EUROPE’S FLAT GLASS SECTOR: AN INDUSTRY PROFILE

EVENT REPORT
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With the support of
After losing the solar PV market to China, Europe’s flat glass industry is concentrating on its strongholds: chiefly buildings, and automotive. But it also has its eyes set on the next generation solar panels as well as high-tech digital applications.

In this Special Report, EURACTIV takes a look at the challenges and opportunities faced by Europe’s flat glass industry, including the transition to zero-carbon manufacturing and the emergence of new competitors at the EU’s borders.
Contents

Glass: A low-hanging fruit for the climate – and a tough nut to crack

Glass industry boss: Replacing old windows can bring huge energy savings
Glass is irreplaceable in buildings, making it a key part of the solution to unlock energy savings and help reach Europe's decarbonisation targets. But it's also an energy-intensive industry, for which no immediate clean energy alternative is available.

As a high-level group of CEOs, academics and politicians gathered in Brussels last week to discuss the future of the glass industry, they were well aware that glass was all around them. It was in the windows looking outside, on the table holding their beverages, even on their smartphone screens.

"Glass is everywhere," noted Philippe Bastien, a regional president at AGC Glass Europe. "You cannot do anything without being in contact with glass. You wake up in the morning, you go to the window. You have glass in your shower, you have glass in your oven, and in the car or train you take to work."

The reason glass is everywhere is because as a transparent material, it serves a unique function for which mankind has found no substitute. And this could make the sector a low-hanging fruit in lowering Europe's emissions.

The dinner debate was an opportunity for industry association Glass Europe to present its vision for 2050, a manifesto for how flat glass can contribute to Ursula von der Leyen's European Green Deal and 2050 decarbonisation target.

The industry sees an immediate opportunity, not in the production phase – at least not for now – but...
rather in the use phase.

Glass is an endlessly recyclable material, and right now most of that material lies locked in inefficient uses in buildings. 80% of glass goes to the buildings sector, and 85% of the glass in that sector is still inefficient, using either single glazing or inefficient double glazing.

These types of windows allow heating, one of the biggest contributors to emissions in Europe, to pour out of a building. The buildings sector alone is responsible for 36% of total EU emissions.

“For the glass industry, the net balance of the emissions remains highly positive,” said Bastien. The CO2 emitted to produce an energy efficient double-glazed window is offset within six to 20 months by its energy savings, according to industry calculations.

“I’m not looking for an excuse – it’s very important that we work on the production emissions side, and for sure we have to do that. But we still have room to do more good thanks to the use of our product.”

EFFICIENCY SCOFFLAWS

The industry is calling on the EU to enforce energy efficiency legislation that would require these windows to be replaced.

Maria Da Graça Carvalho, a centre-right Portuguese MEP who attended the dinner, was receptive to this idea. “There are certain sectors of the economy that are easier to decarbonise than others, so we should start with the sectors that are easier,” she said. “Of course the ones that are more difficult we need to start to find solutions. But for some sectors we can start immediately, like building and construction.”

The problem is that the EU has already legislated in this area, extensively. There has been an energy efficiency target in place since 2012, and there has been legislation requiring improved energy performance in buildings since 2010, revised in 2018. The EU will not meet its target of a 20% improvement in energy efficiency by 2020 because national governments have not correctly implemented the legislation.

“We have a lot of legislation already to get these goals, but also we have member states that are not doing their duty,” said Nicolás González Casares, a centre-left Spanish MEP who was also at the dinner.

“So the Commission has to push them. They have the instruments to tell these countries, you must do it. The Commission can’t only make new rules, they have to force the countries to implement the rules already there.”

THE CHALLENGE: DECARBONISING PRODUCTION

Of course, it is in the glass industry’s economic interest that these renovations be forced by the EU. It would mean the availability of more glass stock from the recycled windows, and more demand for their products.

But the industry says without this increase in demand, they cannot make the investment needed to reduce emissions from their production processes. Despite building renovation and energy efficiency having been made EU policy priorities, glass demand is still below what it would take to make the needed investments.

“The technical challenge [in decarbonising production] for us is huge,” said Christian Quenett, head of architectural glass at NSG Group and chairman of Glass for Europe. “There is no solution on the horizon so far. Every company is doing some research work but we are all too small to find the solution.”

The glass production industry in Europe is small, and proportionately so is its emissions. There are 46 glass industrial installations subject to the EU’s emissions trading scheme in 12 countries, producing 10 million tonnes of glass each year. They primarily meet EU market demand. 85% of windows installed in the EU are made with European glass.

Those plants are powered chiefly by gas. 75% of the CO2 emissions from flat glass manufacturing derive from the use of natural gas to heat the melting furnace, while the remainder comes from the release of CO2 from raw materials carbonates.

