

SCHWENK SUOMI OY

**UUSIA SEMENTTEJÄ JA
KESTÄVÄÄ KEHITYSTÄ**

Jussi Thureson
Helsinki, Betoniteknologiaseminaari
26.11.2025

SUSTAINABILITY THAT WORKS.



SCHWENK

SISÄLTÖ

- SCHWENK lyhyesti
- Vaatimukset eri tahoilta
- SCHWENK: Tavoitteet, klinkkerikerroin-Road map
- SCHWENK:in kolme peruspilaria CO2 –Road map:iin
 - Uudet sementit (Seossementit, Celitement, Opoka, jne.)
 - Uudet tekniikat
 - Uudet seosaineet
- Broceni, hiilineutraali tehdas 2030
- Vähäpäästöisiä tuotteita jo olemassa

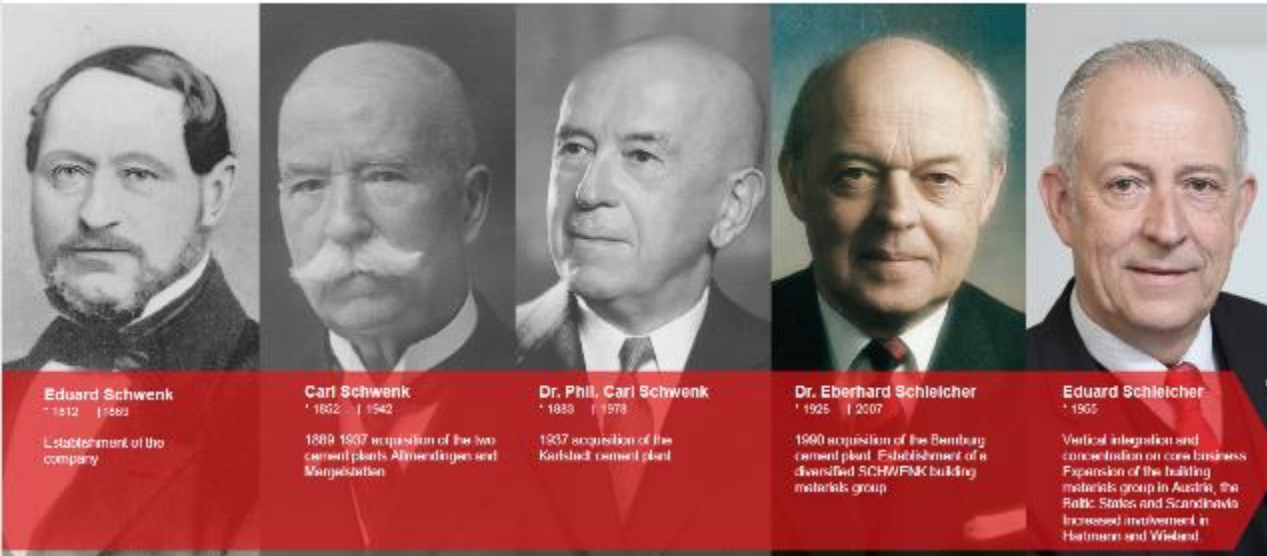


AGENDA

The background features a light gray hexagonal grid. A central teal hexagon contains the word 'AGENDA' in white. Surrounding this are various white icons: a group of three people at the top, a document with a circular arrow at the top-left, a bar chart with an upward arrow at the top-right, a clipboard with a checklist at the middle-right, a target with an arrow at the bottom-right, a gear and a head profile at the bottom, a lightbulb at the middle-left, and a handshake at the bottom-left.

