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Glass for Europe's contribution to the call for evidence on the Heating and Cooling Strategy

If the European Union is to successfully decarbonise heating and cooling, the priority must be to **ensure that overall energy needs are reduced as much as possible**. This requires targeting the most energy-reliant sectors, with the most cost-effective solutions, such as energy-efficient windows.

As highlighted in the Call for Evidence, heating and cooling represent *"more than 60% of the energy consumed by households"*. In the residential sector, **fossil gas remains the dominant source of heating energy**, accounting for 39% of consumption[1]. At the same time, **cooling has emerged as the fastest-growing end-use** due to rising temperatures and more frequent heatwaves, placing a significant burden on electricity systems[2].

Improving the energy efficiency of buildings is therefore essential. Available data indicate that improving the energy efficiency of buildings contribute to savings on grid investments of €44.2B, reduces congestion by 75%, lower electricity prices and reduce energy bills for households and industries alike[3].

Flat glass is an irreplaceable construction material, which plays a unique role in this effort. If all of Europe's buildings were equipped with **high-performance glazing, nearly 30% of the continent's energy consumption for heating and cooling could be saved by 2030**[4].

When constructing or renovating a building, selecting the right glazing configuration is a priority and one of the first choices to be made in the sequencing of energy efficiency works. Starting with the building envelope enables heating and cooling systems to be sized properly and to work more effectively and efficiently.

Glazing ensures thermal comfort in buildings throughout the seasons. Its contribution to reducing energy consumption is twofold:

- advanced glazing solutions can dramatically **lower heating demand in winter by improving insulation**,
- while in summer they can **mitigate overheating and reduce the reliance on air conditioning**.

[1] Directive (Eu) 2024/1275 on the Energy Performance of Buildings. Oil is the second most important fossil fuel for heating, accounting for 11 % and coal accounts for around 3 %.

[2] The Future of Cooling – Analysis, International Energy Agency, 2018

[3] Akhmetov, Fedotova, and Frysztacki, Flattening the peak demand curve through energy efficient buildings: A holistic approach towards net-zero carbon, 2025

[4] More details available in the 2019 TNO study *Potential impact of high-performance glazing on energy and CO2 savings in Europe*

By selectively filtering solar radiation, high performance solar control glazing helps limit unwanted heat gains in summer months, **improving indoor comfort, building resilience and reducing peak cooling demand**, while still allowing abundant natural daylight.

Innovations, such as electrochromic and thermochromic glass regulate solar gain and interior temperature by changing tint in response to electric signals or heat. The EU-funded *Switch2Save* project has recently demonstrated that installing **dynamic glazing** in two European buildings **reduced peak cooling demand by up to 80%**[5] in certain periods. This is especially relevant in the context of increasing climate extremes, as it alleviates stress on electricity systems and reduces dependence on carbon-intensive cooling technologies.

Energy-efficient windows not only deliver significant reductions in heating and cooling needs and bills for citizens, but they are also highly **valued for the comfort they bring**. These upgrades represent one of the **most straightforward and cost-effective renovation measures available**, making them ideally suited to inclusion in large-scale housing strategies.

In addition to promoting energy savings, glass technologies also facilitate on-site renewable energy generation, for example through the use of building-integrated photovoltaics (BIPV) or solar PV. BIPV mean that flat glass can be transformed into energy-generating surfaces by embedding photovoltaic cells directly into façades, curtain walls, or windows; It enables on-site renewable electricity generation without occupying additional land. This not only contributes to energy autonomy but **reduces grid demand and supports decentralised electrification strategies.**

With advanced flat glass technologies, from solar-active façades to smart windows, the EU can unlock a new generation of electrified, energy-generating buildings. Highly energy-efficient buildings that produce their own renewable energy will be able to store, share or export it, which could highly benefit other sectors. The Heating and Cooling Strategy must therefore **support the objectives set out in the revised Energy Performance of Buildings Directive in order to optimise solar energy generation** in buildings.

Glass for Europe invites the European Commission to design its Heating and Cooling Strategy with the Energy Efficiency First principle as its cornerstone. Energy-efficient solutions are not only essential for reducing the demand for heating and cooling, they also free up grid capacity for other sectors, creating more flexibility on the demand side.

The future strategy must acknowledge and leverage the potential of advanced glazing solutions as a central element of building transition, energy security and the decarbonisation of Europe's heating and cooling.

[5] Two buildings – a hospital in Greece and an office in Sweden – were selected for a two-year study comparing energy use before and after the installation of dynamic glazing. In Sweden, peak cooling demand was reduced by up to 80% during certain periods while in Greece, dynamic glazing lowered indoor temperatures by up to 8°C and reduced cooling energy use by 28% significantly improving comfort for patients. More information available here: https://switch2save.eu/