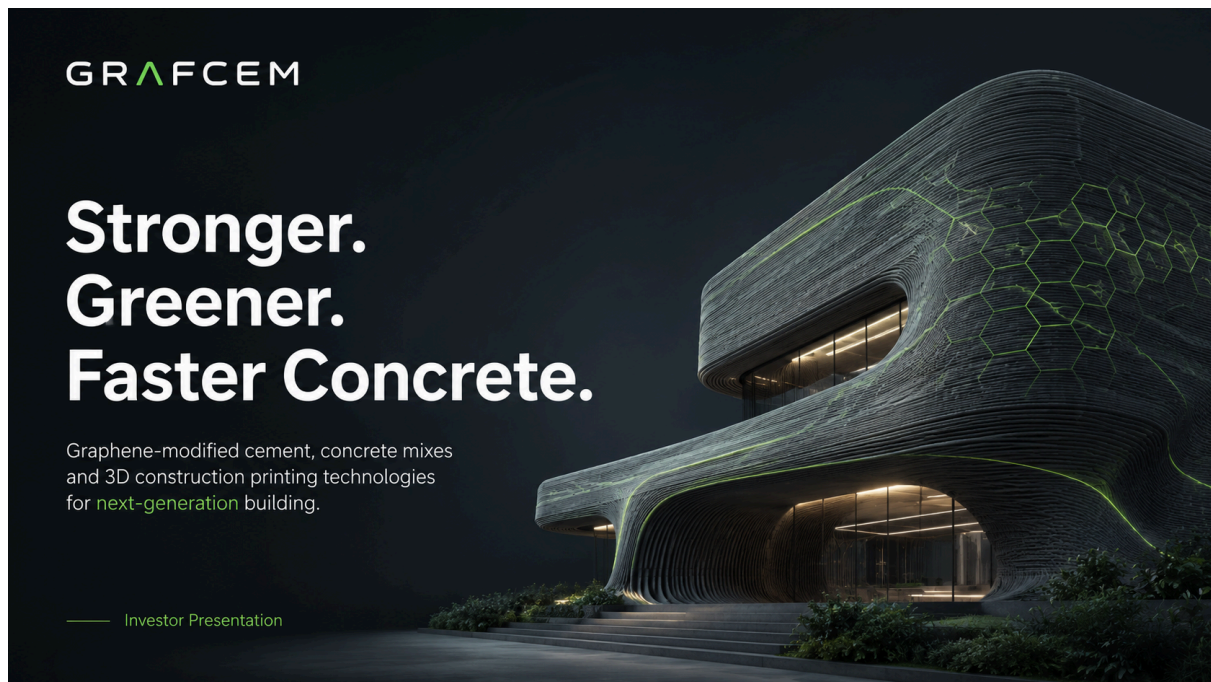


# GRAFCEM

## Graphene-Modified Cement for Stronger, More Cost-Efficient and More Sustainable Construction



### 1. About the Project

**GRAFCEM** is a technology project in the construction materials sector, developing and producing **next-generation graphene-modified cement** and concrete mixes.

The product is based on a graphene modifier that improves the properties of the cement matrix and enables the production of a stronger, more durable and more sustainable construction material. By improving strength characteristics, GRAFCEM cement can be used in smaller quantities while maintaining the required construction parameters.

A conventional concrete mix may **use approximately 330 kg of cement per 1 m<sup>3</sup> of concrete**. According to the GRAFCEM calculation model, **approximately 200 kg of graphene-modified cement per 1 m<sup>3</sup> of concrete** may be sufficient to achieve comparable or improved performance. This reduces cement consumption by approximately 39% and creates significant savings for consumers.

**GRAFCEM** operates in several areas:

- **production of graphene-modified cement;**
- **development of concrete mixes with improved characteristics;**

- **adaptation of materials for conventional construction;**
- **adaptation of materials for 3D-printed buildings;**
- **issuance of the company’s digital certificates to attract investment.**

The company issues digital participation certificates and invites investors to join an already formed business model in the sectors of construction materials, **green concrete and construction 3D printing**.

