CIRAIG™
Interuniversity Research Centre for the Life Cycle of Products, Processes and Services

IMPACT World+

Integrating Water Footprint and Life Cycle Assessment frameworks : IMPACT World+

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POLYTECHNIQUE MONTRÉAL
WORLD-CLASS ENGINEERING

Evaluate product systems within a global economy

A Barbie Doll to illustrate the concept of global economy:

- Barbie's body is made of plastic from **Taiwan**
- it is produced in **China**
- using some frames from **USA**
- thanks to **European** and **Japanese** machinery
- her nylon hair is **Japanese**
- her clothes are **Chinese**
- after production, she goes by boat to **150 different countries**, to be sold all around the planet!

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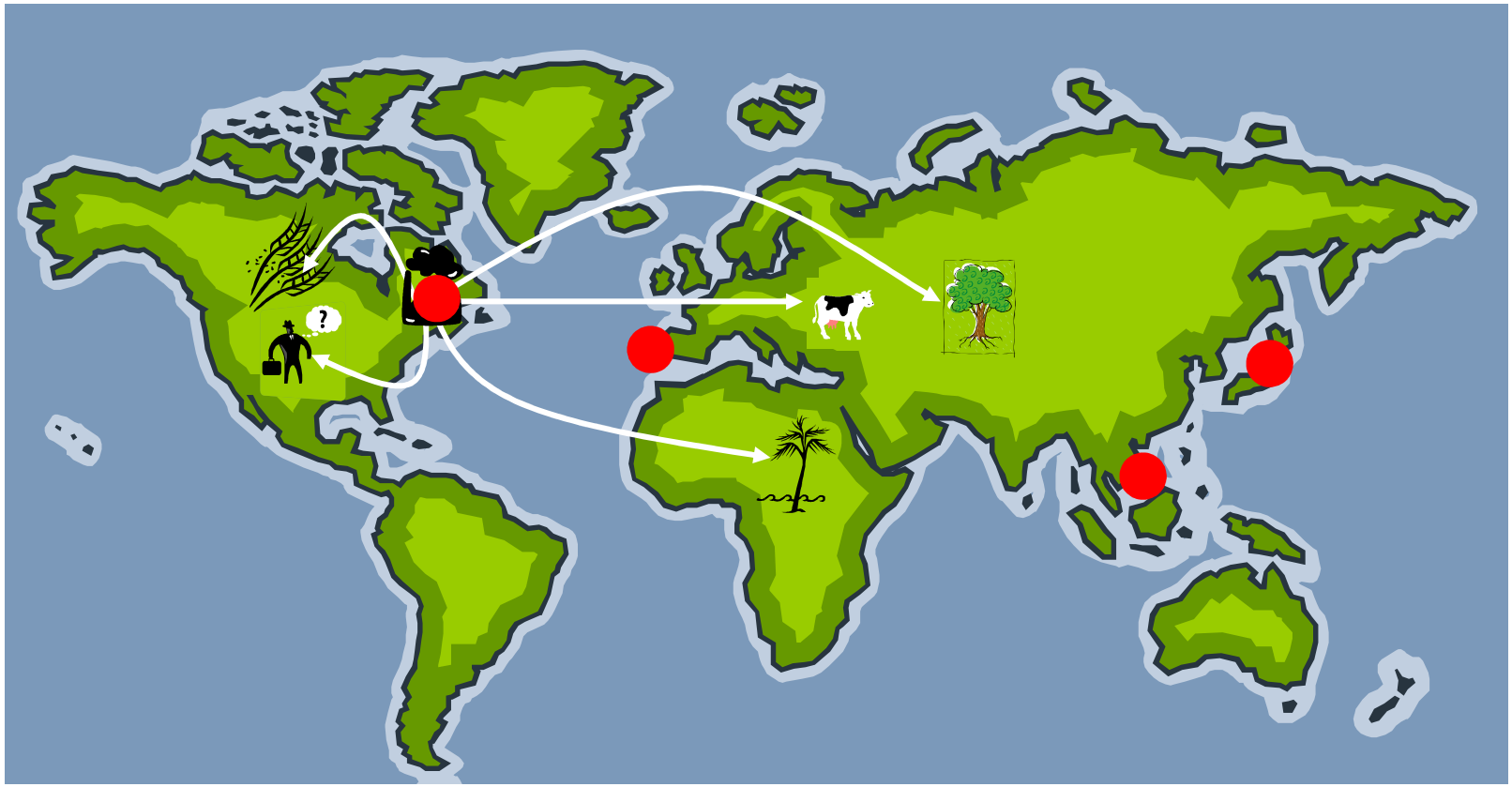
Evaluate product systems within a global economy



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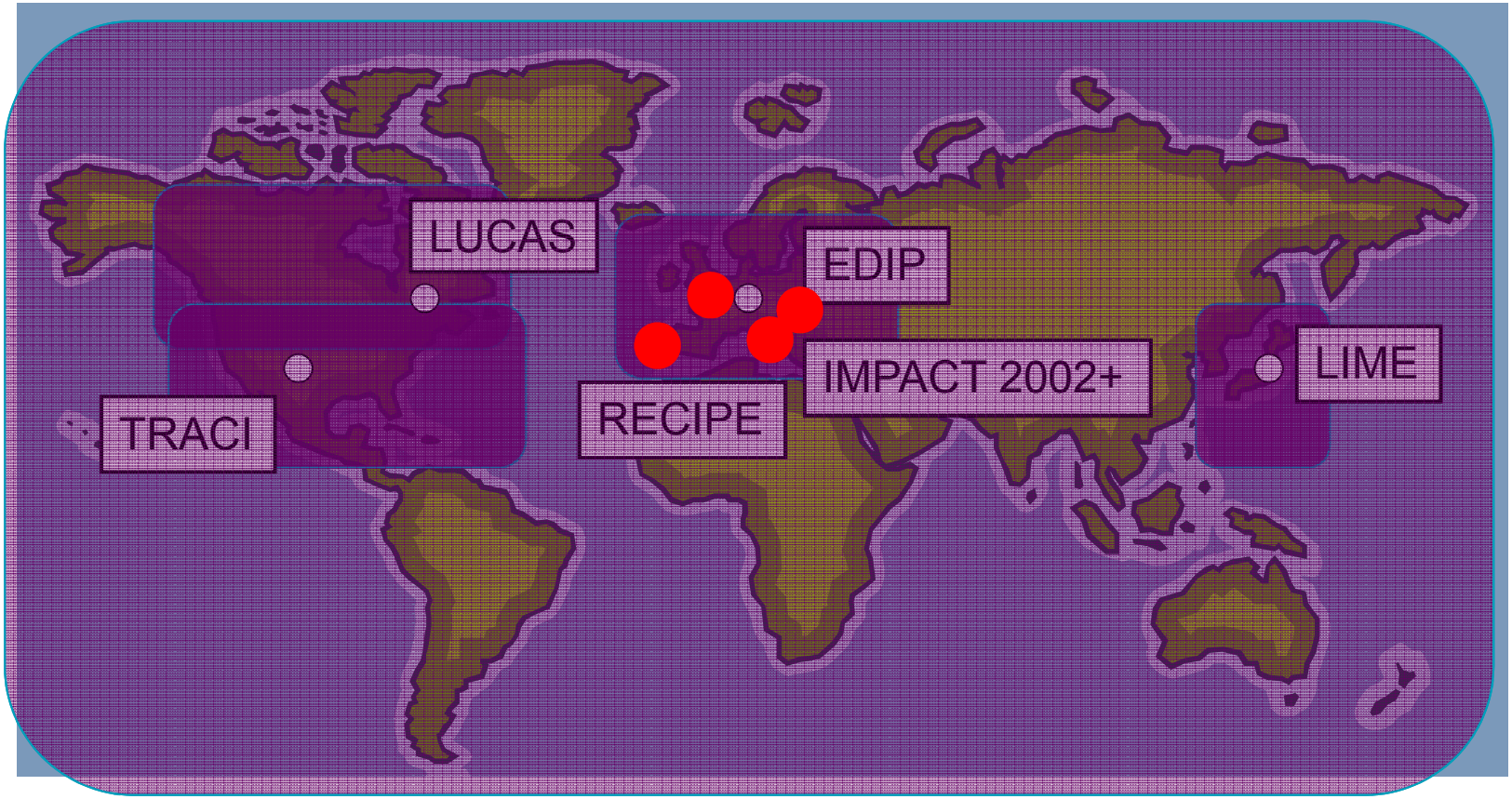
Evaluate product systems within a global economy



