



Cluster Strategy 2.0

A strategy for tomorrow

December 2019

Start with the big picture



Strategic positioning for the country's competitiveness



Stimulus to the development of collective efficiency actions



Promote innovation, R&D and the internationalization of the Portuguese economy



The AEC Cluster difference



By understanding the global dynamics that affect the Portuguese construction industry, AEC Cluster helps connecting the pieces.

Global reach

AEC Cluster helps screening all possibilities by identifying opportunities available to companies worldwide.

Technology at the core

Leverage technology for operational efficiency and to gain a clear vision of relevant opportunities.

Lifecycle view

Each project must be considered in the context of the investment and innovation lifecycle to realize the full financial and commercial benefit.

Leveraging the ecosystem

Innovation does not happen in a vacuum. Connecting with relevant stakeholders will propel innovation capability. AEC Cluster helps build winning relationships.

Industry experience

AEC Cluster knows and understands the industry, its business and technology language.

Total perspective

AEC Cluster's broad sector knowledge is available to help companies further enhance and accelerate their business opportunities.

Key achievements so far...



2017 + 2018



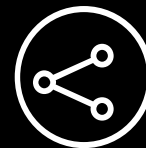
Competitiveness Cluster
IAPMEI



AEC Connect Project
Portugal 2020 | SIAC
EUR 172.000 investment



PAQI Project
Portugal 2020 | NORTE 2020
EUR 411.000 investment



2030 Strategic Innovation and Competitiveness Plan
Mid-term R&D and innovation strategy

2018 + 2019



Contribution to PNI 2030
78 key actions



Sector Pact for Competitiveness and Internationalization
Portuguese Government



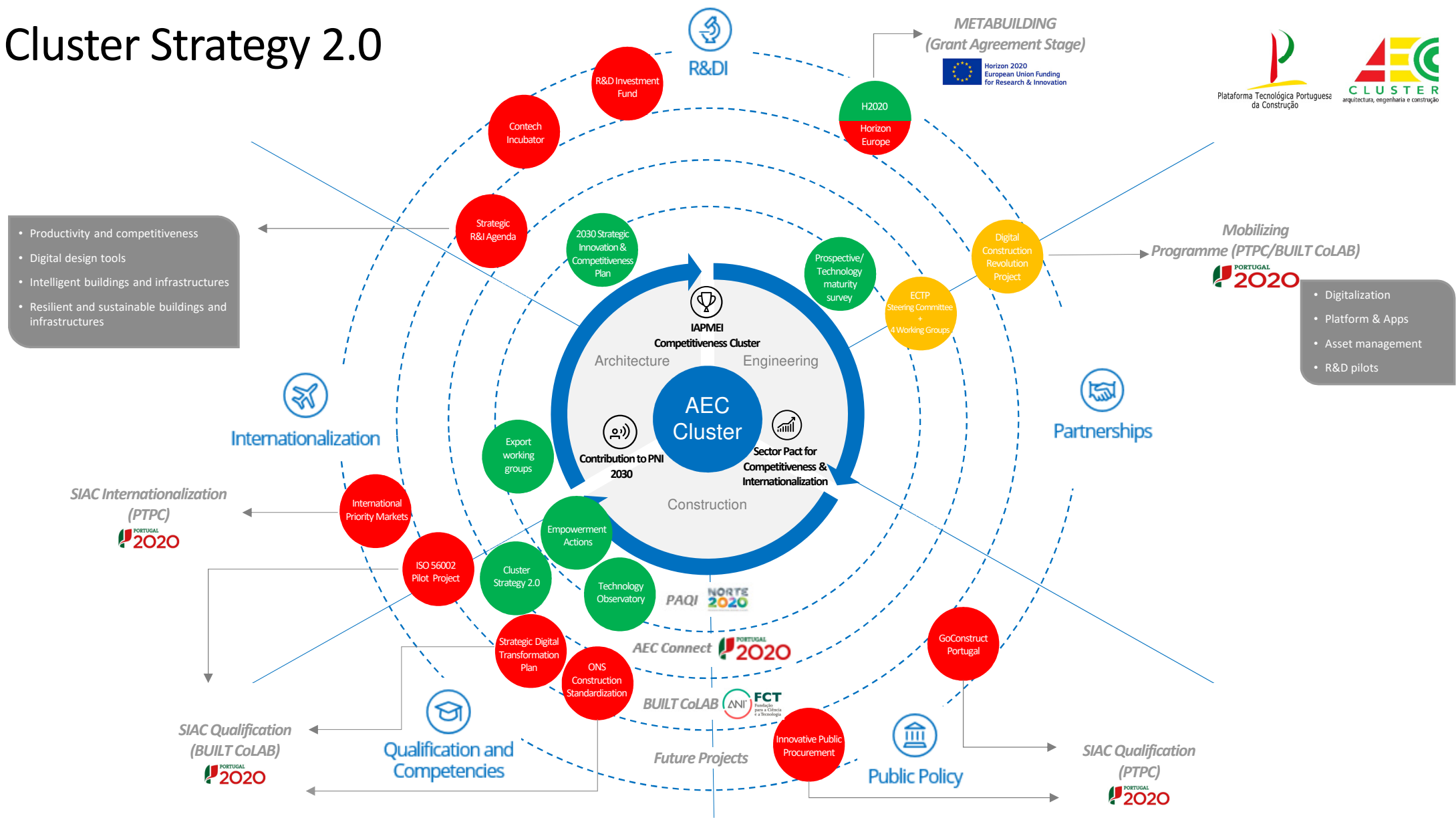
BUILT CoLAB Setting-up
FCT | Collaborative Laboratory
EUR 3,4 million investment
(5 year plan)



