



Radicale Elektrificatie

Pepsico project: Industriële warmte
zonder zorgen

06-02-2024 Stephen Abraham-Reynolds

De Industrie schakelt om

Eneco

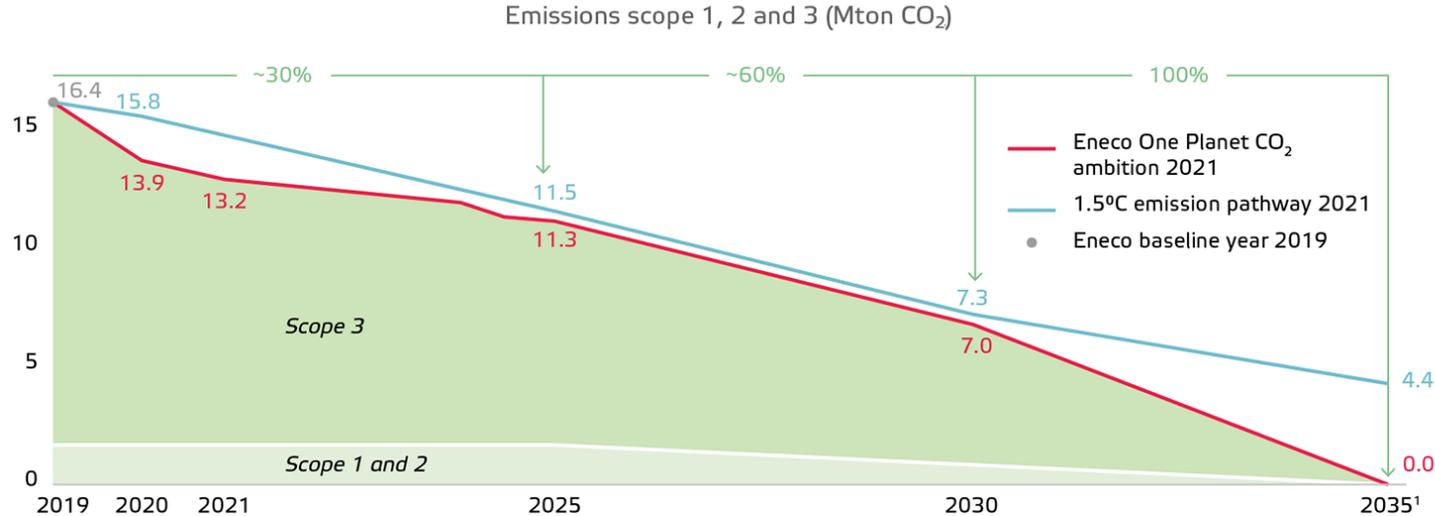
Everyone's
sustainable energy



To climate neutrality in 2035

Radical electrification of industry

Eneco's emissions on the road to climate neutrality by 2035



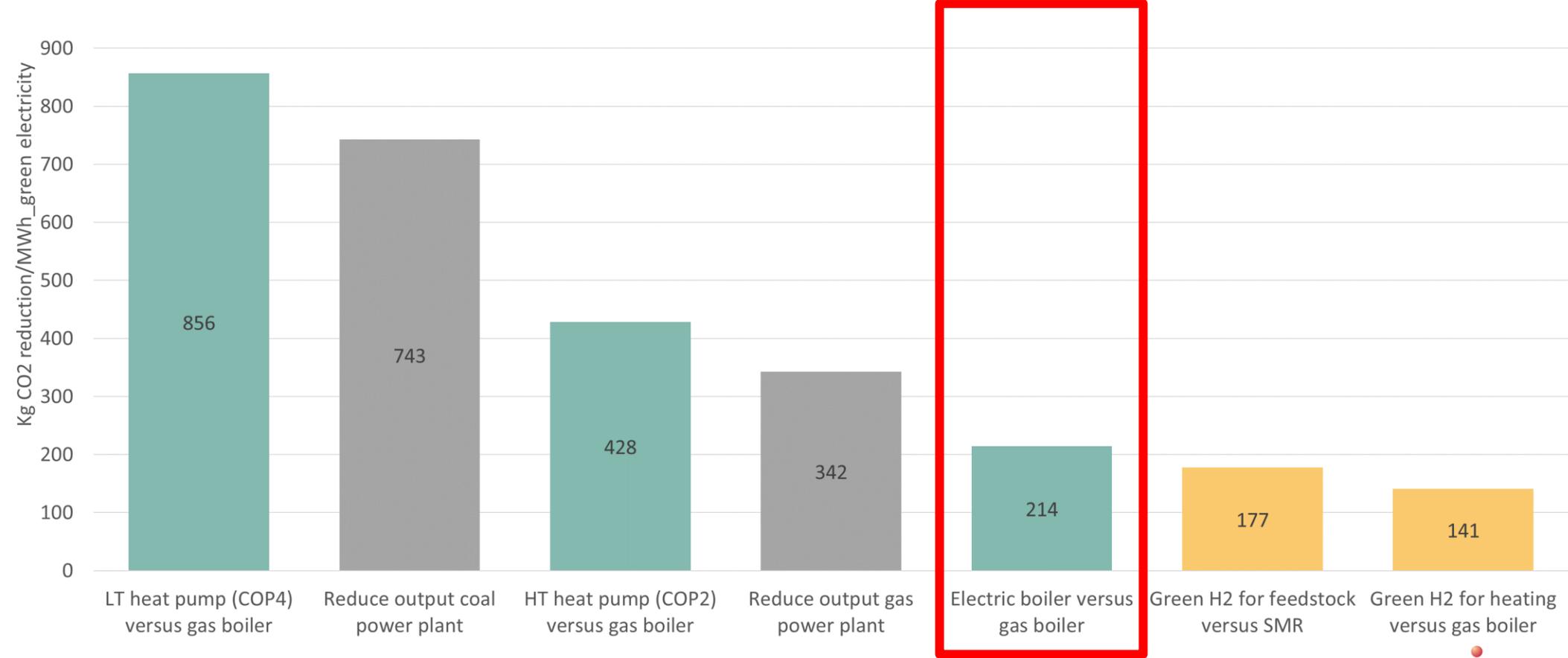
¹ Approximately 0.9 Mton (6%) from a total of 13.9 Mton of CO₂ emissions will be temporarily compensated by 2035.

