



**Designing glass in  
near zero energy  
building**

SAINT-GOBAIN GLASS

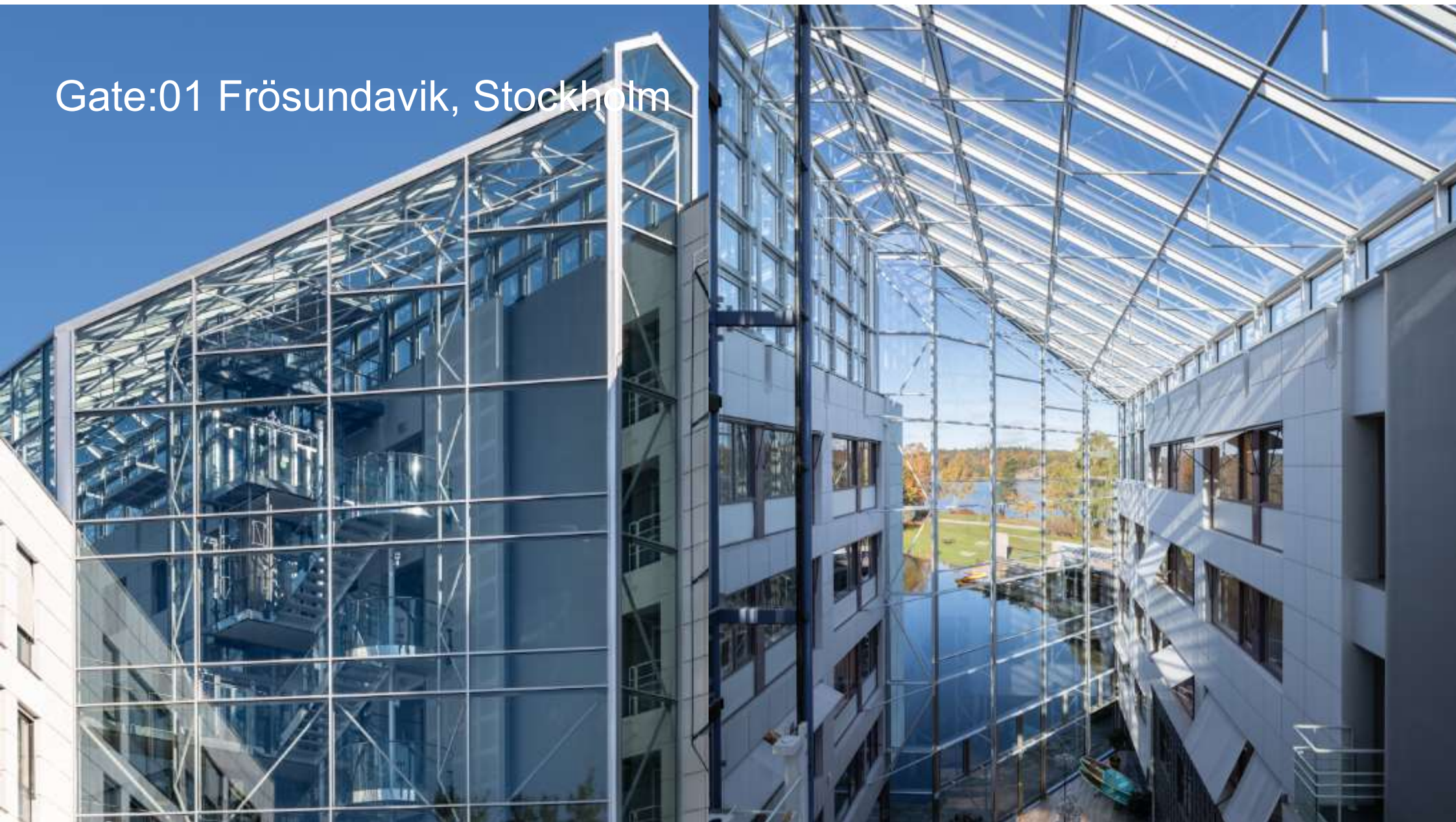




Axis HQ, Lund



Gate:01 Frösundavik, Stockholm

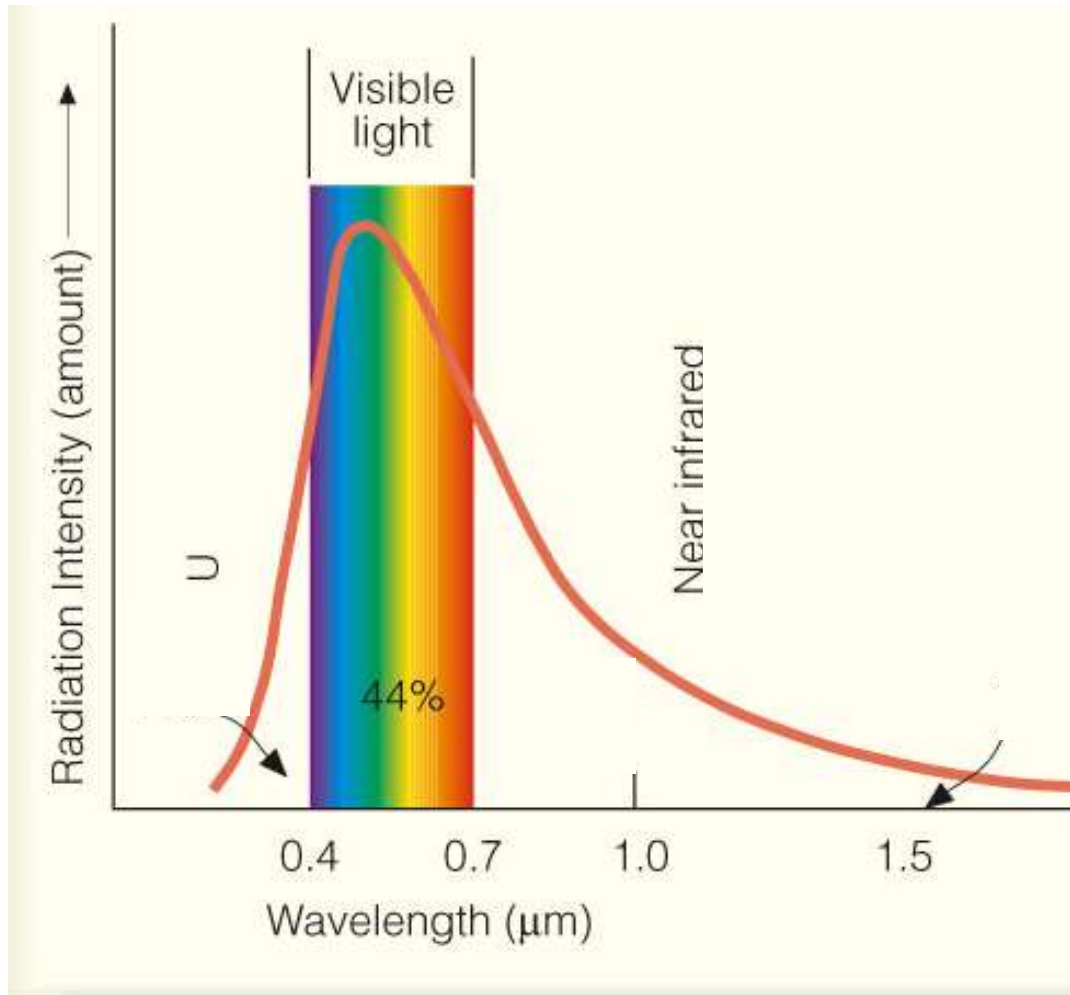


