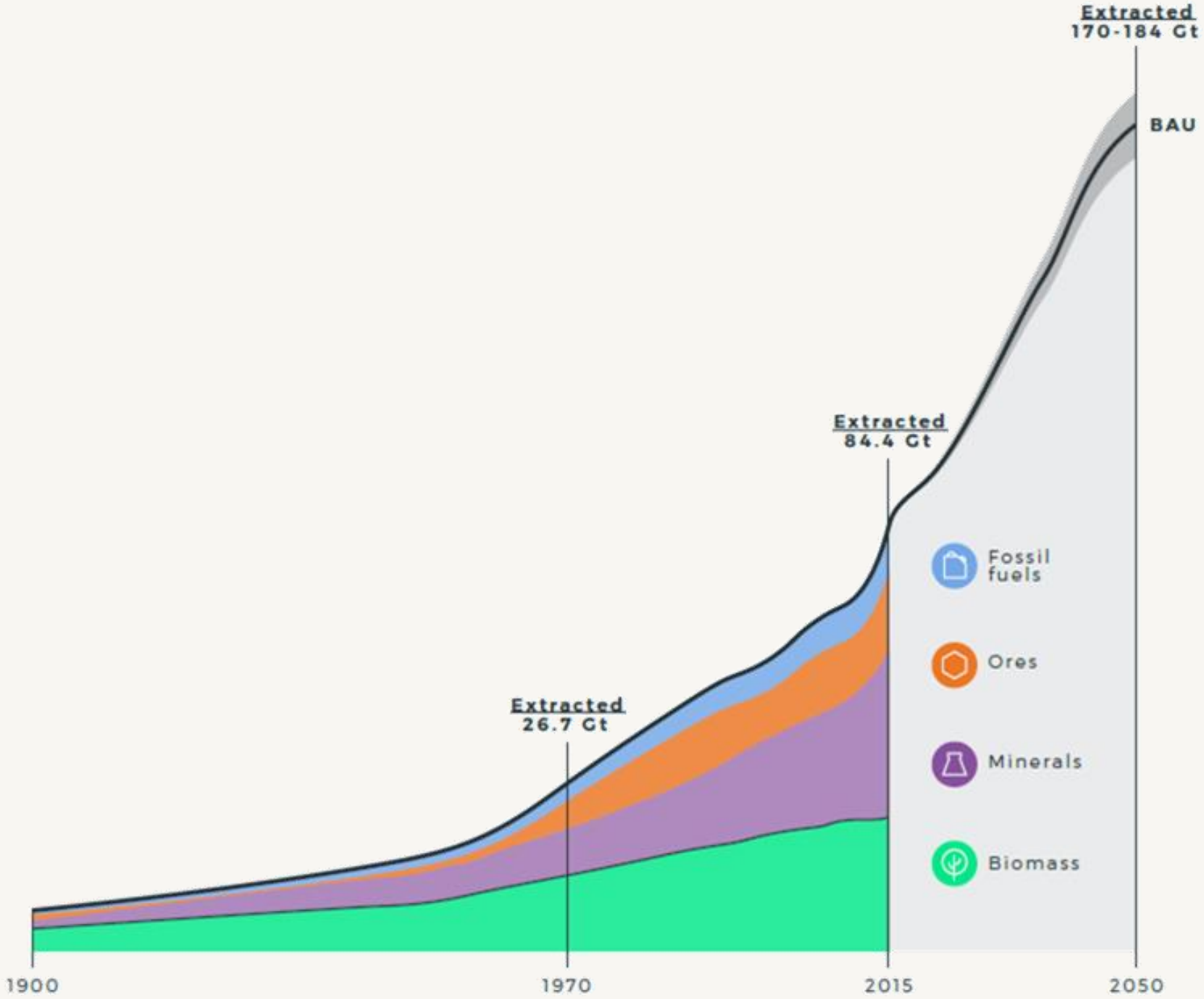
Le métabolisme urbain de Bruxelles : Nexus et Hinterlands

ARISTIDE ATHANASSIADIS – 06 JUILLET 2021

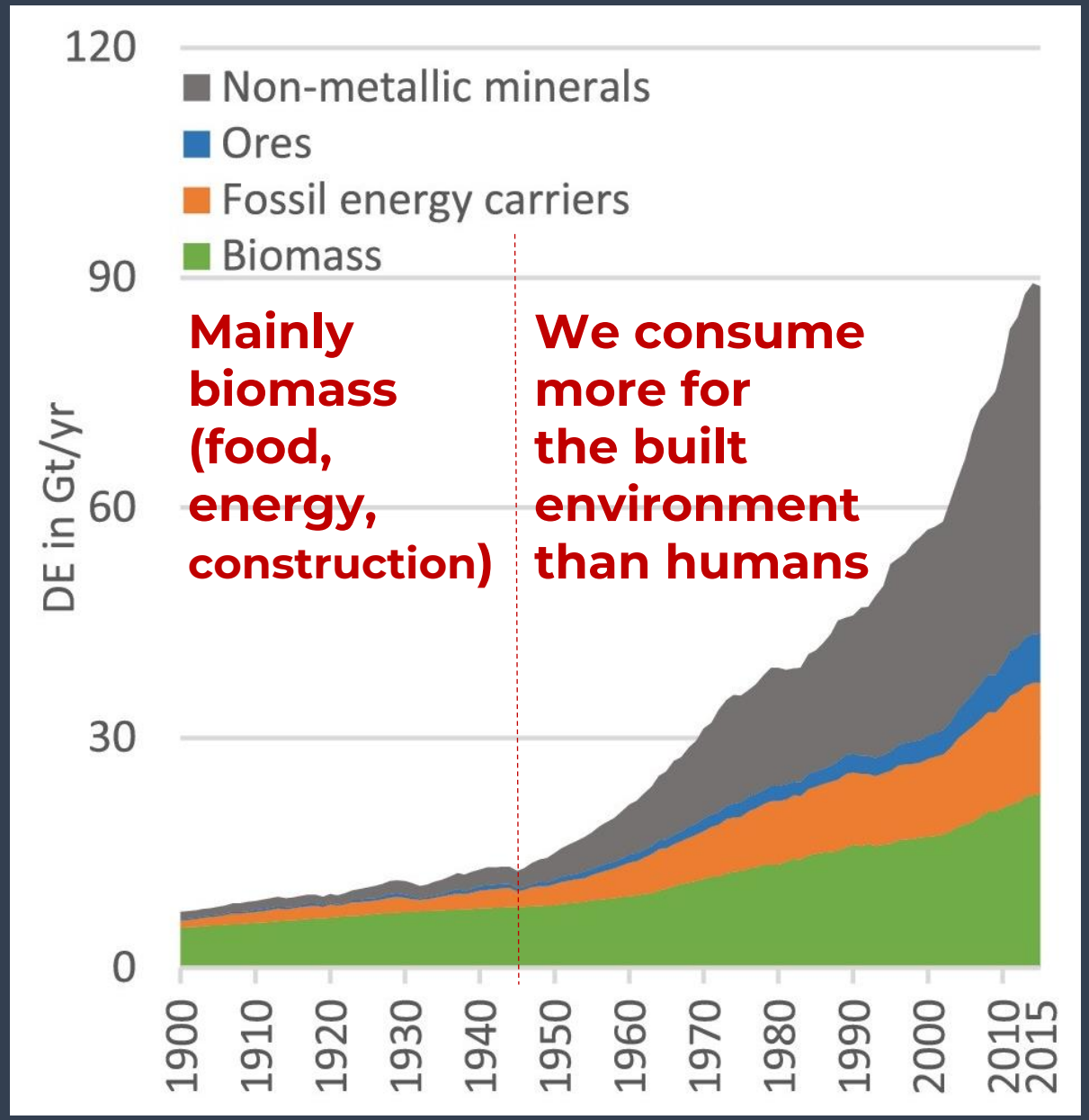
EPFL www.epfl.ch/labs/herus/

METABOLISM OF CITIES www.metabolismofcities.org

Un peu de contexte



Circle Economy (2018). The Circularity Gap Report



De 1900 to 2015,
Population globale a augmenté de 4,5x

- 4x
- 14x
- 33x
- 50x

Extraction matérielle

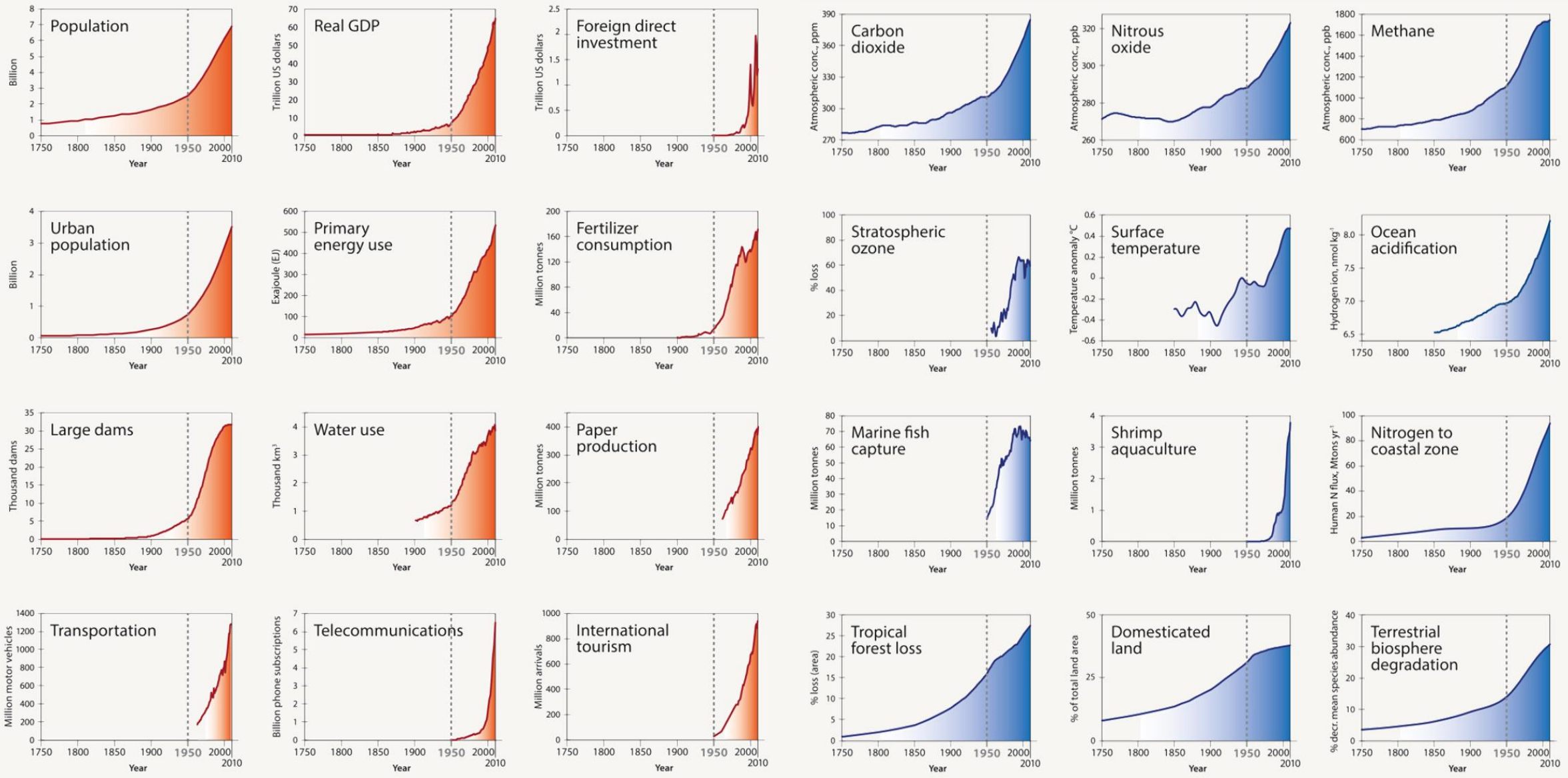
Source: Krausmann, F., Lauk, C., Haas, W., & Wiedenhofer, D. (2018). From resource extraction to outflows of wastes and emissions: The socioeconomic metabolism of the global economy, 1900–2015. Global Environmental Change, 52, 131-140.