IMPACT World+ ™

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IMPACT World + : a LCIA method that:

- Ensures modelling the entire world in a consistent way
- Accounts for regional specificity
- Allows accounting for uncertainty and spatial variability
- IMPACT World+ was developed in response to the need of regionalized impact assessment covering the whole world, implementing state-of-the art characterization modeling approaches developed as a joint major update to IMPACT 2002+, EDIP, and LUCAS.

IMPACT World + : LCIA at complementary scales

Global default characterization factor:

Continental characterization factors:

Country level characterization factors :

Fine resolution characterization facto

Spatial variability can be accounted for by using:

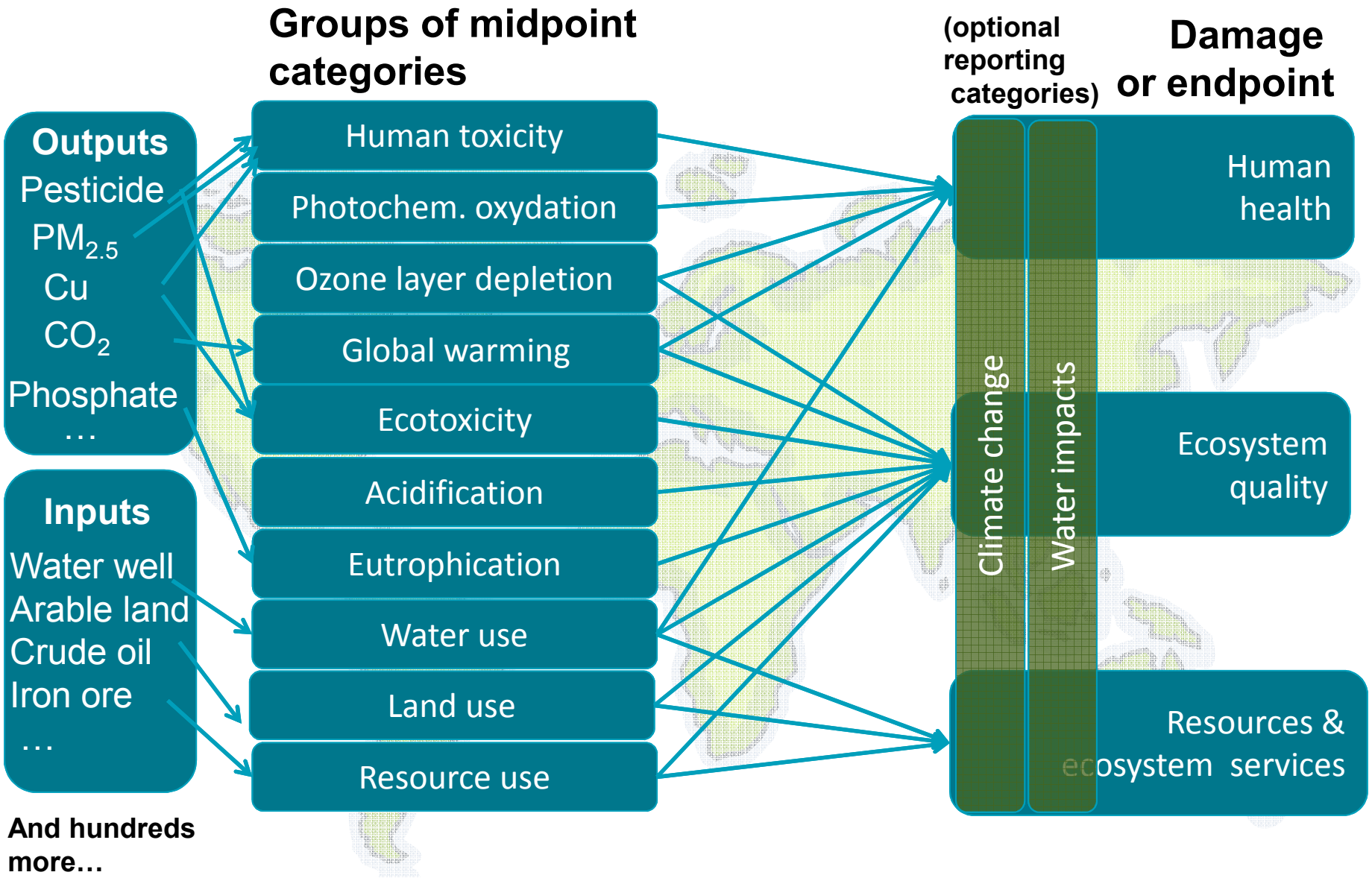
- Regionalised characterization factors
- Generic characterization factors including a spatial variability

