

glass technology

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## IG2Pieces - transforming IGU waste into reusable resources

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# Motivation

## German architectural glass recycling model in figures

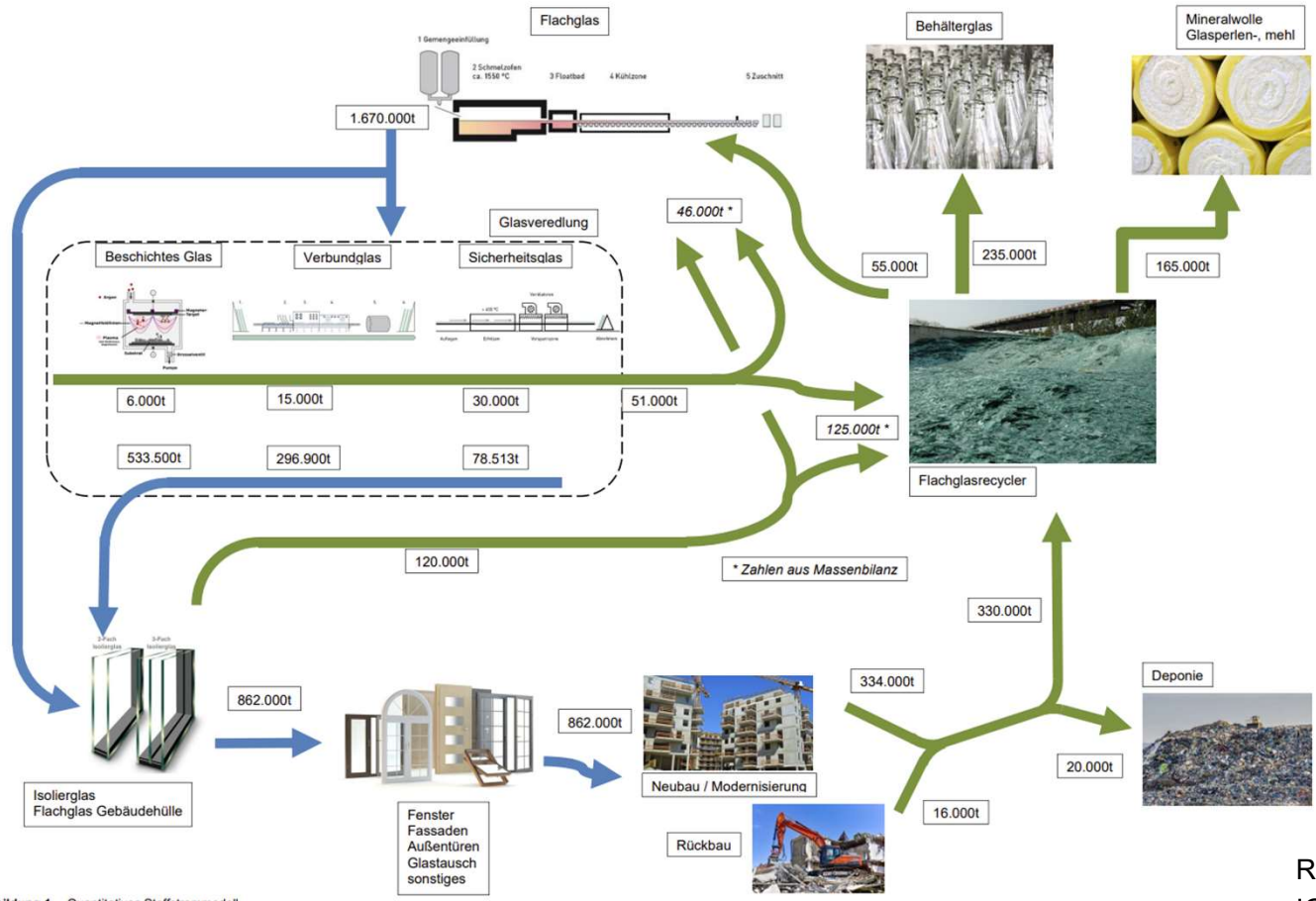
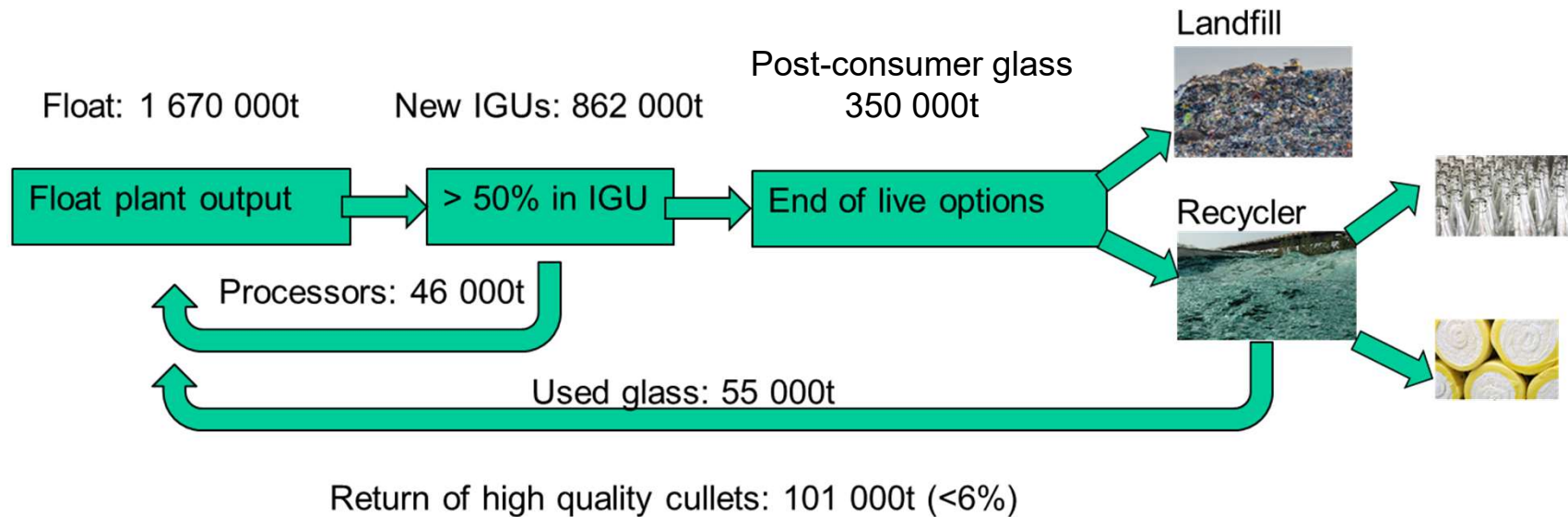


