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DS INDUSTRY 2026 · CIRCULARITY TRACK

From Waste to Resource

Reusing excavated soil for the on-site production of earth blocks in an urban regeneration project

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BEC, Bilbao

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Zorrotzaurre

An 84-hectare former industrial area becoming a new mixed-use district



Zorrotzaurre masterplan. Source: zorrotzaurre.com

84 ha
former industrial area

≈ 5,500
homes, about half affordable

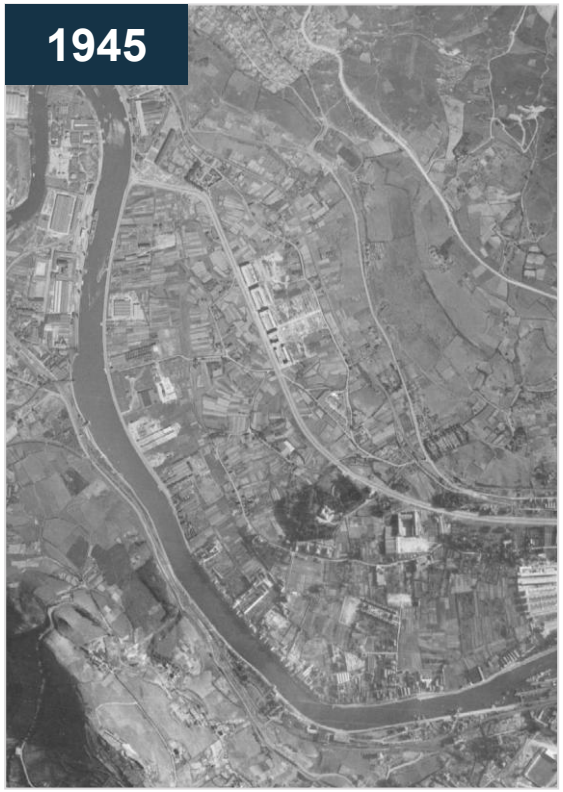
≈ 15,000
new residents

7.5 km
of riverbank as public space

Not just housing
Business, training, leisure and public facilities

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Zorrotzaurre



Riverside of Deusto

Farmland and early industry along the estuary. No canal yet



Canal under construction

Deusto Canal works (from 1950) begin to cut off the riverside



Industrial peninsula

Unfinished canal: an isthmus links it to Deusto. Heavy industry



Island in regeneration

Canal opened in 2018; soils managed plot by plot; new district

Orthophotos: GeoEuskadi – Basque Government (1945-46, 1956-57, 1984-85, 2025). North up

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The challenge

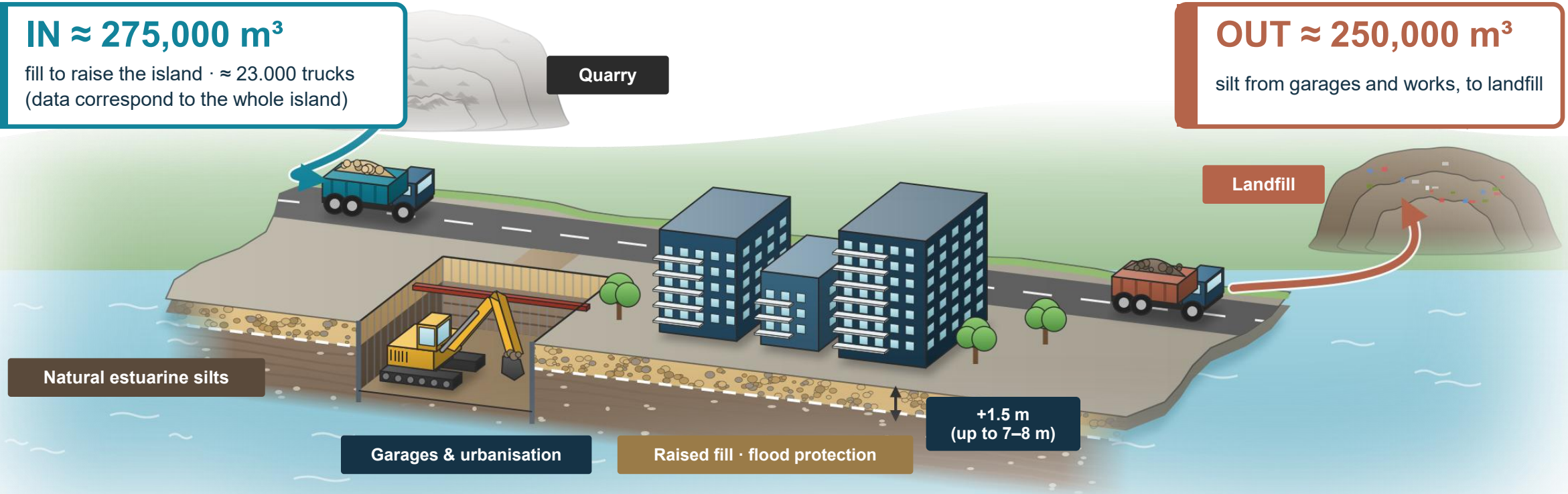
Soil out, fill in: Execution Unit 2 (UE2), now under way, needs both