Synthèse

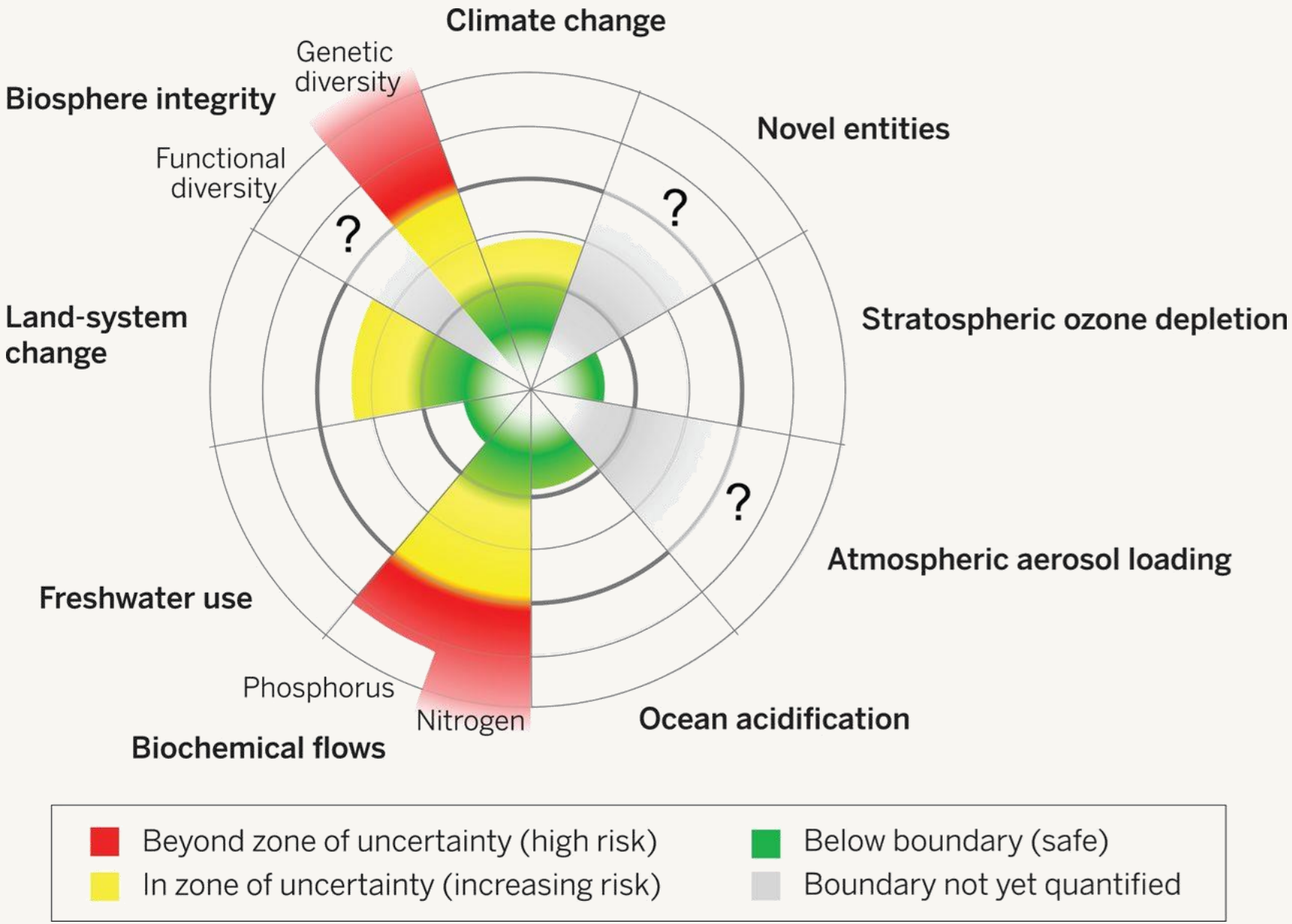
De 1900-2015

- Population Globale : 4.6x
- Population Rurale: 2.6x
- **Population Urbaine : 14x**
- **Consommation Energétique Primaire : 15x/year**
- Consommation d'eau : 6x/year
- **Extraction de matériaux : 12x/year**
- Stocks matériels : 30x
- **Déchets/Flux sortants: 11x/year**
- **CO_2 emissions: 15x/year**

Et alors ?



Steffen et al. (2015). The trajectory of the Anthropocene: The Great Acceleration



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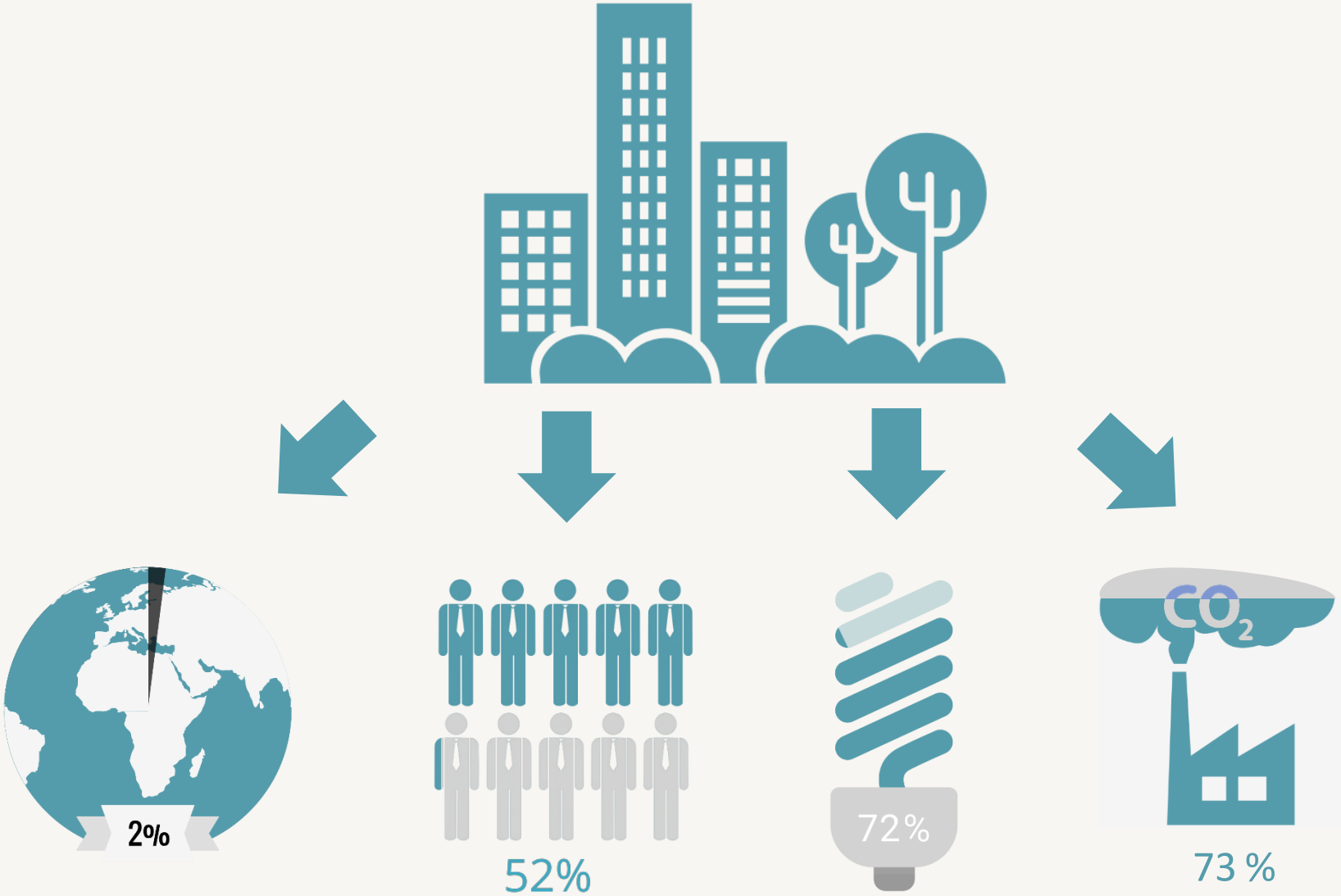
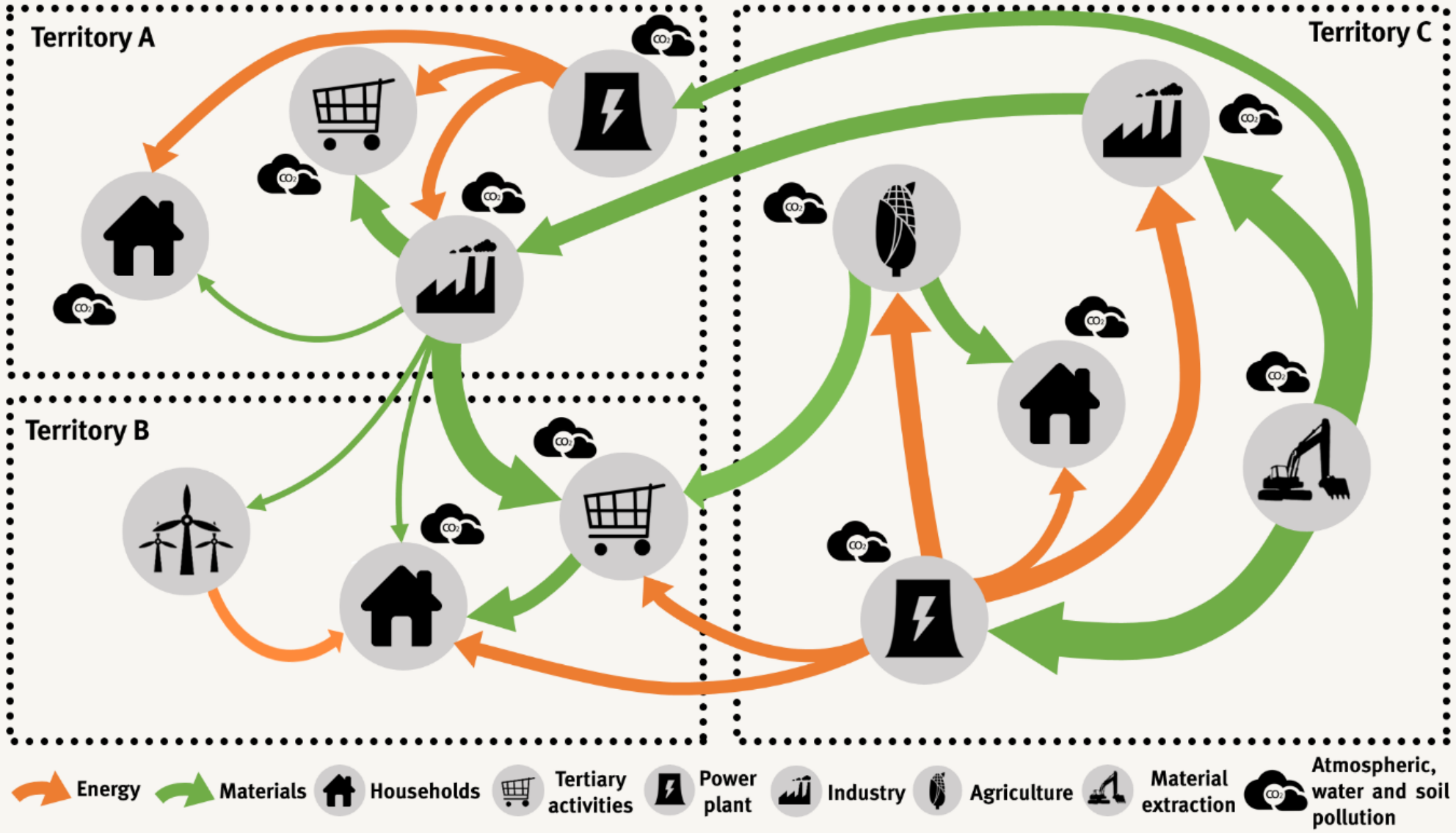
Les villes comme un.e enjeu/solution central.e



Les villes comme un nœud d’enjeux



Qui est responsable ? Par où commencer ?

Importation de produits finis

Loin des yeux, loin du cœur

CAT

NEW YORK CONTAINER TERMINAL INC


KOMATSU

Comment on en est arriver là ?

Désolidarisation

Source: Barles, S. (2005). L'invention des déchets urbains: France, 1790-1970. Editions Champ Vallon.

Specialisation Emplois

Specialisation Spatiale

Des villes-territoires sans ressources ?

EROI

Train
Bateau
Avion

Des ressources trop peu chères

Ville résiliente

Ville durable

Ville sobre

Ville circulaire

Ville autosuffisante

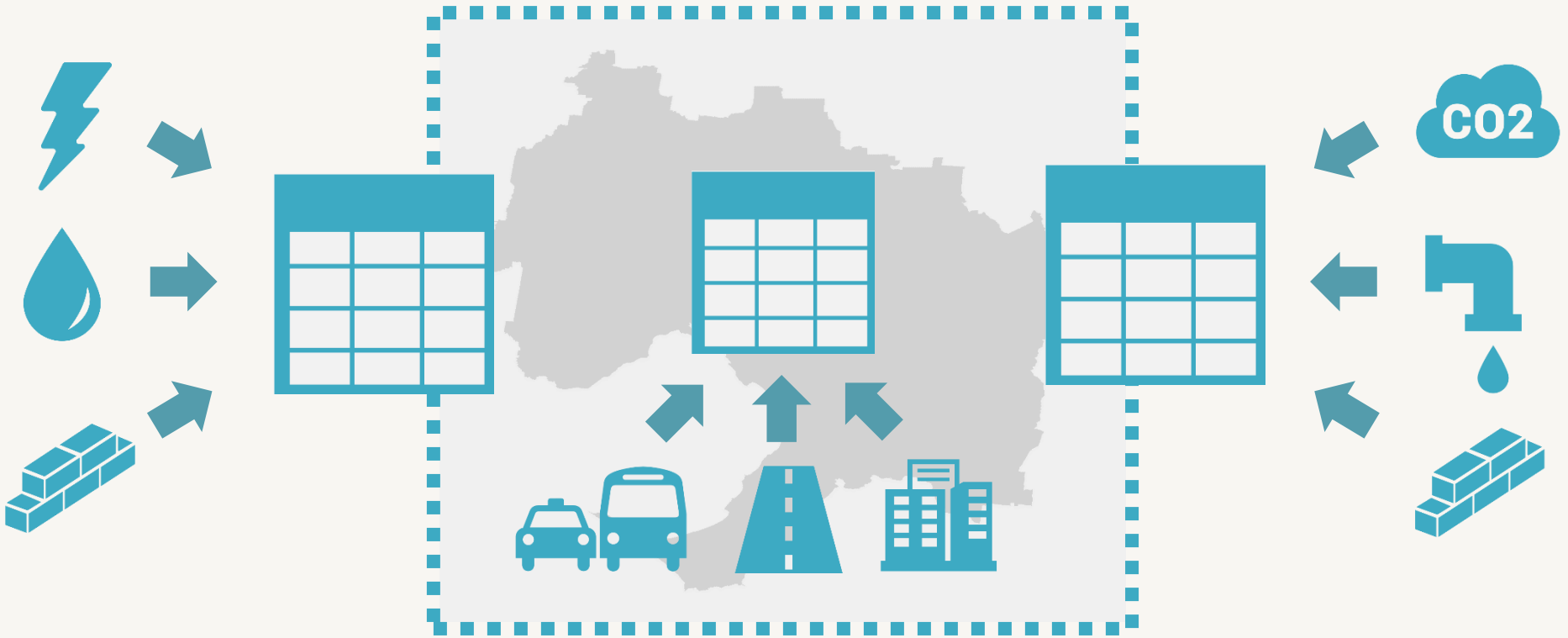
Ville décarbonnée

Comment négocier entre tous ces flux/enjeux ?