Digital certificates should not be regarded as ordinary shares of the company. Their economic nature, holder rights, participation terms, risks and possible conversion should be defined in the official **GRAFCEM** documentation.

## 2. Market Problem

**GRAFCEM**

# Market Problem

Why construction needs stronger, more efficient and lower-carbon materials.

- High CO<sub>2</sub> footprint**  
Cement production remains carbon-intensive.
- Rising construction costs**  
Materials, labor and project timelines keep getting more expensive.
- Limits of traditional materials**  
Conventional cement has limited efficiency gains without new modifiers and technologies.
- Demand for low-carbon building**  
Developers and infrastructure projects increasingly need stronger, greener and more advanced materials.

— Investor Presentation

Cement and concrete are fundamental materials of the global construction industry. Mass housing construction, infrastructure, roads, bridges, industrial facilities, energy facilities and urban development are impossible without them.

However, the modern cement industry faces several systemic problems.

### 2.1. High Carbon Footprint

Cement production is one of the largest industrial sources of CO<sub>2</sub>. A significant part of emissions is associated not only with energy consumption, but also with the chemical process of clinker production. Therefore, simply replacing fuel or improving energy efficiency does not fully solve the problem.

### 2.2. Growing Requirements for Low-Carbon Materials

In Europe, requirements for calculating the carbon footprint of buildings and construction materials are becoming stricter. For developers, contractors and material manufacturers, building lifecycle indicators, material sustainability and documented CO<sub>2</sub> profiles are becoming increasingly important.

### 2.3. High Construction Cost

The construction industry depends on the cost of cement, concrete, reinforcement, logistics, energy and labor. Any reduction in the consumption of key materials directly affects project economics.

If less cement is required to produce 1 m<sup>3</sup> of concrete while maintaining or improving strength, the end consumer receives a direct cost reduction.

### 2.4. Limitations of Traditional Materials

Conventional cement has limited improvement potential without the use of new additives, modifiers and technologies. The construction industry needs materials that can simultaneously provide:

- higher strength;
- lower material consumption;
- reduced carbon footprint;
- compatibility with modern construction methods;
- suitability for 3D printing.

## 3. GRAFCEM Solution

**GRAFCEM**

### Solution / Technology

GM V2 enhances cement performance at the material level, reducing cement use and enabling stronger, more durable and lower-carbon concrete.

- Graphene-based modifier**  
GM V2 improves the cement matrix at the nano level.
- Lower cement consumption**  
Target reduction: 20–40% depending on mix design.
- Higher performance**  
Supports strength development, durability and crack resistance.
- Broad applications**  
Concrete mixes, infrastructure, roads and 3D printing.

Investor Presentation

STRENGTH (MPa)  
TIME (DAYS)

**GRAFCEM** offers next-generation graphene-modified cement and concrete mixes based on Graphene Modifier V2 / GM V2 technology.

GM V2 is a multifunctional graphene modifier-activator for cement and composite binders. It can be used with Portland cement, low-carbon cement, slag cement, geopolymers, concrete mixes and mortars.

The main purpose of the technology is to improve the structure of the cement matrix at the nanoscale. Modified graphene creates an additional surface for the formation of crystalline compounds inside the cement stone, which may improve the strength, density, durability and stability of the final material.

The key advantage of **GRAFCEM** is not only higher cement strength, but also the economics of its application. According to the technological description of GM V2, the use of the modifier may reduce Portland cement **consumption by 20–40%**, depending on the mix composition and cement grade. In certain technological scenarios, when additional active mineral additives are used, **savings may reach up to 70%**. For the base financial model of **GRAFCEM**, it is reasonable to use a conservative range of 20–40%.

