



Inovacije za razogljičenje energijsko  
intenzivne industrije z uporabo OVE  
primer Steklarne Hrastnik

Gorazd Krese  
Steklarna Hrastnik

7. junij 2023

**HRASTNIK1860**

# About us

Hrastnik1860 is developing and manufacturing world-class engineered glass products, distinguished by some of the clearest glass in the world.

**Hrastnik1860** is based in Slovenia and offers wide range of products that include **premium and super premium glass containers**, primarily dedicated to the spirit, perfumery and cosmetics market.

It focuses on flexible and excellent service, short time to the market and innovative tailor-made solutions.

1

**285 t** daily production capacity

2

**600** employees

3

export to more than **50** countries worldwide

4

**full service** solution

5

**160 years** of tradition

What  
We  
Do



**SPIRIT** GLASS  
PACKAGING



**PREMIUM WATER**  
GLASS PACKAGING



**PERFUMERY** AND  
**COSMETICS** FLACONS

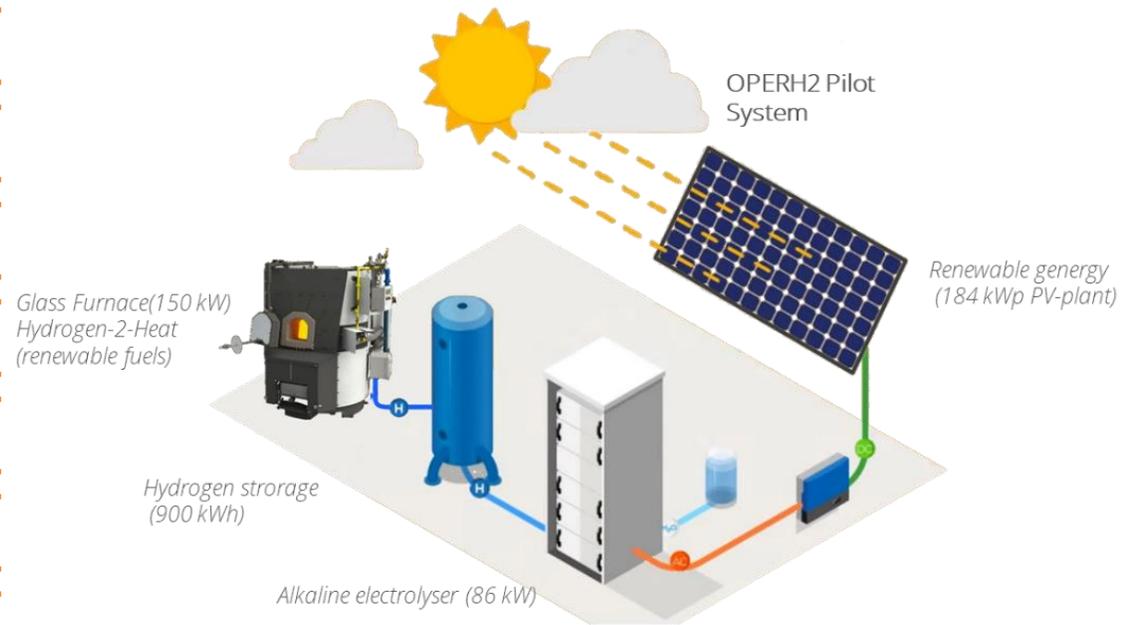
# References



# History

## 160 YEARS OF TRADITION AND DECARBONISATION

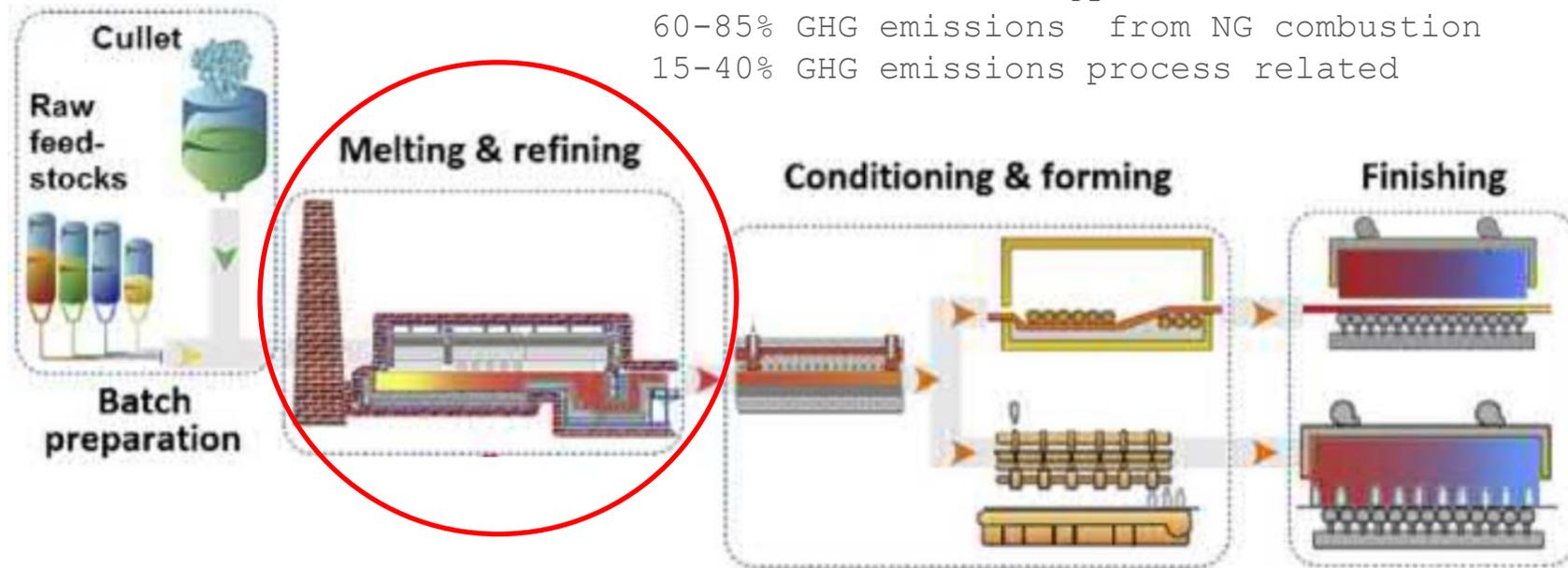
- 1860 • coal firing
- 1873 • coal generated gas firing
- 1966 • heavy fuel oil firing
- 1972 • electric melting (boosting)
- 1976 • natural gas firing
- 2013 • oxy-fuel combustion
- 2018 • local RES generation
- 2020 • oxygen plant
- ... • beyond SOA



# Motivation for innovation

- European green deal
  - 2030: GHG emissions reduction  $\geq$  55% (1990)
  - 2050 Climate neutrality
- Glass manufacturing an energy intensive process

75-85% of total energy use  
60-85% GHG emissions from NG combustion  
15-40% GHG emissions process related