Le métabolisme urbain- une intro

=

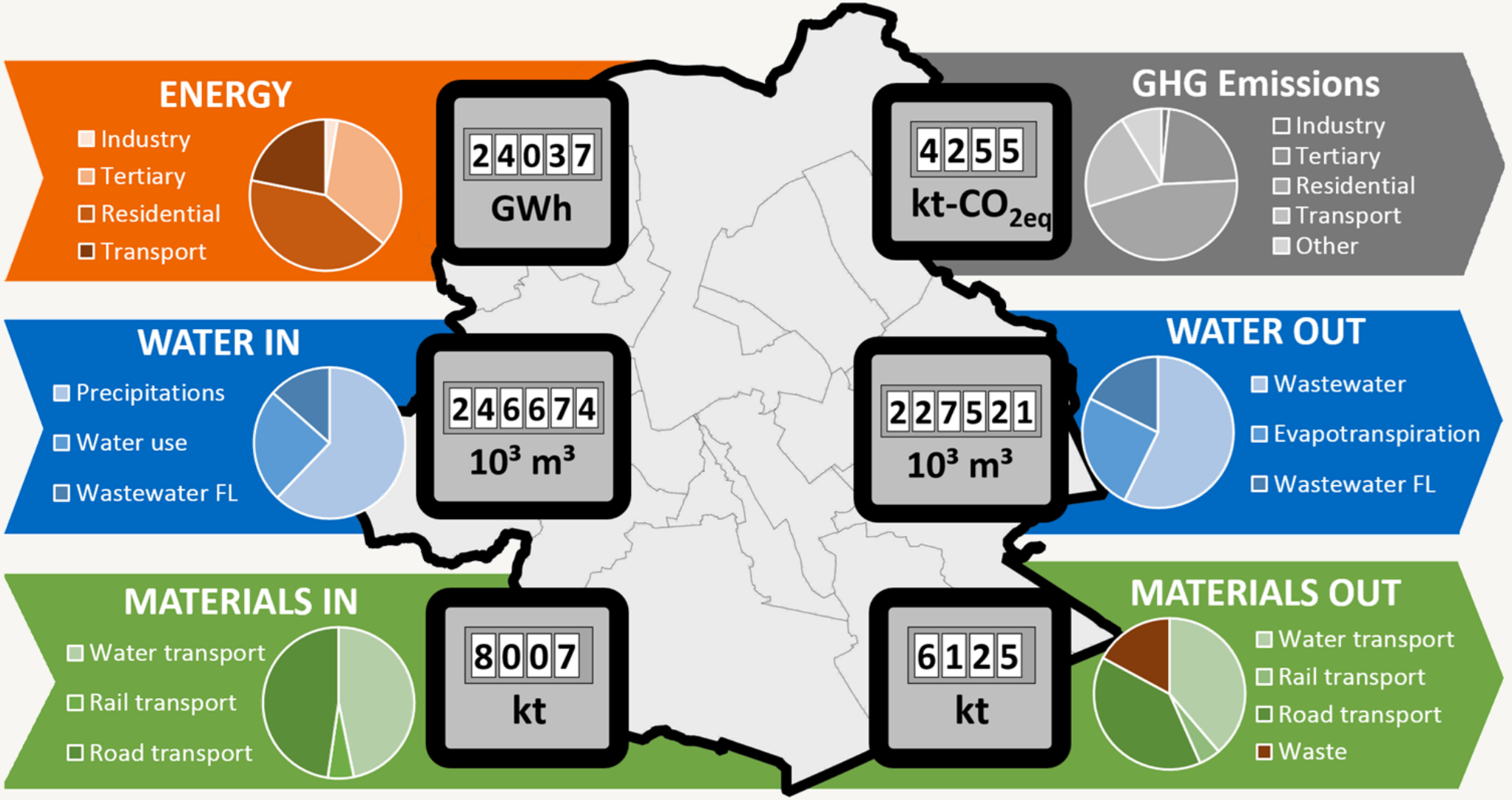
Le métabolisme urbain



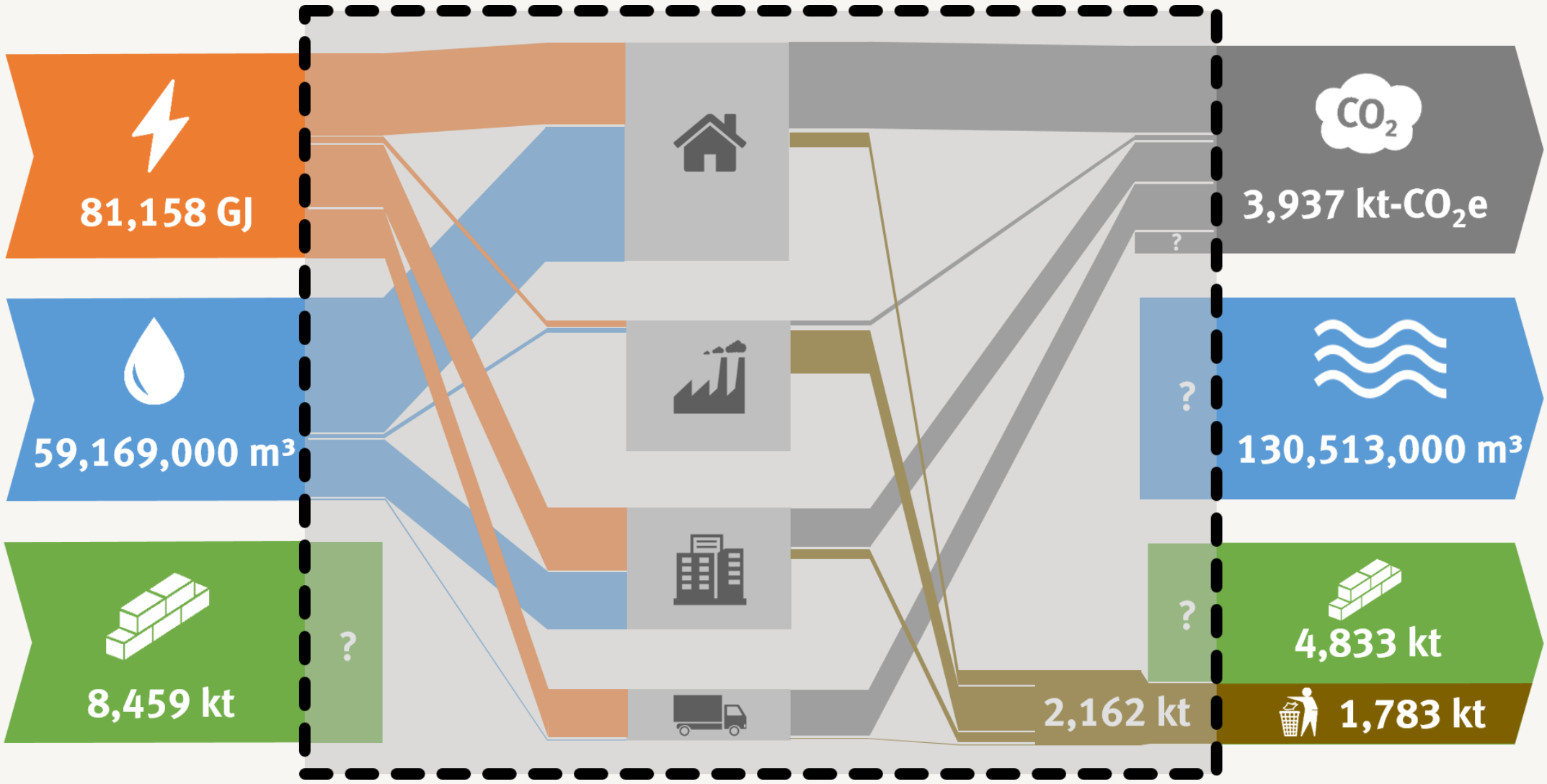
Un domaine d’étude (inconsolidé) étudiant les flux/stocks et les acteurs de villes d’une manière systémique

Le métabolisme urbain de Bruxelles

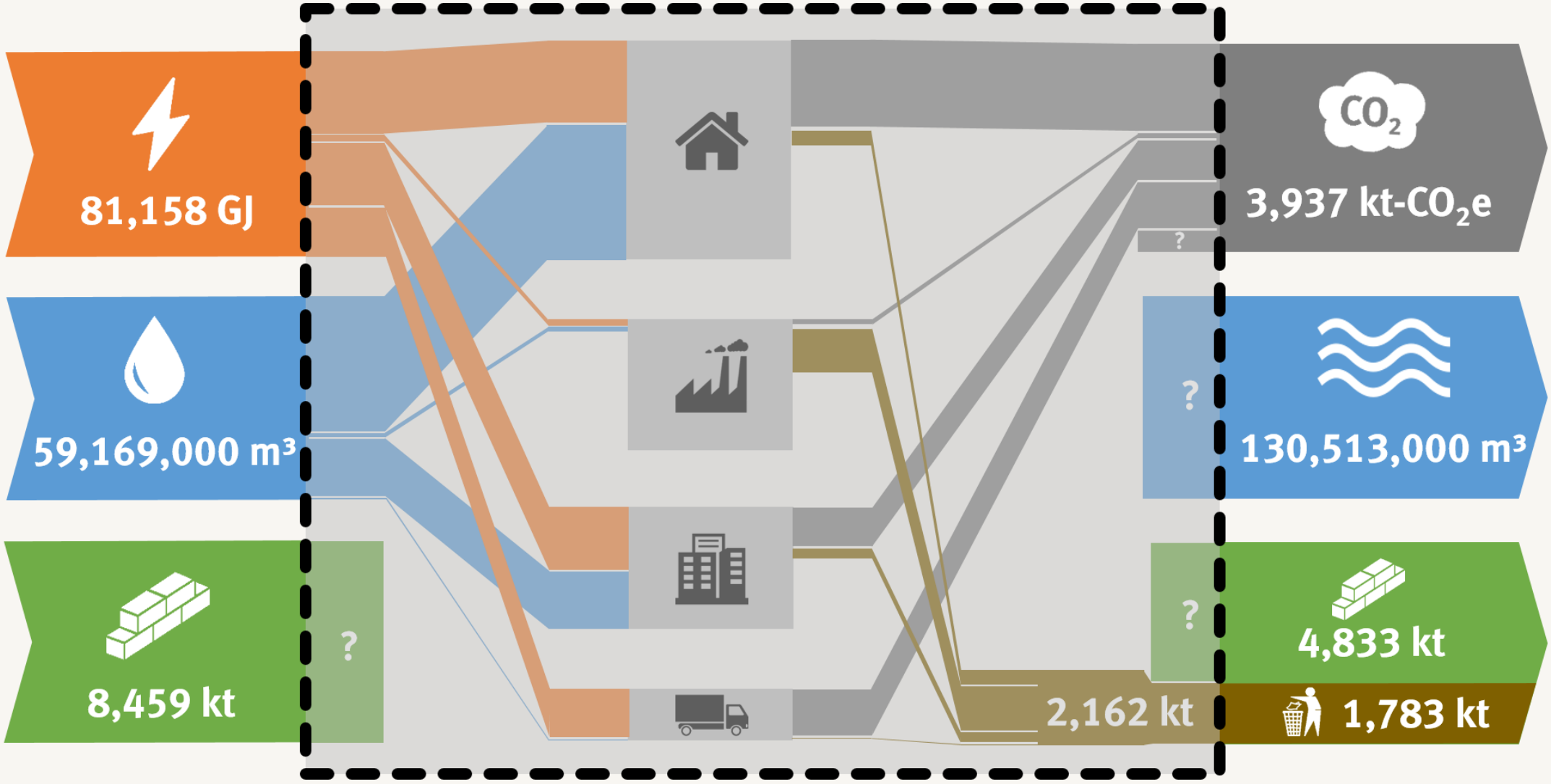
En théorie



En pratique (<3% local)


81,158 GJ
59,169,000 m³
8,459 kt
?
3,937 kt-CO₂e
?
?
130,513,000 m³
?
4,833 kt
2,162 kt
1,783 kt

