in
existing taxonomies**

**Iterate the CE
Taxonomy**

–
**Begin to test CE
Taxonomy with early
CE-solution
prototypes,
prototypes and**

(Assess whether
extensions are possible
regarding indicators/
benchmarks)

–
**Continue to test CE
Taxonomy in
prototypes**

**Prepare
documentation for /
delegate to
EU regulation**

–
**Apply the CE
Taxonomy across
Demonstration sites**

Specialised groups may emerge from the wider group and will receive support / infrastructure

How to contribute?

All work will be public with intermediate results curated by the CircularPSP consortium

TENDERERS TO CIRCULARPSP

NOT expected to disclose input on terminology and data sources here and now

CAN provide (optional) input in proposal

Input will be made public upon discretion of CircularPSP

CE-solution will have to use most recent terminology and data sources*

CE-solution can use any own taxonomy as long it does not „contradict“ important public / CE Taxonomy

EVERYONE ELSE

We will work in two living documents

WORD
-
Terminology
Standards

EXCEL
-
Data Sources

A look into the drafts

* As long as they are actually accessible.



CircularPSP and CE Taxonomy Timelines

Working group activities are in sync with the PCP



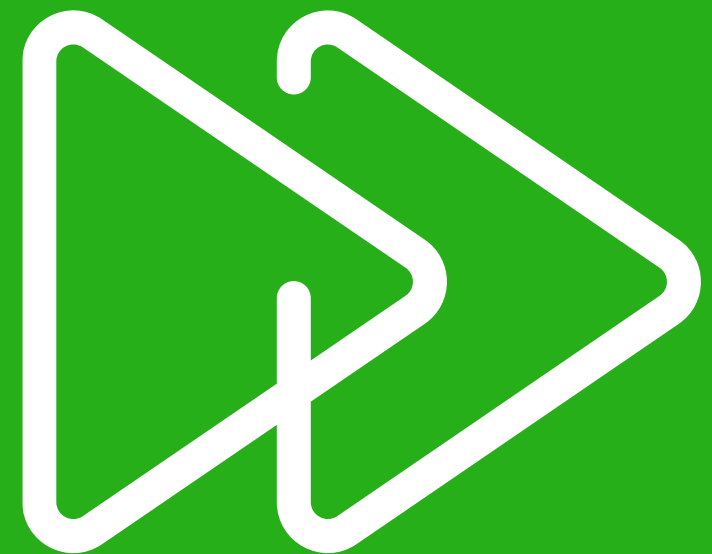
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Matchmaking + Follower Network

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>>**Matchmaking and Follower Network**



Suppliers are invited to create a consortium

Search of partners is supported with the Matchmaking Platform

MATCHMAKING

- ▶ Become visible among other suppliers looking for partners

- ▶ Steps, describe:
 - What you are looking for
 - What you are offering
 - Some basics + contact information