10 - 100

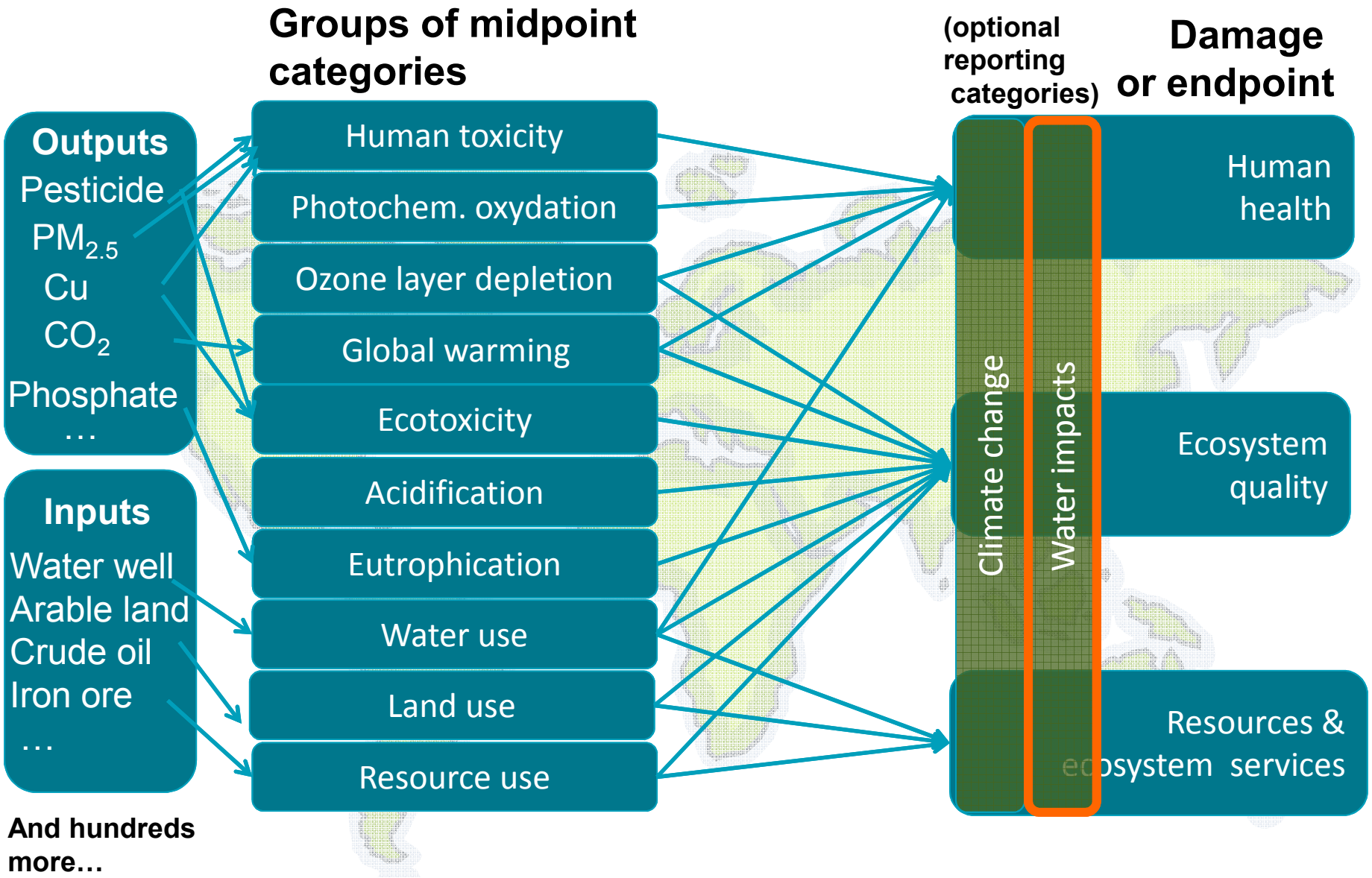
100 - 1000

1000 - 1.5E5

IMPACT World+ Framework



IMPACT World+ Framework



Which “water impacts” ?

Impact from water consumption…

But also impacts from water degradation :

- ~~emissions to water ?~~
  - **what about an emission to water which is instantaneously volatilized ?**
- emission which fate leads to water ?
  - **emissions to water, but also to soil and to air having an impact on aquatic ecosystems ?**
  - **human exposure through water ?**
- other impacts on water resource ?
  - **land use**
  - **water stream use and management**

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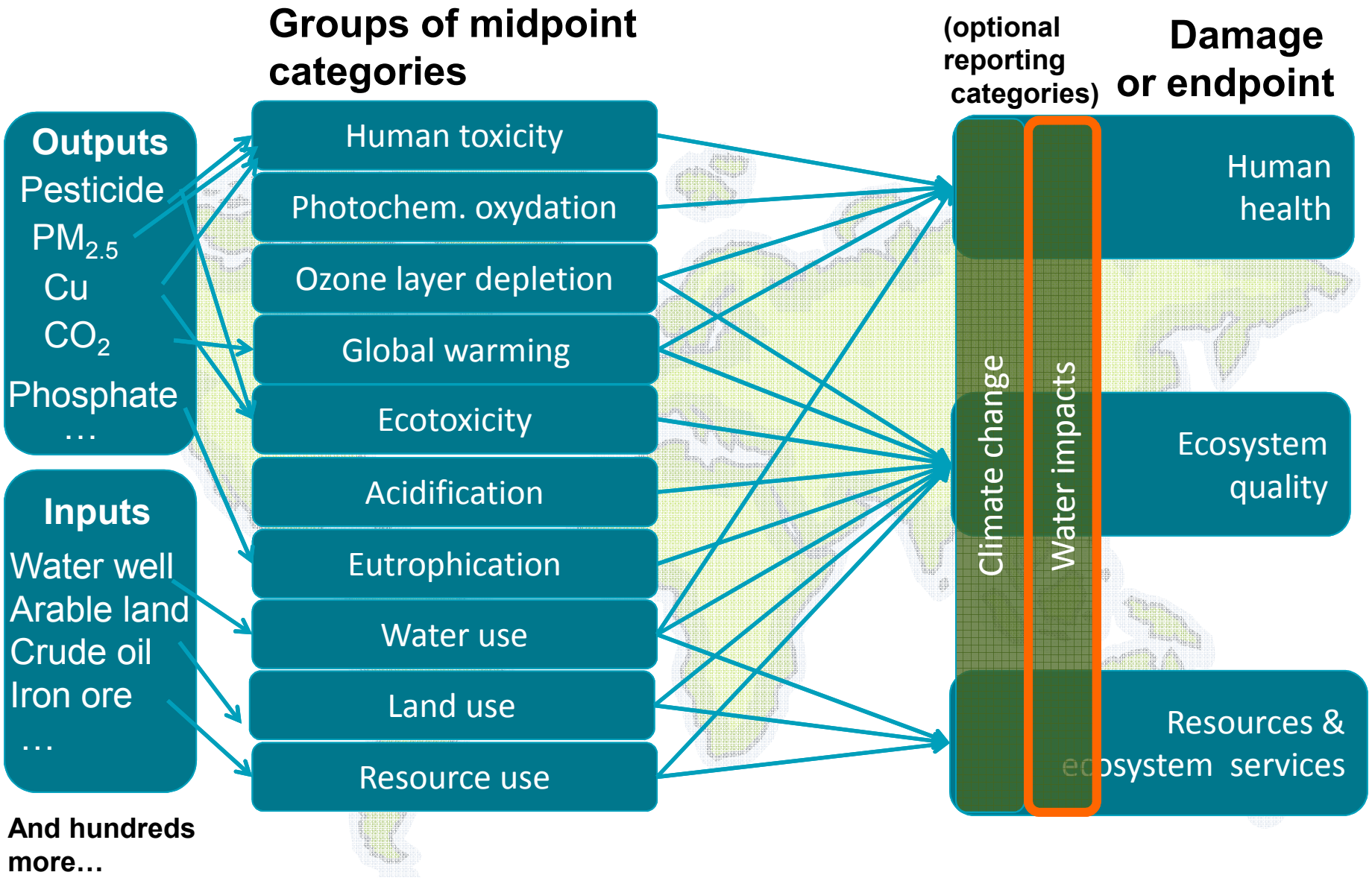
Water Footprint in IMPACT World+ = All « water impacts »



