

THE GOOD REASON TO BUILD WITH ESBG 2015



ENVIRONMENTAL BUILDING ASSESSMENT



2

Comparison of single family homes*:

straw vers. **brick** (same U-values $\sim 0,15 \text{ W/m}^2\text{K}$)

- ▶ Fighting Climate change: Brick house is like the straw plus 500.000km car driving
- ▶ Reducing primary energy demand, non renewable, brick house is like straw house plus 4.000 L oil

* Production, repairing

ENVIRONMENTAL PRODUCT DECLARATION EPD



EPD - ENVIRONMENTAL PRODUCT DECLARATION

UMWELT-PRODUKTTDEKLARATION nach ISO 14025 und EN 15804




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Aggregation of environmental impact and resource demand for material production

LIFECYCLE

	Production					EnEV							disposal/ Recycling				
Phases	A 1-3			A 4-5		B 1-7							C 1-4			D	
	Production			erecting		usage							End-of-life			Outside system	
	Rohstoffbeschaffung	Transport	Produktion	Transport	Errichtung/ Einbau	Nutzung	Instandhaltung	Instandsetzung	Austausch	Modernisierung	Energieverbrauch im Betrieb	Wasserverbrauch im Betrieb	Rückbau/ Abriss	Transport	Abfallverwertung	Entsorgung	Potential für Wiederverwertung und Rückgewinnung und Recycling
Module DIN EN 15978	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D

Production of insulation materials

Primary energy demand non renewable

Estimate:

How much times more is needed for polystyrol than for straw (same U-Value)?

Correct answer: C. 36-times more for polystyrol.