SCHWENK BUILDING MATERIALS GROUP

THE FIVE GENERATIONS OF SCHWENK



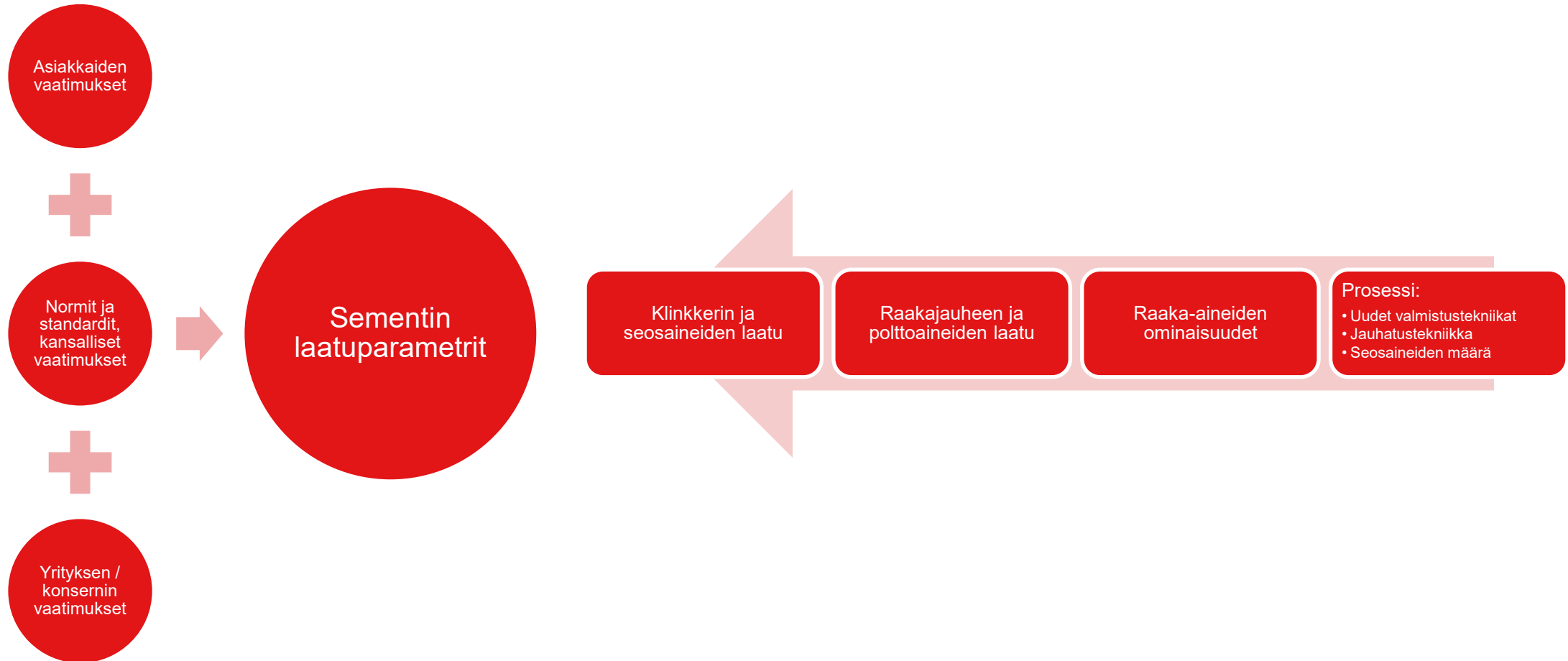
- Cement
- Sand & gravel
- Circular economy
- Technology centre
- Concrete
- Concrete pumps

SCHWENK GLOBAL

Along with our partnerships we are present in many European countries and also Namibia



VAATIMUKSET SEMENTILLE ERI TAHOILTA

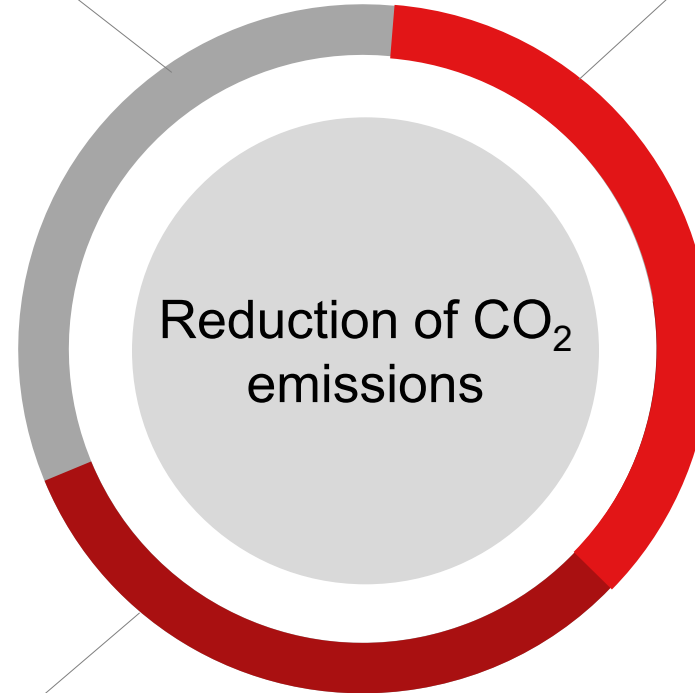


CO₂-PÄÄSTÖJEN VÄHENNYSTAVOITTEET BROCEININ TEHTAALLA

Target 1
Reduce the CO₂ emission factor of clinker by 50 kg/t CO₂ by 2025



Target 2
Reduce the average clinker factor (clinker % in cement) by 10pp to 80% by 2025, and further to 66% by 2030