## MODERN SOLAR CONTROL GLASS MEANS LIGHT WITHOUT HEAT

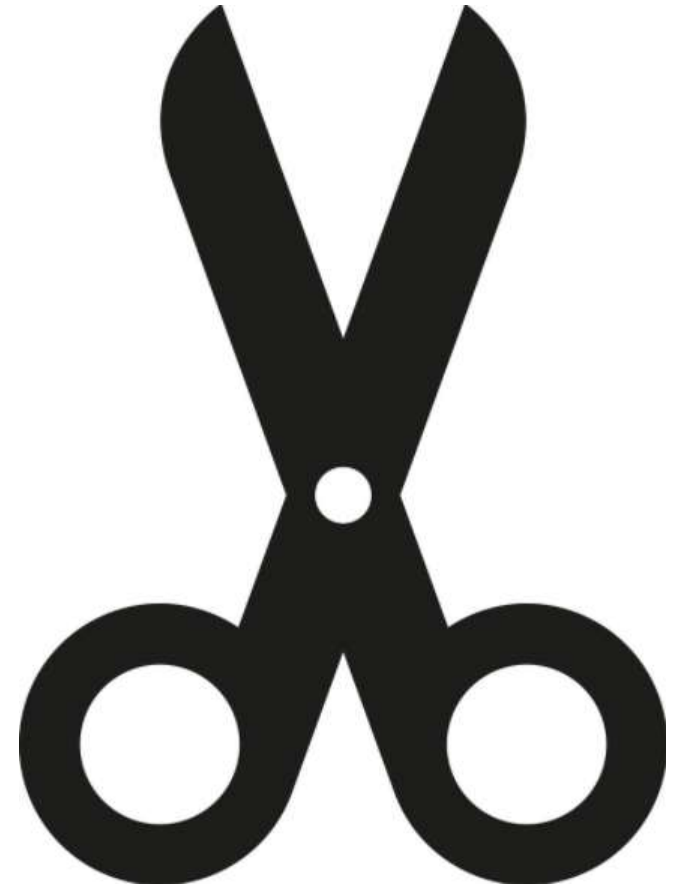
Regionens Hus, Gothenburg



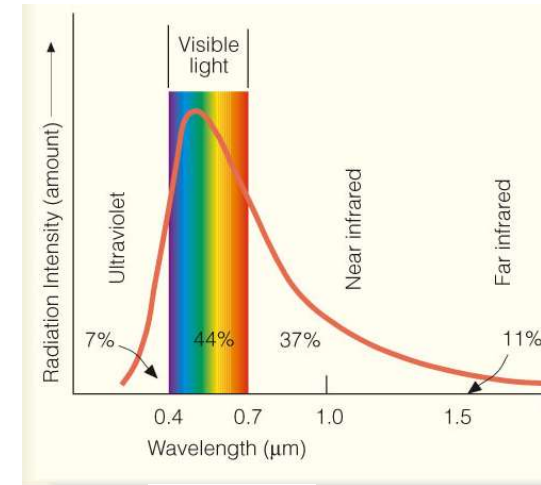
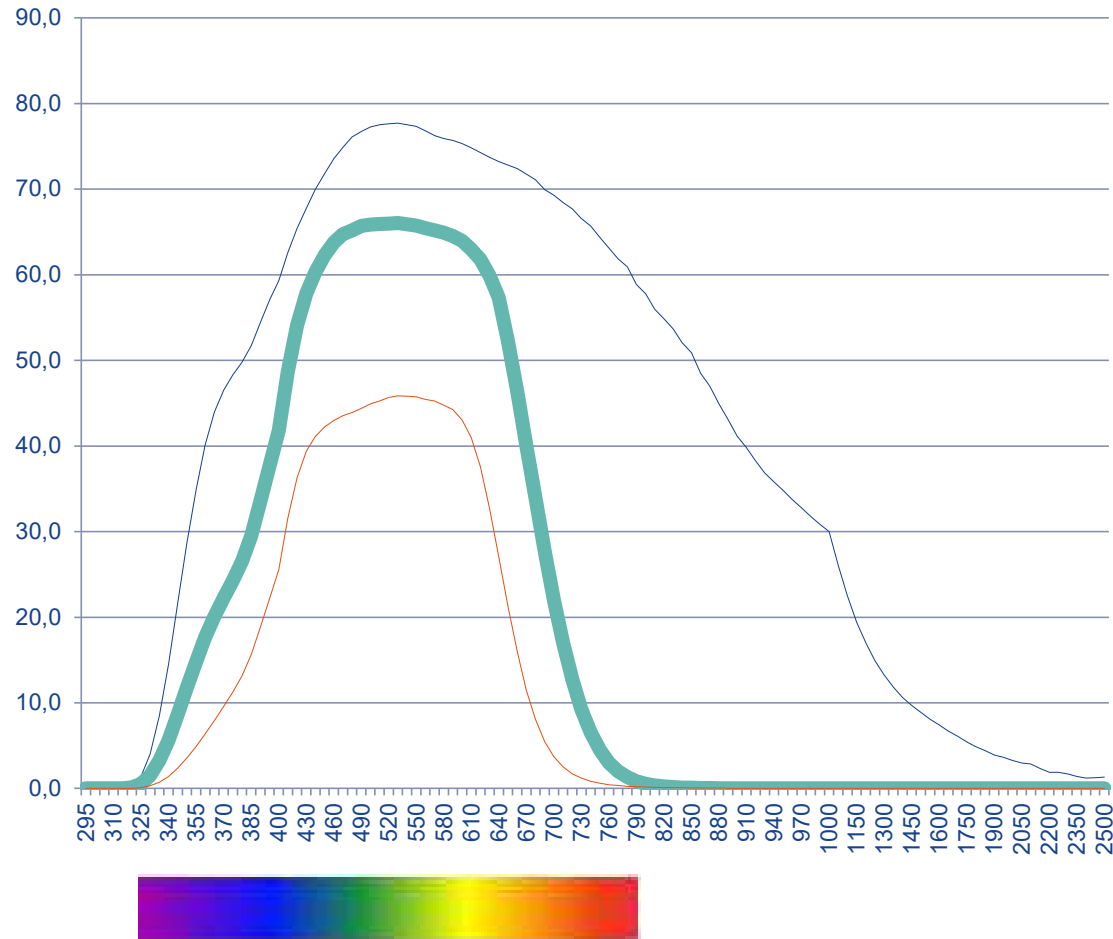
# SPECTROPHOTOMETRICS – LET THE LIGHT IN STOP THE HEAT