Possible answers

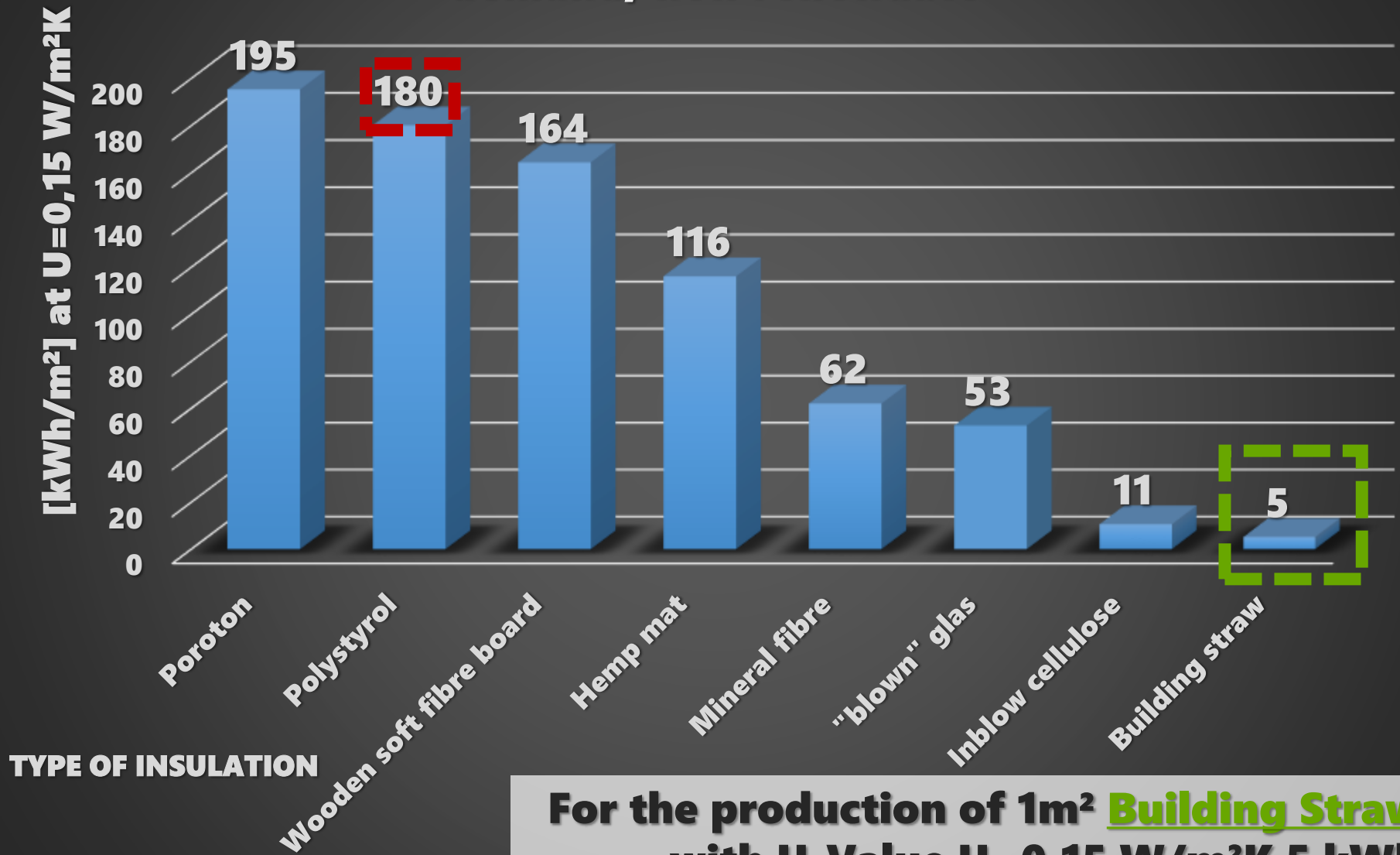
A
20x

B
10x

C
36x

D
2x

Production insulation material: Primary energy demand, non renewable



For the production of 1m² **Building Straw** with U-Value $U=0,15 \text{ W/m}^2\text{K}$ 5 kWh PENRE are needed. **36-times** less then for **Polystyrol** ($180/5=36$)

Production of walls

Primary energy demand non renewable

Estimate:

How much times less is needed for the production of a straw wall (with the same U-Value) as for a brick wall?

Correct answer: **C**. 5 times less.