Abbildung 1 Quantitatives Stoffstrommodell

Recycling according to BV DE 2019  
IGF Rosenheim study

# Motivation

## German architectural glass recycling model in figures



Recycling according to BV DE 2019

# Motivation

Applying circular economy principles to end of life glazing



What do you do with unusable IG Elements?

## Production Failure

- IG Elements with defects right after production



## Returned Window elements

- Broken returns from Installations
- Return of used IG



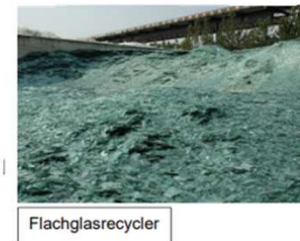
Is it just waste or a valuable material source?

# Motivation

## Applying circular economy principles to end of life glazing



- 350 000t post-consumer glass waste each year from renovation and demolition of old buildings in Germany.
- 55 000t (16%) is recycled in closed loop
- 295 000t (84%) is not



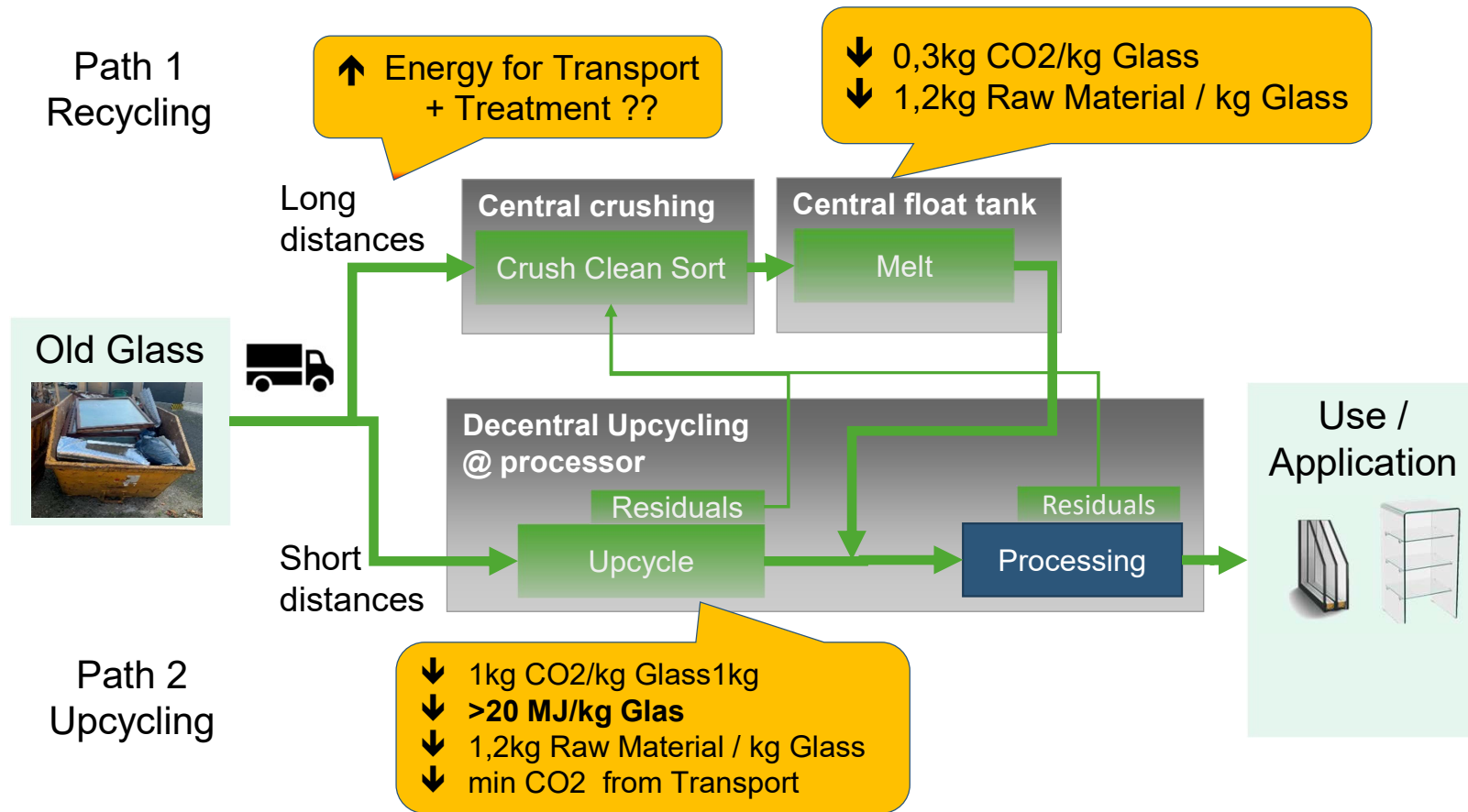
Huge business opportunity



Recycling according to BV DE 2019

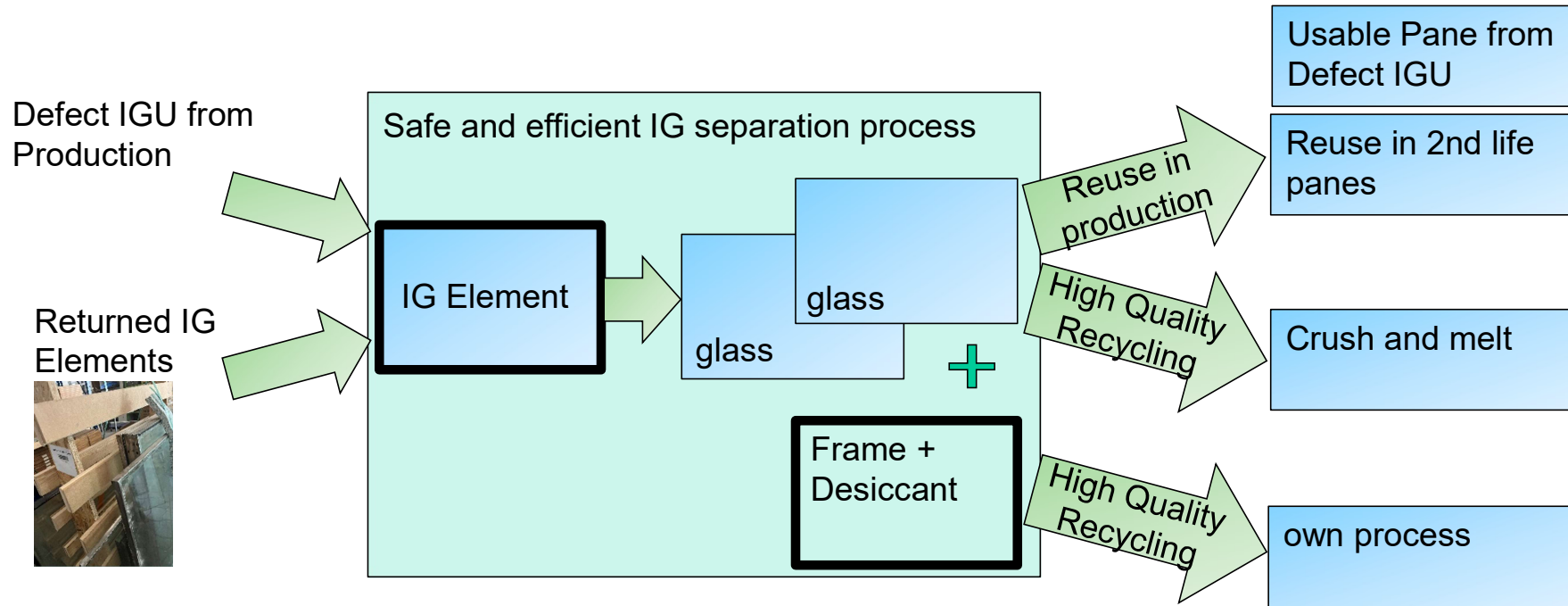
# Motivation

## Applying circular economy principles to end of life glazing



# Solution

## IG2Pieces – efficient IGU re- and upcycling process



# Solution

## IG2Pieces – efficient IGU re- and upcycling process



### Where IG2Pieces makes sense?

	Target	Benefit / Comments	ROI facts