IN ≈ 275,000 m³

fill to raise the island · ≈ 23.000 trucks
(data correspond to the whole island)

OUT ≈ 250,000 m³

silt from garages and works, to landfill



The island exports clean soil and imports fill at the same time

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The challenge

Basque Country: without recovery criteria, a large share of excavated soil ends up in landfill

≈ 625,000 t

of material excavated from potentially contaminated sites in a single year (2018), with landfill as the default destination

≈ 1.5 Mt

of non-hazardous waste landfilled in 2018 (44 % of all non-hazardous waste)

Basque Government: Environmental Profile 2020 (soil); Waste Plan 2030

No criteria for off-site recovery

Clean or mildly altered soil from a potentially contaminated site can only leave it as waste

Case by case, and slow

Reuse elsewhere needs a specific favourable ruling; the regulatory framework has been pending for years

Landfills under pressure

8 non-hazardous landfills, only 4 beyond 2030; ≈ 390,000 t of waste exported to other regions in one year

Without criteria landfill becomes the default

A turning point

Zaldibar, February 2020: a before and after for excavated soil in the Basque Country



Noticias de Bizkaia

Deia

Gure lurraren deia

Viernes, 7 de febrero de 2020

HOY CON DEIA

DOS OPERARIOS SEPULTADOS POR EL DESLIZAMIENTO DE UN VERTEDERO

● Casi cuatro mil metros cúbicos de tierra y residuos se desplomaron sobre la AP-8 cortando el tráfico a la altura de Zaldibar

● Los dos desaparecidos son trabajadores de la empresa Verter Recycling 2002, propietaria de la escombrera de inertes

● La opinión técnica: "Lo más probable es que se haya movido el talud del relleno del material depositado en el vertedero"

Los equipos de rescate trabajaban anoche a contrarreloj para tratar de localizar a los dos trabajadores del vertedero desaparecidos y liberar las carreteras anegadas de tierra.

Deia, 7 February 2020 · front page

EN **"Two workers buried by a landfill slide"**

- ~1 million m³ of earth and waste slid onto the AP-8
- Both missing men worked for the landfill operator
- Experts: the waste-fill slope most likely gave way

6 February 2020 · Landfill collapse onto the AP-8 motorway

The largest receiver closed for good

The landfill taking the greatest volumes of excavated soil and non hazardous waste was permanently shut

Very limited disposal capacity

Only a few landfills remained available, with scarce remaining capacity

No pathway for off-site recovery

No criteria for recovering excavated soils off-site, hitting brownfield works hardest

