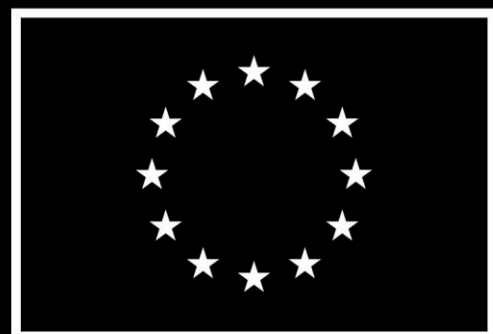



# Holon 0: circular sustainable energy

How the municipality of Cranendonck, Nyrstar, local entrepreneurs and Metalot are committed to storing local sustainable energy (wind and solar) and using it in a circular manner within Cranendonck

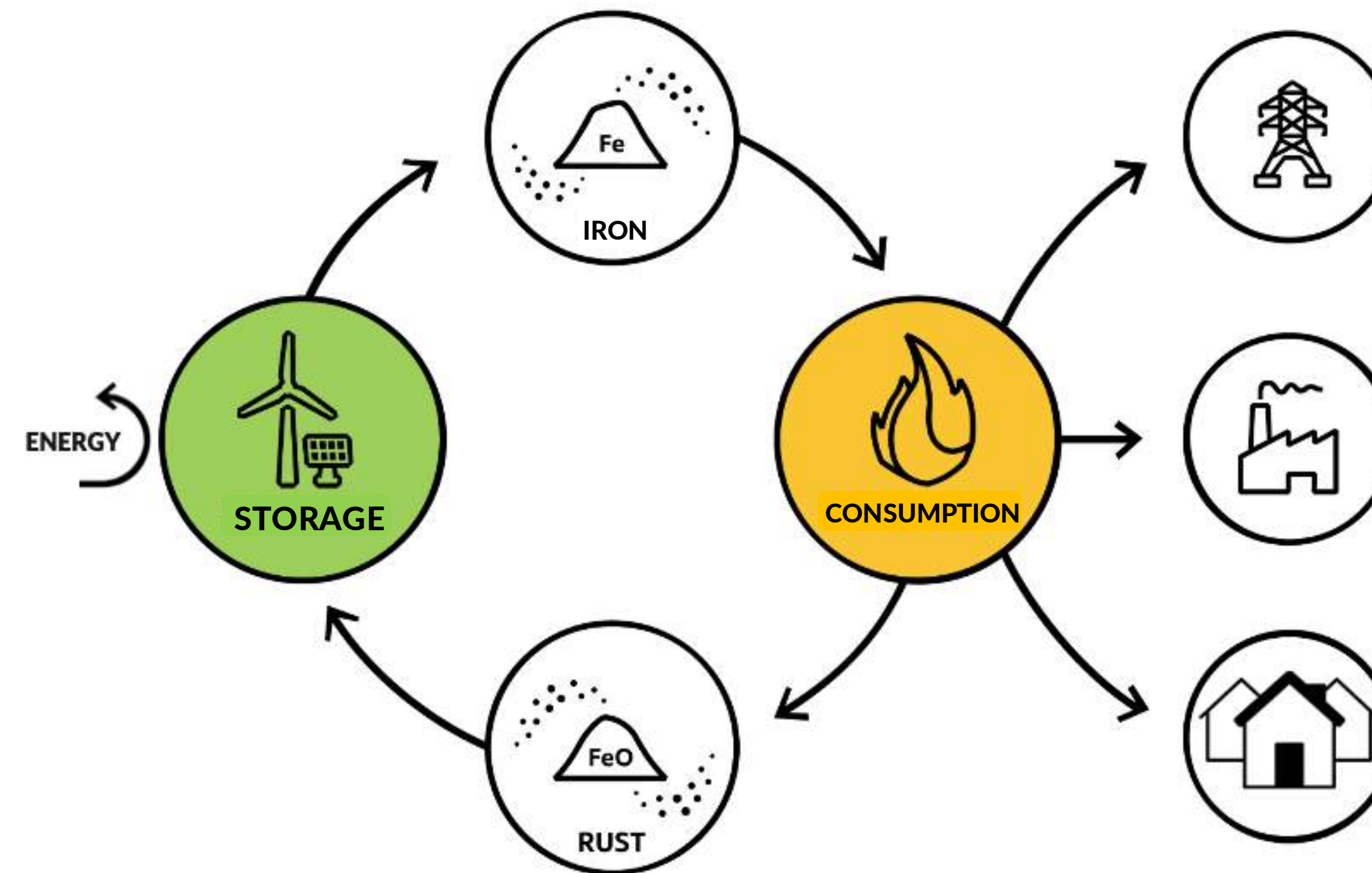


Co-funded by  
the European Union

**OPZUID**   
Europees programma voor transitiegedreven innovatie

metalot 

# Iron powder as an energy carrier





# This innovation supports sustainable, circular, CO2-free and affordable



High temperature  
process applications  
for decarbonization



Cluster 6 companies



Built environment





# Metalot Foundation

The foundation advocates for embedding metals as an energy carrier through:

- ◆ Lobbying for standardization and legislation/regulations
- ◆ Knowledge assurance
- ◆ Community
- ◆ Projects (from academic to pre-commercial)

We are very aware that metals are part of the solution and not the only solution for a successful energy transition.



# History of Metalot

**2015** - Founded shortly after the technology was discovered

- ◆ Focused on building the impact and traction of this innovation
- ◆ The Municipality of Cranendonck, the Province of North Brabant, Nyrstar and TU/e are our founding fathers

**2018** - Establishment of the Future Energy Lab in Budel

- ◆ Scaling up technology
- ◆ Showcasing applications to society

**2020** - The world's first iron powder burner at Swinkels/Bavaria

- ◆ Triggering RIFT and Iron+ as commercial spin-outs

**2026** - The world's first iron powder chain in the municipality of Cranendonck





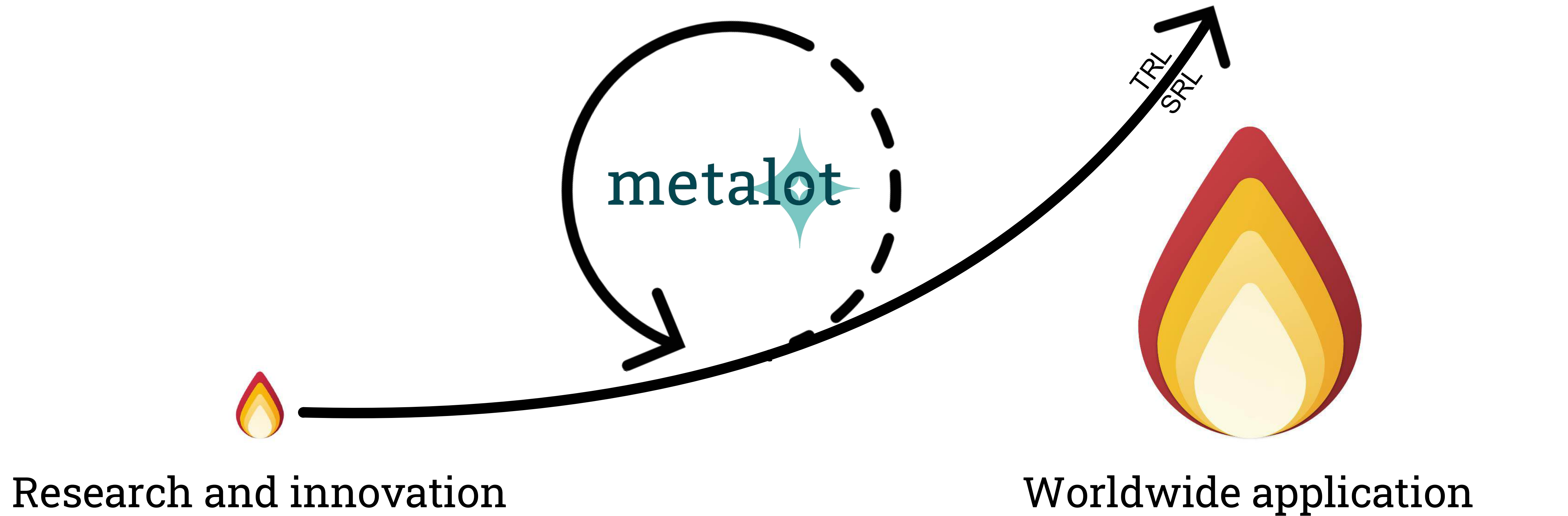
# What started at TU/e in 2015 has grown into global research and innovation