**GRAFCEM** may provide the market with several advantages:

- **increased strength of concrete and mortars;**
- **reduced cement consumption;**
- **reduced carbon footprint per unit of construction volume;**
- **improved water resistance and frost resistance;**
- **improved chemical and fire resistance;**
- **reduced cracking;**
- **longer service life of structures;**
- **compatibility with conventional construction;**
- **applicability in concrete 3D printing;**
- **applicability in road and infrastructure construction.**

The technology may be used in a wide range of products: construction mortars, concrete mixes, reinforced concrete products, road bases, foundations, bridge structures, marine structures, industrial facilities, modular construction and materials for 3D-printed buildings.

Thus, **GRAFCEM** is developing not as an ordinary cement producer, but as a technology platform for creating stronger, more cost-efficient and more sustainable construction materials.

## 4. Market

The first launch market for the project is **Croatia**.

Croatia is a logical starting platform for several reasons:

- **the country is a member of the European Union;**
- **the construction market is integrated into European regulation;**
- **there is demand for modern construction materials;**

- the market is compact enough for the first commercial launch;
- a successful case in Croatia can be used as a basis for expansion into other EU countries.

After launching in Croatia, **GRAFCEM** may scale into the European Union markets.

The European cement market remains large and strategically important. Even a small share of European cement consumption may generate significant revenue for the company.

If **GRAFCEM** captures:

- 0.05% of EU cement consumption — approximately 74 thousand tons per year;
- 0.1% of EU cement consumption — approximately 148 thousand tons per year;
- 0.5% of EU cement consumption — approximately 740 thousand tons per year.

Even with a small market share, **GRAFCEM** may become a significant niche player in the segment of high-performance cement materials.

## 5. Project Economics



The economics of the **GRAFCEM** project are based not only on the sale of graphene-modified cement as a separate material, but also on the economic effect that the technology can provide to the end consumer.

The key economic thesis of the project:

**GRAFCEM** may be more expensive than ordinary cement per ton, but more attractive for the consumer due to lower cement consumption, higher strength, longer service life of structures and lower construction costs.

## 5.1. Economic Effect for the Consumer

In the traditional construction model, the cost of a concrete mix and a construction structure depends on several factors:

- **cement consumption;**
- **consumption of sand, crushed stone and other aggregates;**
- **strength requirements;**
- **strength gain rate;**
- **durability;**
- **resistance to water, frost, chemical environments and fire;**
- **repair and operating costs.**

**GRAFCEM** creates an economic effect through a combined impact on these parameters.

If the technology enables a 20–40% reduction in Portland cement consumption, the consumer receives direct savings on one of the key components of the concrete mix. If strength, durability and operating characteristics are preserved or improved at the same time, the material becomes economically attractive even at a premium price per ton.

## 5.2. Portland Cement Savings

According to the technological description of GM V2, Portland cement savings may amount to:

- **base scenario: 20–40% compared to ordinary cement;**
- **extended technological scenario: up to 70% when additional active aluminosilicate additives are used.**

For the **GRAFCEM** investment model, the 20–40% range should be considered the base case, as it is more realistic and conservative for initial calculations.

Example logic:

if an ordinary concrete mix requires 100 conventional units of cement, the use of a graphene modifier may potentially reduce this consumption to 60–80 conventional units while maintaining the required construction characteristics.

This creates value not through a cheaper product, but through a more efficient product.

## 5.3. Strength Growth as an Economic Factor

Higher material strength may affect construction economics in several ways:

- **lower cement consumption while maintaining design strength;**

- **ability to create stronger structures;**
- **improved durability;**
- **reduced risk of cracking;**
- **reduced repair costs;**
- **longer service life of the facility.**

According to the technological description, on day 56 the strength of concrete samples with the modifier may be 30–50% higher than the strength class of concrete on day 28. A stable increase in strength over time is also indicated.

These indicators must be confirmed by tests on GRAFCEM formulations. In the financial model, they should be used as technological potential, not as a guaranteed result.

#### **5.4. Early Strength and Construction Speed**

The rate of strength gain is also important.

According to the source description, final products using the modifier may demonstrate accelerated early strength gain. In particular, strength gain within 1–5 days of up to 60% relative to the concrete class is indicated.

