

Safety Concepts in reverse – A novel inversive Design Perspective

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Process optimization drivers call for innovative approaches that go beyond conventional process design.

Presentation Rationale: Awareness Raising, Experience Reflections, Peer Interaction

1. Plants in operation are often still not designed to deliver best energy efficiency, performance and safety i.e. no holistic approach.

2. Legislation and market dynamics, however, require optimization of the above KPI's.

3. Design changes in the existing plants are therefore mandatory and effective with key focus on re-evaluation of costly safety concepts and devices – inherently - optimized in process and plant design:

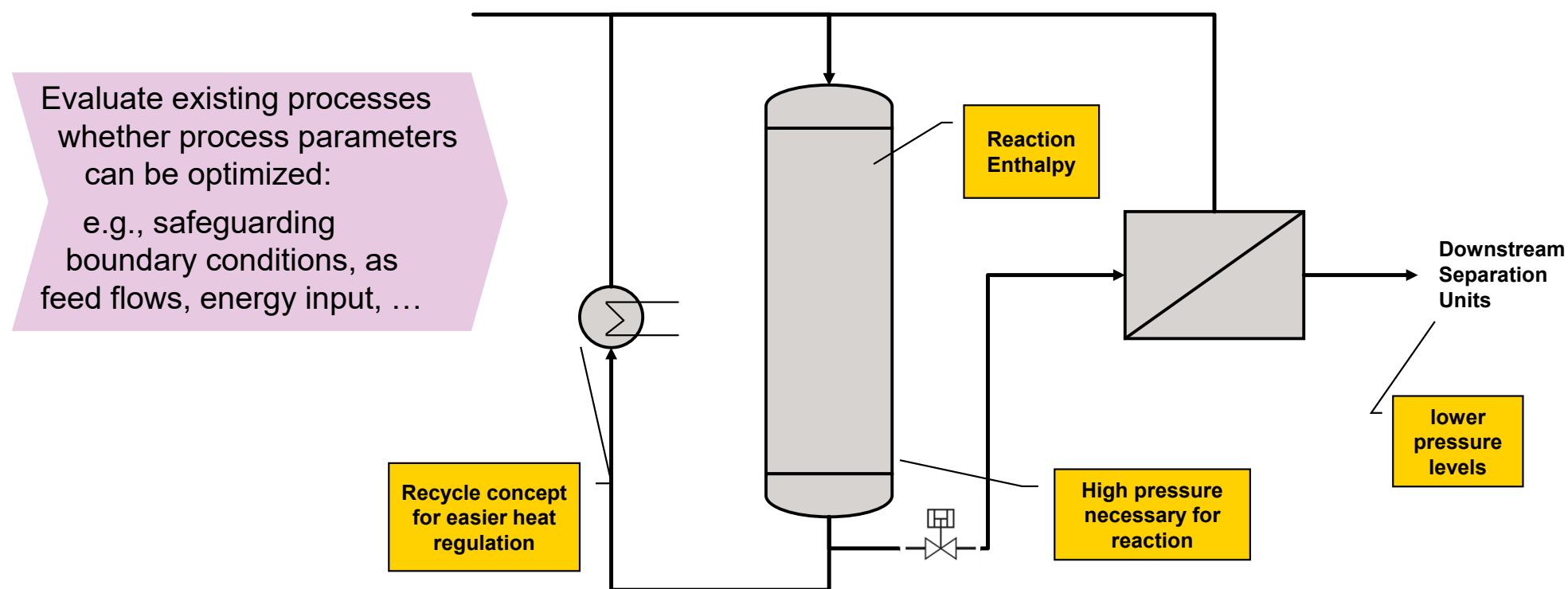
Safety Concept in Reverse

Streamlining Safety by Design

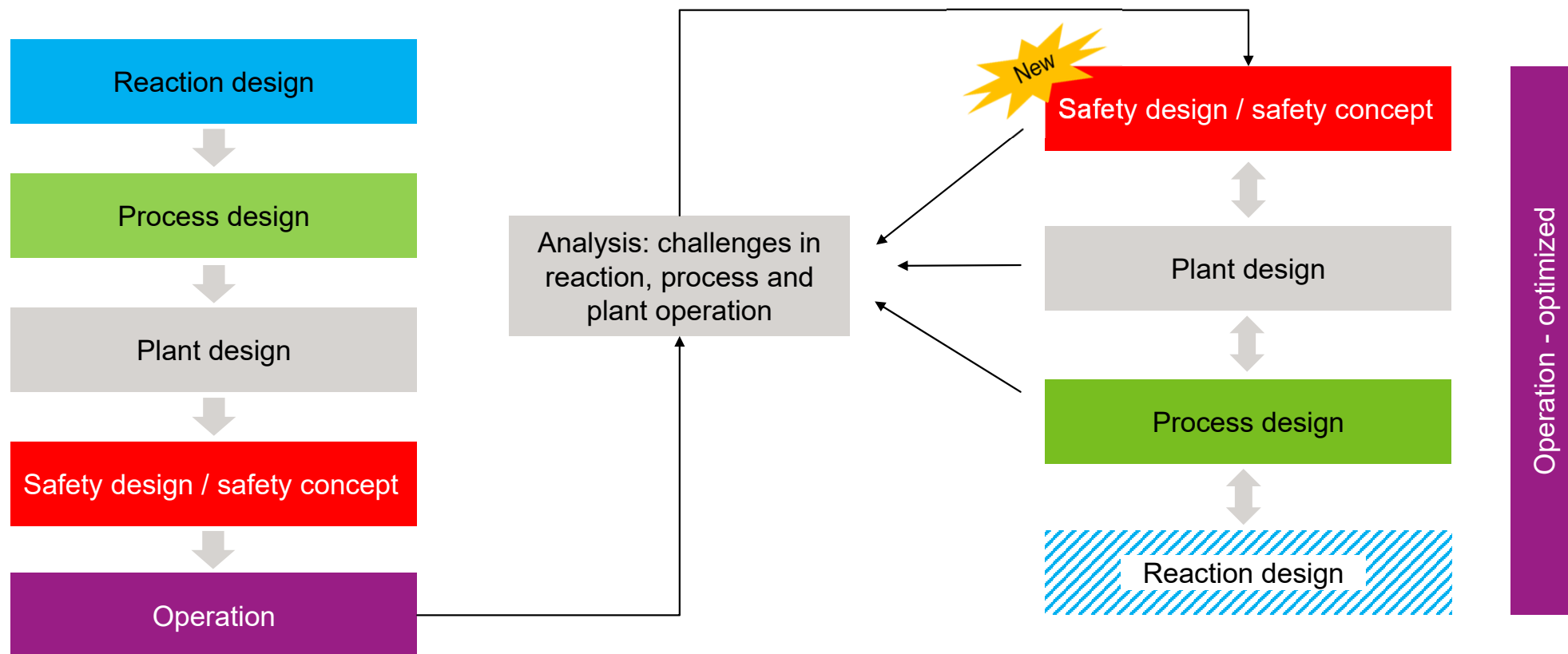
→ Efficient Path to Inherent Safety



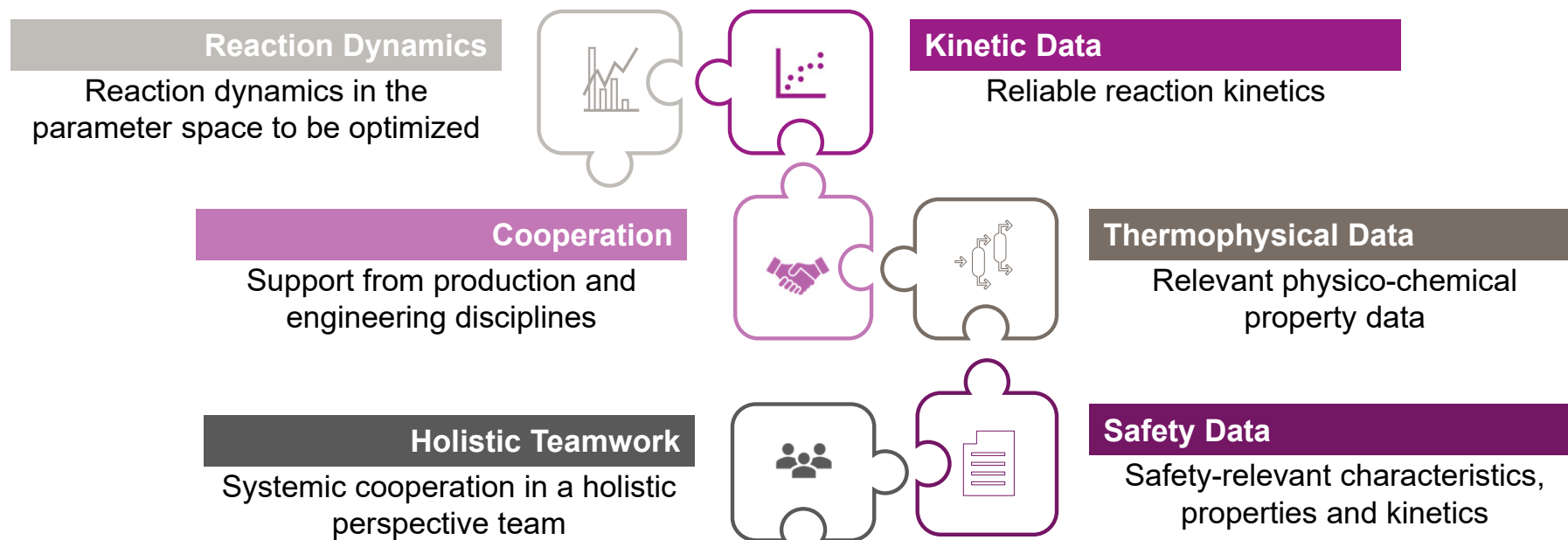
Example of an optimization approach: Challenging process parameters and complex safety devices



