



CARBON CAPTURE BRICKS 2026 BROCHURE

The bricks and mortar of a better future



About us

The 'Wonderwall' is our first pilot project, based at Sustainable Ventures in Manchester. It is a 4 x 4 metre wall cladding made with 1,200 of our N10 bricks. Each brick absorbs 178g of CO₂ - so this wall absorbs and permanently stores as much carbon as making 720 cups of coffee!

As a team of scientists and engineers, we recognise the greatest threat facing humanity today is climate change. Our mission is to decarbonise the construction industry and mitigate global warming through the provision of high quality materials that capture CO₂ directly from the air. Our innovative products transform buildings into CO₂ absorption systems, helping to protect our planet, whilst also supporting the ever-growing need for new homes and infrastructure. They are life-cycle carbon-negative, fully recyclable and *made from the earth, for the Earth*.

We founded earth4Earth in Sheffield in 2023. Since then, the company has experienced rapid growth and we now have over 30 team members, including civil and geotechnical engineers and experts in materials science. We have a Research & Development Centre in Sheffield and a pilot factory in Wuhan, China. Now that we have established our manufacturing process, we plan to open a factory in the UK in 2026. We aim to deliver our products to clients globally and support sustainable construction worldwide.

“

The earth4Earth team were fantastic to work with — responsive, collaborative, and able to deliver at very short notice to meet our tight construction deadlines.

”

Andy Bargh, Development Manager, Sustainable Ventures

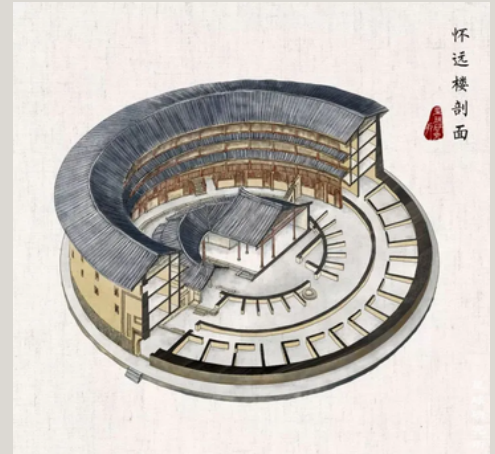


Work in progress in Manchester

The inspiration

The inspiration for our company and our bricks comes from Fujian Tulou, traditional Chinese earth buildings known for their sustainable design and energy efficiency. These structures naturally regulate temperature and are resilient, even to natural disasters.

Fujian Tulou have stood for centuries. They were made using rammed earth, reinforced with bamboo and other natural materials including stone and wood. They are known for existing in harmony with nature. Our Co-founder, Professor Yi Luo, is from the Fujian Province and has studied these buildings throughout her career.



Carbon absorption

The use of natural materials such as rammed earth during construction can contribute to carbon sequestration, helping to reduce the overall carbon footprint.

Sustainable design

Fujian Tulou are built using locally sourced, natural materials, minimising environmental impact and promoting sustainability.

Temperature regulation

The unique construction of these buildings allows them to maintain a stable internal temperature, staying cool in summer and warm in winter.

We have combined this legacy with our scientific research to create earth-based materials that are durable, breathable and inspired by nature.