REV@CONSTRUCTION Project
Portugal 2020 | Mobilizing Programme
EUR 10 million investment
(Evaluation stage)

Cluster Strategy 2.0

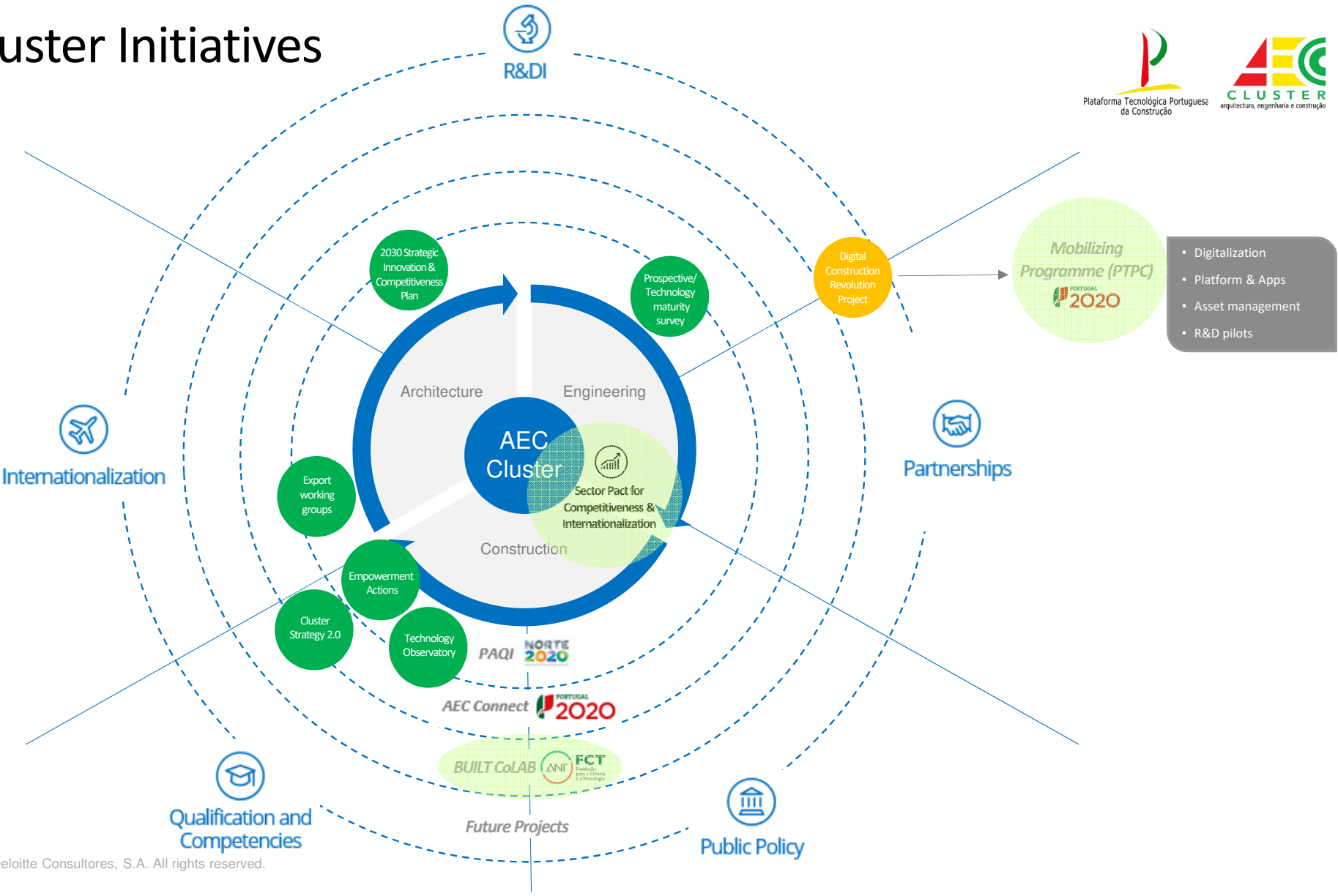
Cluster Strategy 2.0



- Productivity and competitiveness
- Digital design tools
- Intelligent buildings and infrastructures
- Resilient and sustainable buildings and infrastructures

- Digitalization
- Platform & Apps
- Asset management
- R&D pilots

Featured Cluster Initiatives



Featured Cluster initiatives

2030 Strategic Innovation and Competitiveness Plan

Results

- ❖ **Priority horizontal development axes:** (i) Innovation and knowledge, (ii) Qualification and vocational training, (iii) Internationalization, (iv) Financing and (v) Territorial cohesion.
