

# COMPONENT AWARD 2014

Producers of certified passive house windows were invited to make an offer for the windows of a single family home.

41 windows took part in the categories timber, timber-alu, alu and vinyl.

These offers were compared to each other and to a “standard window” according to German legal standard.

## THE RESULT:

Passive house windows are profitable for building owners.

*Hersteller zertifizierter Passivhaus-Fenster waren eingeladen, ein Angebot für die Fenster eines Einfamilienhauses zu machen.*

*41 Fenster nahmen in den Kategorien Holz, Holz-Alu, Alu und PVC teil.*

*Die Angebote wurden untereinander und mit einem “Standard-Fenster” nach EnEV verglichen.*

## DAS ERGEBNIS:

*Passivhaus-Fenster sind profitabel für Bauherren.*

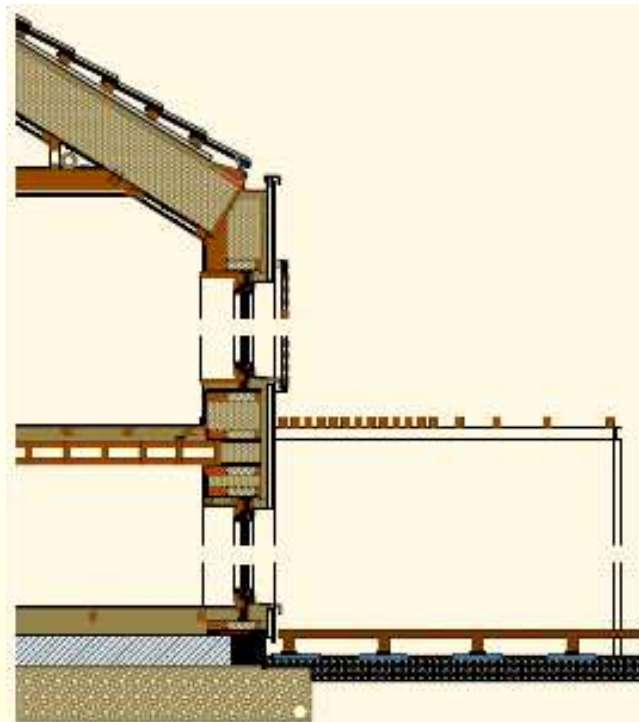
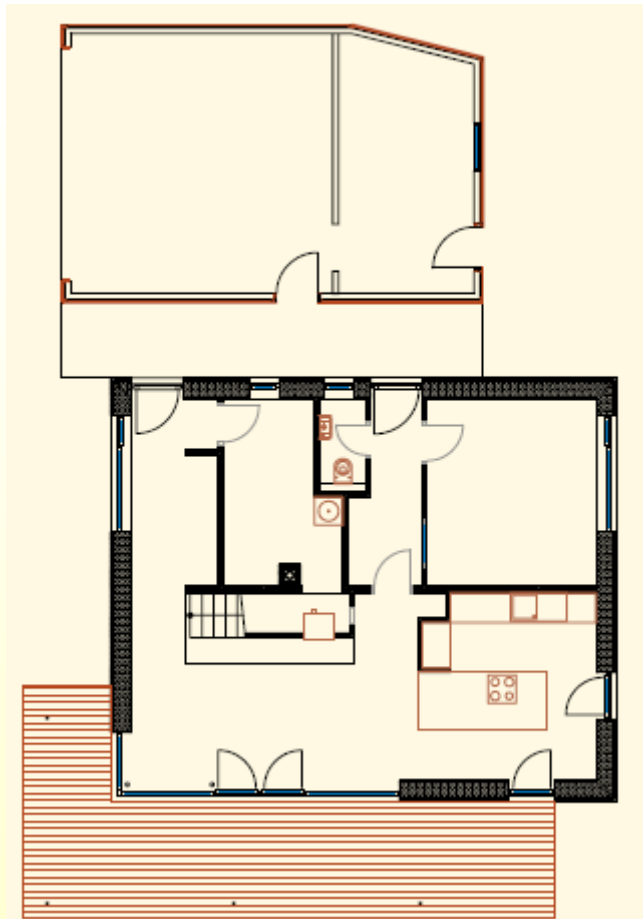


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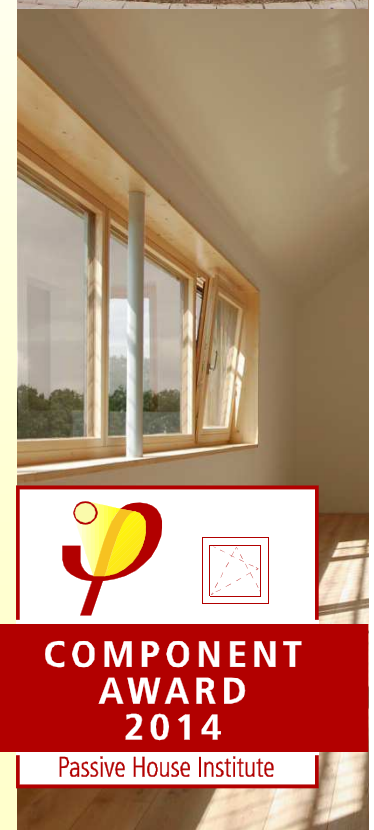
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## THE CHALLENGE

# COMPONENT AWARD 2014



Photos: passivhaus-eco®



[www.passivhausprojekte.de](http://www.passivhausprojekte.de): ID 1200

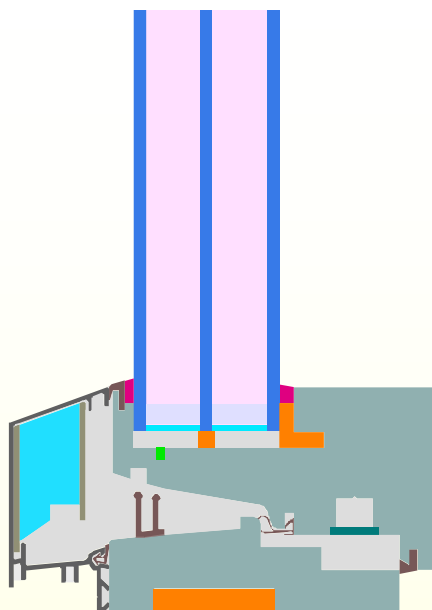
Living area:	155 m <sup>2</sup>
Heating demand:	14 kWh/(m <sup>2</sup> a)
PE-demand:	61 kWh/(m <sup>2</sup> a)
Airtightness (n <sub>50</sub> ):	0,2 1/h
Architects:	passivhaus-eco