# There are now several startups worldwide focused on applications



Metalot is connected to all,  
orchestration for strenght and growth  
has become our primary function







# We are growing rapidly

A robust embedding the innovation as a new energy carrier requires:

1. European lobby
2. Metal Power Platform (in collaboration with the Dutch government)
3. Campus for knowledge retention, sharing, and breeding ground for start-ups and scale-ups
4. Community
5. Projects and forms of exploitation



# Where does innovation stand now?



High temperature  
process applications  
for decarbonization

**Large scale**  
100MW - 1GW  
Approx. 8-10 years



Cluster 6 companies

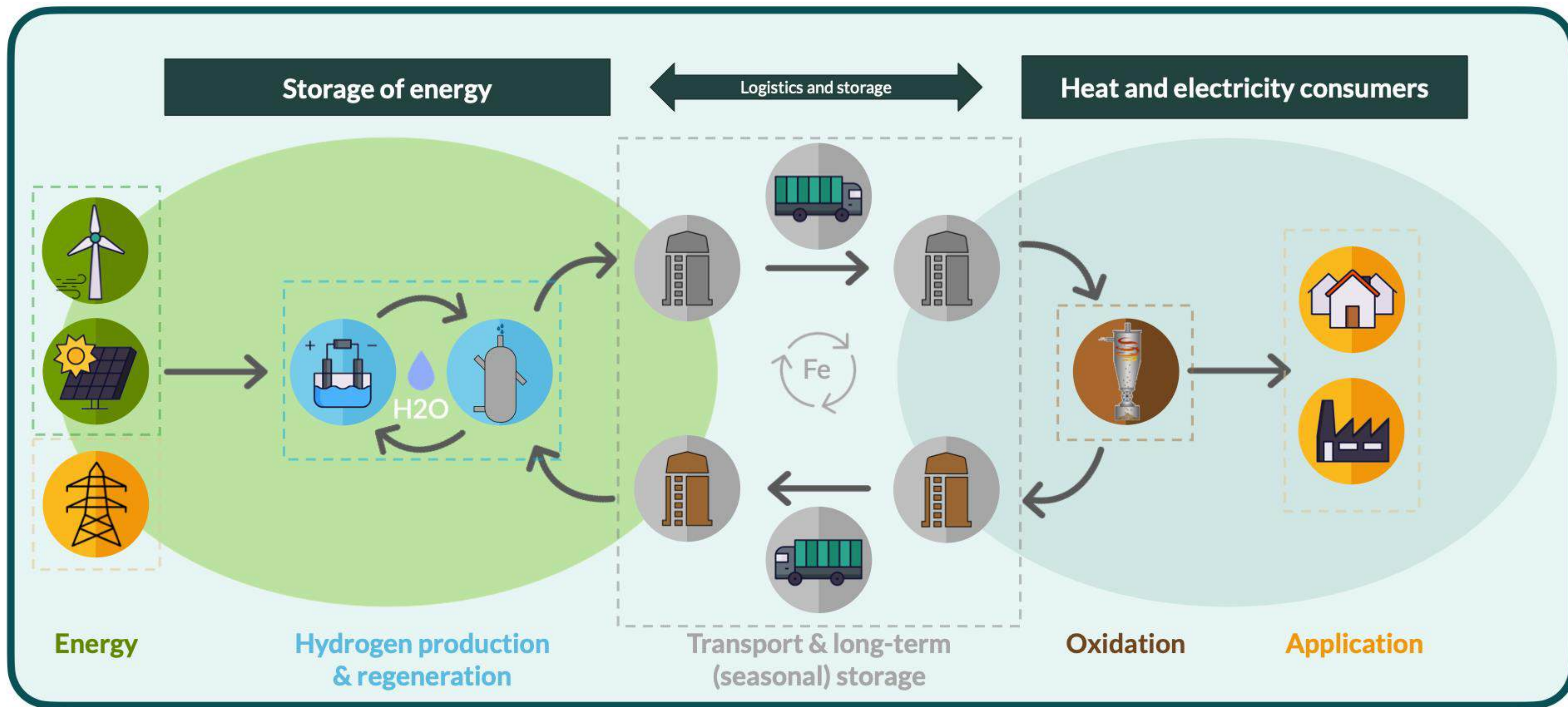
**Medium scale**  
10-100MW  
Approx. 3-4 years