Disposal was gone and recovery had no legal pathway

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The challenge

Clean silt with nowhere to go

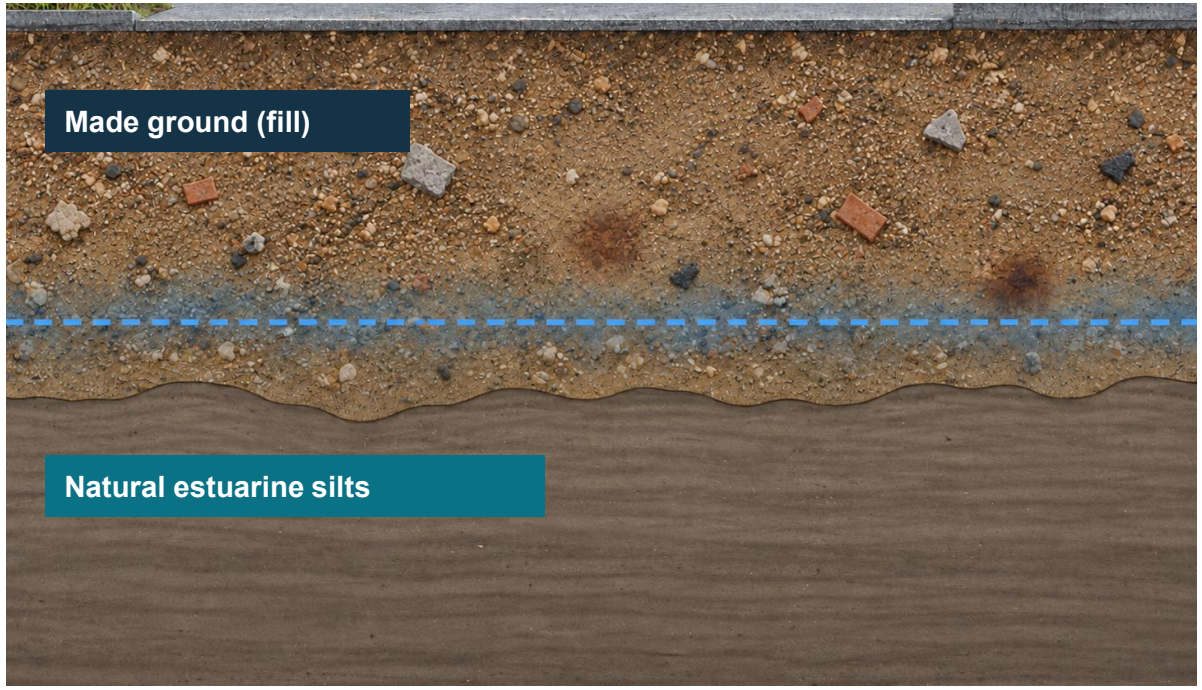
≈ 250,000 m³

of natural, uncontaminated estuarine silts from the island's works

Poor geotechnical properties
Highly plastic, water-sensitive clayey silt: rejected as fill

No criteria for off-site recovery
Clean, but with no legal route to be reused outside the site

Scarce landfill capacity
Since Zaldibar slide, few landfills left and rising disposal costs



≈ 20,000 truckloads through the city to landfill by default

A clean resource treated as a waste

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The challenge

Two ways to handle the same soil

LINEAR ROUTE

Raw materials in → **→ Excavated soil out**



CIRCULAR ROUTE · ALL ON SITE

↓ trucks to landfill

↓ quarried raw material



Meters,
not kilometers

between excavation, plant and use

Linear-route estimate for ≈ 500,000 t of silt (≈ 20,000 trucks), landfill assumed at 30 km; truck 1.2 / 0.8 kg CO_2e/km laden/empty; inert landfill 1.3 kg/t (DEFRA 2026)