En pratique



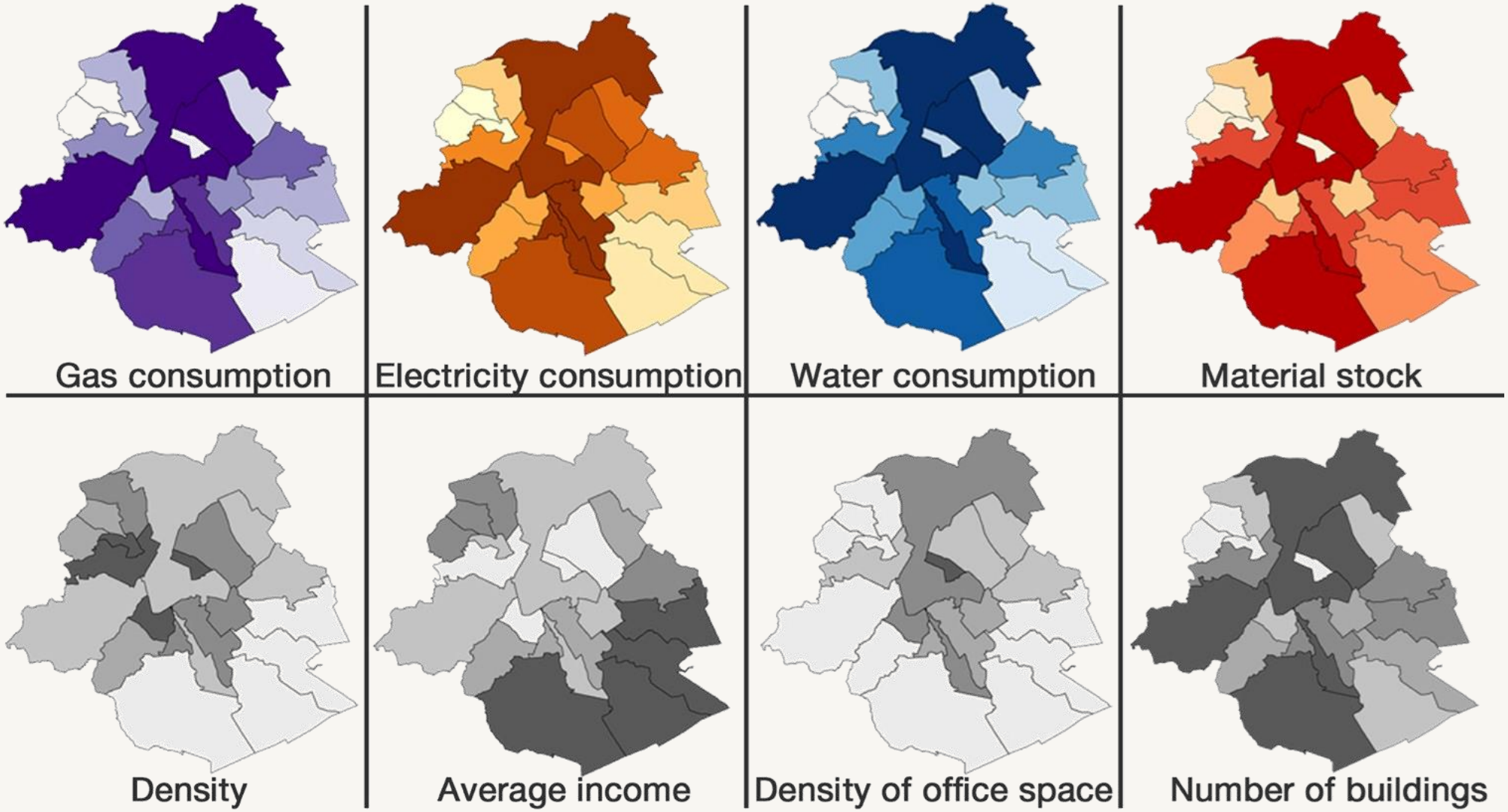
FEW quasi inexistant localement

Quels nexus ?


NEXUS ENTRE FLUX

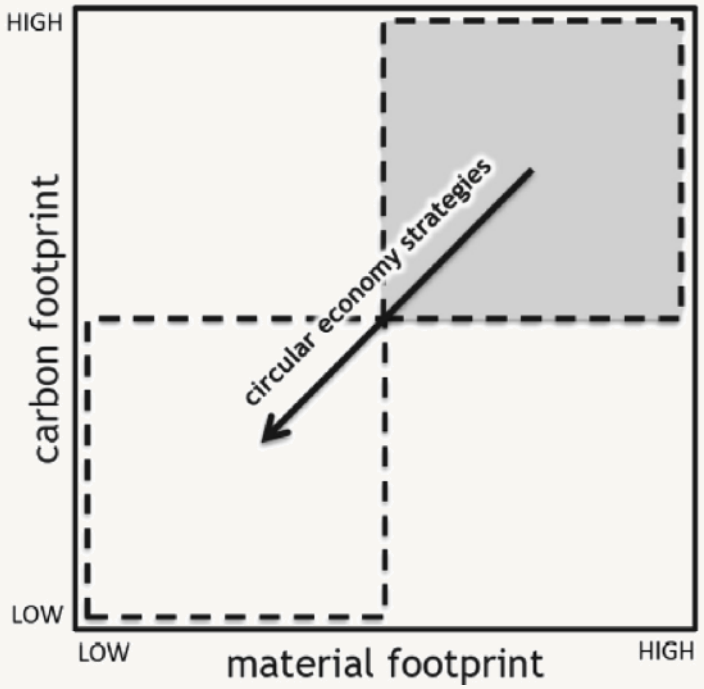

NEXUS FLUX ET STOCKS

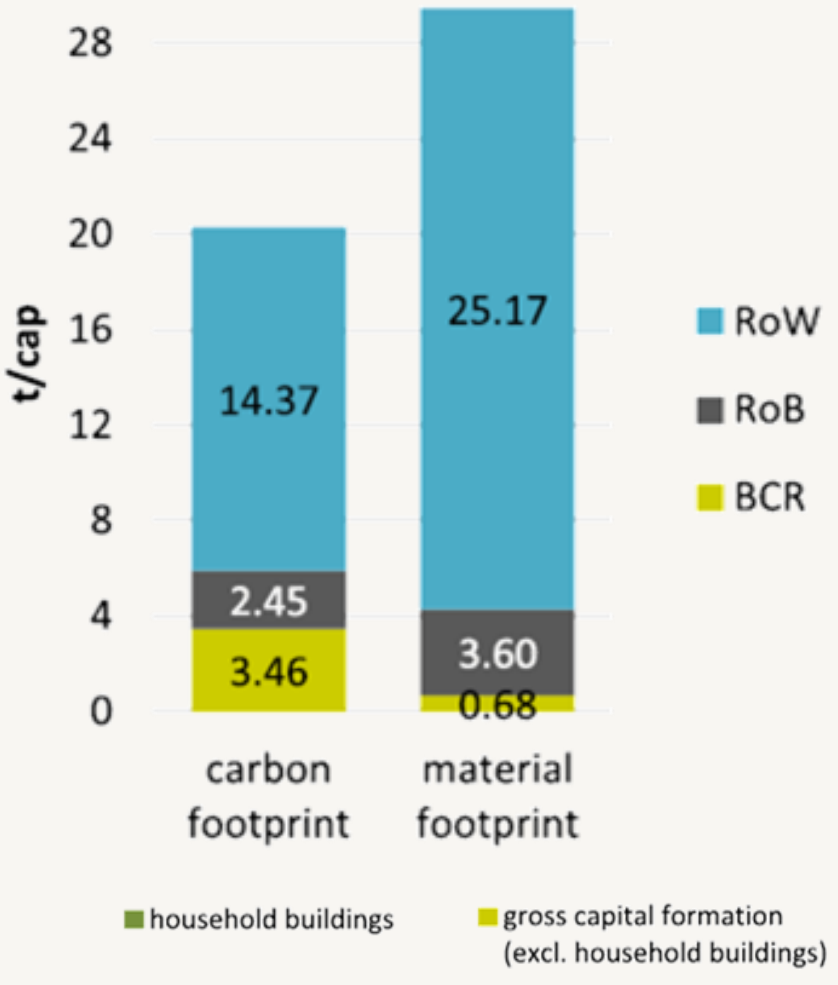

NEXUS ENTRE INFRASTRUCTURES

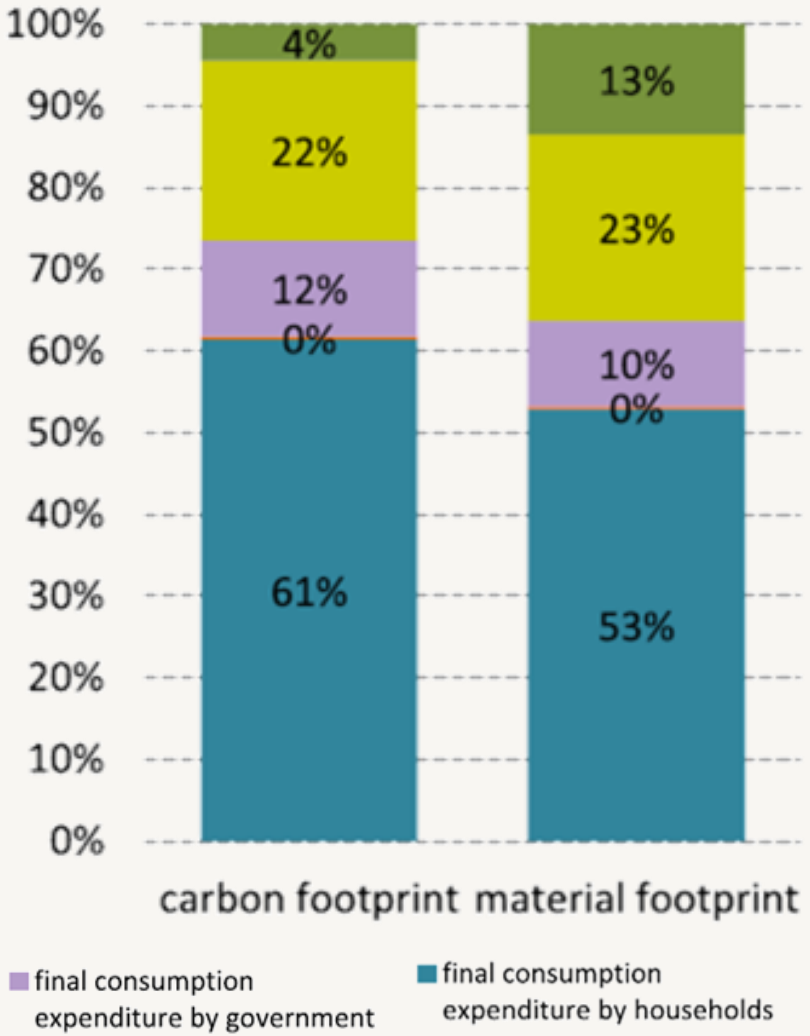


Nexus flux ?

Athanassiadis, A. and P. Bouillard. 2013. Contextualizing the Urban Metabolism of Brussels: Correlation of resource use with local factors. In *Proceedings of CISBAT 2013, International Conference, Cleantech for Smart Cities & Building from Nano to Urban Scale*. Lausanne: EPFL-Lausanne.

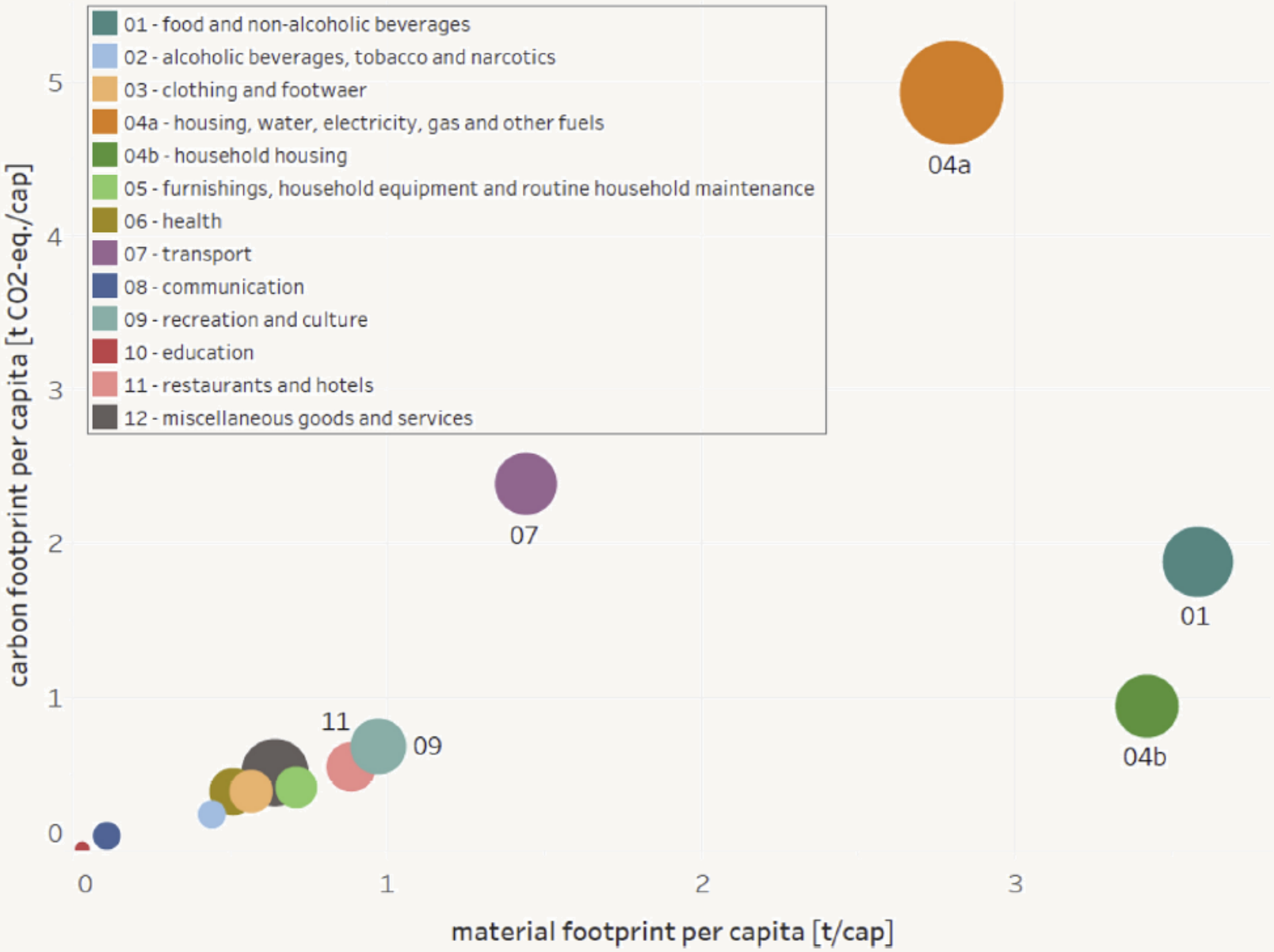






Christis, Athanassiadis and Vercalsteren (2019). Implementation at a city level of circular economy strategies and climate change mitigation – the case of Brussels. *Journal of Cleaner Production*

Circulaire et durable ?