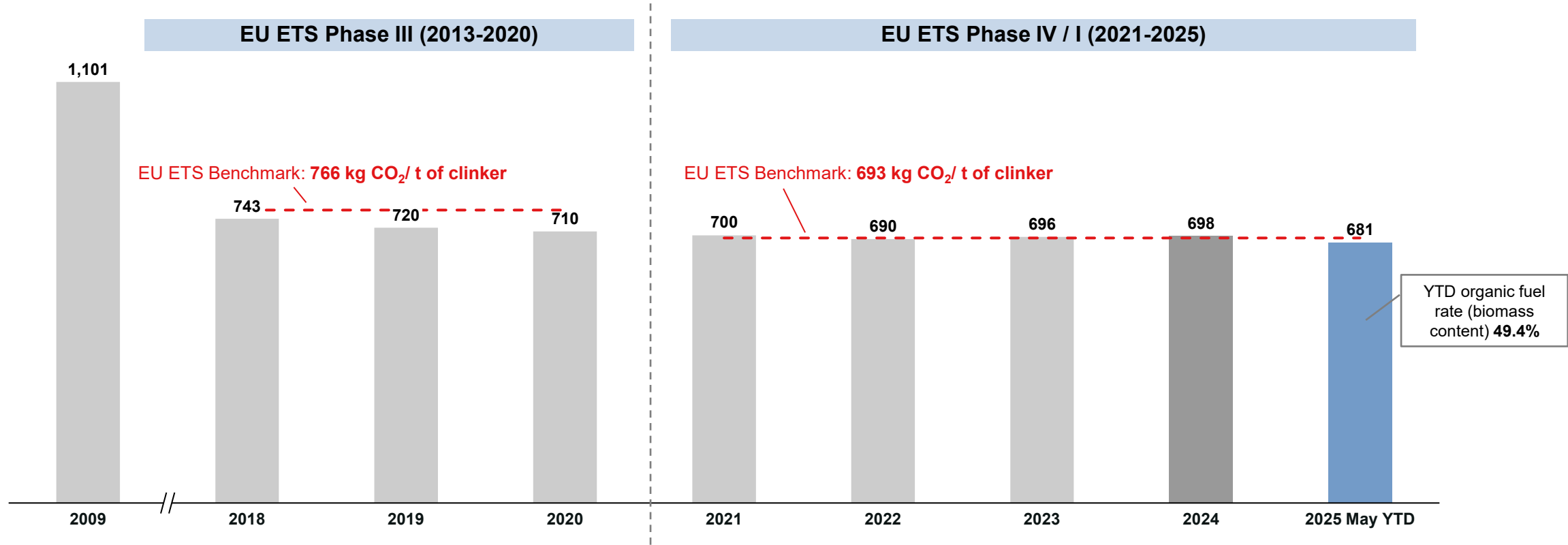


Target 3
By 2030, build the first CO₂ capture plant in the SCHWENK group



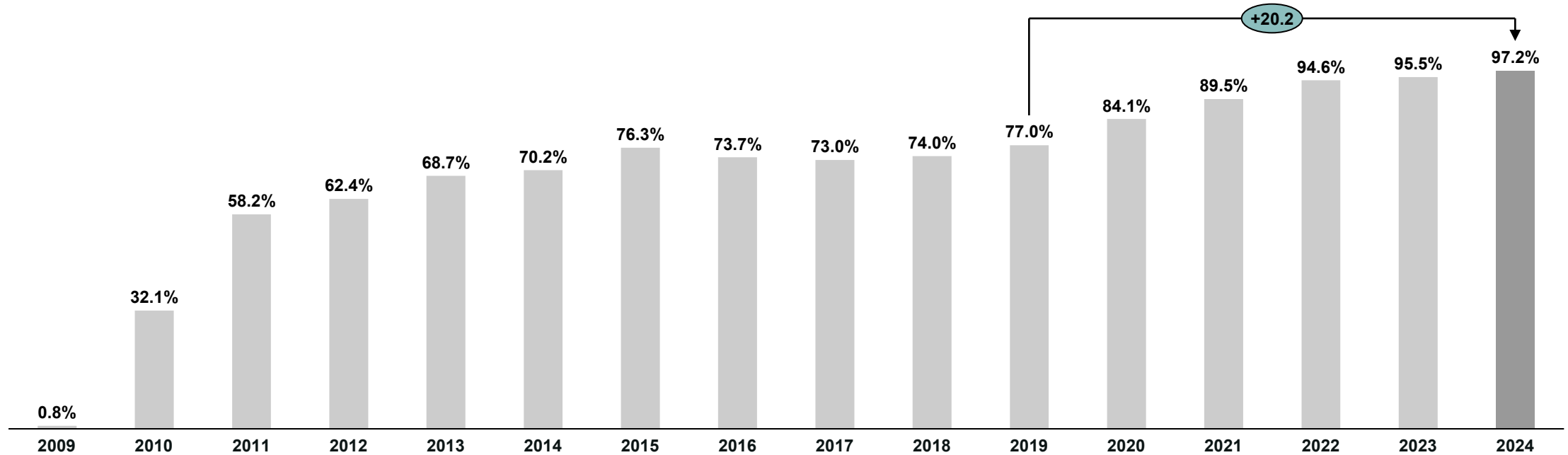
BROCENIN HIILIJALANJÄLJEN KEHITYS

Specific CO₂ emissions, kg CO₂ / t of clinker



VAIHTOEHTOISTEN POLTTOAINEIDEN KÄYTÖN KEHITYS BROCEININ SEMENTTITEHTAALLA

Kiln AF rate (caloricity basis), %



2nd SRF feeding line to main burner

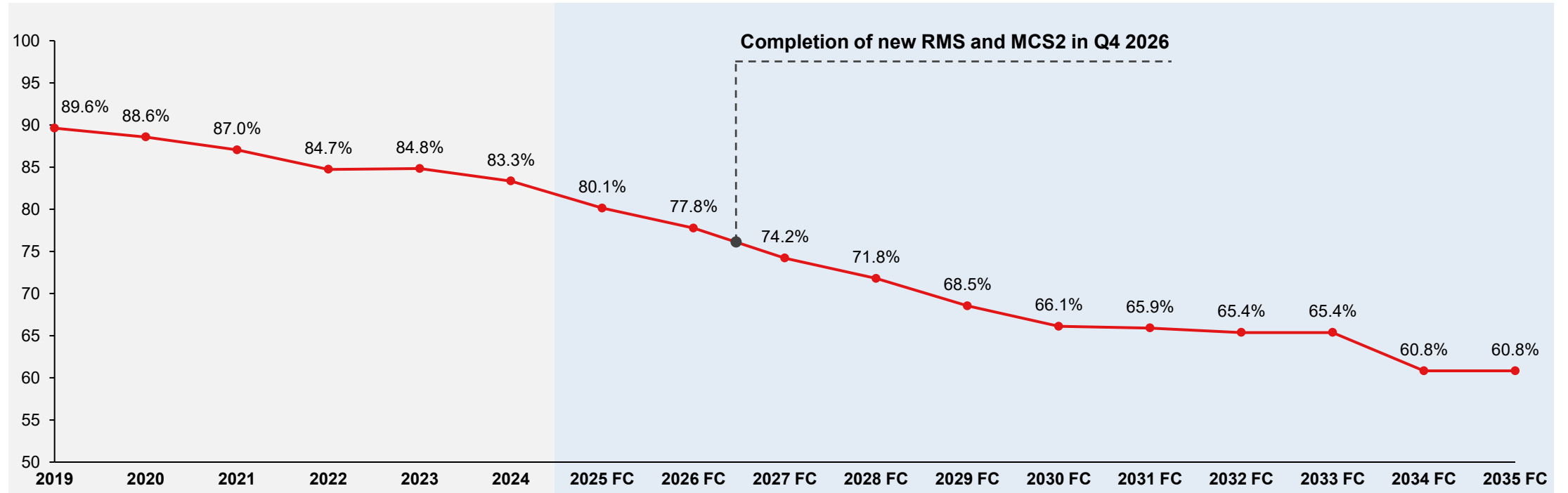


SRF dryer



BROCENIN SEMENTTITEHDAS, KLINKKERIKERTOIMEN PIENENTÄMISEN ROADMAP

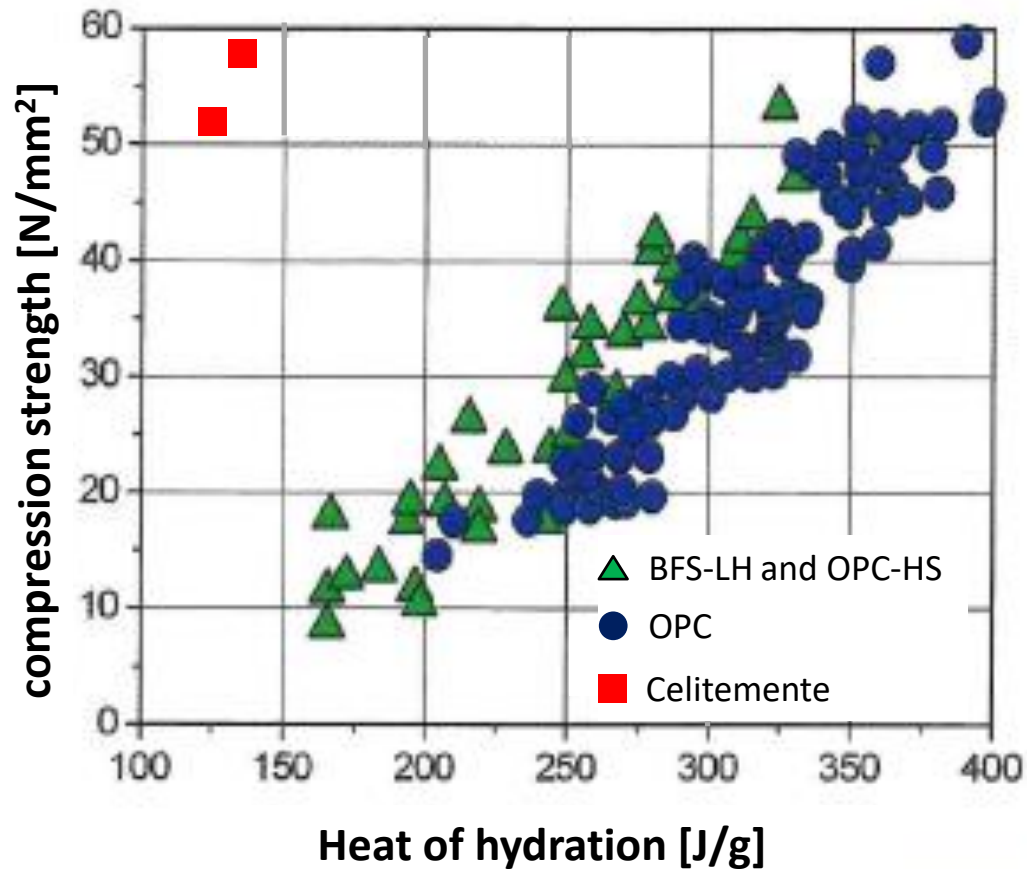
Average clinker factor in cement, %



SCHWENKIN CO2 ROADMAP:IN KOLME PERUSPILARIA

Kehitetään uusia tuotteita, joilla on pienempi CO ₂ -jalanjälki	Otetaan käyttöön läpimurtoteknologioita CO ₂ -päästöjen poistamiseksi klinkkerituotannosta	Optimoidaan jo olemassa olevia teknologioita ja prosesseja
Celitement®	CCS – Carbon Capture & Storage	Lisätään biomassan osuutta polttoaineessa
CEM II/B-M CEM II/C-M CEM II/B-M (P-LL)	CCU – Carbon Capture & Utilisation	Käytetään vähähiilisiä raaka-aineita
Meca-clay	OxyFuel	Kasvatetaan entisestään vaihtoehtoisten polttoaineiden (AF) osuutta