Built environment

**Small scale**  
1-10MW  
Within 2 years

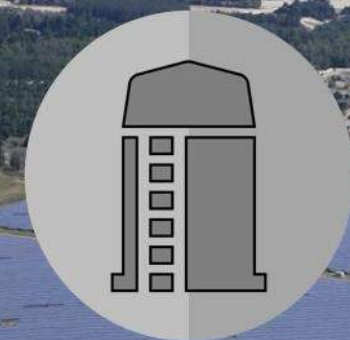




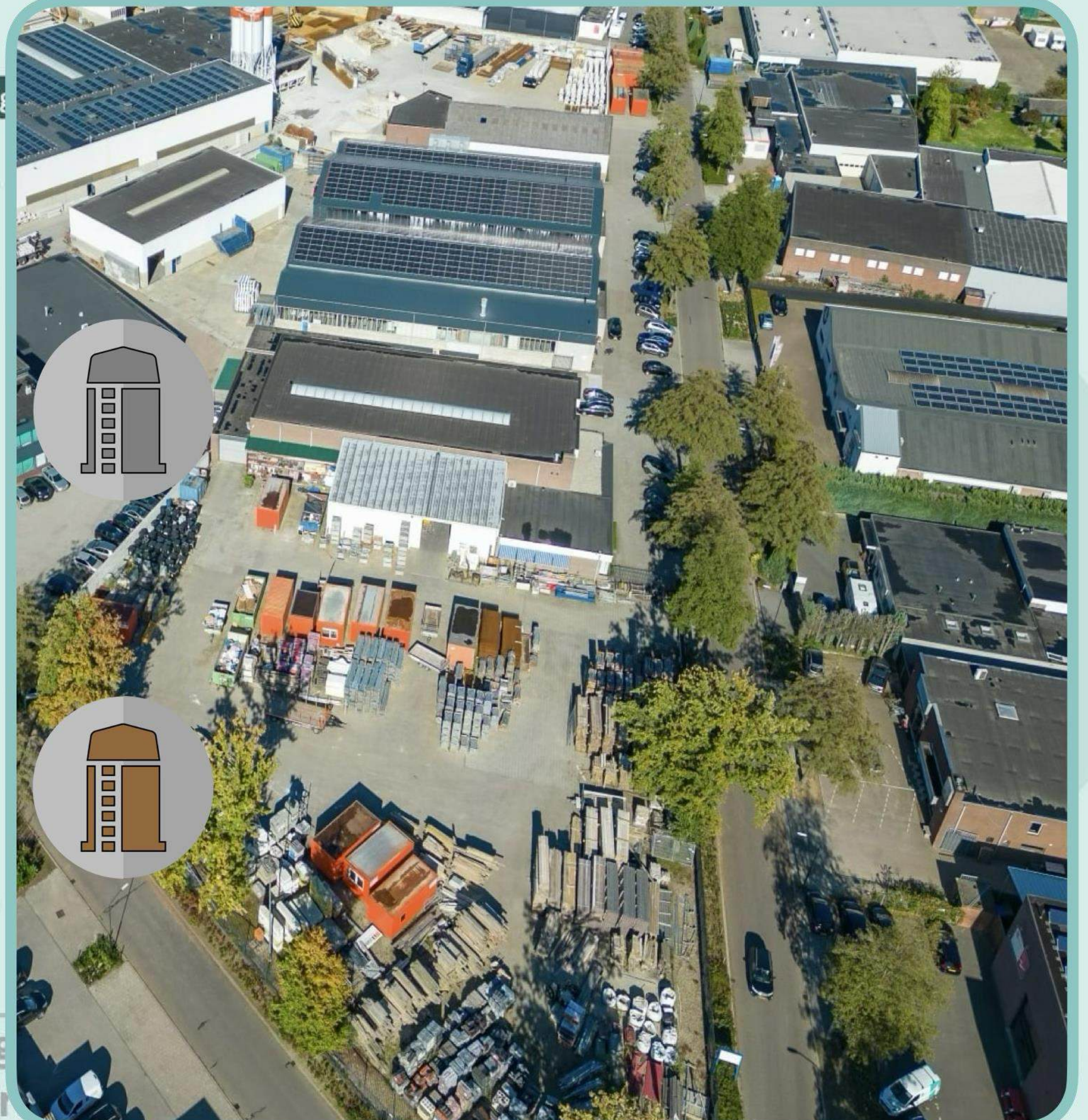




logistics and storage



port & long  
(personal) stor



nyrstar

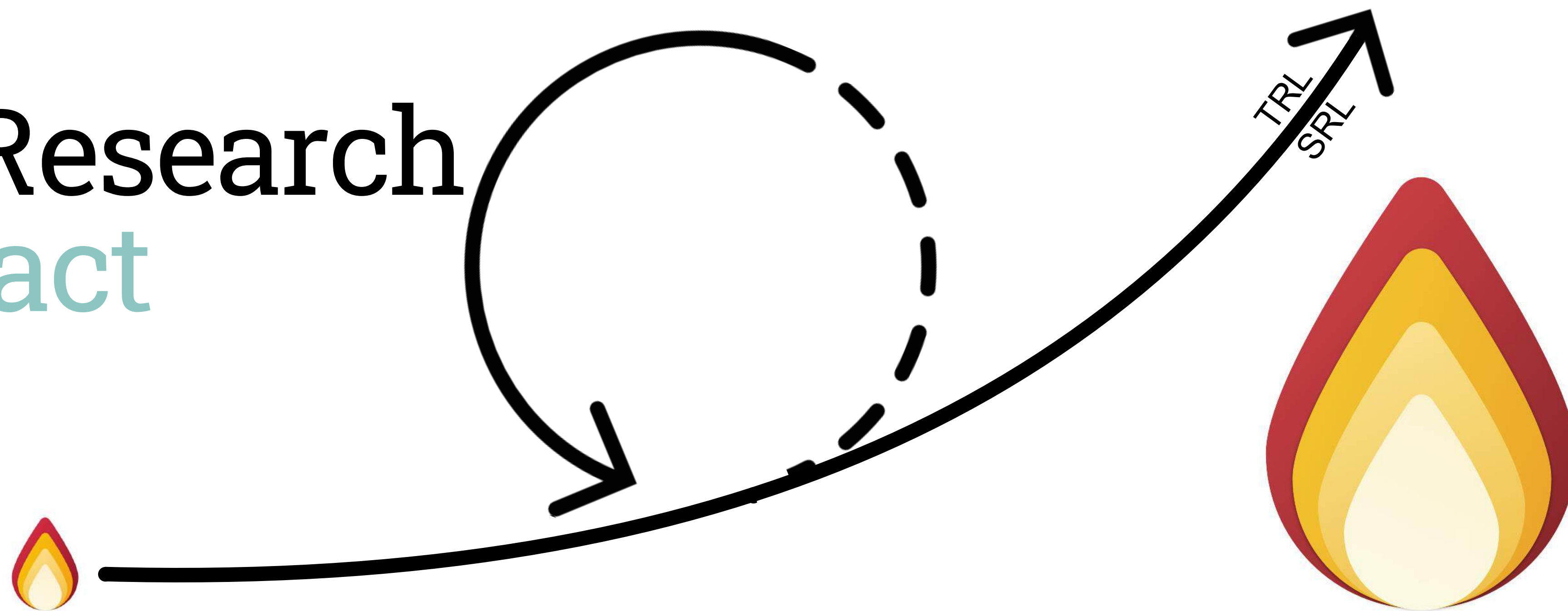
< 5 km >

Industrial estate  
De Meemortel

metalot



# From Research to Impact



Research and innovation

Worldwide application





TUE PROFESSIONAL EDUCATION

# Metal Power Technology Academy

METALOT @ WORK  
SEPTEMBER 24, 2025

Fons Sweegers, Business Developer

Mechanical Engineering, Power & Flow



# Metal Power Technology Academy

## Why

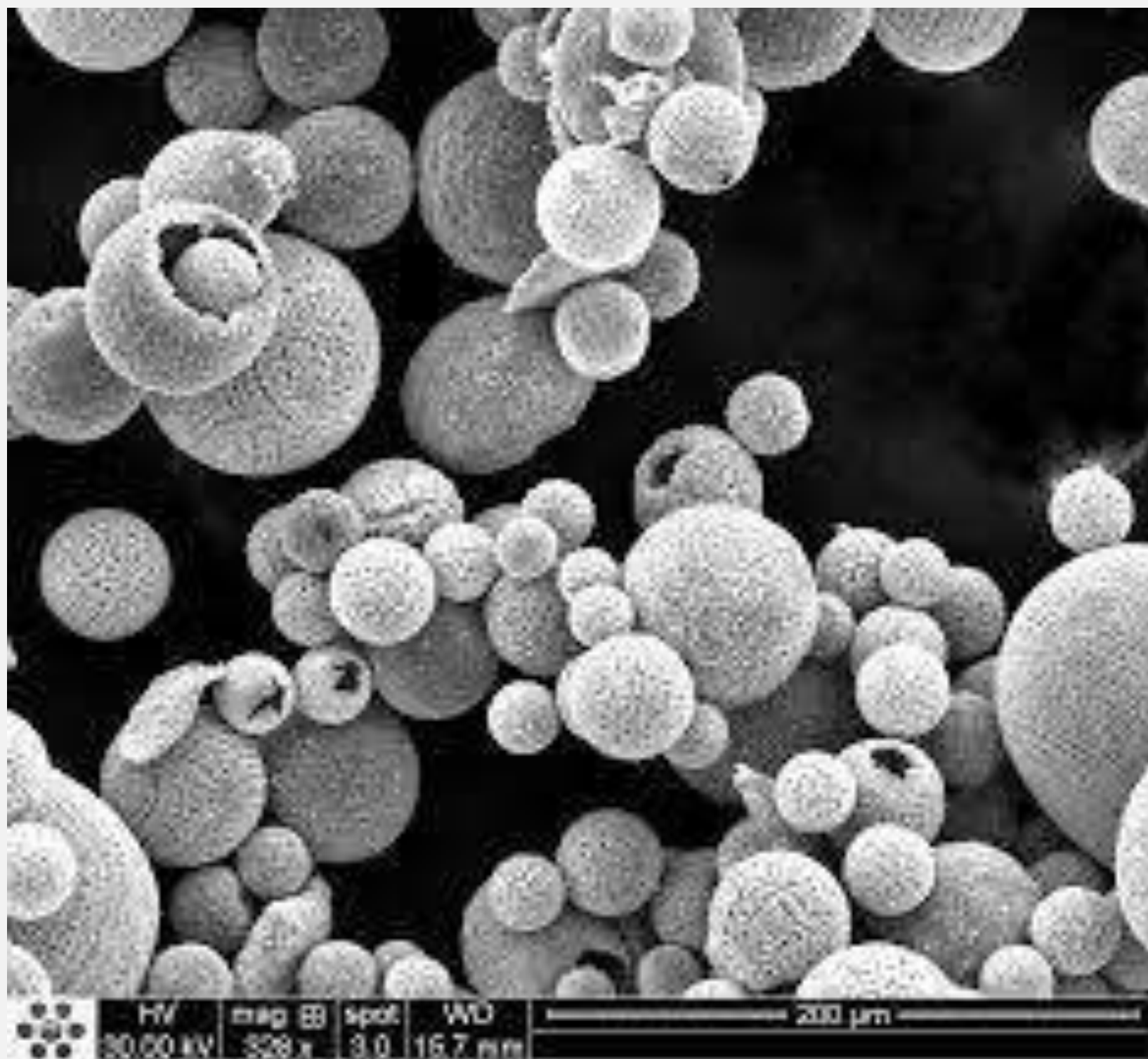
- ✓ We have developed carbon-free and scalable solutions for today's energy challenges
- ✓ The TU/e is the cradle of MPT and we want to invite the world to learn and innovate with us.