The use of recycled glass, called “cullet”, can help tackle the raw material emissions. It also requires less energy to melt. Today it accounts for about a quarter of what goes into European flat glass furnaces. Advances in chemistry could also help reduce these material emissions.

But the gas fuel is proving harder to replace. Full-electric melting technology for flat glass not yet available. Hydrogen might be an interesting option, but it currently does not offer the necessary radiation for glass melting and high share of hydrogen causes technical problems to furnaces. It also would require new infrastructure to deliver.

“It’s really difficult to find the best compromise between hydrogen or electric energy, or a combination of that,” said Quenett. “That is something where I would hope support from the EU would help us in the next decade to revolutionise the process.”

The industry is eagerly awaiting the Commission’s new industrial policy strategy, expected in March, and hoping for an ambitious plan for building refurbishment. But from experience, stakeholders know that the proof will be in the pudding. If national governments don’t implement the changes, windows in Europe’s buildings will continue to let heat pour out.
Glass industry boss: Replacing old windows can bring huge energy savings

By Frédéric Simon | EURACTIV.com

If Europe goes climate neutral, it will consume more flat glass, predicts Christian Quenett. And the benefits could be huge: simply doubling the replacement rate of windows, in line with the European Green Deal, would achieve 20% of the EU’s energy efficiency targets for 2030, he says.

Christian Quenett is a 55-year old physicist with a PhD in mechanical engineering. He has worked in the glass industry for 25 years, now at Nippon Sheet Glass (NSG Group). Since spring 2018, he is also the chairman of the board of directors of Glass Europe, the trade association for Europe’s flat glass sector.

INTERVIEW HIGHLIGHTS:

• With Europe’s announced building renovation wave, the flat glass industry expects demand to grow significantly.
• In Europe, doubling the replacement rate of windows alone would achieve around 20% of the EU’s energy efficiency target for 2030. And deeper CO2 cuts could be achieved still by replacing all windows with high-performance glazing.
• After losing the solar PV market
to China, Europe should avoid repeating the same mistakes and ensure the next generation PV modules can be manufactured here.

- That means protecting European manufacturers against unfair competition as they move to decarbonise production and increase investments into clean energy sources.

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First, let’s get an industry overview: What are the main areas and applications of flat glass today? Does the industry expect demand to grow in the coming years – and if so, in which areas?

There are three main areas of application: buildings, automotive, and the solar sector with solar PV modules.

In each of these, flat glass contributes to the energy transition. In buildings, we can really contribute to energy savings with better glazing. In automotive, flat glass helps reduce fuel consumption with lighter glazing. And with electric cars coming to the mass market, insulation is now becoming increasingly important to reduce power consumption for heating and cooling vehicles. Finally, in the solar sector, you need glass as base sheets and also as covering sheets for PV modules.

There are other areas, like digital glazing and digital signage, which are growing. And there are smaller segments, for example, glazing for interior architecture – bathrooms, kitchens, and furniture – which are quite interesting as well.

Solar PV and digital applications, including glass used in smartphones and tablets: Are these the two areas where you expect most of the growth to happen in the coming years?

In Europe, the biggest area of growth is in the traditional building sector. Because the solar industry in Europe is not as dynamic anymore – it’s booming in China and the US but not over here. Thin-film producer First Solar, for example, does not produce in Europe anymore.

For us in Europe, the biggest opportunity is in the building sector. We really think this is crucial to achieve the necessary CO2 emission reductions over the coming years as required by the European Green Deal.

Let me give you an example: about 37% of the CO2 emissions of buildings could be saved by 2050, by using high-performance glazing in all buildings. And, and in the medium term, just by doubling the replacement rate of windows in Europe – in line with the Green Deal – we would achieve around 20% of the EU’s 2030 energy efficiency targets. We could actually save 240 million tons of CO2 over 10 years just by doing this.

And with an increased renovation rate, we expect flat glass demand in this area to grow significantly. At the moment, the replacement rate of windows is relatively low. And that is something we have to push if we want a quick reduction in Europe’s carbon footprint from buildings.

In Europe, we can expect growth rates per year of 2.5 to 3% in normal years, based on historical data. But if Europe goes further in terms of decarbonisation and renovation of buildings then the growth could be much, much bigger.

If we achieve this doubling of window replacement rate over the next 10 years, this would actually trigger a significant increase in flat glass demand – roughly a 66% increase.

If Europe goes climate neutral, it will consume more high tech flat glass products. And we also have to bear in mind glass as a material cannot be substituted in most applications.

In buildings, there are debates about moving from cement into wood. But flat glass has distinct properties – transparency, full recyclability – meaning it cannot be replaced by another material. This is why we believe flat glass is a strategic material in Europe for decarbonisation.

You mentioned that demand for glass used in solar PV modules lies mainly in China and the US. Are European companies still involved in those countries?