- ❖ **Strategic guidelines:** (i) Foster R&D, innovation, technology transfer and empowerment, (ii) Enhance vocational education and training reforms, (iii) Leverage the competitive positioning of national companies globally, (iv) Diversify funding sources and (v) Strengthen territorial cohesion and demographic sustainability.

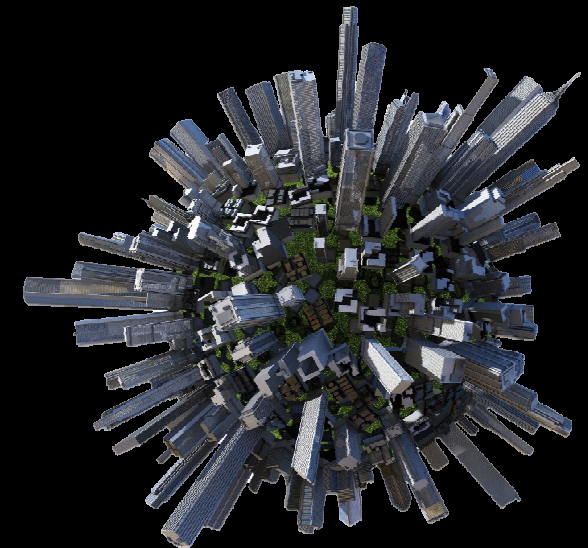
Follow-up

BUILT CoLAB | Mobilizing Programme | METABUILDING



Coordinated by the Executive Board of Directors PTPC/AEC Cluster (Luís Gomes - Mota-Engil)

Project development: Deloitte (Alexandre Andrade, Miguel Taborda)



Featured Cluster initiatives

Prospective/technology maturity survey

Results

- ❖ A large majority of companies do not account for R&D investment;
- ❖ Most companies have no R&D department or systematic procedures for managing R&D;
- ❖ In cases where there is investment in R&D, the amount is usually below Euro 100,000 per year.

