



LCA & Ecodesign in innovation stages

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TOPGEAR Workshop: “Challenges and good practices for carbon footprint identification in very early development stages (R&D) of automotive products (electromobility)”

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ECODESIGN PROCESS

Regulatory context

- Increase number of regulations related to environmental topics, in particular on materials and substances (REACH*, Circular Economy, End-of-life regulation, ...);
- Fast evolution of this regulatory context;

Societal context

- Growing demand from customers and investors in order to take into account environmental considerations;
- Anticipating the future environmental challenges;



 Implementation of a global ecodesign approach within the innovation process since 2014



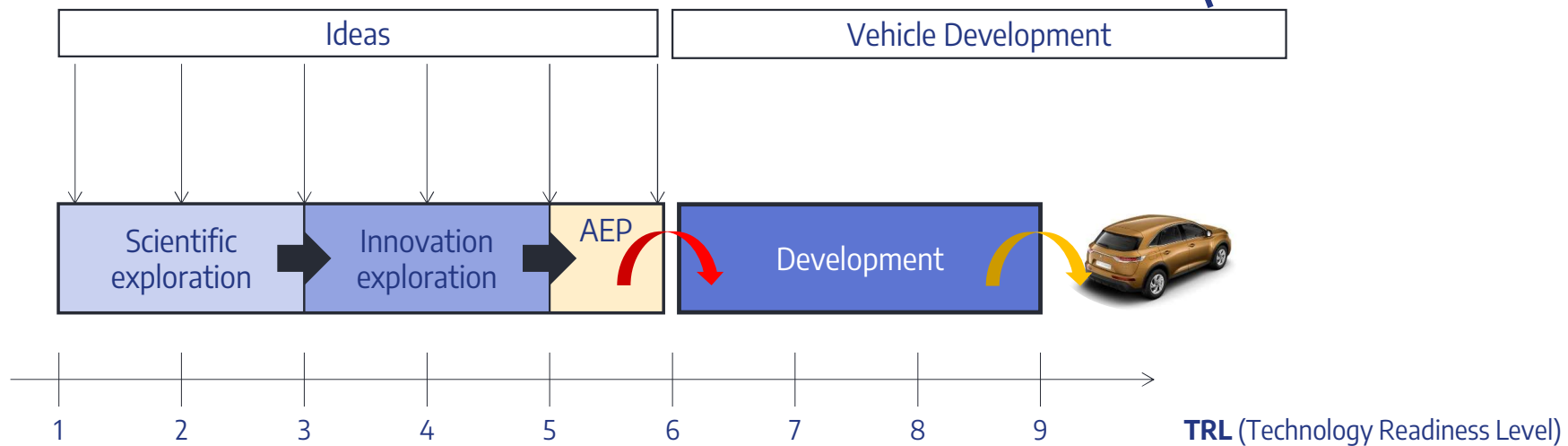
DESIGN PROCESS

Vehicle Development:

