

2050 FLAT GLASS INDUSTRY CLIMATE NEUTRALITY VISION:

THE START OF THE JOURNEY

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GLASS FOR EUROPE

ECEEE


CLIMATE URGENCY
A GLOBAL MATERIAL
EUROPE'S ANSWER
GLASS FOR EUROPE



EUROPEAN CLIMATE POLICY...

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OVER 20 YEARS OF CLIMATE POLICY BASED ON KEY PRINCIPLES

- REDUCE CO_2 EMISSIONS FROM ALL ECONOMIC ACTIVITIES
- ENERGY EFFICIENCY / CONSUMPTION REDUCTION
- POLLUTER-PAY PRINCIPLE APPLIED TO INDUSTRY
- DECARBONISATION OF THE ENERGY SECTOR
- RESSOURCE EFFICIENCY
- CARBON BORDER ADJUSTMENT MECHANISM NEW
- STIMULATING GREEN INVESTMENTS NEW
- CLIMATE DIPLOMACY
- SUPPORT TO INNOVATION
- ADAPTATION TO CLIMATE CHANGE

FLAT GLASS IS KEY for climate-neutrality, circularity, digitalisation, safety, health, innovation

- **Energy efficient** glazing solutions for **buildings**
- More **efficient and interactive glass solutions,** which preserve security, offer new functionalities and contribute to **clean and automated mobility**
- Extra clear glass to capture more **solar energy**
- Innovative **IT integration** to support **digitalisation** with touch-screen, smart mirrors, solar-heat modulation, glazing enhancing radio and telecom signals, invisible sensors and radars, etc.
- Specific glass solutions with **hygienic properties** for use in hospitals and most exposed environments
- **Recyclable** product with potential for enhanced collection



THE TRADE ASSOCIATION'S DUTY to support the flat glass sector

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AGC · GUARDIAN GLASS · NSG GROUP · SAINT-GOBAIN

AGN · ASSOVETRO · BF Bundesverband Flachglas · BV GLAS · UDTVP Union Des Transformateurs de Verre Plat · FÉDÉRATION DE L'INDUSTRIE DU VERRE VERBOND VAN DE GLASINDUSTRIE · Bouwend Nederland · GGF · ZWIĄZEK PRACODAWCÓW POLSKIE SZKŁO



The European flat glass sector

takes it as its role to produce at a competitive price the **materials essential for renovating Europe's buildings, for supporting the clean mobility transition and for increasing the share of renewable solar energy** in Europe.

While already providing net carbon-avoidance products, the flat glass sector is looking into ways **to massively scale up its contributions to the EU's carbon neutrality objective**, including by developing novel ways to lower its industrial emissions.

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DELIVERING THE FLAT GLASS PRODUCTS WHICH ARE ESSENTIAL FOR EUROPE'S TRANSITION TO CLIMATE-NEUTRALITY

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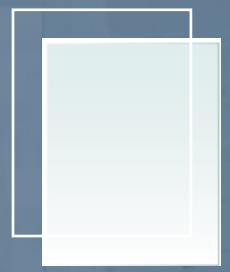
FLAT GLASS AND BUILDINGS

-40%

High-performance glazing can help cut nearly 40% of CO_2 emissions from buildings in the EU.



INSULATING GLASS UNITS



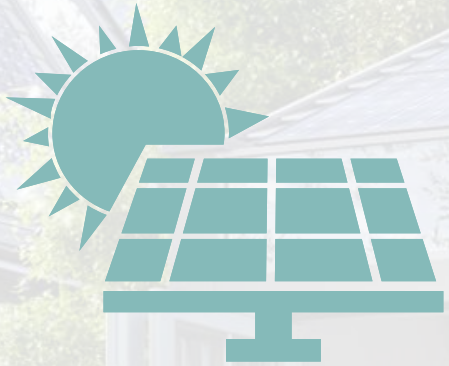
SWITCHABLE GLAZING



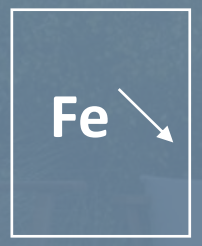
BIPV TRANSPARENT PHOTOVOLTAICS

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FLAT GLASS AND SOLAR ENERGY



Glass represents from 65% to over 95% of the weight of PV modules.



LOW IRON



SELF CLEANING



SOLAR MIRRORS

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Flat glass and Mobility

+17%

The glass area in passenger cars has been increasing since 2000.