Geopolymeerisementit	CapsolGo®	Varmistetaan laitosten mahdollisimman häiriötön toiminta
EMC (Energeettisesti modifioidut sementit)	Svante	Lisätään kierrätetyn materiaalin määrää (esim. RCF)

CELITEMENT YHDISTÄÄ AIKAISEMMIN YHTEENSOPIMATTOMAT OMINAISUUDET



"An important correlation exists between the released heat of hydration and the standard compressive strength of the cements (see picture). From this, conclusions can be drawn about the strength and heat development during early hardening."

S. Röhling und H. Meichser (2018): Rissbildungen im Stahlbetonbau. Fraunhofer IRB Verlag, p. 50

→ *"High cement strength is therefore incompatible with low heat of hydration".*

SEDIMENTARY POZZOLAN FROM LITHUANIA (OPOKA)

- The deposit is large enough to secure access to the pozzolan for at least the next 20 years
- The deposit is in close proximity to both of the cement plants in Broceni and Akmenė



KLINKKERIKERTOIMEN VÄHENNYS SEMENTISSÄ SEOSAINEILLA

Cement main constituents for SCHWENK

Reduction of the clinker content in the cement to lower the CO₂ footprint of cement.

The potential of milling additions to replace clinker will be based on durability of the respective concretes and the availability of these milling additions.



Ground limestone: L and LL



Granulated blastfurnace slag: S



Fly ashes: V and W

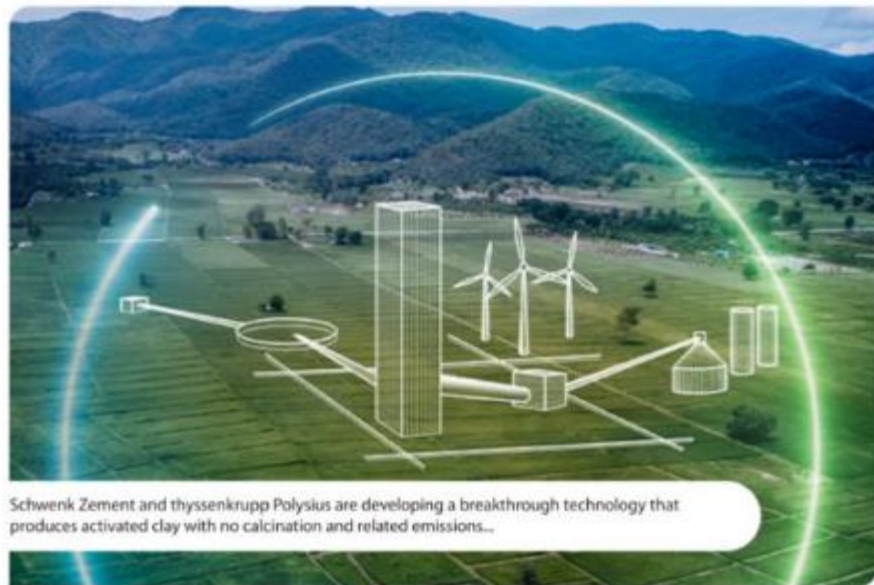


Pozzolanic materials: P and Q

NEW SCHWENK R&D TOGETHER WITH THYSSENKRUPP POLYSIUS

Interview by Peter Edwards, Global Cement Magazine

ACTIVATED CLAY WITHOUT CALCINATION



Schwenk Zement and thyssenkrupp Polysius are developing a breakthrough technology that produces activated clay with no calcination and related emissions...

Global Cement (GC): Please can you outline the new project between thyssenkrupp Polysius and Schwenk Zement?

Hendrik Möller (HM): The use of activated clay to substitute clinker in traditional cement is one very promising way to reduce the massive CO₂ footprint of conventional cement production. Clay activated by calcination has gained momentum in recent years. It is possible to make very reactive clay so that cement producers can substitute up to 30% of clinker in cement and reduce CO₂ emissions by a minimum of 40% when combined with 15% limestone.