Possible
answers

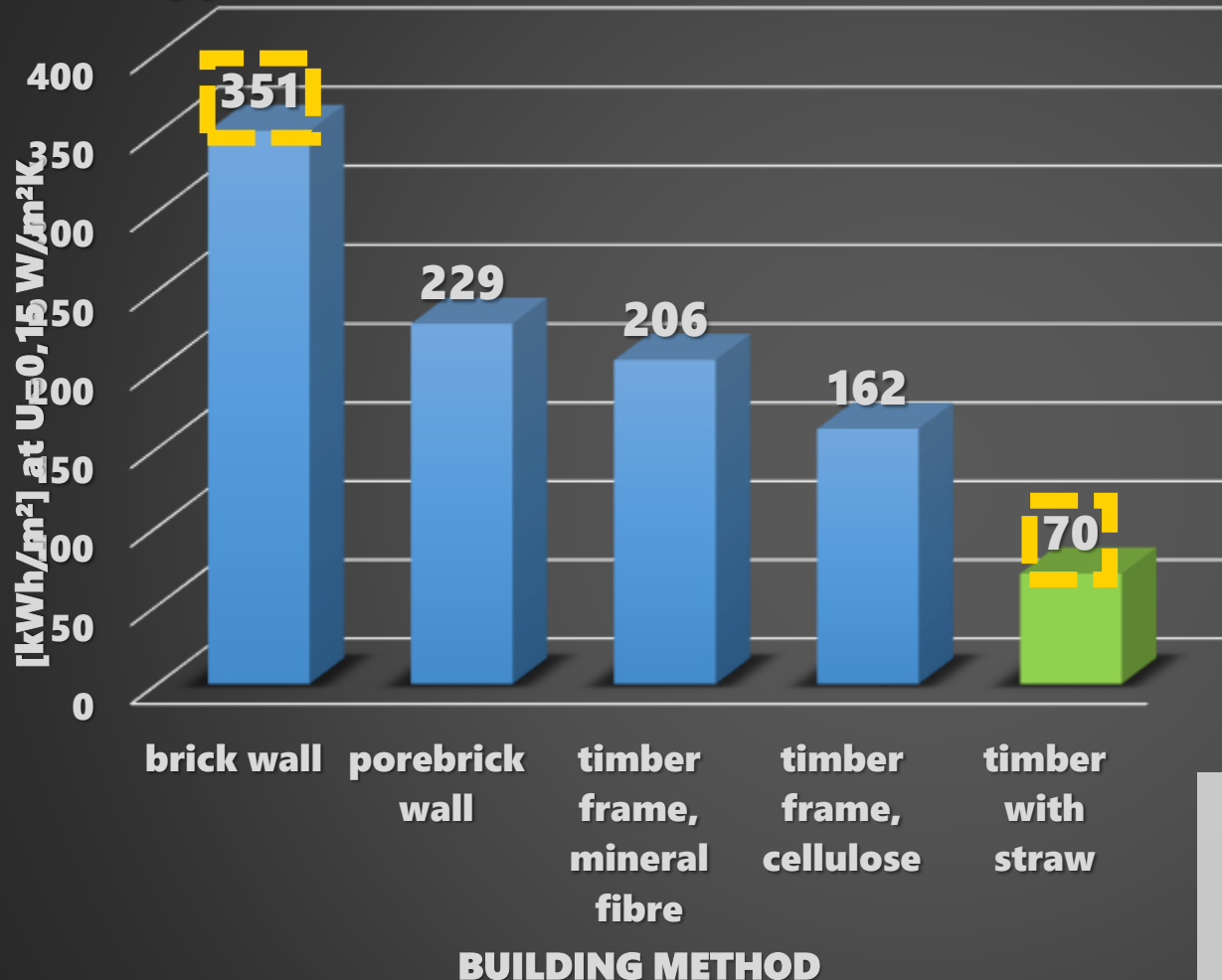
A
100x

B
20x

C
5x

D
10x

production of walls, different methods, Primary energy, non renewable



The straw insulated timber wall needs 5 times less energy For production than a two layer brick wall

Production of typical houses

Primary energy demand non renewable

Estimate:

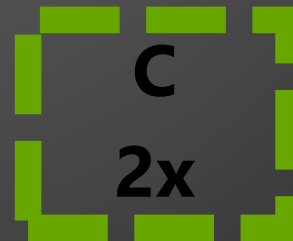
How much times less would straw house would need compared with a typical brick house (same U-Values)?

