

Shortcut to Corporate sustainability reports

combining financial statement and
input-output databases

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NIRAS

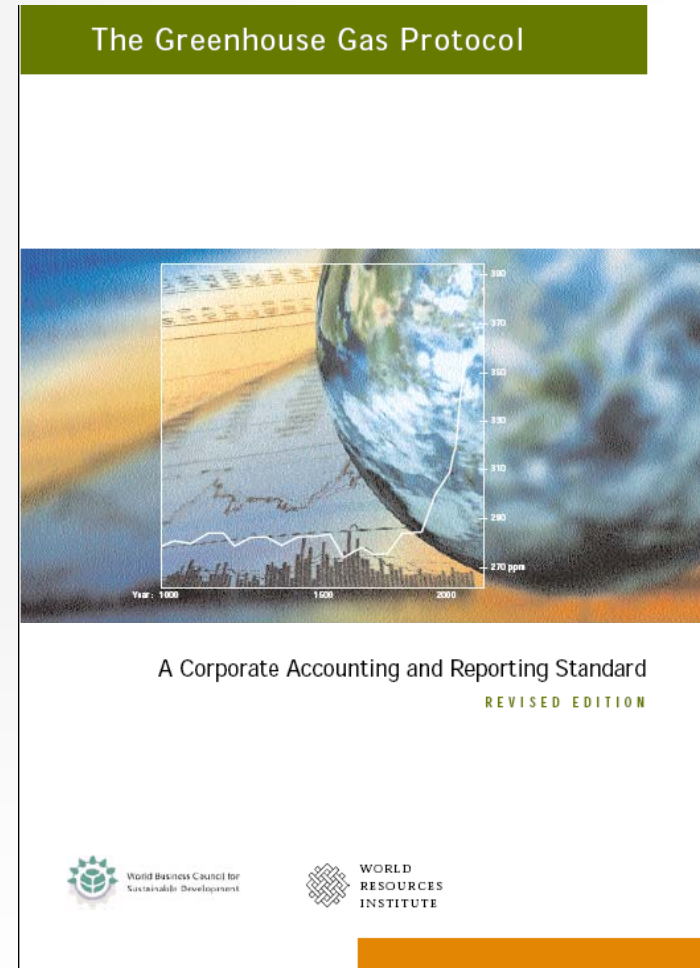
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Corporate sustainability reports

- a large work load is required

- Detailed data collection required for:
 - Scope 1: onsite
 - Scope 2: purchased energy
 - Scope 3: all other
- These data are not immediately present
- Data collection will not be complete
- Why not use already available complete data?
 - Financial statement contains all corporate data!
 - IO-models are complete and compatible with financial data



Data from financial statement

- Purchases in year xxxx

Amount	EUR
Diesel	XX
Renting buildings	XX
Purchase car	XX
Furniture	XX
Computers	XX
Printers	XX
Vegetable oil	XX
Sugar	XX
Chemicals	XX

⋮

Input-output database

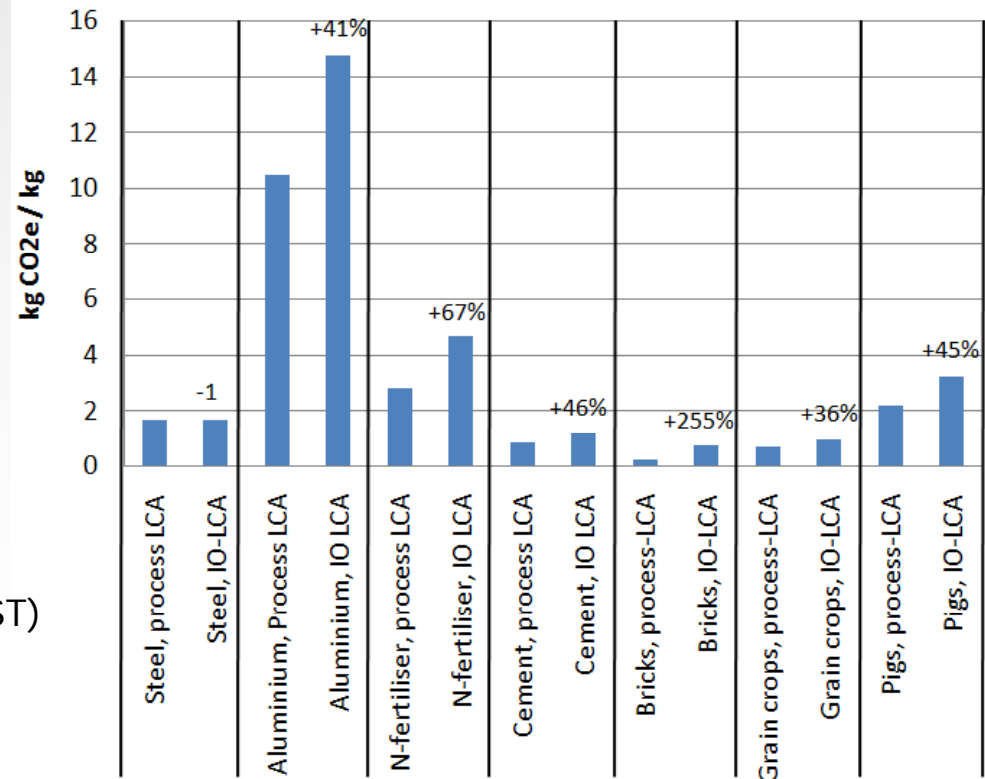
- Fundamentally the same as an LCA database:
 - a large number of interlinked LCA processes
- Difference:
 - Usually product flows in IO-models are in monetary unit
 - IO-data are complete: all products are included
 - IO-data typically shows results 25-200% higher than process data