<b>Repair</b>	<ul style="list-style-type: none"> <li>➤ Defect IGUs from Production</li> </ul>	<ul style="list-style-type: none"> <li>✓ IGUs can be dismantled</li> <li>✓ panes remain intact</li> <li>✓ Value added on panes (Lami; milling,...) saved</li> <li>➤ Requires cleaning of Spacer area (in development) or cut-off</li> </ul>	Calculate against <ul style="list-style-type: none"> <li>➤ Purchasing cost stock sheet</li> <li>➤ Remake cost</li> <li>➤ Delay cost (avoid late, supplementary delivery)</li> </ul>
<b>Recycle</b>	<ul style="list-style-type: none"> <li>➤ Defect IGUs from Production</li> <li>➤ Return IGUs from external</li> </ul>	<ul style="list-style-type: none"> <li>✓ Separation into frame and panes (coated uncoated)</li> <li>✓ Good fractioning of waste</li> <li>✓ Supports circular economy (sales argument)</li> </ul>	Calculate against <ul style="list-style-type: none"> <li>➤ Cost/Price for IG waste</li> <li>➤ Price for broken glass (float / coated /laminated)</li> </ul>
<b>Reuse (future)</b>	<ul style="list-style-type: none"> <li>➤ Return IGUs from external</li> </ul>	<ul style="list-style-type: none"> <li>✓ IGUs can be dismantled</li> <li>✓ panes remain intact</li> <li>➤ Requires cleaning of Spacer area (in development) or cut-off</li> <li>➤ Requires storage</li> </ul>	Calculate against <ul style="list-style-type: none"> <li>➤ Purchasing cost stock sheet</li> <li>➤ Added value as most green glass product</li> </ul>

