Energy transition, ‘aandachtsgebieden’ and safer design

Antea Group

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Roel Steenbergen

17-5-2023

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Question

Two choices:

Hand up: 1 large storage tank with a toxic substance

Hand down: 10 small storage tanks with a toxic substance

Question

Ammonia transport from Rotterdam to Germany

Up: Yes but by using pipelines

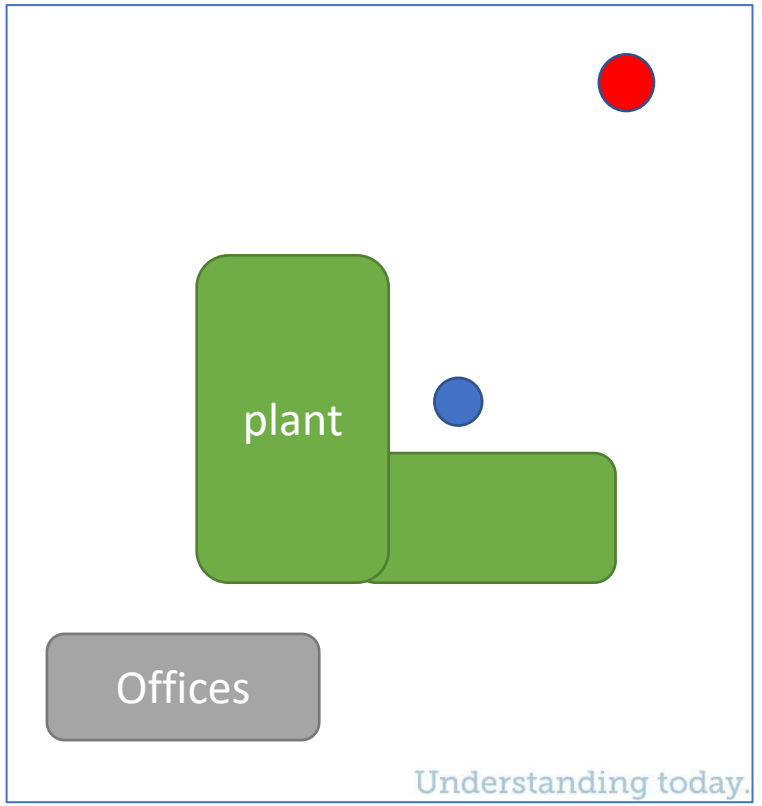
Down: No ammonia transport, but cracking to create hydrogen

Question

As a company you want to use spare energy to generate hydrogen, where would you place your electrolyzer?

Up: Near the edge of your site

Down: More centralized



Energy transition and ‘omgevingsveiligheid’

- There are no correct or wrong answers
- Everybody here will be influenced by his own experience, his current employer, the surrounding area, etc
- How to address this?

Introduction

- Roel Steenbergen
  - Chemical engineer
- Antea Group for more then 15 years
  - Senior consultant industrial safety
- Clients
  - Industrial companies
  - Dutch government

Roel Steenbergen
Senior consultant industrial safety

M: +31 6 51516074
Tolhuisweg 57 | Postbus 24 | 8440 AA HEERENVEEN

roel.steenbergen@anteagroup.com | www.anteagroup.nl

Member of Inogen | www.inogenet.com

Energy transition and its challenges

- One of the bigger challenges at the moment is to facilitate a safe energy transition.
  - How?
  - Where?
  - Which?
  - Who?

