LCA on Danish fish products

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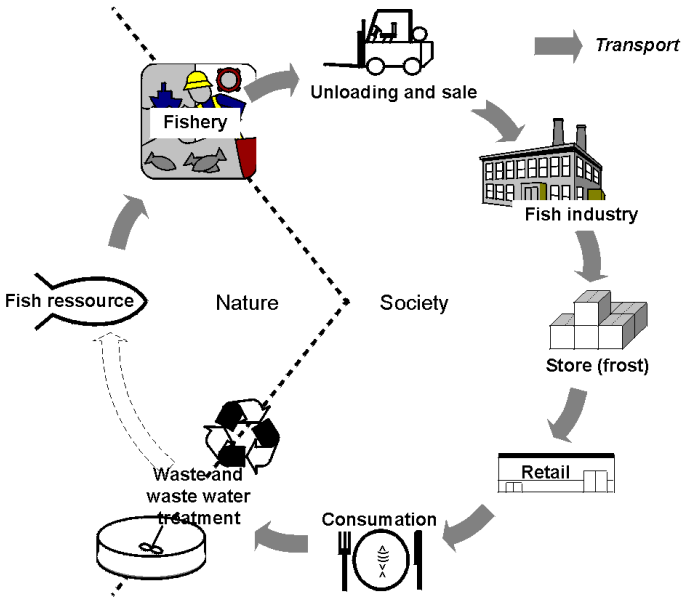
LCA on Danish fish products

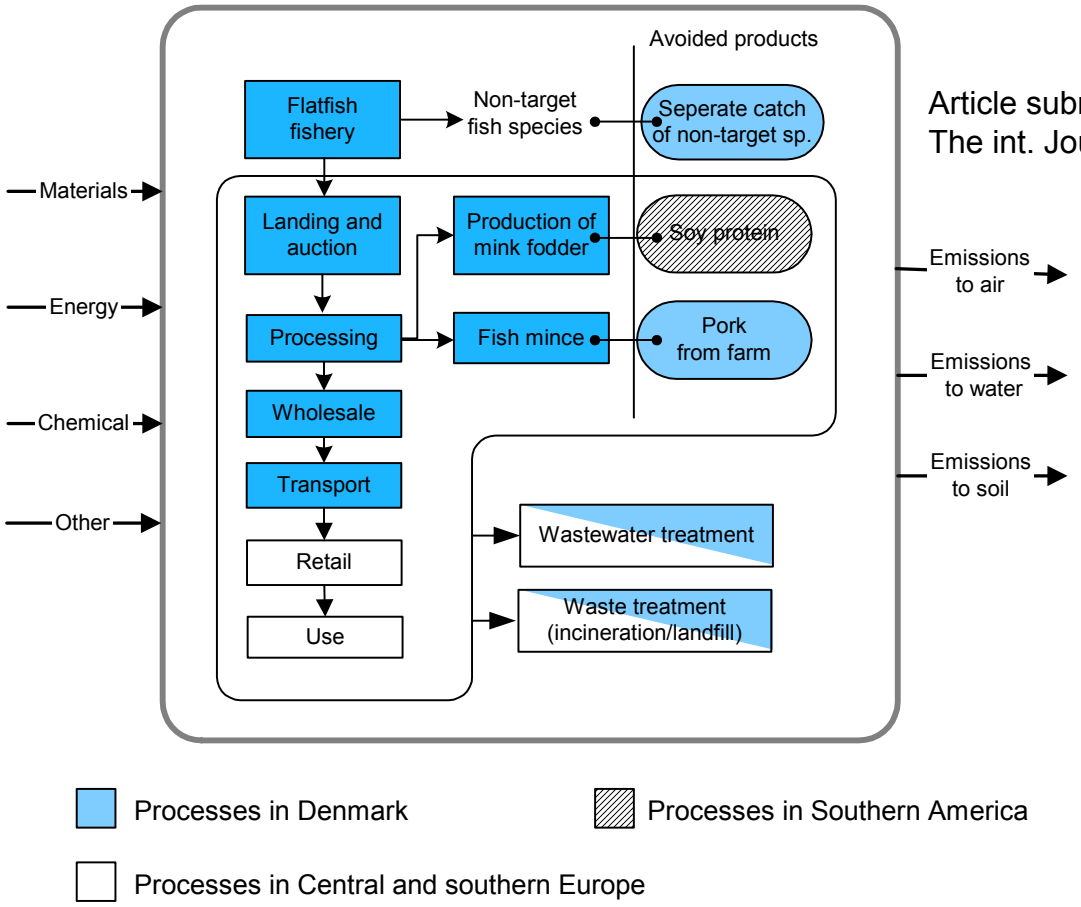
1. Method
2. Characterization results
3. Weighted results (EDIP)
4. LCA screenings of other fish products
5. Conclusions
6. Methodological discussion

Method & database

- Approach: Change oriented LCA
- Data presented today: EDIP-97 update
- ETH-ESU 96 for related processes (energy & materials)
- LCAfood: Food products, waste water treatment etc.