Process-data:

Ecoinvent and LCAfood

IO-data:

Swedish IO-table (FORWAST)



The overall inventory procedure

Financial statement

Categorisation

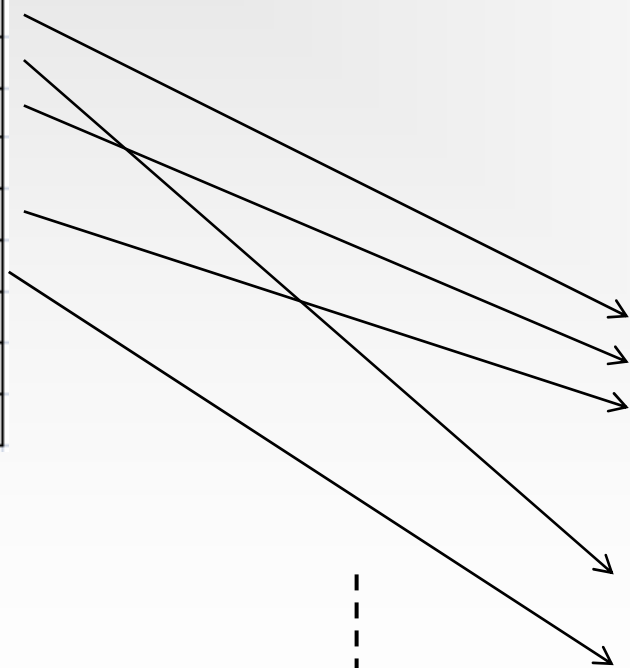
IO-database

Purchases in year xxxx



Amount	EUR
Diesel	XX
Renting buildings	XX
Purchase car	XX
Furniture	XX
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Vegetable oil	XX
Sugar	XX
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Name	Unit
1 Bovine meat and milk, EU27	kg
_2 Pigs, EU27	kg
_3 Poultry and animals n.e.c., EU27	kg
_4 Grain crops, EU27	kg
_5 Crops n.e.c., EU27	kg
_6 Agricultural services n.e.c., EU27	EUR2003
_7 Forest products, EU27	kg
_8 Recycling of waste wood, EU27	kg
_9 Fish, EU27	kg
_10 Coal, lignite, peat, EU27	kg
...	
_75 Electricity, steam and hot water, EU27	kWh
_76 Gas, EU27	kg
_77 Water, fresh, EU27	EUR2003
_78 Buildings, residential, EU27	EUR2003
_79 Buildings, non-residential, EU27	EUR2003
_80 Infrastructure, excluding buildings, EU27	EUR2003
_81 Trade and repair of motor vehicles and service stations, EU27	EUR2003
_82 Wholesale trade, EU27	EUR2003
_83 Retail trade and repair services, EU27	EUR2003
_84 Hotels and restaurants, EU27	EUR2003
_85 Land transport and transport via pipelines, EU27	EUR2003
_86 Transport by ship, EU27	EUR2003
_87 Air transport, EU27	EUR2003
_88 Cargo handling, harbours and travel agencies, EU27	EUR2003