## Goals

- ✓ Educating companies and governmental organisations
- ✓ Building a global ecosystem
- ✓ Creating a market pull



# At TU/e we've the know how on all levels



Particle characterization



Process optimization



Application & system design



# We train while building an ecosystem

## Industry & governmental leadership

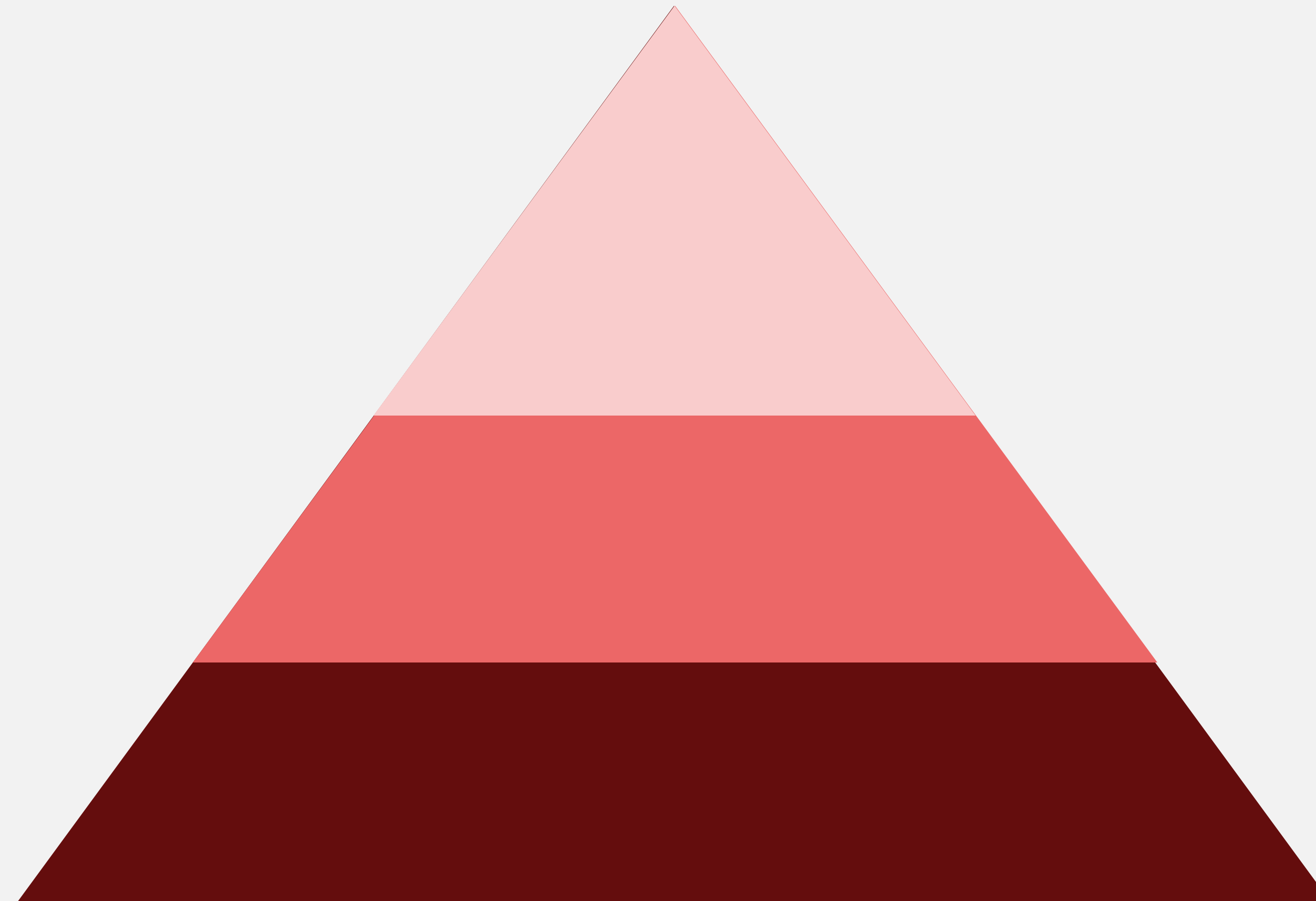
1 Day training

## Project managers & process engineers

3-5 Day training

## Developers, suppliers & service providers

1-2 Day training



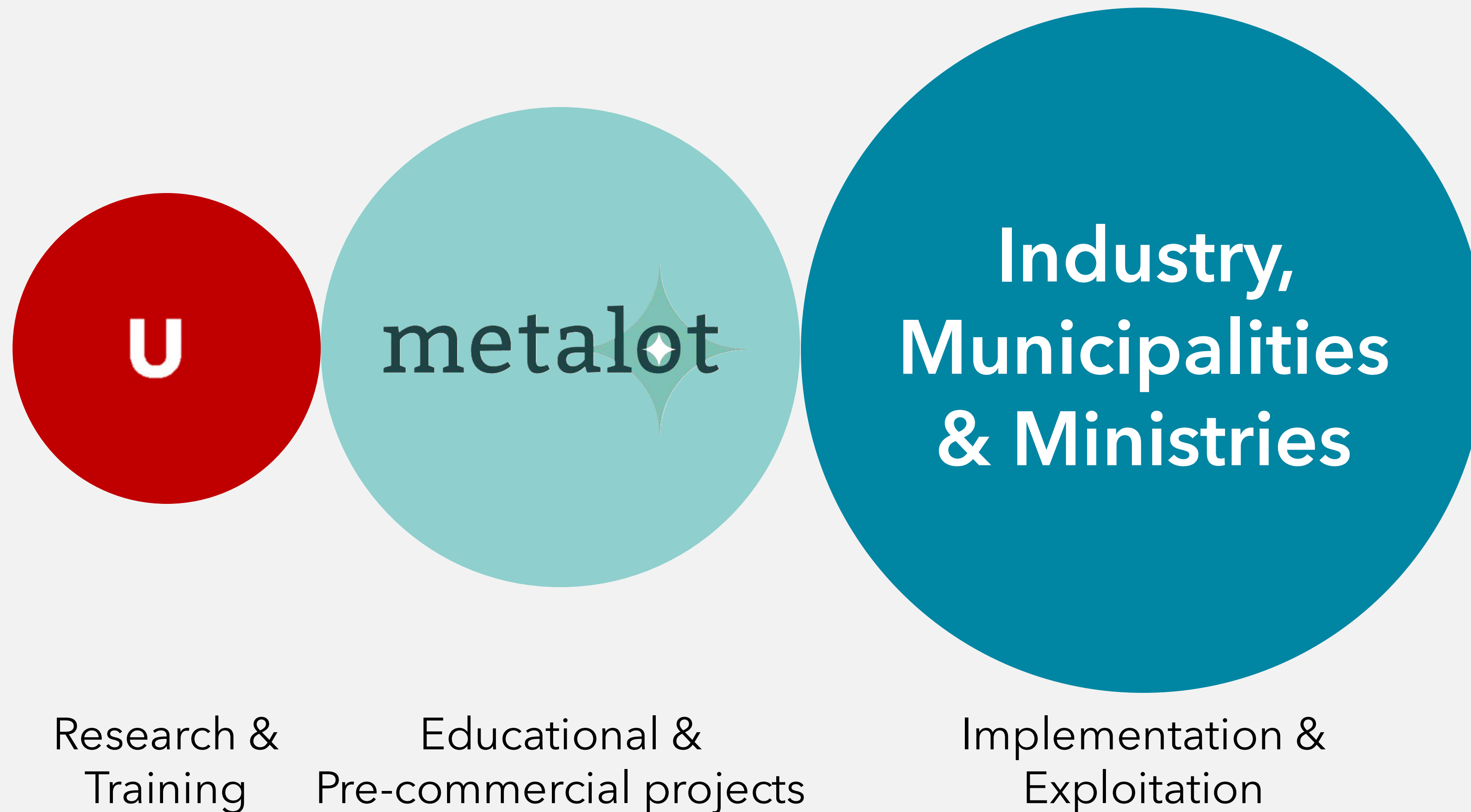
**Decision**

**Execution**

**Operation**



# Together we can scale it up





# Our technology has gained traction globally





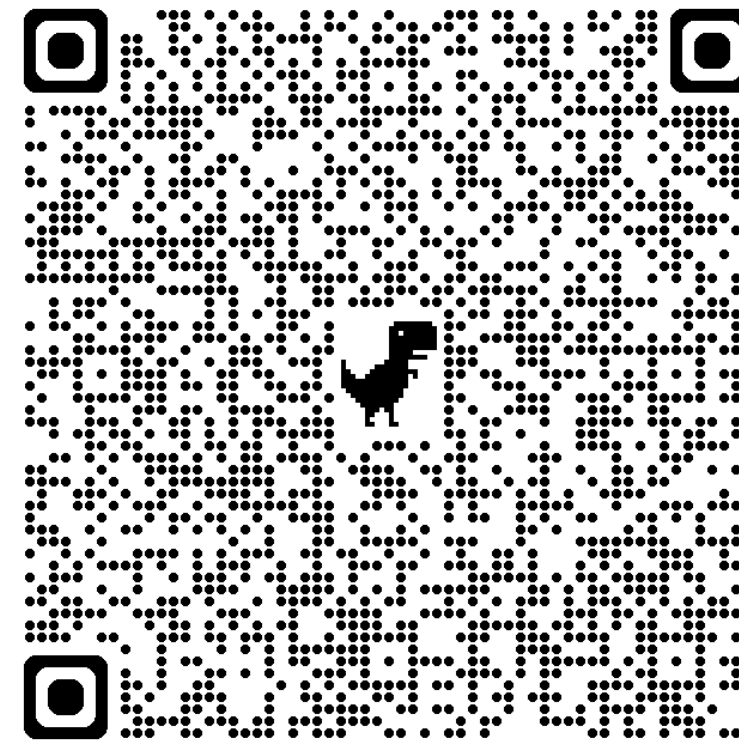
# Secure your seat

## Executive Program

- ✓ Introduction to Metal Power Technology