All with 1 safe and efficient machine concept



## Solution

IG2Pieces – efficient IGU re- and upcycling process



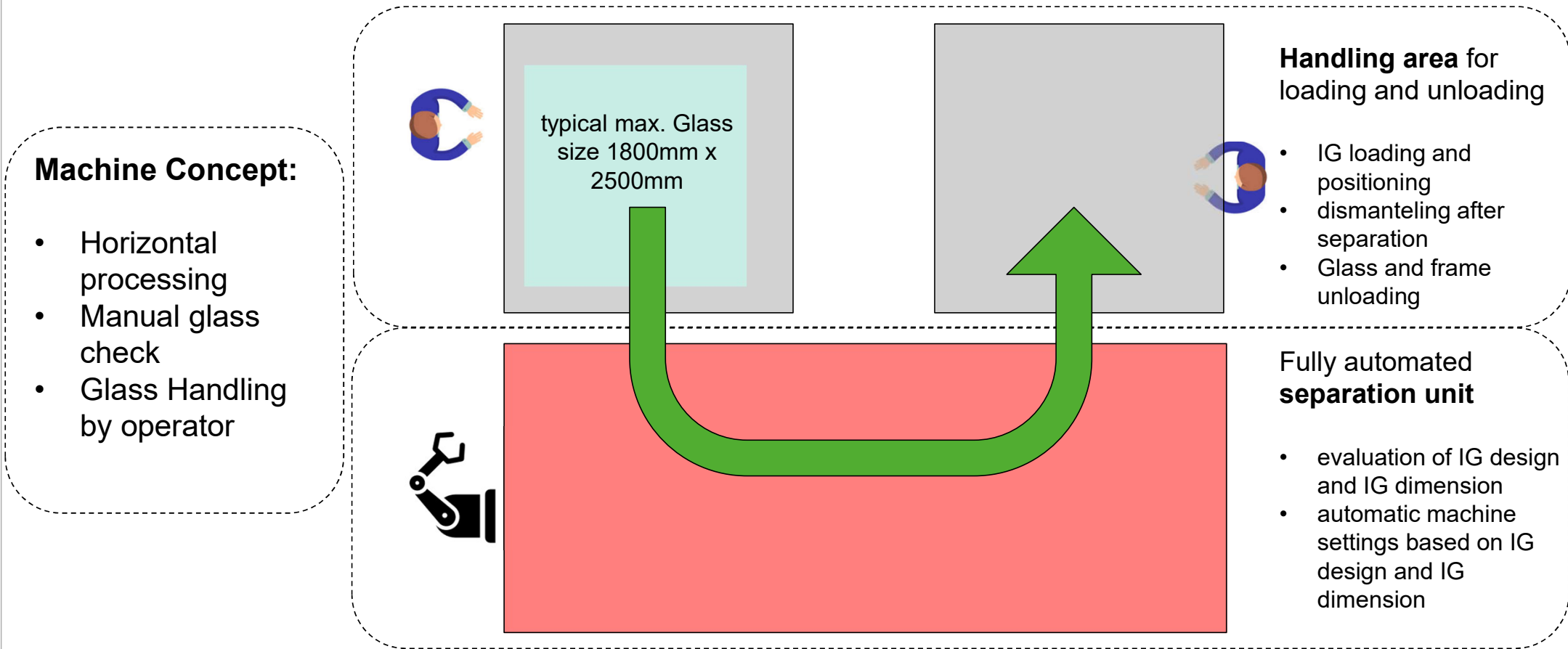
### Features:

#### Separating IG Unit in its components

- ✓ Spacer and glass are separated non-destructive
- ✓ Works for every type of glass and spacer materials
- ✓ fast and clean process enables typed glass sorting and avoids recycling chaos

# Solution

## IG2Pieces – efficient IGU re- and upcycling process



## Solution

### IG2Pieces – efficient IGU re- and upcycling process

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#### Productivity expectations for double IGU 1000mm x 1500mm, 4mm float:

- separation process: appr. 35 seconds from positioned to separated IGU (ready for dismantling)
- additional 10 to 35 seconds (depending on degree of parallelization) for secondary processes like stops, loading, dismantling, passing glasses and frame
- **overall cycle time 45 to 70 seconds**
- **resulting glass quantity** for average 1,5 sqm double IGUs 4 mm float: **1500 kg/h to 2300 kg/h**

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Thank you for your attention!

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