

Introduction to ecoinvent version 3



User meeting, LCM 2013, Goteborg



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Emilia Moreno Ruiz

Deputy manager

ecoinvent Centre



Structure of the talk

- The basics of ecoinvent v3
 - ⇒ activities
 - ⇒ product
- The database
 - ⇒ linked and unlinked
 - ⇒ automated creation and actualisation of supply chains
- The system models
 - ⇒ consequential approach
 - ⇒ attributional approach: allocation at the point of substitution

Activities and Products *versus* Processes

ecoinvent v2

lime, hydraulic,
at plant / CH

→ lime, hydraulic, at
plant / CH

Processes

ecoinvent v3

lime production,
hydraulic / CH

→ lime, hydraulic

Activity

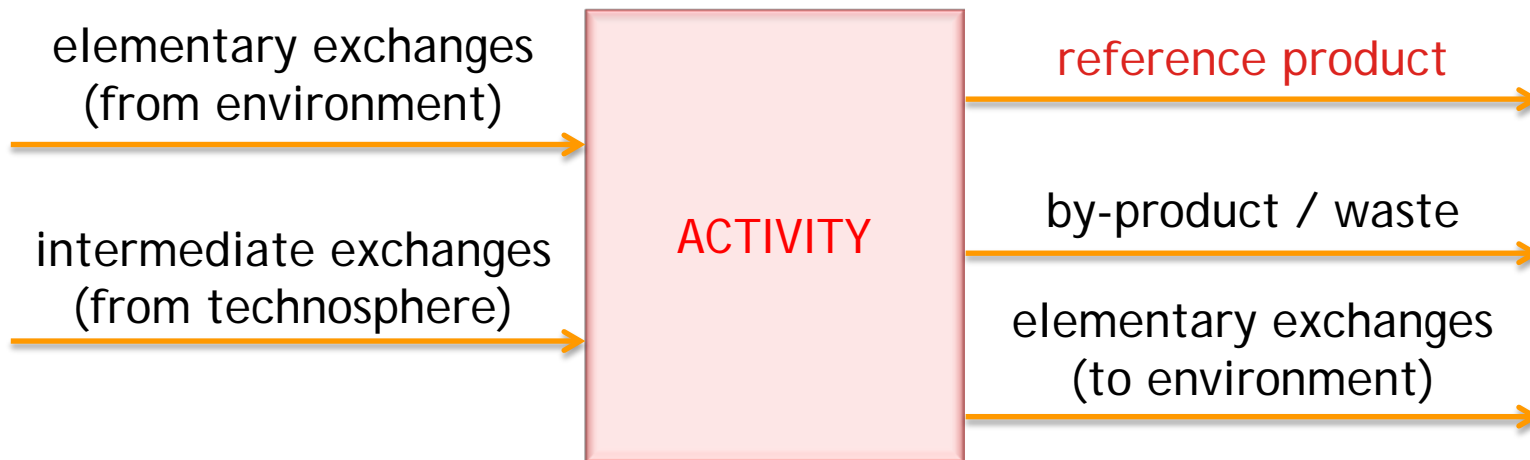
Product

Basics of ecoinvent v3

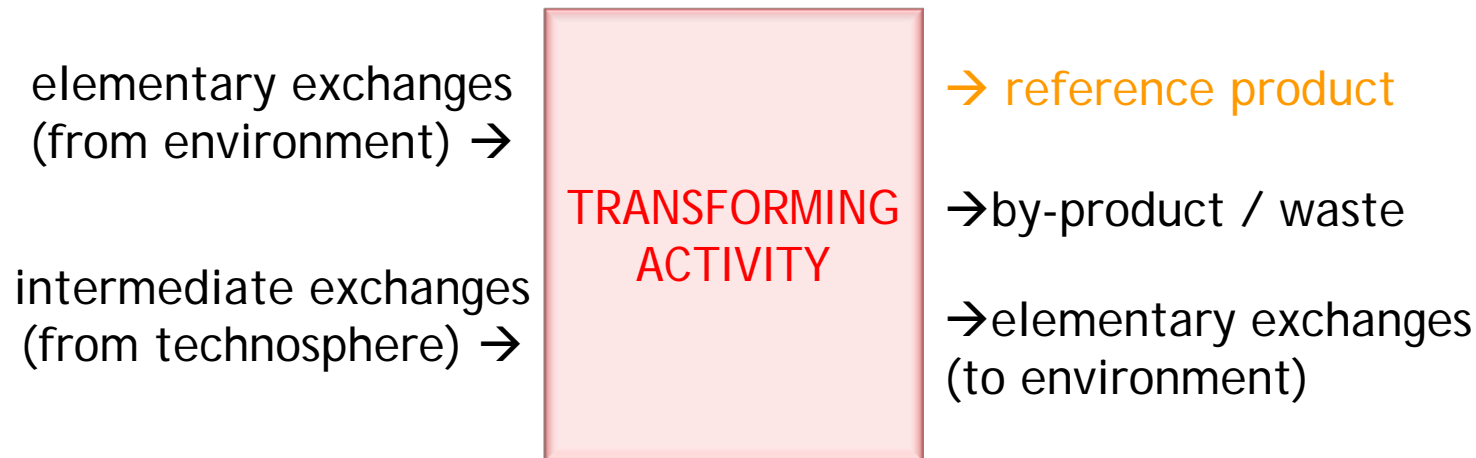
The database

The System Models

Activity: definition



Different types of activities: ordinary transforming activities



Different types of activities: treatment activities

elementary exchanges
(from environment) →

intermediate exchanges
(from technosphere) →

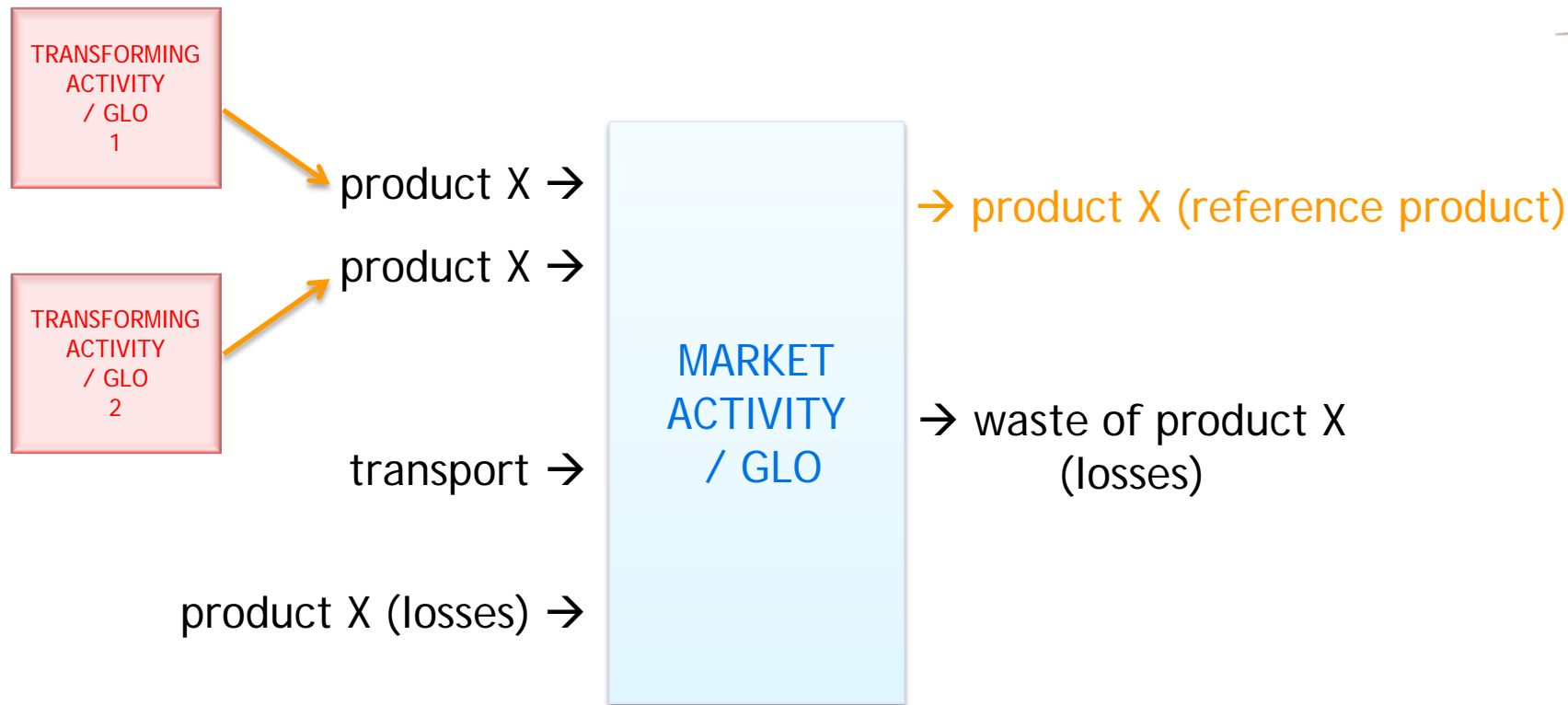
**TREATMENT
ACTIVITY**

→ (-) reference product (MFT)

→ by-product / waste

→ elementary exchanges
(to environment)