- Especially the hydrogen economy and the role of ammonia
  - Ammonia for energy from abroad
  - Hydrogen for the industry and housing

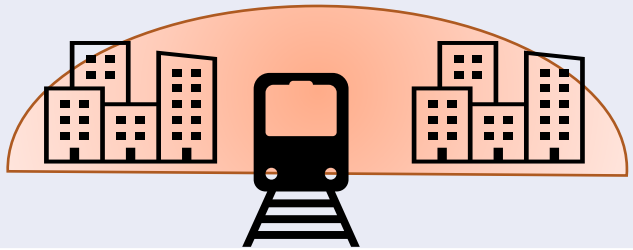
Example: ammonia transportation

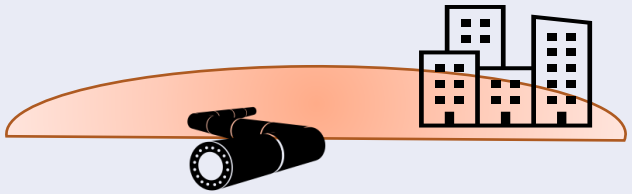
- General consensus:
  - Re-using the current gas network for hydrogen
  - Hydrogen gas has a lower energy capacity.
  - Thus the current network will primarily function to supply the Dutch energy need
  - For transportation of hydrogen to Germany, ammonia is an option

Example: ammonia transportation

- Which modality to use
  - Road
  - Rail
  - Water
  - Pipelines

Rail transport	Pipeline transport
10.000 rail tankers /year Through city centers	Rural areas, but passing cities

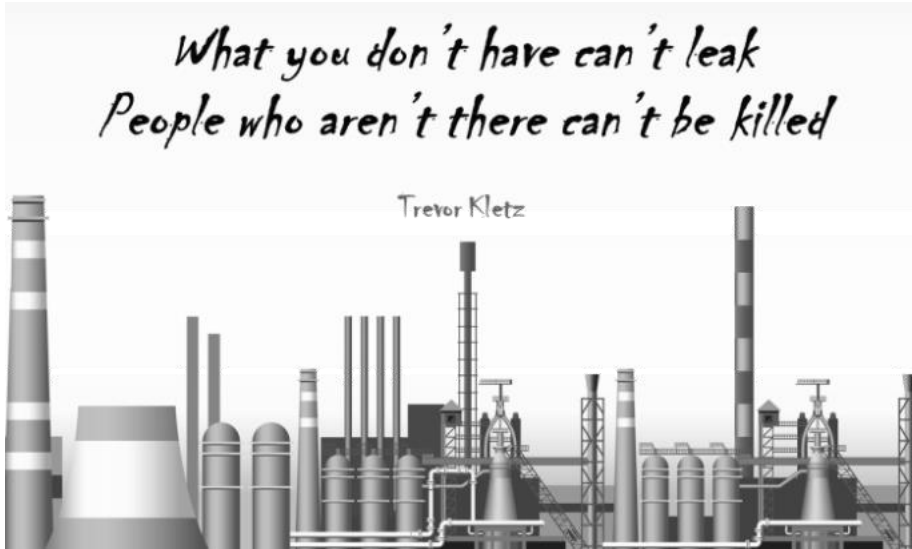




- The problem:
  - Rail is the ‘easiest’ but will cross city centers
  - Ammonia pipelines to Germany do not exist
    - These risks currently don’t exist
    - Which risk will the communities next to the pipelines accept?

‘Aandachtsgebieden’

- The new ‘Omgevingswet’ will include ‘Aandachtsgebieden’
- It defines an area of extra precaution
- Developing a vulnerable object, e.g.
  - Hospital
  - School
  - Daycare

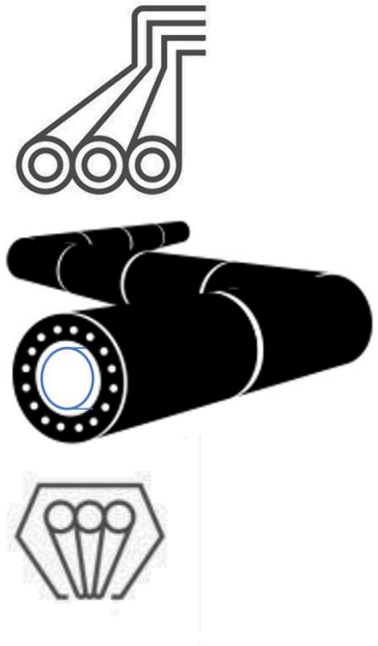


‘Aandachtsgebieden’