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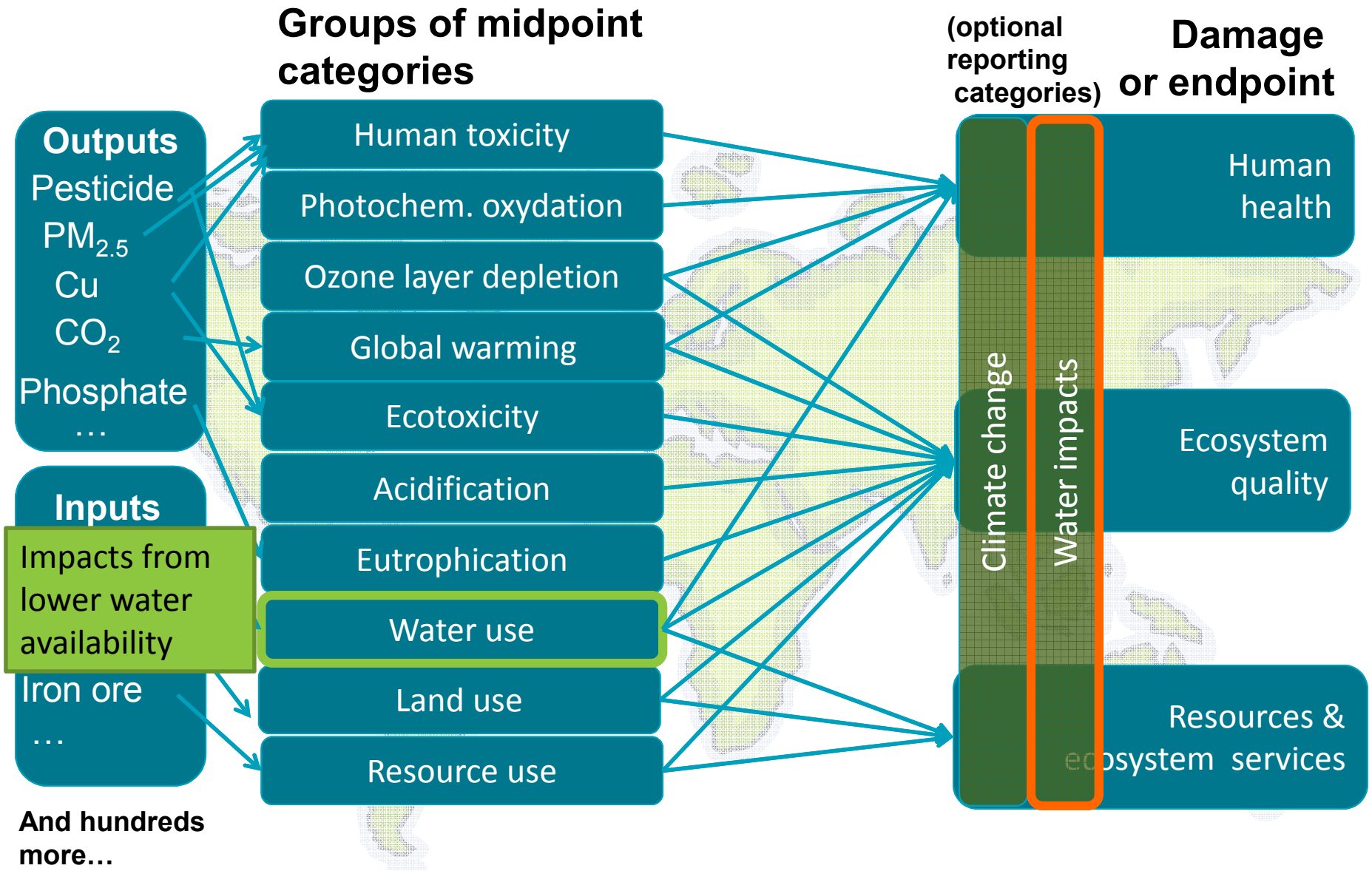
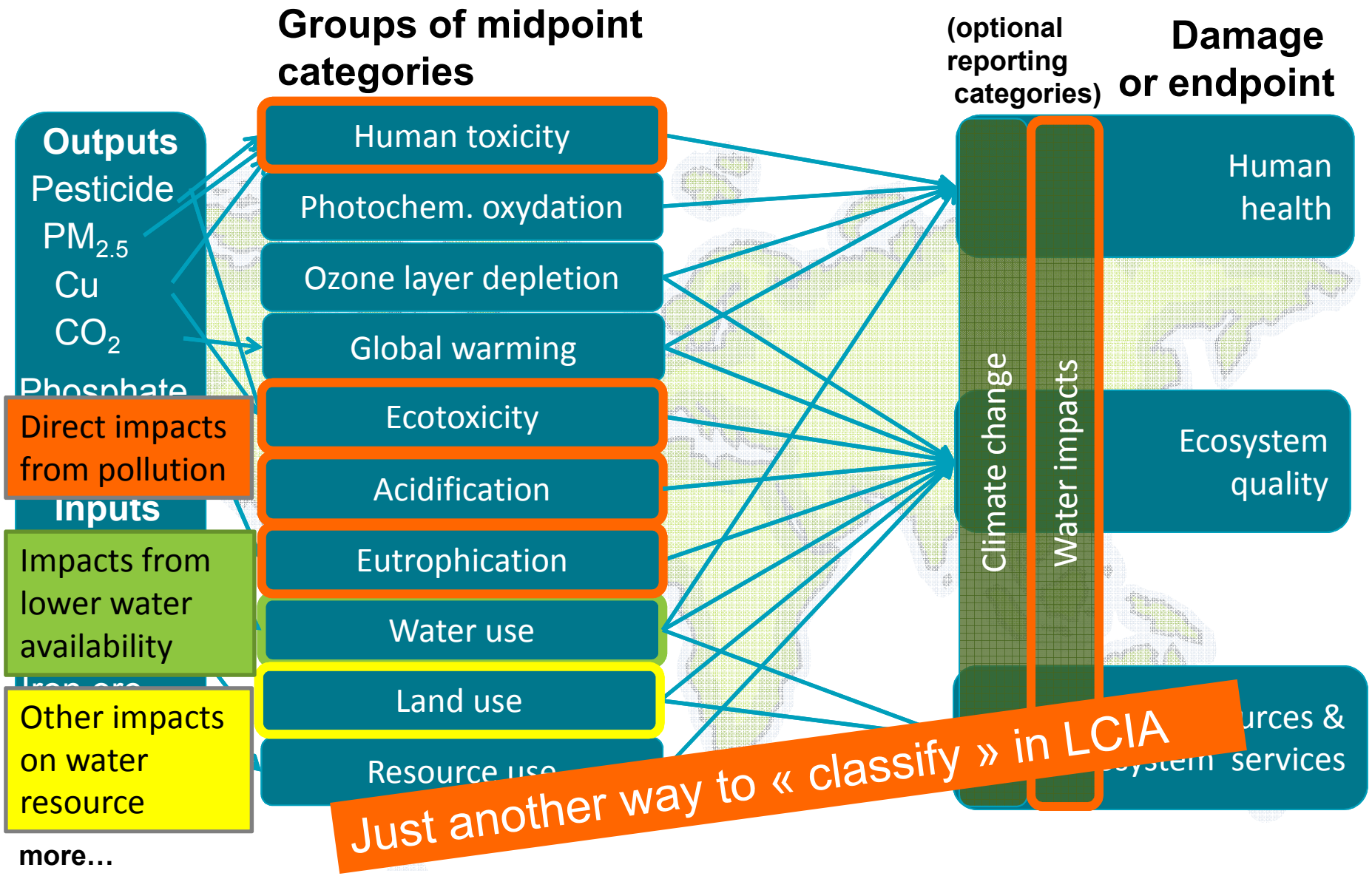