LCA on flatfish (process diagram)



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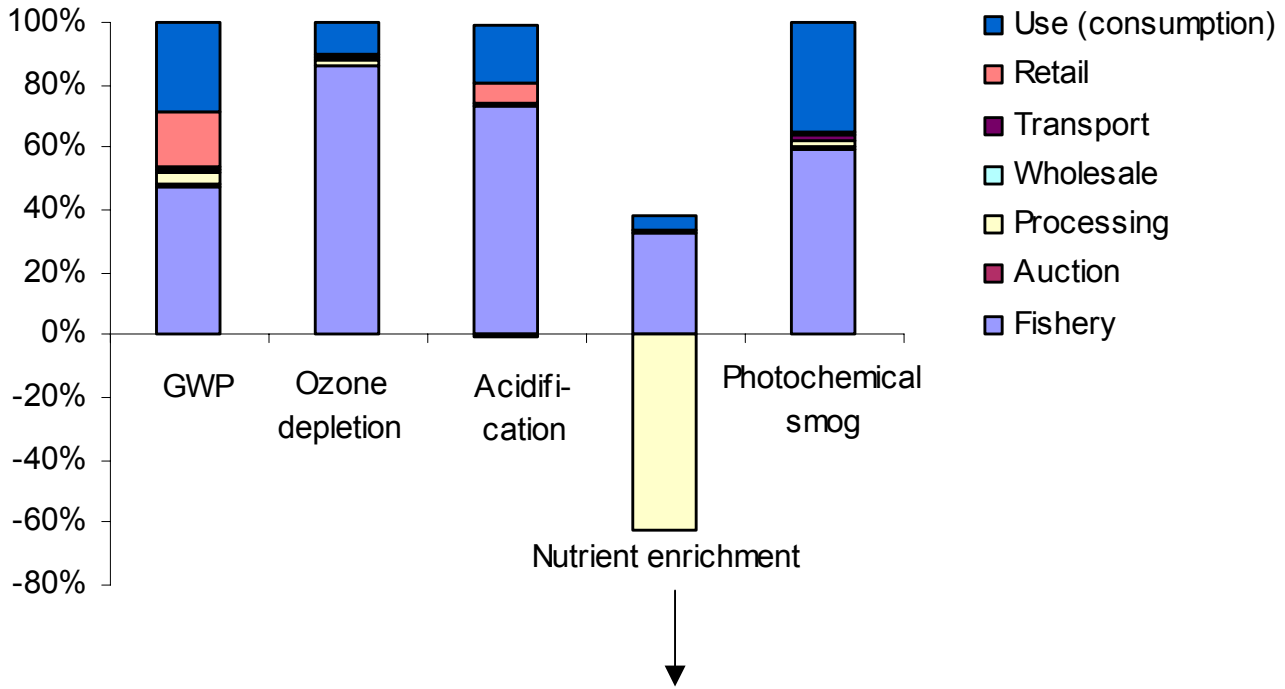
Characterization – flatfish filet (IQF)