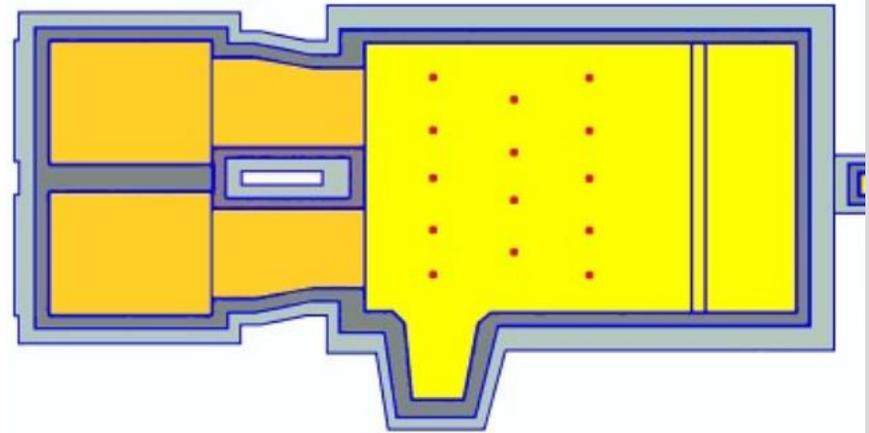


# State-of-the art

End-fired regenerative furnaces

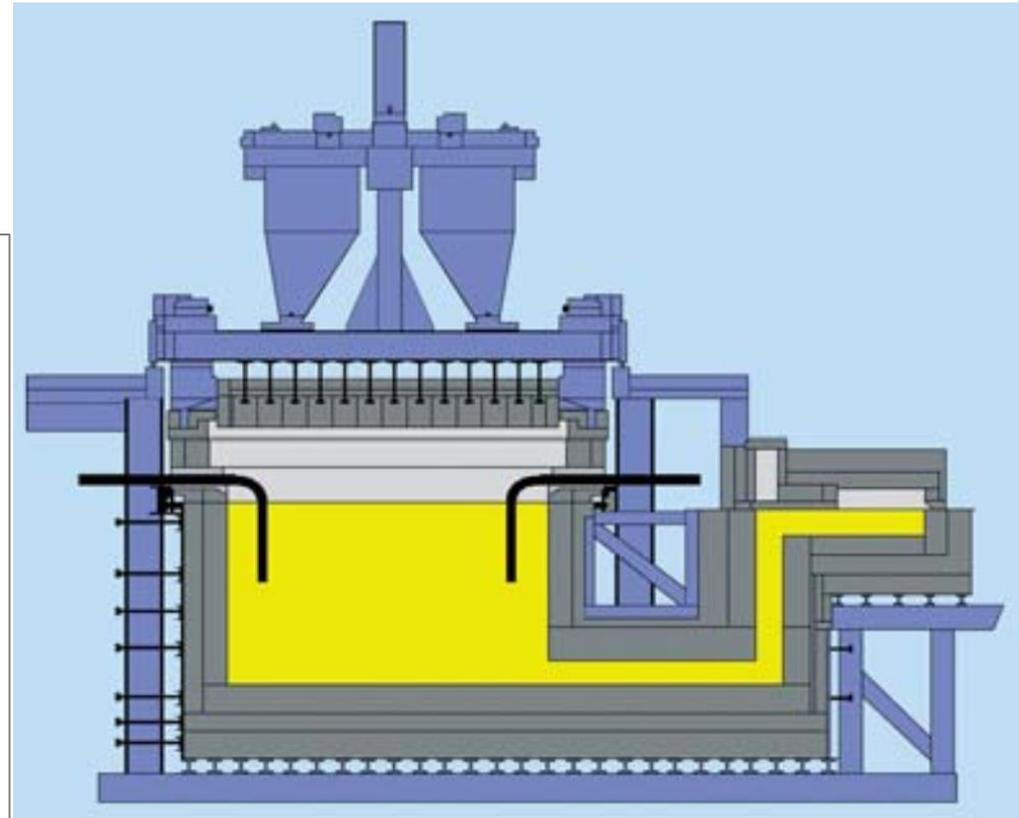
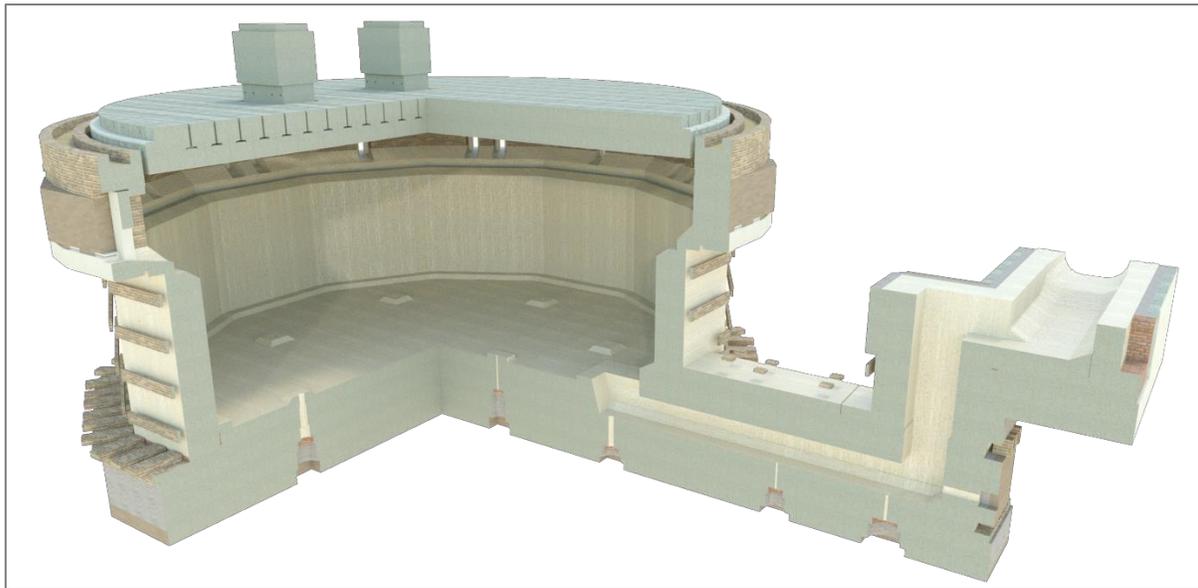