- ✓ Show casing achievements
- ✓ How MPT could work for you?
- ✓ The Science behind MPT
- ✓ Lab visits
- ✓ Business cases
- ✓ The global MPT-community
- ✓ Networking with peers & pioneers

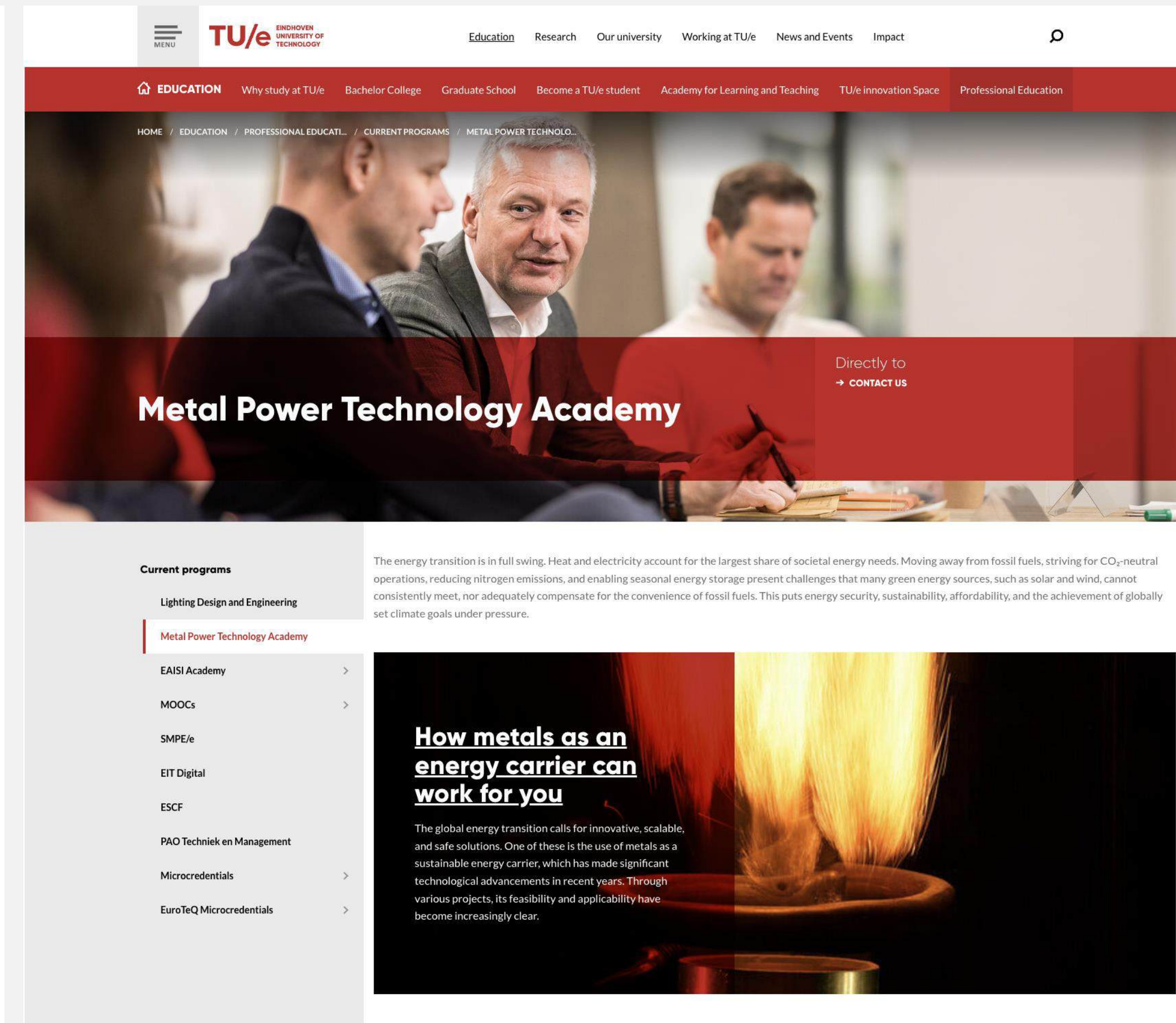
It's free

Sign up now



## Dates

**October 30** Governments  
**November 6** Industries





# Program

- 10:00 Welcome
- 10:15 An introduction to Metal Power Technology
- 11:00 R&D Achievements
- 11:30 How MPT could work for you?
- 12:00 Networking Lunch
- 13:00 The Science behind MPT
- 14:00 MPT Lab visits
- 15:00 Developing the Business Case
- 16:00 Guest speaker (t.b.a.)
- 16:30 Building a global MPT-community
- 17:00 What's next?
- 17:15 Follow up, Networking & Drinks
- 18:00 End of Program