We want to achieve our climate ambition through three climate actions:

- 1. Radical electrification:** large-scale electrification of industry, mobility and the built environment with exclusively renewable energy from new wind and solar farms.
- 2. Phasing out natural gas:** by converting or closing our gas-fired power stations and making natural gas-powered homes and buildings more sustainable with home insulation, (hybrid) heat pumps and heat networks.
- 3. Accelerating sustainable heat:** through innovation and investment in sustainable sources such as geothermal, aquathermal, electrode boilers, heat and cold storage (HCS), green gas and green hydrogen.

Decarbonisation potential of Eboiler/TESS

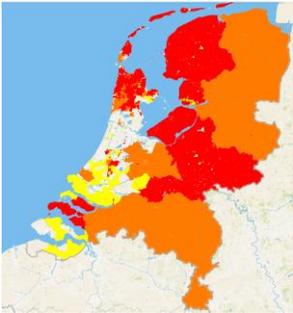
Effectiveness of decarbonisation measures [in kgCO₂ reduction/MWh]



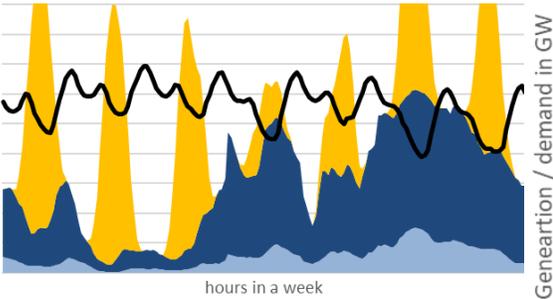
How to apply Radical Electrification?

Challenging environment with allot of moving parts.

Congested grid



Matching Renewable Energy Production



Energy price volatility



Innovative and new Technology

A collection of logos for various energy technology companies: CESAR LUMEN, SIEMENS Gamesa RENEWABLE ENERGY, EnergyNest, SaltX Technology, THERMINOL Heat Transfer Fluids by Eastman, KRAFT BLOCK, and ELEMENT16 TECHNOLOGIES.

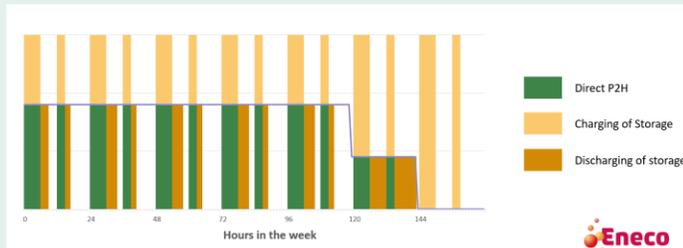


Main drivers for PepsiCo Project

Build experience and expertise and standardize!