If this indicator is confirmed by testing, it may have important commercial significance:

- **faster formwork removal;**
- **faster transition to the next stage of construction work;**
- **fewer delays;**
- **higher construction site turnover;**
- **lower time-related construction costs.**

For developers and contractors, this may be no less important than reducing cement consumption.

#### **5.5. Durability and Reduction of Operating Costs**

The stated properties of the material may reduce not only construction costs, but also the operating costs of the facility.

Such properties include:

- **frost resistance of 500 cycles or more;**
- **water impermeability;**
- **resistance to seawater;**
- **resistance to chlorides, sulfates and acids;**
- **high fire resistance;**
- **reduced cracking;**
- **longer service life of structures.**

For infrastructure facilities, roads, bridges, marine structures, foundations, reservoirs and industrial structures, durability may be a key factor in economic efficiency.

## 5.6. Road Construction Economics

A separate economic potential is associated with road construction.

According to the technological description, the use of GM V2 in road construction may allow:

- **the use of difficult soils as the basis of the roadbed;**
- **reduction of earthworks;**
- **reduction in the consumption of sand, crushed stone and traditional road materials;**
- **reduction of labor costs;**
- **increased productivity of mechanized construction teams;**
- **shorter construction timelines;**
- **longer service life of the road.**

The document states that the cost of building a new motor road may be reduced by 20–50%, while major road repair costs may be reduced by 20–40%. These indicators should be considered technological benchmarks requiring verification for a specific road technology, soil type, climate, mix composition and regulatory requirements.

## 5.7. Recommended Modifier Dosages

According to the technological description, the following modifier dosage ranges are recommended:

- **construction and lime mortars: 0.1–1% of cement mass;**
- **non-reinforced concrete: 0.1–2% of cement mass;**
- **reinforced concrete: 0.1–0.7% of cement mass;**
- **prestressed concrete: 0.1–0.3% of cement mass;**
- **road construction using soil stabilization technology: 0.3–1% of cement mass.**

It is also indicated that, in practice, satisfactory results are achieved when the modifier is used in the range of 0.3–0.5% of cement mass.

This is important for GRAFCEM because a low modifier dosage may create high added value: a small amount of technological additive can change the properties of a large volume of cement mix.

## 5.8. Technology-Based Business Model

The economics of **GRAFCEM** may be built around several areas:

### **Sale of graphene-modified cement.**

The company produces a finished cement product with added value and sells it to construction companies, developers and manufacturers of concrete mixes.

### **Sale of concrete and construction mixes.**

**GRAFCEM** produces ready-made mixes for specific applications: general construction works, high-strength concrete, road construction, 3D printing and industrial facilities.

**Sale of the graphene modifier.**

The company may supply the modifier to cement plants, concrete manufacturers and partner production lines.

**Technology licensing.**

After technology validation and certification, GRAFCEM may license formulations, process maps and material lines to local manufacturers.

**Partner production lines.**

GRAFCEM may scale through joint ventures, contract manufacturing and local partner plants.

**Materials for 3D-printed buildings.**

A separate business line may be the production of mixes adapted for construction 3D printing.

**Road and infrastructure projects.**

After the technology is tested under local conditions, the company may develop the direction of road construction and soil stabilization.

## **5.9. Investment Logic**

An investor buys a GRAFCEM digital certificate not as an abstract token, but as an instrument for participation in the growth of a technology business in the construction materials sector.

The growth in project value may be associated with several factors:

- **confirmation of material characteristics through independent testing;**
- **certification;**
- **production launch;**
- **first sales;**
- **contracts with developers, contractors and concrete manufacturers;**
- **scaling in Croatia;**
- **expansion into EU markets;**
- **launch of new material lines;**
- **application of the technology in 3D-printed buildings;**
- **technology licensing;**
- **development of road and infrastructure applications.**

The main advantage of the investment model is the combination of a real industrial product, technological added value and a scalable model through production, licenses, partner plants and digital certificates.

## 6. Scaling Strategy



The **GRAFCEM** strategy consists of several stages.