Market activities: consumption mix



Several activities, several geographies, several technologies: one Product

Activity

Product

electricity
production,
hard coal
/ AT



→ electricity, high voltage

electricity
production,
hydro, pumped
storage
/ AT



→ electricity, high voltage

electricity high
voltage,
import
from CH
/ AT



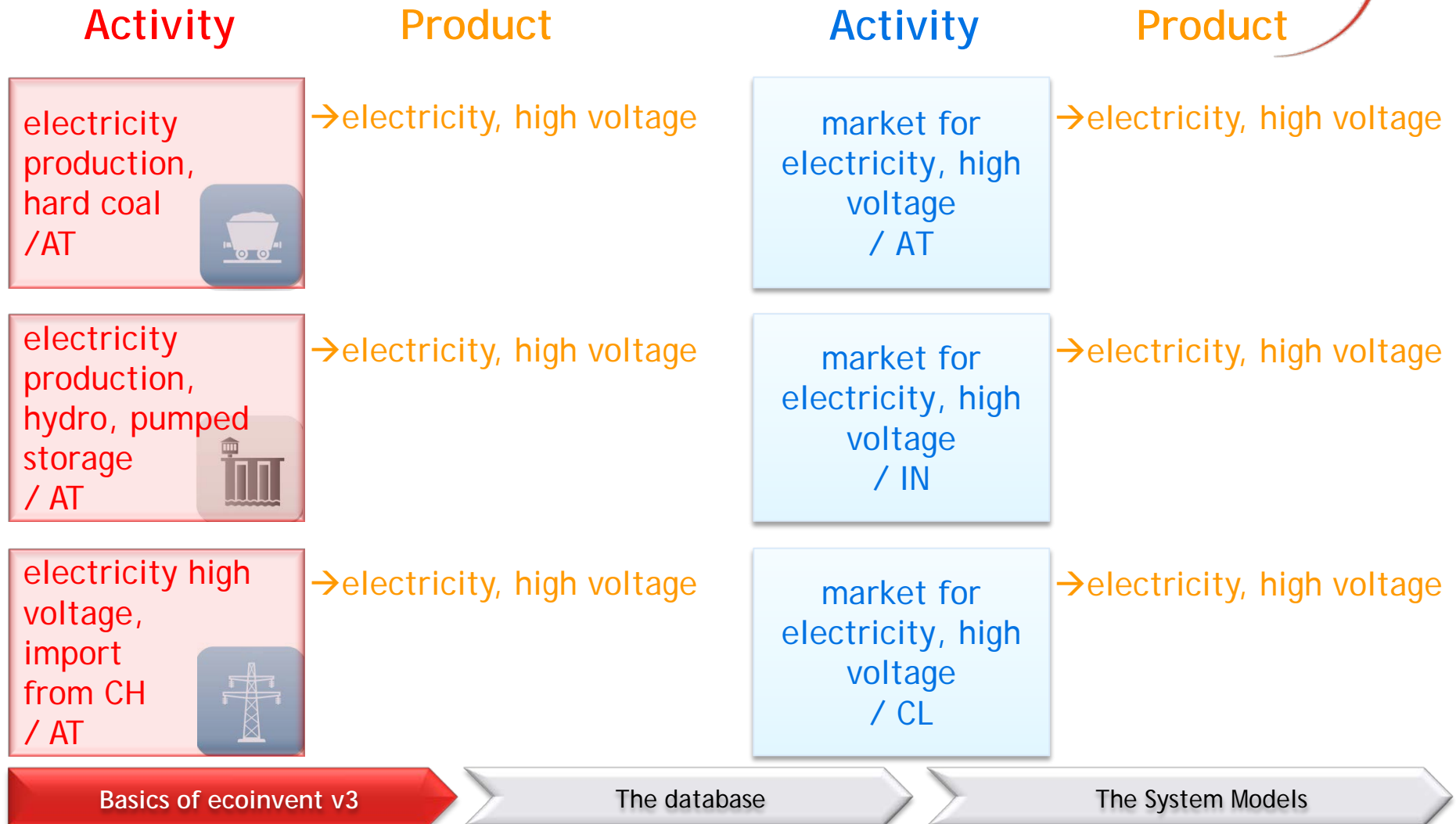
→ electricity, high voltage

Basics of ecoinvent v3

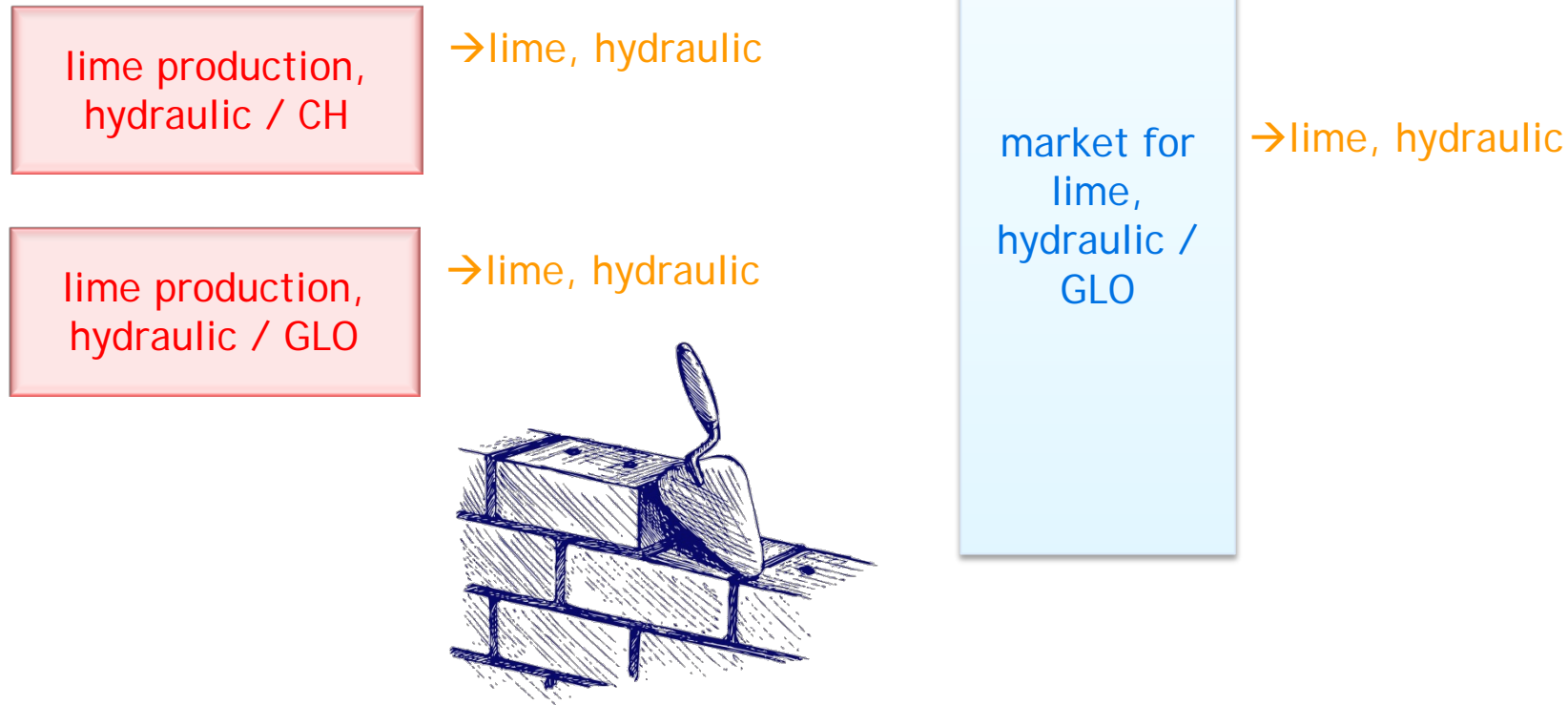
The database

The System Models

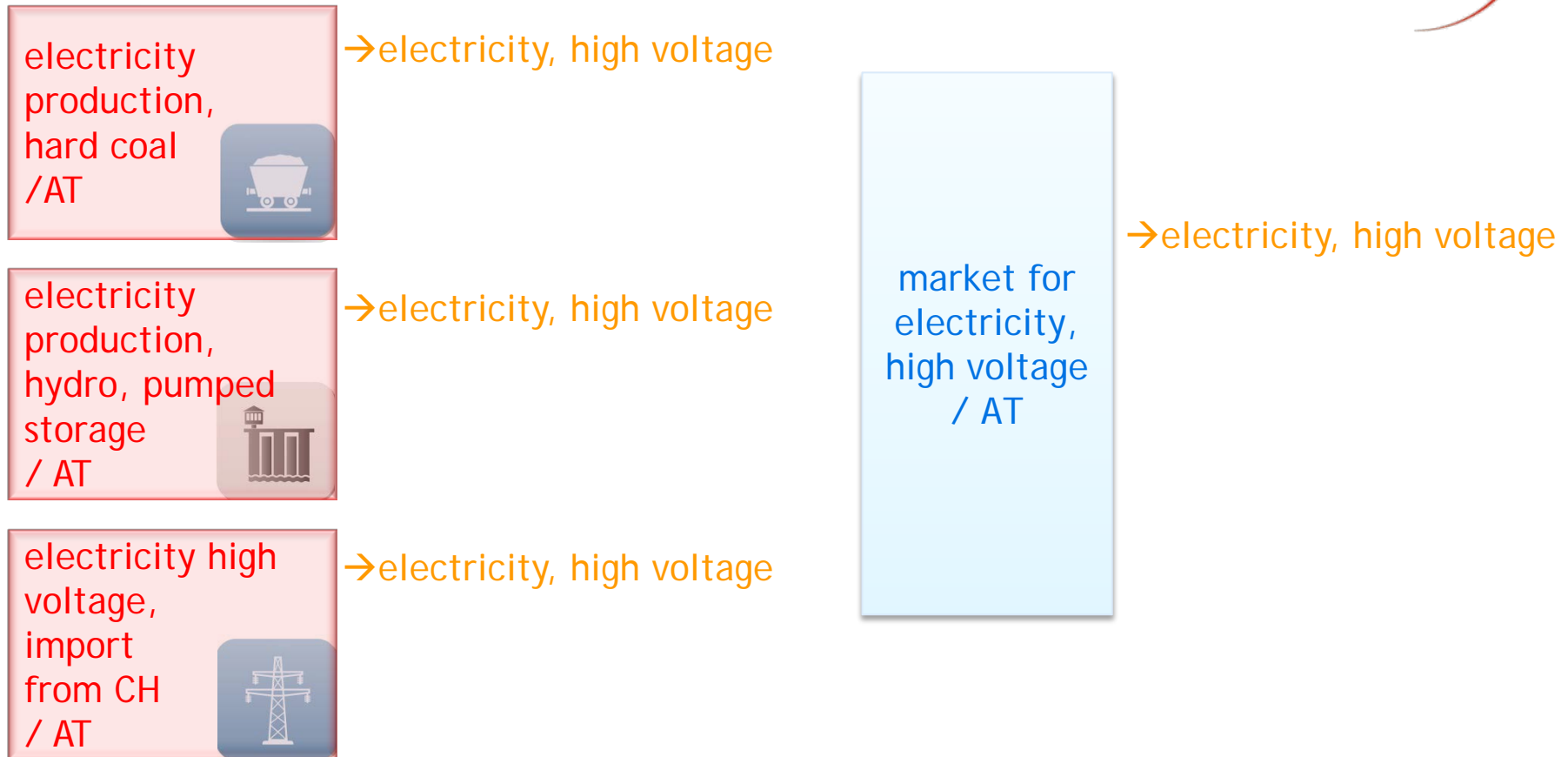
Several activities, several geographies, several technologies: one Product



