

# Model-Based Systems Engineering for Affordable Green Hydrogen



Bas van der Leeuw



Arjan Mooij



Rob Ekkel

## Accelerating the energy transition

- Ambition meeting the goal of net-zero greenhouse gas emissions by 2050
- Green hydrogen has been suggested as solution in all kinds of domains, but would it be effective?
- Challenge to determine in which cases green hydrogen is affordable and sustainable

## Data-driven decision making

### Business analysis for potential customers

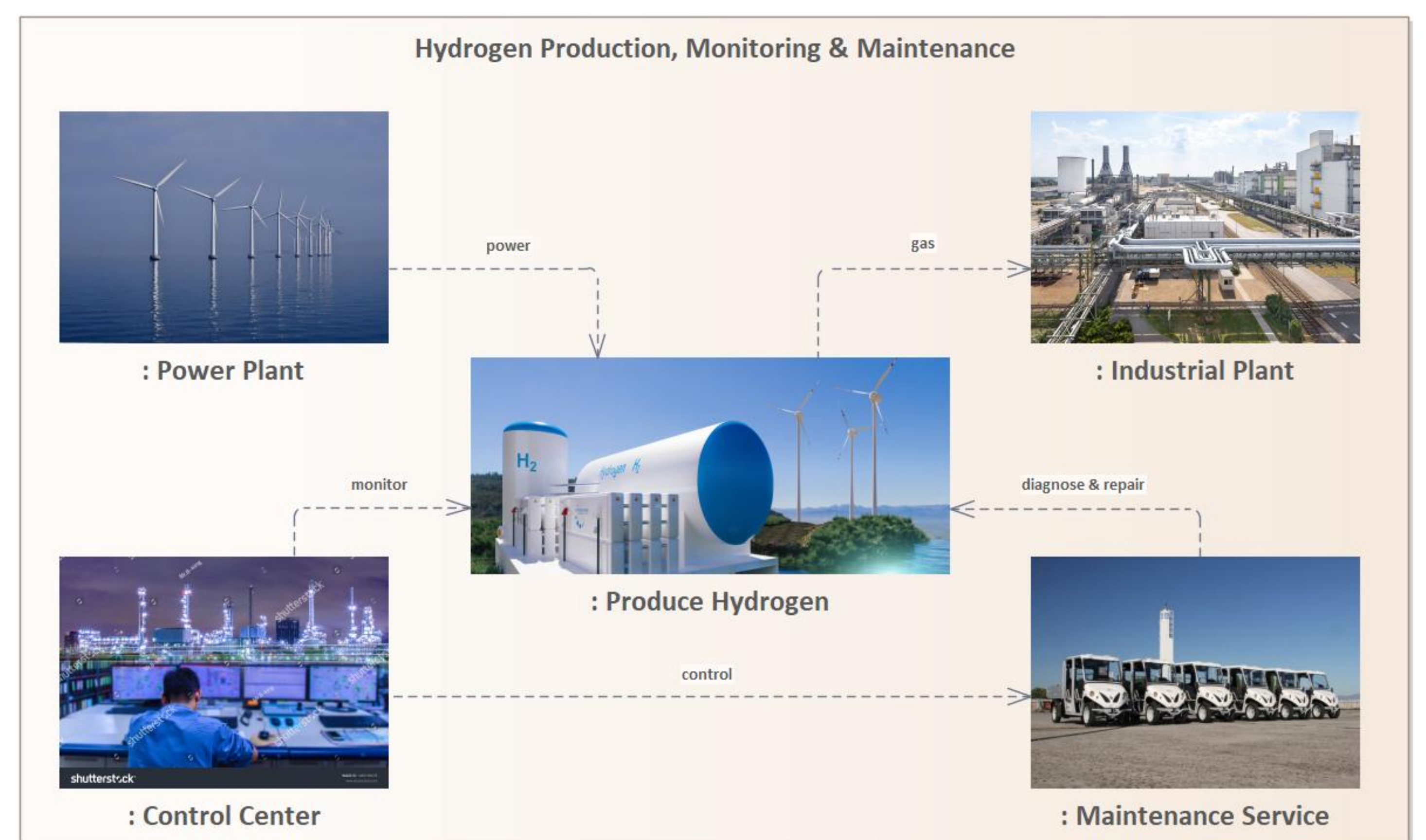
Transition towards green hydrogen

### Operational analysis for operators

Ramping up/down the hydrogen production

### System analysis for maintenance

Maintenance strategies (preventive and predictive)