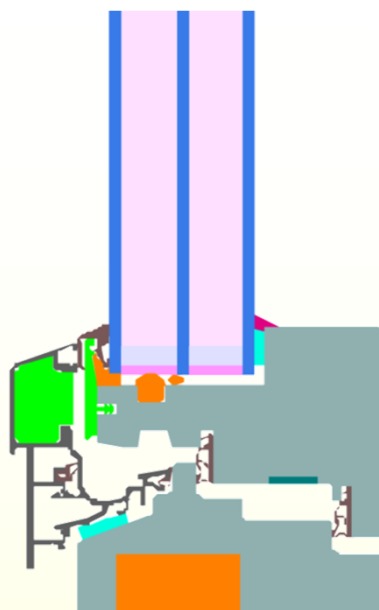
## THE REFERENCE BUILDING

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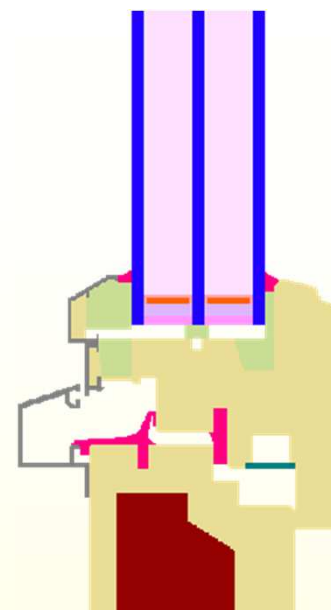
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**1 Lorber I pro PHf.**  
smartwin compact



**1 Bieber I OPTIWIN**  
FUTURA



**2 Freisinger I OPTIWIN**  
Alu2Holz



Photo: passivhaus-eco®

	<b>Prize, Company</b>
	<b>Product</b>
451	Price [€/m <sup>2</sup> inst.w]
24%	LCC savings [%]
288	Oil savings [l]

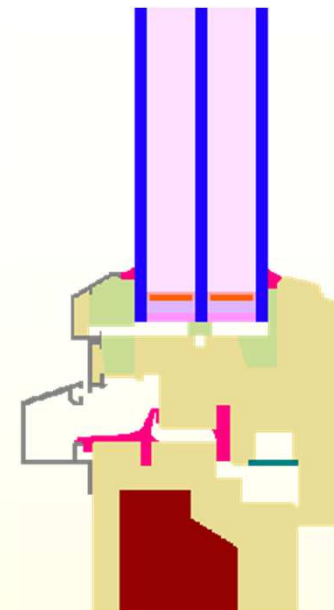
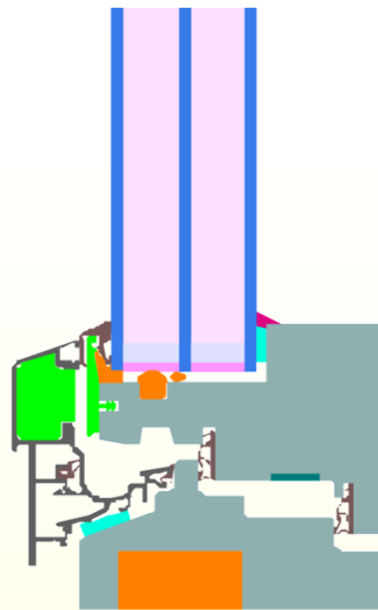
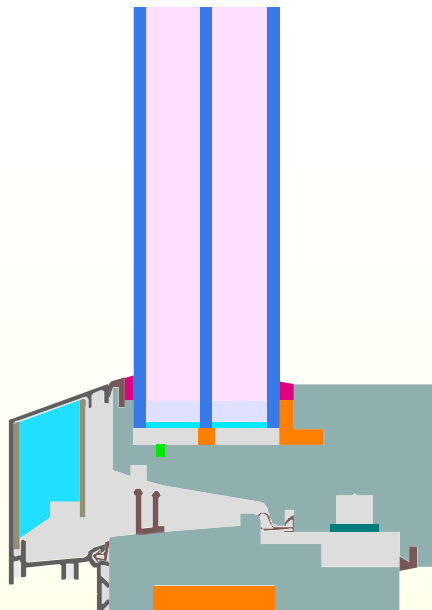
Price: Investment costs for reference building [€/m<sup>2</sup> ins. Window]. Life-Cycle Cost savings: compared to ref. case [%]. Oil savings: per m<sup>2</sup> window compared to ref. window (life-cycle 40 a)



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**THE WINNERS: Timber-Aluminum (18 participants)**



**1 Lorber I pro PHf.**  
smartwin compact

**1 Bieber I OPTIWIN**  
FUTURA

**2 Freisinger I OPTIWIN**  
Alu2Holz

**Prize, Company**  
Product

451	450	452	Price [€/m <sup>2</sup> inst.w]
24%	22%	20%	LCC savings [%]
288	246	214	Oil savings [l]

Price: Investment costs for reference building [€/m<sup>2</sup> ins. Window]. Life-Cycle Cost savings: compared to ref. case [%]. Oil savings: per m<sup>2</sup> window compared to ref. window (life-cycle 40 a)

