



FORWAST

Data Mining in the EU-27 - Methodology

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

Główny Instytut Górnictwa-Central Mining Institute, Katowice, POLAND



- **Methodology of data mining**
- **Supply and Use Tables (SUTs) - input data for model**
- **Construction of SUTs – data sources and tools**
- **SUTs MASTERs for EU-23**
- **Gaps**
- **Conclusions**



1. Data collection and compilation from different sources

-  **Data collection guidelines and forms, scope of data and level of details were provided by 2.0-LCA(WP1) and RMA (WP2)**
-  **Data mining and review: national sector statistics, European Statistics, UN Statistics, other databases and information systems, existing reports and studies for sector economy**

2. Analysis, validation and identification of gaps

- Data were analysed and validated**
- Gaps were identified**
- Missing data were estimated**

3. Construction of SUTs

- Matrices were filling in**
- Inconsistencies in SUTs Master were corrected**

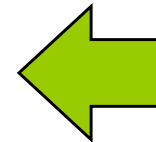
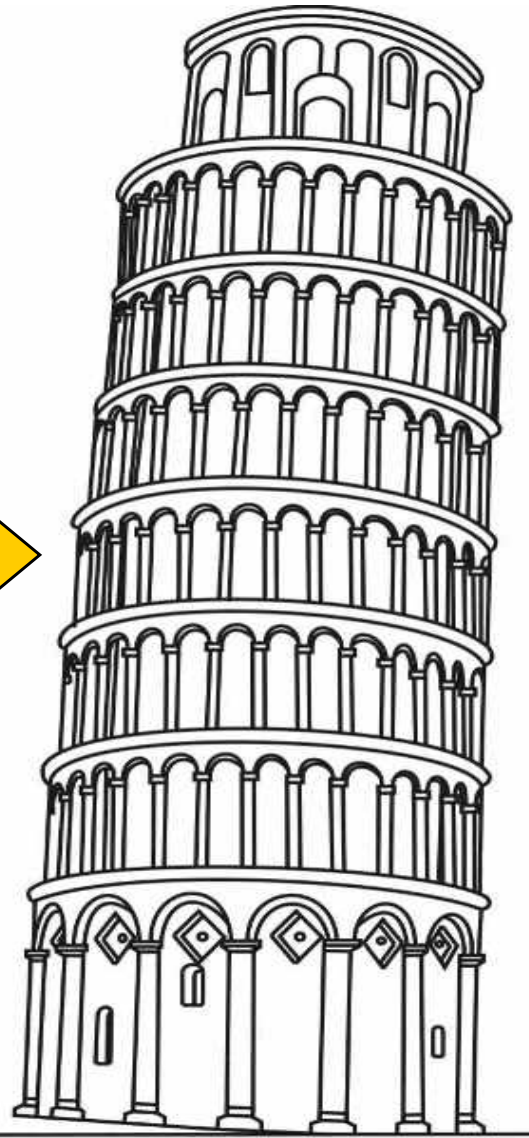
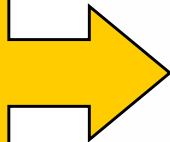
Supply and Use Tables MASTER – INPUT DATA for MODEL

8	Residuals Supply - W
7	Residuals Distribution - J
6	Emissions Distribution – Gc, Gr
5	Emissions – B
4	Resources – R
3	Prices –Pv, Pu
2	Physical SUTs – Import/Export intra EU-27, extra EU27
1	Monetary SUTs – Import/Export intra EU-27, extra EU27



Supply and Use Tables MASTER – INPUT DATA for MODEL

DATA



TOOLS



Krzywa Wieża w Pizie (Włochy)