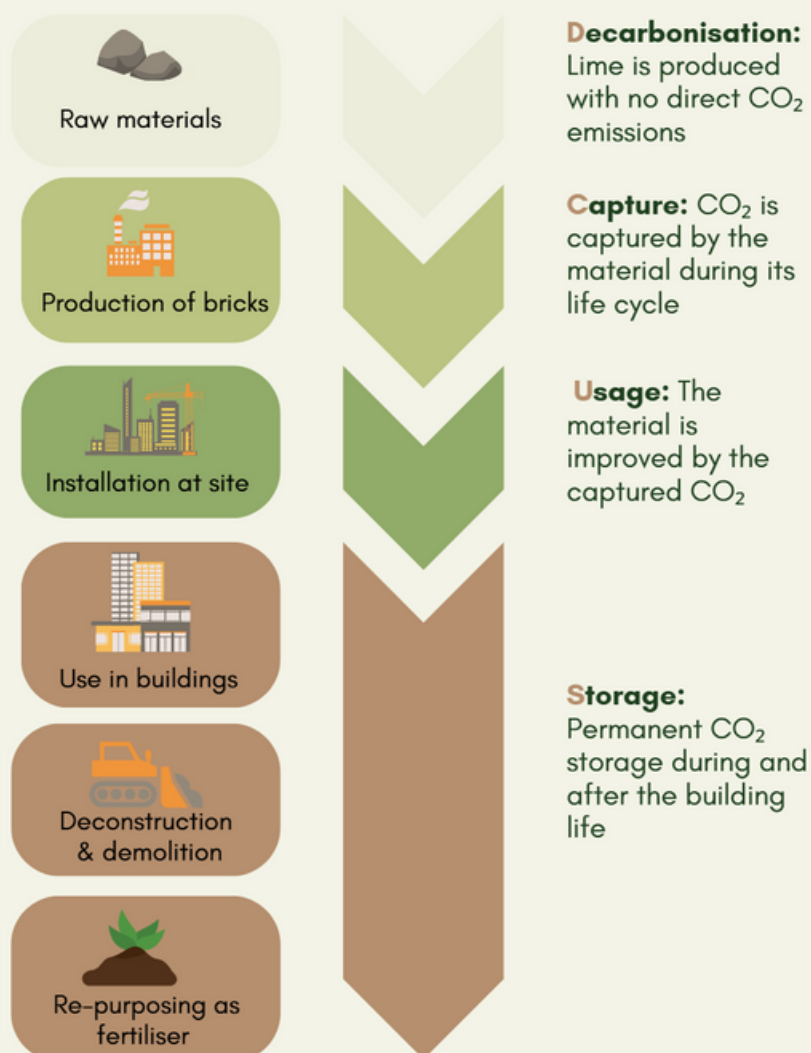


Our technology

Lime-based binders have been used in construction for over 10,000 years. To this day, they are typically produced by heating limestone at elevated temperatures, of at least 900°C. This process generates CO₂ emissions from both the breakdown of the raw materials ($\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$) and the combustion of fossil fuels to achieve the necessary high temperatures.

“ We have developed a zero-emissions lime production process that can be done at room temperature. ”

We create our lime by chemically treating naturally-decarbonised raw materials. The reaction occurs at room temperature, thus avoiding CO₂ emissions from both the material breakdown and combustion. This innovative production process is part of our DCUS Technology – Decarbonisation, carbon Capture, carbon Usage and carbon Storage.



Our products

Our materials enable clients to achieve net-zero and even become carbon-negative by absorbing and storing carbon dioxide from the air throughout their entire lifecycle.



Our first products are a range of carbon capture bricks. We have developed five types, to suit different requirements and budgets. The properties of our bricks are comparable or superior to those used traditionally and they have a range of sustainability credentials.

Upcycled raw materials

Our bricks are made from excavated soil, which would otherwise go to landfill, promoting a circular economy and waste valorisation.



Compressed, rather than fired

We avoid the carbon-intensive kiln firing process and this alone cuts more than half of the carbon emissions of traditional clay brickmaking.



Outstanding performance

Up to 40 MPa compressive strength, water and frost-resistant, excellent durability (F2).



100% recyclable

At end-of-life, our bricks can be crushed and used in new bricks, or returned to the earth for crop growth.

Better-than-zero net carbon

Zero or negative CO₂ emissions thanks to novel binder production and CO₂ Direct Air Capture.

Product Label	Carbon Type	Raw Material	Binder	CO ₂ emissions from binder production per brick	CO ₂ captured per brick during service life
L0	Low Carbon	Recycled Soil	None	N/A	N/A
L10	Low Carbon		10% Commercial Lime	178 g	178 g
N10	Carbon Negative		10% e4E Binder	0 g	178 g
N20	Carbon Negative		20% e4E Binder	0 g	356 g
N30	Carbon Negative		30% e4E Binder	0 g	535 g

Product Information

e4E-N10

Carbon-negative brick

10% e4E binder

↓ 178g Captured CO₂ per brick during service life

EPD Certified Carbon Negative



Technical Details

Dimensions	215 x 102.5 x 65 mm
Tolerance category	T2
Range category	R2
Weight	3 kg
Colour	Light yellow
Declared compressive strength	10 N/mm ²
Water absorption	10.17%
Equivalent thermal conductivity	0.9 W/(m x K)
Specific heat capacity	0.8392 J/(g x K)
Active soluble salts content	S2
Reaction to fire	A1
Dangerous substances	Eco-friendly and fully recyclable, compliant with 2003/33/EC