Lighter safety glass



Coatings for efficiency and range



Automated driving components

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RESEARCHING, TESTING AND DEVELOPING NOVEL WAYS TO LOWER INDUSTRIAL EMISSIONS



-43% CO_2

IN 25 YEARS PER TONNE OF FLAT GLASS



0.13%

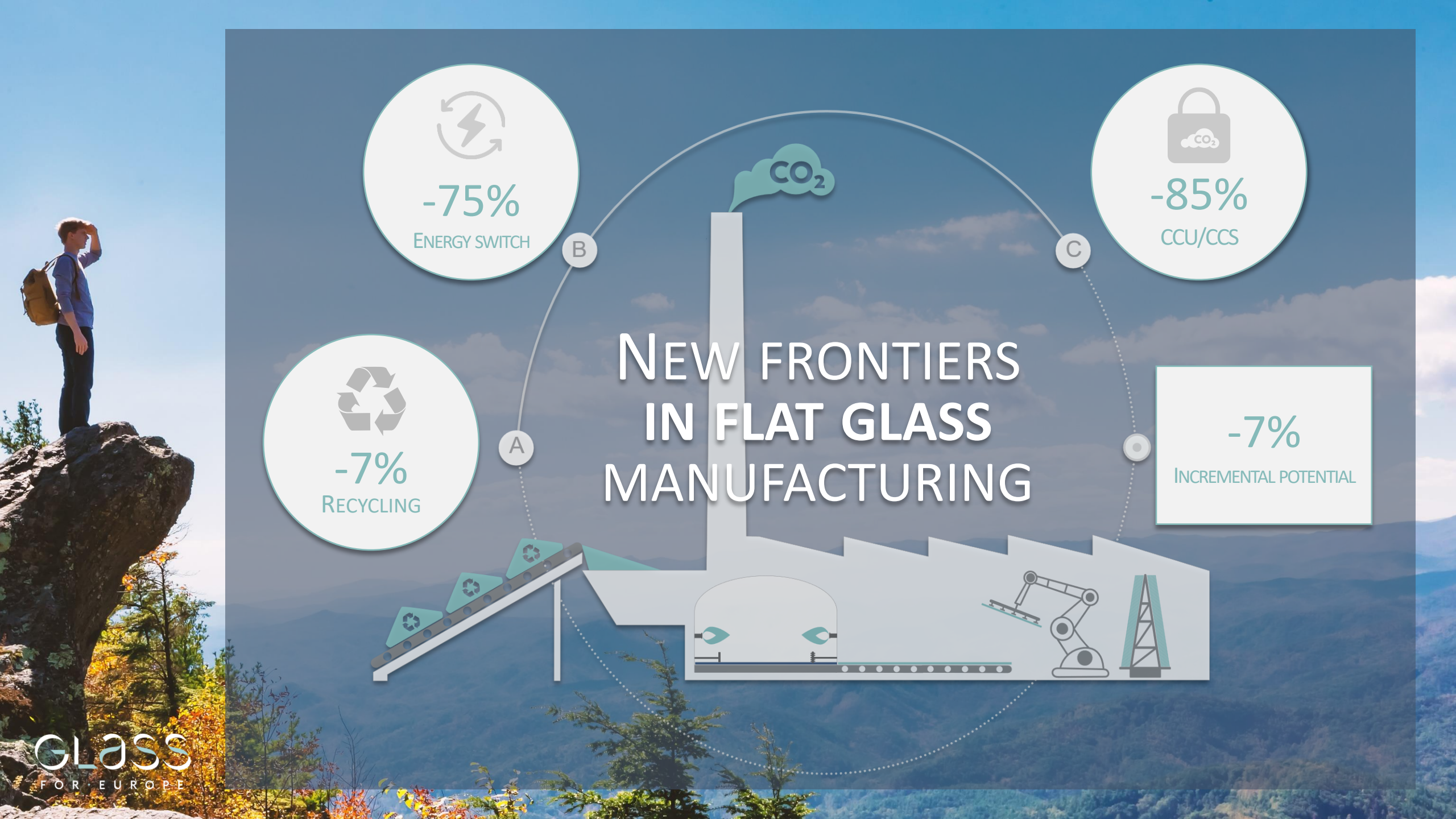
OF TOTAL EU EMISSIONS



25%

OF PROCESS EMISSIONS

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-75%
ENERGY SWITCH
-85%
CCU/CCS
-7%
RECYCLING
-7%
INCREMENTAL POTENTIAL
A
B
C
CO2
NEW FRONTIERS
IN FLAT GLASS
MANUFACTURING
GLASS
FOR EUROPE

RECYLING: KEY EUROPEAN DATA

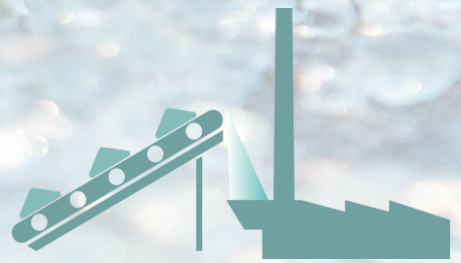
26%

of cullet

in a flat glass batch/

furnace*

(est. 2.75 Mt)