1. Radical Electrification

- PepsiCo sustainability targets:
 - 2030 – 75% CO2 reduction
 - 2040 – 100% CO2 reduction
- Challenging heat demand profile



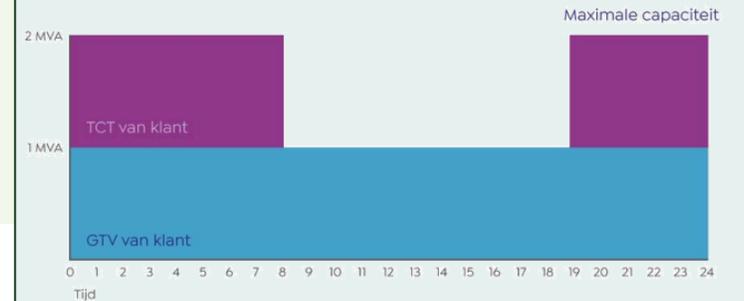
2. NOx permit space benefits

- Main driver for PepsiCo project.
- Alleviate restrictions imposed on industry growth ambitions.



3. Flexible grid contracts

- Stacking of different grid contracts.
- Partly firm capacity and Non-Firm capacity (NFA).
- Discounts up to 50% on grid fees.



Specific to NL



Radical Electrification PepsiCo

First industrial-scale TESS in the World



Charge capacity

9 MW

Direct P2H

6.6 MW



Net Storage Capacity

34 MW

Discharge capacity

9 MW

Efficiency

>95%

Gross Storage Capacity

70 MW



CO2 reduction

8,500 tonnes of CO2 saved per year



Gas saving

4.5 million Nm³ per year natural gas



This project was made possible in part by a DEI+ subsidy from the Dutch Min. E.Z.K.