The inventory procedure – in detail

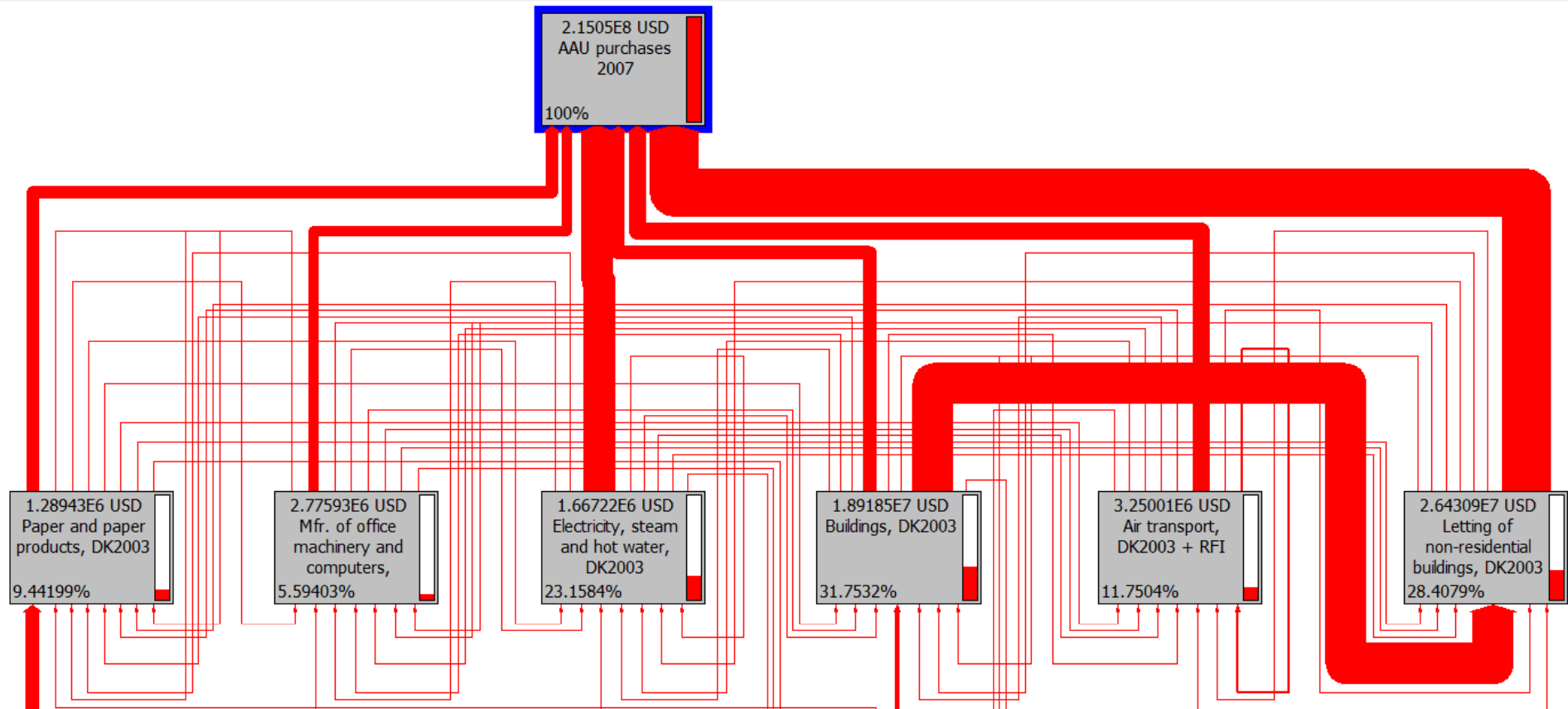
1. Categorisation of transactions in financial statement
2. Convert transactions in financial statement to:
 - a) basic prices
 - b) units of IO-database (if this is in hybrid units)
 - c) currency year
3. Add emissions from combusting fuels (petrol, diesel, gas, fuel oil)
4. Add treatment of generated waste

Large time savings compared to traditional corporate GHG-accounting!

Impact assessment

- Example: Aalborg University purchases 2007

Network diagram: Unit share of total GHG-emissions



Impact assessment

- Example: Aalborg University purchases 2007

Contribution to the total

Emission	Green house gas emissions (tons CO ₂ -eq.)	Distribution
Electricity, steam and hot water, DK2003	9,482	26%
Letting of non-residential buildings, DK2003	9,214	25%
Air transport, DK2003	4,594	13%
Buildings, DK2003	2,514	6.9%
Mfr. of office machinery and computers, DK2003	1,667	4.6%
Paper and paper products, DK2003	1,339	3.7%
General (overall) public service activities, DK2003	1,187	3.3%
Publishing activities, excluding newspapers, DK2003	730	2.0%
Mfr. of domestic appliances n.e.c., DK2003	612	1.7%
Mfr. of furniture, DK2003	608	1.7%
Computer activities exc. software consultancy and supply, DK2003	578	1.6%
Post and telecommunications, DK2003	519	1.4%
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Total	36,288	100%

Outlook

- How to improve model: IO-based sustainability reports?
- How does the method perform compared to alternatives?