Additional Information

Contents	Soil, Sand, Carbon-Free Lime
Lime (Ca(OH)₂) content	10%
Life-cycle CO₂ absorbency (EPD)	0.208 kg
Life-cycle CO₂ emissions (EPD)	0.195 kg
Net life-cycle CO₂ balance (EPD)	-0.013 kg



Carbon Capture Bricks

Product Information

e4E-N20

Carbon-negative brick

20% e4E binder

↓ 356g Captured CO₂ per brick



Technical Details

Dimensions	215 x 102.5 x 65 mm
Tolerance category	T2
Range category	R2
Weight	3 kg
Colour	Light yellow
Declared compressive strength	7.5 N/mm ²
Water absorption	13.55%
Equivalent thermal conductivity	0.8 W/(m x K)
Specific heat capacity	0.7756 J/(g x K)
Active soluble salts content	S2
Reaction to fire	A1
Dangerous substances	Eco-friendly and fully recyclable, compliant with 2003/33/EC

Additional Information

Contents	Soil, Sand, Carbon-Free Lime
Lime (Ca(OH) ₂) content	20%
Life-cycle CO ₂ absorbency (est.)	0.3 kg
Life-cycle CO ₂ emissions (est.)	0.1 kg
Net life-cycle CO ₂ balance (est.)	-0.2 kg

Product Information

e4E-N30

Carbon-negative brick

30% e4E binder

↓ 535g Total Captured CO₂ per brick



Technical Details

Dimensions	215 x 102.5 x 65 mm
Tolerance category	T2
Range category	R2
Weight	3 kg
Colour	Light grey
Declared compressive strength	7.5 N/mm ²
Water absorption	16.86%
Equivalent thermal conductivity	0.8 W/(m x K)
Specific heat capacity	0.8584 J/(g x K)
Active soluble salts content	S2
Reaction to fire	A1
Dangerous substances	Eco-friendly and fully recyclable, compliant with 2003/33/EC

Additional Information

Contents	Soil, Sand, Carbon-Free Lime
Lime (Ca(OH) ₂) content	30%
Life-cycle CO ₂ absorbency (est.)	0.5 kg
Life-cycle CO ₂ emissions (est.)	0.125 kg
Net life-cycle CO ₂ balance (est.)	-0.375 kg

Product Information

e4E-L0

Carbon-neutral brick

100% compressed earth from upcycled waste excavation soil



Technical Details

Dimensions	215 x 102.5 x 65 mm
Tolerance category	T2
Range category	R2
Weight	3 kg
Colour	Light brown
Declared compressive strength	3.5 N/mm ²
Water absorption	n/a
Equivalent thermal conductivity	0.8 W/(m x K)
Specific heat capacity	0.8411 J/(g x K)
Active soluble salts content	S2
Reaction to fire	A1
Dangerous substances	Eco-friendly and fully recyclable, compliant with 2003/33/EC

Additional Information

Contents	Soil
Lime (Ca(OH)₂) content	0%
Life-cycle CO₂ absorbency (est.)	0 kg
Life-cycle CO₂ emissions (est.)	0 kg
Net life-cycle CO₂ balance (est.)	0 kg

Product Information

e4E-L10

Carbon-neutral brick

10% hydrated lime Ca(OH)_2

↓ 178g Total Captured CO_2 per brick



Technical Details

Dimensions	215 x 102.5 x 65 mm
Tolerance category	T2
Range category	R2
Weight	3 kg
Colour	Light yellow
Declared compressive strength	10 N/mm ²
Water absorption	14.31%
Equivalent thermal conductivity	0.9 W/(m x K)
Specific heat capacity	0.7822 J/(g x K)
Active soluble salts content	S2
Reaction to fire	A1
Dangerous substances	Eco-friendly and fully recyclable, compliant with 2003/33/EC