- Product expectations defined
- Main design definitions defined

→ **Very few design freedom**

→ **Detailed specifications and complete traceability needed**

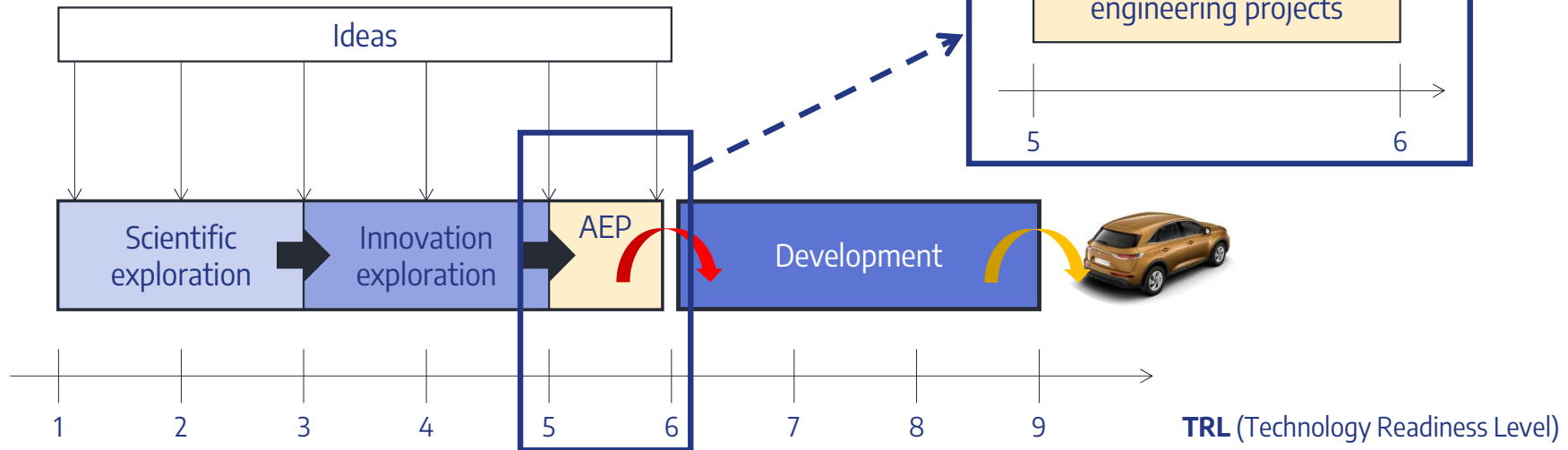


DESIGN PROCESS

Advanced Engineering Projects:

- Organic definition to be validated
- Targetted to be used on future projects

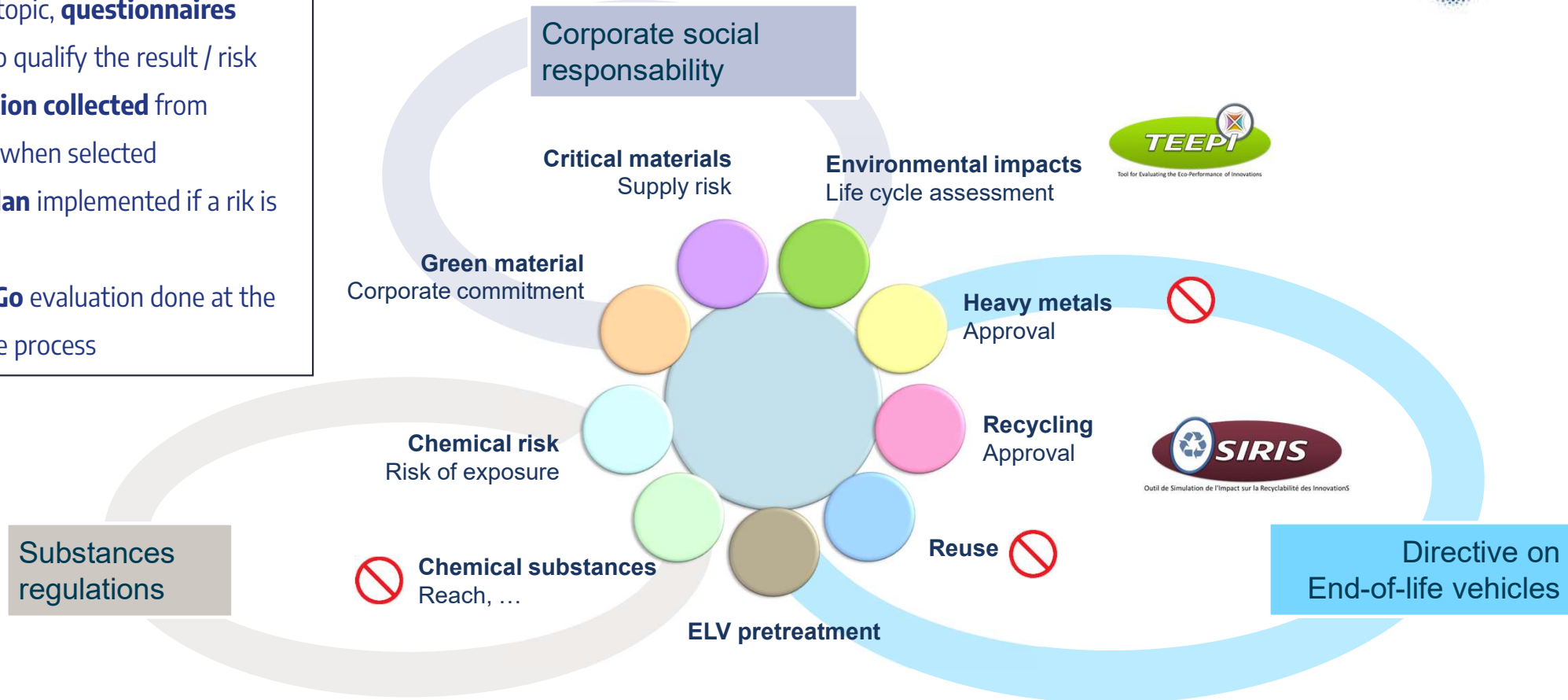
- Allows design choice
- No detailed traceability available
- Ecodesign within questionnaires