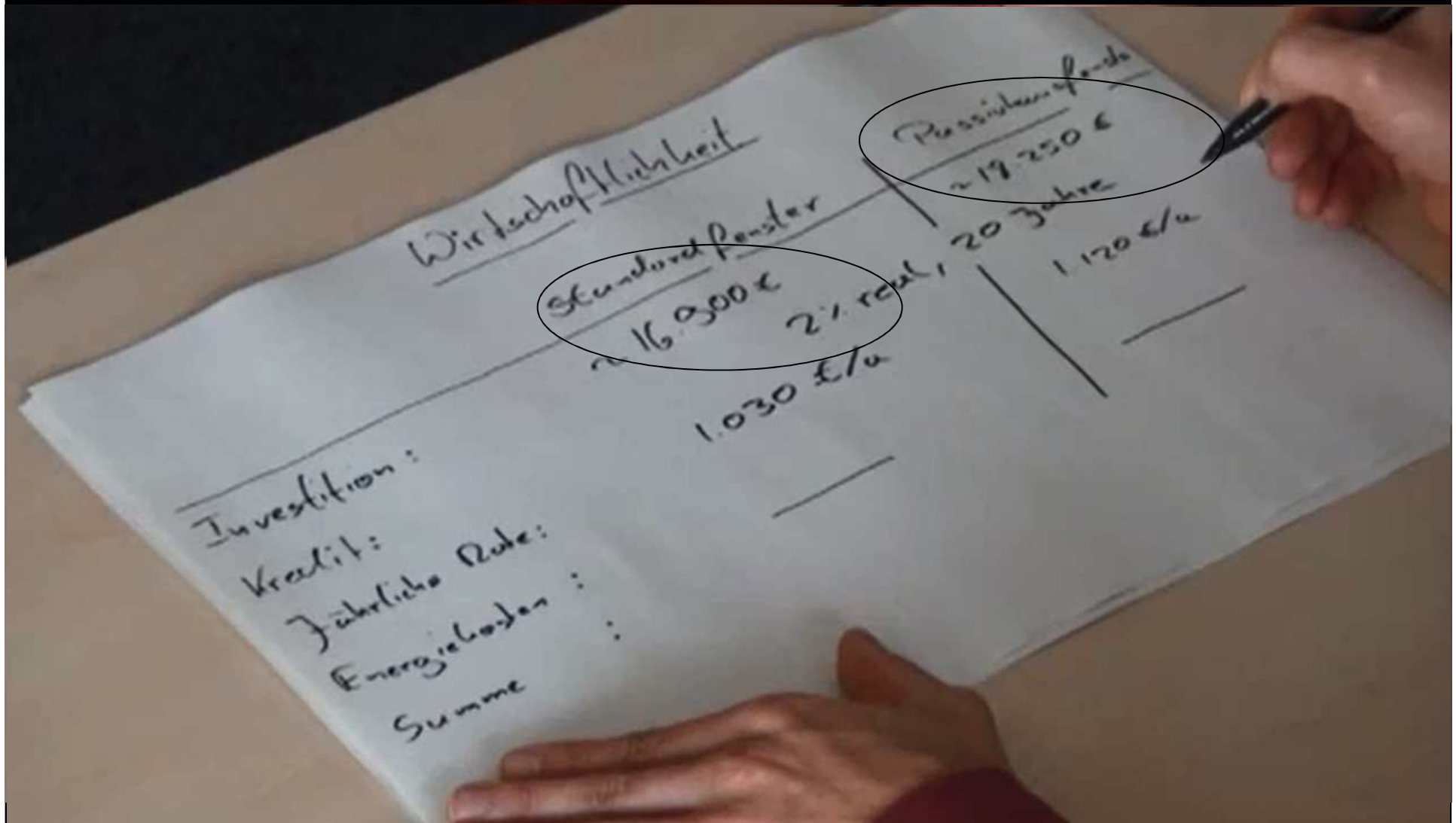


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**THE WINNERS: Timber-Aluminum (18 participants)**

# LCC savings [%]: Was ist den das?



Für ein Passivhausfenster muss ich erst mal mehr bezahlen.

# LCC savings [%]: Was ist den das?

Wirtschaftlichkeit	Passivierungsfonds
Standardforder	~19.250 €
~16.900 €	20 Jahre
2% real	1.120 €/a
1.030 €/a	

Investition:  
Kredit:  
Jährliche Rate:  
Energiekosten:  
Summe

Entscheidend ist aber, was ich an laufenden Kosten habe.  
2% Realzins heißt: effektiv und inflationsbereinigt = tatsächlich

# LCC savings [%]: Was ist den das?

The image shows a handwritten table comparing two window options. The table is divided into two columns by a vertical line. The left column is titled 'Wirtschaftlichkeit' and the right column is titled 'Passivhausfenster'. The left column lists 'Standardfenster' with a value of '≈ 16.900 €' and '1.030 €/a'. The right column lists 'Passivhausfenster' with a value of '≈ 19.250 €' and '1.120 €/a'. The values '1.030 €/a' and '1.120 €/a' are circled in black. Below the table, there is a list of items: 'Investition:', 'Kredit:', 'Jährliche Rente:', 'Energiekosten:', and 'Summe:'.

Wirtschaftlichkeit	Passivhausfenster
Standardfenster	Passivhausfenster
≈ 16.900 €	≈ 19.250 €
2% real, 20 Jahre	
1.030 €/a	1.120 €/a

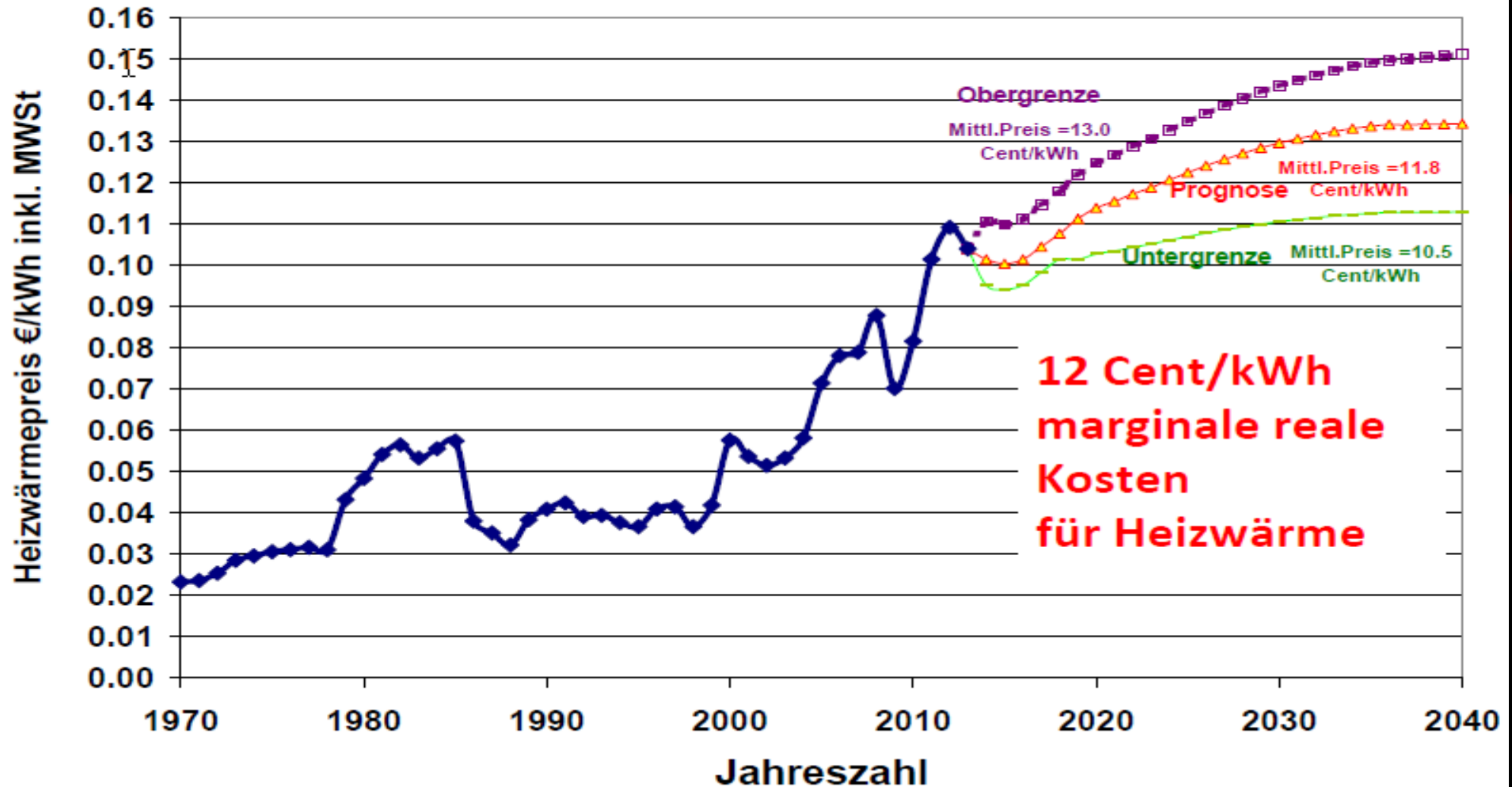
Investition:  
Kredit:  
Jährliche Rente:  
Energiekosten:  
Summe:

Da zahle ich für meine Passivhausfenster 90 € mehr pro Jahr. Mein Energieberater sagt mir die jährlichen Energiekosten.