One reference product=at least one Global market



Local markets do of course exist



The database ecoinvent v2

ecoinvent v2



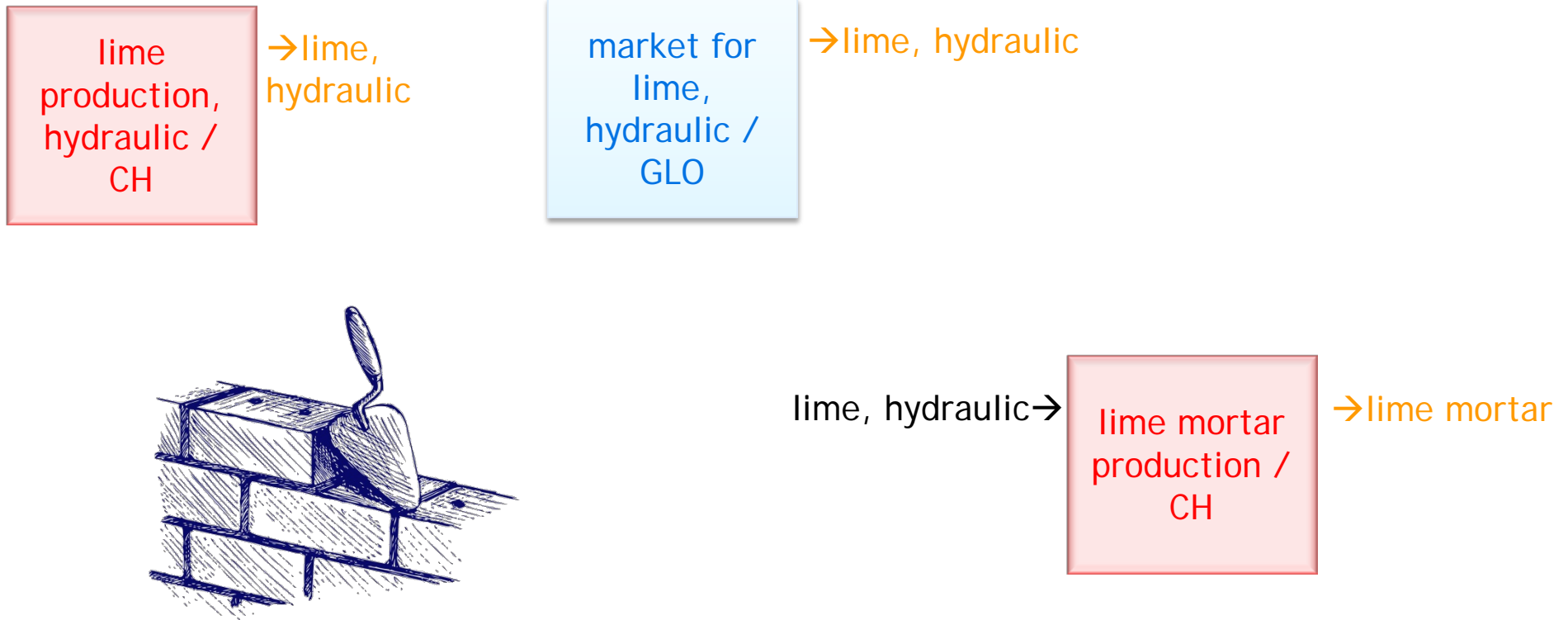
Basics of ecoinvent v3

The database

The System Models

The undefined database version 3

ecoinvent v3



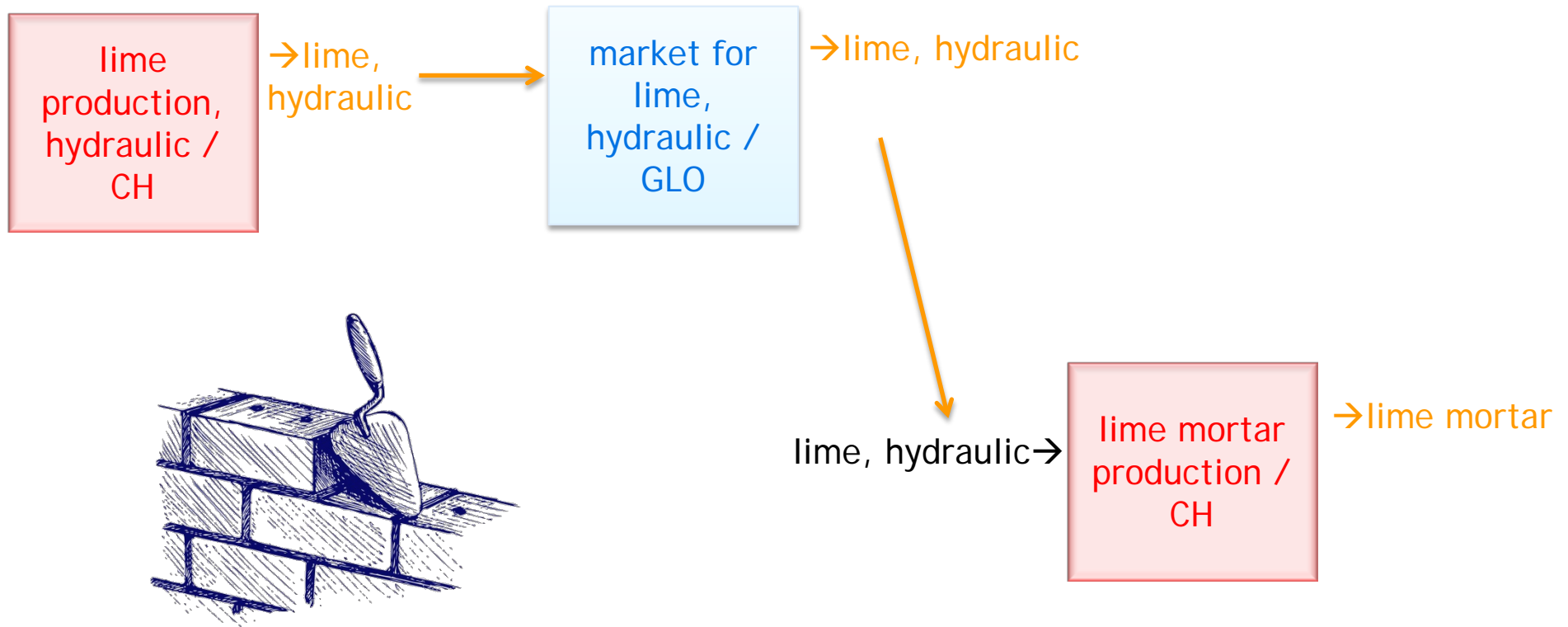
Basics of ecoinvent v3

The database

The System Models

Linking through the markets

ecoinvent v3



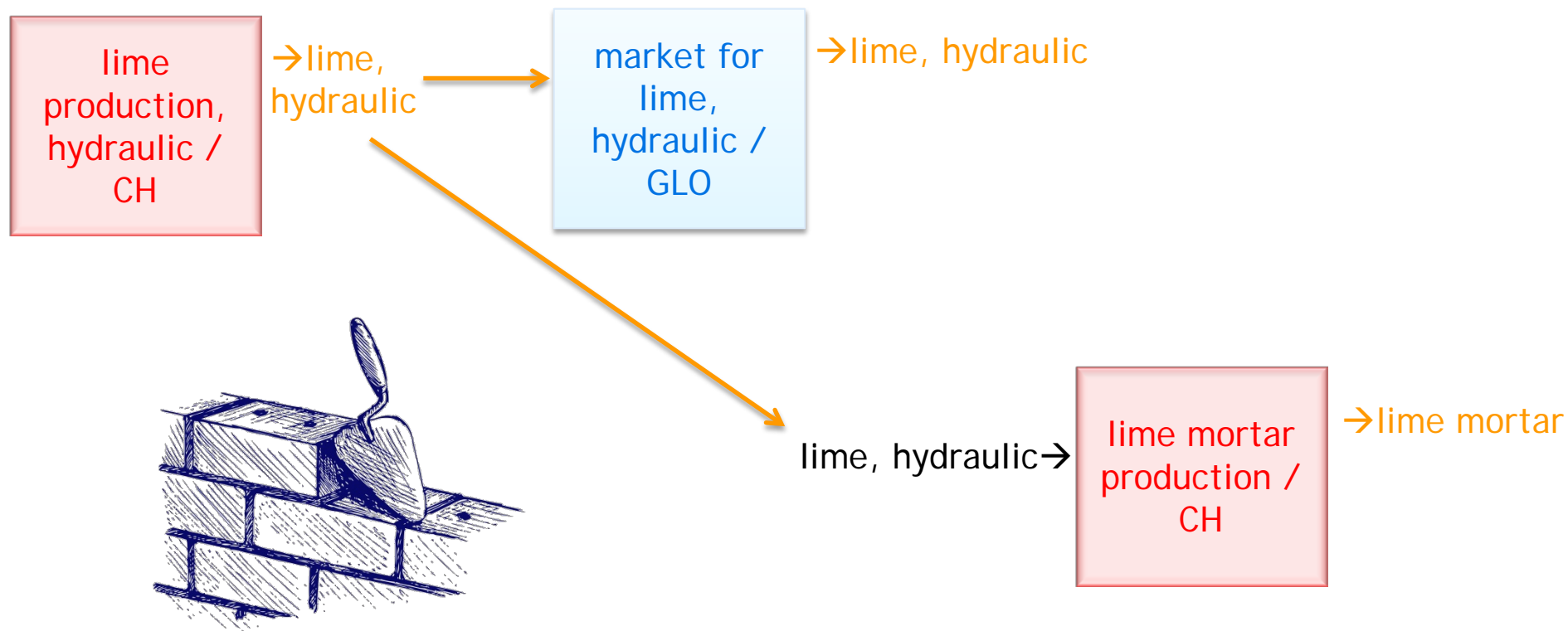
Basics of ecoinvent v3

The database

The System Models

Direct links may exist

ecoinvent v3

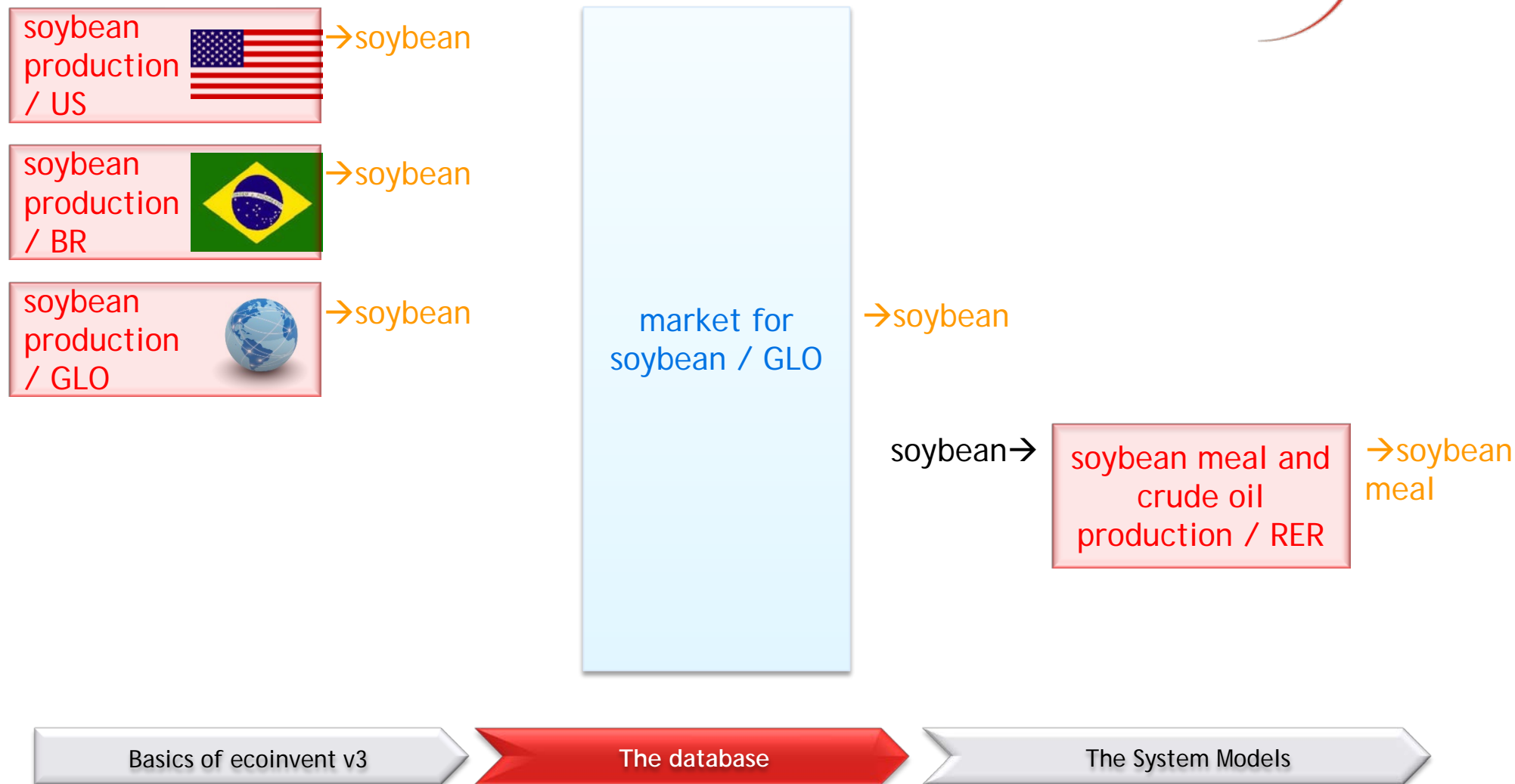


Basics of ecoinvent v3

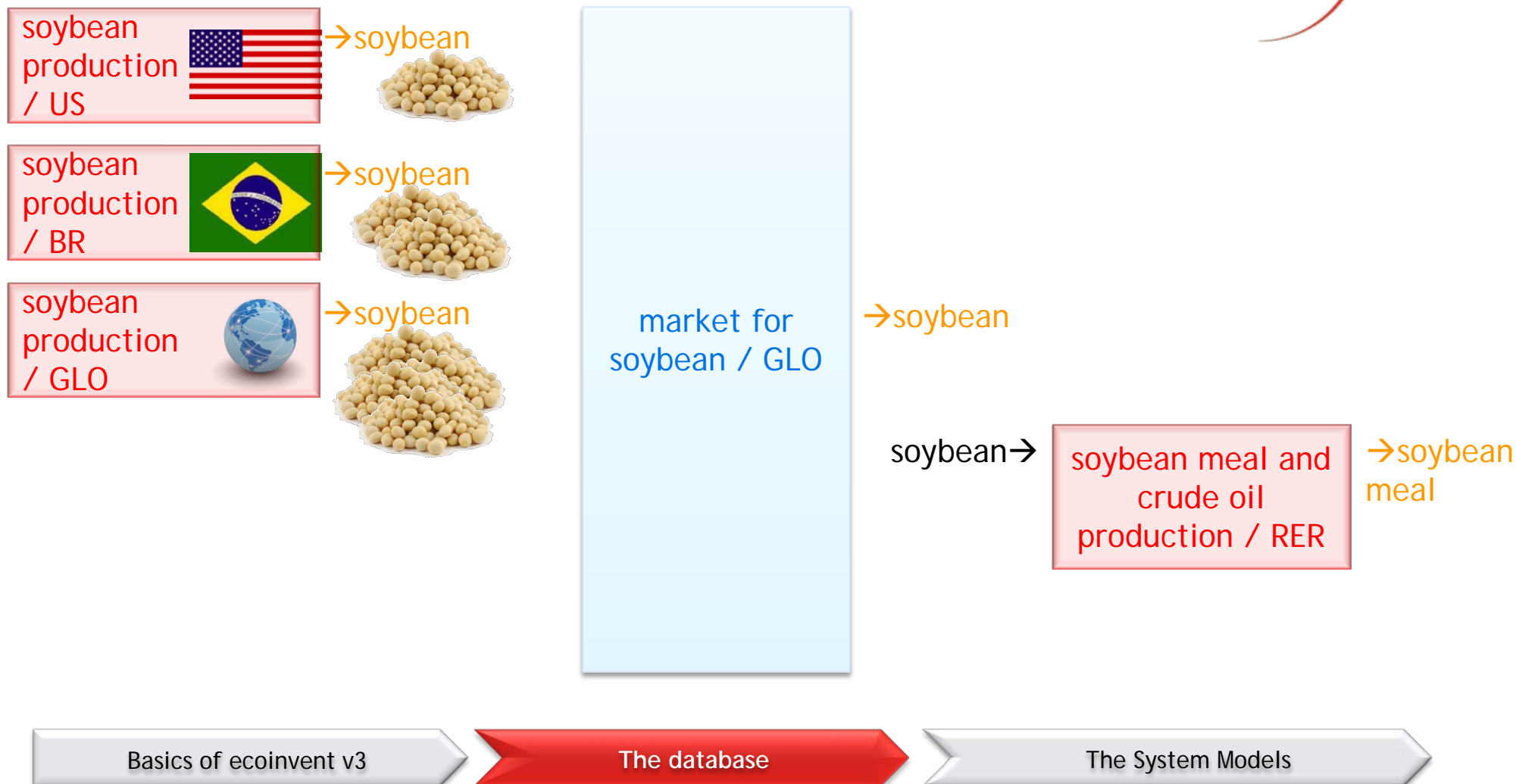