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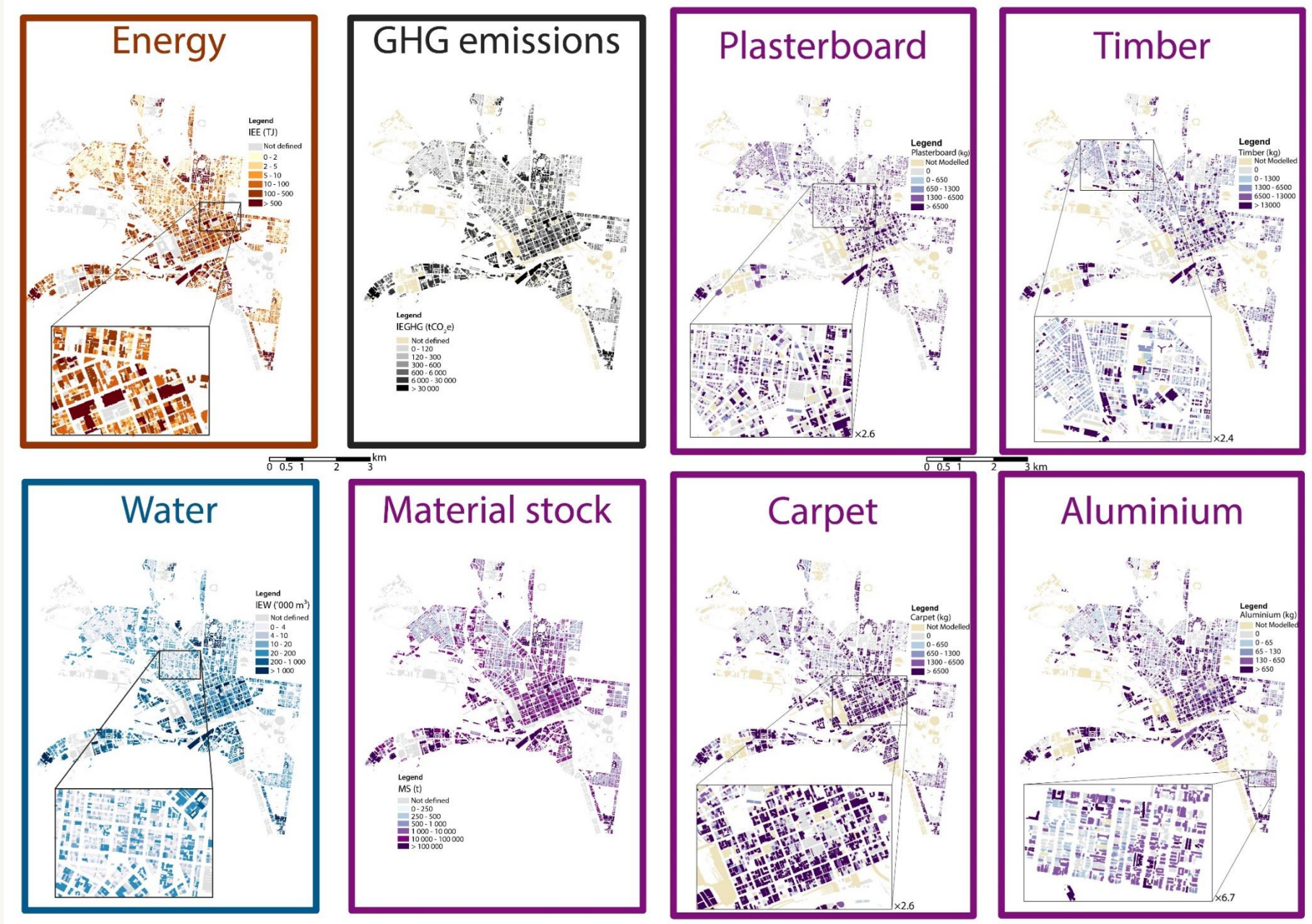
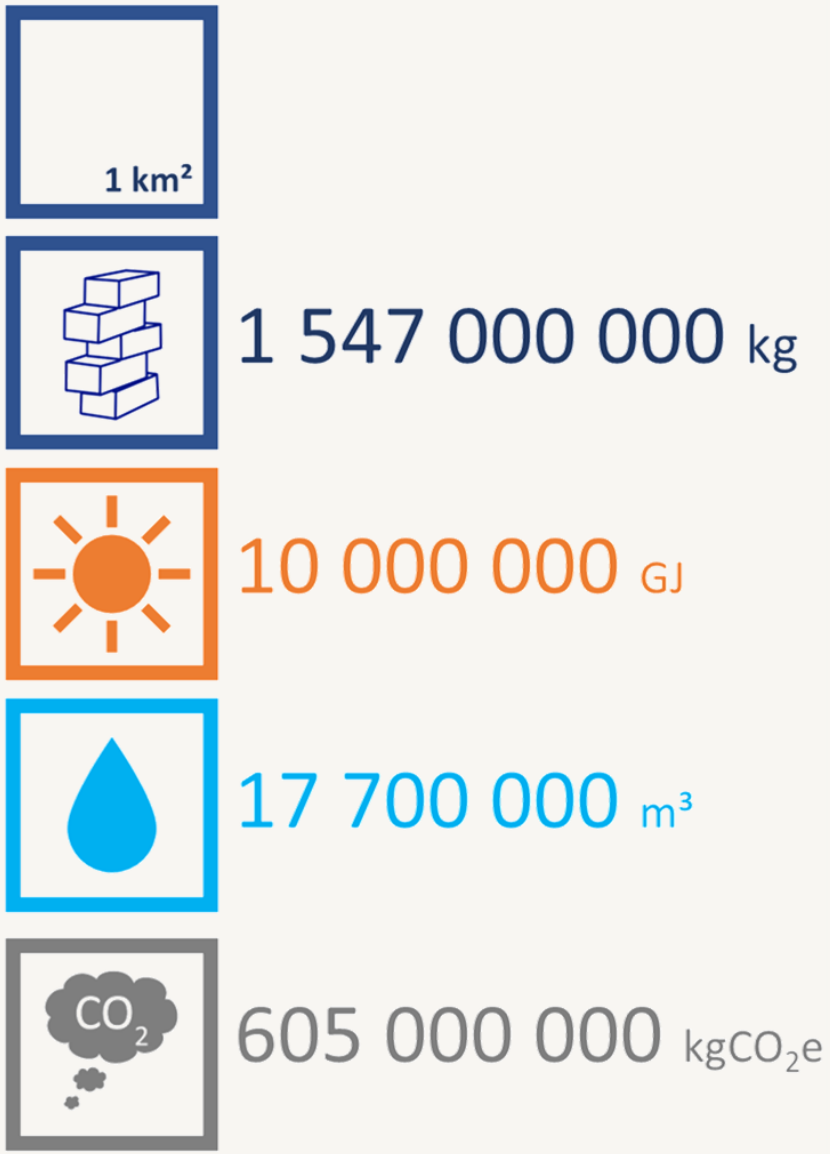


Explorer la mine urbaine

Stephan, A. and A. Athanassiadis. 2017. Quantifying and mapping embodied environmental requirements of urban building stocks. *Building and Environment* 114: 187-202.

Stephan, A. and A. Athanassiadis. 2018. Towards a more circular construction sector: Estimating and spatialising current and future non-structural material replacement flows to maintain urban building stocks. *Resources, Conservation and Recycling* 129: 248-262.



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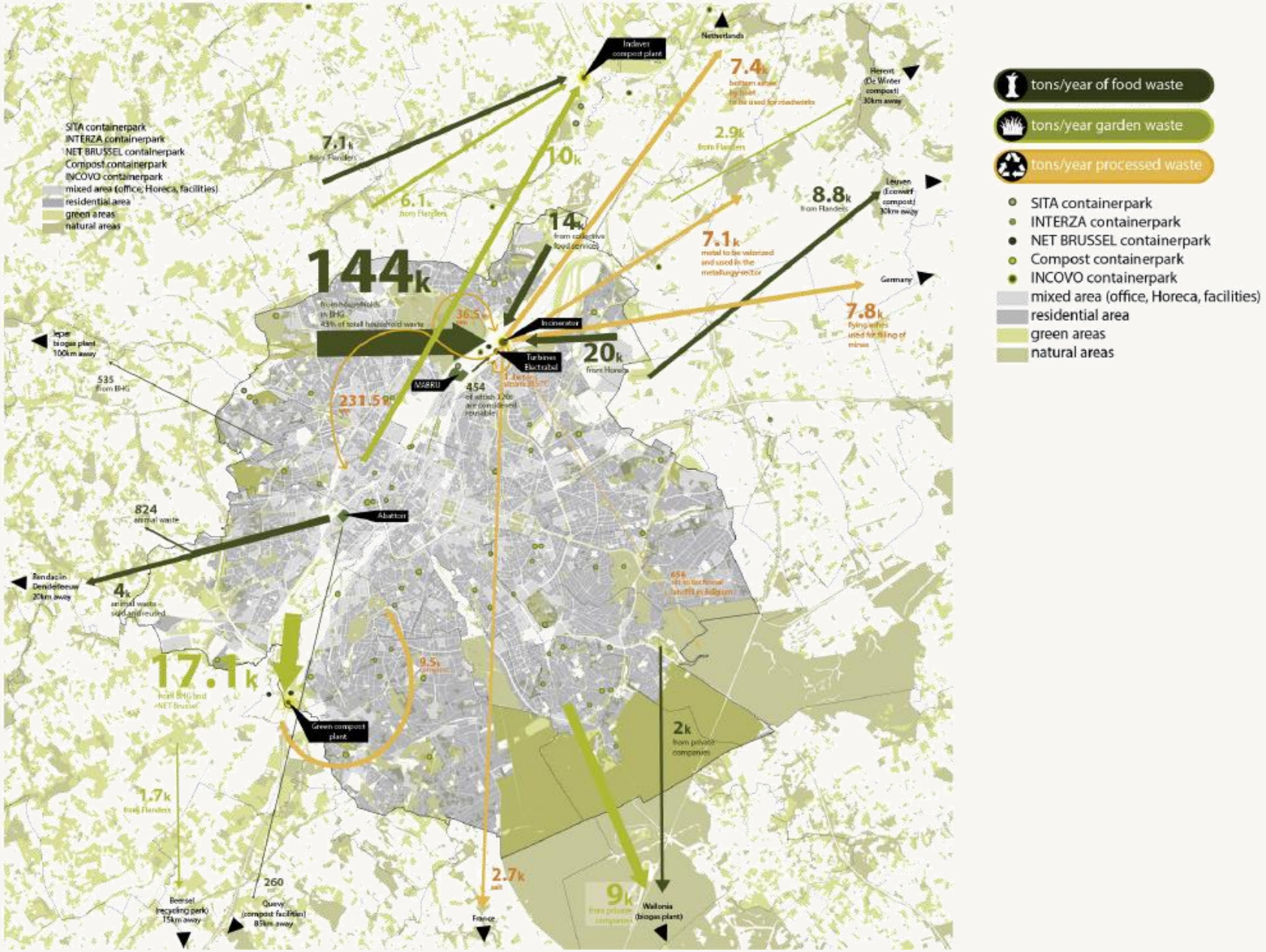
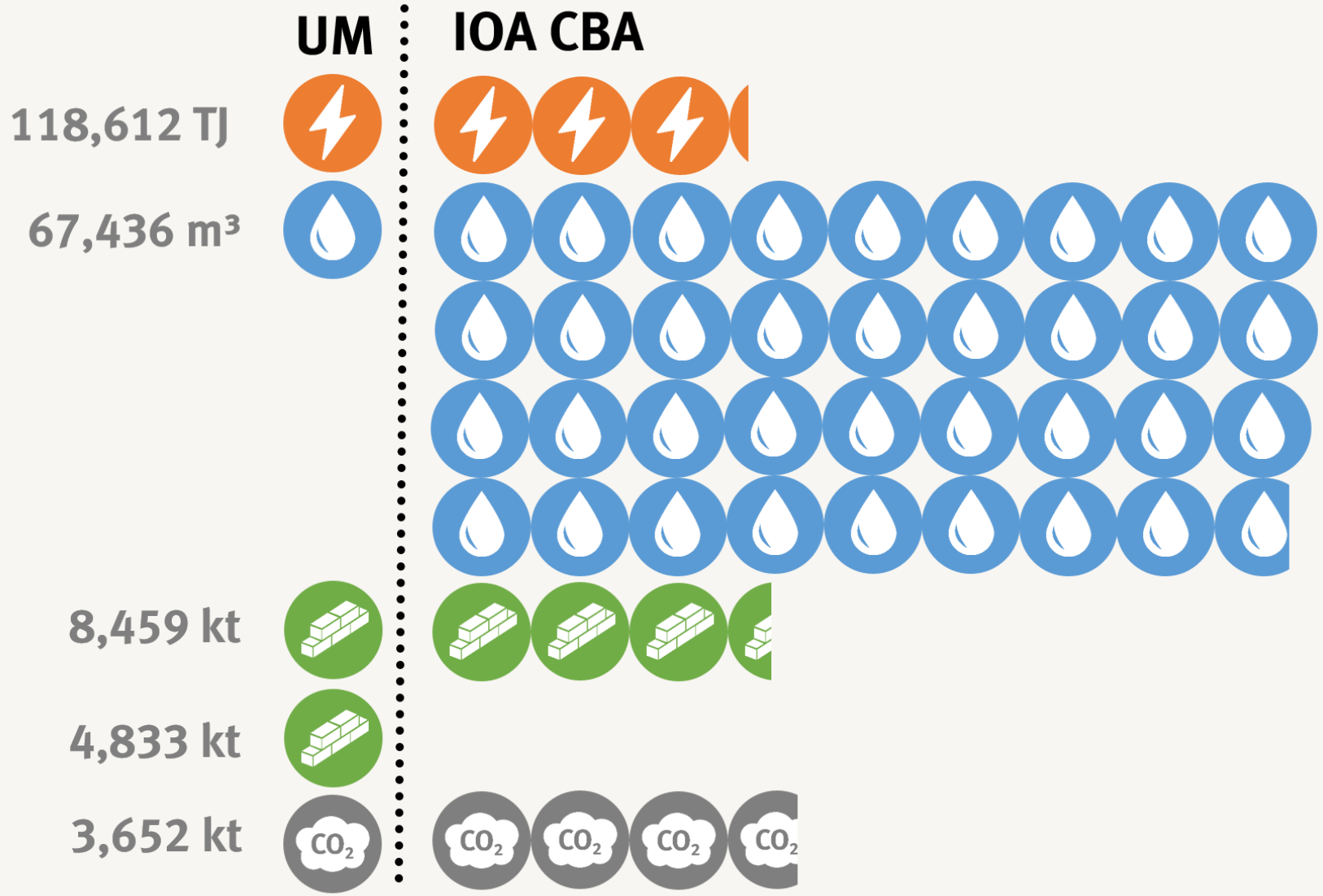
Explorer la mine urbaine – et ses impacts