The Chinese PV module market is pretty much dominated by Chinese flat glass manufacturers.

This is a market that Europe has lost, essentially?

Yes. Europe was too slow reacting with anti-dumping measures on both PV modules and solar glass when it was evident that dumping was taking place.

It is sad to say but for us in Europe, the photovoltaic market is not a strategic question because there’s no real industry anymore for solar PV modules manufacturing over here.

We should avoid repeating the same mistake and make sure that the products Europe needs for decarbonisation can be produced in Europe, including, maybe the next generation PV.

Do you have concerns about Chinese exports of flat glass undercutting the share of EU companies?

Of course, we have concerns. We have to bear in mind that about 60% of the whole flat glass manufacturing capacity globally is installed in China so we are used to Chinese competition because China has been exporting glass products to Europe since many years. That is predominantly in the

Continued on Page 8
area of process products, and less for the traditional building products market.

Because the building products industry is working with “jumbo size” glass, as we say, which are 6.00×3.21 meters. And that's difficult to transport from China to Europe. So for building products, which is traditionally our biggest market, China is not so visible at the moment.

Where the Chinese are more active is in the area of furniture glazing, and also in the automotive sector. There, Chinese competitors are quite important.

But in addition to China, we are more affected by competitors which are at the border of the EU, and which are also exporting into Europe.

**Such as?**

For example, Russia, Belarus, Turkey or North Africa. In all these countries, we have relatively new flat glass plants and they are also exporting a lot to the EU. We have to bear this in mind when talking about CO2 emission reductions in our production processes: in these countries, the environmental requirements and the production processes are different.

**The EU will soon put a “climate neutrality” target into law for 2050. Can flat glass bring CO2 emissions down to zero? What would it take to reach that objective?**

That’s a difficult one. Switching to low-carbon energy sources is one route to drastically cut emissions. But it’s highly disruptive and it would not allow going down to zero. That's because 25% of the emissions in the flat glass melting process are emissions resulting from the carbonate released by raw materials as they melt. So, these cannot be brought down to zero by switching to renewable energy sources.

The maximum potential reduction linked to energy switch would be minus 75%. Going beyond that requires looking into other options.

There are basically three low-carbon energy sources that can be looked at:

1. **Renewable electricity.** That is one potential energy resource. But the technology to power flat glass furnaces fully with electricity is not yet mature enough. This is because the flat glass melting requires very high temperatures – more than 1,600 degrees – and the furnaces are quite large, for efficiency reasons (output typically ranges between 600-1,000 tons of glass per day).

   So we have high temperature and large capacity. And at the same time, we have high-quality requirements for our products and we also put in recycled materials. Altogether, these are obstacles. And so far, we have not yet overcome that challenge, going for 100% electric melting in our industry. But research is ongoing and we are asking for more support in the R&D area. We have electric heating as an additional technology in our furnaces, but only on a much smaller scale.

2. **Hydrogen.** This could be an option but there are other technical challenges. Hydrogen has a low flame radiation which contributes to the efficiency of flat glass. But research is also needed to adapt the furnace technology when more than 20% hydrogen is mixed with natural gas, which is the main source of energy to power furnaces at the moment.

3. **Biogas.** This is the third option. But there are issues with gas quality. And the question is whether enough biogas will be available in the future.

**All of these things require a lot of investments, including R&D. At the same time, you mentioned competitors at Europe’s borders who do not have the same CO2 emission constraints. So how do you think a level playing field can be established? Would you support a carbon border tax, as the European Commission suggests?**

From what I saw in the political debate, our sector is currently not considered for a pilot phase. So at the moment, we are not involved in the discussions over the design of the scheme. And therefore it’s hard for us to take a position without having a clear understanding of how the system would work and what its impact would be.

That said, the idea that importers would have to bear equivalent carbon costs is a relevant one. Yet it’s hard to see how it could work in the flat glass sector. For example, how to assess the carbon content of imported products? Would Europe rely on importers’ declaration? How would checks be made?

Our industry is also exporting worldwide, so how would the competitiveness of our export activities be maintained? Can free allocation or some form of compensation for exports be designed that would be WTO compatible?

So, our industry has more questions than answers at the moment on this
Continued from Page 8

topic at this stage. But we will analyse any option considered in light of our sector’s realities.

Do you think these barriers can be overcome? For example, calculating the carbon content of imported product requires checks on all exporting countries. Isn’t that too burdensome? Doesn’t that disqualify the carbon border tax in your sector?

As I said, it’s difficult to say. I have my doubts that a practical solution can be found in the near future.

But of course, it would be desirable to find a way to calculate the carbon footprint of imported glass because otherwise we would face a carbon leakage problem in Europe. We are doing our best to reduce CO2 emissions in our processes and if imported products increase our emissions, no-one benefits.