# Iron Power Advisor (IPA)

Metalot@Work  
September 24, 2025

Mohammad Izadi





# Risk Management – Climate & Geopolitical

Short-term affordability can lock consumers and businesses into **long-term vulnerabilities**



- **Geopolitical risks**  
Exposure to supply insecurity & price shocks.
- **Climate risks**  
Higher CO<sub>2</sub> emissions, rising carbon costs, and failure to meet sustainability goals.

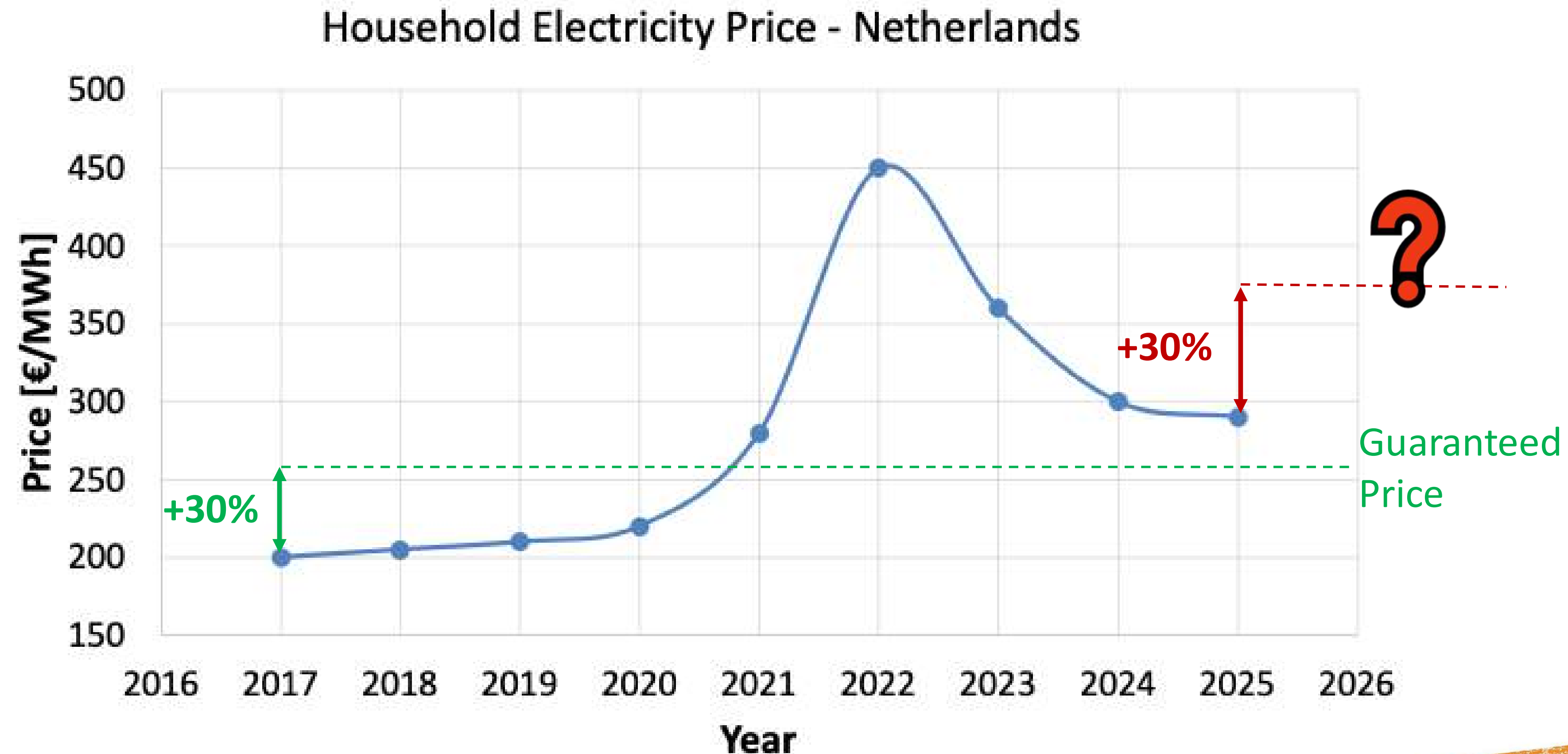
**Gas Dependence = Double Risk**

**AVOID**



# Risk Management - Price Insurance

Guaranteed prices provide predictability for households and businesses



- Stability supports budgeting, investment decisions, and risk management.

