

IMEA Workshop  
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# Material flow accounts

## IMEA WP5

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# Content

- Present status of MFA
- Experiences from the Finnish ENVIMAT project
- Concluding assesment

# Types of MFA accounts

- **Macro-level: Economy-wide MFA**
  - Direct Material Input (DMI) based accounts
  - Total Material Requirement (TMR) based accounts (extension of DMI)
- **Meso-level: input-output tables and models**
  - Physical Input-Output tables (PIOT)
  - Environmentally extended monetary input-output models with material flow components (EE-MIOT or MFA-MIOT)
- **Micro-level: MIPS - Material inputs per unit service**

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DMI: Total mass of materials entering the economy

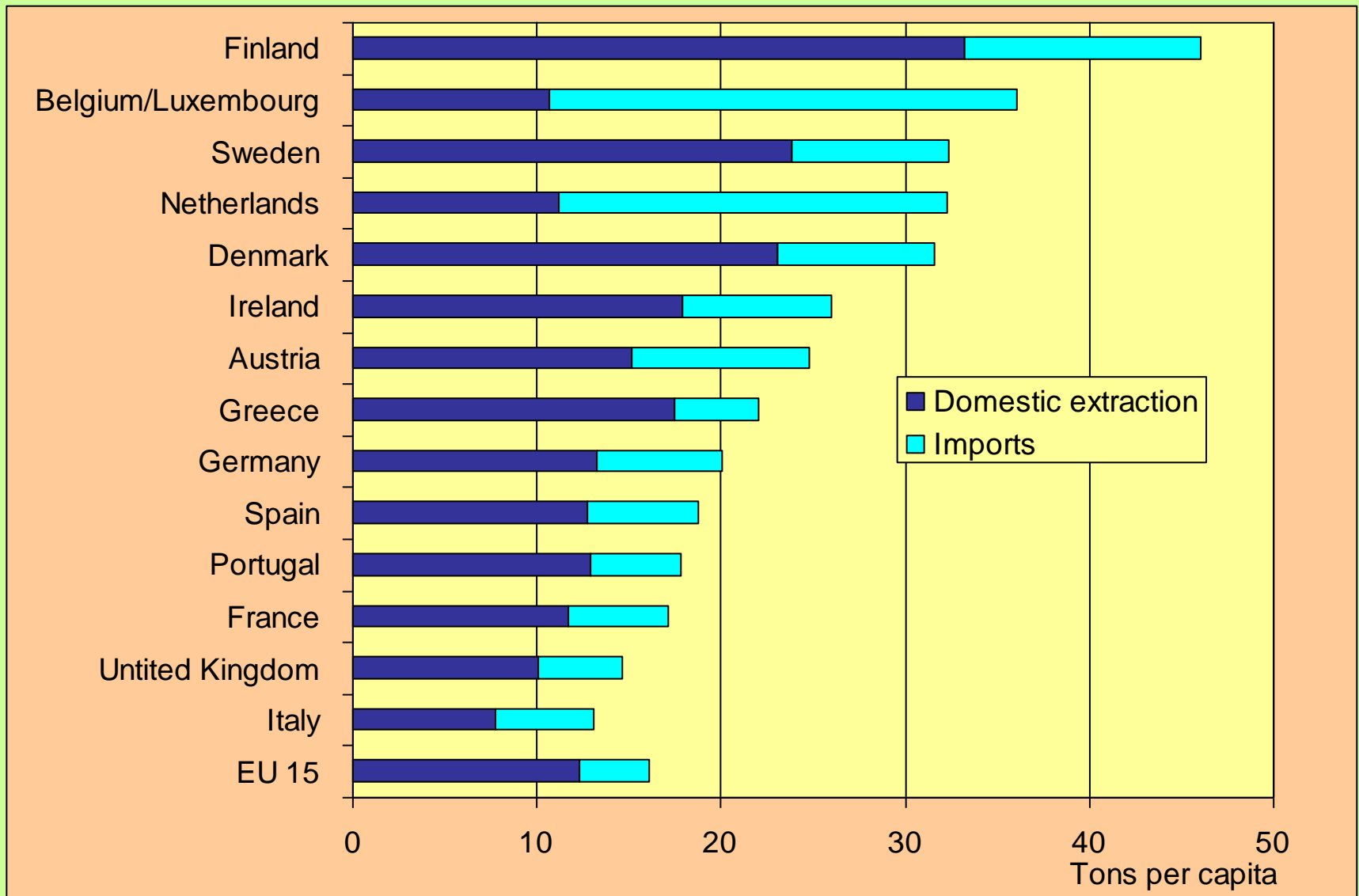
TMR: Total mass of nature mobilized by the economy  
directly or indirectly