<10% boosting



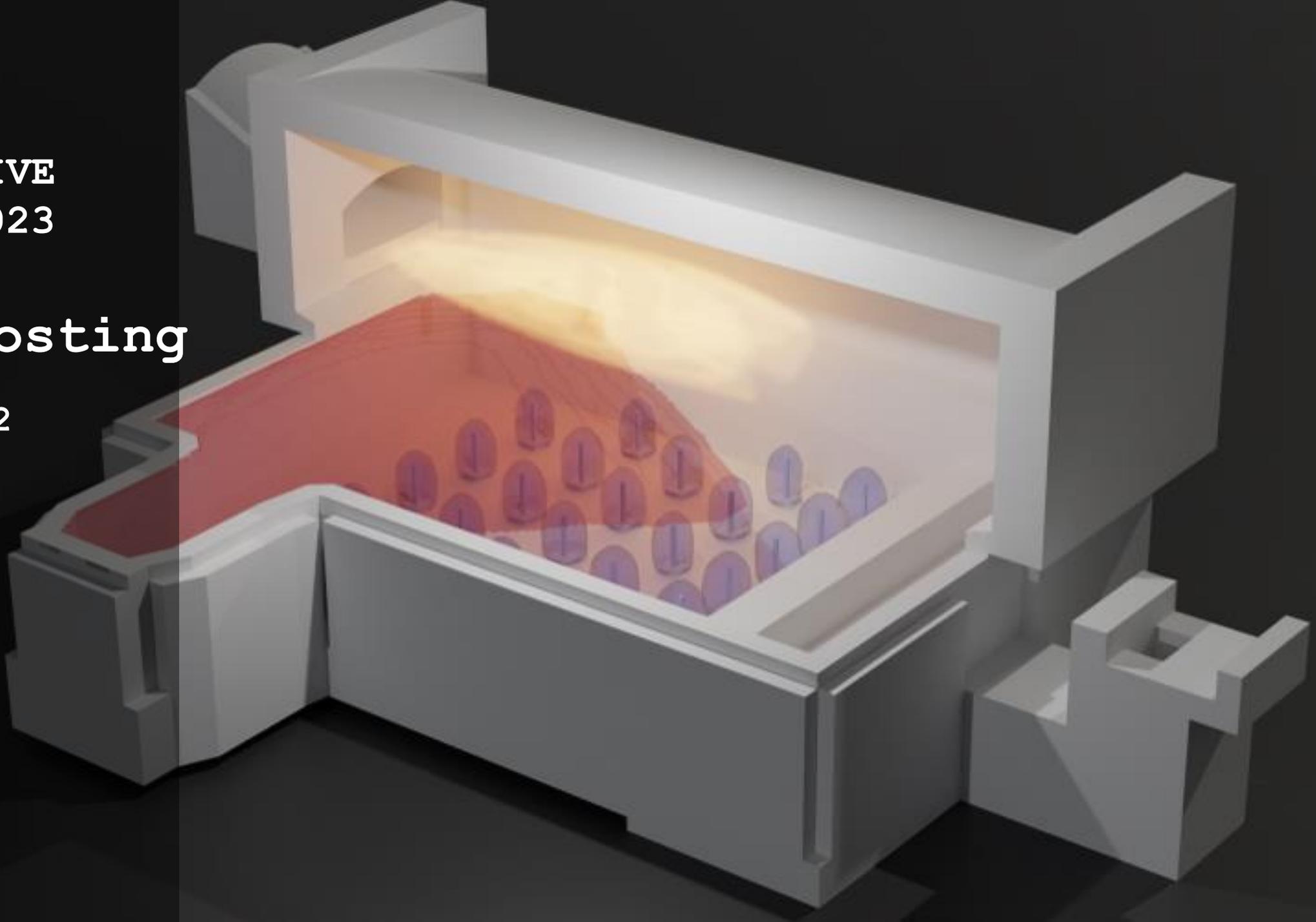
# State-of-the art

All-electric furnace



**HYBRID  
REGENERATIVE  
FURNACE 2023**

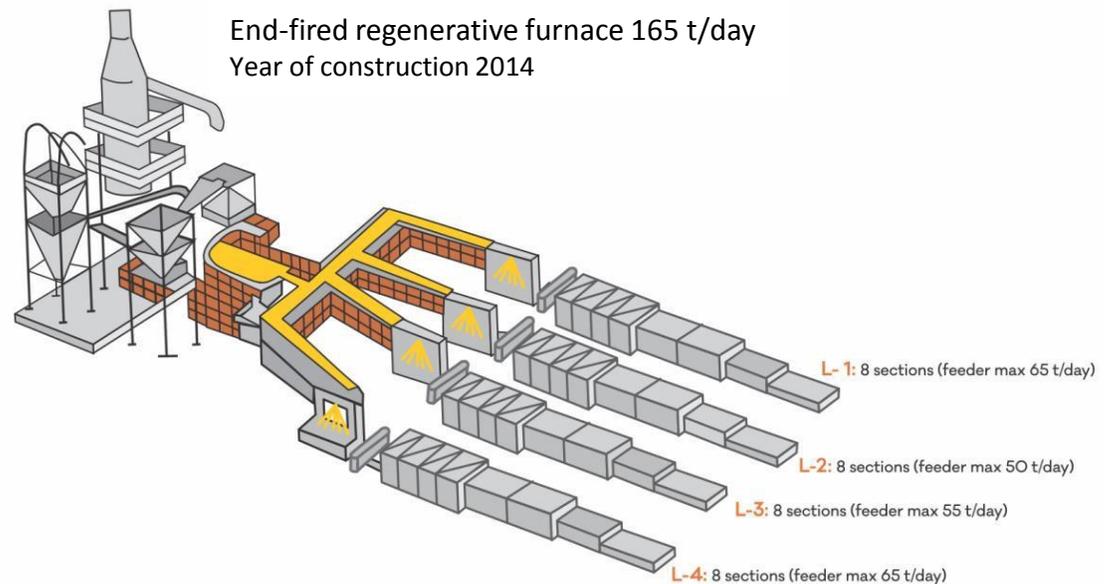
**>40% boosting**  
**-35% CO<sub>2</sub>**  
**-50% NG**