 **Implementation of an Ecodesign process for Advanced Engineering Projects**

ECODESIGN OVERVIEW FOR INNOVATIONS

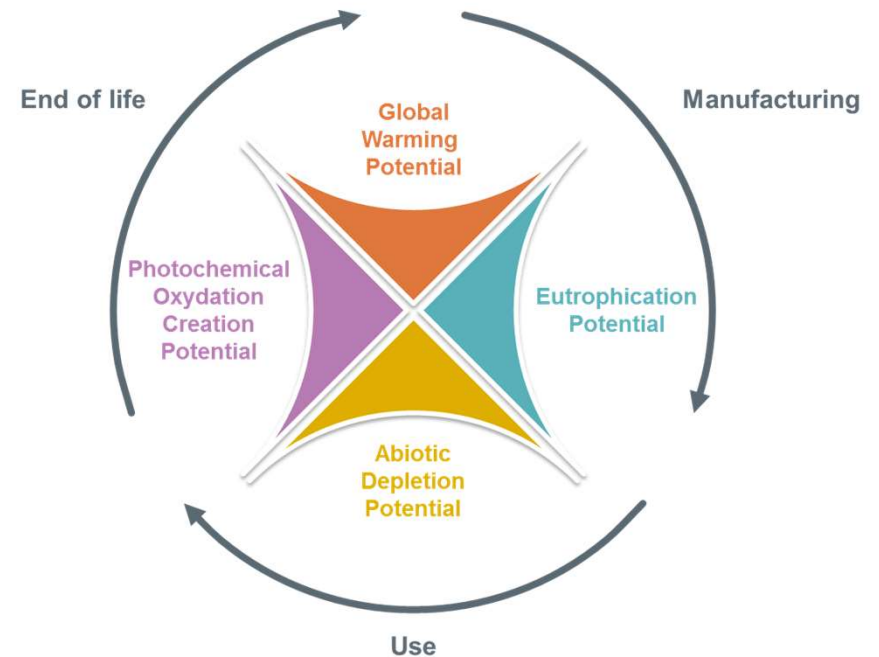
- For each topic, **questionnaires** defined to qualify the result / risk
- **Information collected** from suppliers when selected
- **Action plan** implemented if a risk is identified
- **Go / No Go** evaluation done at the end of the process



SIMPLIFIED LCA APPROACH



- Tool for evaluating the environmental performance of innovations \equiv simplified life cycle assessment
- Based on mass and material balances of innovative parts and replaced parts
- Based on the main characteristics of the future vehicle (mass, finish, plant, ...)
- LCI* data for materials based on GABI database or LCI results from suppliers



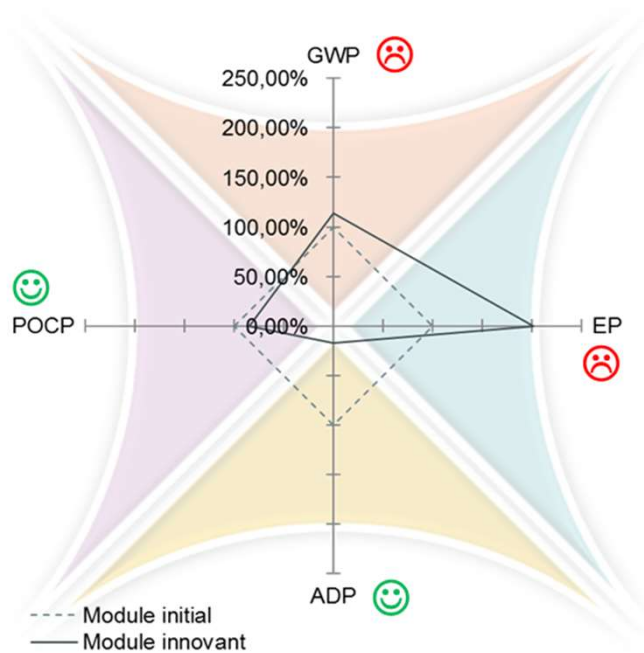
Allows to compare an innovation to a reference product