IO-data are aggregated

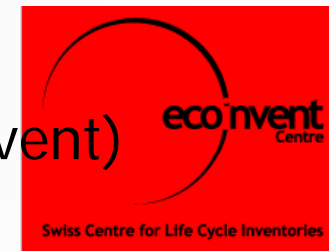
– is this good enough?

Aggregated data produce less meaningful results:

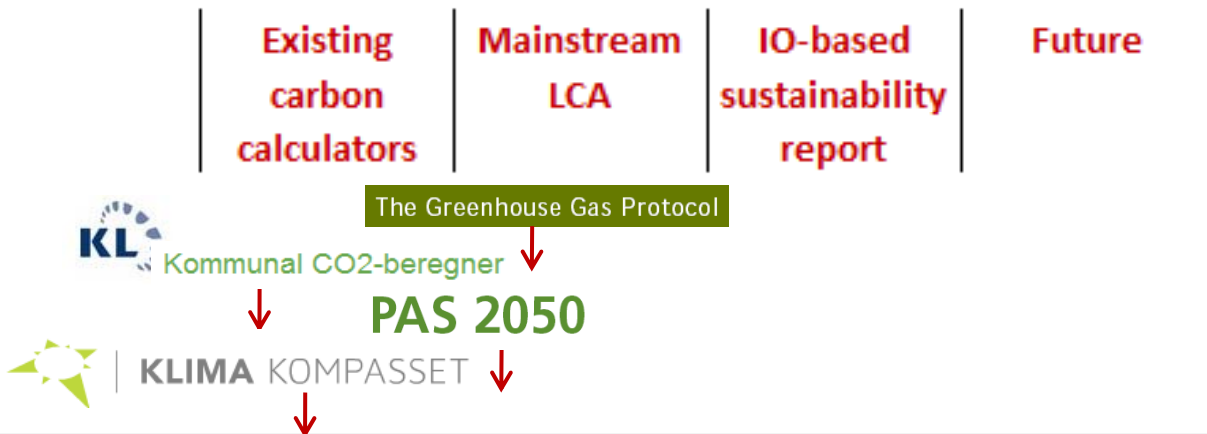
- Most IO-models subdivide economy (industries and products) into 60 to 500 different categories
- Examples: **Chemicals n.e.c.** & **Food n.e.c.** & **Land transport**

How to overcome the problem of aggregated data?

- Starting point: Use aggregated data
- For significant hotspots or inputs where improvements are relevant;
=> **subdivide**
- Use detailed process data, e.g. LCA database (ecoinvent)



How good are we performing?

	Existing carbon calculators	Mainstream LCA	IO-based sustainability report	Future
				
Direct emissions (scope 1)	ok	ok	ok	ok
Upstream emissions (scope 2&3)	<i>lacking/poor</i>	ok	ok	ok
Completeness	<i>lacking/poor</i>	<i>lacking/poor</i>	ok	ok
Consistent modelling	<i>lacking/poor</i>	<i>lacking/poor</i>	ok	ok
Mass/substance/energy/economy balances	<i>lacking/poor</i>	<i>lacking/poor</i>	ok	ok
Cause-effect modelling (alca/clca)	<i>lacking/poor</i>	<i>lacking/poor</i>	<i>partly</i>	ok
Inclusion of indirect land use effects	<i>lacking/poor</i>	<i>lacking/poor</i>	<i>lacking/poor</i>	ok

!! Note that IO-based model may be too aggregated for some purposes if not subdivided

Carbon calculators - Quality criteria

- TRANSPARANCY!
- Cause-effect modelling: Include the relevant
 - Carbon calculators produce decision support
 - => Should calculate the consequence of a decision
 - => Therefore, include actually affected GHG-emitters in calculation
- Completeness
 - Do not exclude anything!
- Consistency
 - Modelling assumptions should be consistently applied throughout the model
- Flexible
 - Capability to change modelling assumptions
 - Easy to modify/refine modelling
 - Easy to update

Examples of cause-effect modelling