**HRASTNIK1860**

# Hybrid regenerative furnace

- Implementation in existing production site in 2023:
  - extra white flint glass ((super)premium quality)
  - 170 tons of glass per day
  - from <10% to >40% electrical melting



# INNOVATION FUND

## BEAR: Hybrid regenerative glass furnace

- First-of-a-kind hybrid end fired regenerative furnace
  - electric melting share >40% (SoA <10%)
- 50% natural gas consumption reduction
- 35% GHG emissions avoidance
- Alignment of glass melting with availability of RES
- Higher operational flexibility and resilience
- Improved job security for 600 employees (5% region, 10% GDP)



Co-funded by  
the European Union

### COORDINATOR

Steklarna Hrastnik d.o.o.

### BENEFICIARY

Kemijski inštitut (NIC)

### LOCATION

Hrastnik, Slovenia

### SECTOR

Glass, ceramics and construction material

### GHG EMISSION AVOIDANCE

0.1 Mt CO<sub>2</sub> eq

### AMOUNT OF INNOVATION FUND GRANT

EUR 2 238 000

### RELEVANT COSTS

EUR 3 730 000

### STARTING DATE

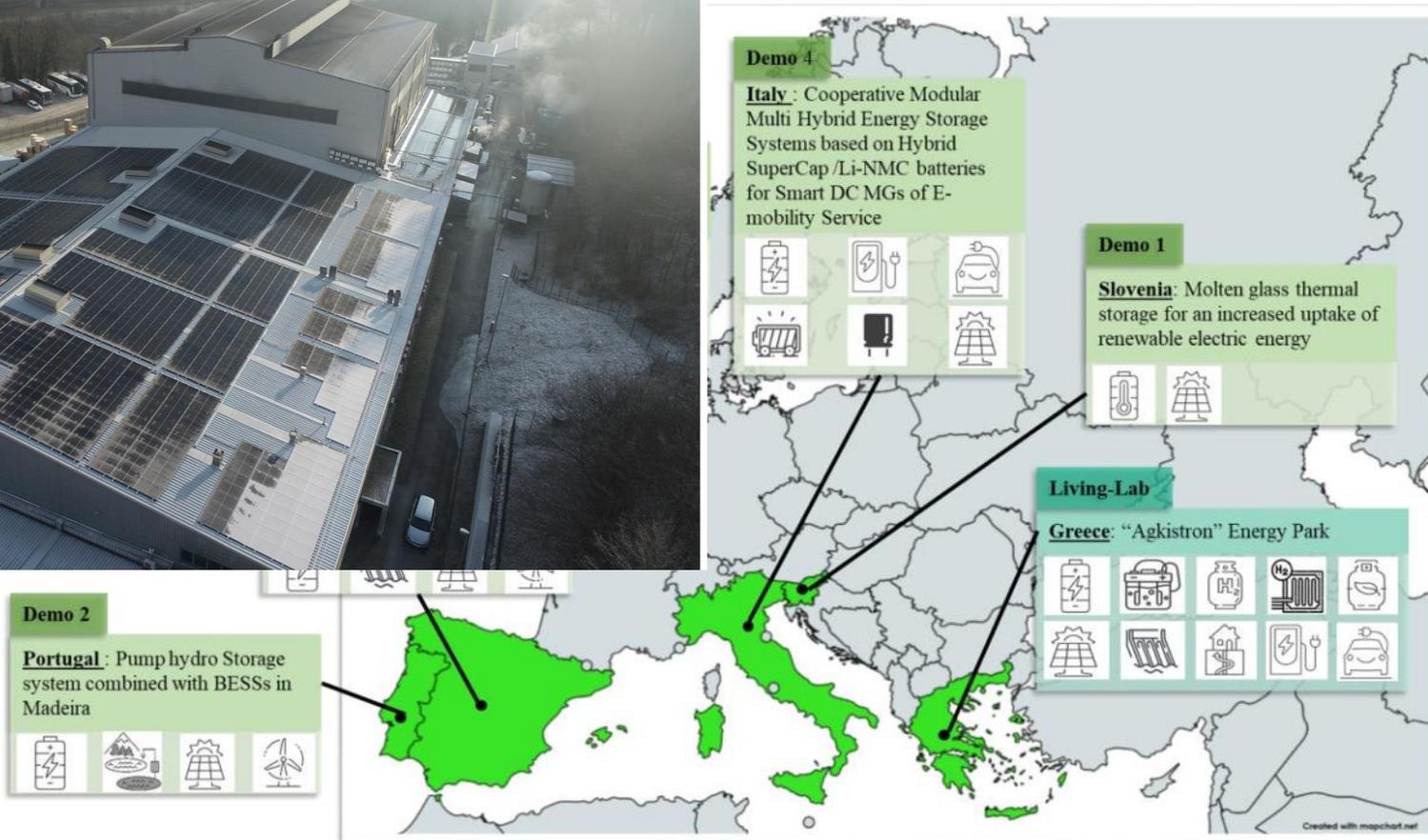
1 September 2022

### PLANNED DATE OF ENTRY INTO OPERATION

Q1 2025

# Horizon Europe i-STENTORE

innovative Energy Storage TEchnologies TOwards increased Renewables integration and Efficient Operation



# Horizon Europe H2GLASS

SSC InnovFund application:

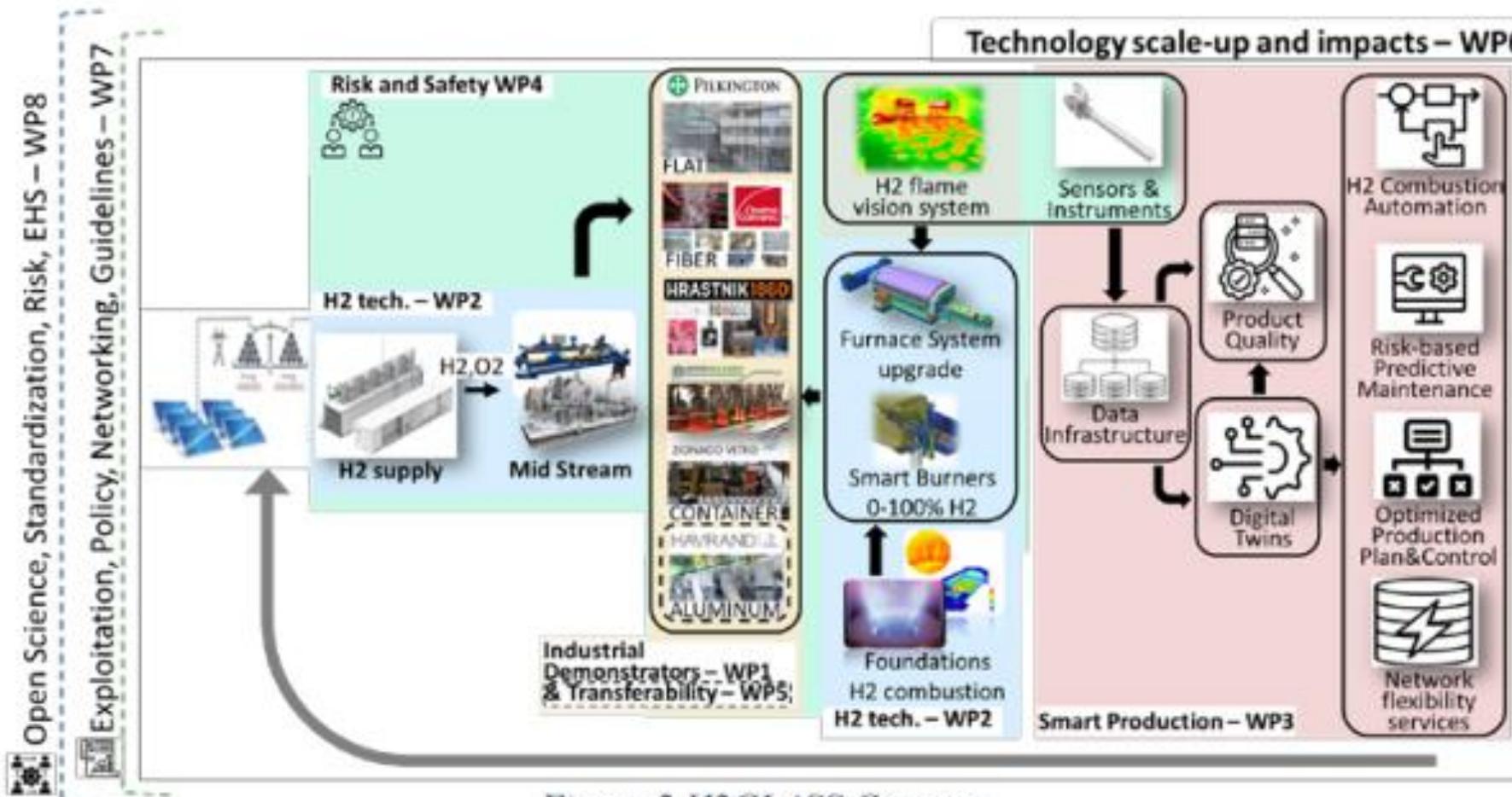
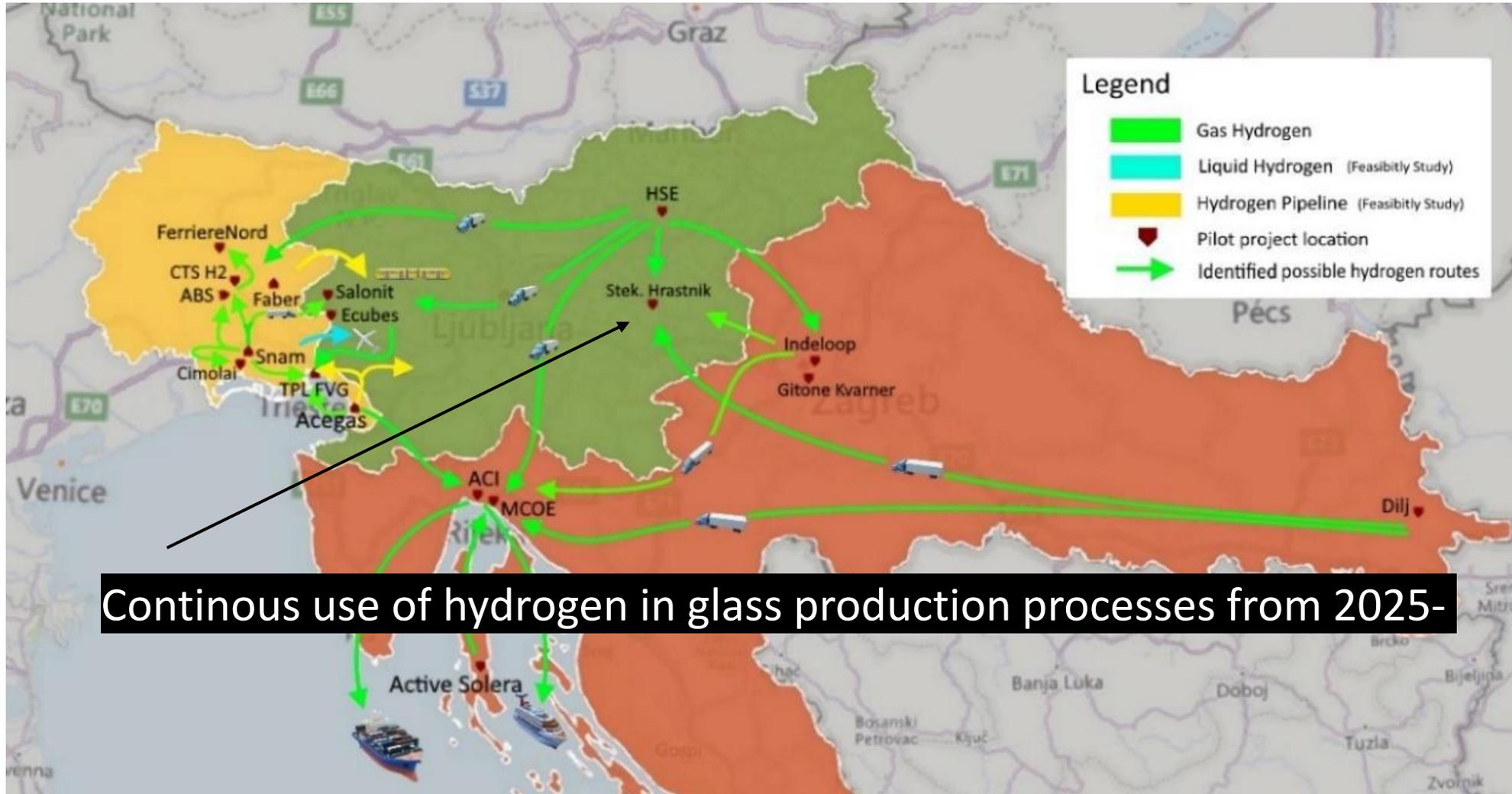


Figure 2 H2GLASS Concept

# NAHV Project

North Adriatic hydrogen valley is one of the first EU transnational hydrogen valleys