## Application challenges

### In which cases is green hydrogen affordable?

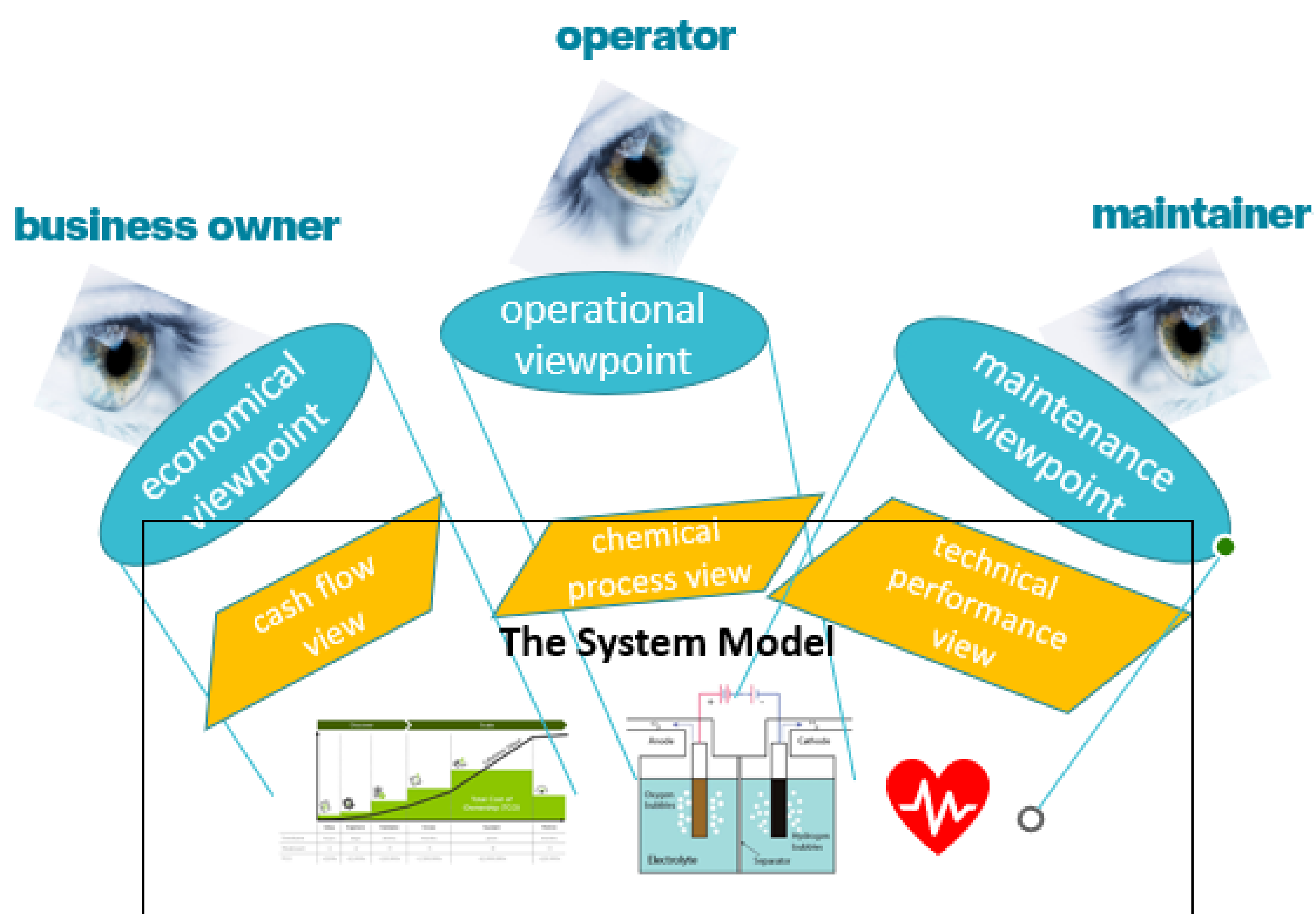
Focus is on the chemical industry:

- Manufacture chemicals such as ammonia
- Generate heat (for steel production)
- Oil refinery

### How to optimize the hydrogen production?

Balance the production and storage with respect to:

- Intermittent renewable energy (solar, wind, etc.)
- Degradation profiles of the electrolyzer



## Research challenge

### How can MBSE support decision-making?

- Common understanding on system and context
- System analysis and simulation
- Trade-off analysis

Partners:



Contact

bas.huijbrechts@tno.nl

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