# Energiekosten steigen und steigen



## Wärmepreis-Entwicklung



Aber nicht ins endlose, Erneuerbare bilden das Maximum.



# Energiekosten aus der Energiebilanz

	<u>Wirtschaftlichkeit</u>	<u>Passivtausch</u>
Standardfenster		~ 19.250 €
~ 16.900 €	2% real, 20 Jahre	1.120 €/a
1.030 €/a		<u>3 €/a</u>
~ 250 €/a		

Investition:  
Kredit:  
Jährliche Rate:  
Energiekosten:  
Summe

Ohne Energiebilanz „wilde Spekulation“

# Investition + Energie = Gesamtkosten

	Wirtschaftlichkeit	Passivhausfenster
Investition:	Standard Fenster ~ 16.500 €	~ 19.250 €
Kredit:	2,1 real, 20 Jahre	
Jährliche Rate:	1.030 €/a	1.120 €/a
Energiekosten:	~ 290 €/a	3 €/a
Summe	1.280 €/a	1.123 €/a

160 €/a Energieersparnis

Passivhausfenster verdienen 160,-€/a gegenüber EnEV Fenstern.

# Investition + Energie = Gesamtkosten

Wirtschaftlichkeit

Standard Fenster	Passivhausfenster
~ 16.500 €	~ 19.250 €
2,1 real, 20 Jahre	
1.030 €/a	1.120 €/a
~ 250 €/a	3 €/a
280 €/a	1.123 €/a
	160 €/a

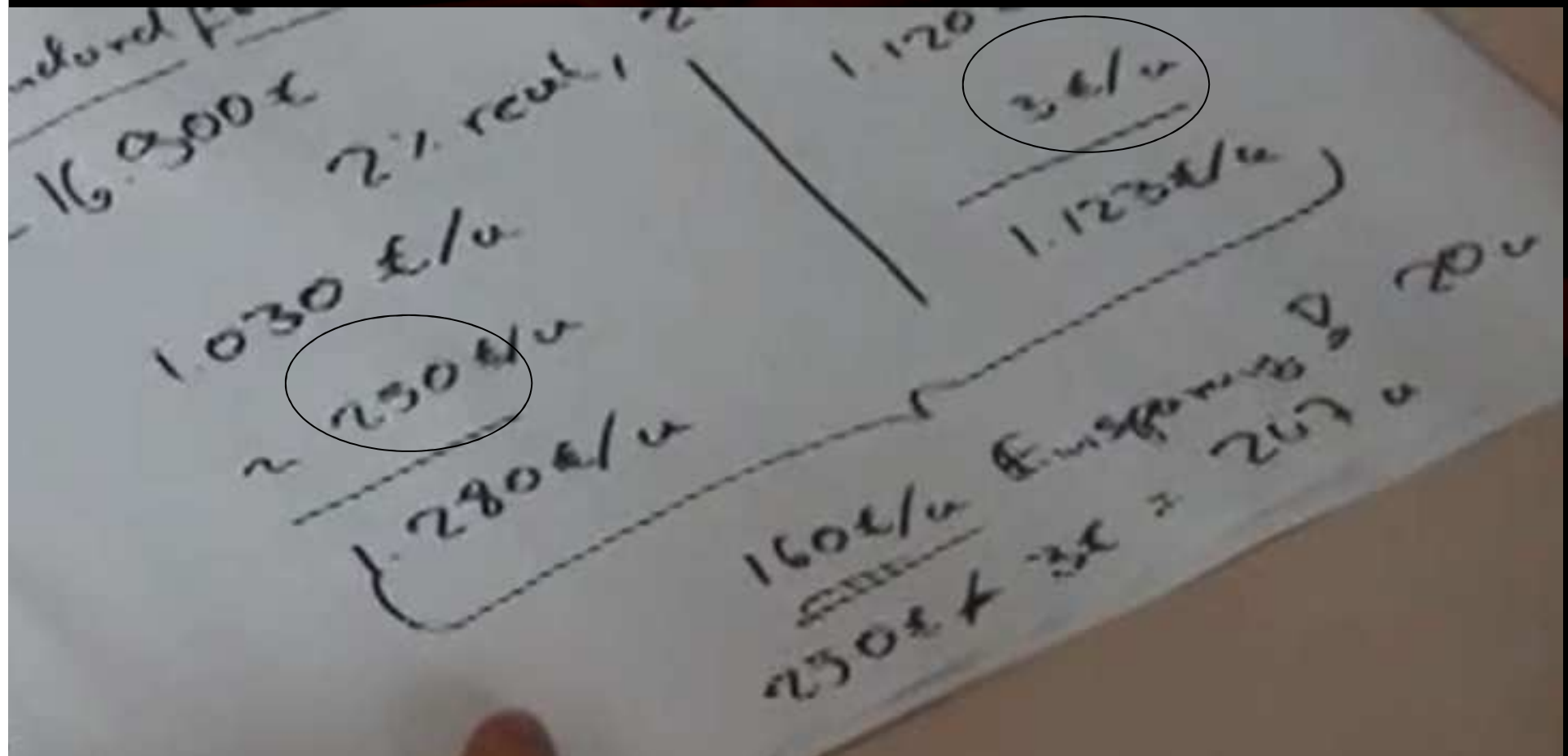
Investition:  
Kredit:  
Jährliche Rate:  
Energiekosten:  
Summe