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# FINDING THE PERFECT CURVE



- TGU ECLAZ
- TGU 70/33
- TGU 50/22





Villa Anders, Gothenburg



# Tryggestad 9, Borgholm





Merkurhuset, Gothenburg





# Regionens Hus, Gothenburg







Gate:01 Frösundavik

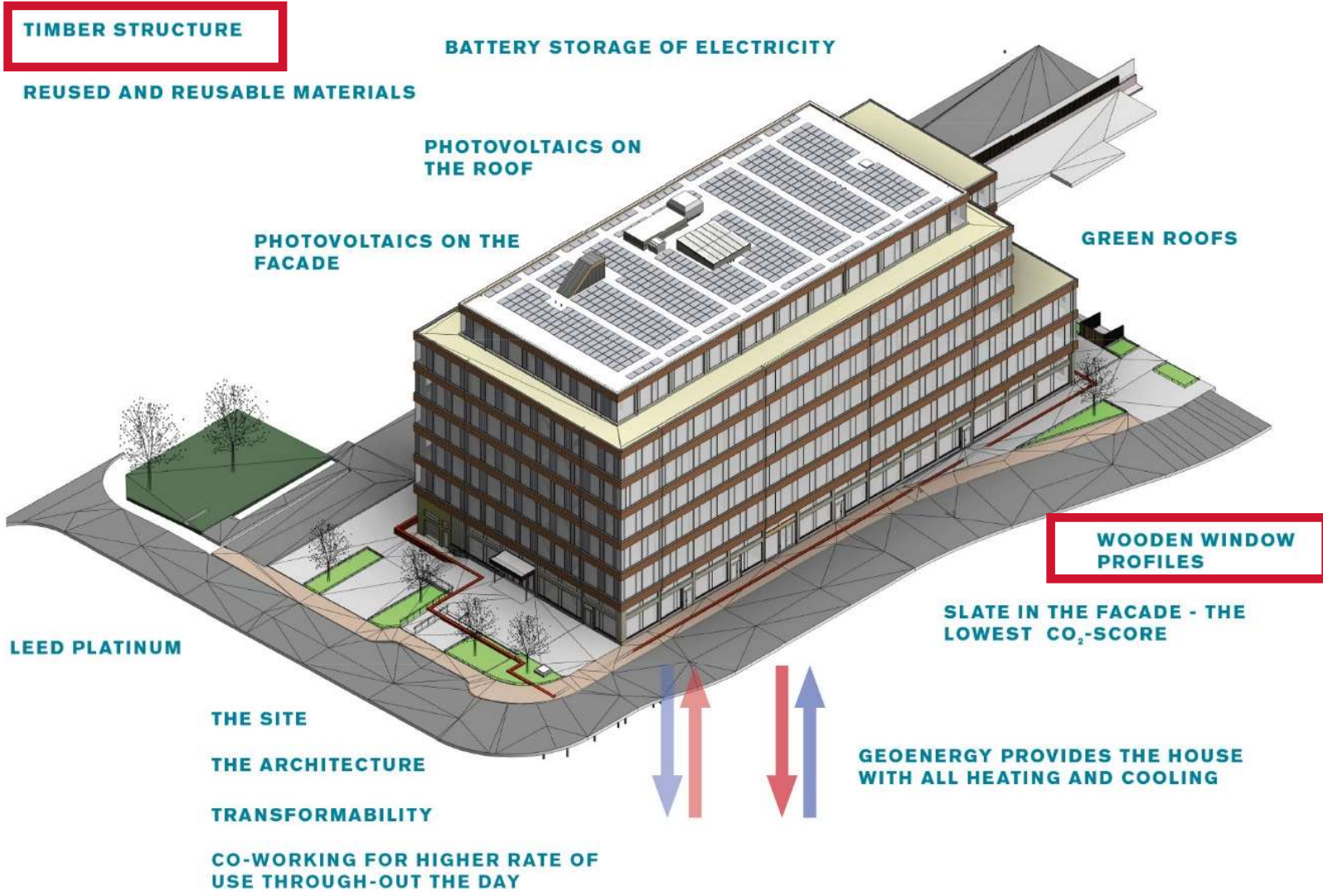


# HOW TO PUT THE DEVELOPMENT TO BEST USE?

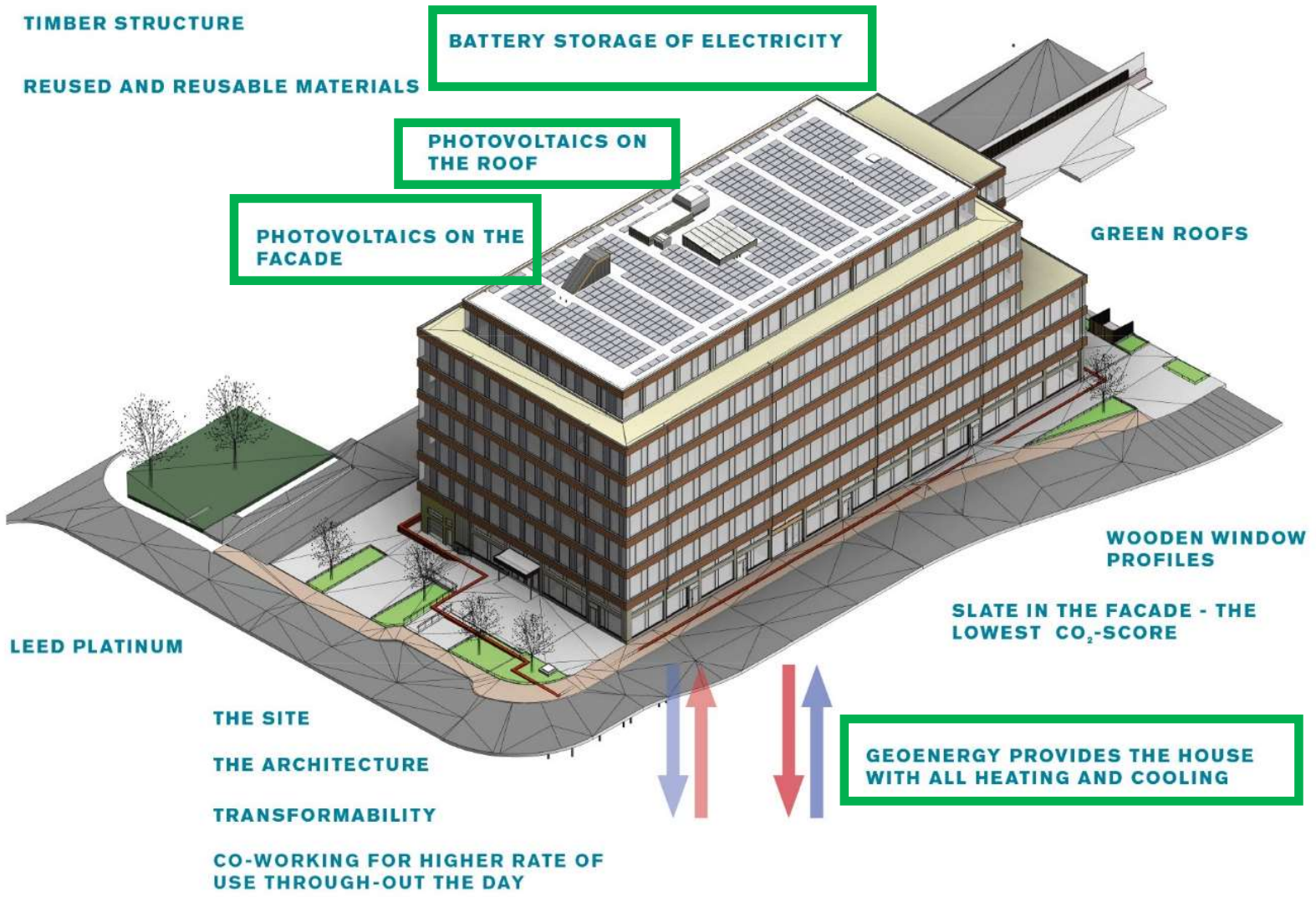




# LOW EMBODIED CARBON

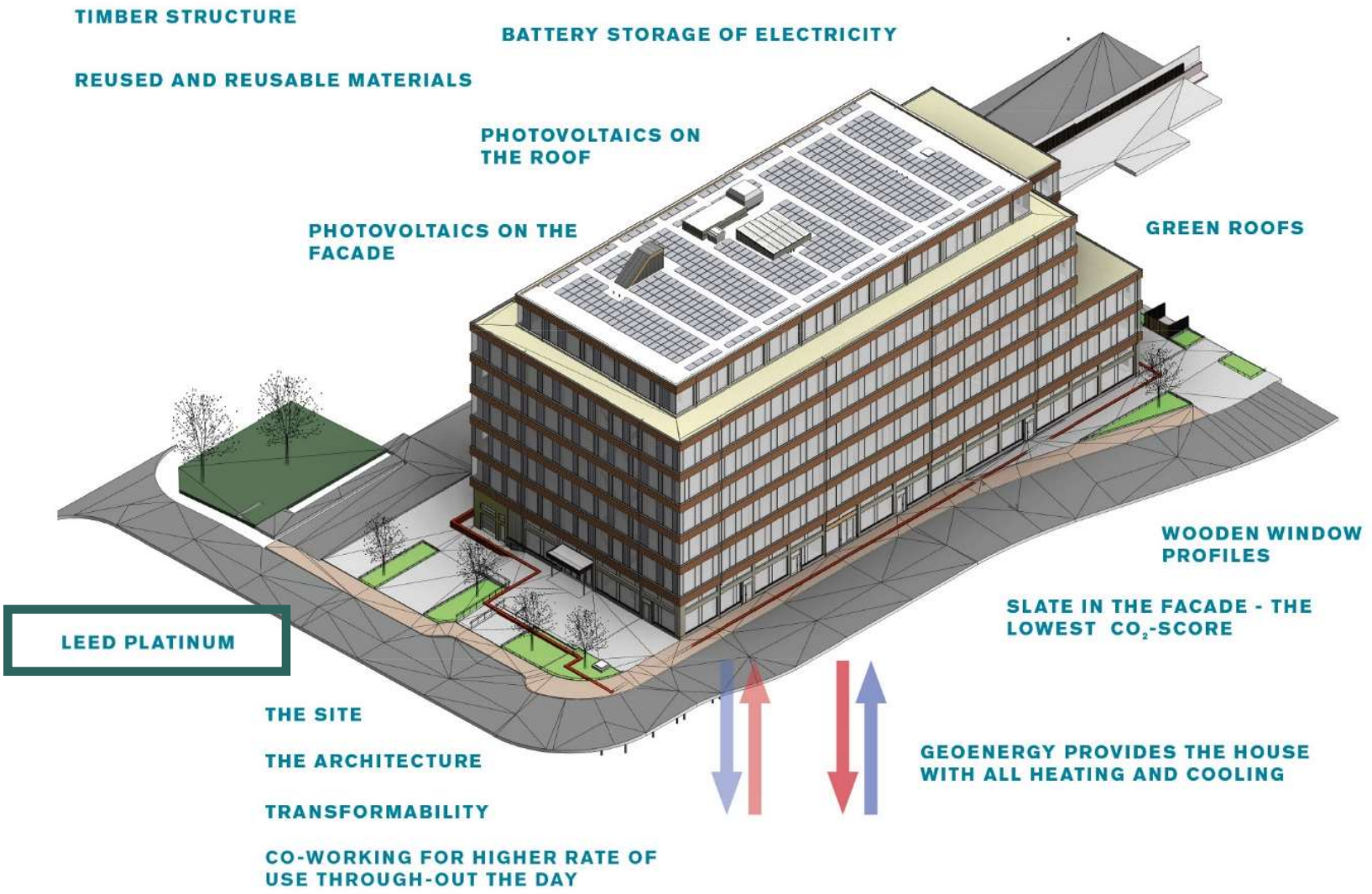


# ENERGY PRODUCTION ON SITE





# HIGH AMBITION: ENERGY CONSUMPTION 20 KWH/M2 FLOOR SURFACE/YEAR



## WHAT ABOUT GLASS?

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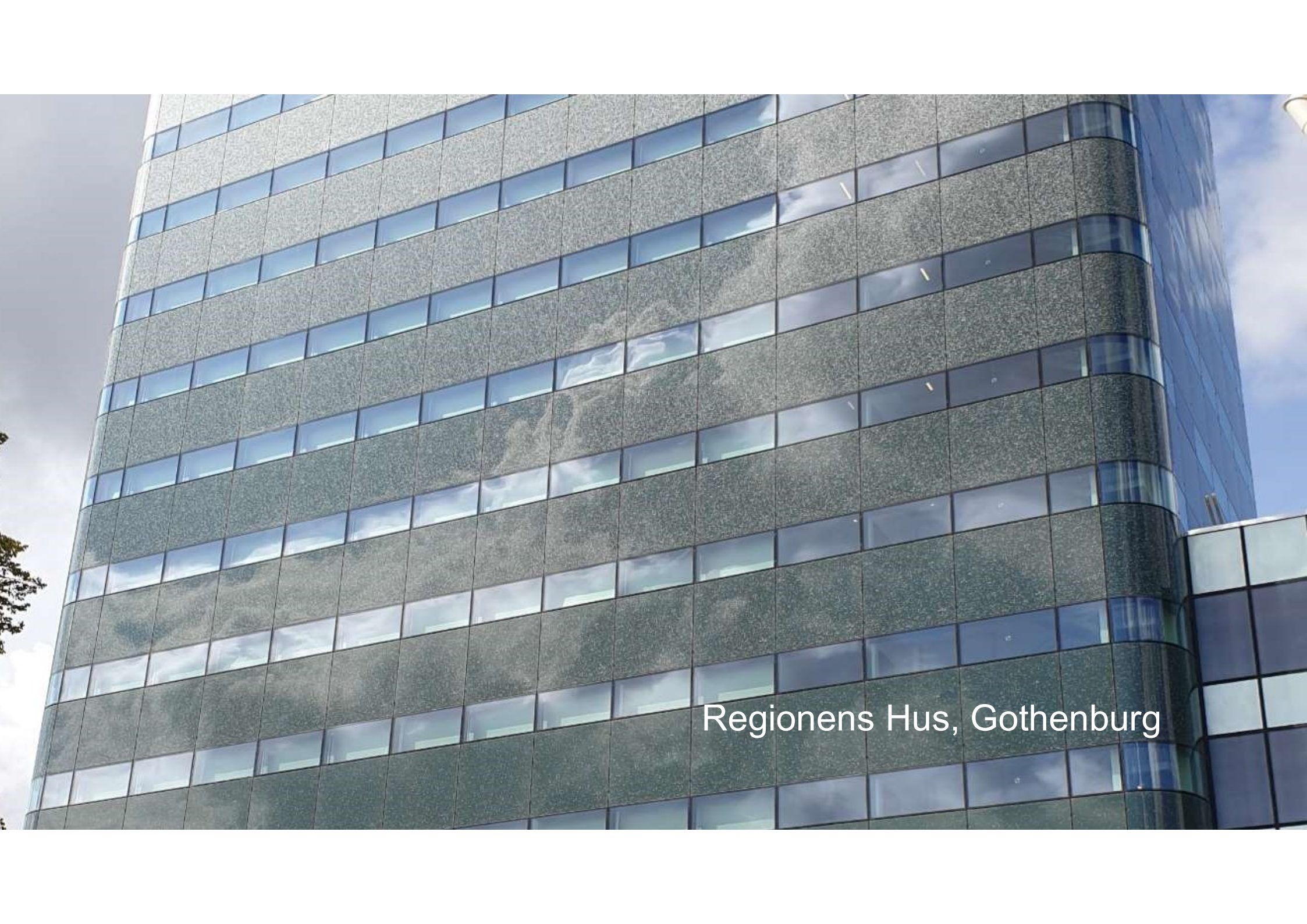