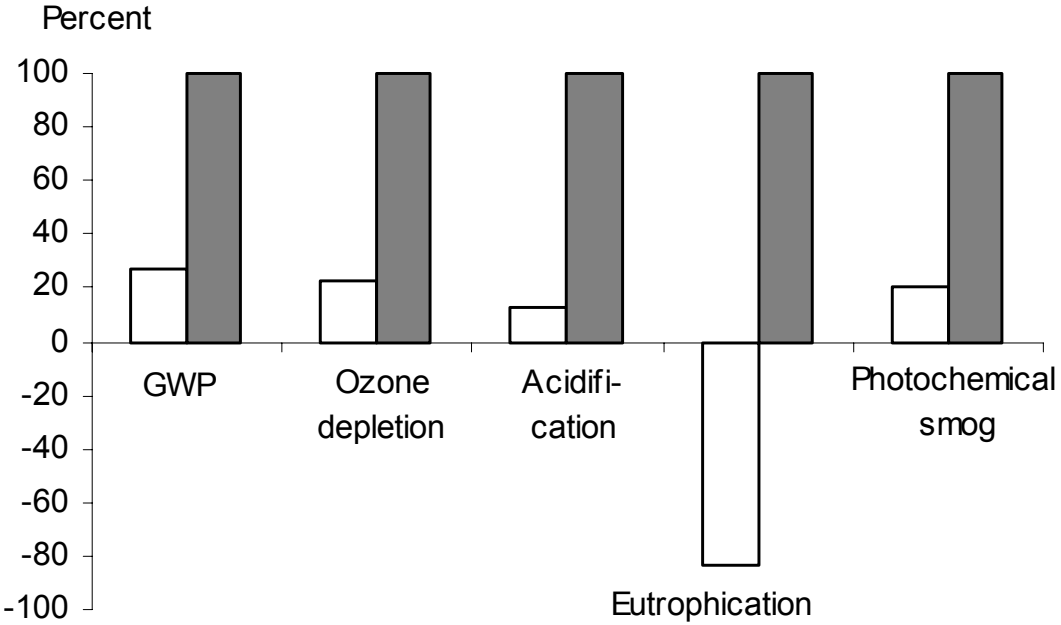


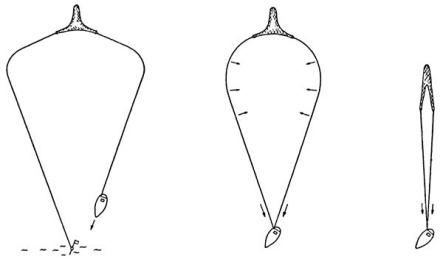
System expansion: two types of by-products

1) Offal used for mink fodder (substitute soy protein)

2) Fish mince – human food (substitute minced pork)

