Exposure assessment and the Chemical Safety Report

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28 Septembre 2012

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Overview

- Recap on REACH requirements
- Assessment workflow
- Scope of exposure assessment
- Few ECHA's observations related to the exposure scenarios received so far

Recap on REACH requirements

CSA in a nutshell

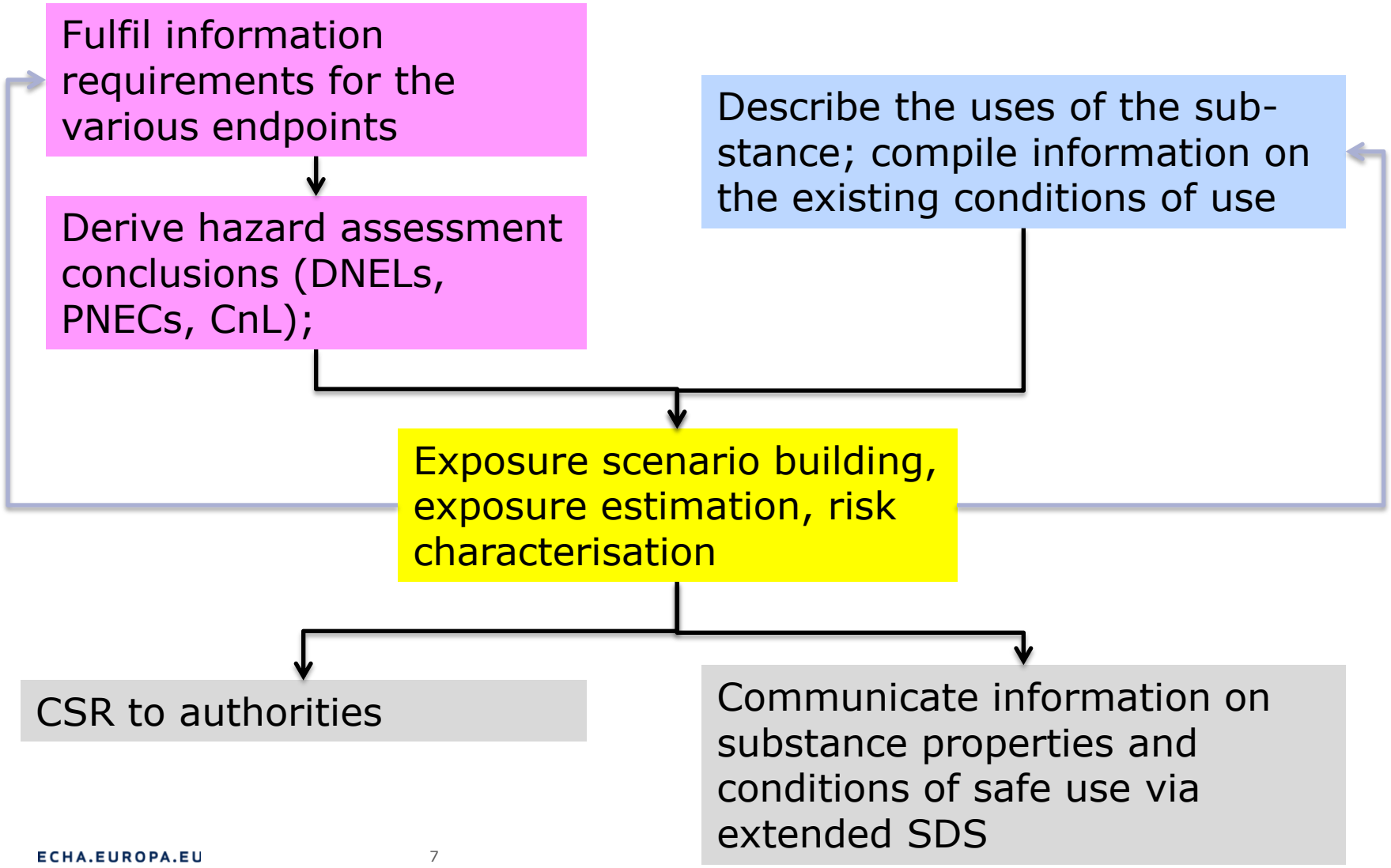
- Determine the hazards based on the information required for registration of the substance
- Describe the conditions of safe use (operational conditions and risk management)
  - => set of **exposure scenarios** addressing all identified uses
  - Estimate the expected exposure under these conditions
  - Compare the expected exposure with the hazards
  - Conclude whether control of risk is demonstrated; refine the assessment, if needed;
- *Annex I of REACH sets out the general provisions for the assessment*