The database

The System Models

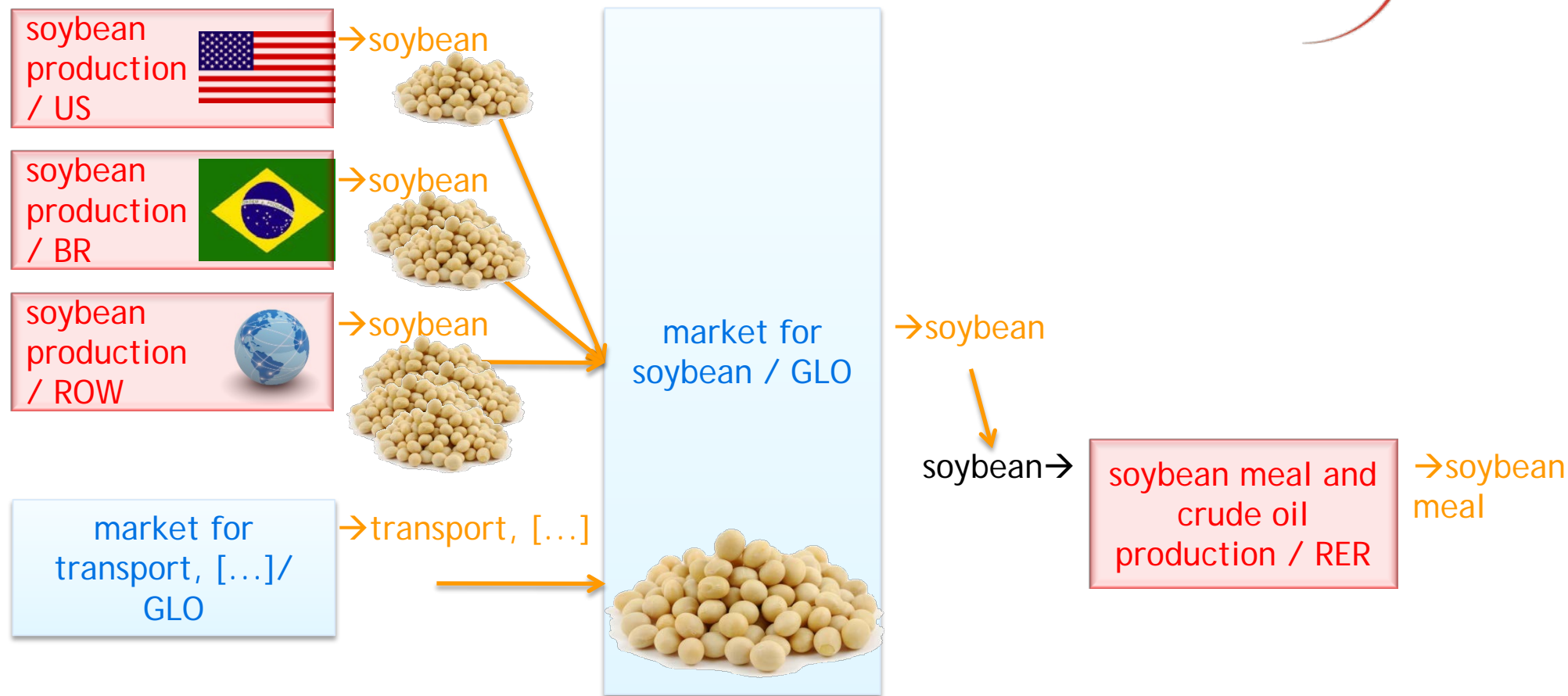
Creation of global supply chains



Creation of global supply chains



Creation of global supply chains



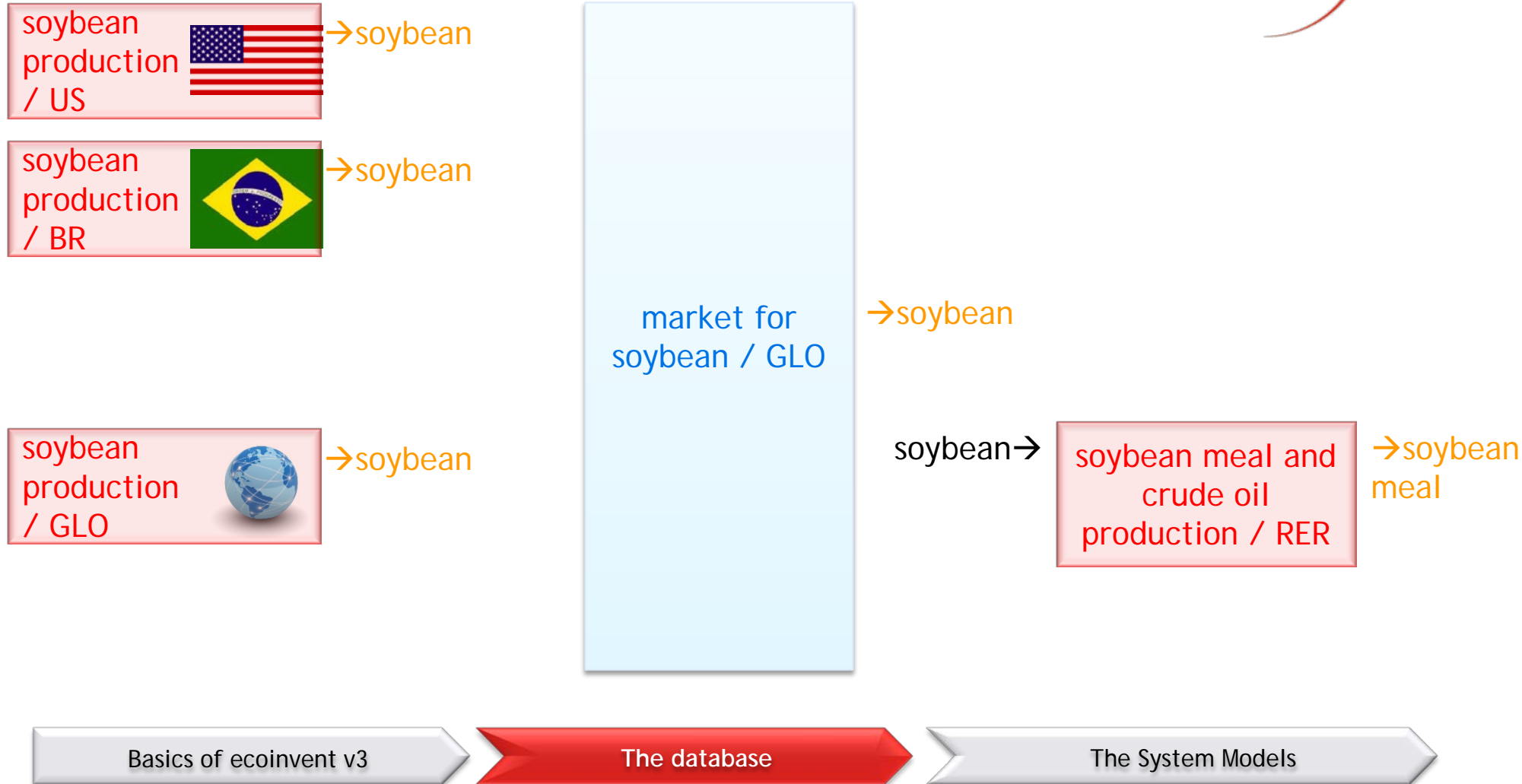
*RoW; rest of the world, the global production (GLO) minus the local ones.

Basics of ecoinvent v3

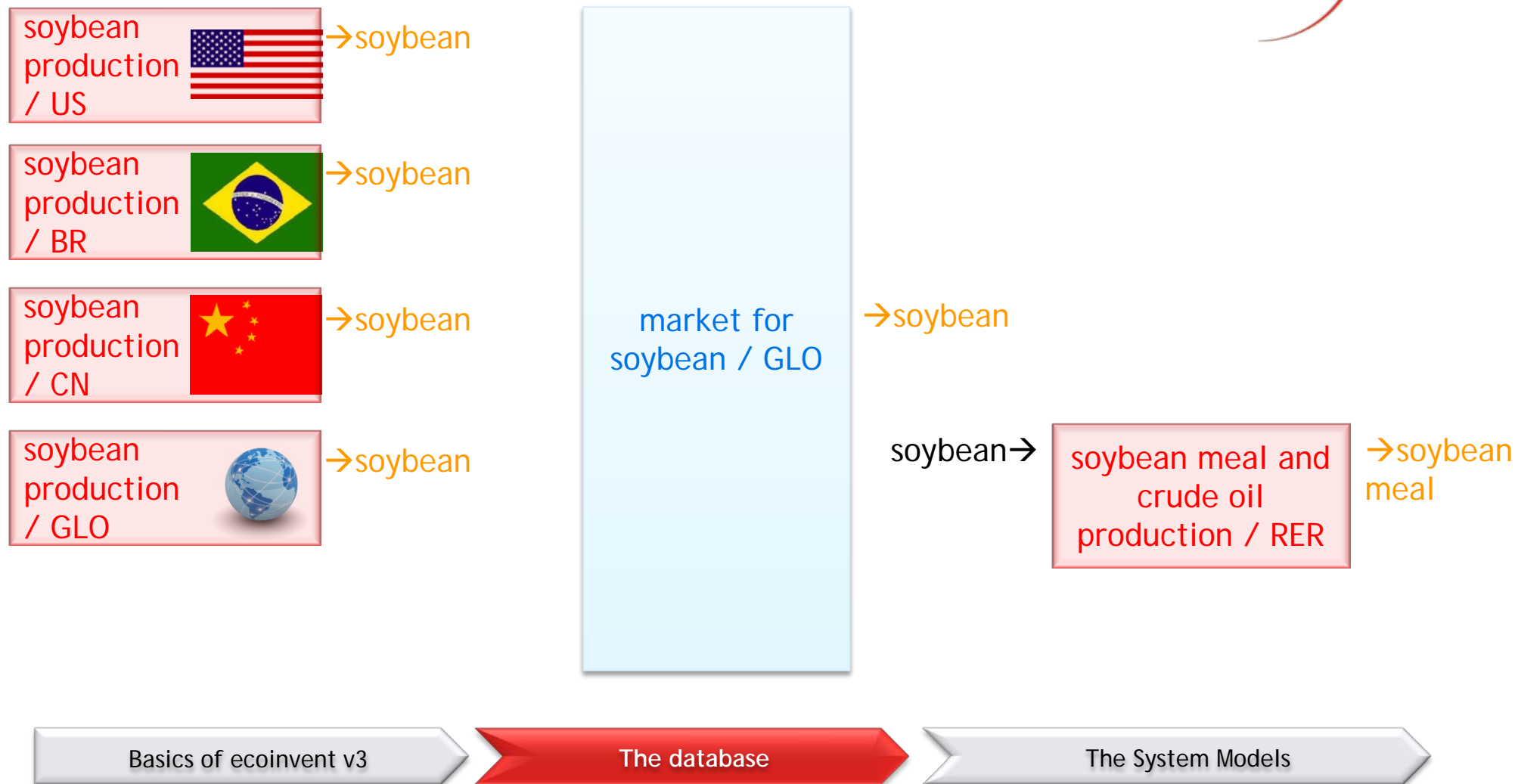
The database

The System Models

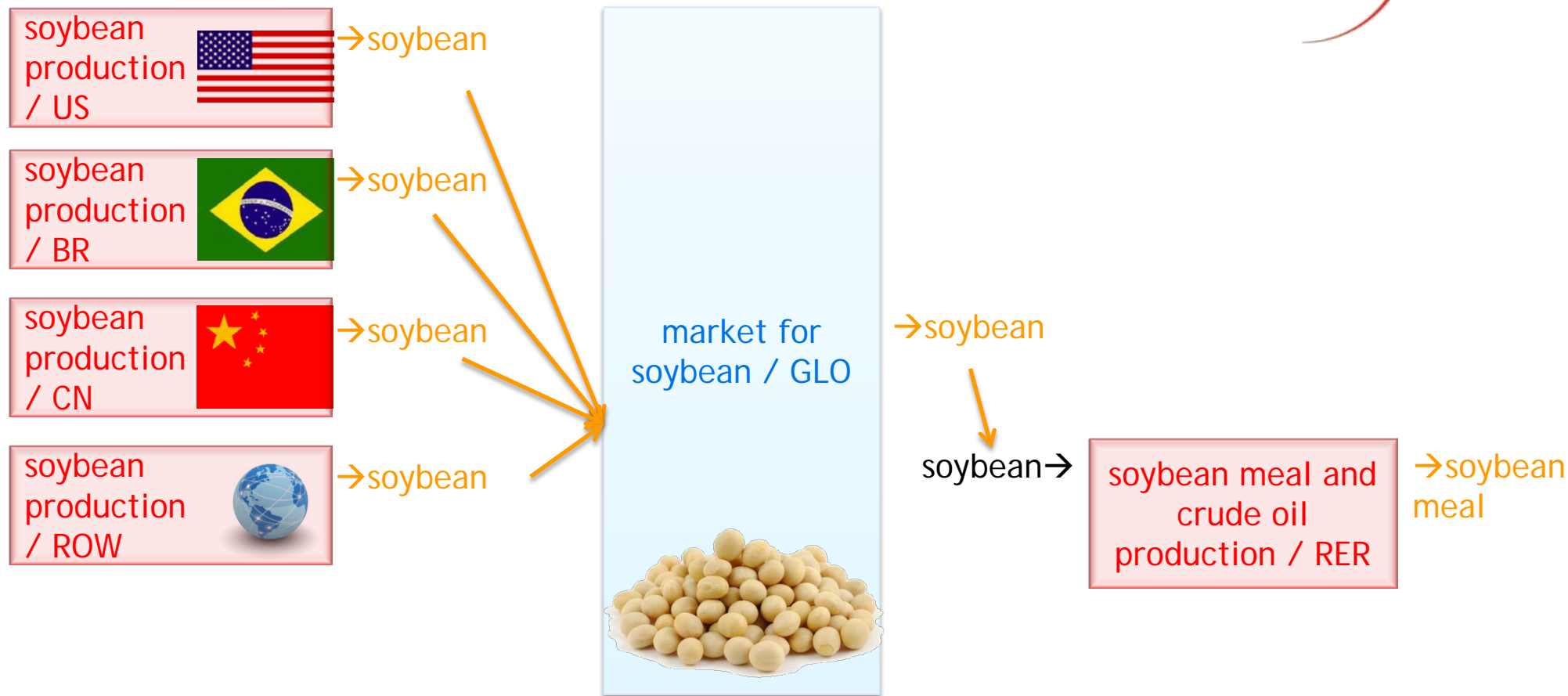
Automatic actualisation of global supply chains



Automatic actualisation of global supply chains



Automatic actualisation of global supply chains



*RoW; rest of the world, the global production (GLO) minus the local ones.