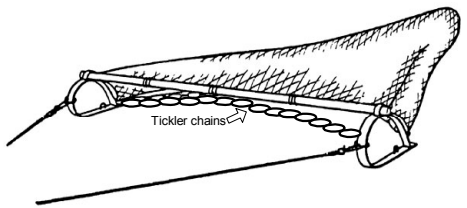
…Improvement potential – fishing gear





Danish seine

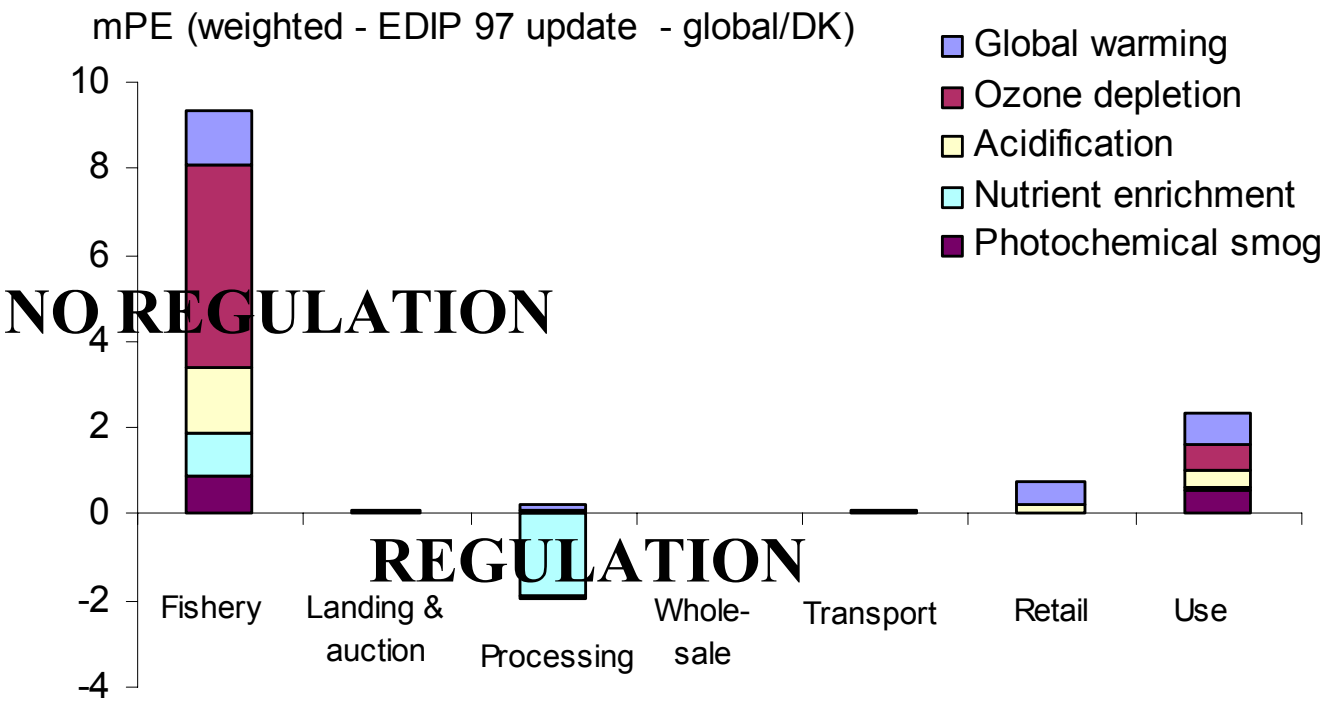
Beam trawl



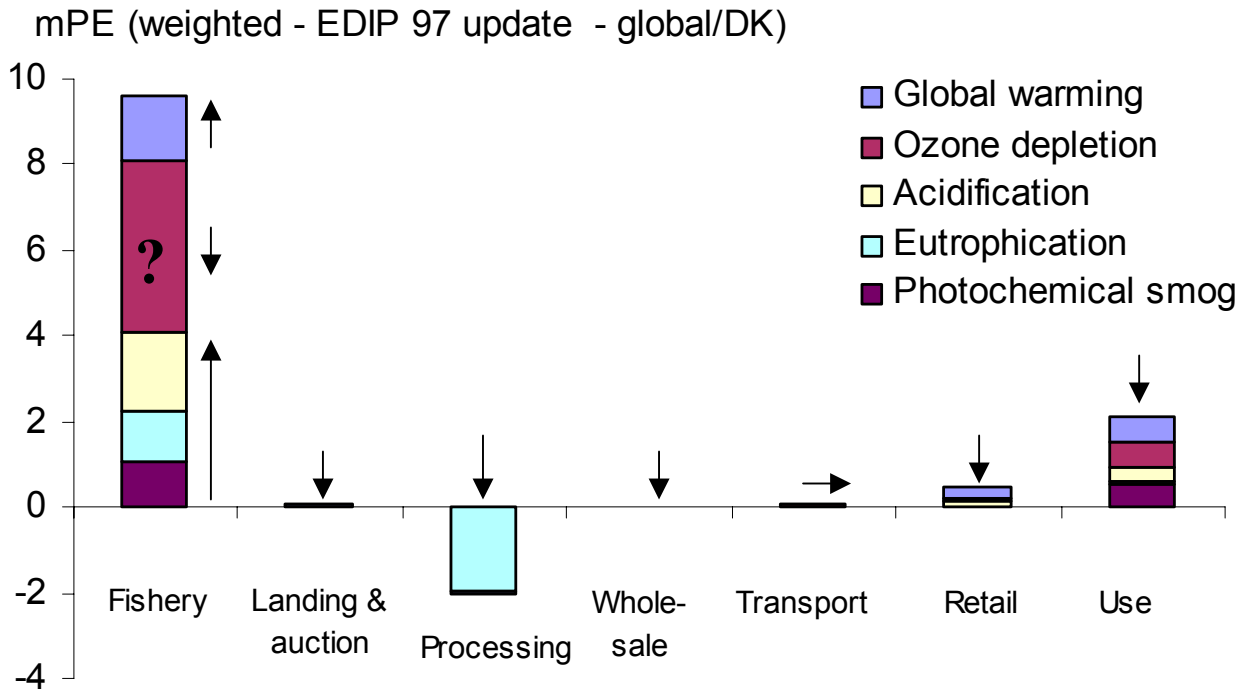
NB: *Factor 4 improvement due to a factor 18 difference in fuel consumption at the fishery stage*

3. Weighted results (flatfish)

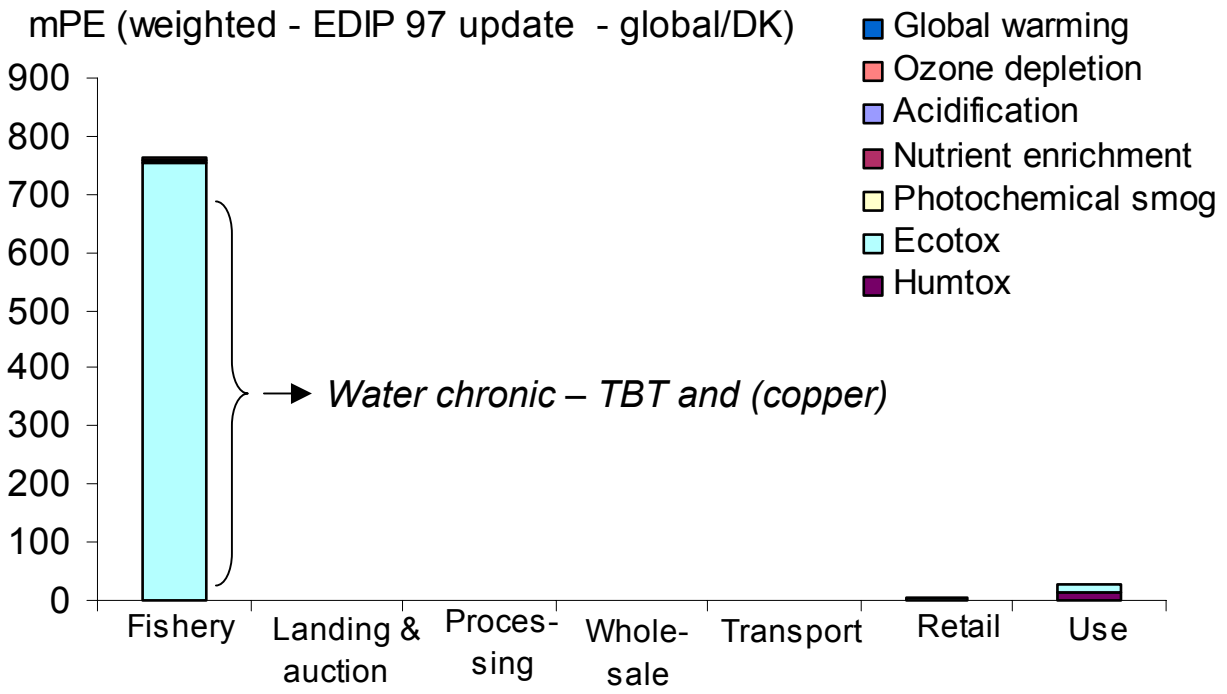
Weighted results (present)