When is a CSA required?

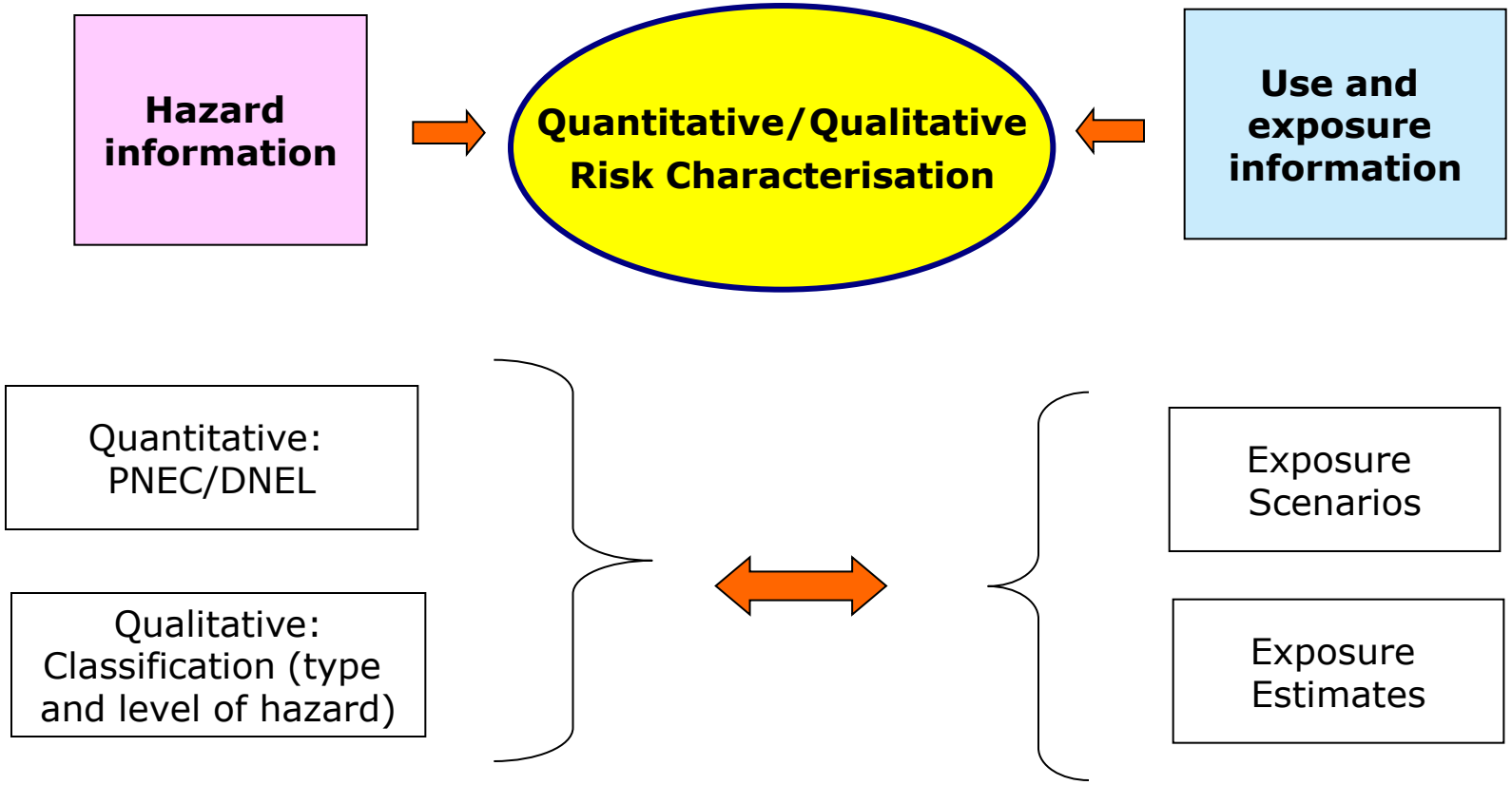
- Required if the substance is manufactured or imported at 10 tonnes or more per year.
- The CSA includes exposure assessment and risk characterisation for all the identified hazards
  - if one of the criteria is met to classify the substance as hazardous, or
  - if the substance is to be treated as PBT/vPvB, or
  - if information requirements are adapted based on exposure considerations according to Annex XI (3)
- Identified hazards = adverse effects observed based on guideline studies (or other adequate information)