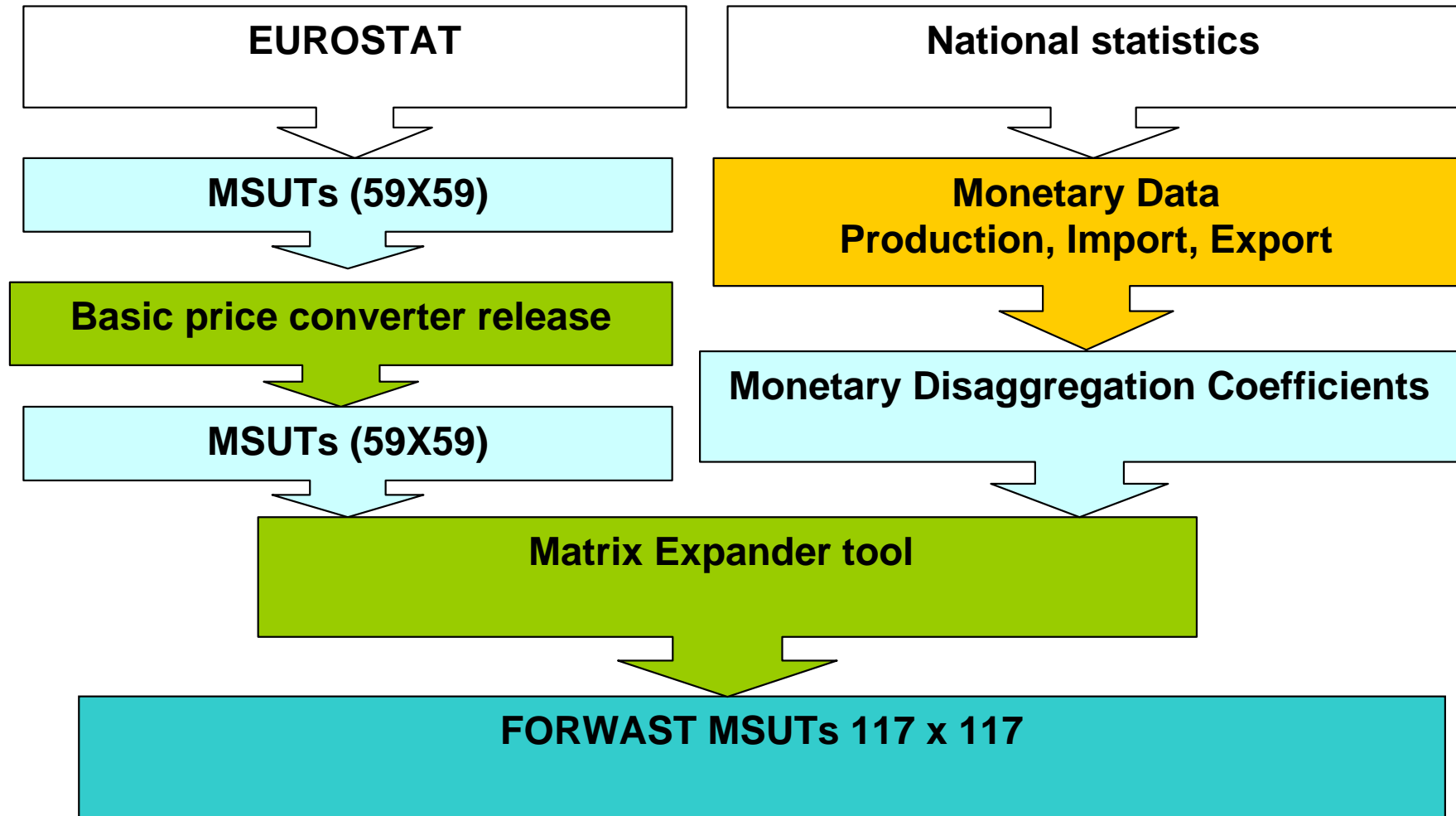
rys. N.Burduli
Fundacja Edukacji Międzykulturowej