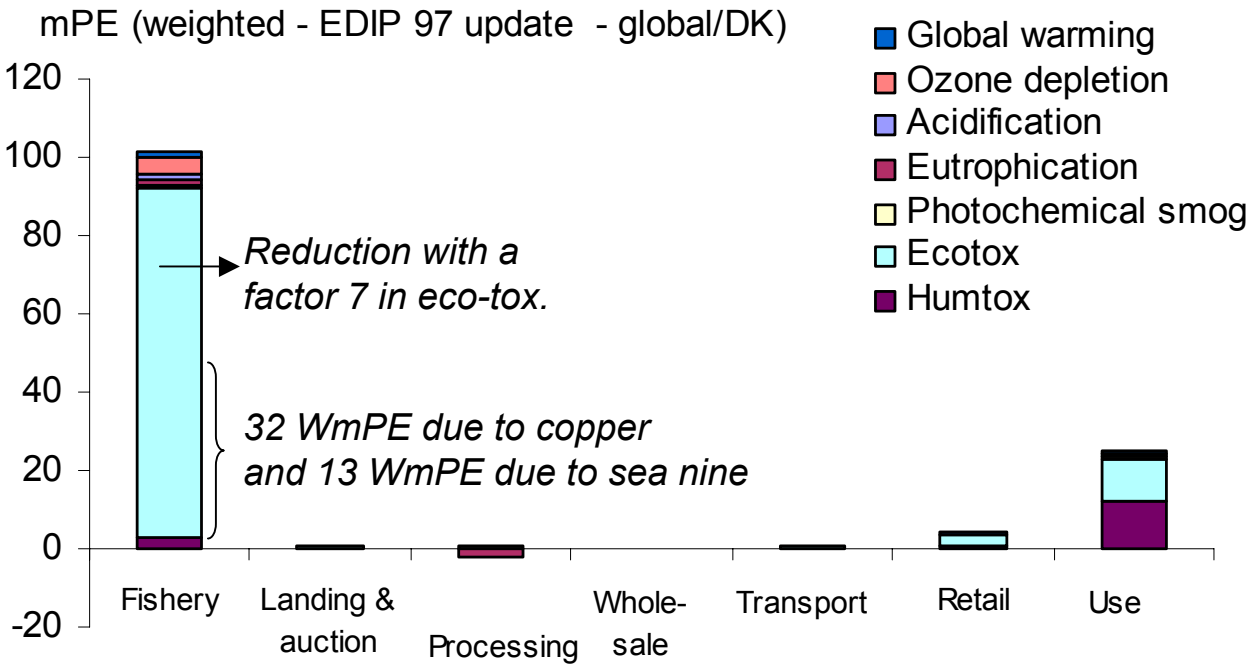
Weighted results (year 2010-15)



