

MAGIC multiscale analysis

National level case study: Spain



Aim of the case study: This case study explains how to integrate the information referring to different dimensions of analysis (food, water, energy, human activity and power capacity) at the level of a whole country: Spain. It illustrates: (i) definitions and calculations of the main elements of the system; and (ii) the overall results.

Innovative results

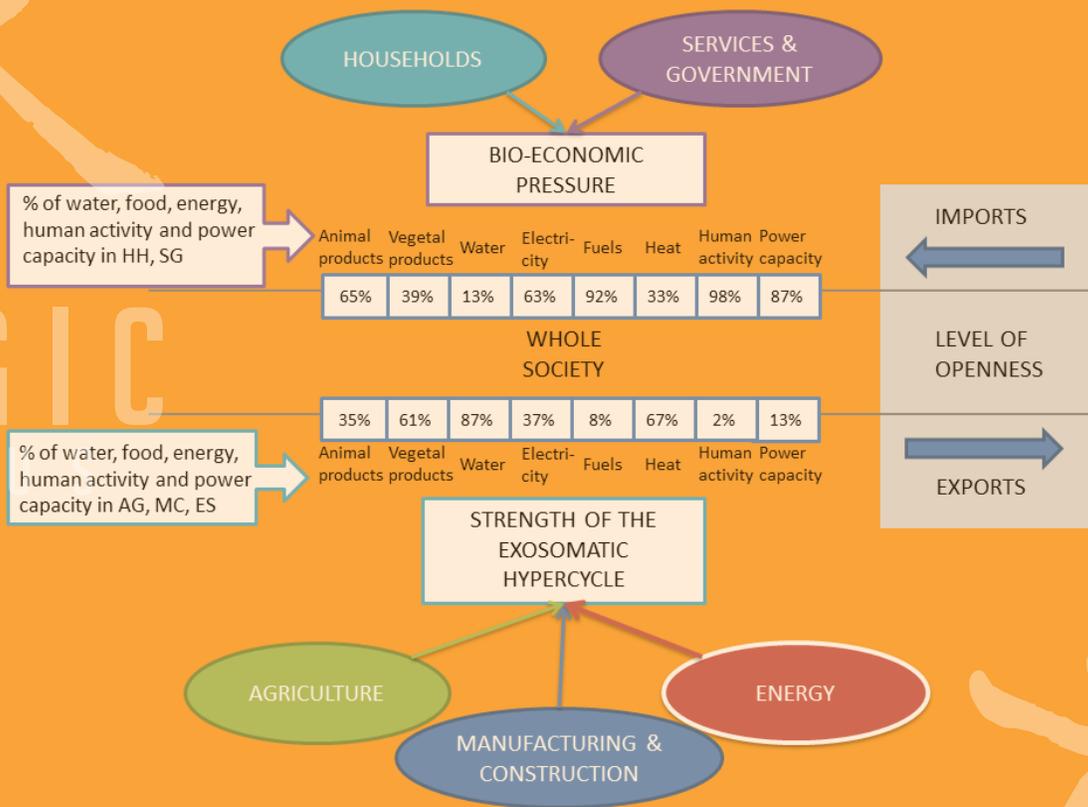
The document shows how to apply the MuSIASEM framework to characterise the metabolic pattern of a country. That is, how to calculate the data for the main socio-economic sectors of society (households, service and government, agriculture and forestry, energy and mining, manufacturing and construction), adopting a metabolic perspective:

- The biophysical indicator of living standards related to the nexus: Bio-Economic Pressure (BEP), the percentage of flows and funds devoted to consumption activities;
- A biophysical indicator of nexus security: Strength of the Exosomatic Hypercycle (SEH), the percentage of flows and funds used in production activities (production is defined from a strictly biophysical point of view);
- The profile of distribution of the fund human activity most unevenly distributed between BEP (10%) and SEH (90%), leaving a mere 2% of human activity to operate the primary and secondary economic sectors;

- The fraction of flows and funds available to consumption activities, which depends on the characteristics of the productive activities;
- The requirement of the productive sectors associated with a desirable (adaptive, well maintained and well reproduced) level of consumption. This implies that the relation between BEP and SEH is impredicative.

Policy relevant insights

- Modern societies operate with a mismatch between the characteristics of BEP and the characteristics of SEH, thanks to imports: externalisation diminishes nexus security
- When the Bio-Economic Pressure becomes too high, importing flows from other countries becomes a very effective way, and an obliged solution, to maintain the desired level of consumption.
- A low allocation of flows and funds in the primary and secondary sectors can be associated with the ability to guarantee high material living standards in the household sector, and of enjoying a large overhead of services from SG.



Nexus insights

The same framework of accounting is used for water, energy, food (using processors defined in the same way across levels). This makes it possible to analyse the NEXUS both at the national level, and at the level of individual economic sectors.

Future steps

All countries of the EU will be analysed in this way to compare benchmarks across countries looking for patterns (clusters) in the allocation of resources in different economic sectors.

Project website: www.magic-nexus.eu

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The research leading to the present results has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 689669. The sole responsibility for this factsheet lies with the authors. The funding Agency is not responsible for any use that may be made of the information it contains.