# Current status of EW-MFA: DMI

- Methods standardized in manuals: Eurostat, OECD
- Eurostat/IFF time-series of DMI based time serie for EU15 countries 1970-2004
- Moreover several country studies of new EU members and outside the EU (most important: US, Japan, China, Australia)
- Eurostat's inquiry to national statistical offices last year about national DMI series over the years 2000-2006. The statistical summary still under preparation (?)

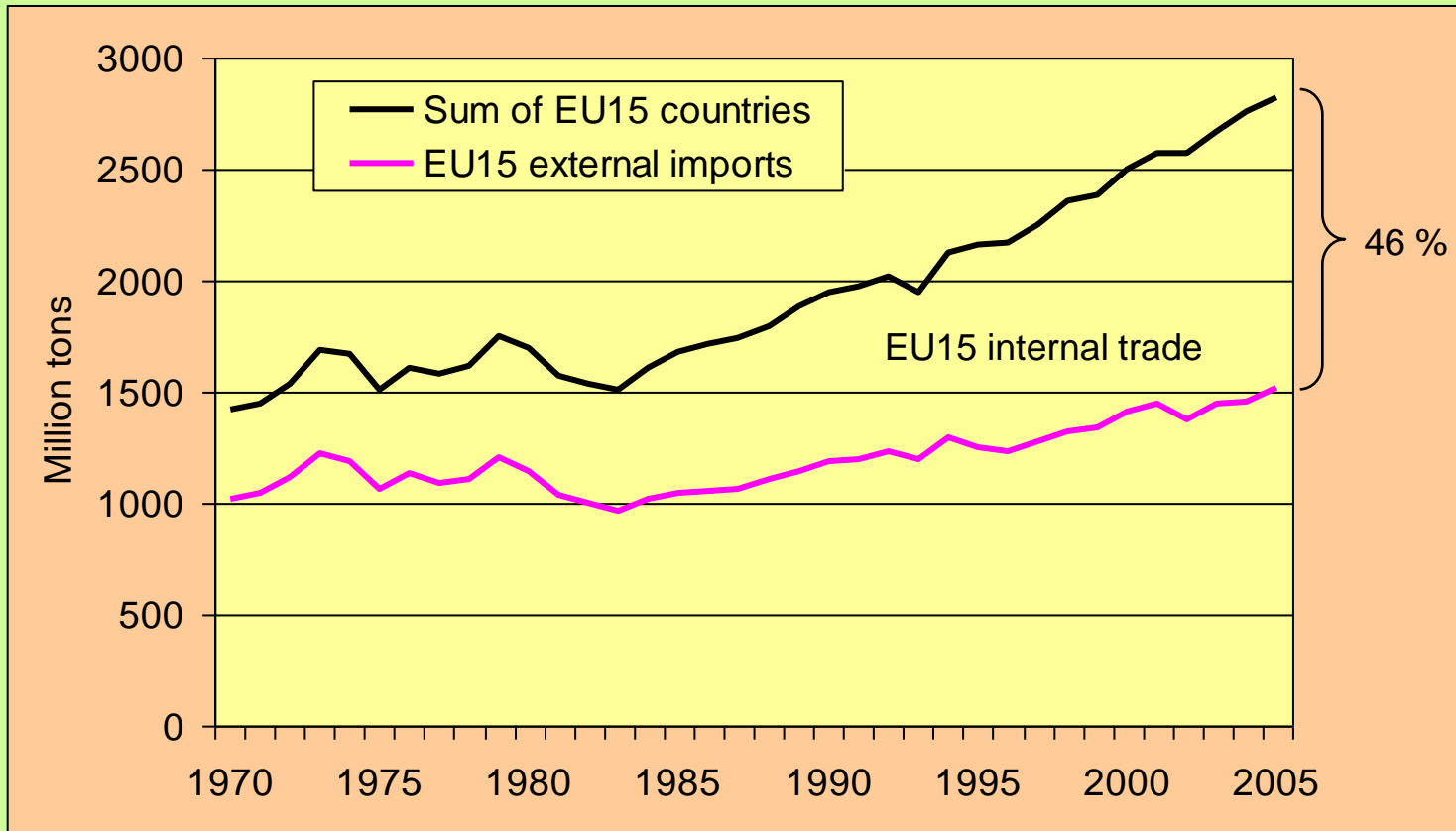
# DMI per capita of EU15 countries 2004

Source: Weitz et al 2007