**MITIGATE**






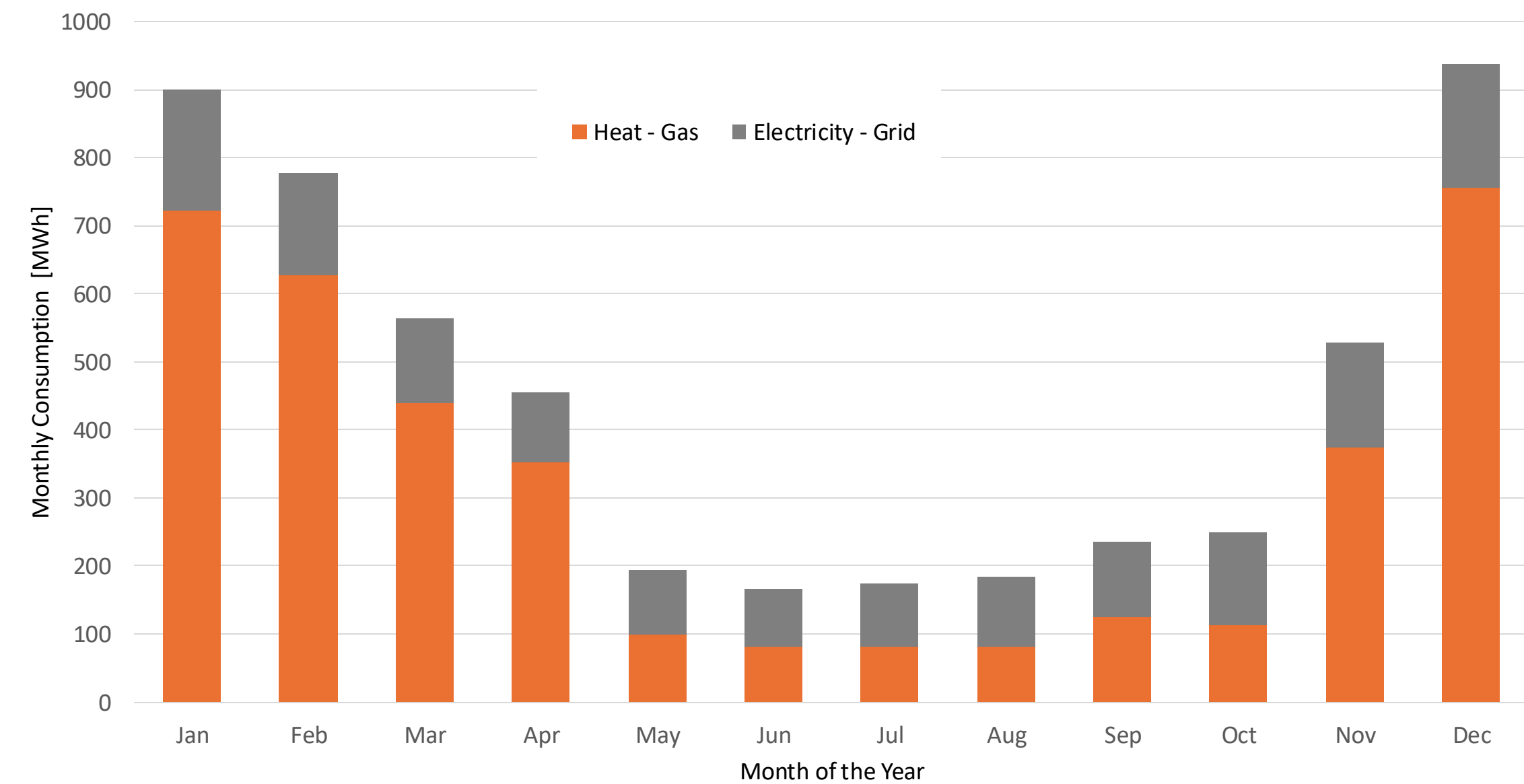
# A real case

A Village of 160 households in the Netherlands would like to have **Energy Security**

## Current Situation

Annual Gas Consumption (Heat)	3845 MWh
Annual Electricity Consumption	1515 MWh

-   Geopolitical Risks
-   Climate Risks
-   Price Security

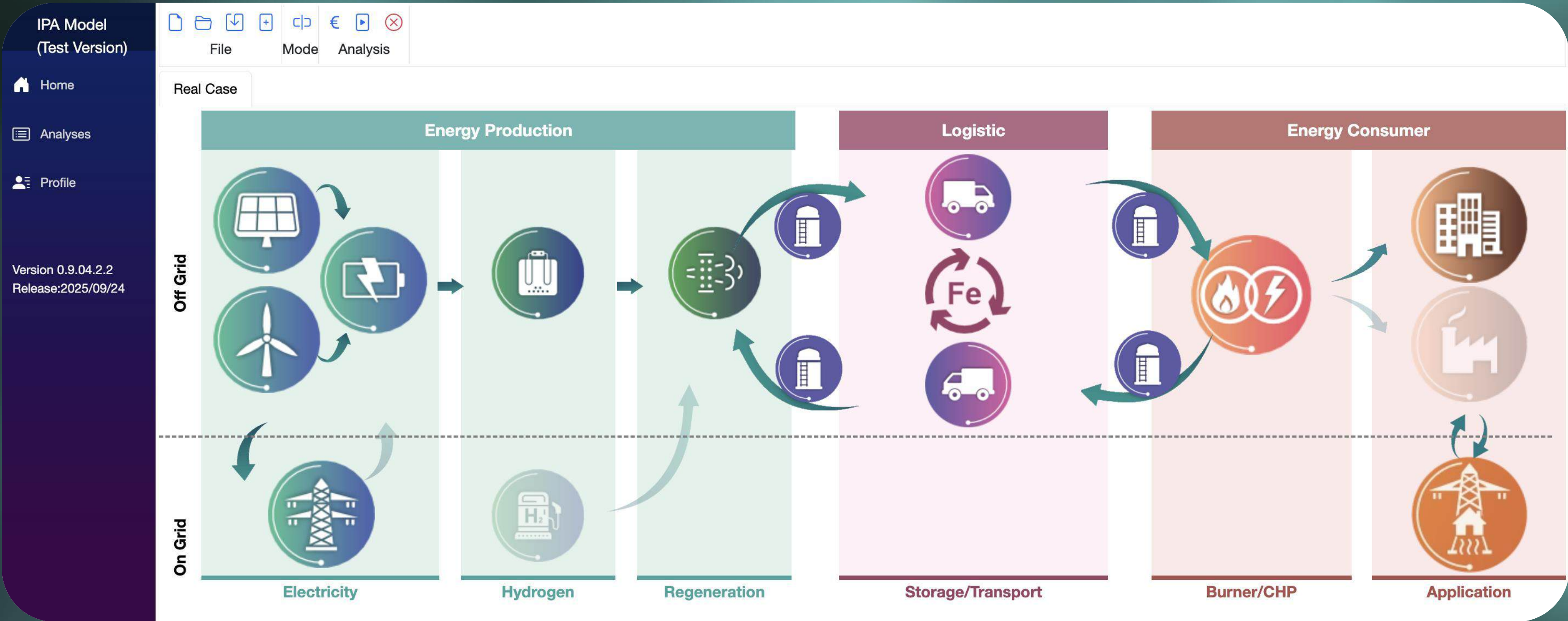


## Future Scenario

Is **Iron Power** a solution to Manage Risks ?