Basics of ecoinvent v3

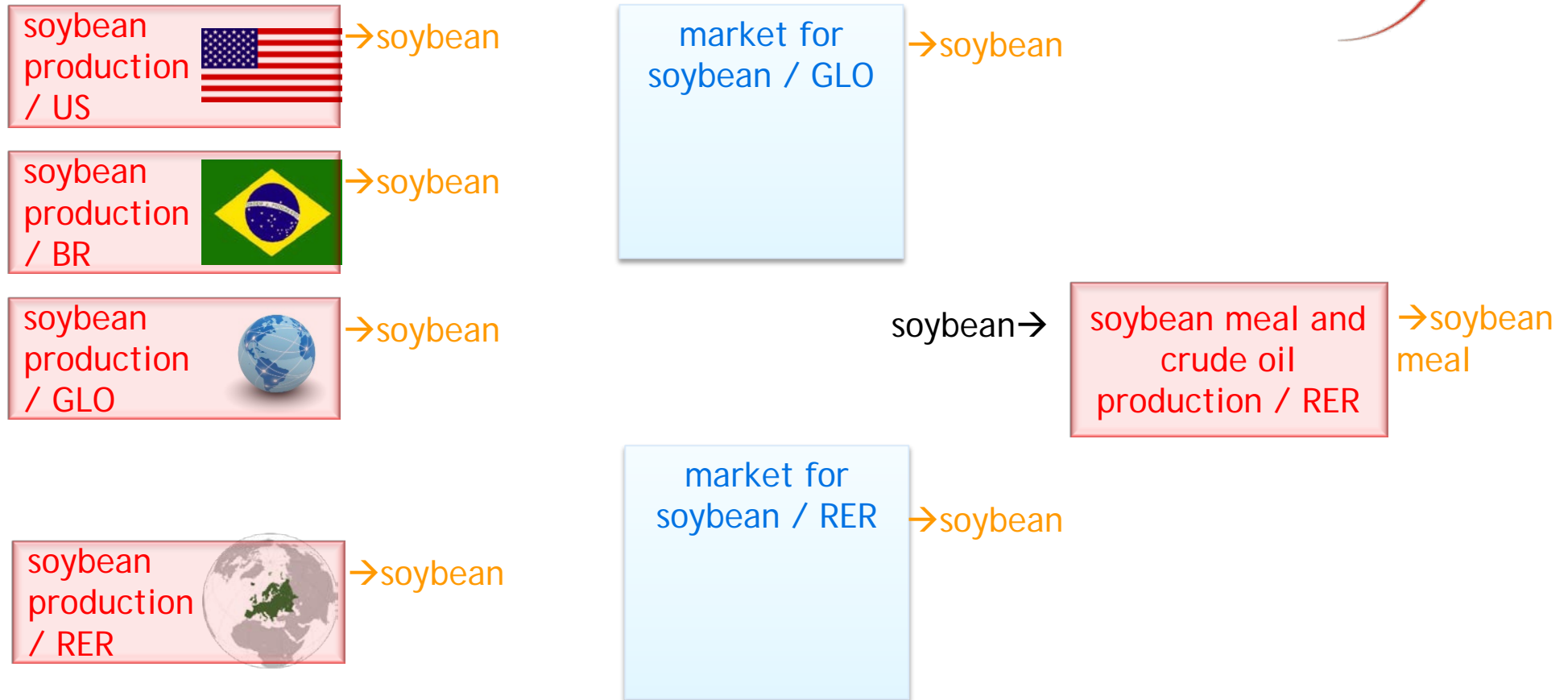
The database

The System Models

When global supply chains get local



When global supply chains get local

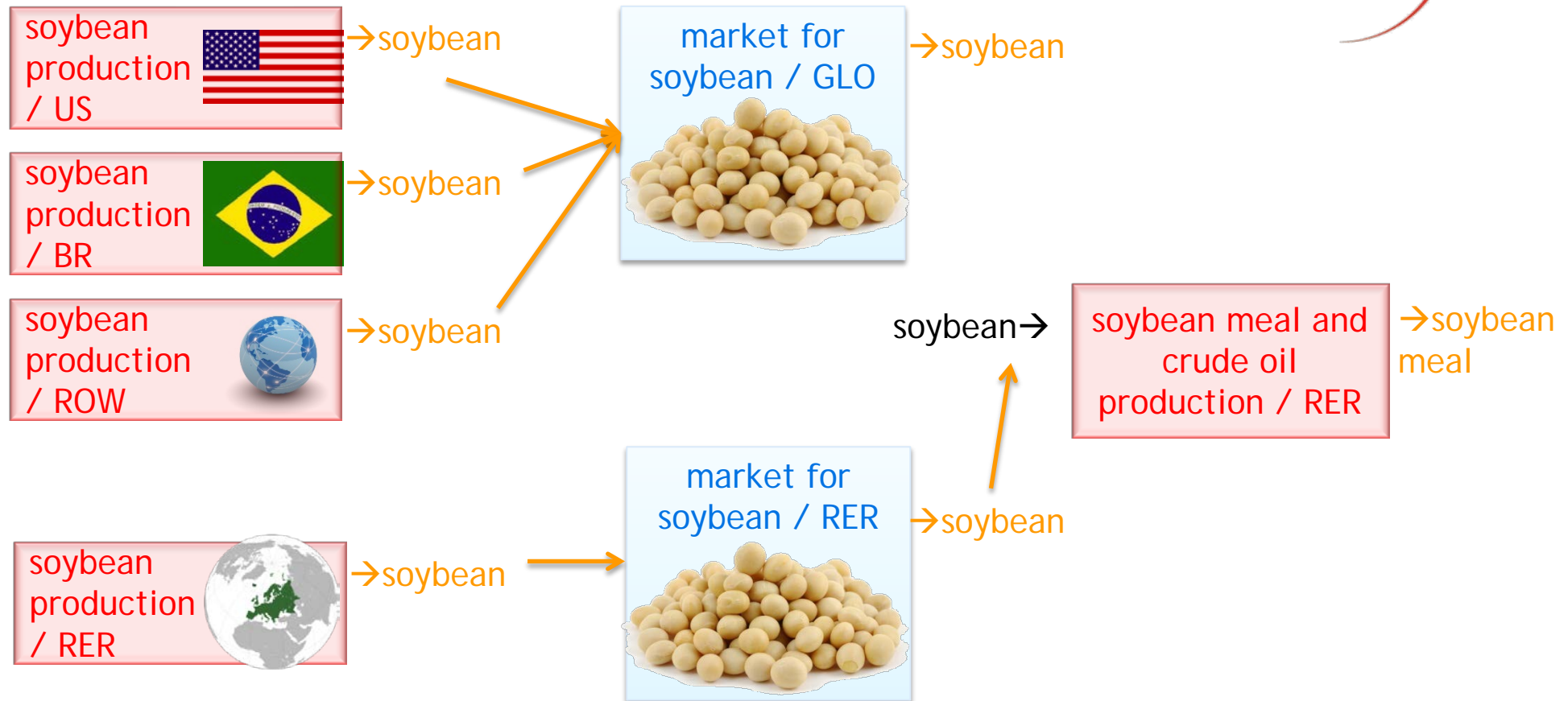


Basics of ecoinvent v3

The database

The System Models

When global supply chains get local



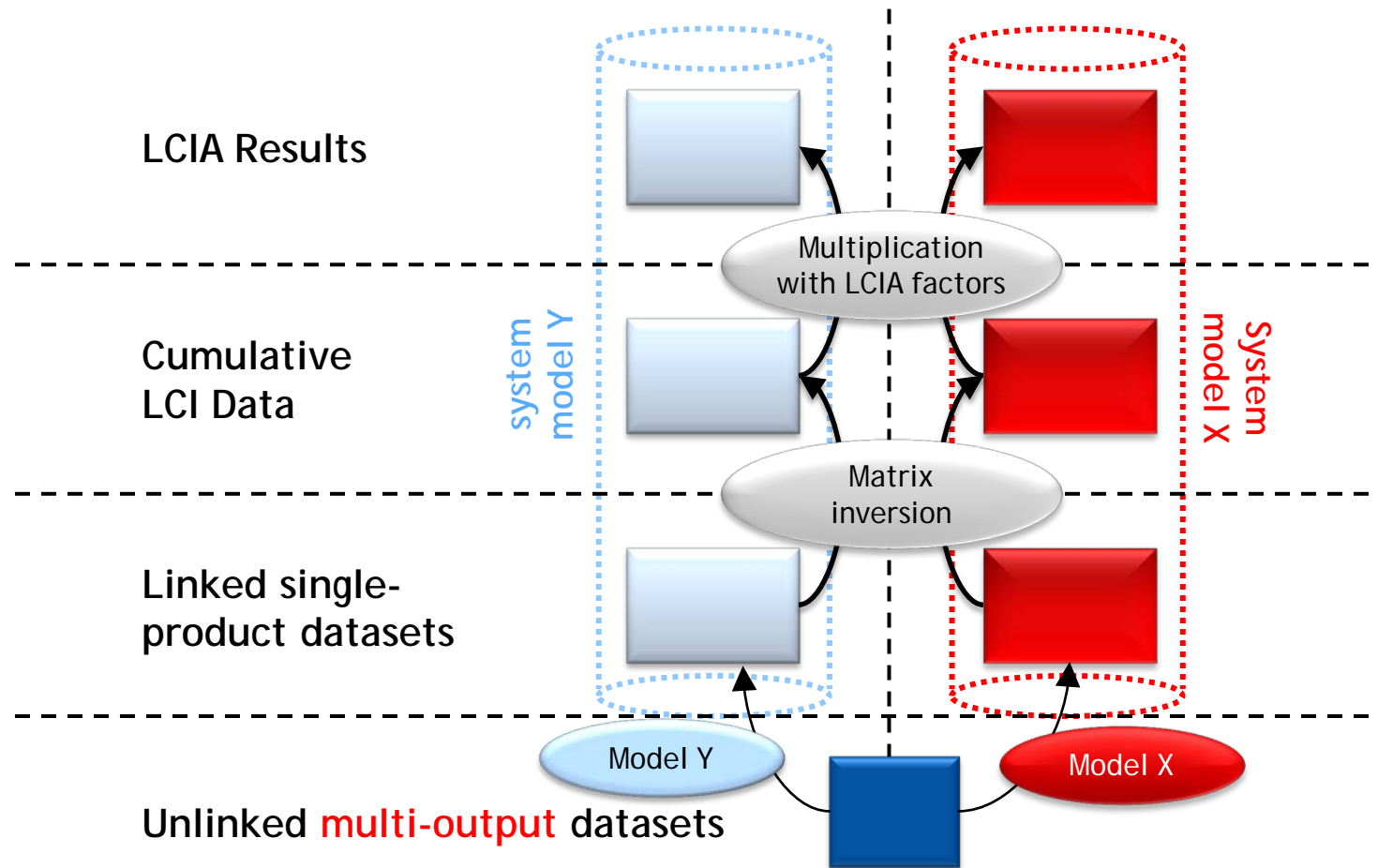
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Basics of ecoinvent v3

The database

The System Models

Same undefined DS, different results



Modelling choices

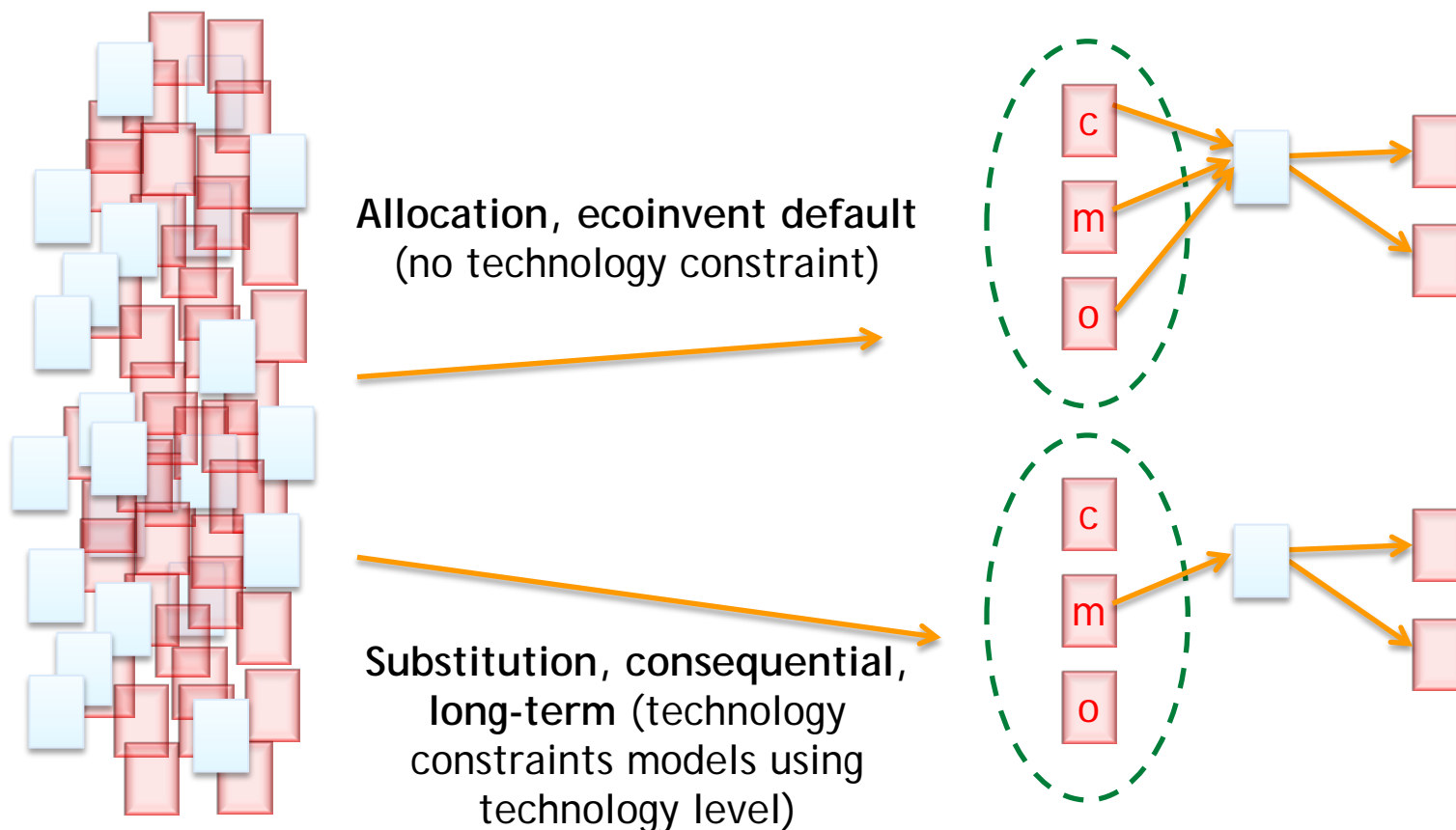
1. System model with partitioning (attributional linking)