The greenest truck is the one that never leaves the site

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The idea

A building material that never leaves the island

01



Excavated on the island

Natural, uncontaminated estuarine silt from the works

02



Made on the island

Dried, milled, mixed and pressed, with no firing, now at industrial scale

03



Built into the island

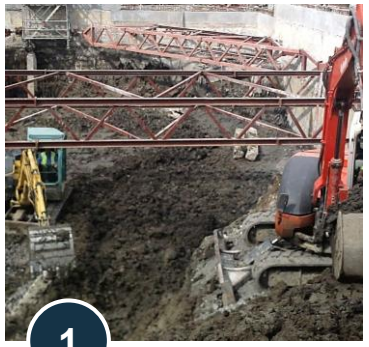
Interior walls for the new district

From soil to wall: meters not kilometers

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LURBLOCK®

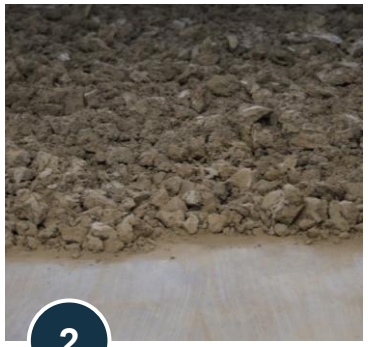
From silt to product, inside the regeneration project



1

Excavation

Only natural, uncontaminated silts



2

Stockpiling & drying

Air-dried on site



3

Milling

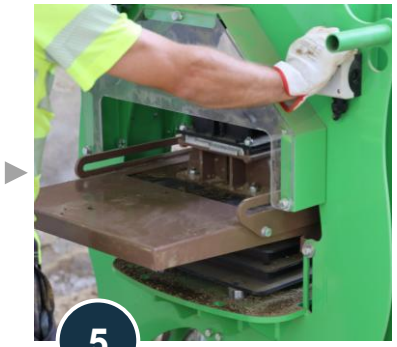
Impurities removed, homogenised



4

Dosing & mixing

Low-carbon cement and mineral by-product



5

Pressing

Compressed, no firing



6

Curing

Ready for use in the district

From laboratory assays to a pilot plant → industrial production on the island, under way

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LURBLOCK®

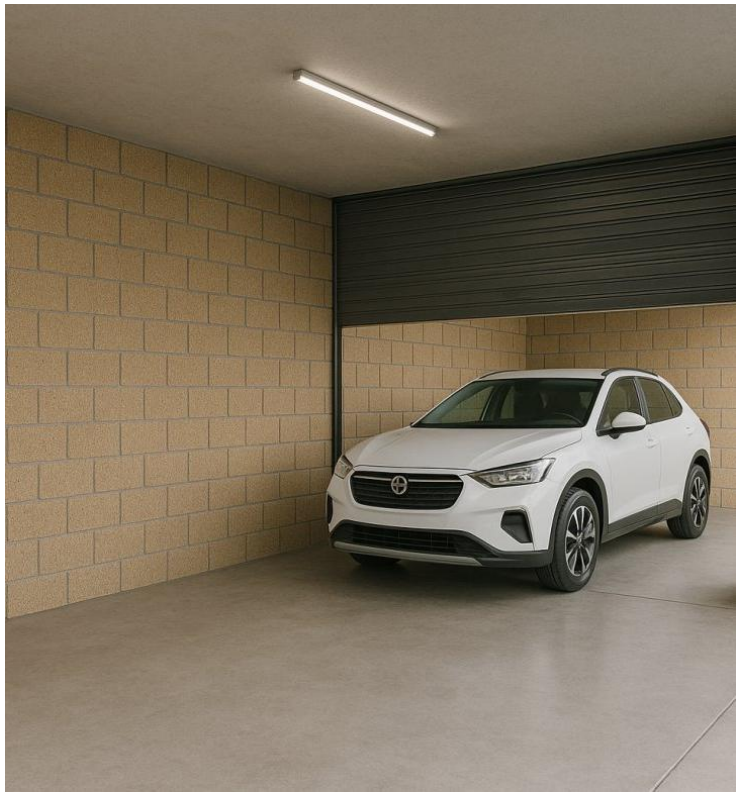
Two outputs that keep the silt in the project

In industrial production



LURBLOCK

Compressive strength	≥ 5 N/mm²
Accelerated erosion	0 mm
Sound insulation	Rw 42 dB
Fire resistance	EI 180