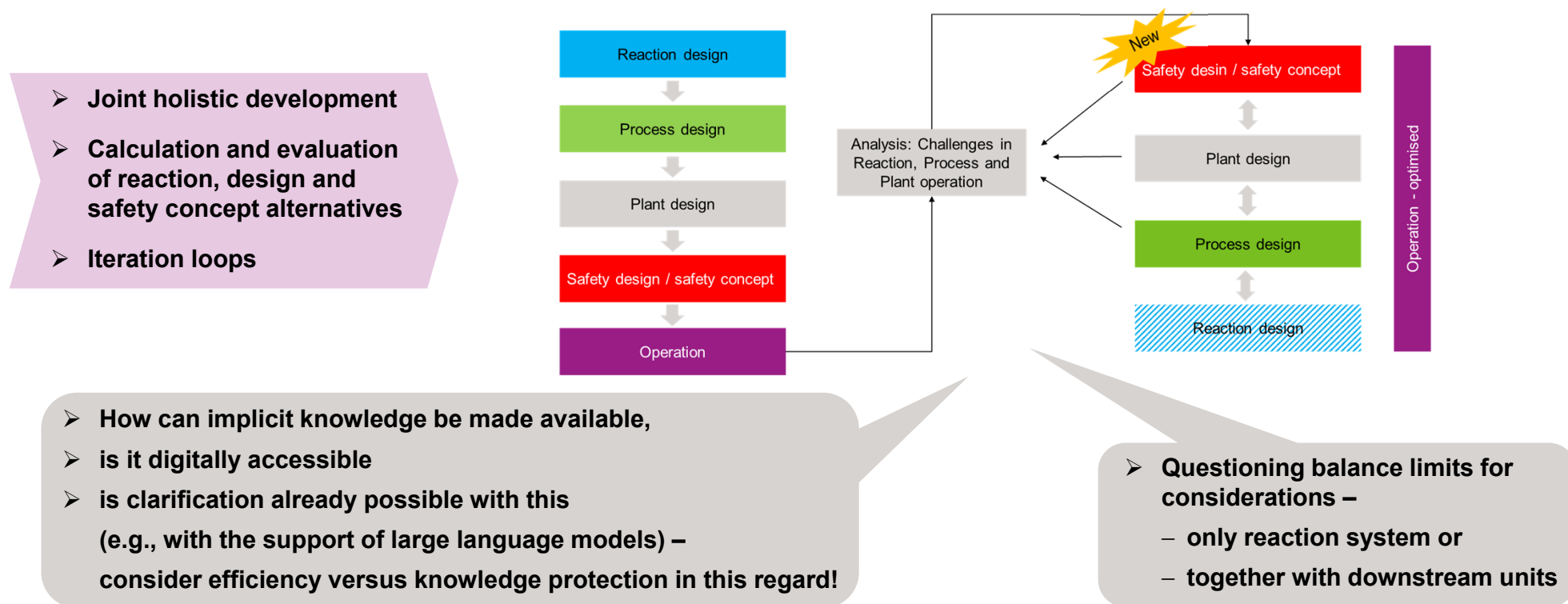
Process development – Standard and In-Reverse