Ministerie van Economische Zaken
en Klimaat



PepsiCo project enables future high impact projects

Flex P2H derisks market exposure of RES production

Thermal Energy Storage Systems



Lessons learned Pepisco



Overcoming challenges



Seizing the opportunities

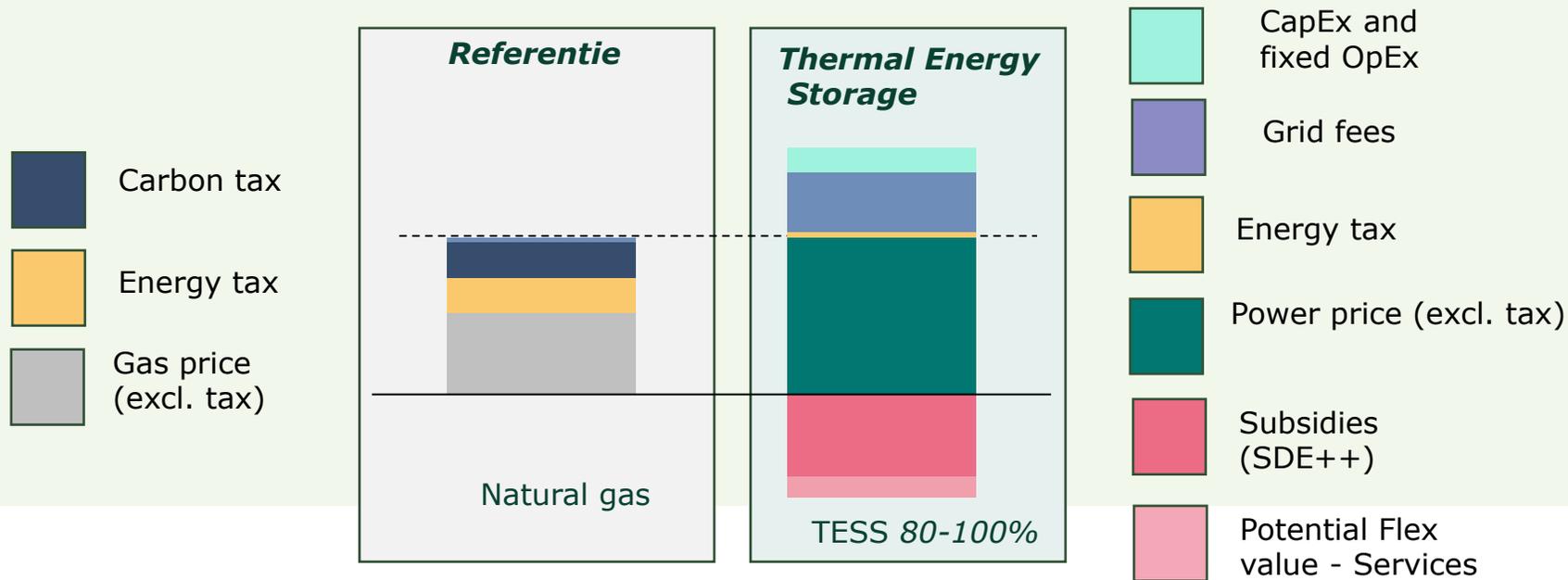


Deliver the plan



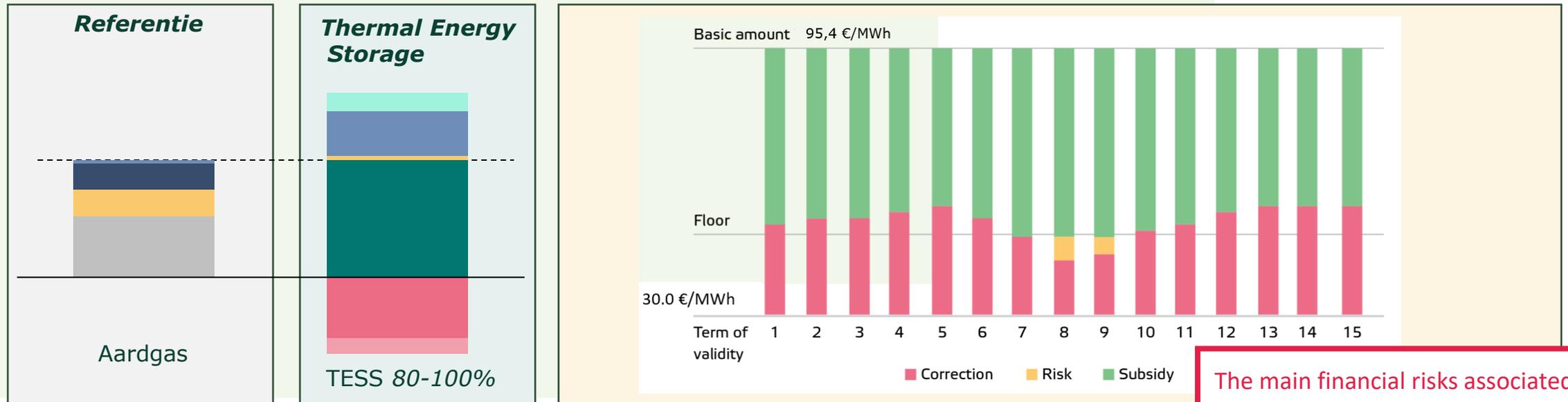
Risks associated with complex business case are shared between Eneco and Client

Example levelised cost of heat [LCOH]



SDE++ Subsidy enables business case

Levelised cost of heat [LCOH]



The main financial risks associated with the SDE++ revenue:

High gas and/or CO2 prices during the project life reduce the subsidy payout



From advice to operation

Eneco can help you in five steps



1. Advice

- Exploratory advisory meeting
- Quick scan of site
- Indicative business case and proposal for feasibility study
- Agreements about the collaboration:
Letter of Intent or Partnership Agreement

2. Feasibility + Design

- Concept Study
- Indicative business case
- Permitting and subsidy strategy
- Main points in future contract, including steam price:
Heads of Terms

3. Development

- Permit application or environmentally neutral change
- Basic engineering
- Permitting and subsidy applications
- Contracting

4. Implementation

- Permits ready and SDE++ granted
- Agreements about PR and marketing
- Construct installation
- Commissioning

5. Operation

- Optimized dispatch of flexible P2H asset for 15 years.

Together with Eneco

Eneco understands the challenges of the industry. With our experience in the energy transition, we can help the switch to more sustainable heating and cooling solutions, green electricity and smart services.

Lower emissions and lower costs

www.eneco.nl/grootzakelijk

Curious about suitable solutions for your project?

We'd be happy to come see you and, of course, you are also very welcome to visit us at our Eneco World office in Rotterdam Alexander.

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Q&A: Radicale Elektrificatie

RVO Online inspiratour 6 februari

Question

What is the footprint and height of this design?

Answer

On the top of my head for TESS with 2x 4.5 MW power, its 20m x 20m x 12m.

Q&A: Radicale Elektrificatie

RVO Online inspiratour 6 februari

Question

Not every factory is big enough to make this interesting.

From which energy consumption / Steam consumption per month/year is this interesting? (I understand that this will be different per situation, but a rough estimate?)

Answer

We see the potential already for factories with an average heat load of 5-10MW and yearly heat demand from 25 GWh. But as you stated it depends on a lot of other factors.

Q&A: Radicale Elektrificatie

RVO Online inspiratour 6 februari

Question

By storing heat, could you prevent your grid fees from rising with the grid operator because you can purchase power for your e-boiler at times when you are below your contracted value with the grid operator?

Answer

In theory yes, but this requires that your current electrical consumption has a lot of high peaks. For most industry this is rather flat. We see more potential for reduced grid fees with Alternative Transport contracts (NFA/TCT) in combination with storing Heat in a TESS.