2 to 3%

reduction in energy consumption

for every **10%** extra cullet

in the batch

1t (tonne) **of cullet saves**

1.2t (tonne) of raw materials

310kg CO_2 in glass manufacturing

+/- 600kg CO_2 (including CO_2 saved upstream)

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* Average EU 2018

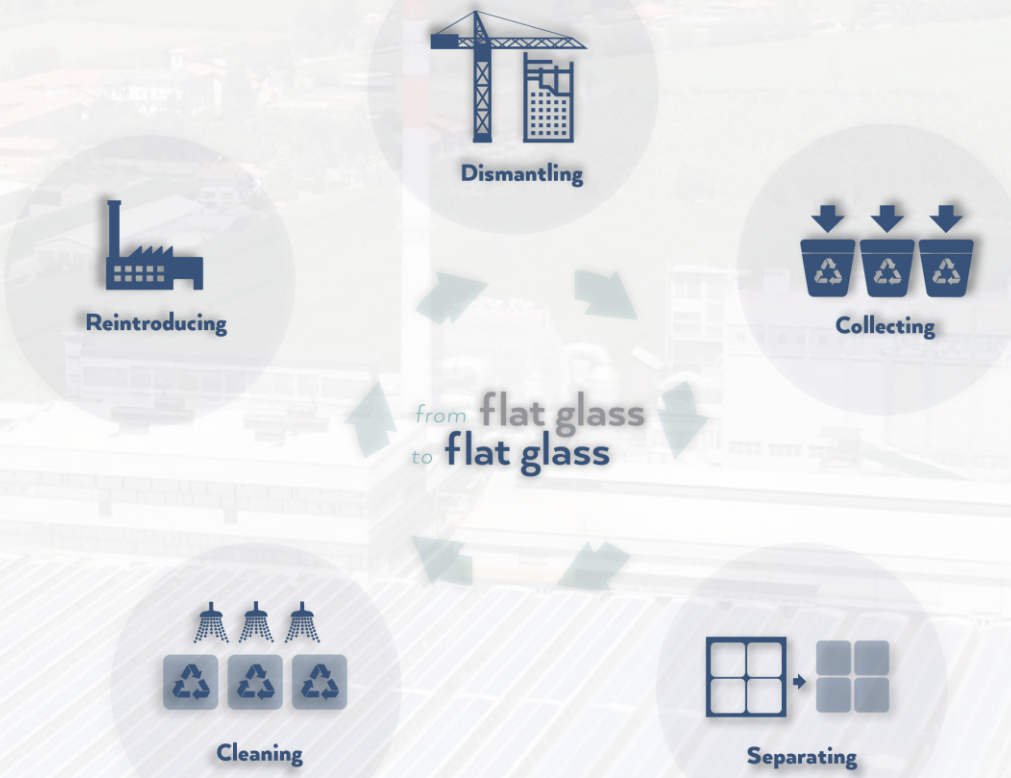
Source: Glass for Europe

Challenges

- ✓ Collection and sorting
- ✓ Highest quality levels required
- ✓ Cost-benefit balance
- ✓ Competition

Main Success factor:
Cooperation across the sector

Objective:
FLAT GLASS TO FLAT GLASS



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ENERGY SWITCH: TESTING & PILOTS

ELECTRICITY

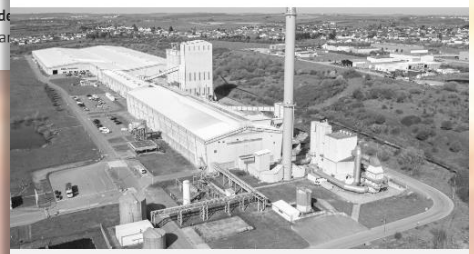
AGC and Saint-Gobain partner to create a revolutionary pilot flat glass line with drastic CO2 emissions reduction.

AGC and Saint-Gobain, worldwide flat glass manufacturers leading in sustainability, announce that they are collaborating on the design of a **pilot breakthrough flat glass line** that is expected to reduce very significantly its direct CO2 emissions.

As part of this R&D project, Czech Republic, will be entir the-art line that targets to b of oxygen and gas. This is a technology used in flat glas **sustainable flat glass line de** towards carbon neutrality a industry decarbonization.