# Material imports of EU15 countries 1970-2005

Source: Weitz et al 2007

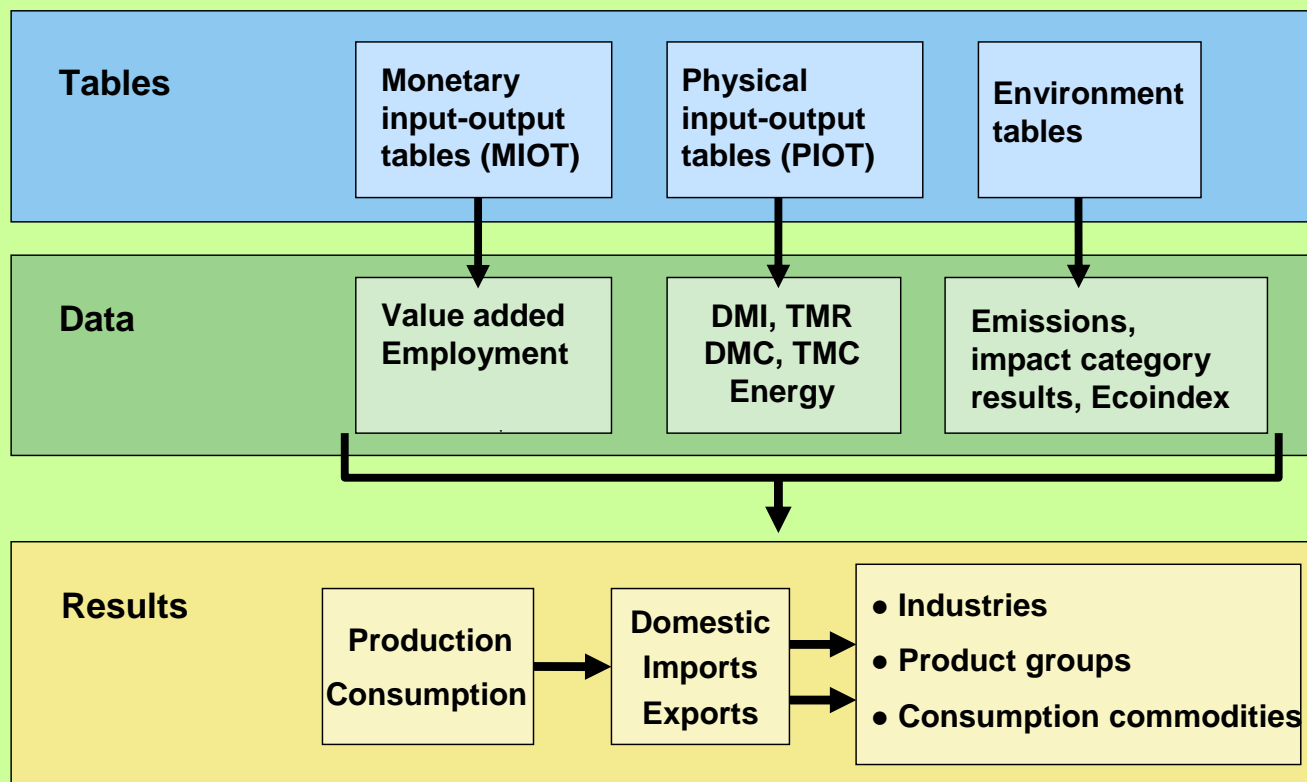


# Present status of EW-MFA: TMR

- TMR studies relative rare, time series accounts exists for Germany, US, Great-Britain, Finland, and an earlier work for total EU15
- SERI has compiled domestic DMI and TMR series for all countries of the world – imports are lacking
- Definition of unused extraction in TMR still varies and coverage of estimated indirect material use of imports especially for refined products are often deficient