- (Timber) frame energy transmission influence  
how much heat can escape through glass  
( $U_g/U_f/U_{cw}$ )
- Cooling capacity influence how much solar  
energy can enter through the facade (g/g-tot)
- Strong influence on Window/Wall-Ratio (WWR)



# Regionens Hus, Gothenburg







Regionens Hus, Gothenburg





Mercurhuset, Gothenburg





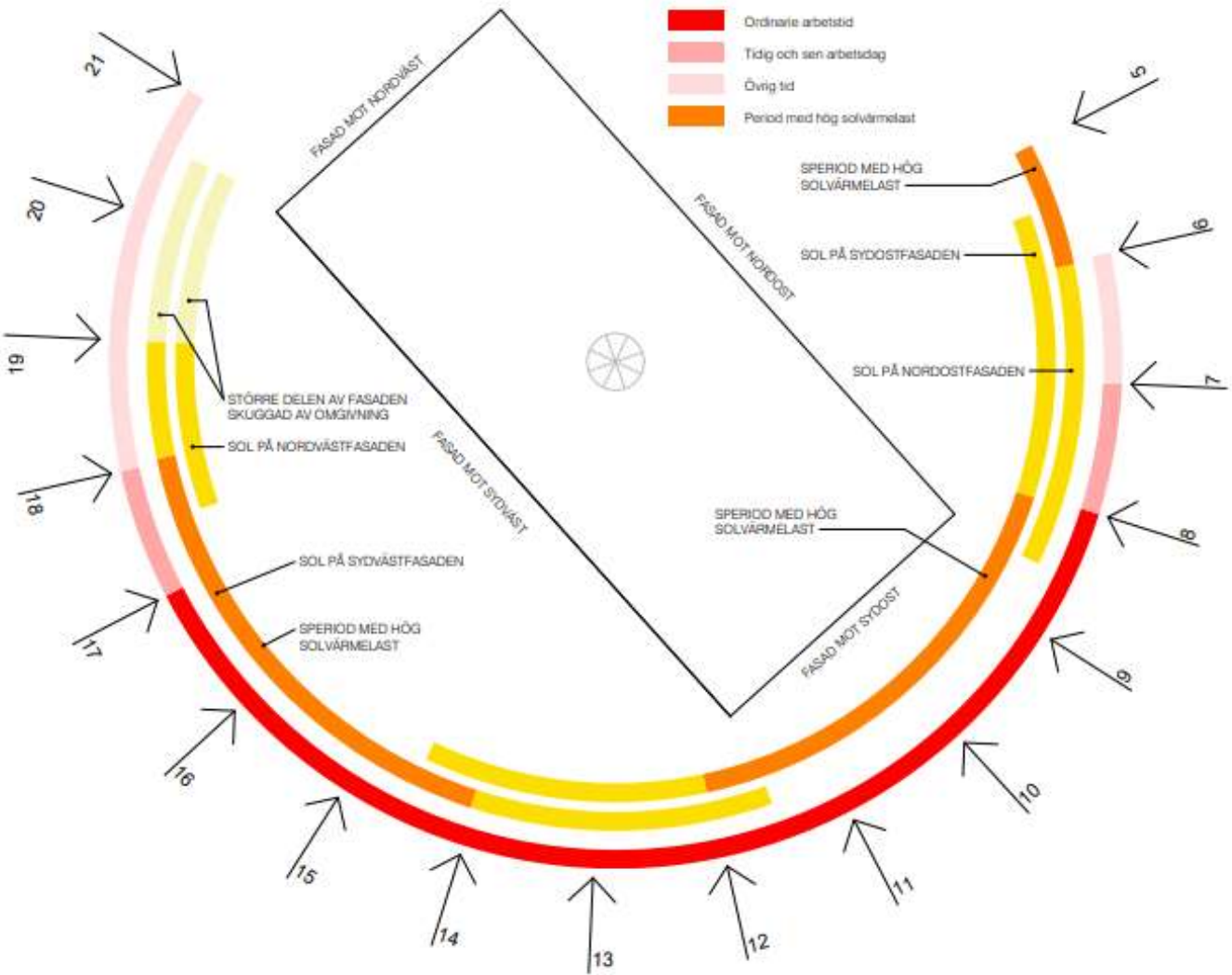
Merkurhuset, Gothenburg

## PRIORITY FOR MAGASIN X FACADE SOLUTIONS

1. Static solution (solar control glass  $LT > 60\%$ )
2. Dynamic solution inside
3. Dynamic solution outside



# DEMANDS SPLIT BY FACADE





## SOLUTIONS SPLIT BY FACADE

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XTR 70/33 TGU

XTR 70/33 TGU  
g-value 0.30

XTR 70/33 TGU  
+ inside shading  
Verosol Silver Screen  
g-tot 0.13

SNX 50 TGU  
g-value 0.20

Southwest g-tot 0.17

Southeast g 0.20





Estimated view to outside



## GLASS IS BIG CO2 CONTRIBUTOR AT MAGASIN X

TGU project	Planiclear
Magasin X 8-6-55.2	97*

\* Kilos of CO2 per m2 IGU according to Calumen



## LOW CO2 GLASS REALLY MAKES A DIFFERENCE

TGU project	PLC	ORAÈ
Magasin X 8-6-55.2	97	61
Habitat 7 8-6-66.2	104	<b>64</b>

ORAÉ®



**-42%**

carbon footprint  
of **ORAÉ®** vs  
**PLANICLEAR®**



**6.64kg**

CO<sub>2</sub> eq./m<sup>2</sup> for  
4mm **ORAÉ®**



CHECK OUR  
EPD OF  
ORAÉ® (4mm)