Correct Answer: C. Straw house would need 2 times less energy

Possible
answers

A
100x

B
20x

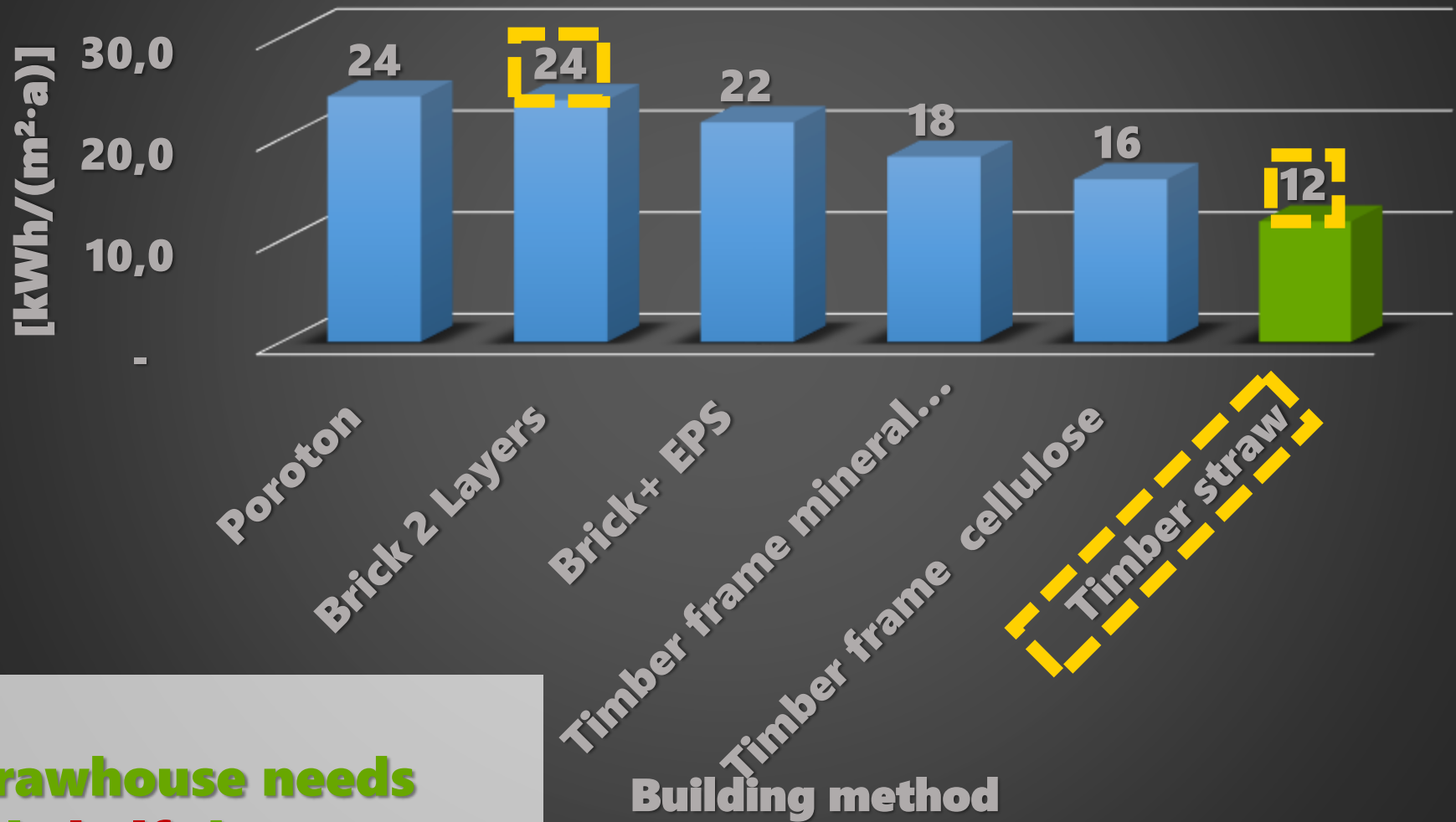


C
2x

D
10x

Production of typical houses

Primary energy demand non renewable



**Strawhouse needs
only half the amount
of the brick house**

Production of house, Global warming potential

Ausgangssituation:

Vergleich von sechs verschiedenen Einfamilienhausbauweisen:
Emissionen durch Herstellung.

Production of typical Brickhouse emits **47t CO₂** strawhouse
takes **19t CO₂** out of the atmosphere.

Estimate:

*How far can you go with 5L-car(~120g CO₂/km) for
difference?*

Correct answer: **A.** over 500.000 km

Possible answers



A

>500.000

B

ca. 100.000

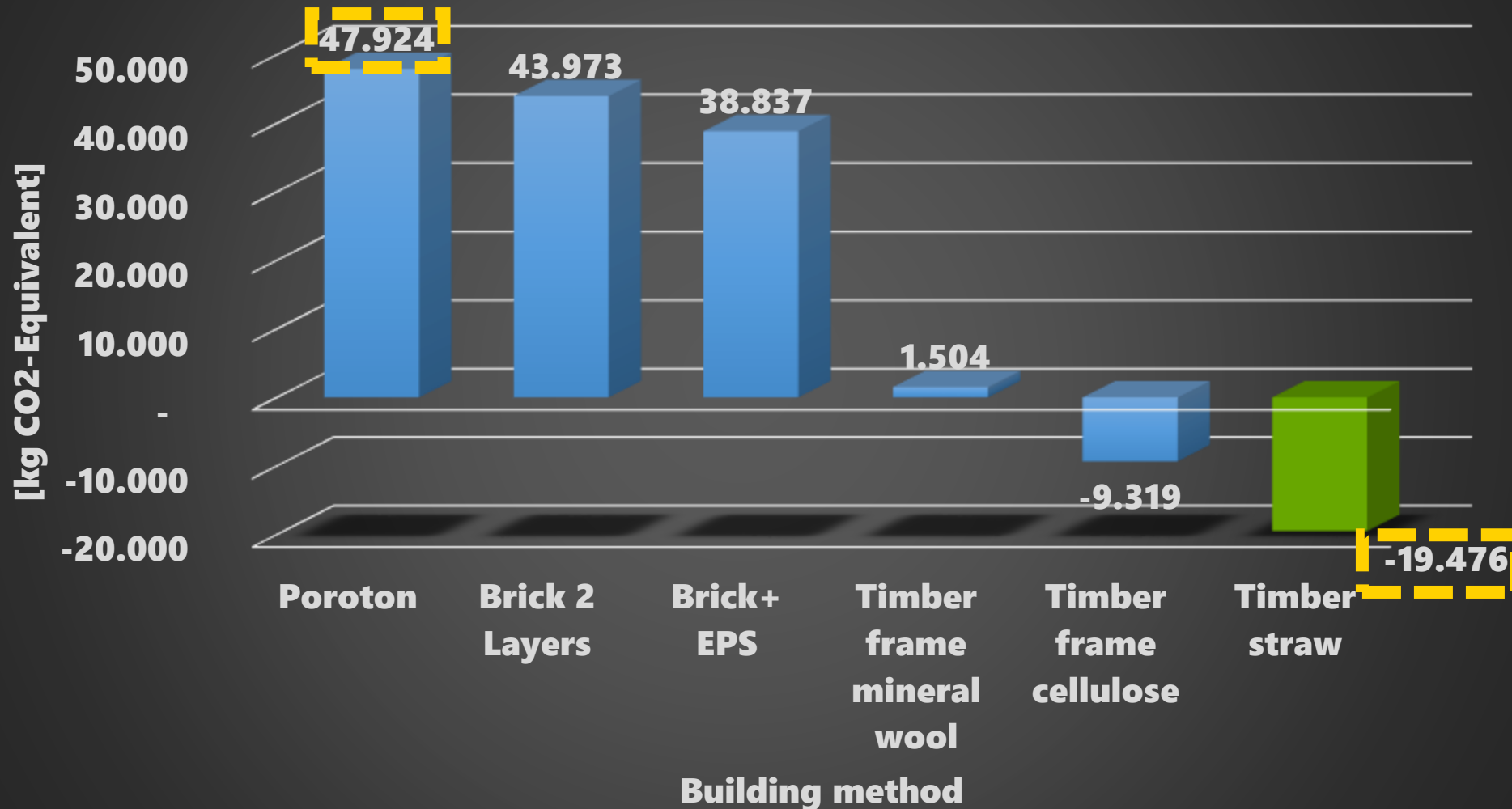
C

<10.000

D

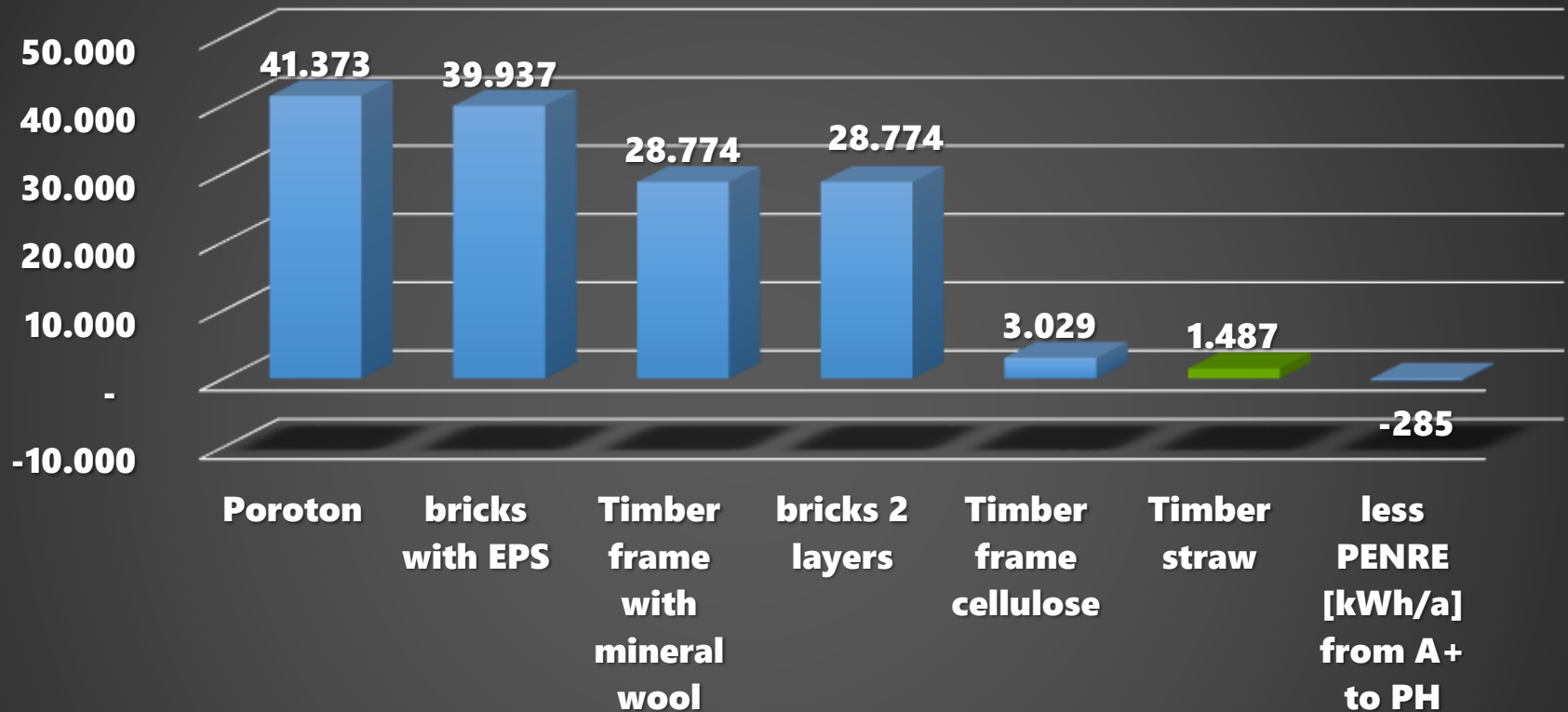
1.000

Production of house, Global warming potential



The straw building stores 19t, the typical one out brick emits 47t. Difference: ca. 66t. With a 120g-Auto you would have to drive over 500.000km to emitate this amount.

DEMAND of PENRE [kWh/a] for additional insulation from A+ to Passivhaus



Δ for A+ to Passivhaus in conventional building is like 100 years heating (renewable)

Production of claddings

Primary energy demand, non renewable

Estimate:

Which cladding needs most, which one fewest?