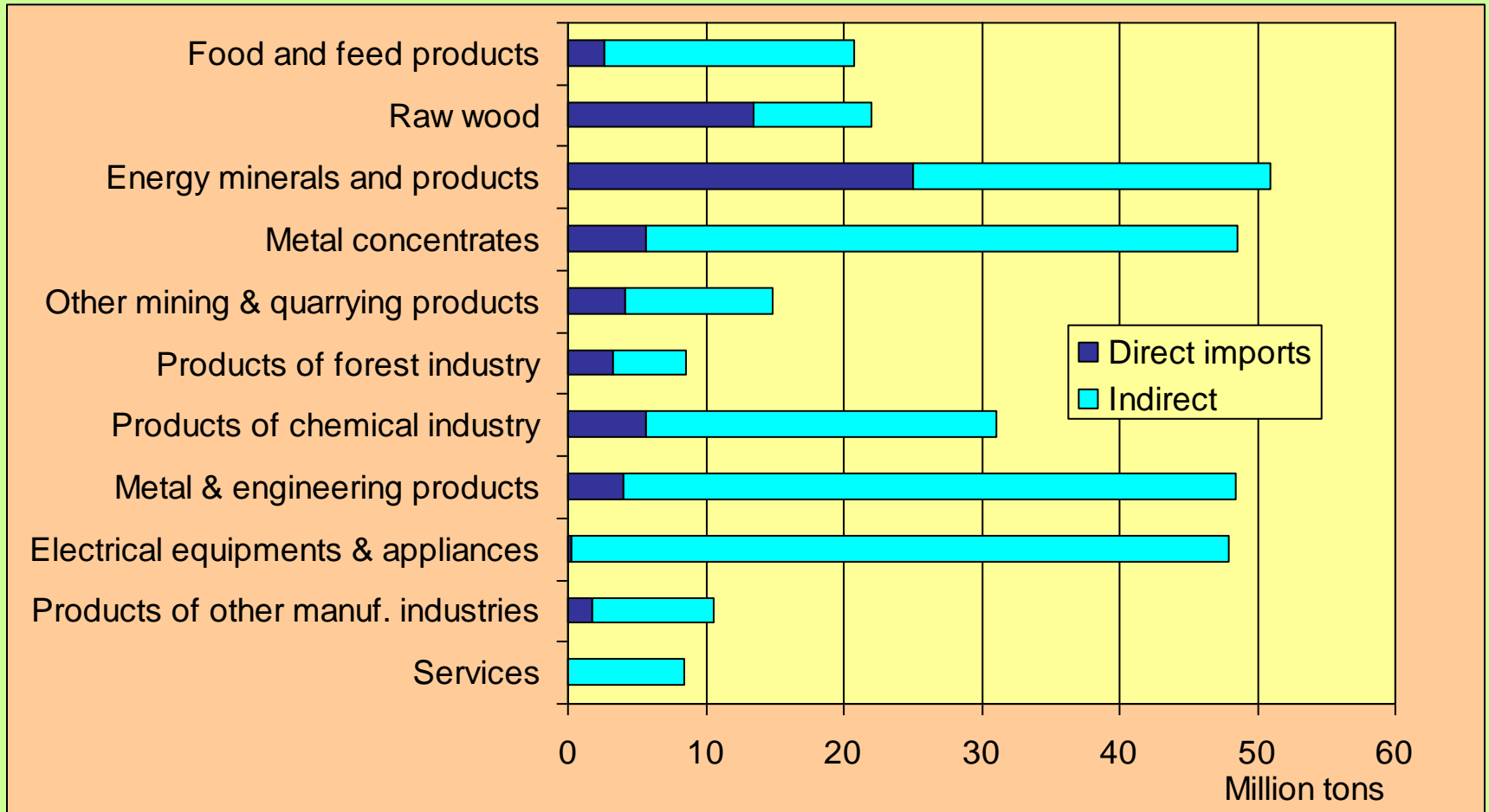
# Experiences of the Finnish ENVIMAT model

Finnish Environment Institute, University of Oulu, Agrifood Finland,  
funded by the Finnish Ministry of Environment