- ➡ all activities supply the markets
- ➡ by-products are allocated at the point of substitution

2. System model with substitution (consequential linking)

- ➡ only unconstrained (marginal) activities supply the markets
- ➡ by-products are treated by substitution (system expansion)

The technology constraint



Unlinked database

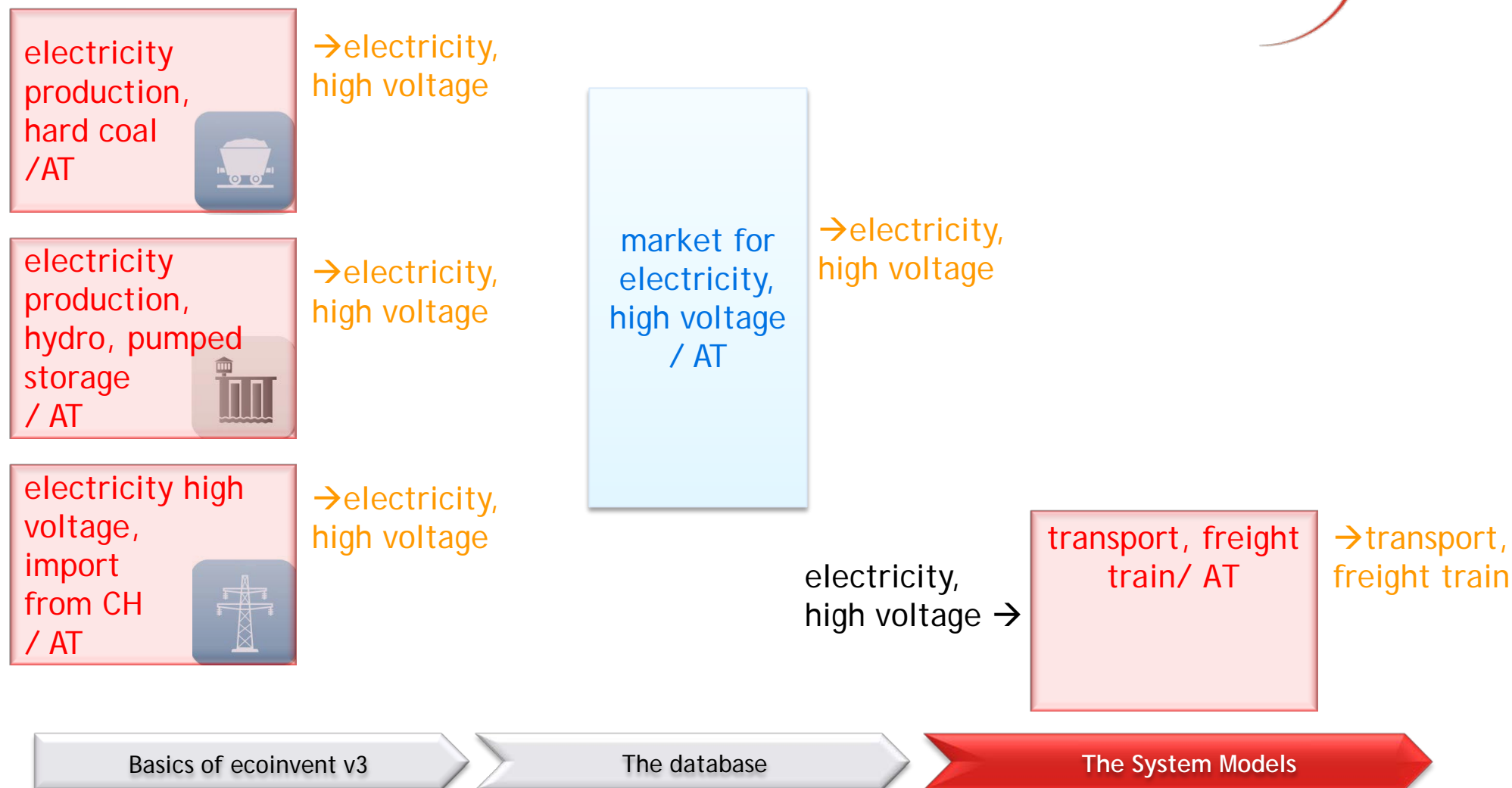
Calculated database

Basics of ecoinvent v3

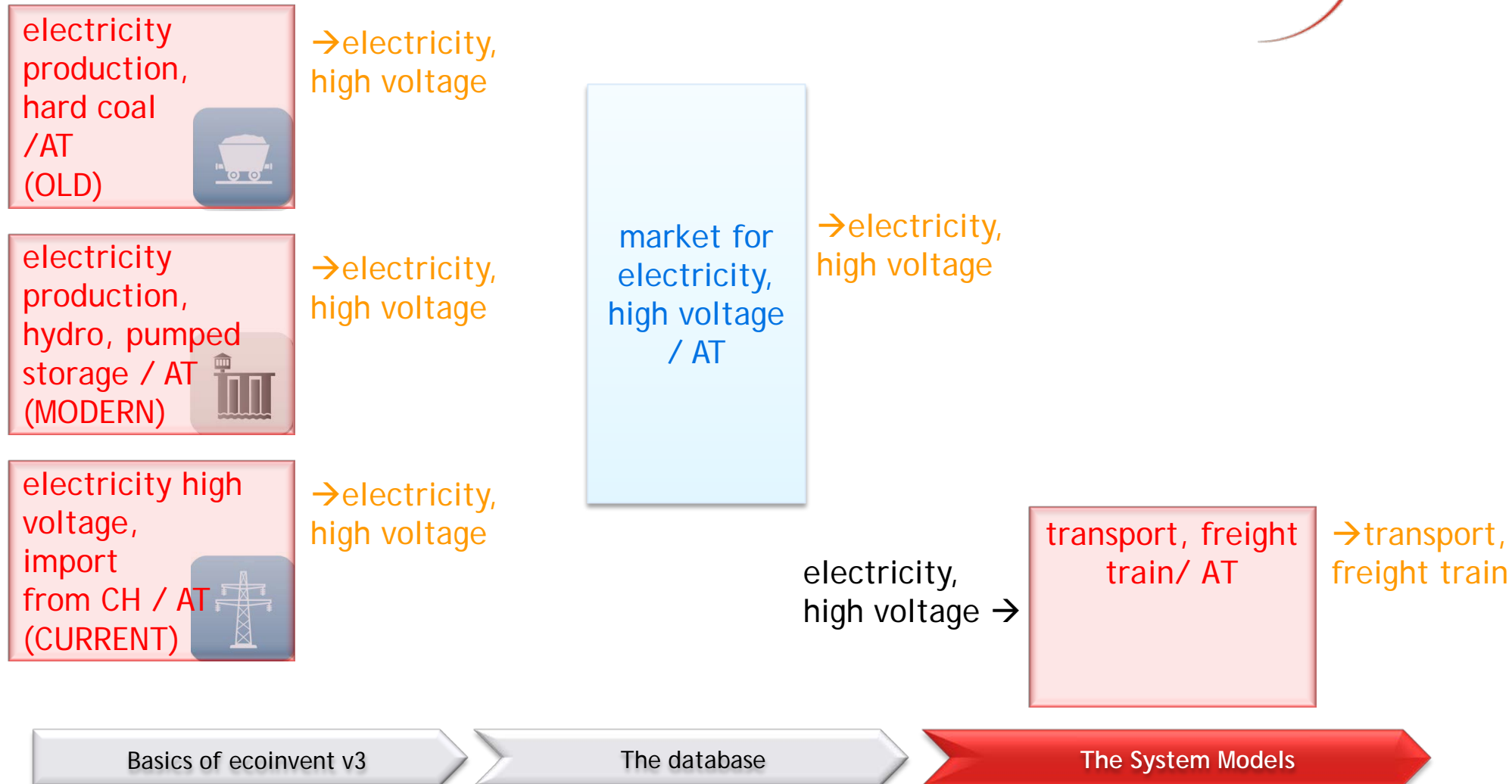
The database

The System Models

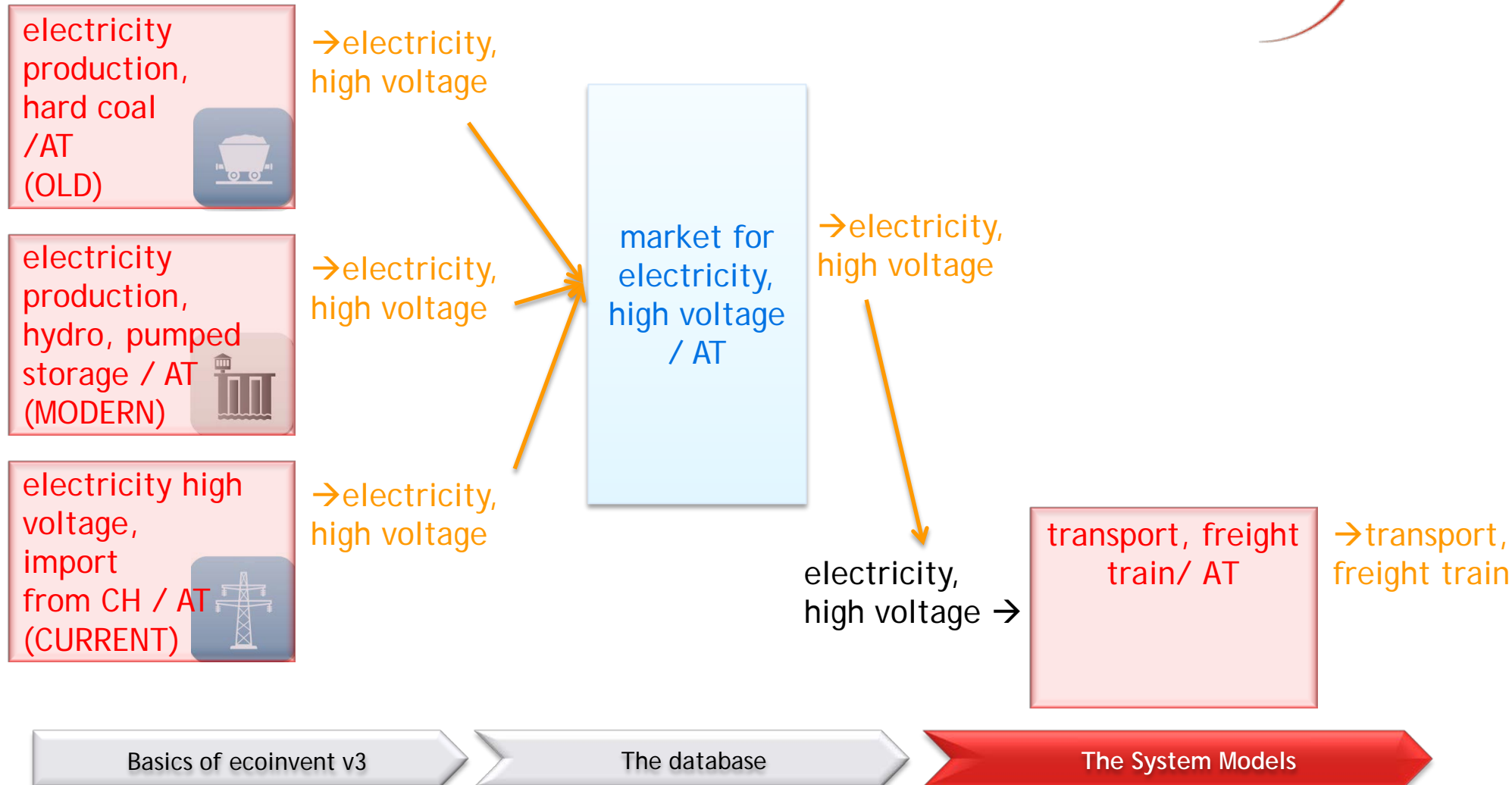
Setting the technology constraint



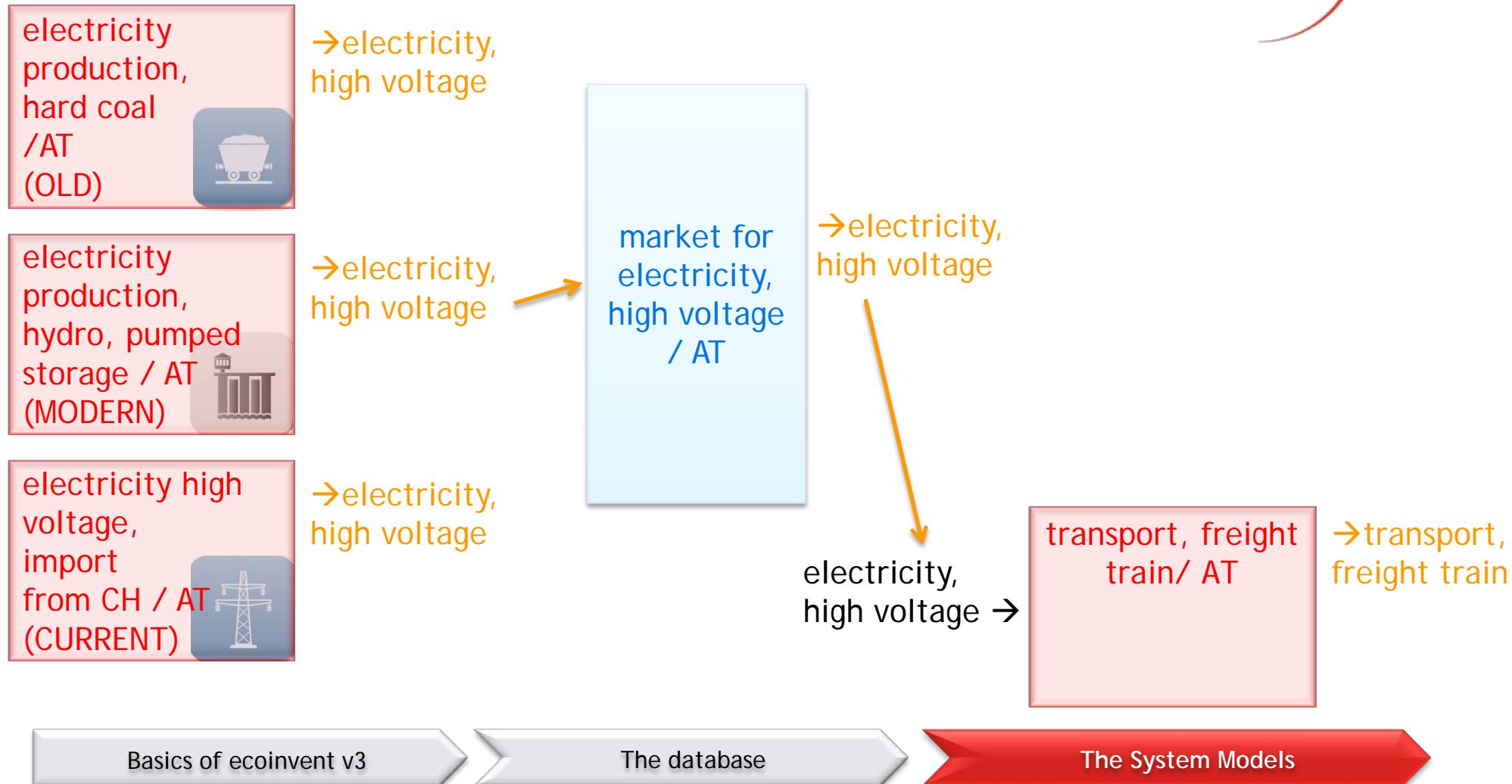
Setting the technology constraint



