

HYBRID FURNACE FOR FLAT GLASS: VOLTA MID-SIZED PILOT

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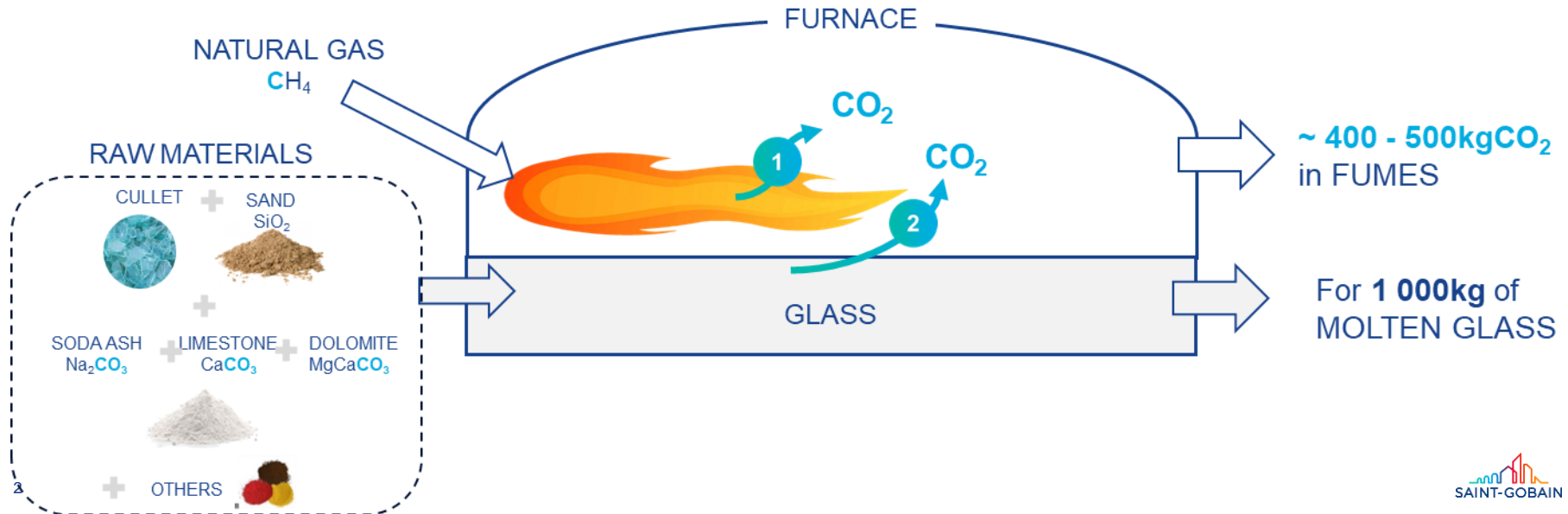
GLASS MAKING & CO₂ (SCOPE 1 & 2)