Assessment work flow

Assessment Workflow



Risk Characterization (RC)



Assessment types

Assessment Type	Exposure Scenario (conditions of use)	Exposure estimation	Risk characterization
Quantitative	yes	yes	RCR < 1
Semi-quanti-tative	yes	yes	exposure < threshold + additional argument
Qualitative	yes	may be required to demonstrate control of risks	control strategy corresponds to hazard

Mandatory elements of the CSA/CSR (1)

Assessment of intrinsic properties/hazards:

- Physicochemical properties, “environmental fate” properties
- Human health hazards
  - Local effects (skin, eyes, or respiratory tract)
  - Systemic effects (intake via skin, inhalation or oral)
  - effects after single event exposure (short term) or after repeated/long-term exposure
  - effects due to flammability, explosivity, oxidising potential.
- Environmental hazards:
  - Adverse effects on organisms in water, sediments, soil or waste water treatment plant; adverse effects in the food-chain (aquatic and terrestrial)

Mandatory elements of the CSA/CSR (2)

- Use identification for the full life cycle
- Exposure assessment
  - Conditions of use (operational condition and risk management)
  - Corresponding release and exposure estimates
- Risk characterisation
  - Quantitative: Compare estimated exposure with PNEC or DNEL. RCR < 1 indicates control of risk
  - Qualitative: Compare estimated exposure and/or foreseen risk management with type and level of hazard.