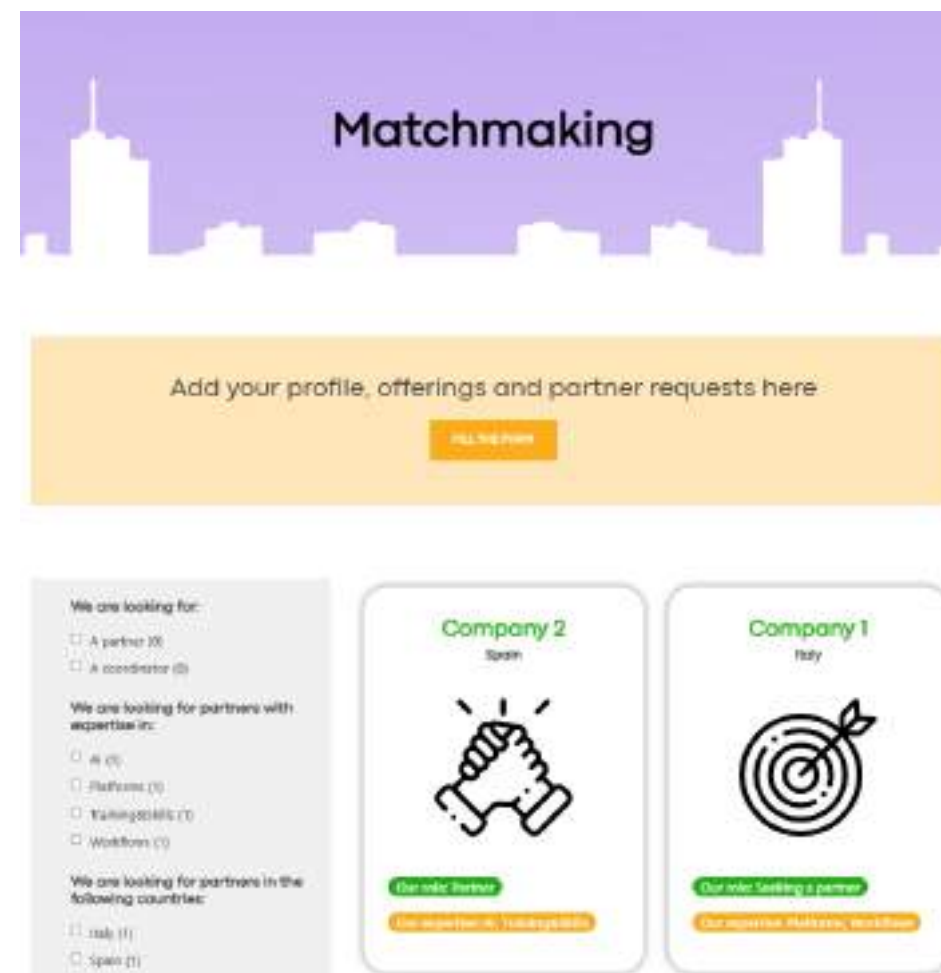
- ▶ Completing the form takes only ~5 minutes

- ▶ We encourage companies that cannot cover the whole CircularPSP solution to team up with other companies and apply together with international partners in a joint tender (consortium).

We will organise a matchmaking and training events in October / November

PLATFORM

- ▶ Location: <https://circularpsp.eu/matchmaking/>



Procurers: Become part of our Follower Network

Follower network

BECOME A FOLLOWER

- ▶ If you are interested in solutions and suppliers:
 - Simply state your interest via mail to CircularPSP@empirica.com
 - We only need a brief description and a logo
 - We invite you to events and aim to allow testing by Followers

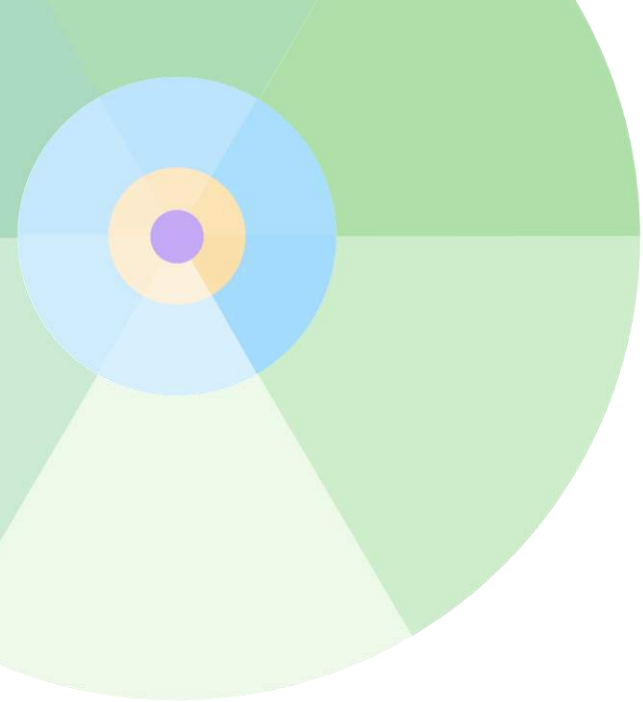



CURRENT FOLLOWER NETWORK

- ▶ Location: <https://circularpsp.eu/follower-network/>
- ▶ Cities and regions, for instance:




- ▶ Networks and other Followers:
 - CIRCULÉIRE (Ireland)
 - KEINO (Finland)
 - Helsinki Region Environmental Services (Finland)
 - BUILD (Horizon Europe project)
 - InvestCEC (CCRI project EU)
 - Circular and Fair ICT Pact (Public Buyers Community)
 - Procurement of AI Community (Public Buyers Community)
- ▶ In discussion
 - CCRI Initiative (31 cities and regions)
 - C40 (40 large cities)



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