What has been the impact of the Emissions Trading Scheme (ETS) on the glass sector up to now? Did the risk of carbon leakage increase in the flat glass industry because of the ETS?

Let’s look back a little bit. In the flat glass industry, we have a good track record at decreasing CO2 emissions per ton of flat glass produced. Since 1990, we emitted 43% less emissions per tonne of flat glass produced. During the last ETS phases, investment in state-of-the-art flat glass plants has continued to take place in order to minimise costs, including the carbon costs induced by the ETS.

At the same time, we observed a risk of carbon leakage in the flat glass industry, which has grown over the last couple of years. And therefore, we have to preserve the competitiveness of our operations in this context, which is a challenge. Free allocations of CO2 emission permits will remain essential for us.

But we are also aware that fewer free allocations will be available in the new decade. So, the competitiveness challenge will grow so long as the technology is not available to drastically cut emissions. There are some really disruptive technologies on the horizon but they are not mature yet.

So my expectation for the future trading periods is that the ETS becomes better anchored in science. What I mean is that allocations could be better channelled to sectors which still have a limited potential for greenhouse gas reduction and face carbon leakage.

And that could support the deployment of technologies where they exist and better preserve the competitiveness of those strategic sectors where innovations are still to come. And that’s the case of the flat glass industry.

The European Commission recently presented a proposal to revise state aid guidelines for industrial sectors covered by the ETS. Glass was not mentioned in the list of sectors eligible to receive compensation for costs related to their inclusion in the ETS. Do you think it should have been included?

Ideally, we would like to be included in that list. Our trade association provided evidence to the European Commission that our sector is at risk of carbon leakage due to the indirect costs, passed through electricity bills.

But as you have just said, our sector is not in it. My hope is that perhaps this can re-evaluated. It makes no sense to exclude the flat glass industry from this protection because our electricity usage is not insignificant and the impact of these ETS indirect costs are high for our industry. Therefore, of course, we would like to be listed also.

An EU sustainable finance taxonomy was agreed last year to channel private investments into green technologies, like renewables and energy efficiency. Glass, as you said, enables considerable energy savings. So do you think that the glass sector could claim a “green” label under the taxonomy?

The flat glass industry is a net carbon avoidance industrial activity. Looking at the total life cycle of our products, we can show that we save more CO2 in the application of our products than what is being emitted by the production process. Our products are recyclable and have also no adverse environmental impact.

Flat glass ticks all the boxes of an industrial activity that should qualify as green in the context of investments by the financial sector. It is important however to approach this taxonomy with a complete value chain thinking. For example, if the production of a high-performance window is regarded as green in the taxonomy, then the production of high-performance glazing should also be regarded as green. Because 80% of the window is made of glazing, which contributes to its efficiency.

So flat glass manufacturing should be considered for qualification as green in the context of the taxonomy. And it makes sense that the qualified investments are linked to performance standards such as the use of best available technologies.

The Commission is preparing an EU industrial strategy for publication in March. What are your expectations there?

I expect an industrial strategy that makes the best use of Europe’s decarbonisation-enabling industrial basis to achieve climate neutrality. This industry strategy must be supportive of industries like flat glass, which are strategic for the decarbonisation of Europe.

And this means ensuring this

Continued on Page 10
industry can continue growing as it goes through the process of decarbonisation, which requires research and investments. This is why we need R&D support for these breakthrough decarbonisation technologies.

Another thing is to guarantee long-term competitiveness mitigation tools. Most importantly, for the coming building renovation wave and the new circular economy plan, the strategy needs coherence and should provide certainty to industry. Because as a long-term investment industry, we need to know that authorities will do their part of the deal.

Let me give you an example: The European Commission says that we have to double the rate of renovations per year. If this really materialises, the demand for glazing will grow. And that means our production capacity needs to be adjusted accordingly. But we’re talking about hundreds of millions of investment. And before our companies invest this amount of money in new production capacity, we want to be certain that the demand will be there.

So, the authorities must provide that certainty. We need binding obligations and concrete measures. This is true for many other elements of the European Green Deal such as the recycling of building waste, the development of low carbon infrastructures, renewable energy production, etc.

From our perspective, flat glass is a strategic material for decarbonisation. But at the same time, we need the space to produce this glass and test the technologies that will allow us to drastically cut manufacturing emissions.

You mentioned competitiveness mitigation tools, can you expand a little bit on what these are?

That’s the question of carbon leakage, and how to ensure it doesn’t go further. It’s not in the EU’s interest if products with higher carbon content enter the European market because they’re cheaper. And the benefits of applying a carbon border tax are not immediately clear.

Are there other options than a carbon border tax?

At the moment, I don’t see many other significant options. And because there are still question marks over the implementation, the best option we have for the time being is to continue with the free allocations of CO2 permits on the carbon market. And support for R&D.