Luc Rudowski (LR): However, calcining clay - albeit at a lower temperature than clinker - still generates significant fuel-derived CO₂ emissions. To further reduce the CO₂ emissions of clay-containing cements, thyssenkrupp Polysius and Schwenk Zement have joined forces to develop a new clay activation process without calcination or fuel. The process is fully electrical, so it would emit no CO₂ at all if renewable energy were to be used. There are no other air pollutants or dust associated with the process.

GC: What stage has the process currently reached?

Luc Rudowski is Head of innovation and member of the extended board at thyssenkrupp Polysius GmbH. He started in sales at Polysius in 1994. He started his current role in October 2018.



HM: The team, comprising members from both companies, successfully produced activated clay in thyssenkrupp Polysius' and Schwenk Zement's research centres without any heating. The team has produced many tonnes of highly-reactive clay from different clays that were low in kaolinite. These have been mainly composed of 2:1 clay minerals, giving us confidence that the new process is able to produce very reactive supplementary cementitious materials (SCMs) from almost any raw clay - available at most cement plants.

GC: How does the process work?

LR: We are not able to provide further details at this point, as patents are still being filed. What I can say is that both Hendrik and I have seen a lot of new developments in our sector. We both feel like we are at a once in a 50-100 year step change for the industry. Readers who would like to know more should register to attend the Global FutureCem Conference in Brussels, Belgium, on 6-7 December 2023, where the technology will be explained in full.

GC: Until then, what else can you tell our readers?

HM: Based on the shared research results of the activated clays produced and the outstanding performance reached, both in cement mortars and multiple concrete formulations, we are now looking to demonstrate that the new process is superior to the conventional clay calcination process.



Hendrik Möller is a full-time member of the managing board at Schwenk Zement GmbH & Co KG, a cement producer based in Ulm, Baden-Württemberg. He has been in his current role since 2006.

LR: Our team has even replicated the familiar grey colour of cement, again through the development of a novel process. This may seem like a minor point but it is still the case that grey is associated with high quality and strength in many markets.

GC: When will we see the first industrial project?

HM: In view of the very promising results, we believe that the new technology is a breakthrough. Less than 12 months into the collaboration we are already considering a demonstration scale plant to be installed at a Schwenk Zement cement plant.

GC: You seem to be making quick progress...

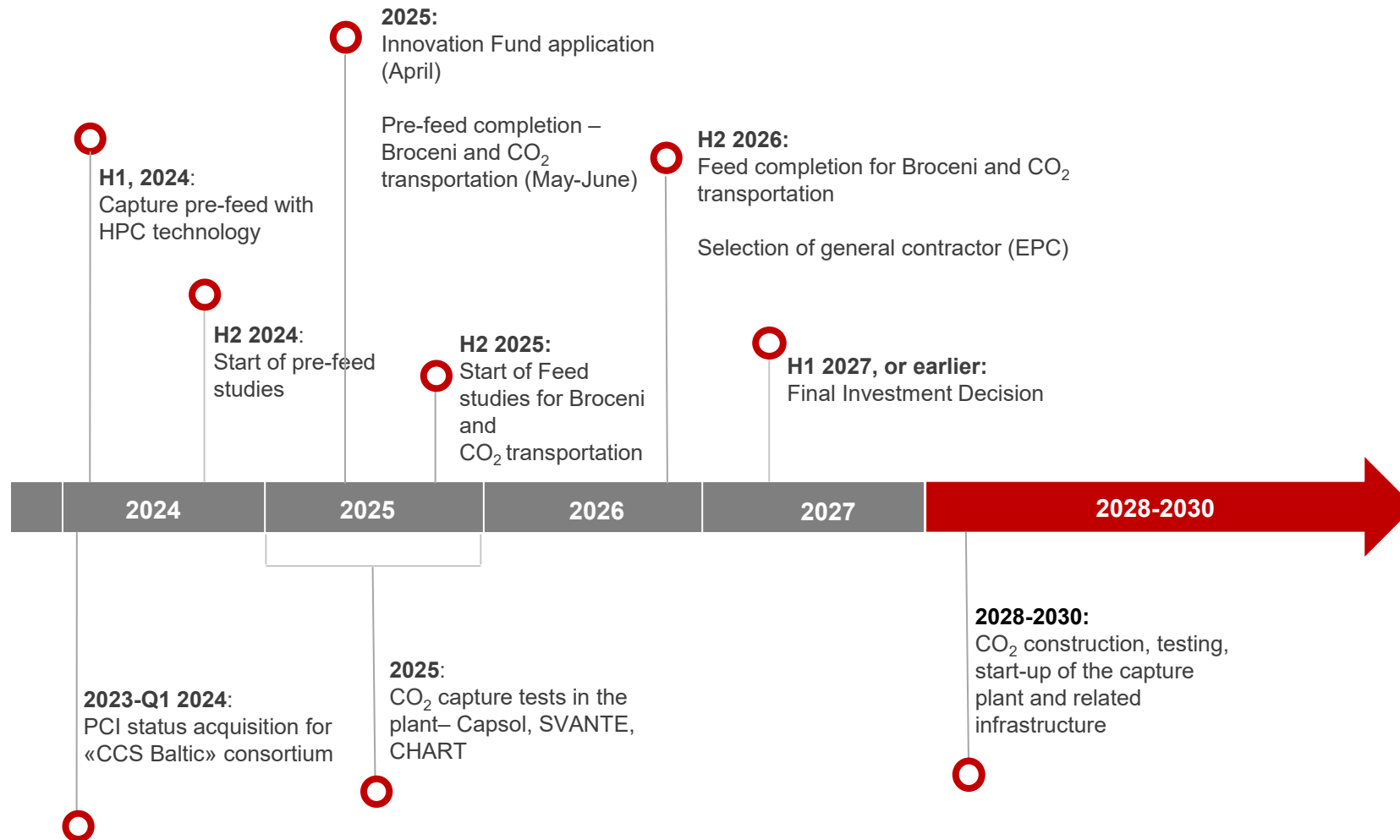
LR: Yes - I would say that this is a direct result of the dedication of our team and effectiveness of the collaboration between thyssenkrupp Polysius and Schwenk Zement. We have a problem to solve and a joint team that is working on it - with full transparency. There is no differentiation between client and supplier. We feel that this level of openness is essential to develop any green technology with the urgency demanded by the climate change challenge.