Interior partitions with LURBLOCK (UNE 41410:2023)



Soil-cement for roads

- Spread and compacted
- Tested at pilot scale

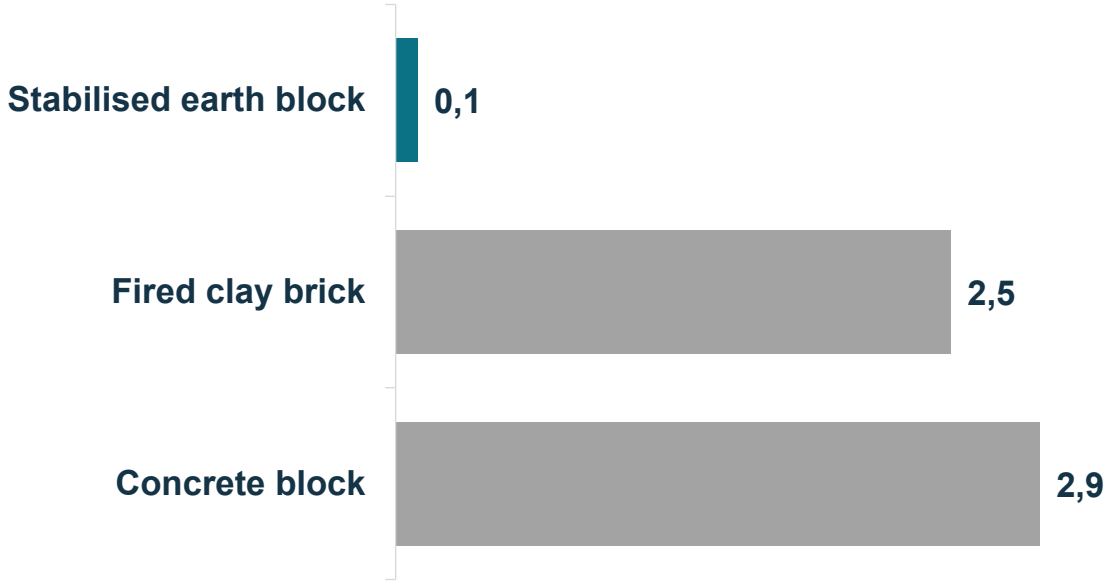
Authorised to treat 42,200 t of silt per year

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Decarbonisation

Less CO_2 at every step

Production emissions, t CO_2 per m³ of material



Literature reference values compiled in the LURBLOCK technical report

No landfill
A material bound for disposal moves up to reuse

No haulage
Soil is transformed where it is excavated

No extraction
Replaces quarried clay and aggregates

No firing
Cold-pressed and air-cured, no kiln

Circular at end of life
Blocks can be crushed and reused

Local circularity is decarbonisation

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Overcoming hurdles

LURBLOCK®: the hurdles behind the blocks

01 · PLANNING

A plant on the island?

At first, a temporary on-site manufacturing plant did not fit the land-use rules for the island

Solved: the plant is now producing on the island

02 · PERMITTING

No track record for innovation

Little experience in permitting innovative solutions and procedures far slower than the works

Authorised: the blocks now hold end-of-waste status

03 · SPACE

Finding a place to produce

Suitable land and facilities were hard to secure

Unlocked by the commitment of the landowners Board

04 · MARKET

Will the blocks be used?

Uncertainty over whether the materials, once made, will actually be bought and used

Approval from architects and builders and interest in purchasing

Hurdles overcome: LURBLOCK® is now produced on the island

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Next steps

A replicable model, beyond the block and beyond the island

New uses for the silt

- **Soil-cement for roads**
  Spread and compacted, tested at pilot scale
- **Stabilised rammed earth**
  Tests ongoing
- **Thermal storage and nature-based solutions**
  R&D lines

Where the model fits

- **New urban developments**
  Greater Bilbao and other areas close to estuaries
- **Large road infrastructure projects**
  Earthworks with surplus excavated soil
- **Other urban regenerations**
  Large volumes of inert excavated soil