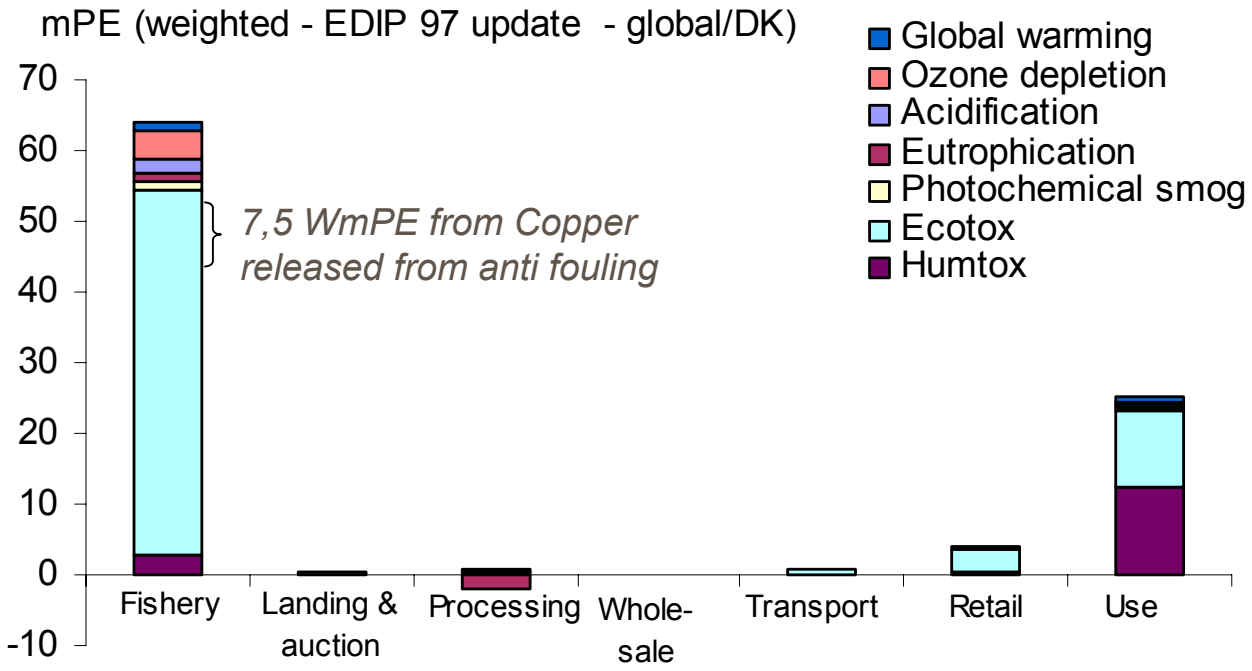
..... toxicity included (present)



….toxicity included (future 1)

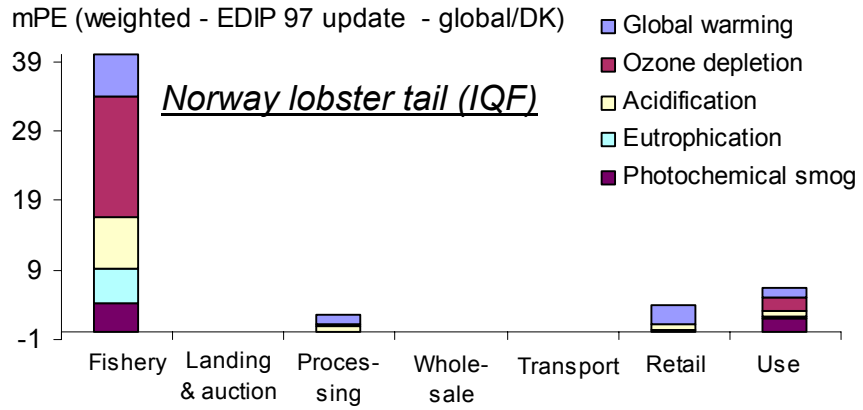


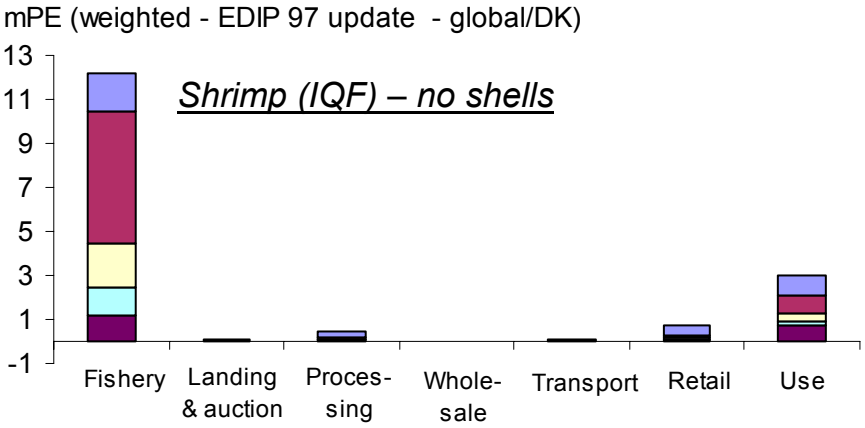
….toxicity included (future 2)



4. Weighted results for other fish products

LCA screenings





Similar conclusions for other Shellfish, while the processing Stage is relatively more important for Pickled herring in glass and Canned mackerel (aluminum)

Eco- and human toxicity (in general)

- The fishery stage is the hot-spot for eco-toxicity and remains so in both future scenario - for all species analyzed (except canned mackerel and blue mussels).