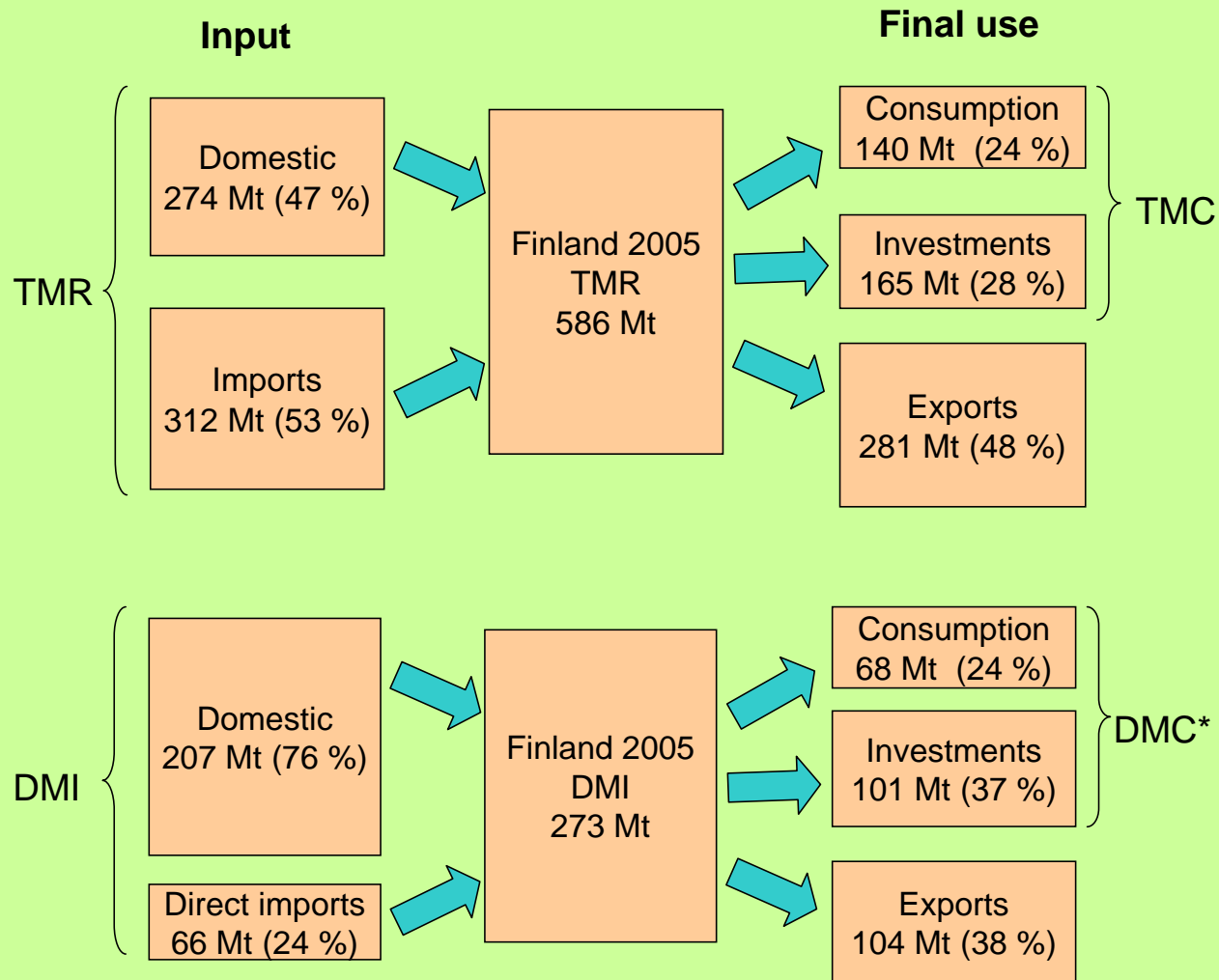


- 151 branches of production
- 720 imported products

# Aggregated material flows of Finnish imports 2005 (ENVIMAT)



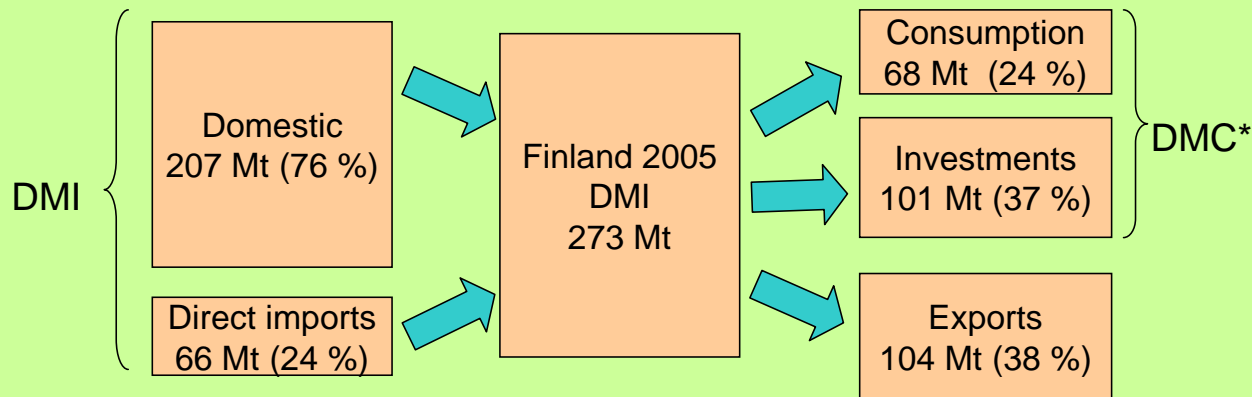
# ENVIMAT results on aggregate material flows



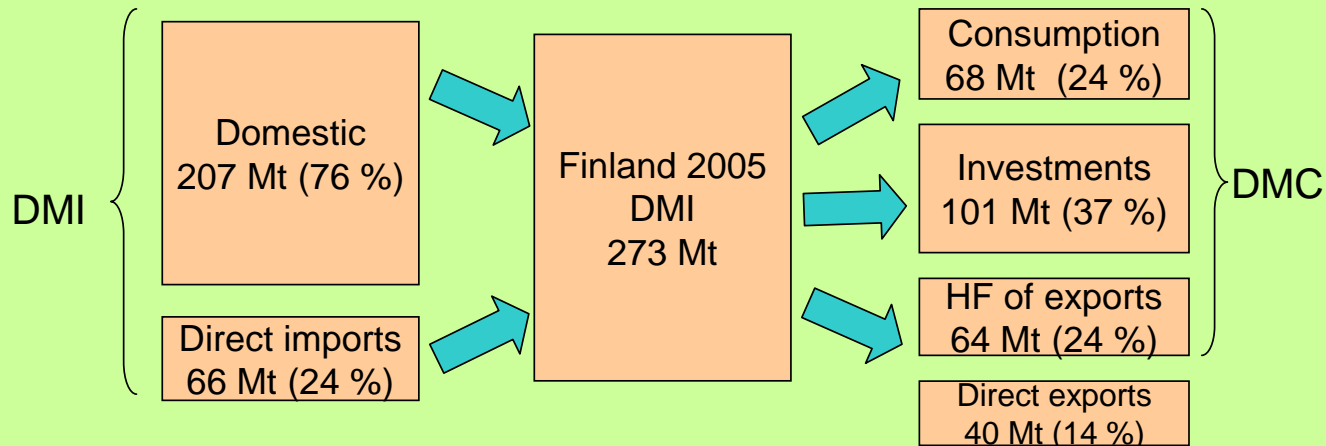
=> DMI hugely underestimates the global resource use impacts of imports

# DMC\* and DMC as DMI content of the domestic final use of products

## DMC\* as calculated by ENVIMAT



## DMC as DMI minus direct exports



=> DMC is not the material use of the domestic final demand

# Conclusions 1

- Material flow accounting has a strong theoretical ground in the first law of thermodynamics: conservation of mass or energy
- Do not describe qualitative effects of those flows: the environmental burden caused by different material flows varies
- Gives “big picture” of the physical properties of the economy
- In DPSIR belongs into Pressure category

# Conclusions 2

- Uniform time-series database exist for EU15 and in near future for EU27, however only for direct material flows
- Worldwide domestic extraction database in SERI
- Manuals: Eurostat, OECD
- Urgent problem: estimates of indirect material input of imported products still need development

# Conclusions 3

- Time series needed for understanding current trends
- In prospective analysis EE-IO model tools seem to be most plausible