Data sources

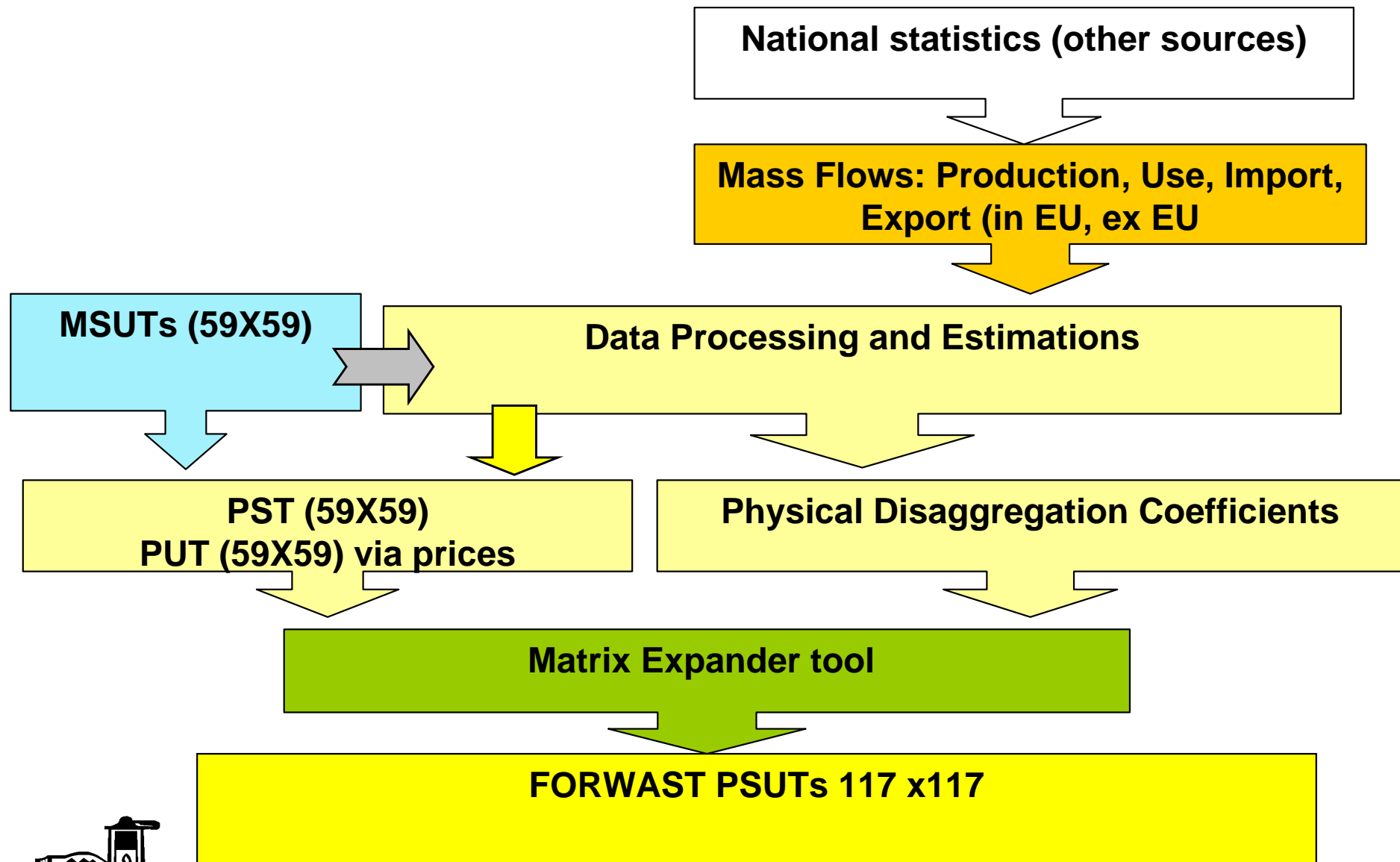
- **National sectoral Statistics: Agriculture, Forestry, Industrial Production, etc.**
- **EUROSTAT, UN Database, FAOSTAT, UNCE Timber Database**
- **Energy Statistics: IEA Statistics, IMUNDI, etc.**
- **Minerals: USGS, BGS, PAN**
- **Metals: IISICES (Steel Yearbook), EAMI, EUROFER,**
- **Emissions: UNFCCC (National Inventory-CRF)**
- **Waste: EUROSTAT, EIONET, UN, CEPI, National Waste Management Programs**
- **Import/Export intra EU-27 and extra EU-27: EUROSTAT, External Trade, ComExt**



1. Construction of Monetary Supply and Use Tables




2. Construction of Physical Supply and Use Tables



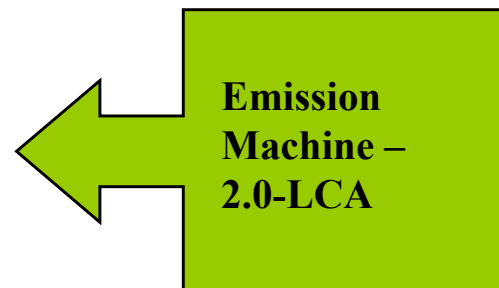
Construction of PSUTs cases

-  PSUTs Lithuania: Agriculture products
-  PSUTs Finland: Coke, petroleum refined products

4. Matrix Resources -R

Material No.	Material (Dry Mass)	Agriculture products Gg
1	Aluminium	0
2	Fibre carbon	2384,9
3	Food carbon, (including tobacco)	14238
4	Coal carbon	0
5	Crude oil and natural gas carbon	0
6	Carbonate carbon	0
7	Copper	0
8	Iron	0
9	Metals, n.e.c.	0
10	Minerals, n.e.c. (including nitrogen)	6550,3
11	Oxygen (only in products, but not in H2O)	13100
 glg	Clay and soil	0
	Sand, gravel and stone	0
14	Total material (T)	36273