20 Jahre

160 €/a

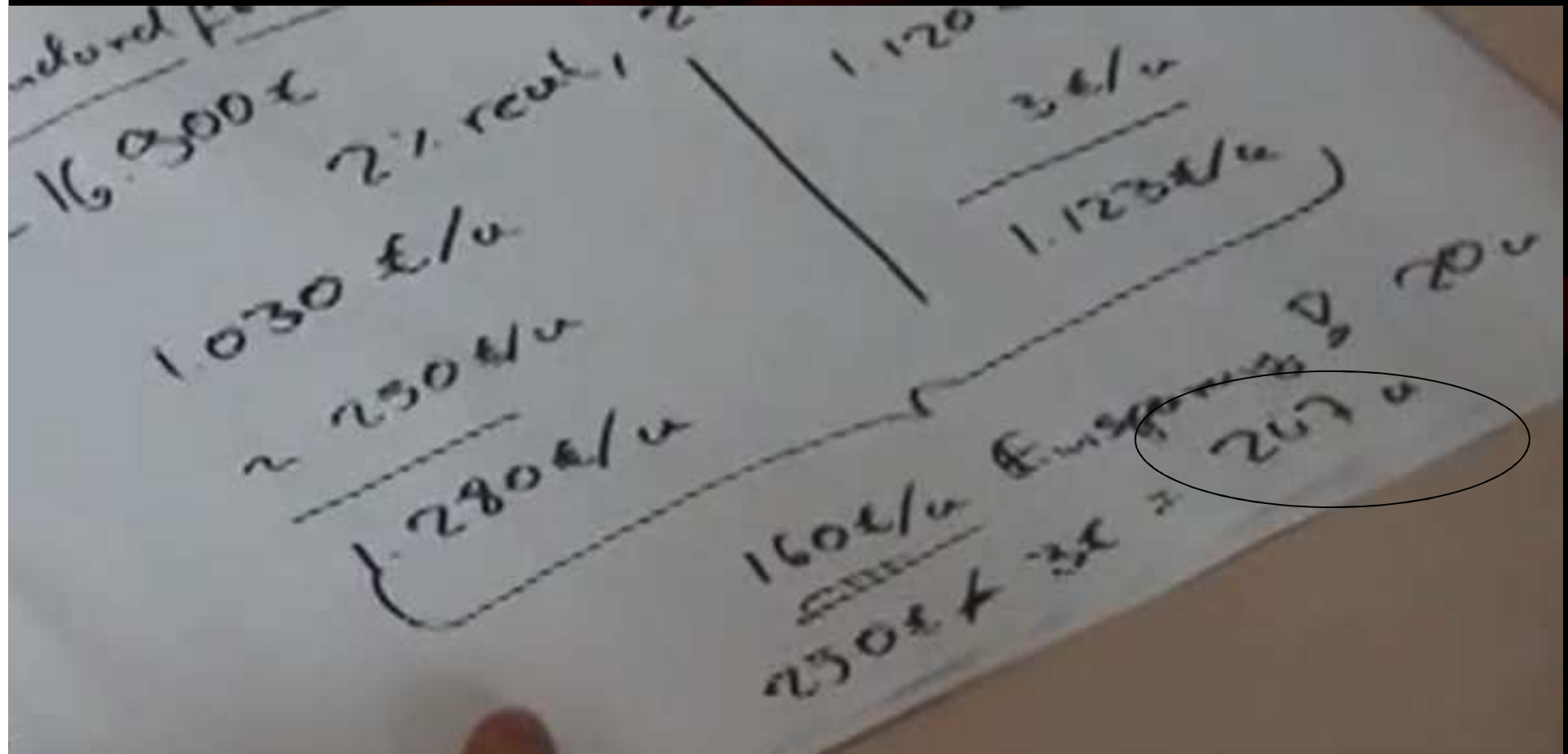
Passivhausfenster verdienen 160,-€/a gegenüber EnEV Fenstern.

# Was ist nach den 20 Jahren?

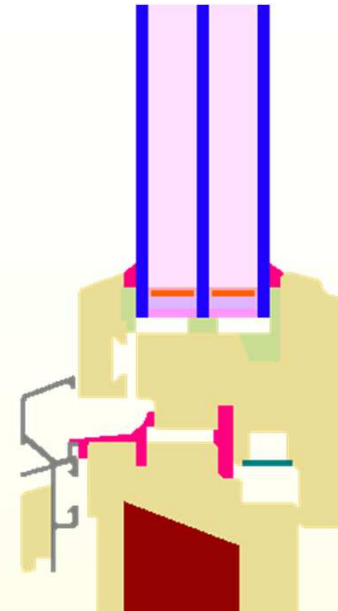
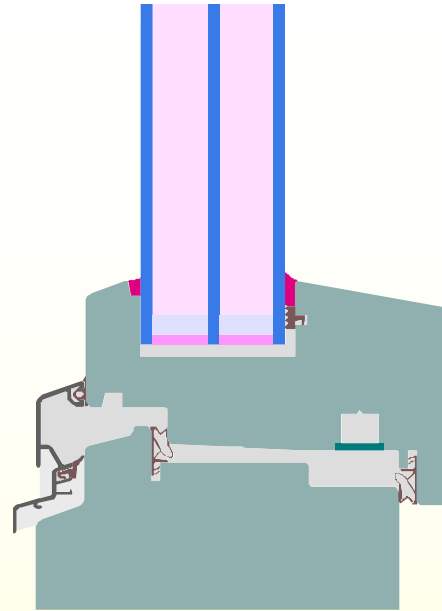
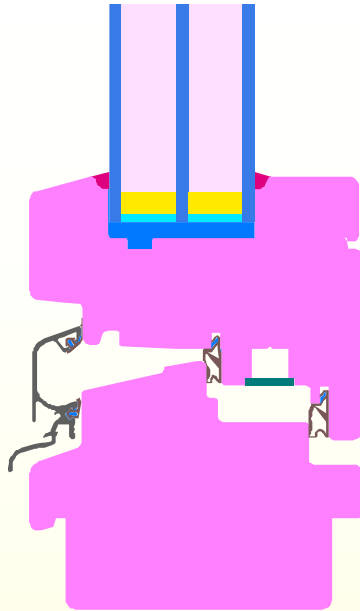


Da geht es nur noch um die Energiekosten.

# Was ist nach den 20 Jahren?



Nun verdienen die Passivhausfenster 247,- €/a mehr und das lebenslänglich.



**1 M SORA**

**1 Pfeffer Fenster**

**2 Freisinger I OPTIWIN**

**Prize, Company**

NATURA OPTIMO XLT	RPS	Holz2Holz	Product
384	396	452	Price [€/m <sup>2</sup> inst.w]
23%	22%	13%	LCC savings [%]
228	222	201	Oil savings [l]

Price: Investment costs for ref. building [€/m<sup>2</sup> inst. window incl. VAT]. Life-Cycle Cost savings: compared to ref. case [%]. Oil savings: per m<sup>2</sup> window compared to ref. window (life-cycle 40 a)



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**THE WINNERS: Timber (6 participants)**

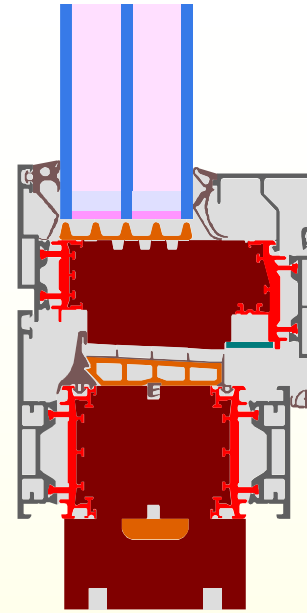
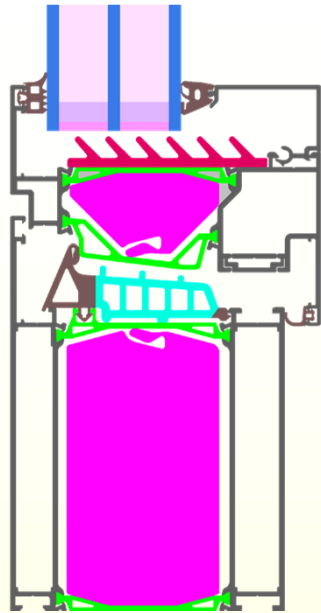


Photo: passivhaus-eco®

**1 RAICO**

**1 PURAL**

**Prize, Company**

FRAME 90 WI	eco90	Product
492	540	Price [€/m <sup>2</sup> inst.w]
14%	12%	LCC savings [%]
185	230	Oil savings [l]

