

# Arctic & cold climate



**Affordable Zero Energy Buildings**



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# Manufacturer Window

## Advantage Architectural Woodwork, LLC smartwin solar

Country 

Climate 

Material **Timber HPL**

### Description of baseline window

Inward opening timber aluminium window, double glazed (3-13-3) with aluminium spacer

Shaded by venetian blind.

Neither the hygiene nor the comfort criterion is achieved.

### Description of Passive House window

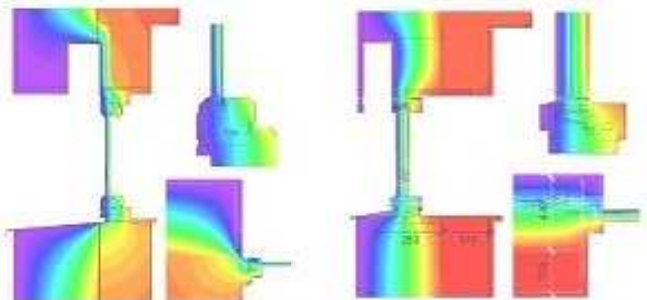
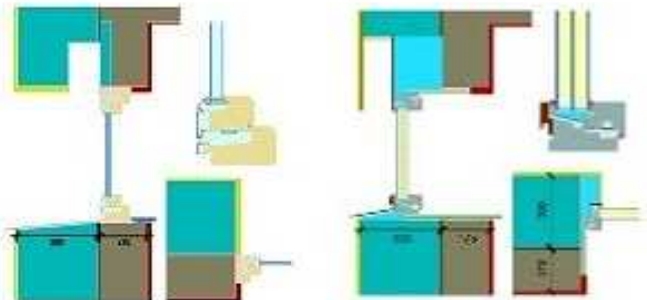
Narrow timber window frame with HPL cladding. High performance, solar optimized triple glazing ECLAZ (4-18-4-18-4 - imported from Europe) for optimum energy balance.

Hygiene criterion is achieved in combination with the installation situation.

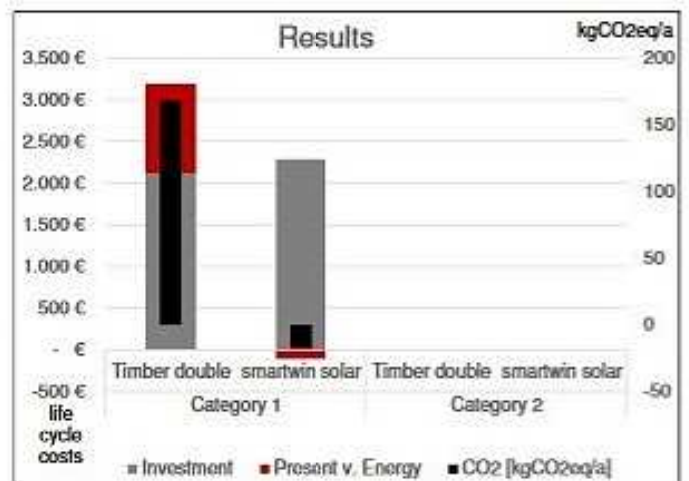


### Baseline

### PH window



| United States of America<br>US0094a_Gunnison | Category 1    |                | Category 2    |                |
|--|---------------|----------------|---------------|----------------|
|  | Timber double | smartwin solar | Timber double | smartwin solar |
| $U_g$ [W/(m²K)]                              | 1,42          | 0,55           |               |                |
| $U_t$ [W/(m²K)]                              | 1,68          | 0,82           |               |                |
| $U_w$ [W/(m²K)]                              | 1,67          | 0,66           |               |                |
| $U_{w,j}$ [W/(m²K)]                          | 2,56          | 0,68           |               |                |
| Glass fraction                               | 73%           | 80%            |               |                |
| g  | 41%           | 60%            |               |                |
| Shading factor                               | 10%           | 10%            |               |                |
| Investment                                   | 2.111 €       | 2.285 €        |               |                |
| Present v. Energy                            | 1.082 €       | - 109 €        |               |                |
| LCC  | 3.193 €       | 2.176 €        |               |                |
| LCC Saving                                   |               | 1.017 €        |               |                |
| LCC Saving                                   |               | 32%            |               |                |
| CO <sub>2</sub> [kgCO <sub>2</sub> eq/a]     | 168           | -18            |               |                |
| CO <sub>2</sub> Saving                       |               | 186            |               |                |
| CO <sub>2</sub> Saving                       |               | 110%           |               |                |





Manufacturer  
Window

i2 Factory  
smartwin solar

Country



Climate



Material

Timber HPL

### Description of baseline window

Inward opening timber aluminium window, triple glazed (4-16-4-16-4).