*LCI : Life Cycle Inventory

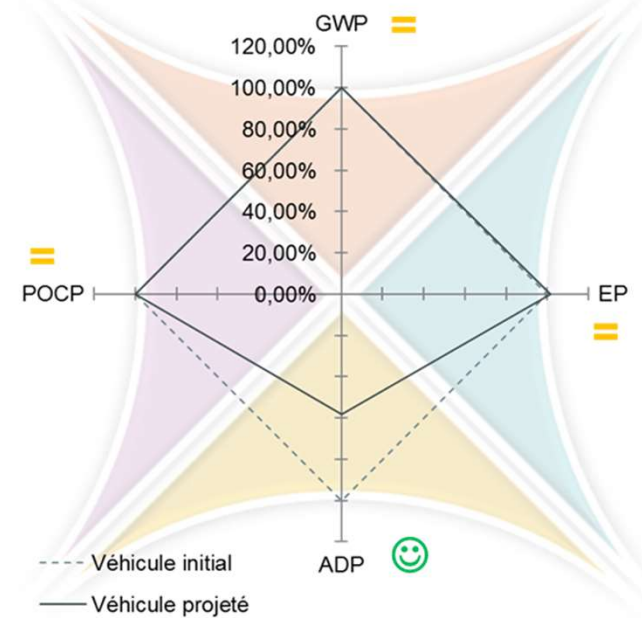
SIMPLIFIED LCA APPROACH



LFP vs. Pb batteries



Simulation of the implementation on a hypothetical car



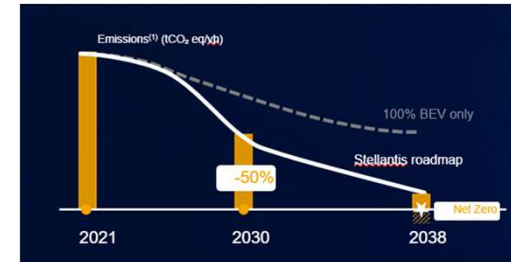
Main limits : availabilities of the LCI to obtain a multicriteria analysis !!

*LCI : Life Cycle Inventory

FOCUS ON CARBON FOOTPRINT

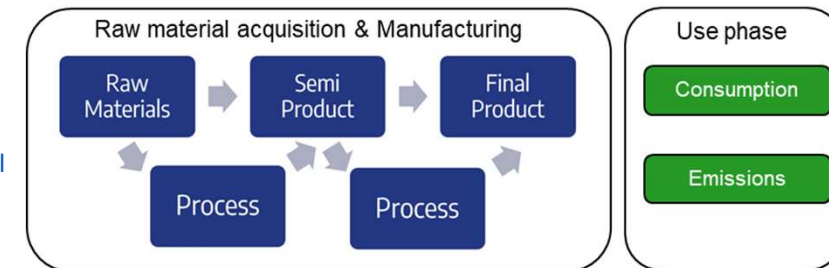
- Main companies are committed to Carbon Net Zero Emissions
- Decarbonized trajectories are put in place
- Strong need to evaluate the future technologies to fit with these trajectories
- For innovations :
 - Data collection from suppliers to rely on primary data for cradle to gate evaluation
 - Simplified calculation tool to build model including use phase
 - Internal database built with secondary data and supplier data including trajectories

STELLANTIS Carbon Net Zero in 2038



Product Carbon Footprint form

Carbon Footprint calculation model



CONCLUSIONS



- Need to tackle at the earliest stage the environmental stakes
- LCA is one of the tools enabling multicriteria evaluation
- Additional criteria should be added as recyclability ...
- Global Warming Potential is the main environmental stake taken into account
- Decarbonization strategies are put in place by the industry
- Need for multicriteria approach to evaluate these trajectories :
 - How to build the dynamic scenario for decarbonization
 - How to built accurate databases with multicriteria evaluations and dynamic approach



Thank you for your attention!

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