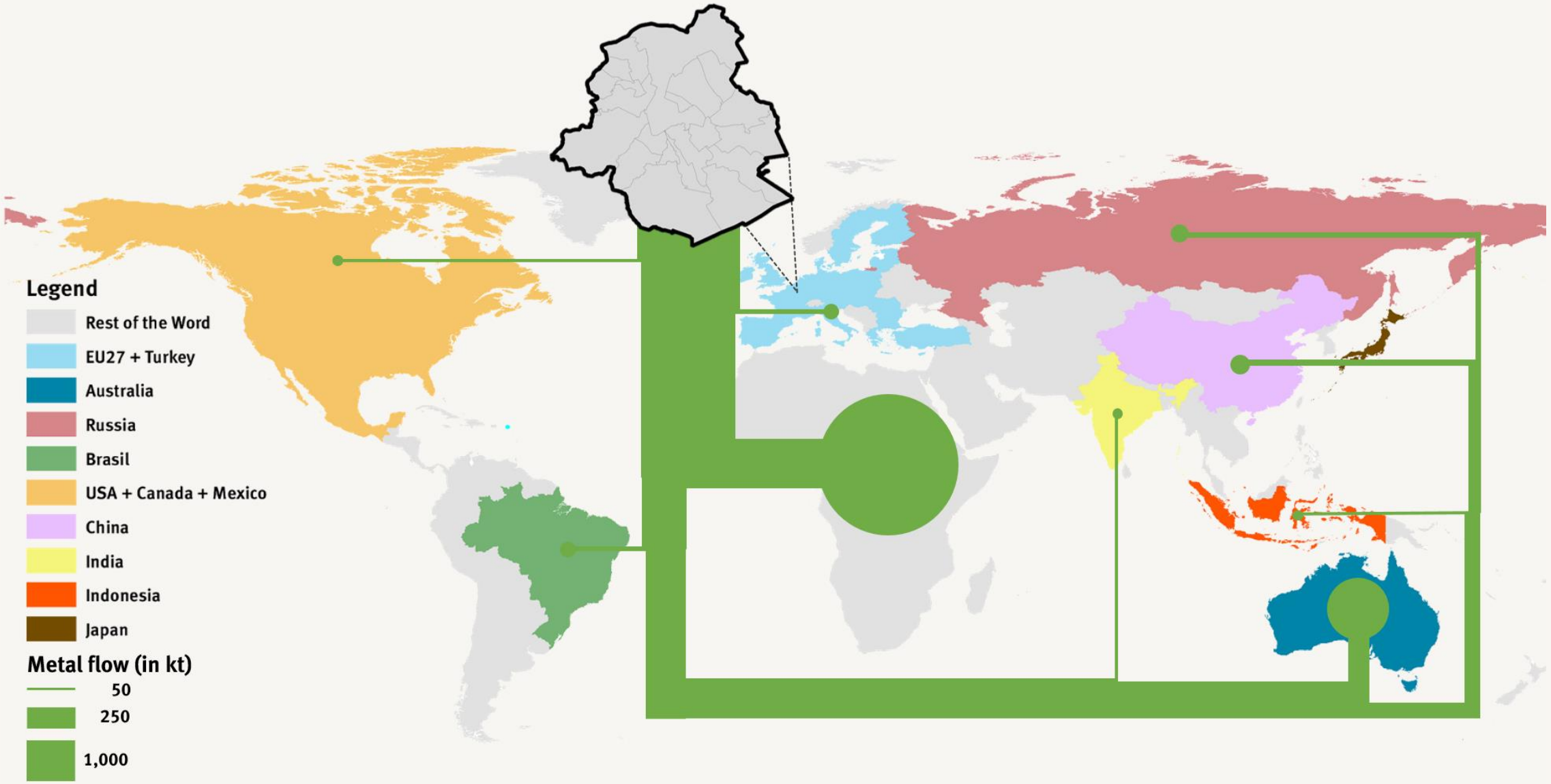
Nexus flux-infrastructures (eaux usées/biodéchets) ?

Quels hinterlands ?



Effets/impacts indirects des villes

Athanassiadis, A., M. Christis, P. Bouillard, A. Vercalsteren, R. H. Crawford, and A. Z. Khan. 2018. Comparing a territorial-based and a consumption-based approach to assess the local and global environmental performance of cities. *Journal of Cleaner Production* 173: 112-123.



Impossible d'être circulaire

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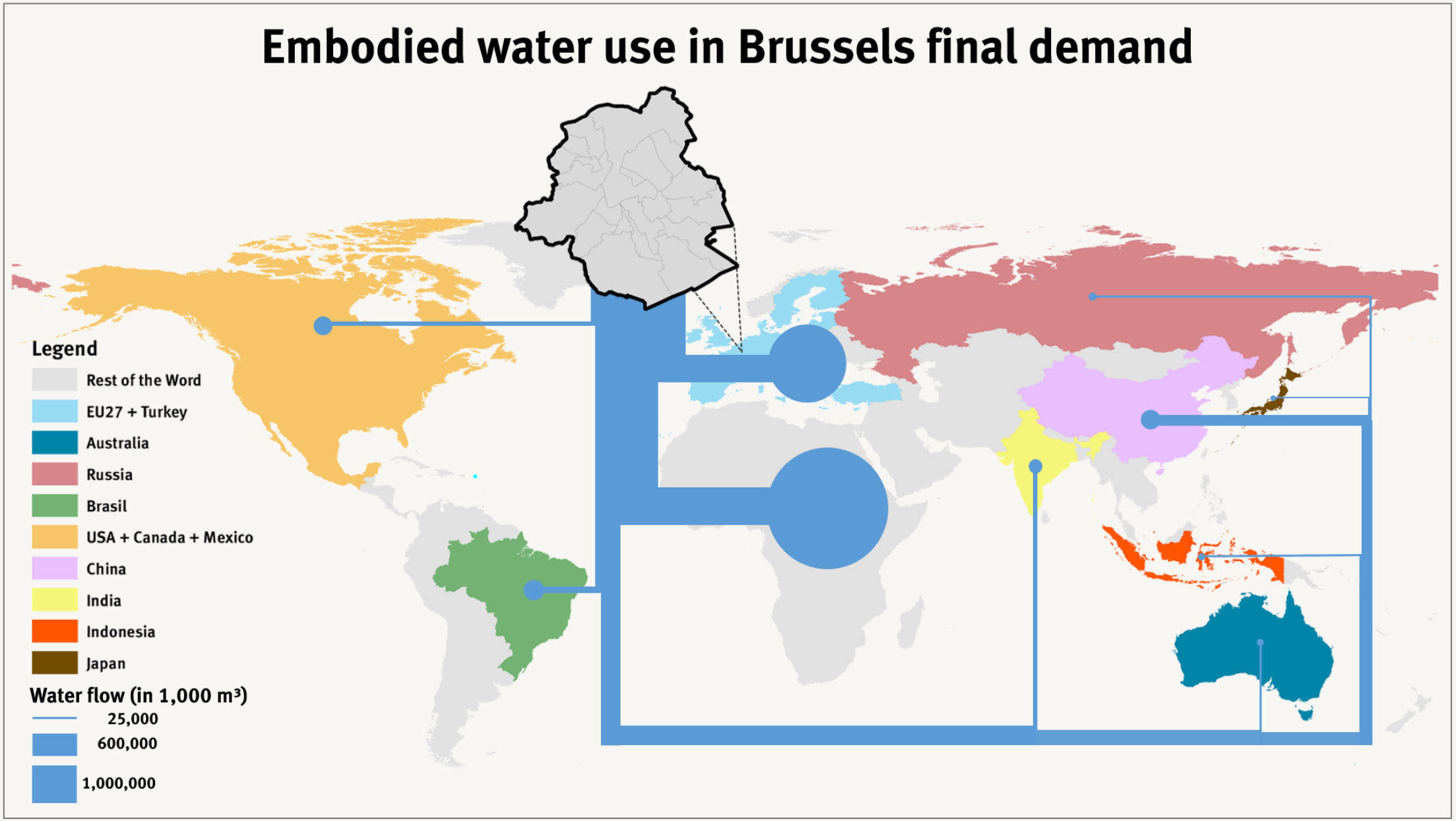

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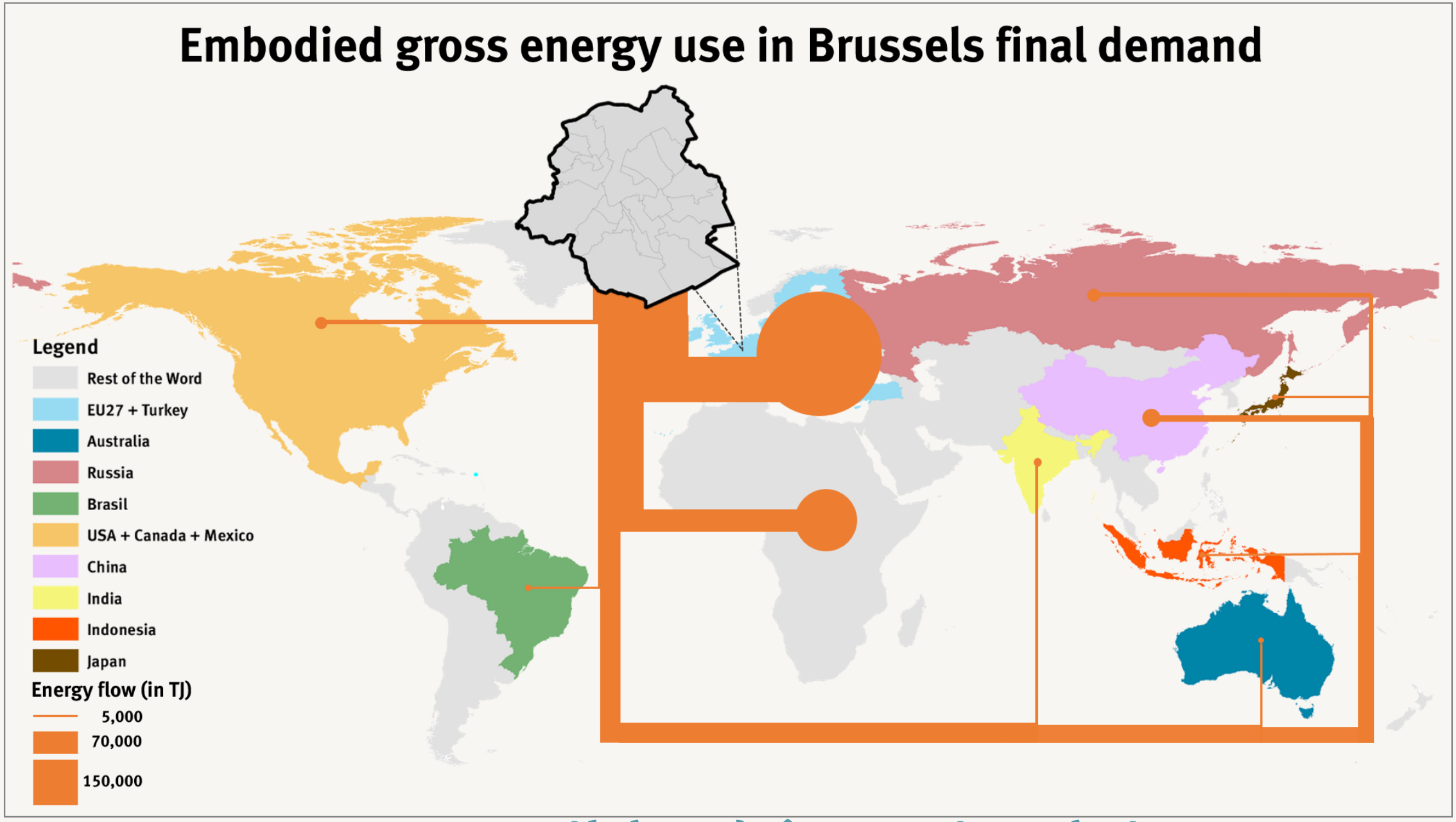
Embodied gross energy use in Brussels final demand