That means around  
**-30/40%**  
carbon footprint for  
a glazing made  
with **ORAÉ®** vs  
regular glazing

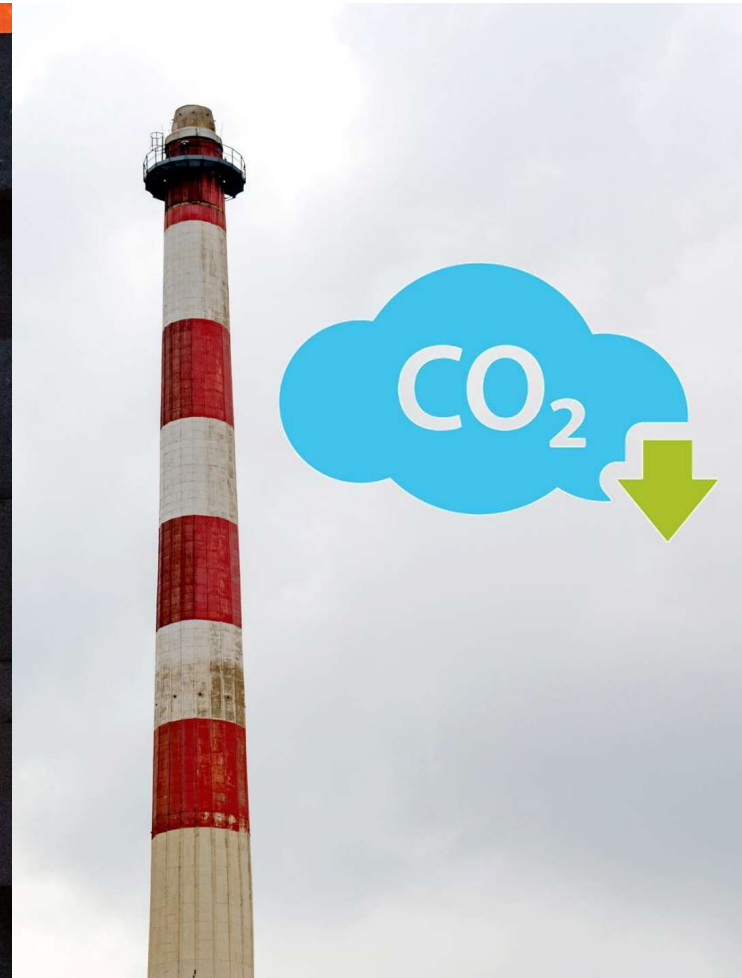
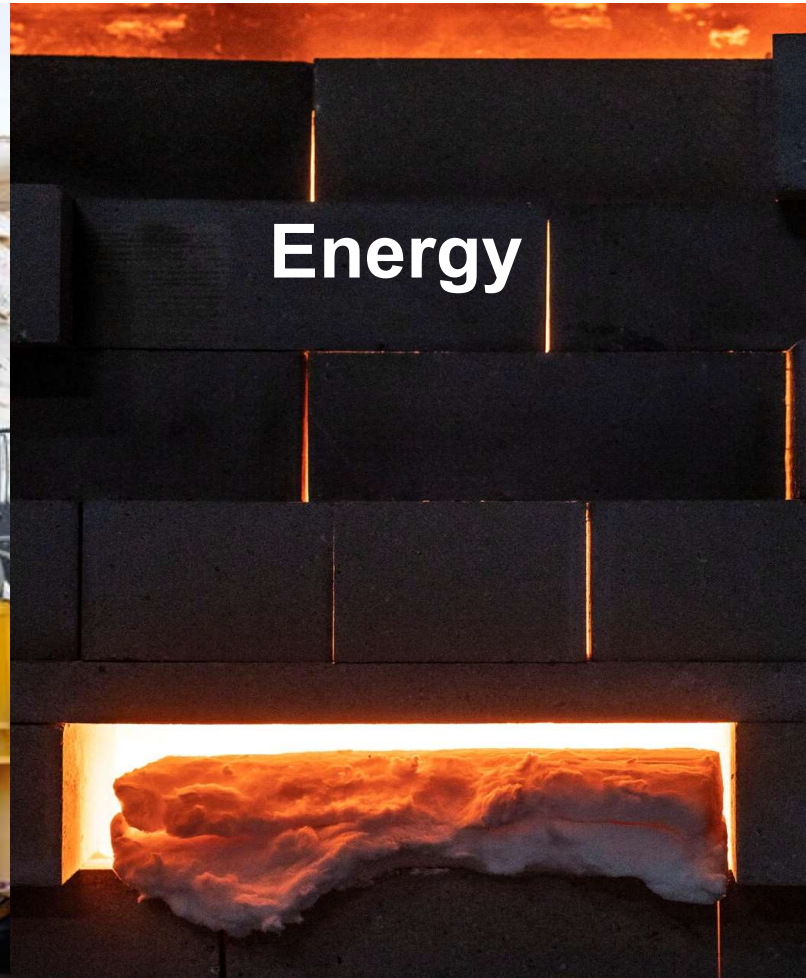
SAINT-GOBAIN GLASS