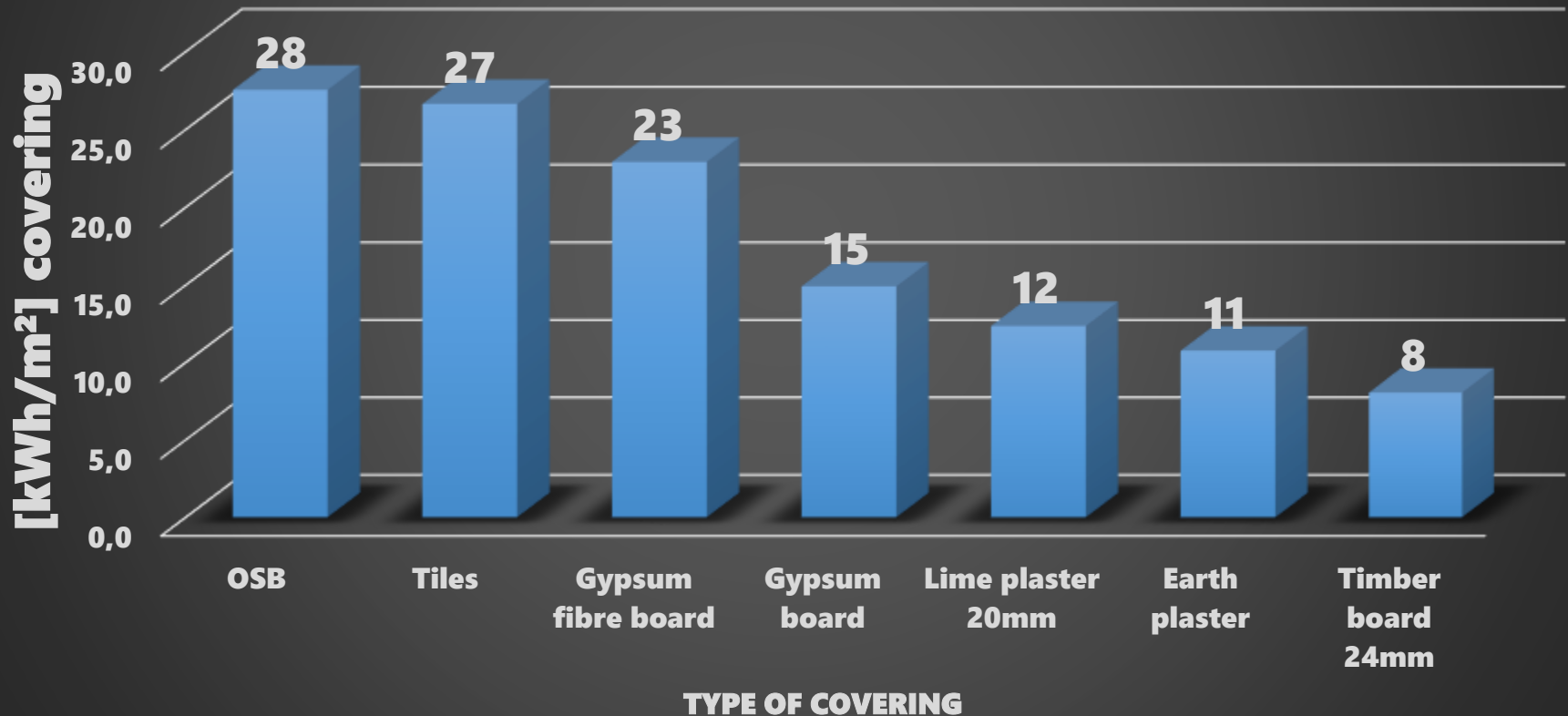
Correct Answer:

most: chipboard.

Fewest **Timber boards**

Auswahl:
Earth plaster
chipboard
Fliesen
Timber boards
Limeplaster gypsum
fibre boards
gypsum boards

Production of coverings: Primary energy demand, non renewable



A chipboard need most.
A timber board need fewest

THANK YOU!



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