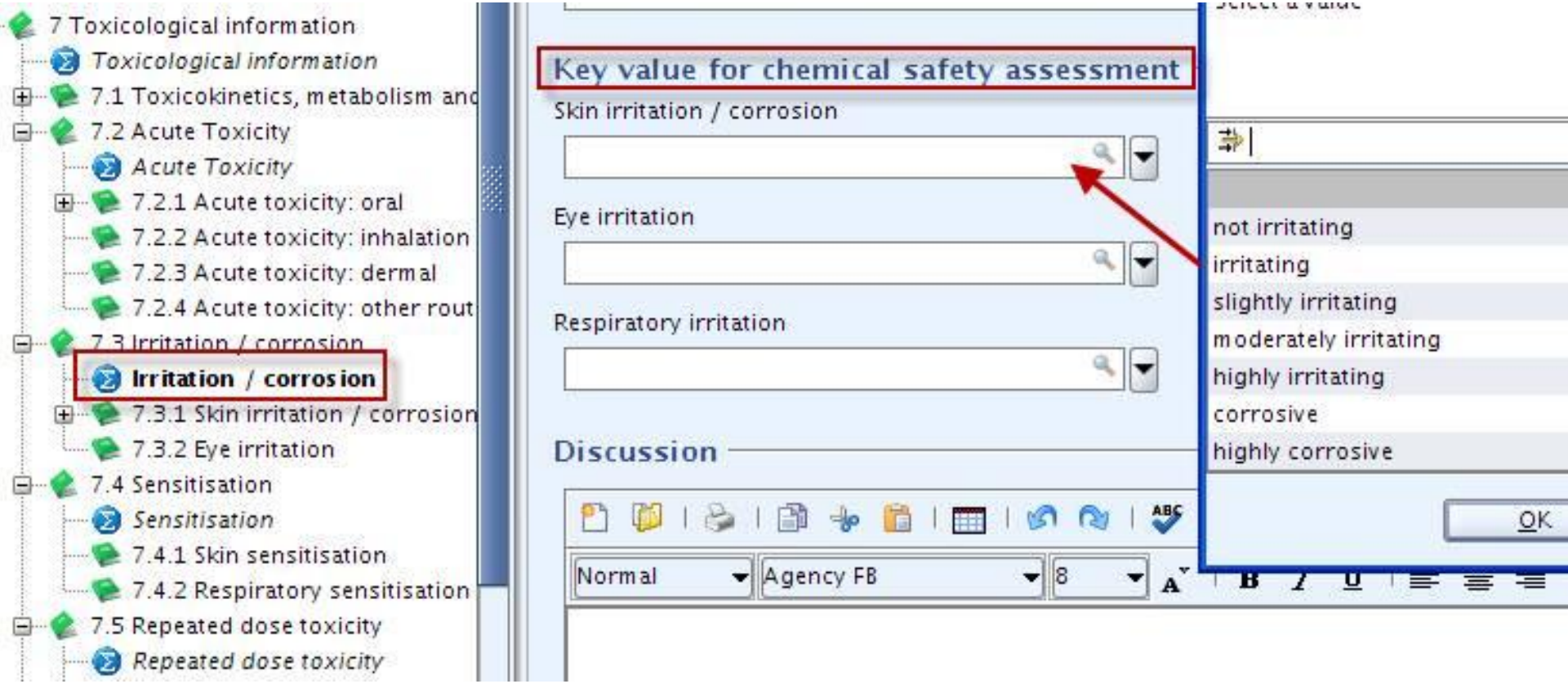
Scope of exposure assessment

From study records to hazard assessment conclusions in IUCLID 5.4

Toxicological hazard conclusions

- The endpoint summary for section 7 of IUCLID 5.4 has been expended to better support
  - Transparency in the hazard conclusion (e.g. derivation of DNELs)
  - Identification of the scope of exposure assessment

Hazard assessment information in IUCLID



Example (1): Overview on endpoint summaries in section 5.11 of the CSR

Source: IUCLID 5.4, section 7

Endpoint	Route	Dose descriptor or qualitative effect characterisation; test type;
Acute toxicity	Oral	No adverse effect observed
Acute toxicity	Dermal	No adverse effect observed
Acute toxicity	inhalation	No adverse effect observed
Irritation / Corrosivity	Skin	irritating
Irritation / Corrosivity	Eye	irritating
Irritation / Corrosivity	respiratory	No study available
Sensitisation	Skin	No adverse effect observed (not sensitising)
Repeated dose toxicity	Oral	NOAEL: 700 mg/kg bw/day (subacute; rat)
Repeated dose toxicity	Dermal	No study available
Repeated dose toxicity:	inhalation	No study available
Mutagenicity		No adverse effect observed (negative)
Reproductive toxicity: fertility impairment	Oral	No adverse effect observed

Example (2): Hazard conclusions in section 5.11 of the CSR

Source: IUCLID 5.4, section 7 (overall toxicological summary)

Route	Type of effect	Hazard conclusion	Most sensitive endpoint (referring to original study)
Inhalation	Systemic effect - Long-term	DNEL = 24.7 mg/m3	Repeated dose toxicity (oral)
	Systemic effects -Acute	No hazard identified	Acute toxicity (Inhalation)
	Local effects - Long-term	Hazard unknown (no further information necessary)	
	Local effects - Acute	Hazard unknown (no further information necessary)	
Dermal	Systemic effect - Long-term	DNEL = 7 mg/kg bw /day	Repeated dose toxicity (oral)
	Systemic effects -Acute	No hazard identified	Acute toxicity (dermal)
	Local effects - Long-term	Low hazard	Skin irritation/corrosion
	Local effects - Acute	Low hazard	Skin irritation/corrosion
Eyes	Local effects - Acute	Low hazard	Eye irritation