Additional Information

Contents	Soil, Sand, Hydrated Lime
Lime (Ca(OH)_2) content	10%
Life-cycle CO_2 absorbency (est.)	0.178 kg
Life-cycle CO_2 emissions (est.)	0.178 kg
Net life-cycle CO_2 balance (est.)	0.0 kg

Carbon Absorbency

	L0 - No binder	L10 - Conventional binder	N10 - 10% e4E binder	N20 - 20% e4E binder	N30 - 30% e4E binder
CO ₂ emissions from binder production per brick	n/a	178g	0g	0g	0g
CO ₂ absorption per brick	n/a	178g	178g	356g	535g

Packaging Specifications

	L0 - No binder	L10 - Conventional binder	N10 - 10% e4E binder	N20 - 20% e4E binder	N30 - 30% e4E binder
Bricks per m ²	343	343	343	343	343
Bricks per ft ²	32	32	32	32	32
Bricks per pallet	400	400	400	400	400
Pack weight (tonnes)	1.1~1.2	1.1~1.2	1.1~1.2	1.1~1.2	1.1~1.2
Pack dimensions (m)	~1.08 x 1.08 x 0.69	~1.08 x 1.08 x 0.69	~1.08 x 1.08 x 0.69	~1.08 x 1.08 x 0.69	~1.08 x 1.08 x 0.69

FAQs

What are e4E bricks made of?

They are made of excavated soil from construction projects, which would otherwise go to landfill. We treat the soil to make it optimal for use. This is combined with sand and our unique e4E binder. The production of binders traditionally releases high levels of CO₂, but we have developed a novel production process which drastically reduces the related CO₂ emissions.

How is the e4E binder made?

As with most traditional binders, ours is lime based. Lime is typically produced by heating limestone at temperatures of around 900C. Traditional production generates CO₂ emissions from both the breakdown of the raw materials and the fossil fuels needed to achieve the high temperatures required.

We have developed a unique lime production process that can be done at room temperature. All of the carbon produced during the manufacture of the e4E binder is also permanently stored in a solid form, rather than being released into the atmosphere as CO₂.

How are e4E bricks made?

Our bricks are compressed, rather than fired, saving significant CO₂ emissions. Our unique e4E binder is used to enhance the mechanical properties and durability of the bricks.

How do e4E bricks capture carbon?

The binder in the bricks captures and stores atmospheric CO₂ quickly through a carbonation reaction. Once it is absorbed, the carbon further enhances the materials' properties.

How are e4E bricks recycled?

At end-of-life, the bricks can be crushed and used in new bricks or added to soil for crop growth. As a result, they are 100% recyclable.

FAQs

How is the carbon permanently stored?

When the bricks are recycled (by being crushed and used in new bricks or added to soil for crop growth), the carbon stays in the crushed material as it is chemically bound in the form of stable carbonates.

What certification do the bricks have?

UKCA certification for the British Standard for clay masonry units BS EN 771-1

CE certification for clay masonry units EN771-1

Our N10 brick (which contains 10% of our unique e4E binder) has received Environmental Product Declaration in accordance with EN 15804+A2 & ISO 14025

Certification from the British Board of Agréments (BBA) and further Environmental Product Declarations (EPD) have been applied for and are pending.

How do I request a sample?

Please contact us at info@earth4Earth.co.uk so we can discuss your project and the sample you require.

Where can I buy e4E bricks?

We sell them directly. Please contact info@earth4Earth.co.uk so we can arrange your order.

Do you ship worldwide?

Yes, we have a minimum order quantity for bricks shipped outside the UK. Please contact info@earth4Earth.co.uk

FAQs

Do you make other shapes and sizes of brick?

Not at the moment but we plan to make different products available in the future, including brick slips.

What mortar can be used with the bricks?

Any mortar specified in the British standard (i.e. BS EN 998-2) can be used. We are currently developing our own e4E mortar in accordance with British Standards.

Where are the bricks made?

The bricks are currently made in Wuhan in China where we have opened our first factory. We identified this as the best place to develop and establish our manufacturing processes because of our connections there and the time and cost savings. Now that we have established our production line, we are able to make our bricks wherever they are being used. We have plans to begin production in the UK next year.



Carbon Capture Bricks

Contacts

If you have any questions, please do not hesitate to contact us at

info@earth4Earth.co.uk

or visit our website

www.earth4Earth.co.uk