Water footprint profile in IMPACT World+ = « water impacts »



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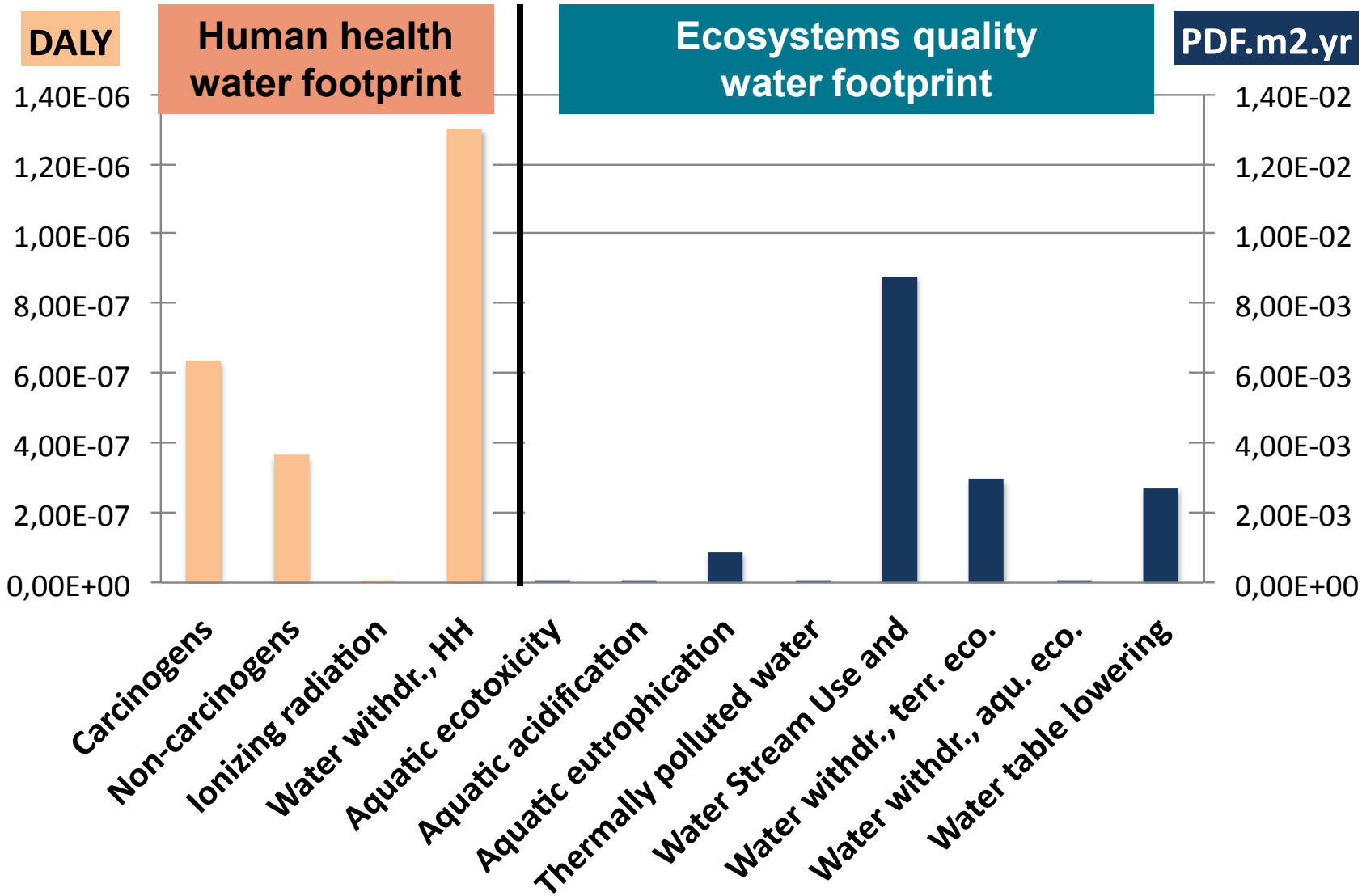