Co-funded by  
the European Union

Continuous use of hydrogen in glass production processes from 2025-

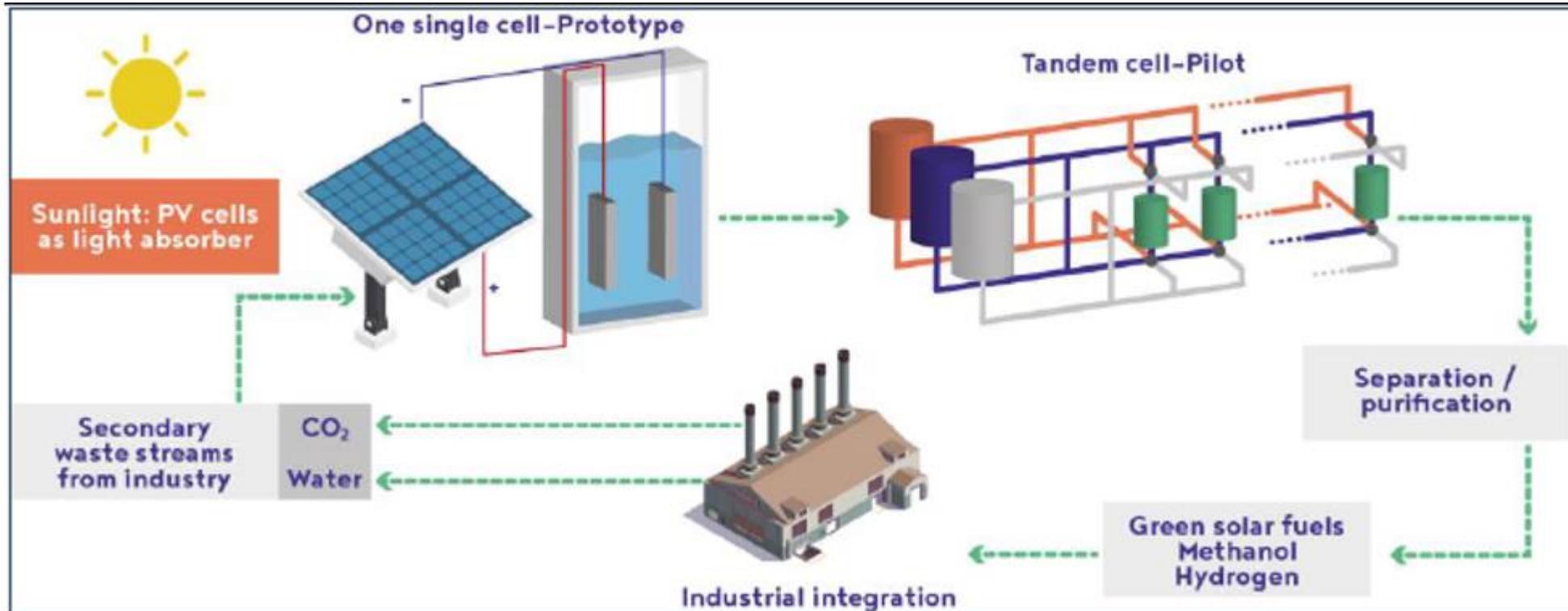
# Horizon Europe PHOTOSINT

PHOTOelectrocatalytic systems for Solar fuels energy INTEgration into the industry with local resources

**PHOTOSINT**



Co-funded by the European Union



# Product innovation

n

LIGHTWEIGHTING

SMART SOLUTIONS

E.BOTTLE

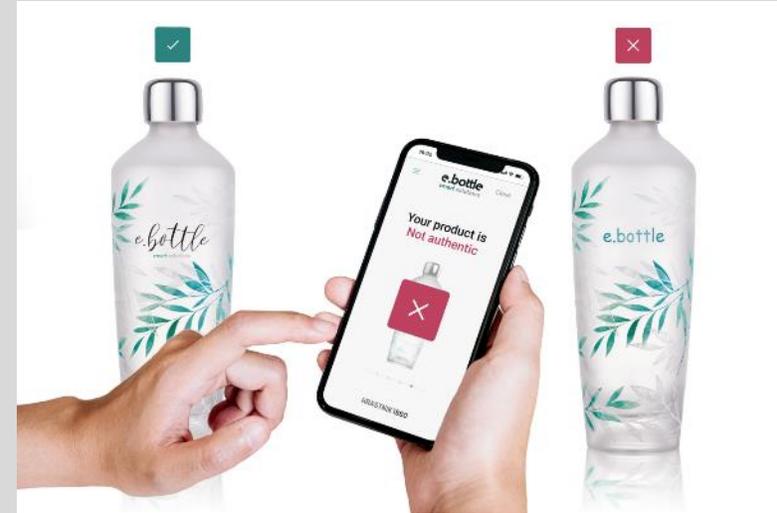
E.CAP

E.LABEL

SUSTAINABLE SOLUTIONS

DECOR SMART

FUNCTIONALITIES



e.bottle  
smart solutions



GERMAN  
INNOVATION  
AWARD '21  
GOLD



reddot winner 2022



# TRANSFORMING GLASS PACKAGING INDUSTRY



Q & A

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