- Three types of areas:
  - Flammable
  - Overpressure
  - Toxic
- They will be derived from hazardous activities
- Distance not based on risk, but effect

‘Aandachtsgebieden’ and ammonia

- The challenge is to design in such a way that we create a ‘controlable’ situation
- Ammonia pipelines:
  - Risk reduction is not enough
  - Pipe bundles with smaller diameters
  - Pipe in pipe systems
  - Protective barriers above



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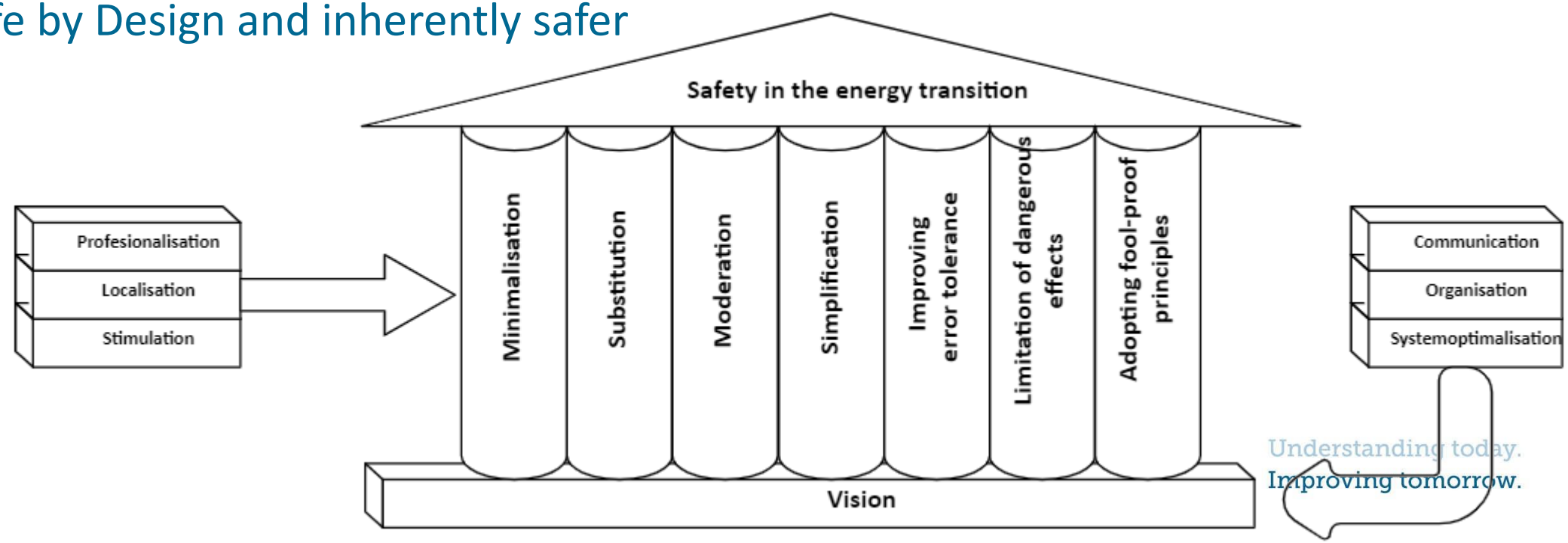
Energy transition and Safe by Design