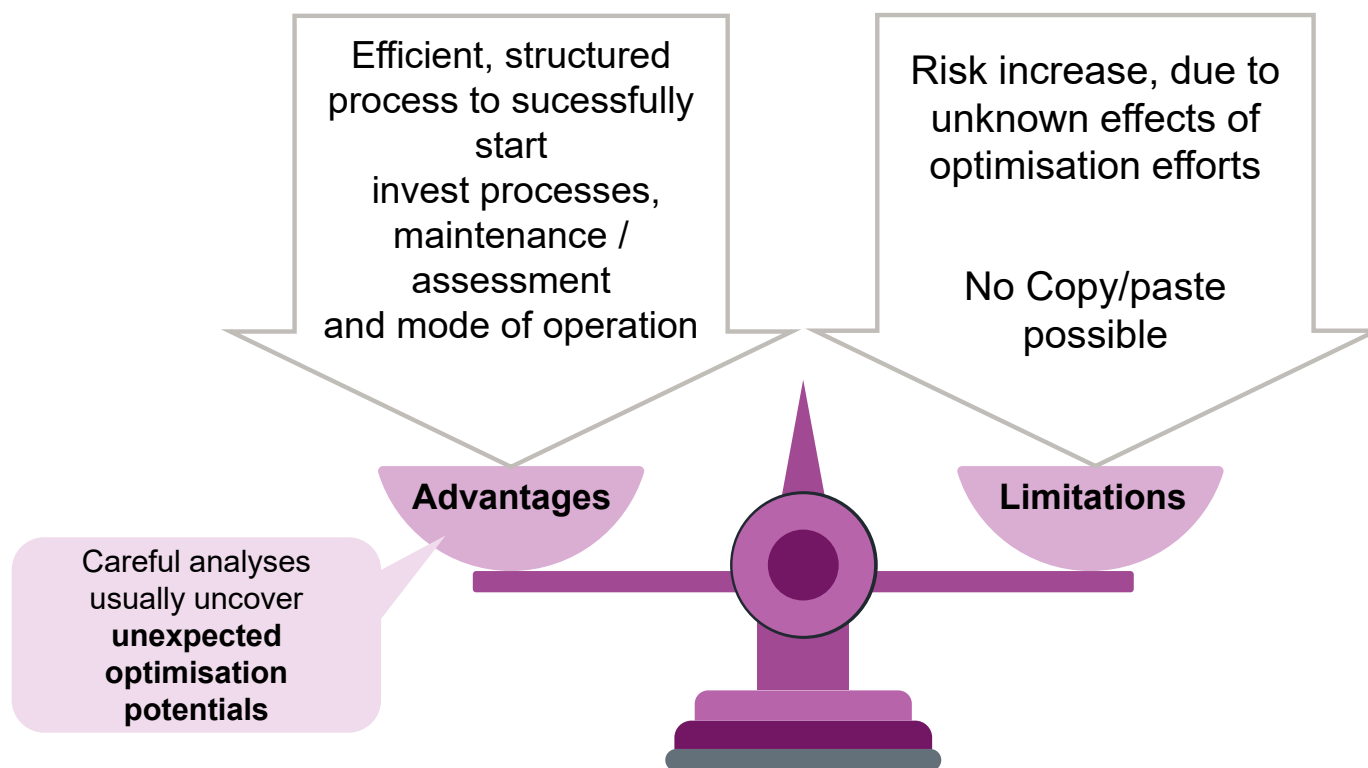
Requirements for process optimization and „Safety Concept in-reverse“