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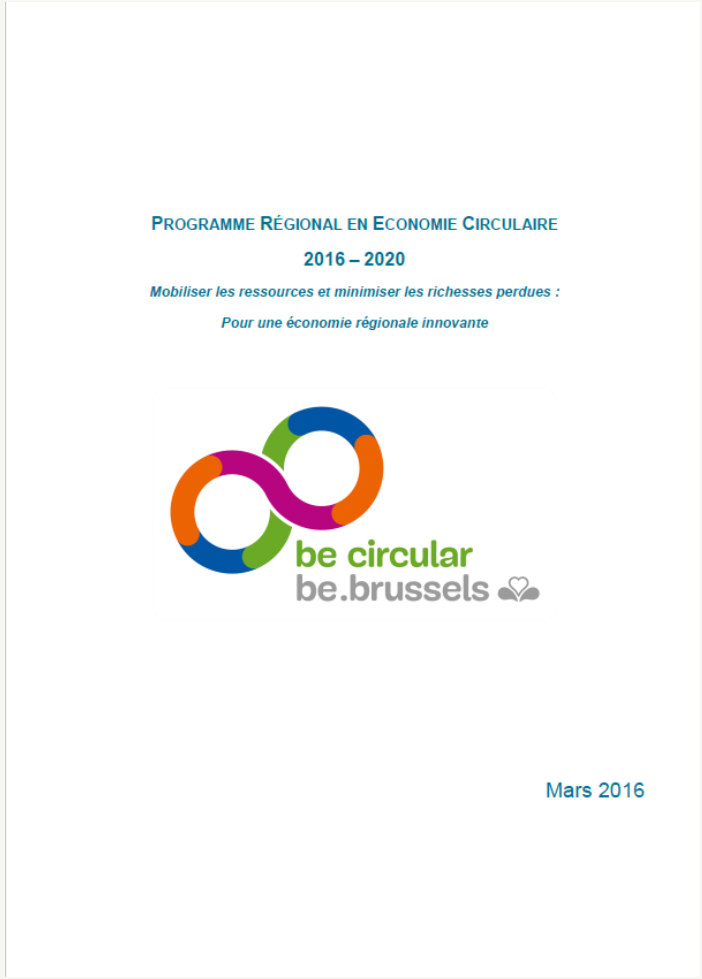
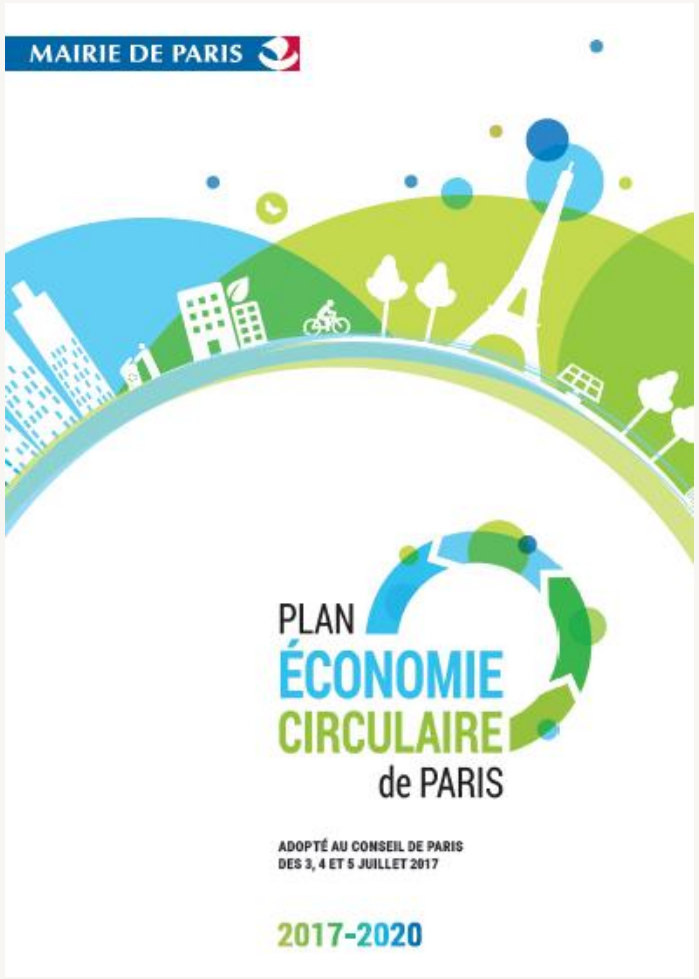
Des politiques locales pour un métabolisme urbain mondialisé ?





Outil d'analyse pour l'économie circulaire

be circular
be.brussels

Programme Régional en Economie Circulaire

GOUVERNANCE

4 ADMINS

3 CABINETS

1 STRATÉGIE 2025

3 OBJECTIFS

Objectifs environnementaux
=
Opportunités économiques

Relocaliser l'économie à Bruxelles

Contribuer à **créer de l'emploi**

FOCUS SUR 5 SECTEURS

2025

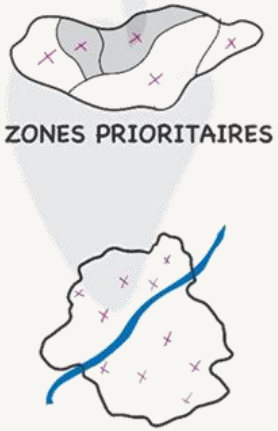
AUJOURD'HUI

INDICATEURS

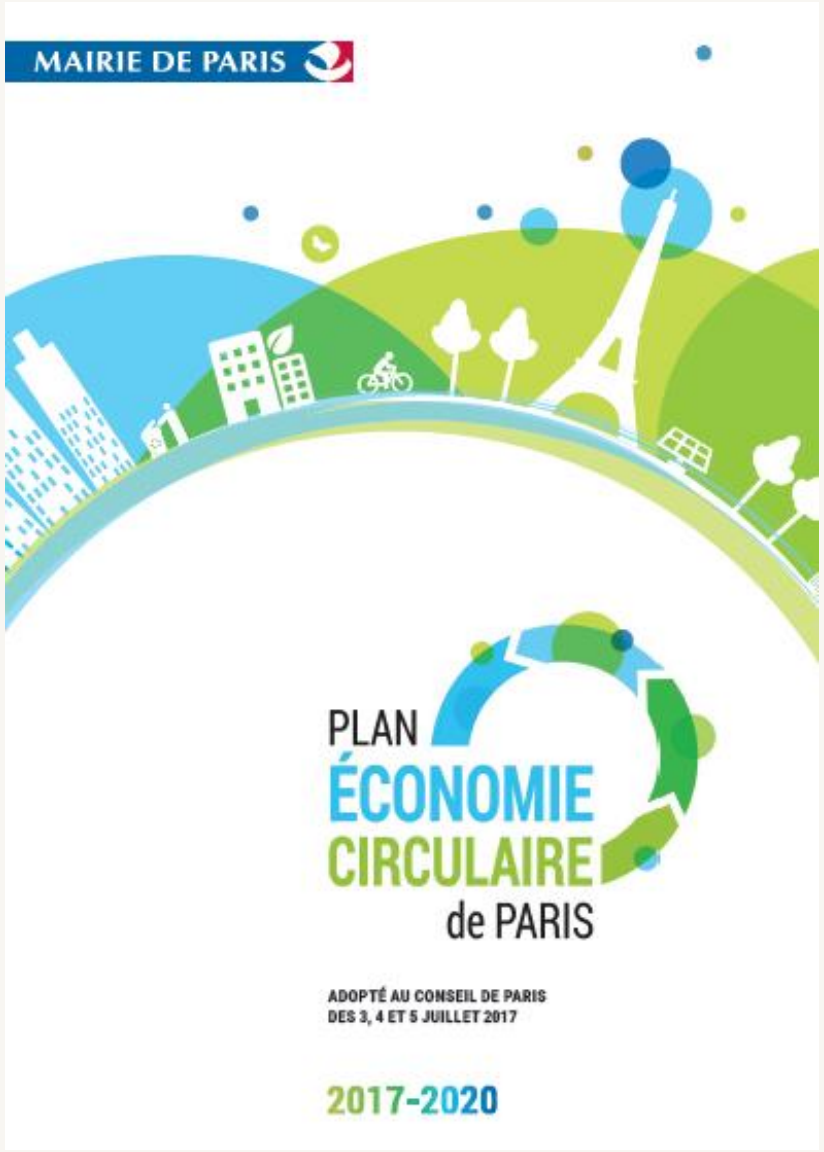
MESURES TRANSVERSALES

- Aides économiques directes
- Marchés publics
- Innovation
- Formation
- Economie Sociale
- Emploi
- Cadre législatif
- Aides économiques indirects

UN TERRITOIRE



10 ZONES PRIORITAIRES



Circular Economy Plan of Paris

Comment avancer ?


SPATIALISER LES FLUX

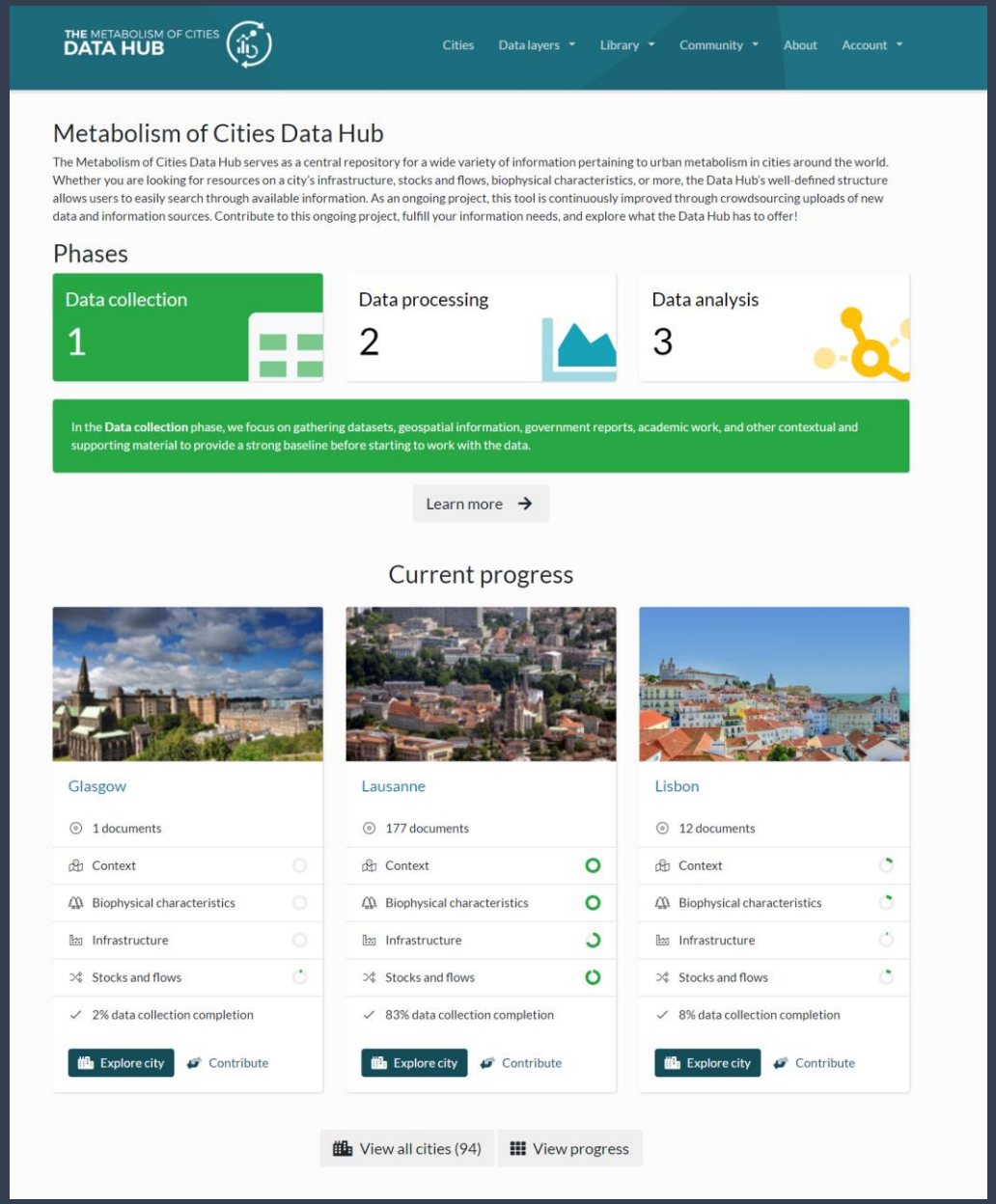

SUIVRE LES CHAINES DE VALEURS (ACTEURS-FLUX)


PENSER SYSTEME

Comment avancer?