Remark: Table expected for workers and for general population

Example (3): Scope of exposure assessment for human health in section 9.02

Route	Type of effect	Type of risk characterisation	Hazard conclusion (see section 5.11)
Inhalation	Systemic effect - Long-term	Quantitative	DNEL = 24.7 mg/m3
	Systemic effects -Acute	Not required	No hazard identified
	Local effects - Long-term	Qualitative	Hazard unknown (no further information required)
	Local effects - Acute	Qualitative	Hazard unknown (no further information required))
Dermal	Systemic effect - Long-term	Quantitative	DNEL = 7 mg/kg bw /day
	Systemic effects -Acute -	Not required	No hazard identified
	Local effects - Long-term	Qualitative	Low hazard
	Local effects - Acute	Qualitative	Low hazard
Eyes	Local effects –Acute	Qualitative	Low hazard

Example (4): Explanation of DNEL derivation in section 5.11 of the CSR

		Assessment factors for DNEL derivation
Inhalation (Long-term - systemic effects)	**DNEL derivation method:** ECHA REACh guidance **Dose descriptor starting point** NOAEC = 617 mg/m3	AF for difference in duration of exposure: 2 (*DNEL is based on an oral 90 day study*) AF for interspecie differences: 1 (*AF not used for inhalation route*) AF for other interspecie differences: 2.5 AF for intra species differences:5 (workers) Overall Assessment Factor: 25
Dermal (Long-term - systemic effects)	**DNEL derivation method:** ECHA REACh guidance **Dose descriptor starting point** NOAEL = 700 mg/kg bw/day	AF for difference in duration of exposure: 2 (*based on an oral 90 day study*) AF for interspecie differences: 4 (*experimental animal was rat*) AF for other interspecie differences: 2.5 AF for intra species differences:5 (*this is for workers*) AF for remaining uncertainties: Overall Assessment Factor: 100

Explanation for route to route extrapolation: …….

Few observations on CSRs from first registration wave

What has been submitted to ECHA

- For about 1400 substances CSRs with exposure scenarios are principally available. That is a success.
- The CSR information is submitted in form of text documents attached to the Technical Dossier.
- The Technical Dossier is submitted in electronic format and usually contains
  - the brief description of identified uses in section 3.5 (required to be consistent with the titles of the exposure scenarios)
  - no information related to guidance on safe use
  - no information related to expected exposure or risk
- ECHA does not see the ES for communication.

Observations on the use description (1)

- Very generic, does not support understanding of what is practically done with the substance; no descriptive narratives (often just a bare list of descriptors)
- Includes often nearly all use descriptors (regardless of whether this is plausible or relevant for the substance)
  - Registrants try to cover everything i) just to be on the safe side or ii) to include everything they have received from downstream
  - Registrants have copied their use descriptions from lead registrant or even from a generic CSR generated at sector level

Observations on use description (2)

- The use descriptions lack consistency, e.g.
  - Article service life reported although the substance is described as a processing aid
  - Use descriptors indicating wide dispersive use are reported for industrial sites

Observations on scope of exposure assessment

- Environmental part of the ES missing
- Exposure men via environment missing
- RMM corresponding to qualitative hazards not addressed
- RMM related to physicochemical hazards not addressed

Support provided by ECHA

- All existing guidance and practical guide
- Chesar (Chemical Safety Assessment and Reporting tool): IT tool developed by ECHA to support registrants in carrying out their CSA and preparing their CSR

  http://chesar.echa.europa.eu/
- NEW: Practical guide 14: How to prepare toxicological summaries in IUCLID and how to derive DNELs
- NEW (to be published with IUCLID 5.4.1 in October): IUCLID Helptext for section 3.5 (life cycle description) and for endpoint summaries

Merci.

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