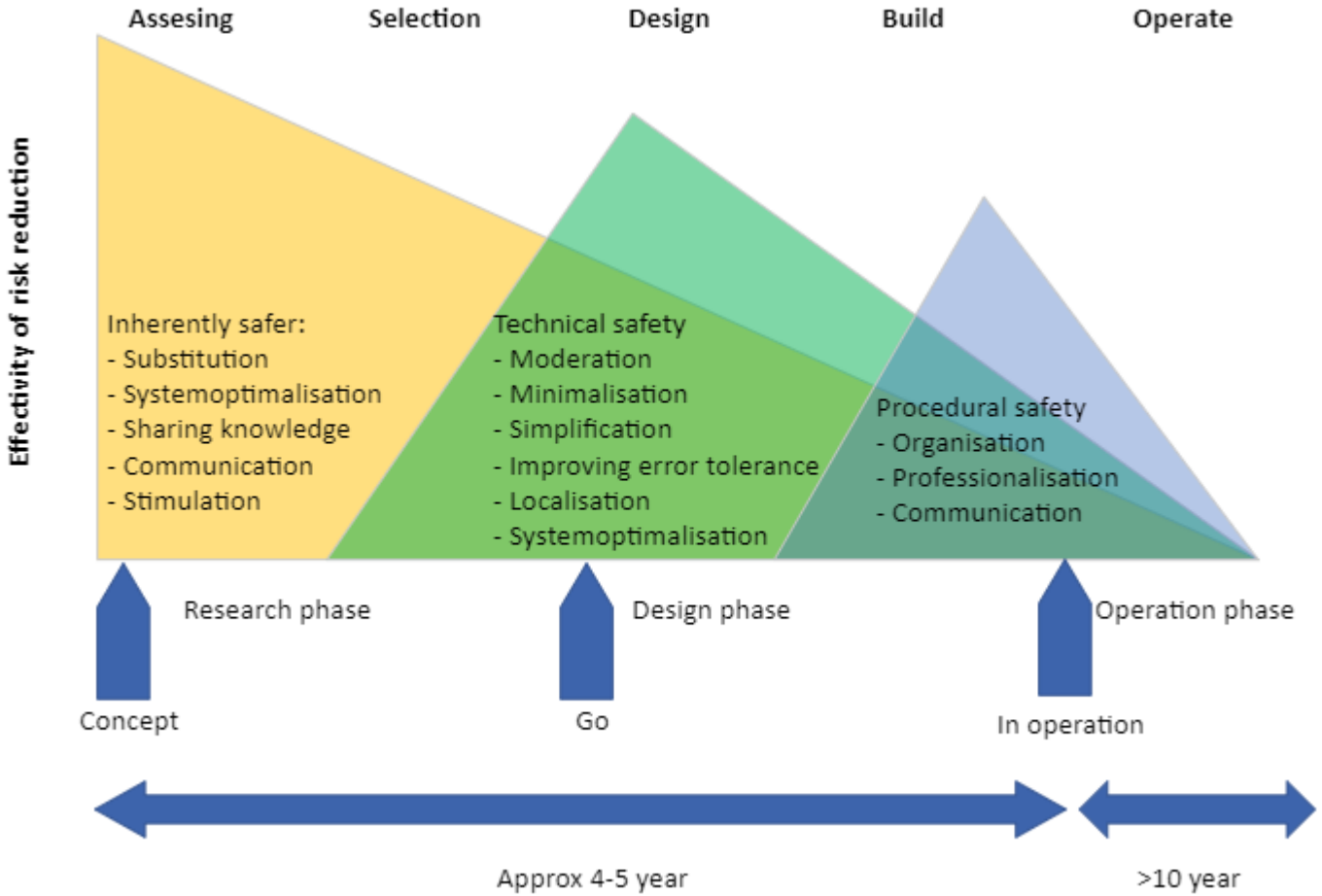
- Recent study
  - Expert-consultation in regards to energy transition and external safety
    - Industry and energy transition
    - Focus on medium and small scale initiatives
  - Safe by Design and inherently safer



What does it mean

- How to create maximal impact

- How can you do this within your company?
  - When will you get involved?
  - Who should you contact?
  - What is possible in each phase?



Conclusion

- The energy transition will introduce new risks
- Try to address them as soon as possible in the design process
  - Use inherently safer principles
  - Learn from your colleagues and share lessons learned
- The ‘aandachtsgebieden’ will emplify the focus on effect reduction
  - Show how you considered safety during all stages of the design

Questions?

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