# End to End Techno-Economic Analysis





# Summary

## Energy Security by Iron Power



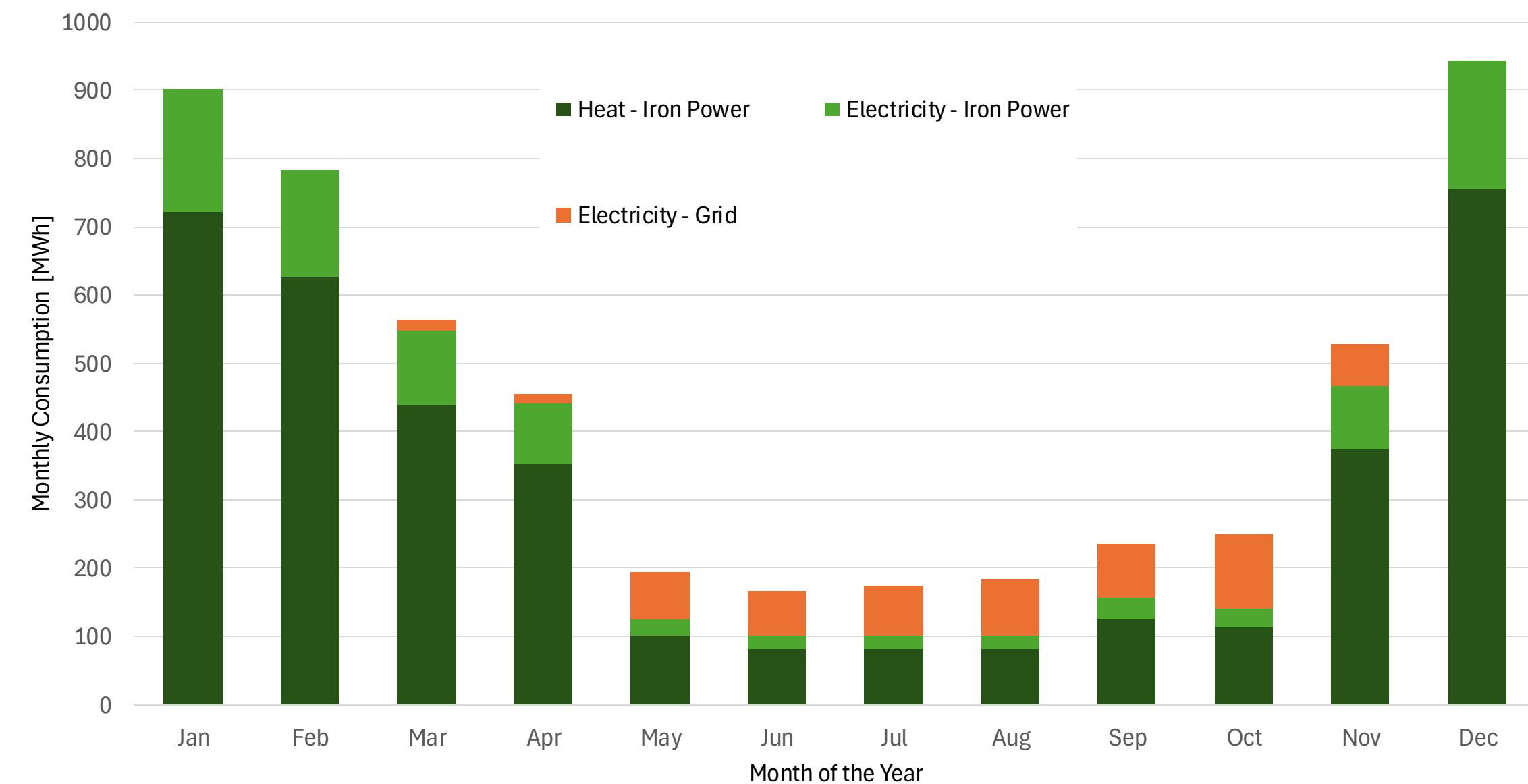
### Future Scenario

Annual Heat by Iron Power	3845 MWh
Annual Electricity Consumption	950 MWh
Annual Electricity Consumption	565 MWh

  Geopolitical Risks

  Climate Risks

  Price Security



**~90% Energy Security: No Geopolitical Risk, Fully Green & affordable long-term price Security by Iron Power**





# Looking for an End-to-End Solution?

We deliver innovative, scalable, and sustainable energy solutions.



info@armantech.nl  
mo.lzadi@armantech.nl

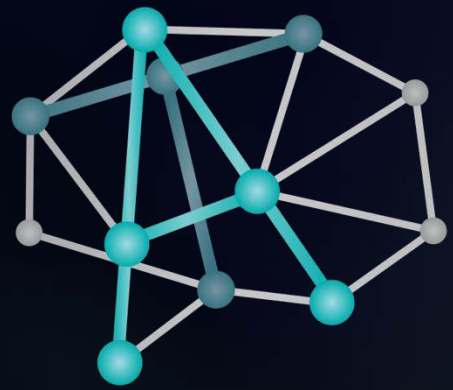


[www.armantech.nl](http://www.armantech.nl)



[www.linkedin.com/company/arman-tech](https://www.linkedin.com/company/arman-tech)





ARMANTECH

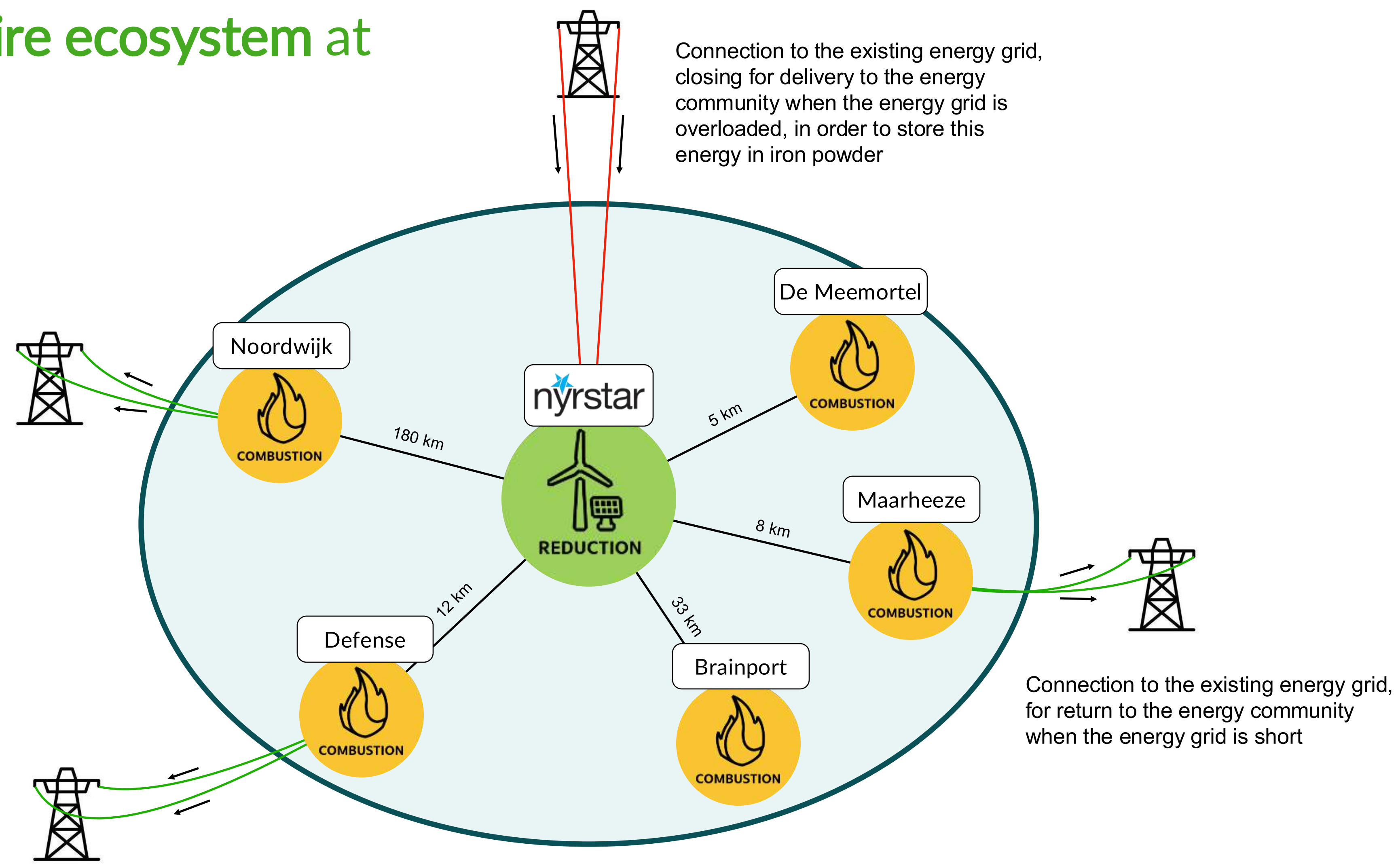
# Thank You



How 1MW...  
...becomes 25MW



But more importantly:  
lifting the entire ecosystem at  
national level





# How about the world turning metal power into a commodity



**European  
Union**



Ministerie van Klimaat en  
Groene Groei



# Metal Power Ambassador

Fons Sweegers

For your continuous effort to help gain  
visibility and traction of the Metal Power  
Technology



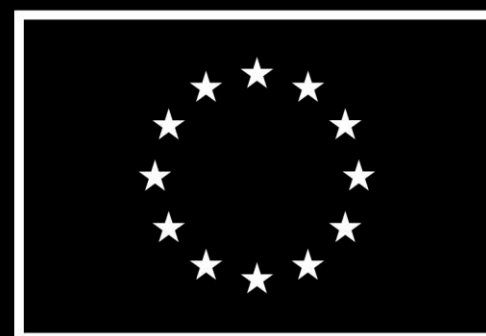


Questions?  
Discussions?  
...or network & drinks?



Thanks for  
your attention

Next session:  
12/12/2025



Co-funded by  
the European Union

**OPZUID** 

Europees programma voor transitiegedreven innovatie