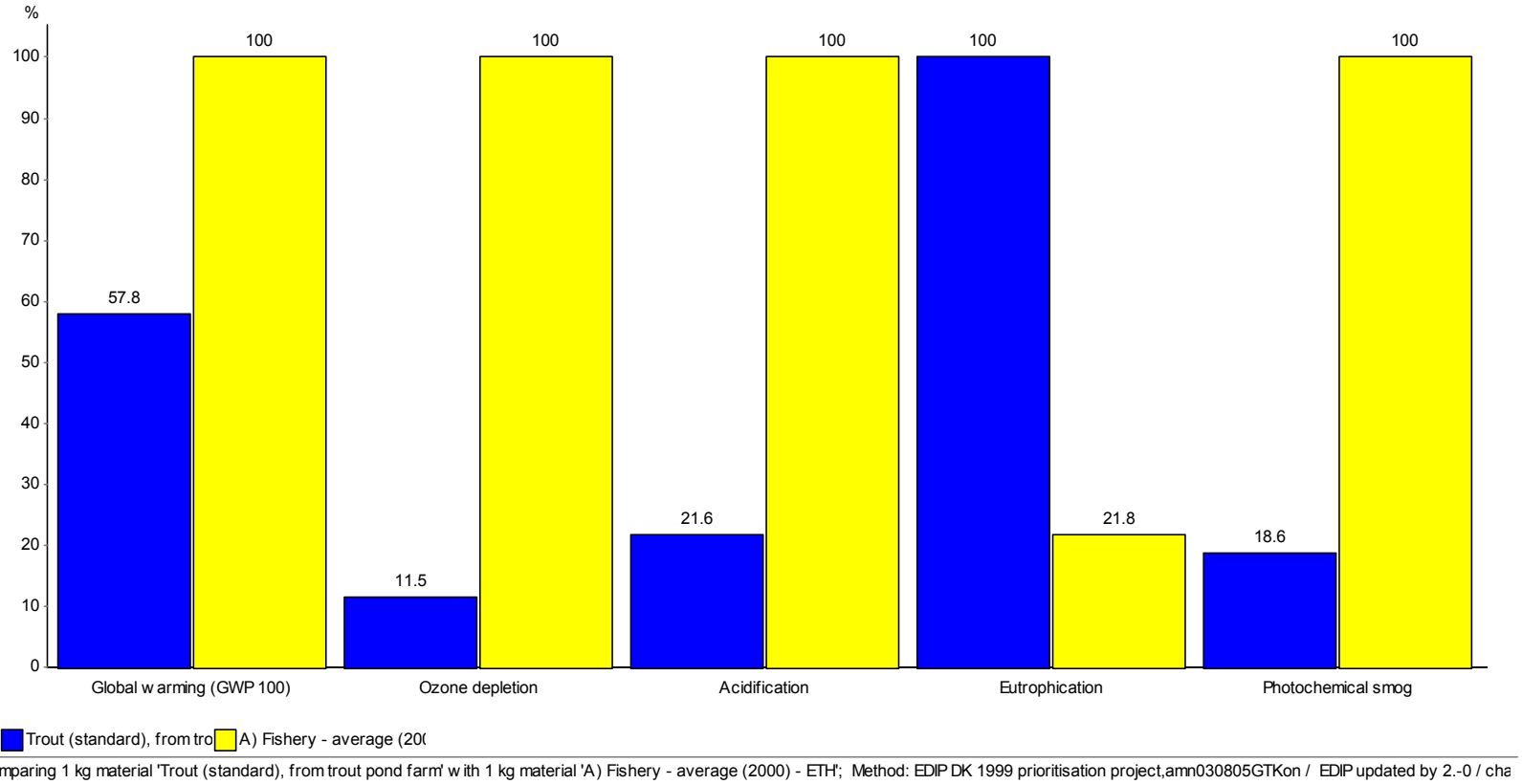
- The use stage is the hot spot for Human toxicity for all products.

5. Conclusion

Conclusions

- The **fishery is hot-spot**, followed by use and retail (7 categories)
- Fishery also hot-spot for most of the non-flow related impact
- **Energy consumption is a key process** for all seven impact types (even more in the future)
- Authorities need to address energy consumption and sea floor impacts (**Solve two problems by addressing one**):
  - Adjustments of the fleet capacity (maintain small vessels)
  - Cleaner technology (not only processing stage)
  - Eco-labelling (not only focus on exploitation)
  - Fuel tax