AGC Glass Europe
53,673 followers
1yr •

AGC and energy company E.ON strengthen their existing partnership with a joint project for waste heat recovery and production of green power at AGC's float glass plant in Seingbouse, France. Read more on https://lnkd.i ...see more



AGC and E.ON deepen their partnership to improve energy efficiency and decarbonization by signing the first Green PPA in France | AGC Glass Europe

BIOGAS

Pilkington UK runs furnace on biofuel in four-day trial

Published 23rd February, 2022 by Jess Mills



Pilkington UK, part of the NSG group, has become the world's first flat glass manufacturer to fire its furnace on 100% biofuel. https://youtu.be/5B7I3W-VWwQ

A WORLD'S FIRST: TWO WEEKS OF ZERO CARBON PRODUCTION

- ✓ ANICHE (FRANCE)
- ✓ 100% MADE OF RECYCLED GLASS
- ✓ 100% GREEN ENERGY
- ✓ MARCH 2022

HYDROGEN

Saint-Gobain
734,837 followers
2w •

[#PressRelease]
#SaintGobain achieves the first flat glass production using more than 30% hydrogen. ...see more



NSG GROUP

NEWS RELEASE

3 September 2021
Nippon Sheet Glass Co., Ltd.

Architectural Glass Production Powered by Hydrogen in World First

The NSG Group has successfully manufactured architectural glass at its facility in the UK, using hydrogen power in a world-first trial.

As previously announced on 27 February 2020, this trial is part of the "HyNet Industrial Fuel Switching" project (*1). The successful three-week trial late August was conducted at the Greengate site of Pilkington United Kingdom Limited, a group company, in St Helens.

In the trial the NSG Group managed to achieve a seamless transition between its current main fuel, natural gas, and hydrogen, with the expertise overcoming many challenges. The trial proved that hydrogen was as capable as natural gas in achieving excellent melting performance and that it could be possible to operate the furnace with vastly reduced carbon emissions. It is a key step in the Group's plans to decarbonize. The switch to hydrogen to power the production from natural gas means that float glass furnaces – which account for the majority of the Group's overall carbon emissions – would be able to operate with hugely lower emissions.

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ENERGY CHALLENGES TO GO LOW-CARBON

ELECTRICITY

Full electric melting not yet ready in flat glass

BIOGAS

Availability challenge

HYDROGEN

Availability and infrastructure lacking

HYBRID

The most probable middle-term solution

CAPEX (roll-out) + OPEX (competitiveness)

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MORE AVENUES PURSUED

EFFICIENT
FURNACES

AGC Glass inaugurates renovated furnace

Published 15th October, 2021 by Zahra Awan



Guardian Glass invests in expanded capacity and energy-saving technology for Goole plant

OCTOBER 7, 2021

Bertrange, Luxembourg – October 7, 2021 – Guardian Glass is investing significantly in its Goole, East Yorkshire float glass production plant to increase the company's ability to supply float glass, primarily to the United Kingdom (UK) and Ireland, while also improving the plant's energy efficiency.

RAW
MATERIALS

Synthetic raw materials for float-glass production

A. B. Zhimalov, I. N. Gorina, L. N. Bondareva, G. A. Polkan & E. P. Gordon

Glass and Ceramics **67**, 249–251 (2010) | Cite this article

82 Accesses | Metrics

It is shown that there is promise in replacing the conventional mix with one that includes synthetic raw materials (SRMs) or consists entirely of SRMs. This will permit economizing raw materials and fuel-energy resources, simplify the technology for preparing glass mix, intensify the technological process of making glass, increase the equality and stability of the characteristics of the glass produced, and improve the environment. SRMs will make it possible to organize glass production in regions which do not have their own raw materials



RESEARCH

Glass Futures construction nears completion

Published 15th March, 2023 by Greg Morris



The main contract works of the 165,000ft2 glass research and development building has been completed.

It has been handed over to Glass Futures ready for the internal fit out works to commence next month.

The building is expected to be operational later this year.

Delivery of the project has been managed by landowner and developer Network Space Developments (NSD), on behalf of a partnership including not-for-profit Glass Futures, St Helens Borough Council, the Liverpool City Region Combined Authority and UKRI (UK Research & Innovation).

LOGISTICS & AUTOMATION



A CHALLENGE FOR **THE ENTIRE FLAT GLASS ECO-SYSTEM** REQUIRING COOPERATION

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DEFINES AN INDUSTRY AGENDA



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2050 FLAT GLASS IN CLIMATE-NEUTRAL EUROPE

TRIGGERING A VIRTUOUS DECARBONISATION CYCLE

THANK YOU!

Iva.Ganev@glassforeurope.com



AGC · GUARDIAN GLASS · NSG GROUP · SAINT-GOBAIN · AGN · ASSOVETRO · BF Bundesverband Flachglas · BV GLAS · UDTVP Union Des Transformateurs de Verre Plat · FÉDÉRATION DE L'INDUSTRIE DU VERRE VERBOND VAN DE GLASINDUSTRIE · Bouwend Nederland · GGF · POLSKIE SZKŁO