GC: Thank you for this peek into the future. We look forward to finding out more in December!

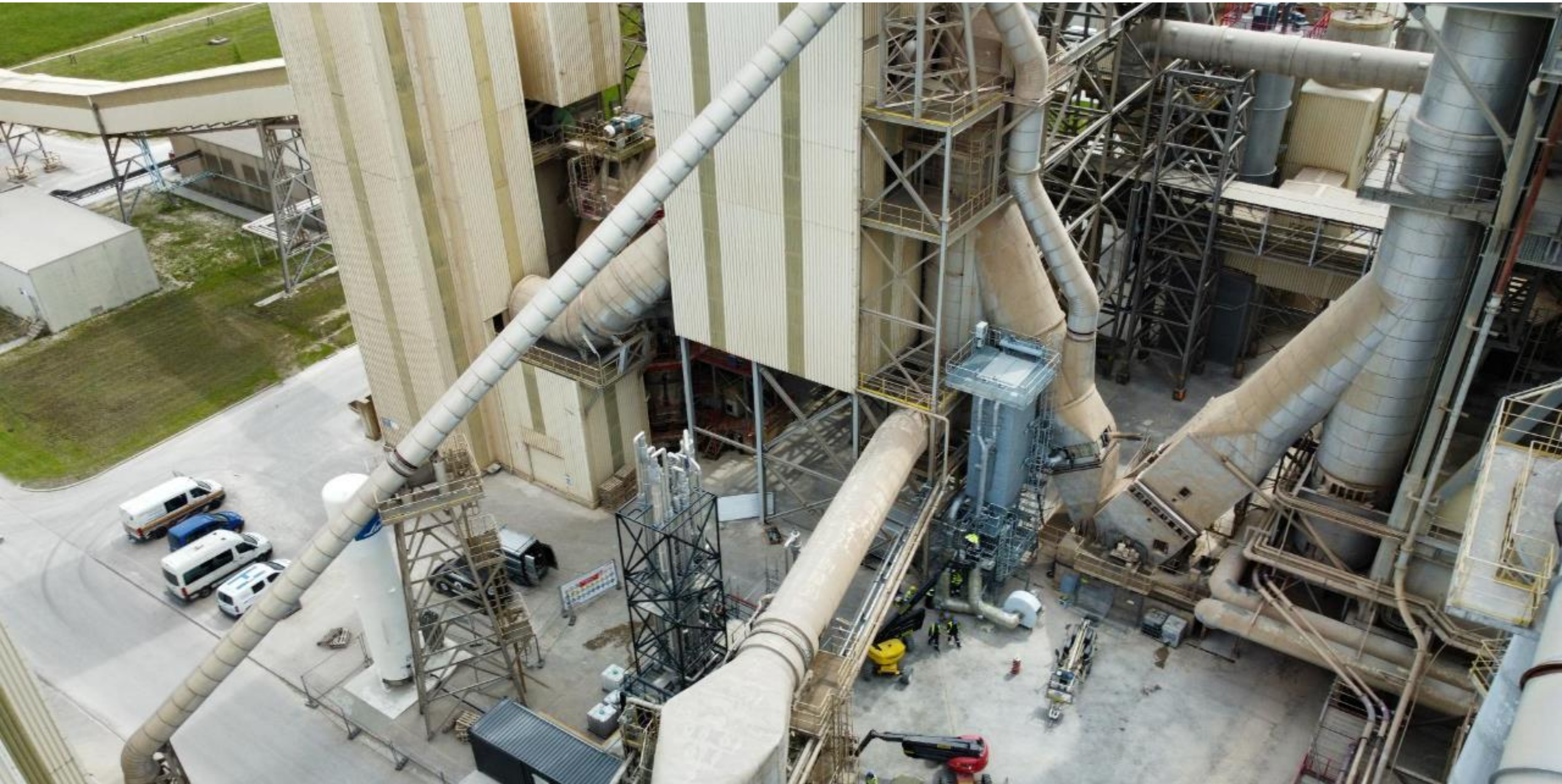
LR/HM: You are very welcome indeed.