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SAINT-GOBAIN



# WHAT DOES CULLET DO?



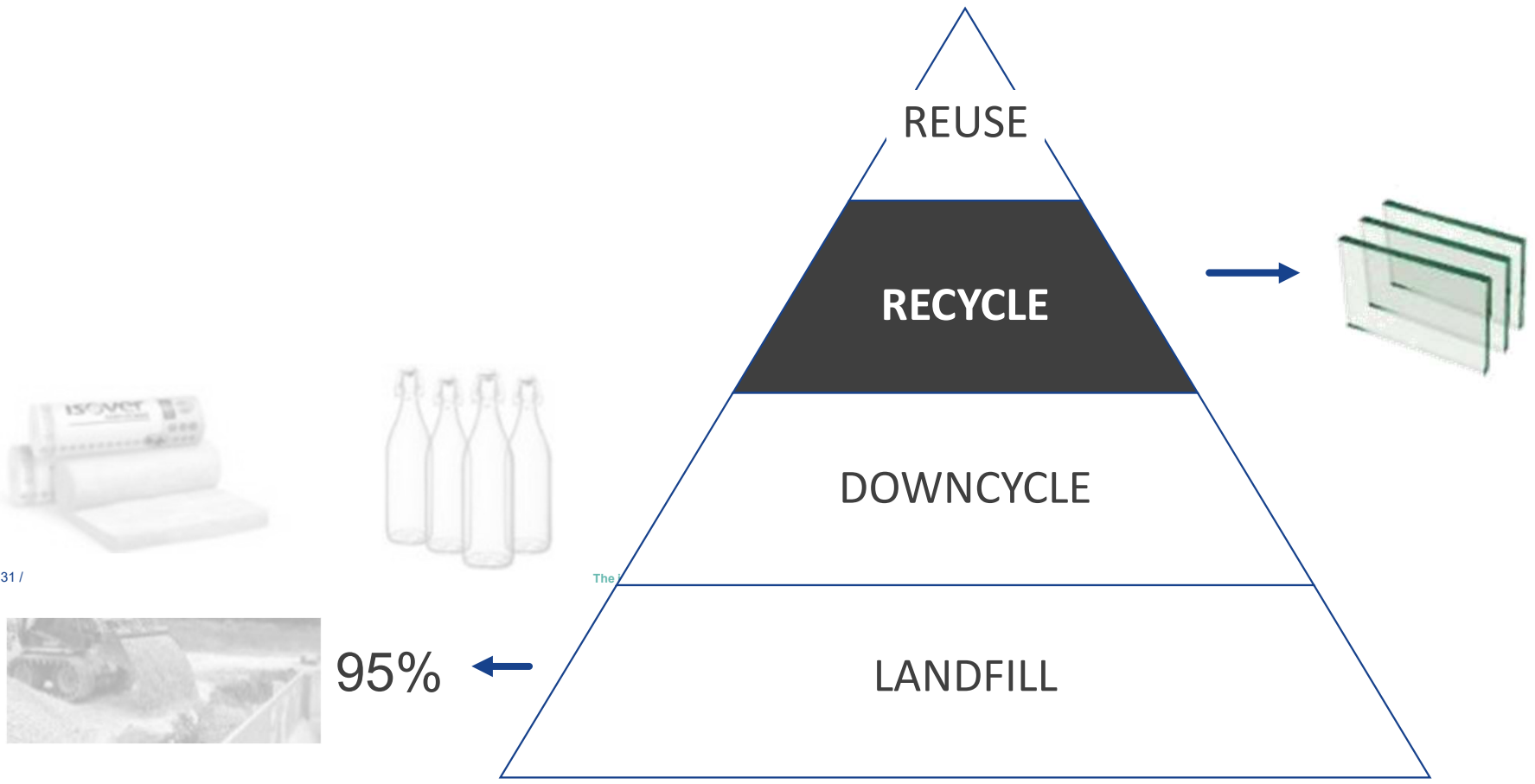
## POST-CONSUMER CULLET UNTAPPED SOURCE



\*Scope 1-3

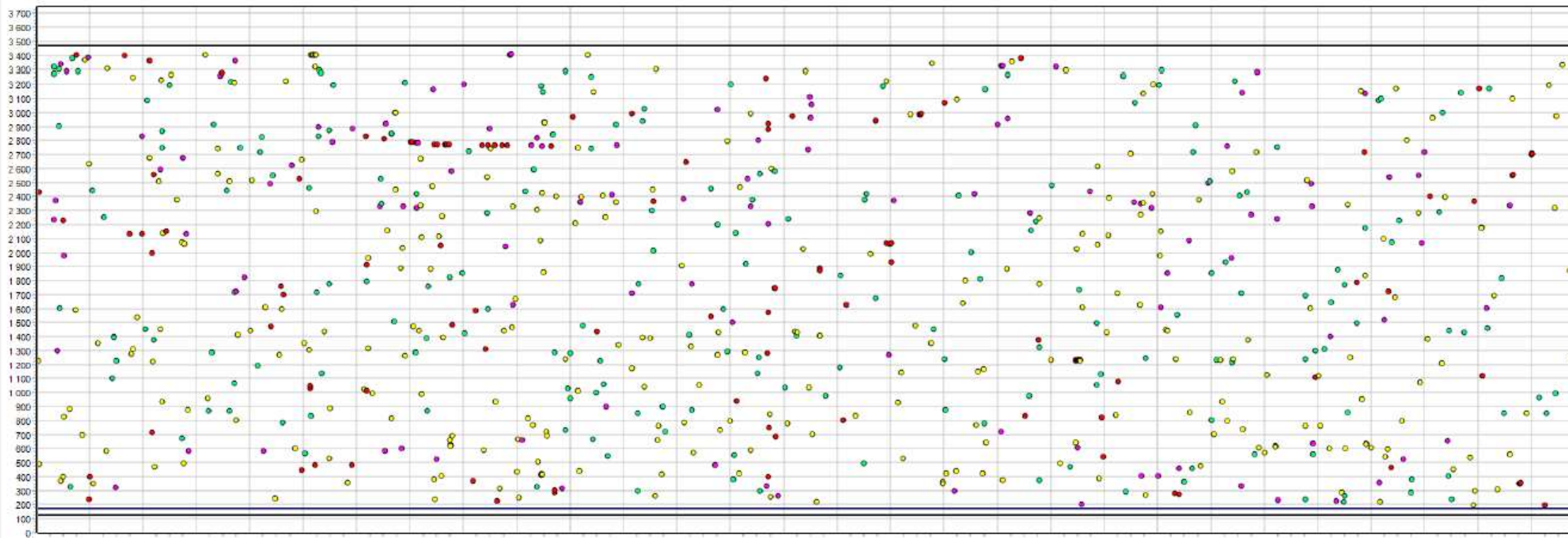


# FLAT GLASS IS INFINITELY RECYCLABLE, BUT...



# IT IS NOT WITHOUT RISK

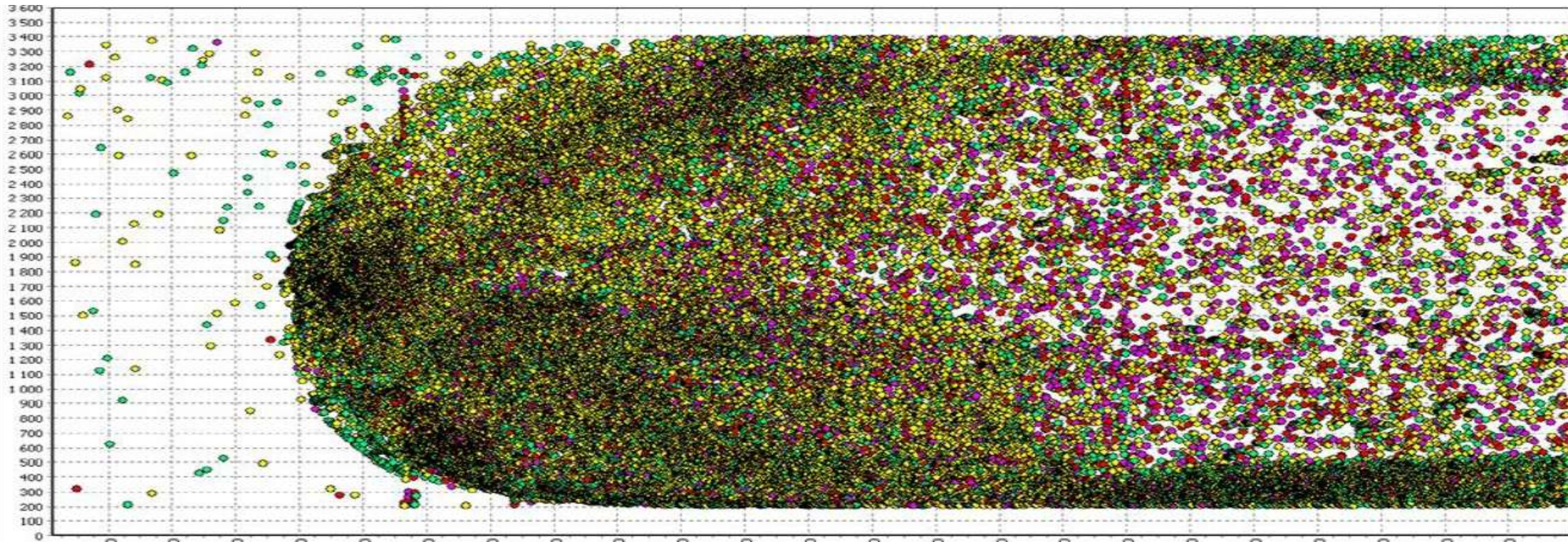
Normal production





# THE RISK IS DIFFICULT TO MANAGE

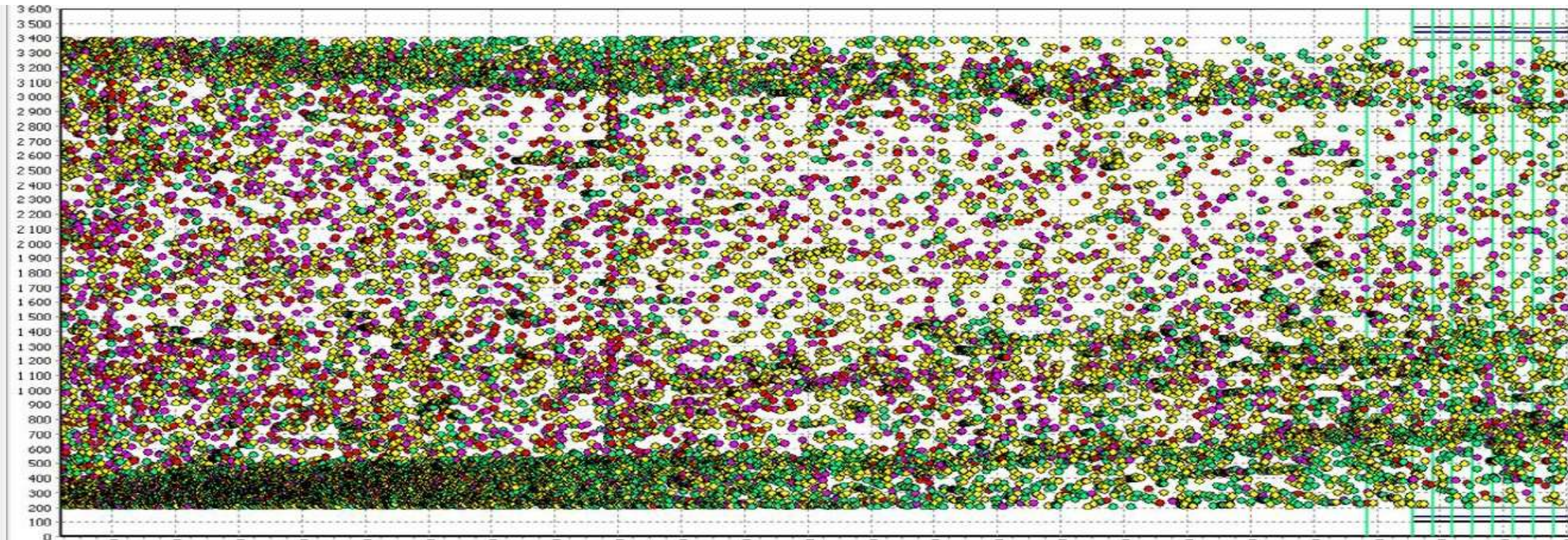
1 impurity introduced