Price: Investment costs for ref. building [€/m<sup>2</sup> inst. window incl. VAT]. Life-Cycle Cost savings: compared to ref. case [%]. Oil savings: per m<sup>2</sup> window compared to ref. window (life-cycle 40 a)



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**THE WINNERS: Aluminum (3 participants)**

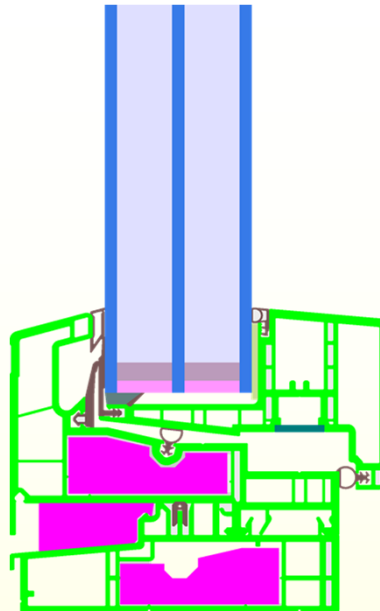


Photo: passivhaus-eco®

**1 Hilzinger**

**Prize, Company**

VADB 550

Product

224

Price [€/m<sup>2</sup>inst.w]

37%

LCC savings [%]

257

Oil savings [l]

Price: Investment costs for ref. building [€/m<sup>2</sup> inst. window incl. VAT]. Life-Cycle Cost savings: compared to ref. case [%]. Oil savings: per m<sup>2</sup> window compared to ref. window (life-cycle 40 a)



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**THE WINNERS: PVC (3 participants)**



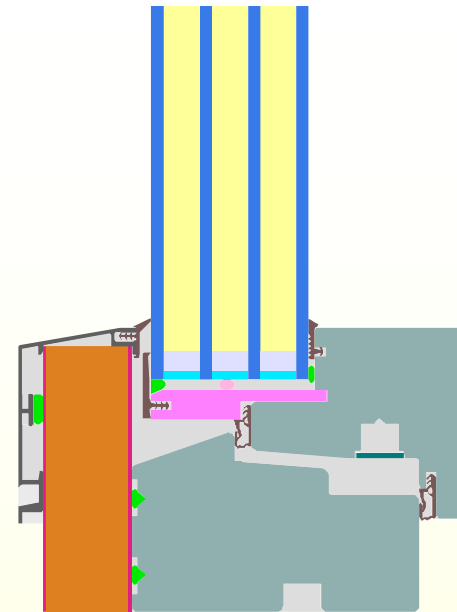
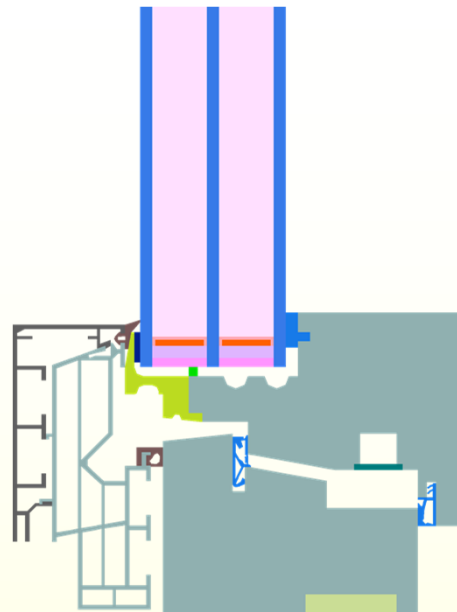
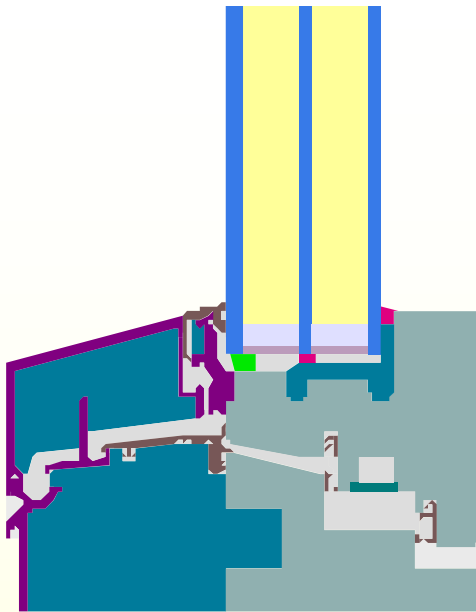


Photo: passivhaus-eco®

<b>Timber-GRP, dHPt</b>	<b>Glazing, Wiegand</b>	<b>U-value, Pazen</b>	<b>Prize, Company</b>
Delta Plus cold climate	DWplus	ENERsign arctis*	Product
353	543	599	Price [€/m <sup>2</sup> inst.w]
27%	12%	8%	LCC savings [%]
225	237	276	Oil savings [l]

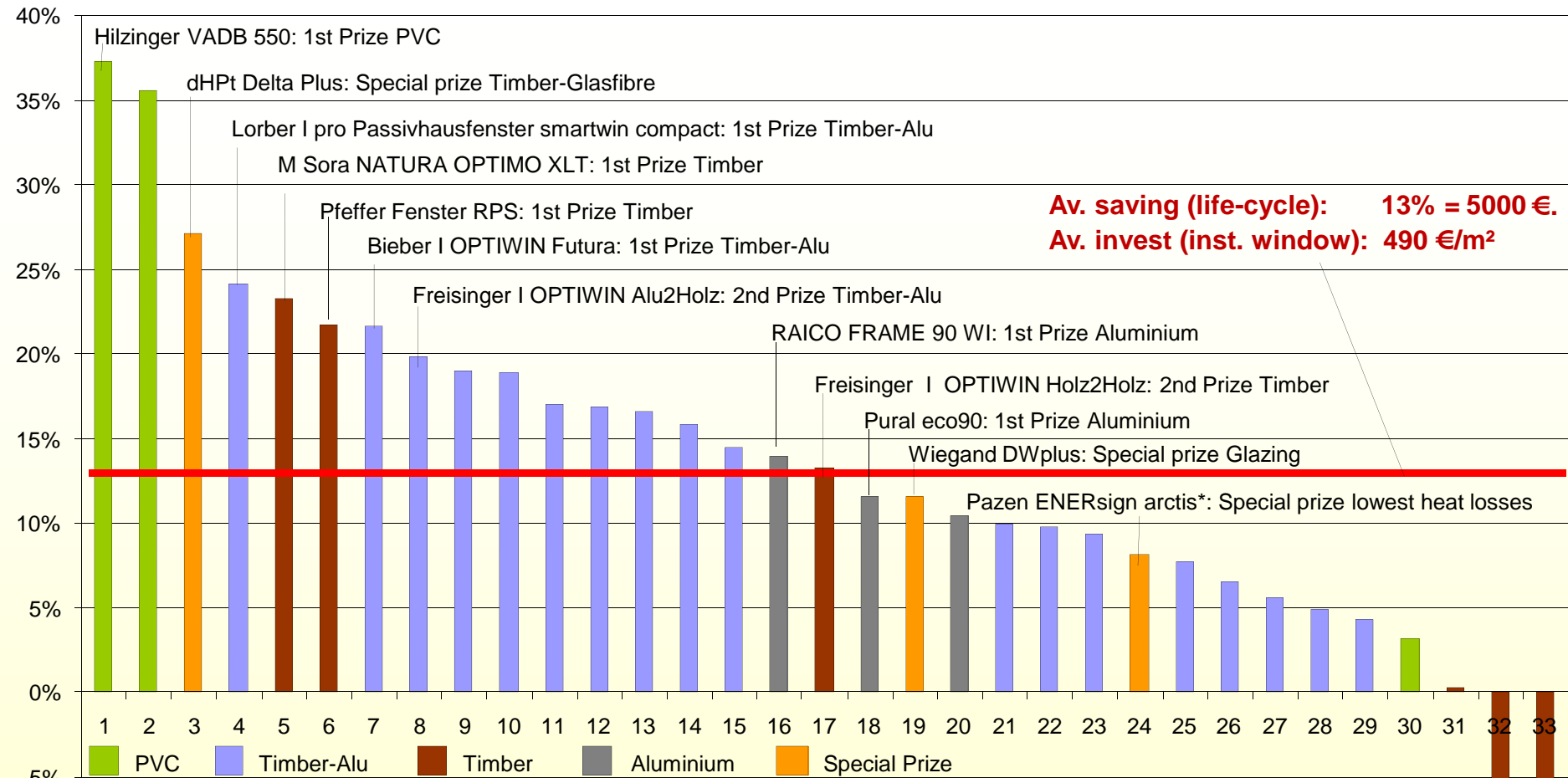
Price: Investment costs for ref. building [€/m<sup>2</sup> inst. window incl. VAT]. Life-Cycle Cost savings: compared to ref. case [%]. Oil savings: per m<sup>2</sup> window compared to ref. window (life-cycle 40 a)