BROCENI, CCS-AIKAJANA



PILOT-HANKE BROCENISSA KÄYNNISSÄ

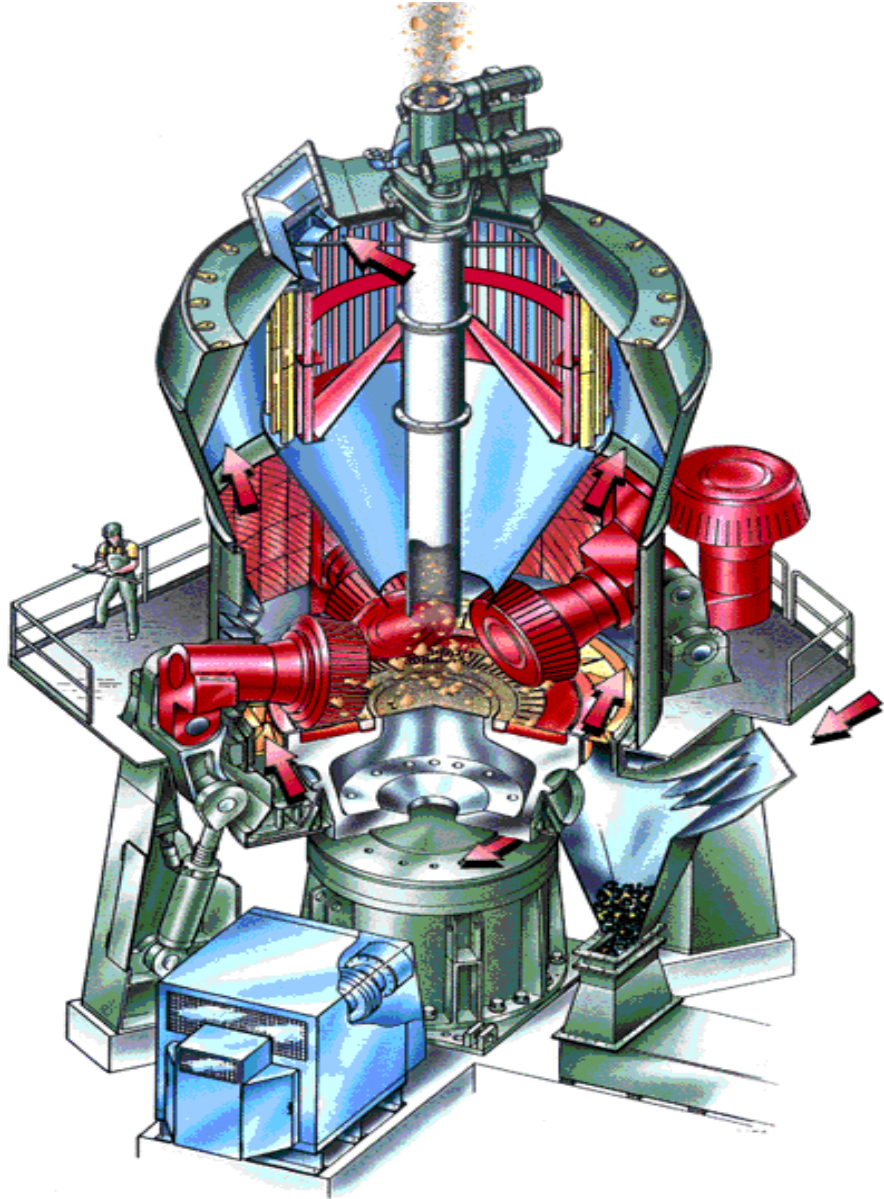


OXYFUEL-PILOTTIHANKE MERGELSTETTENIN TEHTAALLA



YMPÄRISTÖYSTÄVÄLLINEN SEMENTTITUOTANTO

PYSTYMYLLY



UUSI SEMENTIN JAUHATUSLINJA BROCENIN TEHTAALLA

Ympäristöystävällisempien sementtien
valmistukseen käyttäen enemmän
vaihtoehtoisia raaka-aineita

Uusi energiatehokas jauhatusteknologia

14 m pitkä, halkaisija 4,4 m, 2
kammaria, 4.3 MW



BROCENIN SEMENTTITEHTAAN AURINKOPUISTOT



External park, 5 MW line (6.34 MW total)

- 2024' generation ~6.1 GWh/y net



Internal park, 5 MW line (6.50 MW total)

- Commissioning expected Q2,2026
- Expected generation ca6.4 GWh/y over 25 years

VÄHÄHIILISET SEMENTIT

CEM I 52,5 N
GWP-total, net

571 kg-CO2 eq/tn sem



CEM II/B-M (S-LL) 52,5 N
GWP-total, net

431 kg-CO₂ eq/tn sem





SCHWENK

Baustoff leben