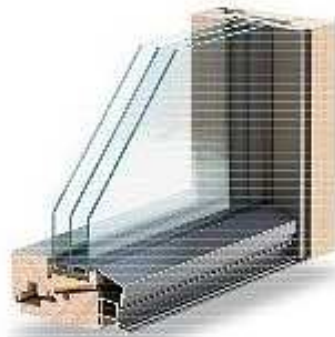
Shaded by venetian blind.

Neither the hygiene nor the comfort criterion is achieved.

### Description of Passive House window

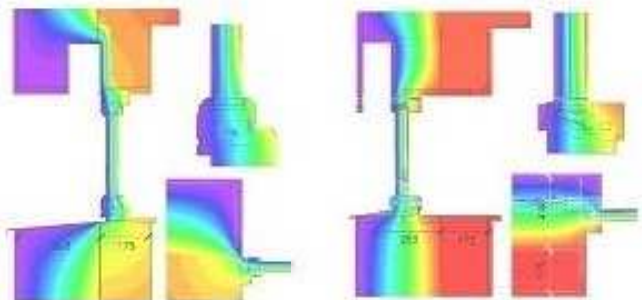
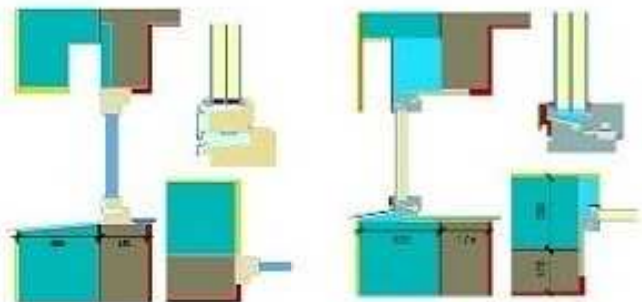
Narrow timber window frame with HPL cladding. High performance triple glazing (4-18-4-18-4) to achieve the comfort criterion.

Hygiene criterion is achieved in combination with the installation situation.

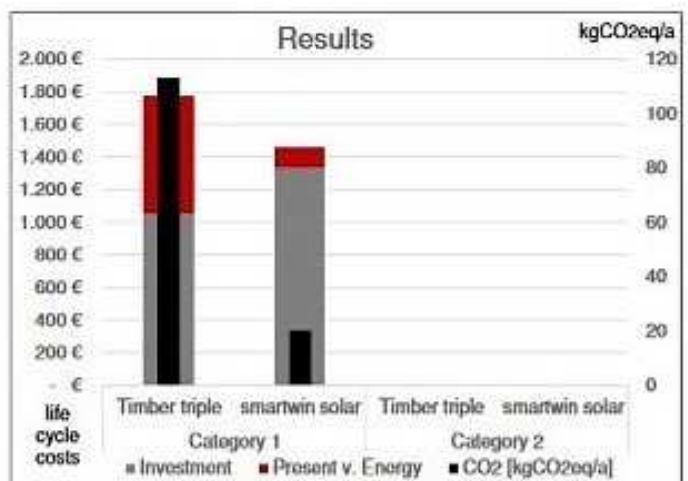


### Baseline

### PH window



| Sweden<br>SE0012a-Umeå                   | Category 1    |                | Category 2    |                |
|--|---------------|----------------|---------------|----------------|
|  | Timber triple | smartwin solar | Timber triple | smartwin solar |
| $U_g$ [W/(m <sup>2</sup> K)]             | 0,58          | 0,48           |               |                |
| $U_i$ [W/(m <sup>2</sup> K)]             | 1,52          | 0,82           |               |                |
| $U_w$ [W/(m <sup>2</sup> K)]             | 0,98          | 0,60           |               |                |
| $U_{w,i}$ [W/(m <sup>2</sup> K)]         | 1,87          | 0,63           |               |                |
| Glass fraction                           | 73%           | 80%            |               |                |
| g  | 53%           | 41%            |               |                |
| Shading factor                           | 10%           | 10%            |               |                |
| Investment                               | 1.049 €       | 1.330 €        | 1.793 €       | 2.679 €        |
| Present v. Energy                        | 726 €         | 129 €          |               |                |
| LCC                                      | 1.775 €       | 1.459 €        |               |                |
| LCC Saving                               |               | 316 €          |               |                |
| LCC Saving                               |               | 18%            |               |                |
| CO <sub>2</sub> [kgCO <sub>2</sub> eq/a] | 113           | 20             |               |                |
| CO <sub>2</sub> Saving                   |               | 93             |               |                |
| CO <sub>2</sub> Saving                   |               | 82%            |               |                |



Affordable / net  
Energy to live

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