### Stage 1. Launch in Croatia

At the first stage, the company launches production and sales in Croatia.

The goal of this stage is to:

- **validate the product in the local market;**
- **obtain first sales;**
- **collect operating data;**
- **confirm savings for consumers;**
- **prepare materials for certification and scaling.**

### Stage 2. Certification and Partnerships

After first sales, the company should strengthen its evidence base:

- **laboratory tests;**
- **construction tests;**
- **strength confirmation;**
- **confirmation of consumption of 200 kg per 1 m<sup>3</sup>;**
- **environmental calculations;**
- **partnerships with developers and contractors.**

### Stage 3. Expansion into the EU

After confirming the model in Croatia, the company may scale into EU markets.

Priority directions:

- countries of Central and Eastern Europe;
- markets with active residential construction;
- markets with high demand for low-carbon materials;
- countries where developers and contractors are interested in reducing construction costs.

### Stage 4. Production Network

Further scaling may proceed through several models:

- own production;
- contract manufacturing;
- technology licensing;
- production of the modifier and sale to cement plants;
- joint ventures with local manufacturers;
- supply of materials for 3D-printed buildings.

The strongest scaling model is not only the sale of cement, but the creation of a technology platform: formulation, modifier, certified product line, brand, licenses and partner production capacities.

## 7. Project Capitalization

The valuation of **GRAFCEM** should take into account not only current production economics, but also the technological component.

A conventional cement business may be valued as a production asset with limited margins. However, **GRAFCEM** has additional value due to:

- the graphene modifier;
- reduction of cement consumption per 1 m<sup>3</sup> of concrete;
- potential reduction of CO<sub>2</sub> footprint;
- application in 3D-printed buildings;
- the possibility of a certified material line;
- scaling through licenses and partner plants;
- issuance of digital certificates;
- entry into the European market for low-carbon construction materials.

### 7.1. Preliminary Valuation at the Current Stage

If the project is at the stage of formed technology, initial testing, production preparation and investment launch, the preliminary valuation range may be:

## EUR 10–25 million

This range is applicable if the project has:

- **confirmed formulation;**
- **understandable cost structure;**
- **rights to the technology;**
- **team;**
- **initial production model;**
- **prepared investment and legal structure.**

If the project already has laboratory protocols, first clients, preliminary agreements or a ready production site, the valuation may be higher:

## EUR 45–60 million

### 7.2. Valuation After Production Launch

With sales of 10,000 tons per month, the company may generate:

- annual revenue: **EUR 27.6–28.8 million;**
- annual gross profit: **EUR 13.8–15.0 million.**

Under this model, the project may be valued approximately in the range of:

## EUR 90–220 million

provided that the technology is confirmed, sales are stable, operating expenses are controlled and market demand is proven.

### 7.3. Valuation When Scaling in the EU

If **GRAFCEM** captures 0.1% of the EU cement consumption market, this may correspond to approximately 148 thousand tons of sales per year.

At a price of EUR 230–240 per ton:

- revenue: **EUR 34.1–35.5 million per year;**
- gross profit: **EUR 17.0–18.5 million per year.**

If the company captures 0.5% of the EU market, this may correspond to approximately 740 thousand tons of sales per year.

At this market share:

- revenue: **EUR 170–178 million per year;**
- gross profit: **EUR 85–93 million per year.**

In this scenario, the company's capitalization may reach the range of:

**EUR 0.7–1.5 billion**

provided that the technology is confirmed, production is scaled, certification is obtained, contracts are signed and the company successfully enters several EU markets.

#### **7.4. Investment Conclusion**

**GRAFCEM** is attractive to investors because the project combines three directions:

- 1. A real industrial product with understandable economics.**
- 2. A technological advantage through the graphene modifier.**
- 3. A scalable investment model through digital certificates.**

The investor gets an opportunity to enter the project at an early stage, before large-scale expansion into the EU market, when the company's value does not yet reflect the full potential of the technology, production network and future contracts.