Extending the scope of ProScale

Proscale guidance Section 1.2.

"ProScale is intended as a widely applicable method that can cover both human and eco-toxicity aspects, be applicable to any kind of products on a worldwide basis. The ProScale consortium decided to first focus on near-field human toxicity, on …. The method can nevertheless be extended following the same principles."

How about a tough starter on this "next step"?

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Main challenge

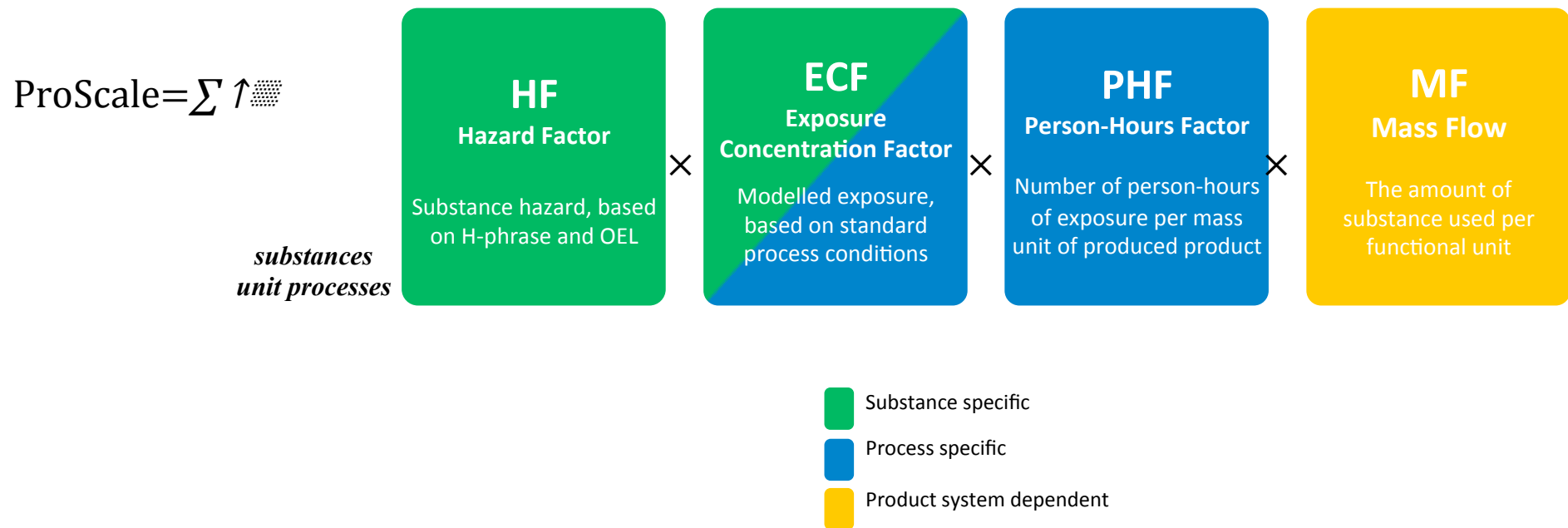**Make it simple or make it exhaustive?**

- Simplify to make it "easy" to use?
  → *Current limitation of UseTox?*

OR

- Make it more exhaustive, but also more data-,
  expertise- and labour-demanding

Elements of ProScale – schematic presentation

$$\text{ProScale} = \sum \uparrow \blacksquare$$

substances
unit processes

HF **Hazard Factor** Substance hazard, based on H-phrase and OEL	×	**ECF** **Exposure Concentration Factor** Modelled exposure, based on standard process conditions	×	**PHF** **Person-Hours Factor** Number of person-hours of exposure per mass unit of produced product	×	**MF** **Mass Flow** The amount of substance used per functional unit

■ Substance specific

■ Process specific

■ Product system dependent

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Hazard Factor

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- Grouping according to a hazard banding approach based on GHS classifications, taking into account the route of exposure
- Modified according to OEL(-surrogate) to take into consideration potency differences

Environmental applicability?

- Which environmental compartments (≈ exposure routes)?
  - Aquatic only?
    - 2 GHS hazard classes
    - Limit and PNEC values ± available
  - Also sediment, soil, atmosphere (man via environment)?
    - Limit and PNEC values , most often derived from aquatic PNECs

  Interesting source? ECETOC Task Force: Sufficiency of aquatic hazard information for environmental risk assessment

- Hazard factor: only limited number of classification classes under GHS (Aquatic Acute, Aquatic Chronic)
  - Use lowest NOEC?
  - Include persistency, bioaccumulation, mobility, … as modifier?

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Exposure Concentration Factor

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- Workers : ECETOC TRA Tier1

- Consumers: ECETOC TRA Tier 1

- Service life consumers

- End-of-life workers: ECETOC TRA Tier 1

- Input parameters/modifiers:

  – PROC- Product (sub-)category

  – Use

  – Physical state

  – Fugacity

  – Risk management measures

  – Concentration

Environmental applicability?

- Equivalent to environmental release factors for water, soil and air?

  To be combined with fate/fugacity models (e.g. for sediment)?

- Use of ERC, spERC and usual RMM (e.g. municipal STP) covering manufacturing to consumers (wide dispersive use)?

  What about service life, end-of-life and recycling?

- 100% bioavailability to be assumed (worst-case hypothesis)?

Person-Hours Factor

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- Production: determined by annual hours worked , annual production volume

- Use: determined by duration and amount

- Service life: determined by persons, surface, product lifetime, amount

Environmental applicability?

- No real equivalent for environment?

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Mass Flow Factor

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- To take into consideration the amount of substance required for fulfilment of the functional unit
- Based on the mass fractions of inputs and outputs of the unit process

Environmental applicability?

- Same approach for environment?
- "Background levels" and other sources; not relevant for comparative LCA-like approach?