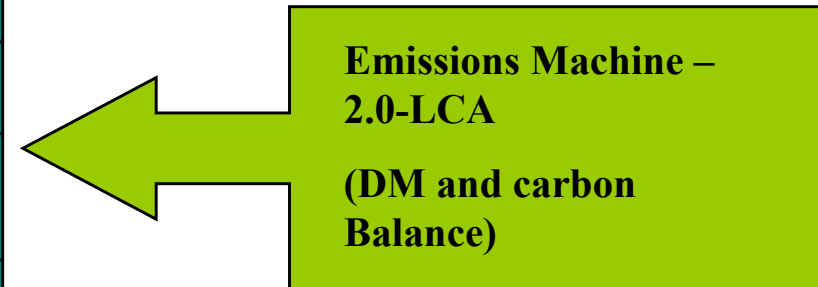
-  Agriculture products
-  Forestry products
-  Fishing products
-  Coal, lignite and peat
-  Crude petroleum and gas
-  Metal ores
-  Other mining and quarrying products



5 - 6. Matrices: Emissions B and G

		Emissions	Agriculture Gg
Air	1	Ammonia	0
Air	2	Arsenic	0
Air	3	Cadmium	0
Air	4	Carbon dioxide, fibre carbon	10,079
Air	5	Carbon dioxide, food carbon	16741
Air	6	Carbon dioxide, coal carbon	225,51
Air	7	Carbon dioxide, crude oil and natural gas carbon	1434
Air	8	Carbon dioxide, carbonate	0
Air	9	Carbon monoxide	2,0437
Air	10	Chromium	0
Air	11	Copper	0
Air	12	Dinitrogen monoxide	37,881
Air	13	Hydrogen chloride	0
Air	14	Hydrogen fluoride	0
Air	15	Lead	0
Air	16	Mercury	0
Air	17	Methane	234,34

- > UNFCCC- Data CRF: Fuels, Industry, Solvents, Agriculture, Waste
- > Respiratory emissions



3 steps:

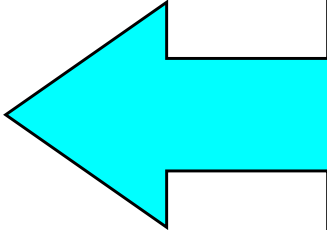
- 1. crude data for emissions**
- 2. data were fitted to the FORWAST activities**
- 3. matrices B and G were generated**



7. Matrix Residuals Distribution - J

Waste Treatment Activities:

-  Recycling
-  Incineration of waste
-  Manure treatment
-  Biogasification of waste
-  Composting of waste
-  Wastewater treatment
-  Landfill of waste
-  Land application
-  Export
-  Import



**Estimations / Assumptions
on the basis of
available data and
information or expert
knowledge**

Correcting inconsistency in SUTs MASTER



Balance checks:

- > Monetary SUT products
- > Monetary SUT activities
- > Physical SUT products
- > Physical SUT activities
- > Physical SUT negative waste
- > D matrix = (0,1)



Supply and Use Tables MASTER for EU-23

FORWAST - WP4

SUTs (117 x 117)	SUTs (Quasi 117 x 117)	(SUTs 57 x 57)
GREECE – AUT	CZECH R.-SLOVAKIA- HUNGARY - GIG	BELGIUM - 2.-0 LCA
IRELAND - UST	ESTONIA-LITHUANIA- LATVIA - GIG	BULGARIA - BRGM
NETHERLANDS -BRGM	FINLAND - GIG	CYPRUS - AUT
POLAND - GIG		ITALY - AUT
SLOVENIA - RMA		LUXEMBURG - AUT
SPAIN - TUV		MALTA - AUT
SWEDEN- 2.-0 LCA		PORTUGAL - AUT
UNITED KINGDOM -UST		ROMANIA - BRGM



Identification of gaps -1



FORWAST - WP4

- **MSUTs (2003) for some countries are not available from EUROSTAT, in some cases not consistency**
- **MSUTs: for confidentiality reasons some products and industries have been merged and added up, the sum was shown for one of the products**
- **No available physical data for USE for most of the product / activities categories**
- **Mass data for heterogeneous streams of products were difficult for estimation, different units from mass units**
- **National classifications of products/activities are not exactly harmonized with CPA/NACE**






Identification of gaps - 2

FORWAST - WP4

-  **Lack of data and clear information on mass flows of waste directed to different activities of waste treatment**
-  **For many recycled flows corresponding to FORWAST categories of products statistical data are not available (except of basic metals)**

Conclusions -1

FORWAST - WP4

-  **Within FORWAST (WP4) SUTs Masters for EU-23 countries have been developed**
-  **The availability and quality of physical data as well as data processing related to supply, use, import and export, varied significantly between categories of products/industries.**
-  **The availability of statistical data differed from one matrix to another.**



Conclusions - 2

FORWAST - WP4



Two areas related to waste statistics emerged during data mining, which we consider to be of particular importance, it means there is a need for good quality data and consistent information on mass flows of waste directed to different activities of waste treatment as well as quantity of recycled materials defined in FORWAST