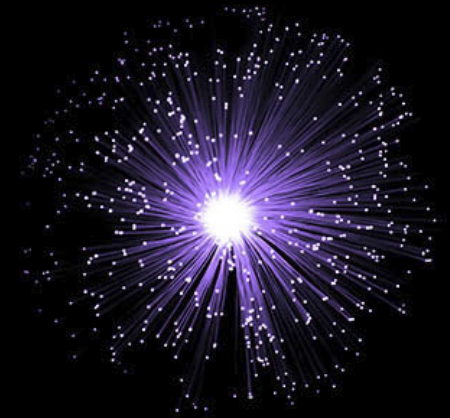
Follow-up

BUILT CoLAB | Mobilizing Programme



Coordinated by the Executive Board of Directors PTPC/AEC Cluster (Paulo Fonseca – ELEVO)

Project development: Deloitte (Miguel Taborda)



Featured Cluster initiatives

Empowerment actions

Results

- ❖ Action 1: Productivity & digital transformation (FULL FILL);
- ❖ Action 2: Introduction to BIM (IST)
- ❖ Action 3: Digitization and future trends in the AEC sector (FEUP/INESCTEC);
- ❖ Action 4: New Materials: Functional, Smart and Eco Efficient (UM/INL);
- ❖ Action 5: New Technologies for Urban Rehabilitation (IST/FCT-UNL/FEUP).

Follow-up

BUILT CoLAB



Coordinated by the Executive Board of Directors PTPC/AEC Cluster (Paulo Fonseca – ELEVO)

Project development: ShiftUp (Tiago Martins, Sara Serra)



Featured Cluster initiatives


Technology Observatory

Results

- ❖ Technological tool (electronic platform) that supports the registration and dissemination of information gathered as part of prospective and strategic surveillance actions;
- ❖ Assist in identifying industry opportunities.

Follow-up

BUILT CoLAB | H2020/Horizon Europe/PT2030

 **Coordinated by the Executive Board of Directors PTPC/AEC Cluster (Álvaro Vale e Azevedo – LNEC)**
Project development: SPI (Sérgio Alves)



Featured Cluster initiatives

Export working groups

Results

- ❖ 3 core groups: construction, project management and materials;
- ❖ 2-phase meeting schedule (Porto and Minho) with a total of 118 participants;
- ❖ Priority recommendations: (i) foster national and European collaborative R&D projects, (ii) financing tools, (iii) invest in digital transformation, (iv) innovation management, (v) new markets and (vi) develop international industry brand.

Follow-up

SIAC Internationalization (PTPC)



Coordinated by the Executive Board of Directors PTPC/AEC Cluster (Fernando Branco – IST)

Project development: Magellan (Filipe Botelho, Joana Dias)



Featured Cluster initiatives

Sector pact for competitiveness & internationalization

Results

❖ Boost and strengthen the internationalization of companies in the AEC sector, through initiatives in the following domains:

- i. Innovation and knowledge;
- ii. Qualification and professional training;
- iii. Internationalization;
- iv. Sustainability and financing.

Follow-up

BUILT CoLAB | Mobilizing Programme | H2020/Horizon Europe/PT2030



Signed between the Ministry of Economy (Deputy Minister and Economy Minister - Pedro Siza Vieira) and Executive Board of Directors PTPC/Cluster AEC (Chairman and Vice-President – Rita Moura, Luís Gomes).