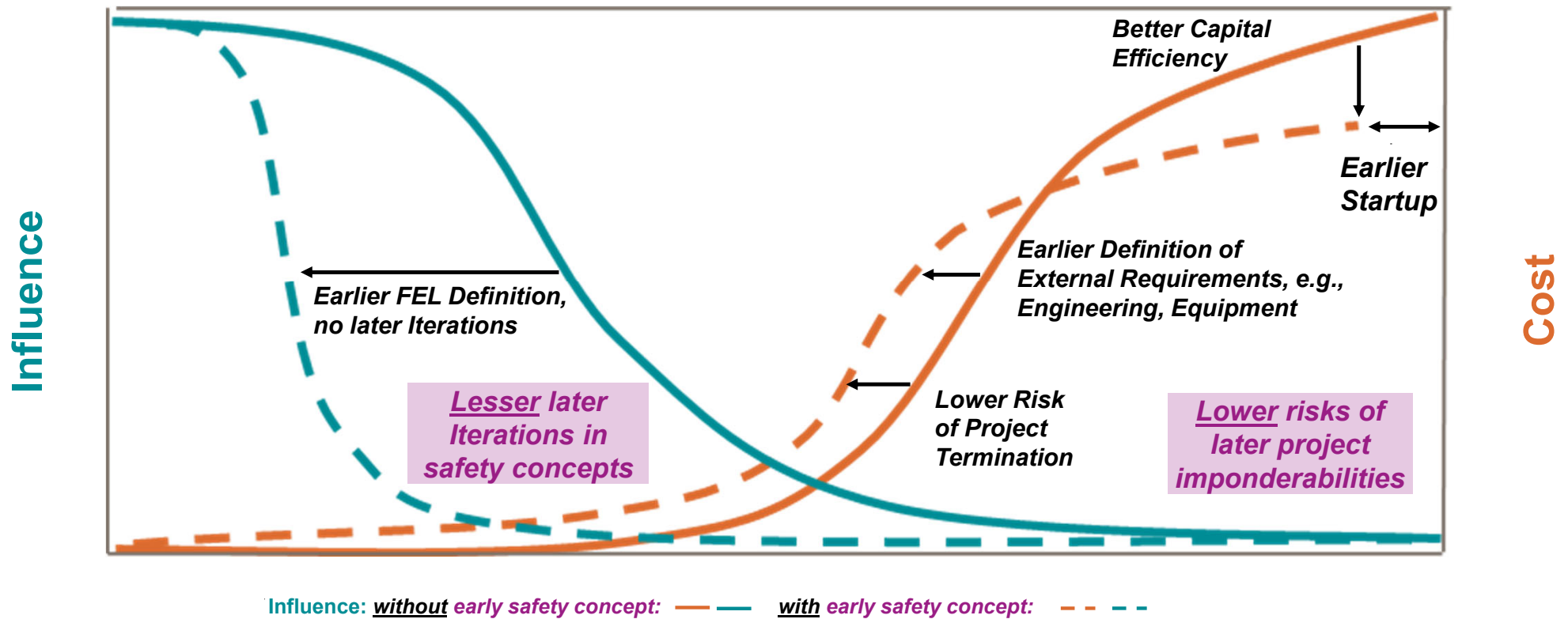
Implementation - First start is already possible and sensible with little preparation – asking questions, providing stimuli → low 'threshold for hesitation'



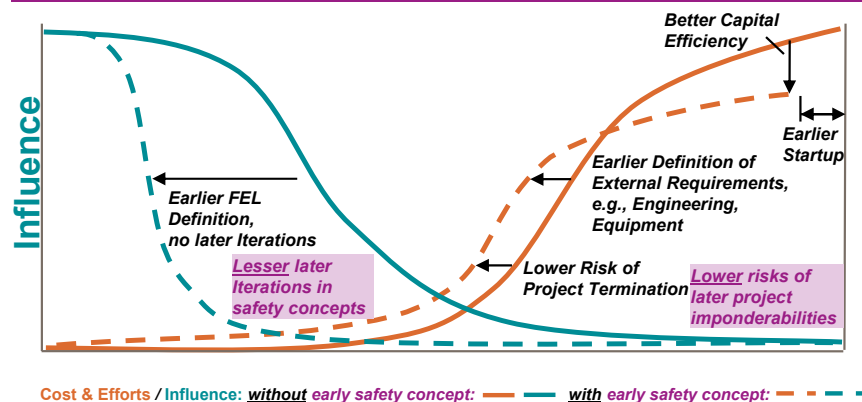
**Safety-integrated process development can lead to robust, efficient, and sustainable solutions.
For these advantages, limitations are to be considered**



Outlook For a novel inversive Design Perspective



Outlook For a novel inversive Design Perspective



Start safety consideration early

- initially more effort/costs
- BUT ALSO less effort with changes



Joint holistic efficient
Process & Plant & Safety Design

Discussion and Experience exchange



Was there an example where it could have been used but could not be applied/implemented?

Was there an example where it was applied and did work?

What are the challenges in practice?