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**SPECIAL PRIZES**

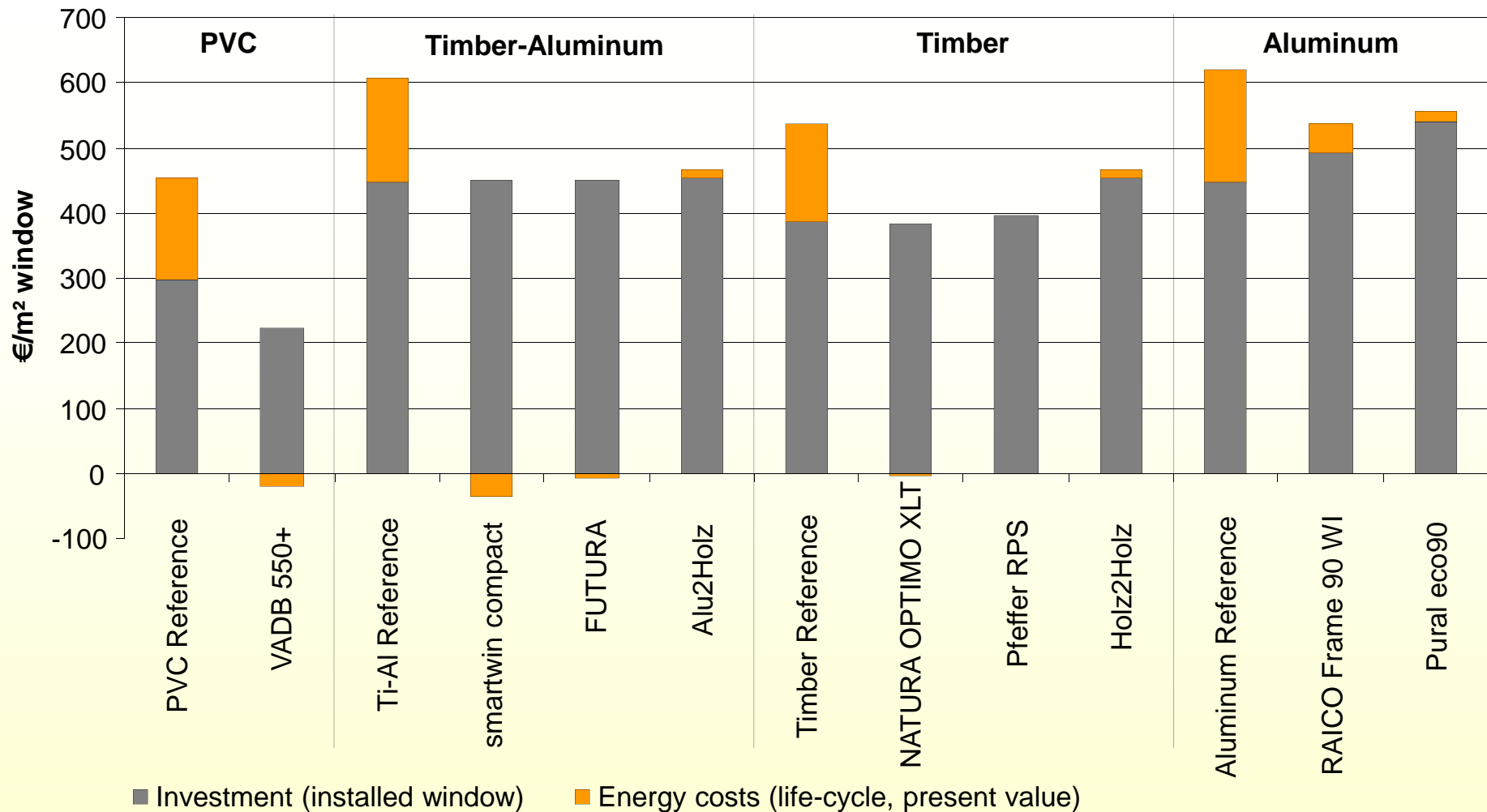


**Passive house windows are profitable for building owners**  
*Passivhaus-Fenster sind profitabel für Bauherren*



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**RESULTS: Savings compared to reference**