Same soil, same opportunity, wherever we build

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Opportunity

LURBLOCK®: an opportunity to build together

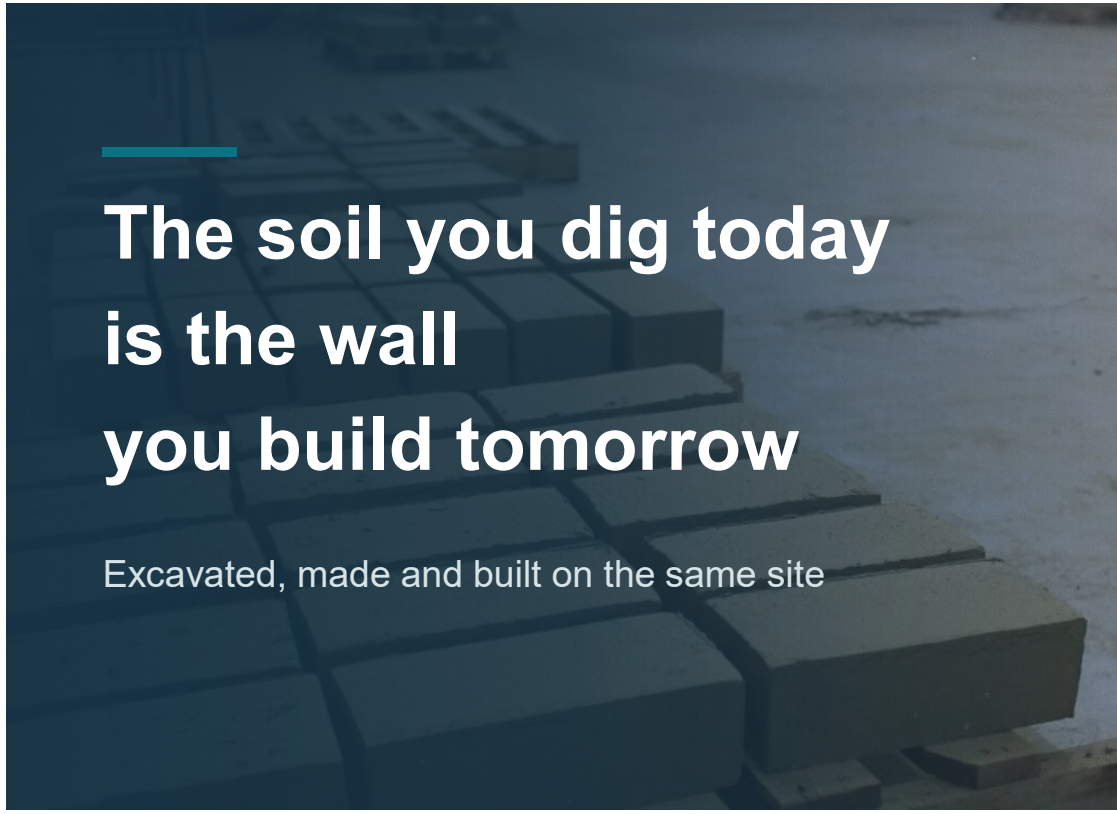
Developers and builders

- Local, certified material for interior walls
- No landfill fees, no quarry supply
- Lower-carbon buildings, ready to show

Public administration

- Landfill capacity saved
- Fewer trucks through the city
- Circular-economy targets, met on site

Room to scale
Looking for partners, sites and new plants to replicate the model



Let's build the next district with its own soil

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Conclusions

Zorrotzaurre is being rebuilt with its own soil

1 Clean excavated soil is a resource

Island silt, turned into building material instead of landfill

2 LURBLOCK is already in production

Industrial-scale blocks meeting UNE 41410:2023, made from island silt

LURBLOCK

3 On-site circularity decarbonises

No haulage, no landfill, no extraction, no firing

4 Next: market and replication

Specifiers and buyers, and the same model in other regeneration projects

Excavated soil: from waste to wall

Thank you

Questions and discussion

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