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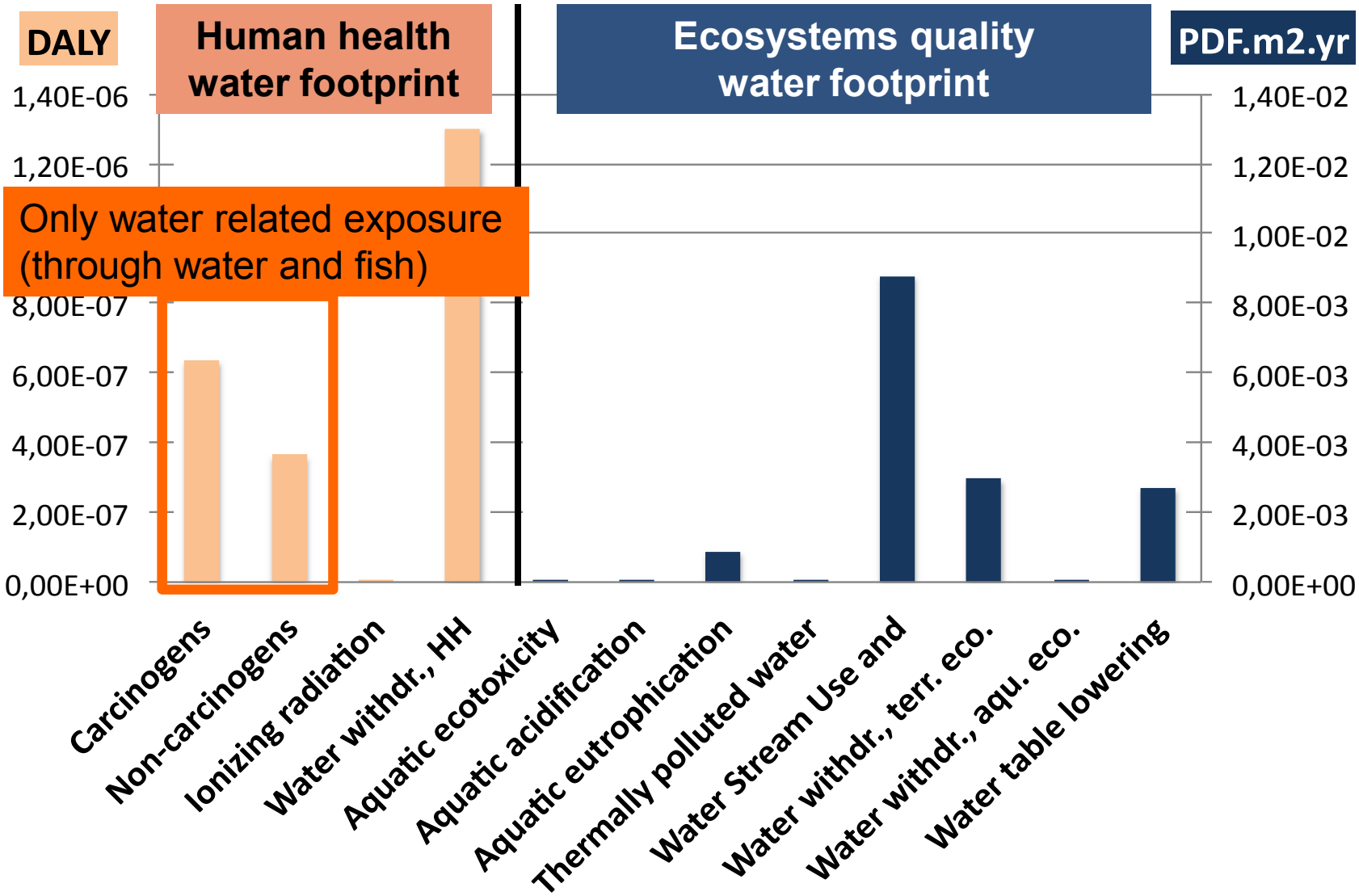

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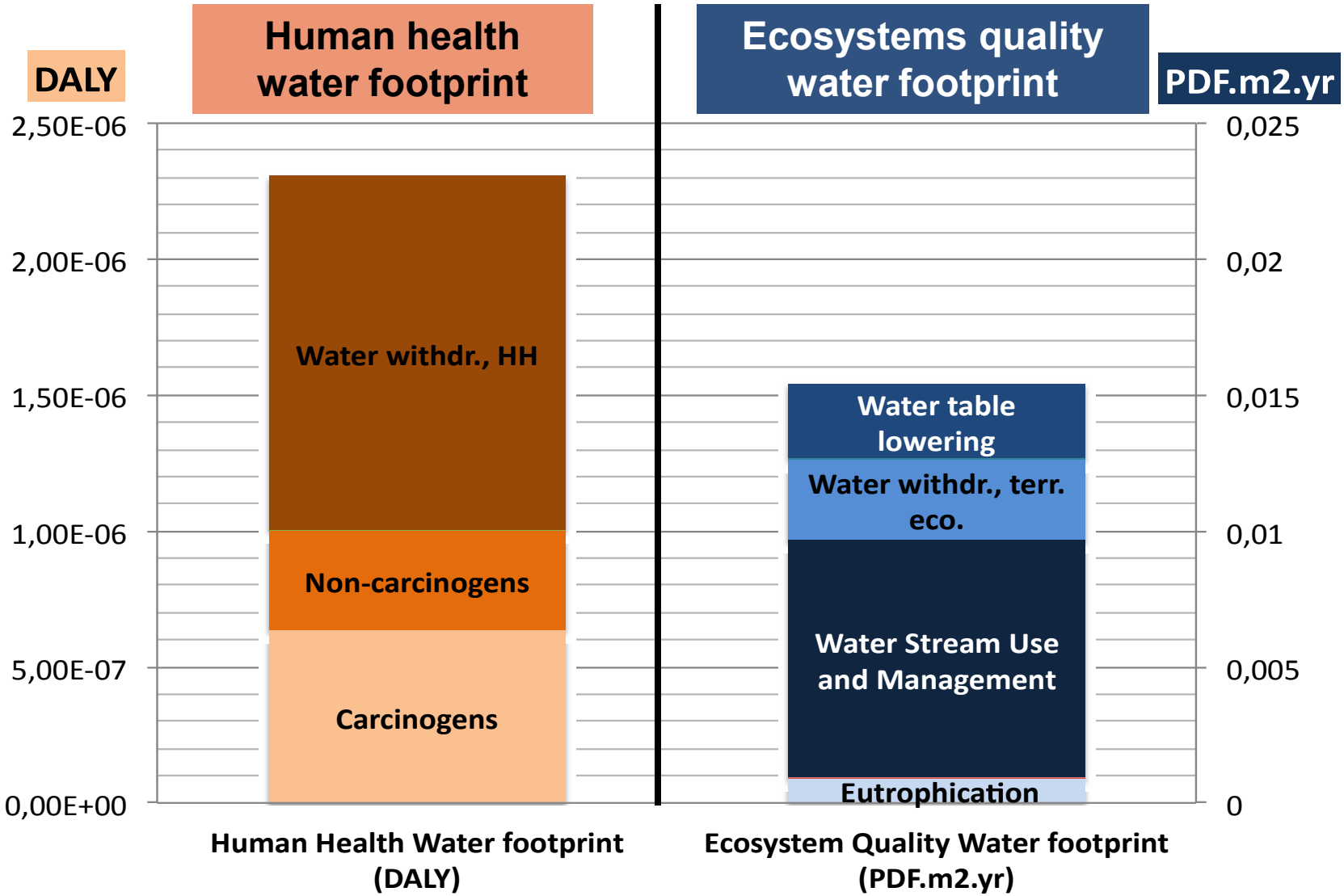