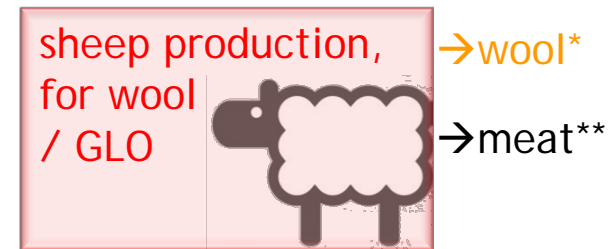
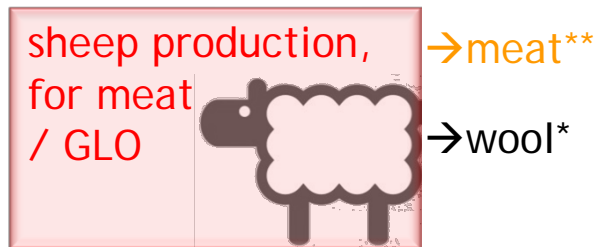
Attributional linking



Consequential linking



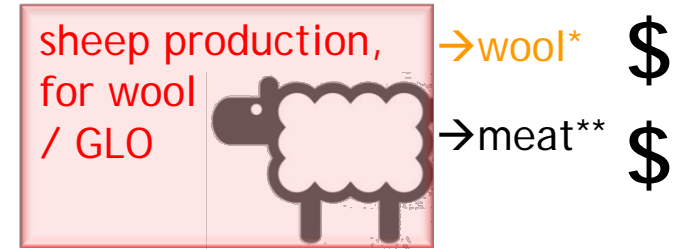
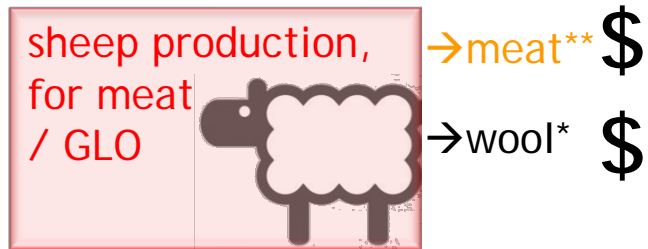
Dealing with by-products



*sheep fleece in the grease

**sheep for slaughtering, live weight

Dealing with by-products



*sheep fleece in the grease

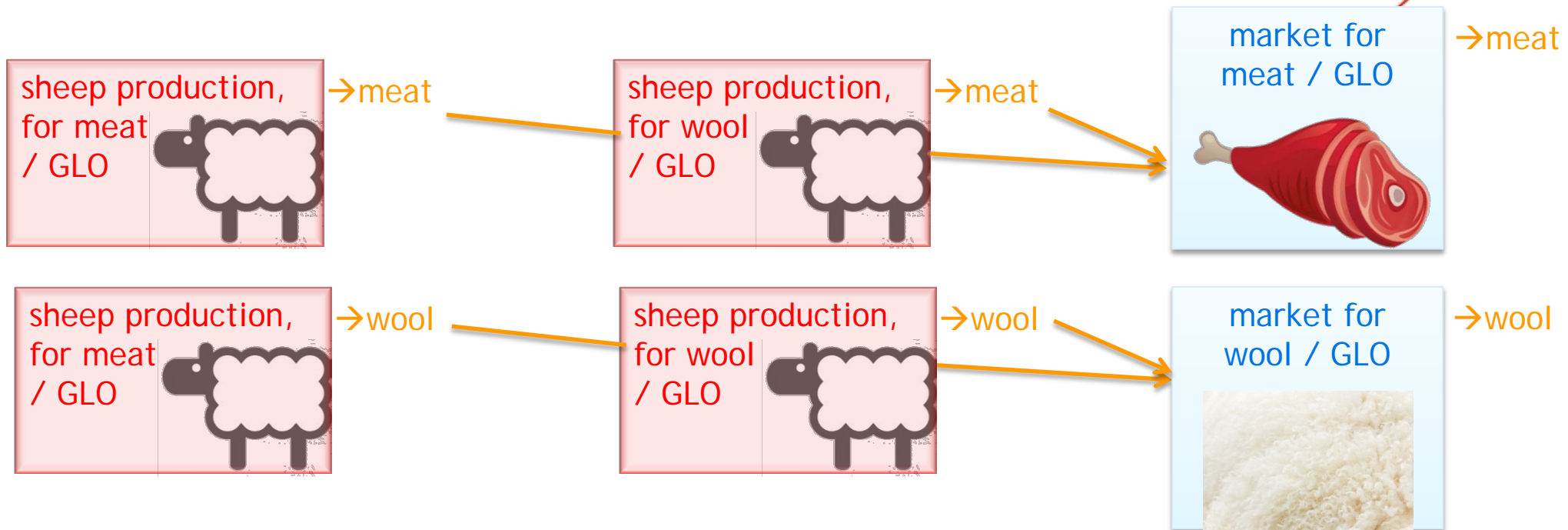
**sheep for slaughtering, live weight

Basics of ecoinvent v3

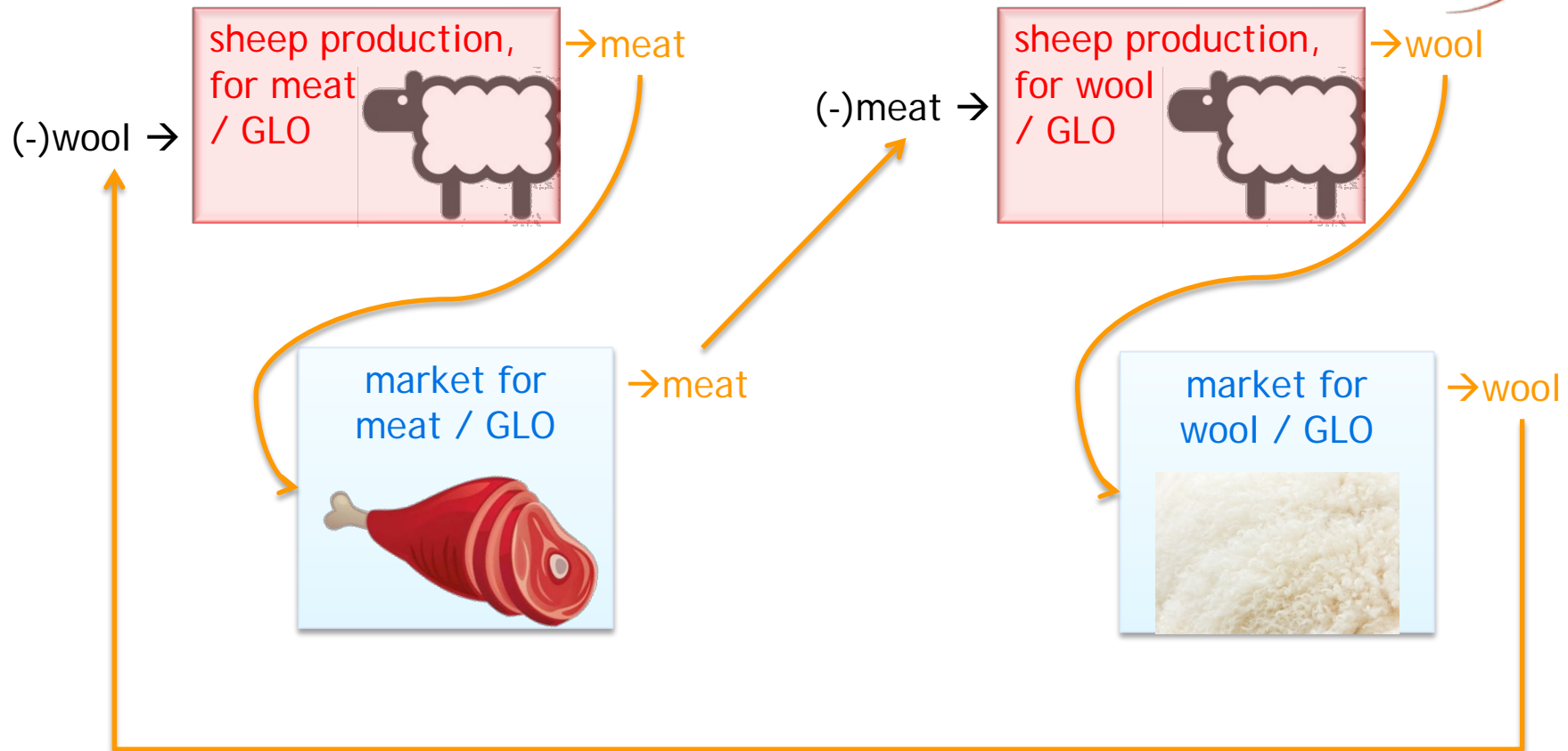
The database

The System Models

Dealing with by-products in “Allocation, ecoinvent default” SM



Dealing with by-products in “Substitution, consequential, long-term”