Farmed trout versus flatfish



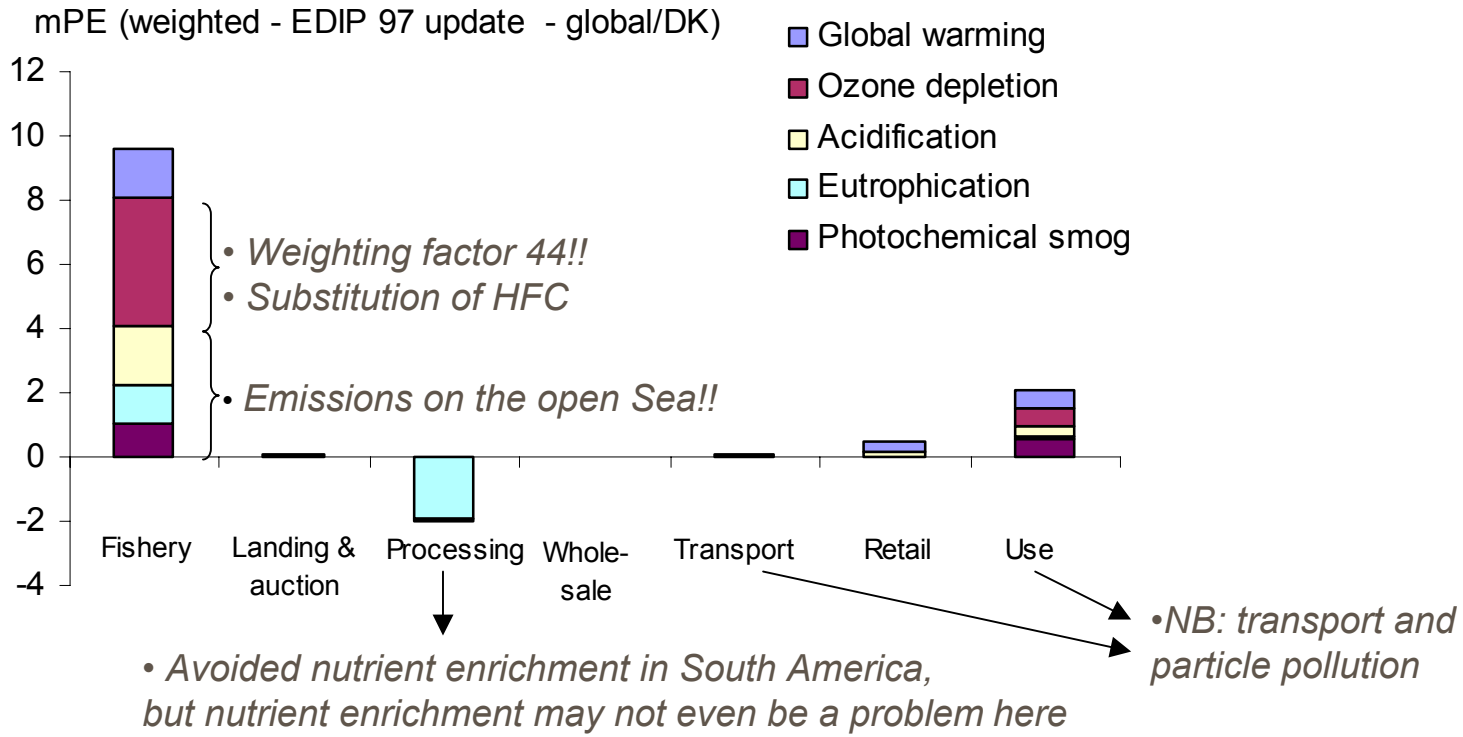
Fuel consumption in fishery

	Demersal fish		Shellfish				Pelagic		Indus.
Allocation method	Atlantic cod	Eu. Plaice	Prawn	Shrimp	NL.	Mus-sels	Herring	Mack-erel	Sand-eel etc.
	Total catch volume (1000 ton)								
	67.80	40.74	5.72	2.58	5.04	109.74	134.96	34.27	1,117.71
	Relative fuel consumption - per caught fish (liter per kg)								
Mass	0,47	0,56	0,54	1,02	1,16	0,01	0,14	0,08	0,10
Value	0,86	0,92	0,89	1,22	3,95	0,08	0,07	0,27	0,04
Sys. Exp.	0,36	0,97	0,76	1,03	6,05	0,01	0,18	0,06	0,06
	Absolute fuel consumption per caught fish (million liter)								
Mass	31.780	22.754	3.115	2.629	5.864	1.378	19.009	2.891	107.692
Value	58.245	37.565	5.068	3.149	19.929	8.233	9.791	9.263	45.870
Sys. Exp.	24.460	39.630	4.354	2.664	30.539	1.365	24.253	1.916	67.930

- Up till a factor 100 in difference (same fishing gear different species)
- Up till a factor 18 in difference (same species, different fishing gear)

6. Sensitivity - methodological aspects?

Methodological aspects (2010-15)



LCA screenings (herring and mackerel)