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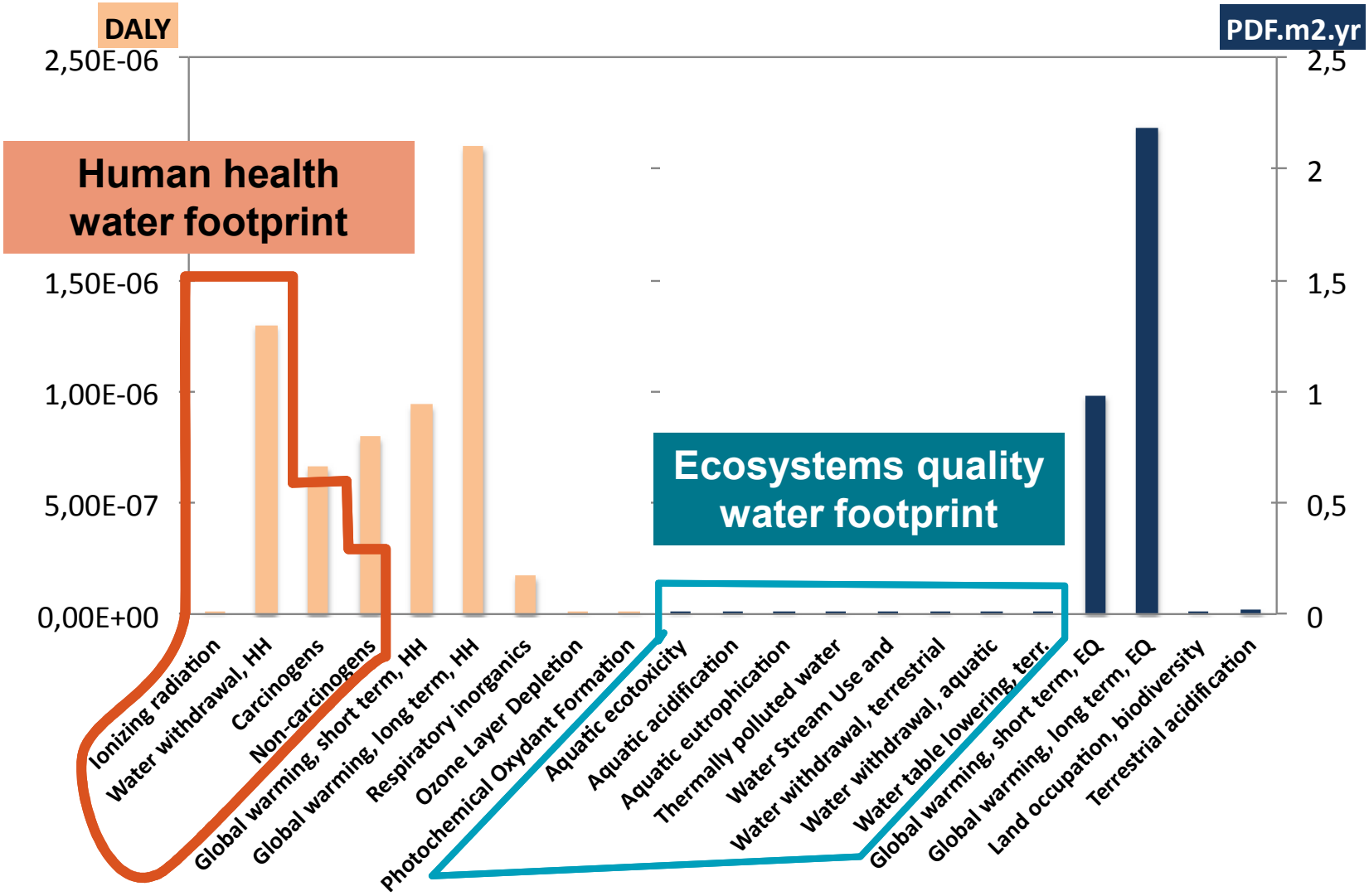
Water footprint as part of a full LCA