Quelques outils

https://data.metabolismofcities.org/



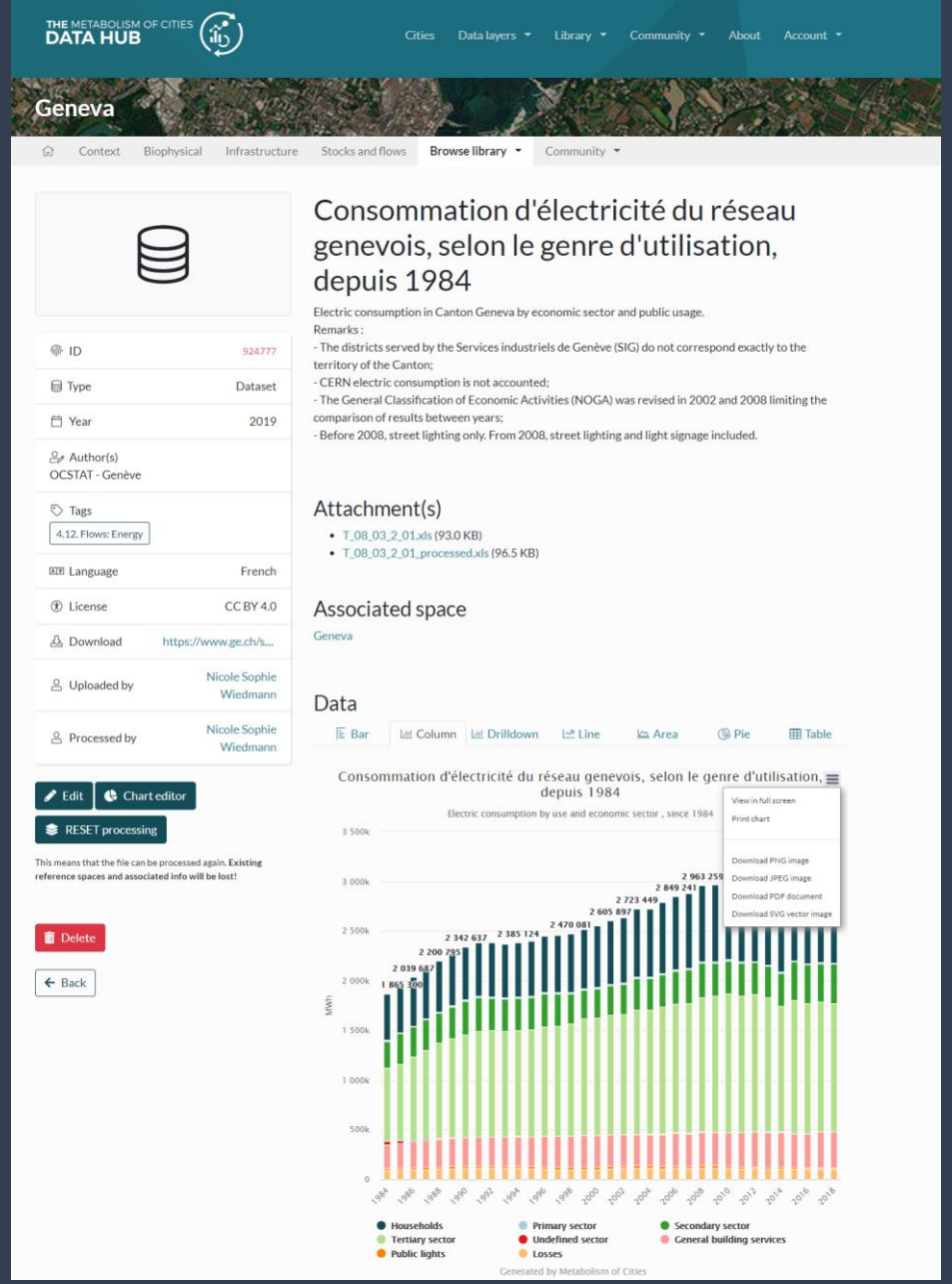
90+ cities

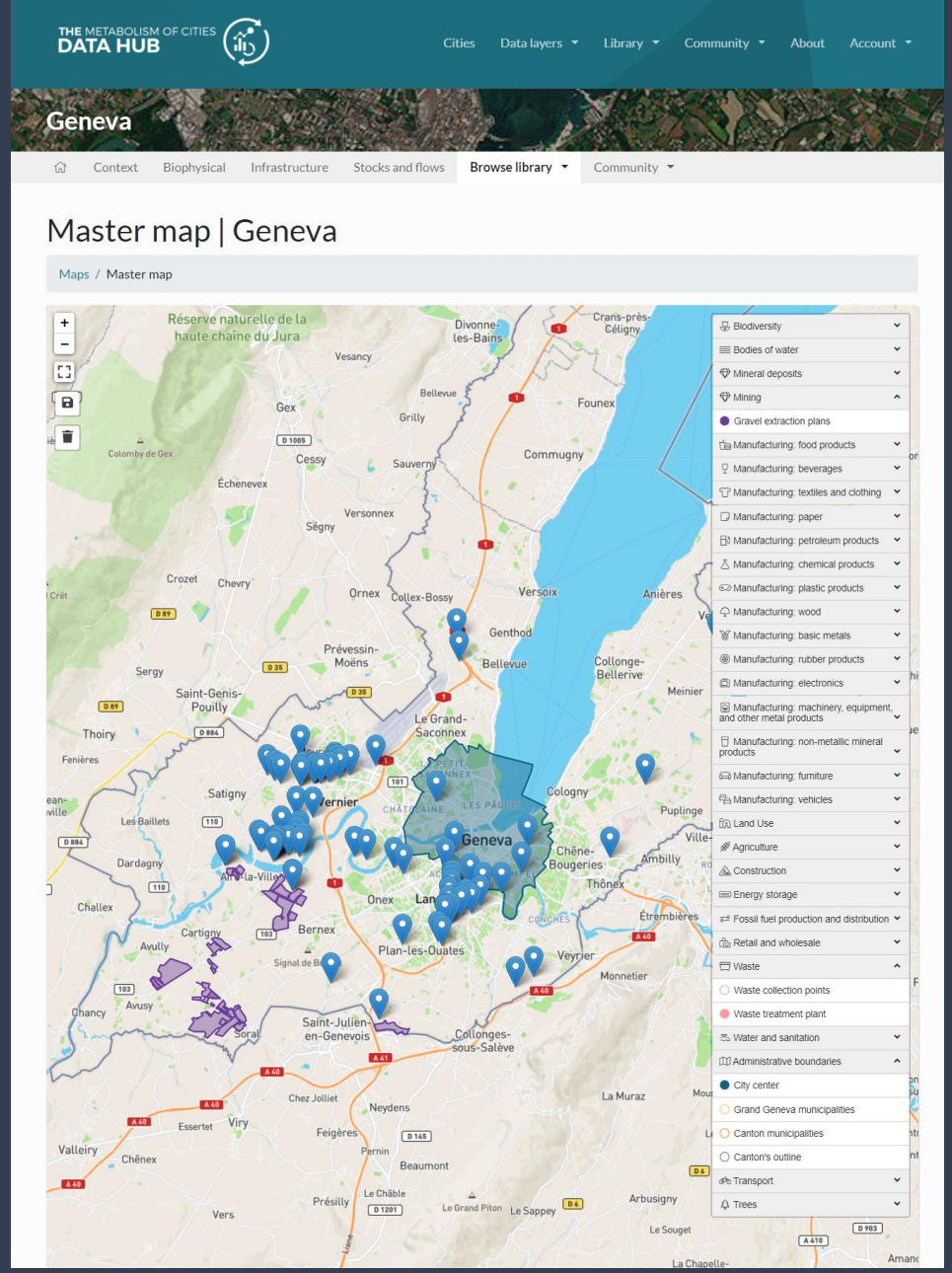
1790 datasets

827 maps

200+ people

Metabolism of Cities Data Hub





https://data.metabolismofcities.org/

Metabolism of Cities Data Hub

Material Stocks

Cities Contribute Publications Account

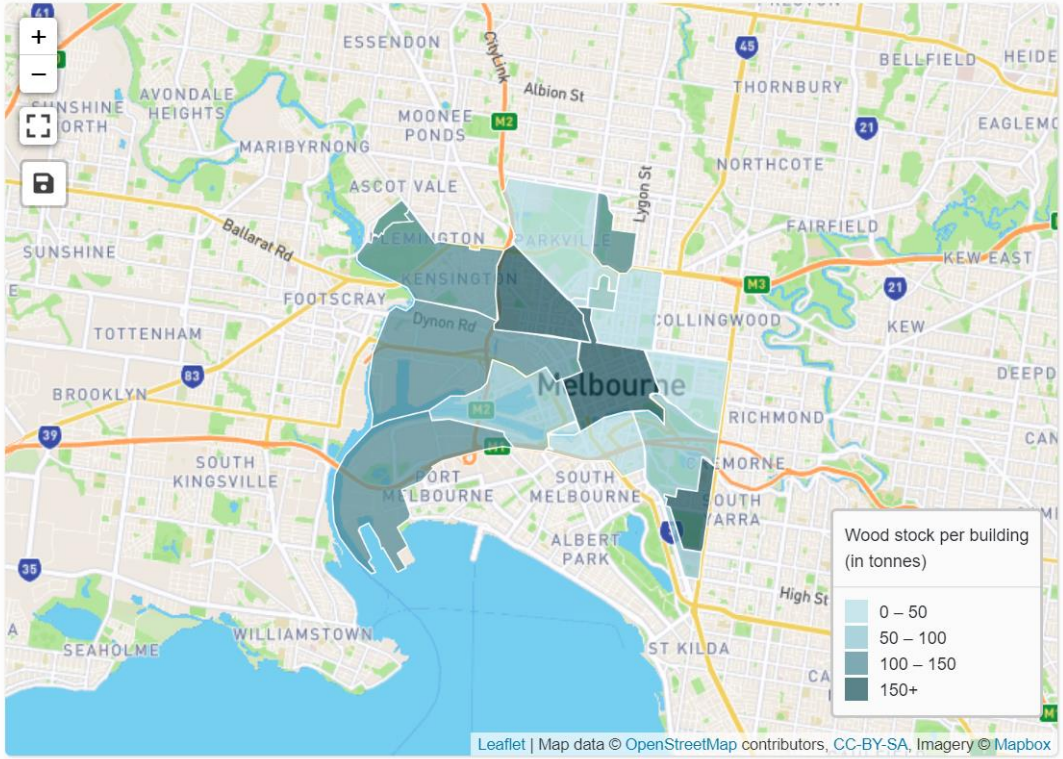
Melbourne

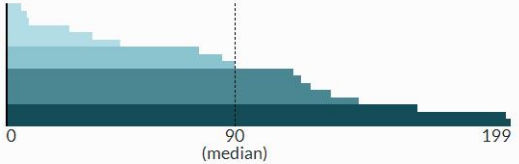
Overview Data Compare areas Modeller Archetypes Stories

Dataset: Wood stock

Area: Blocks for Census of Land Use and Employm...

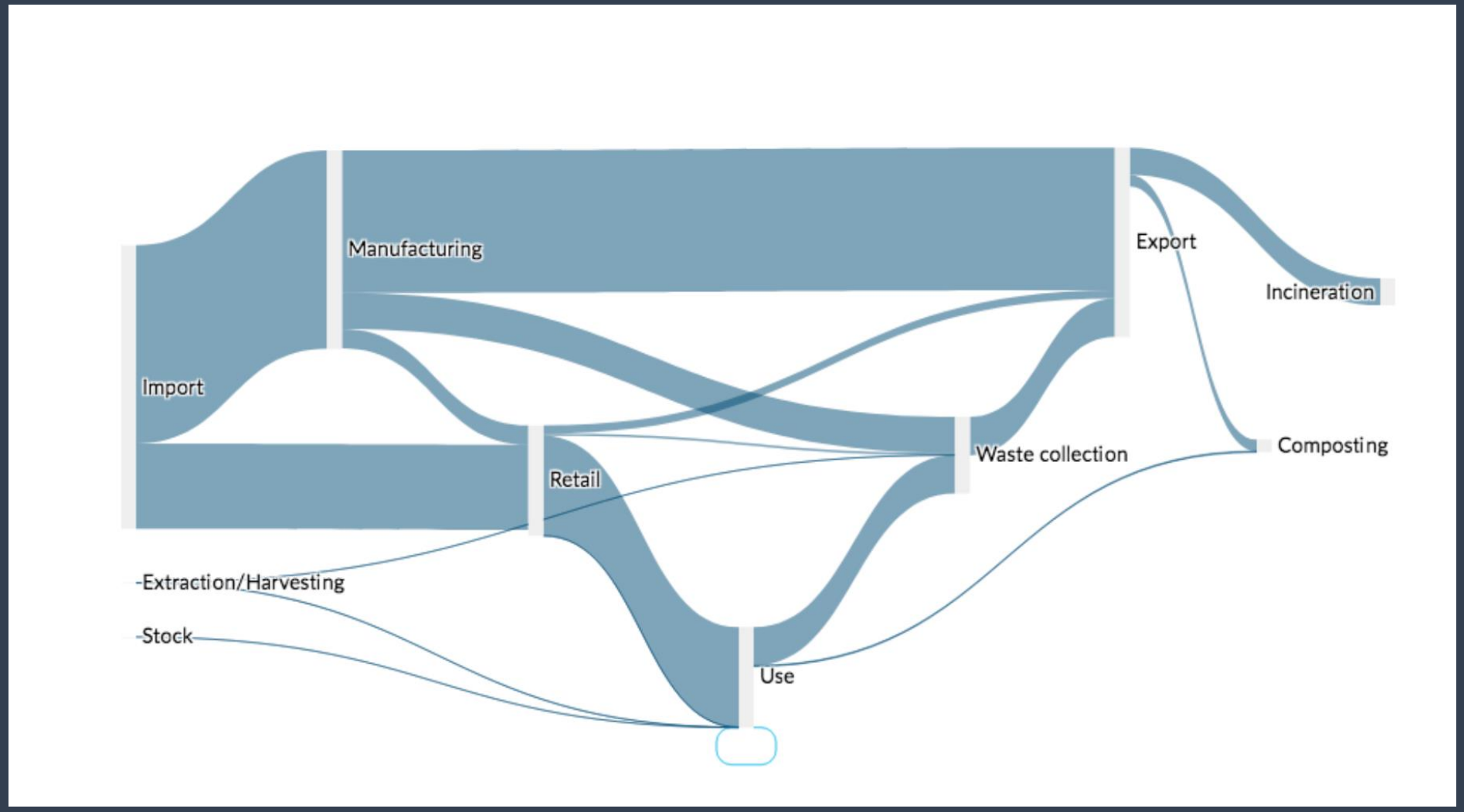
Detail level: City-wide





3000.0	199
3002.0	34
3003.0	116
3004.0	76
3005.0	9
3006.0	8
3008.0	90
3010.0	85
3031.0	128
3032.0	139
3050.0	25
3051.0	197
3052.0	45
3053.0	6

Material Stocks



Sector-wide circularity assessment

ARISTIDE ATHANASSIADIS – 06 JUILLET 2021

CIRCULAR METABOLISM PODCAST

METABOLISM OF CITIES

@CITYMETABOLISM

@METABOLISMOFCITIES

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