CO₂ emissions of 1 Saint-Gobain Glass plant per year

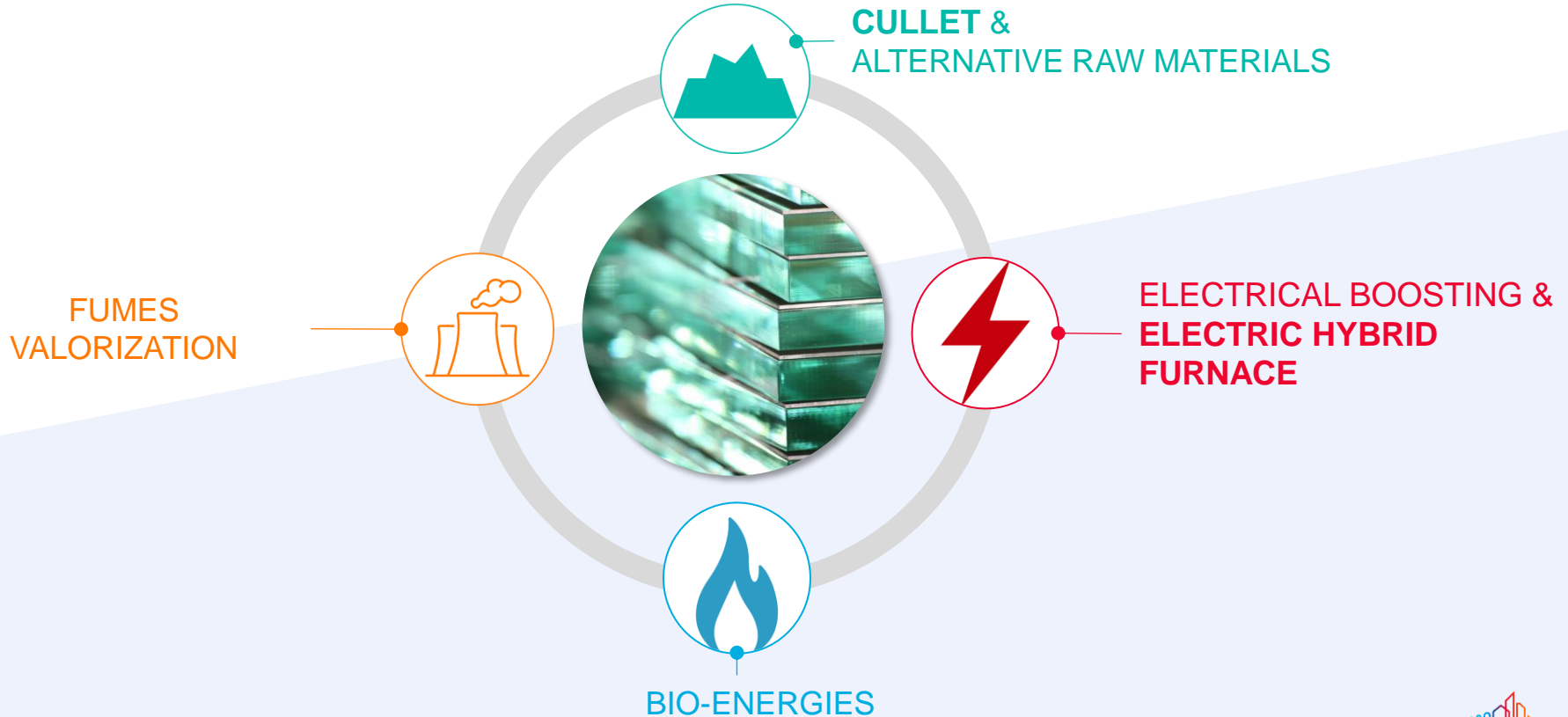
~ 100kt

TWO SOURCES OF CO₂ FROM GLASS MELTING

- 1 COMBUSTION (2/3)
- 2 DECARBONATION OF RAW MATERIALS (1/3)



MAIN LEVERS FOR DECARBONATION (SCOPE 1 & 2)



HYBRID ELECTRIC-GAS FURNACE

MAIN PAIN POINTS



Glass quality is the main pain point of high level of electrification



STRATEGY TO DELIVER



Joint development with AGC on a 90t/day **pattern glass** production line to **validate concept & glass quality**



VOLTA HYBRID ELECTRIC-GAS FURNACE

BREAKTHROUGH TECHNOLOGY TARGETS



NEW FURNACE DESIGN

- Combining experience of AGC & Saint-Gobain for:
 - Electrical melting expertise
 - Oxy-combustion expertise
 - Flat glass quality for building & automotive application



PYRAMIDE DU LOUVRE



VOLTA PROJECT
JDA with AGC



VOLTA PROJECT
Start of Production



Funded by the European Union
Emissions Trading System
Innovation Fund

VOLTA project is supported by European Innovation Fund

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KEY INSIGHTS AND TARGETS

- Novel furnace design **50% electricity / 50% oxy-combustion**
- Circularity via a high **cullet recycling rate of 80% on average**
- **Scope 1 & 3 emissions avoidance of ~75%** while achieving float glass quality



NEXT STEPS

- Novel design is being tested in **Barevka (patterned glass, CZ)**
- During **36 months we will test float glass quality** and assess scalability



VOLTA project is supported by European Innovation Fund

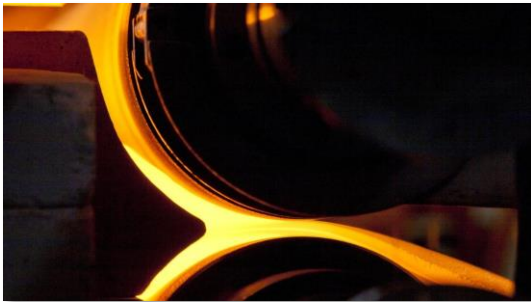
VOLTA PROJECT SITE WORK & START OF OPERATION



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VOLTA PROJECT TIMELINE

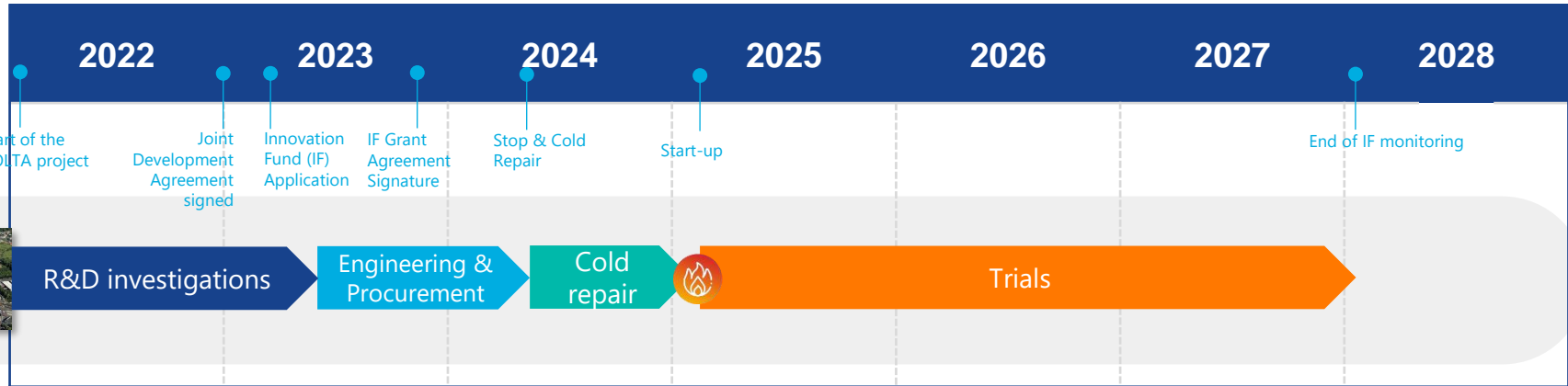
5 YEARS PROJECT TO DELIVER DISRUPTING TECHNOLOGY



VOLTA pilot line: **production started Feb. 2025**



End of trials by the end of 2027



Next steps:

- Trials to reach **float-glass quality**
- When successful, **extrapolation** toward float furnaces (>500T/d)

MERCI