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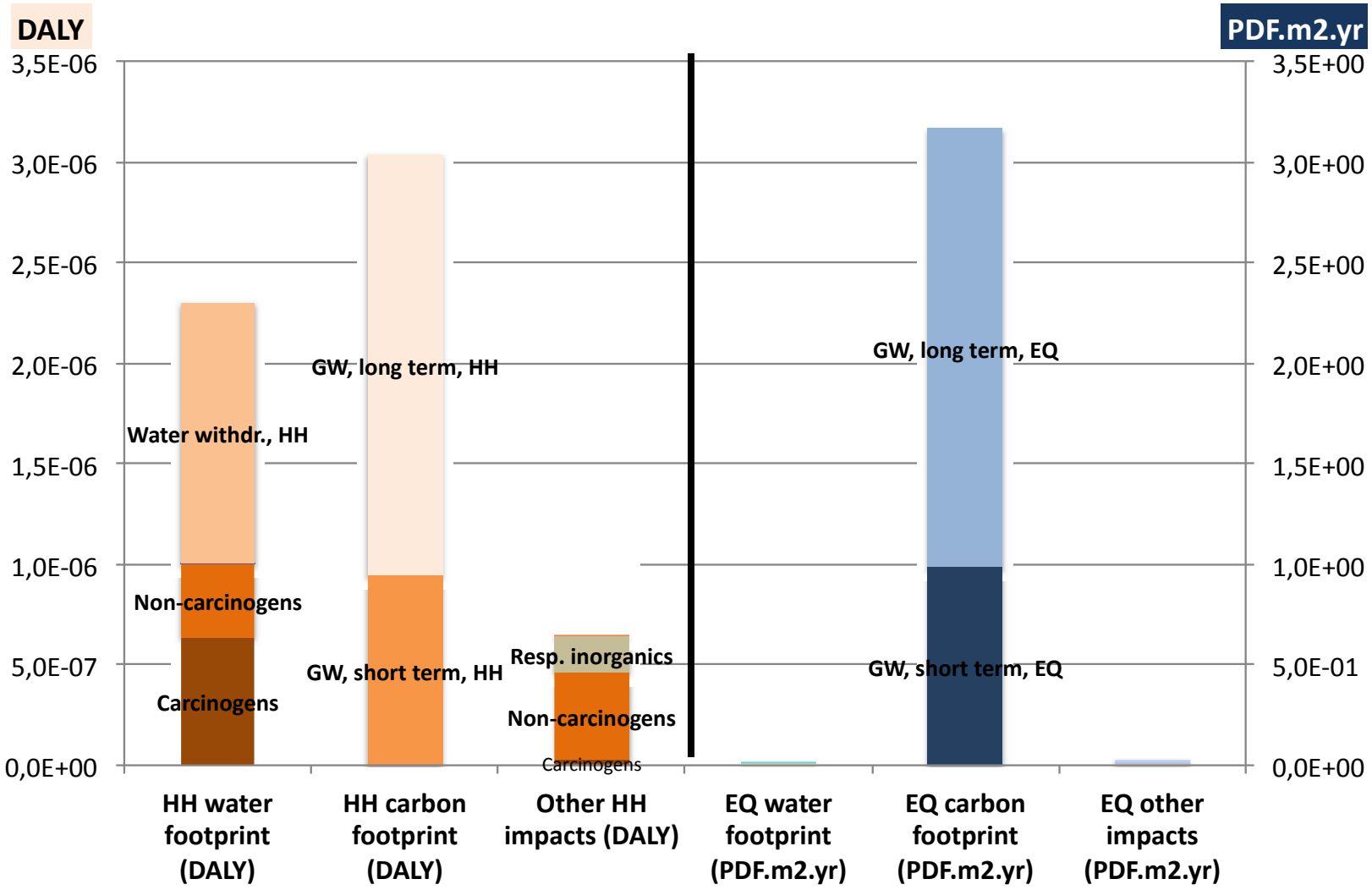

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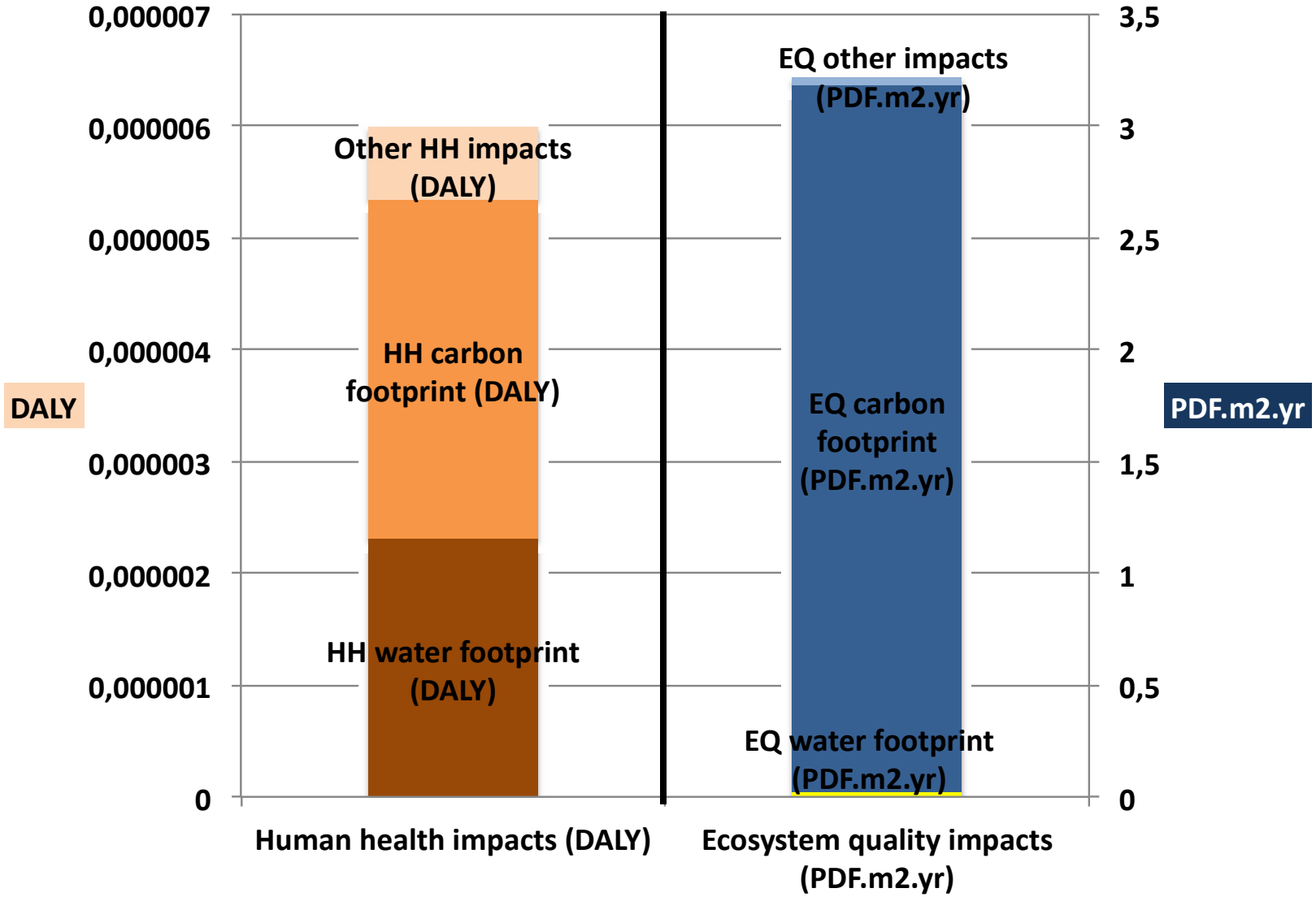

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Conclusion

Water Footprint is compatible with LCA and already operational in IMPACT World+ "optional reporting categories" version.

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