**Investment and energy costs | Investitions- und Energiekosten**

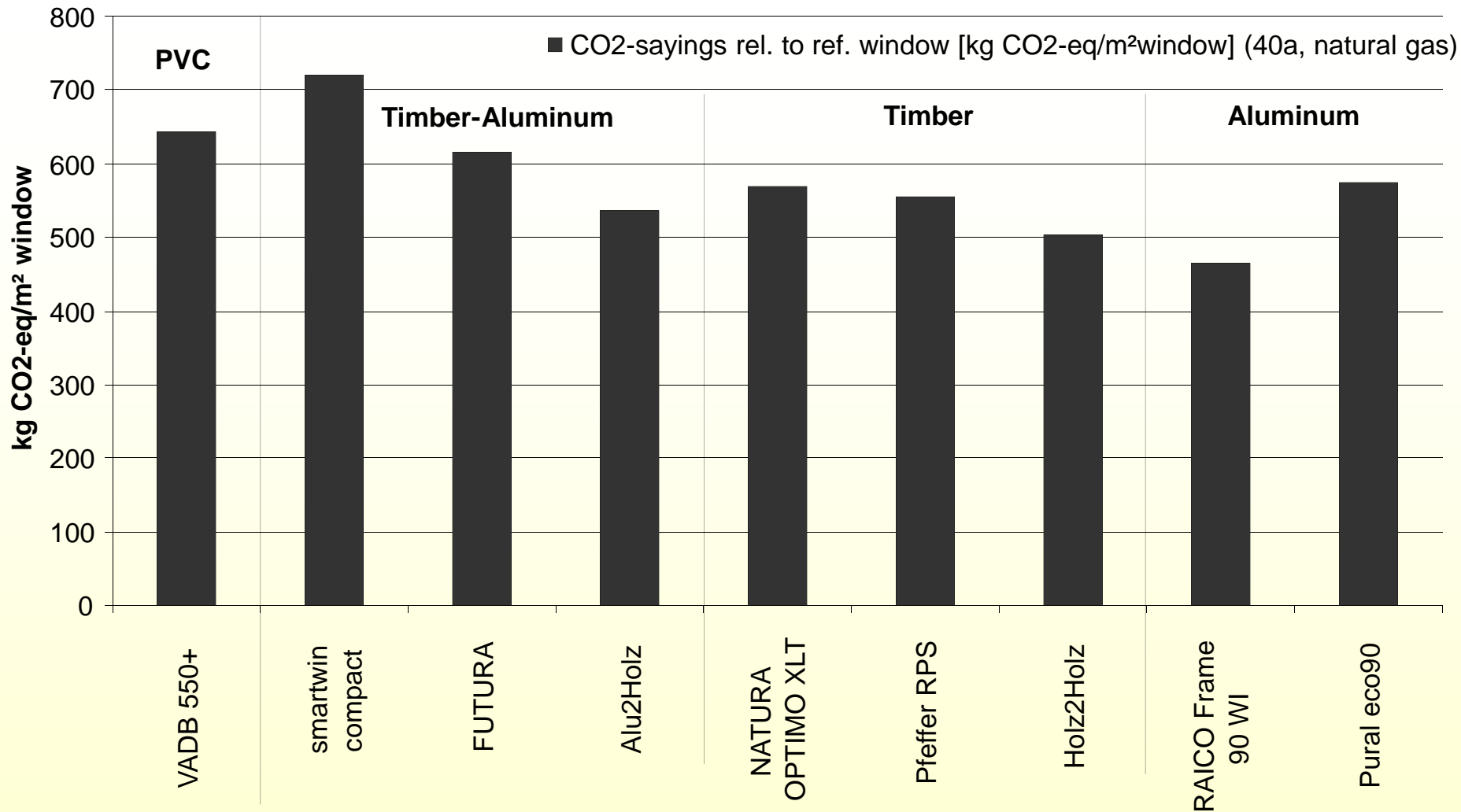
No energy costs for passive house windows | Keine Energiekosten für Passivhausfenster



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**RESULTS: The winners**

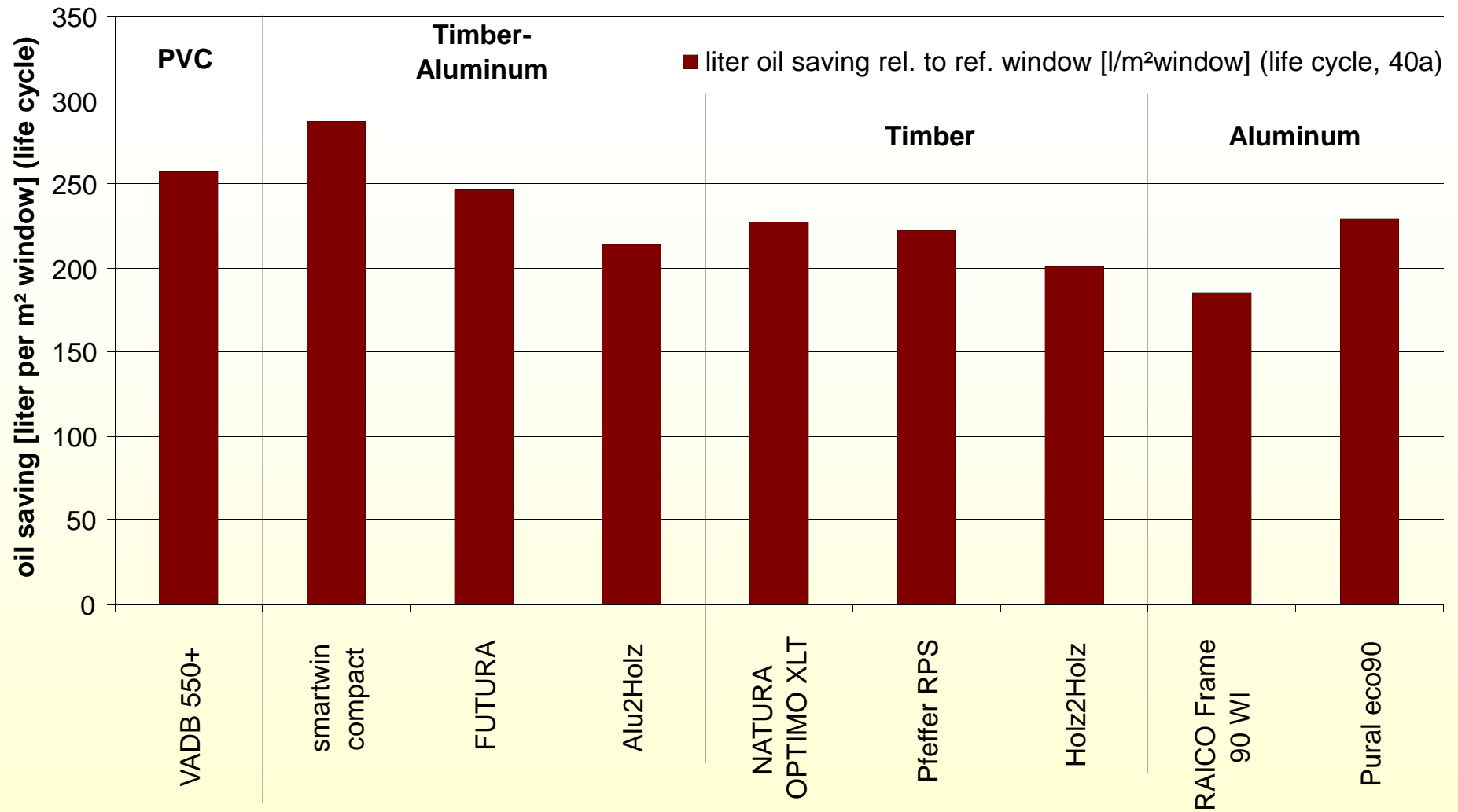


## RESULTS: The winners – CO<sub>2</sub> savings



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# RESULTS: The winners – fuel savings



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