Allocation at the point of substitution

kraft paper
production,
bleached
/ GLO

→kraft paper, bleached

→MSW

treatment of
MSW,
incineration
/ GLO

→(-)MSW

→electricity, high voltage

→heat, district or industrial, other than natural gas

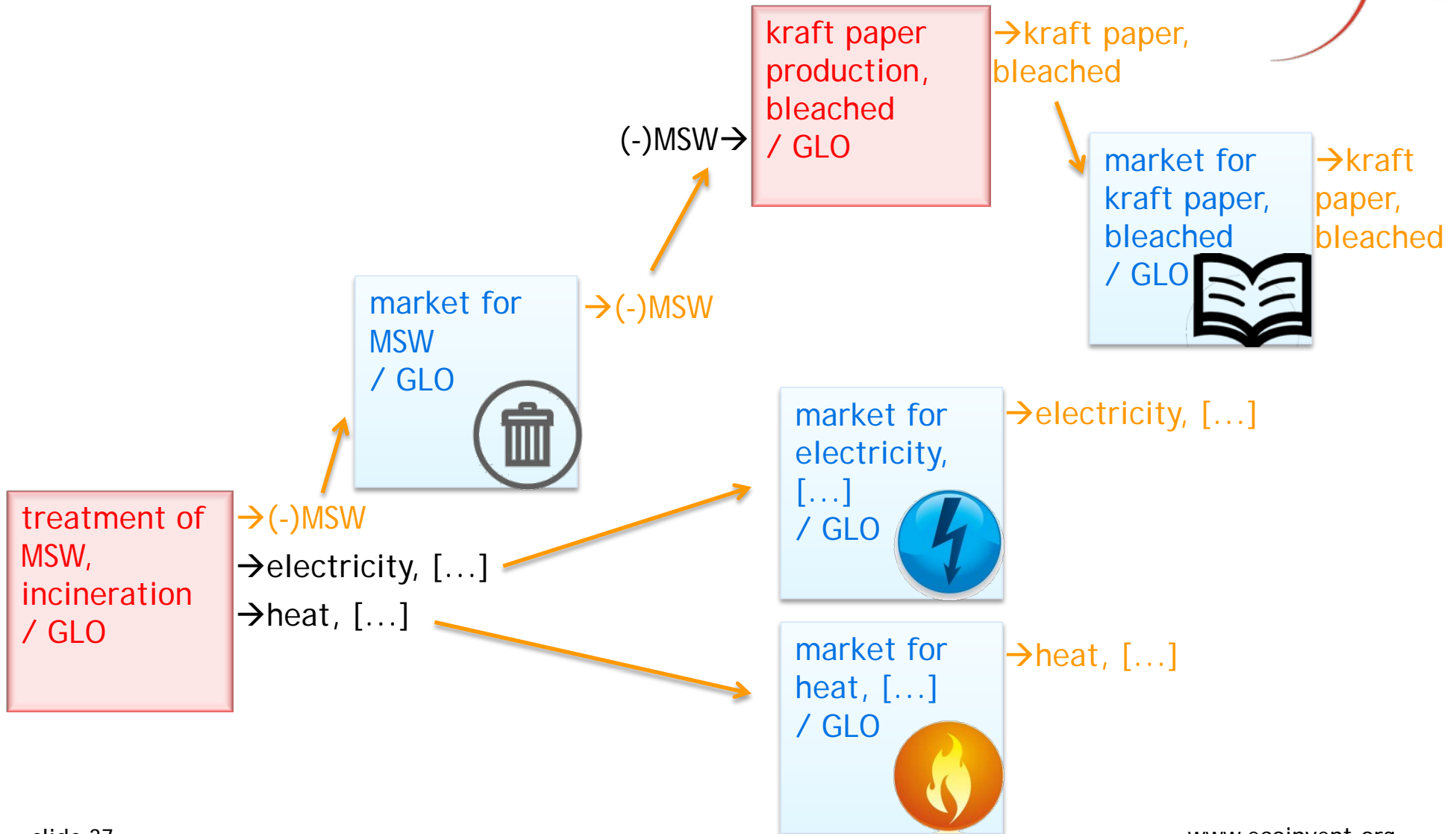
MSW: Municipal Solid Waste

Basics of ecoinvent v3

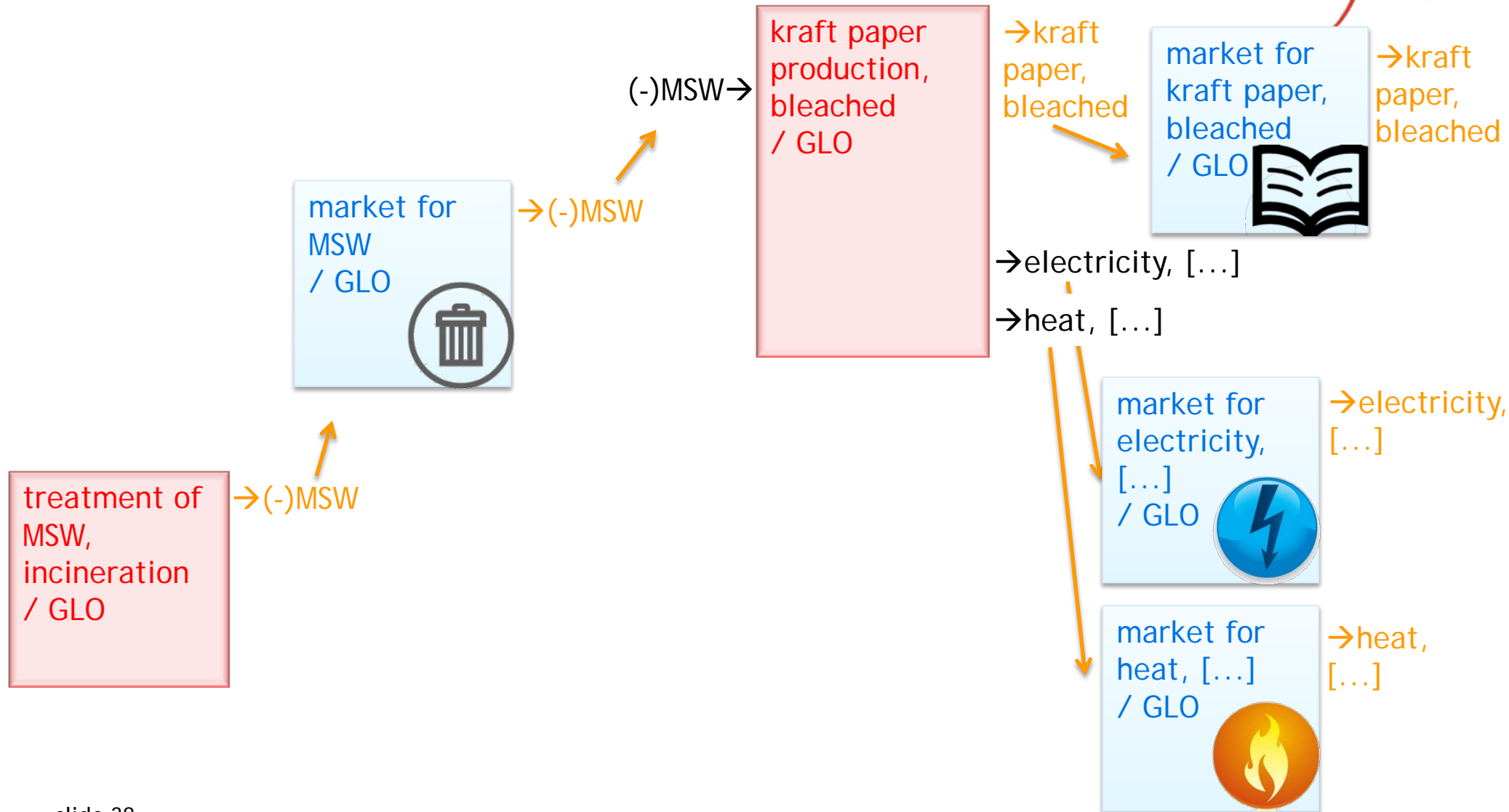
The database

The System Models

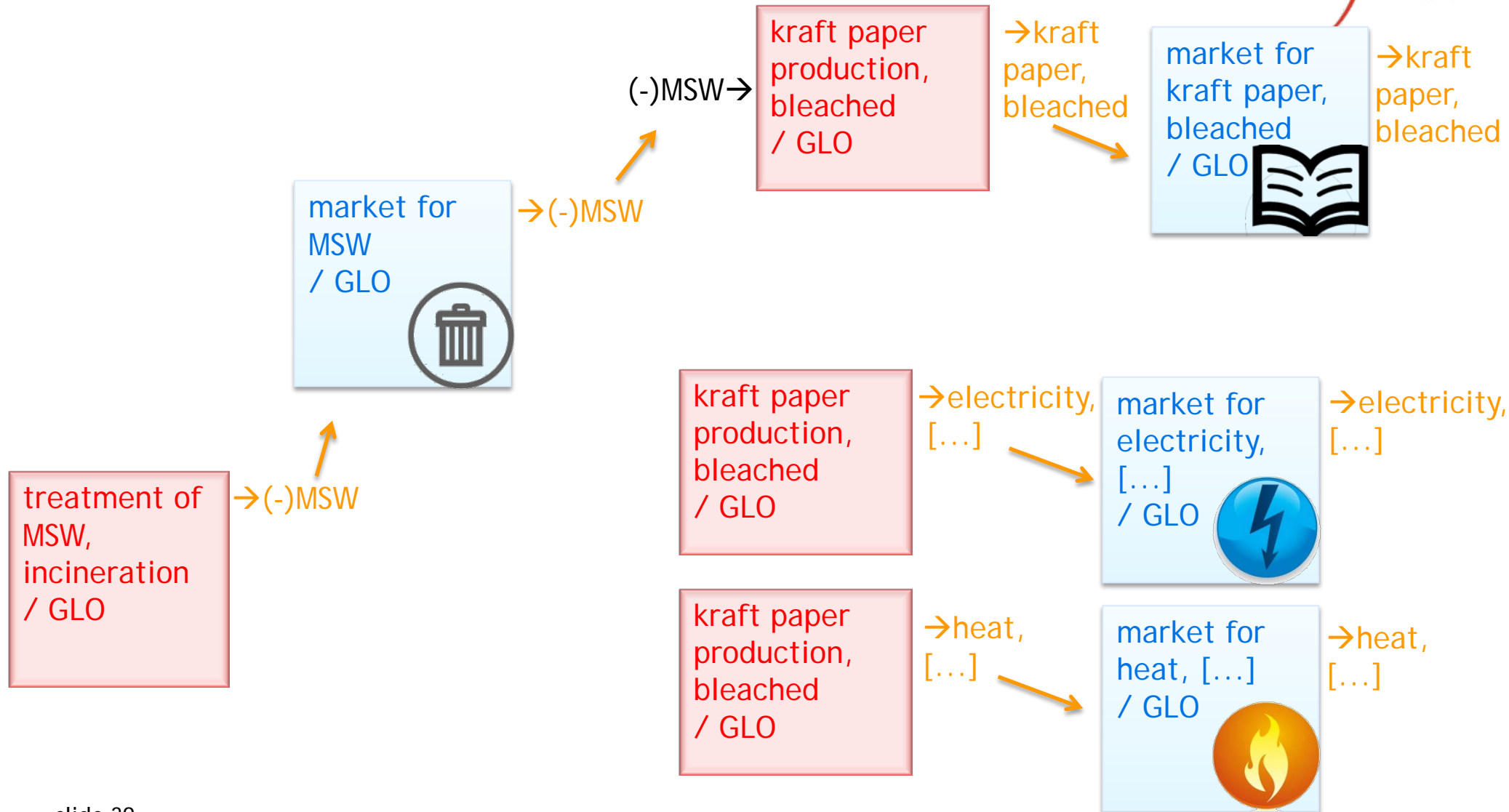
Allocation at the point of substitution



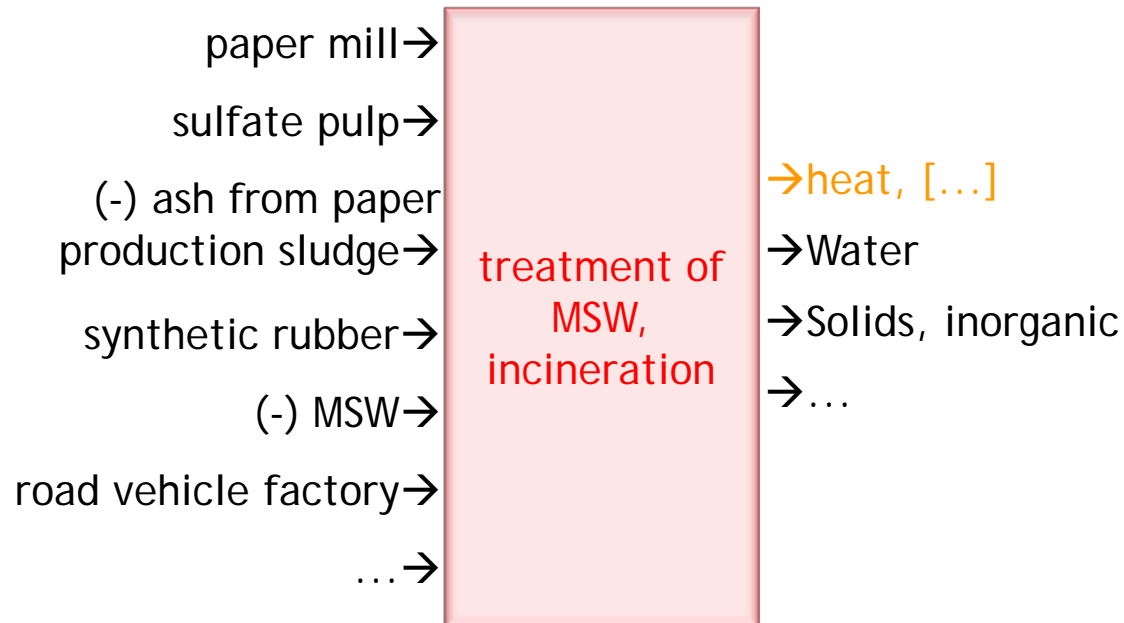
Allocation at the point of substitution



Allocation at the point of substitution



Allocation at the point of substitution



Thank you for your attention!

Emilia Moreno Ruiz

Deputy manager
ecoinvent Centre



moreno@ecoinvent.org

support@ecoinvent.org



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