# THE RISK IS DIFFICULT TO MANAGE

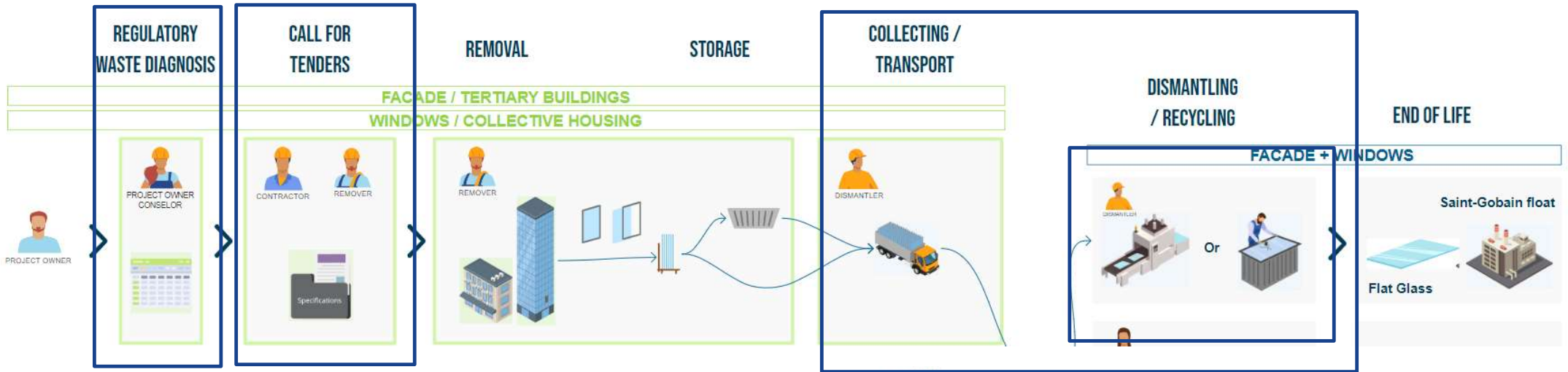
24 hours later





# POST-CONSUMER CULLET SWEDEN

Scope: Renovation / France



Diagnosis suitcase



SAINT-GOBAIN GLASS



## CONCLUSIONS

- Facade design is at least as important as u-value and embodied carbon for different materials
- Modern solar control glass has key role to play for operational and embodied carbon
- Low-CO2 glass already exists
- Post-consumer cullet is **OUR** big task