Featured Cluster initiatives

BUILT CoLAB

Results

- ❖ Develop innovative solutions for adaptable, intelligent, resilient and sustainable buildings and infrastructures;
- ❖ 4 key research Areas: (i) productivity and competitiveness, (ii) digital design tools, (iii) intelligent buildings and infrastructures and (iv) resilient and sustainable buildings and infrastructures;
- ❖ 50 qualified HR recruitment: Euro 3,4 million (5 year plan).

Follow-up

SIAC Qualification | H2020/Horizon Europe/PT2030 | R&D services



Coordinated by the Executive Board of Directors PTPC/AEC Cluster (Paulo Fonseca – ELEVO)

Project development: 3drivers (António Lorena)



Featured Cluster initiatives

Digital Construction Revolution – Mobilizing programme

Results

- ❖ Proposes a cross-sectional approach (24 AEC entities) to the value chain of the construction industry, supported by key pillars of R&D;
- ❖ R&D driving force: development of various digital tools linked to key industry aspects, that will facilitate the introduction of the concept of **digital twin** in the construction industry, making use of research in cutting-edge digital areas such as augmented reality, sensing, big data, IoT, among others;
- ❖ Euro 10 million investment.

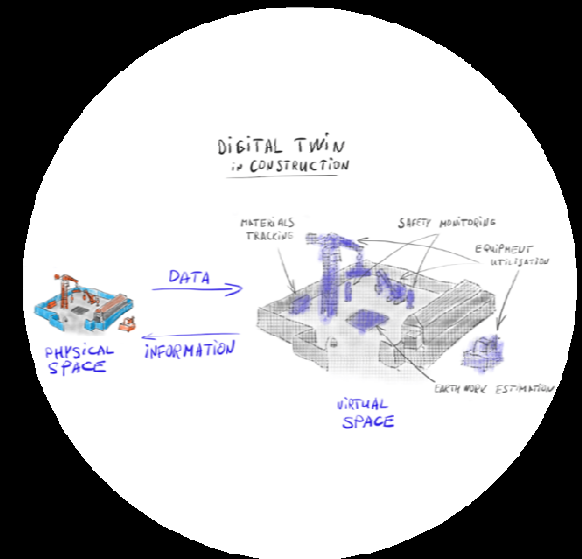
Follow-up

4 sub-projects (PPS) led by the AEC construction industry | BUILT CoLAB



Coordinated by the Executive Board of Directors PTPC/AEC Cluster (Paulo Fonseca – ELEVO)

Project development: Magellan (Filipe Botelho, Eulália Soares) / INESC TEC (Luís Carneiro e Augustin Olivier)



What's next for the AEC Cluster?

Walk (2017)

Mobilize Stakeholders

- Develop implementation budget and build awareness
- Engage sector stakeholders to develop the process
- Formalize governance structure
- Initiate identification of potential projects for pilot phase

Run (2018-2019)

Launch Pilots

- Launch pilot projects at a national level
- Expand AEC Cluster team
- Track and report progress
- Pursue projects over a certain threshold

Fly (2020...)

Implement Globally

- Roll out process internationally
- Actively engage in European R&D projects
- Strive for Cluster Management Excellence (ECEI Bronze Label)
- Implement key projects (BUILT CoLAB, Mobilizing Programme, H2020...)
- Launch dedicated R&D Investment Fund
- Set up Contech Incubator
- Track and report value

Cluster Strategy 2.0

Innovation and R&D fuel performance

Architecture | Engineering | Construction

A maturing technology ecosystem...

For years the construction industry has been mocked for its low margins and lack of innovation. Fueled by innovation and R&D, a turning point seems to have been reached over the last decade.

Throughout the world, foremost larger construction companies are increasingly focusing on innovation and digitalization of their business model.

Clusters such as AEC should take a closer look at the emersion and growth of the construction technology (“**Contech**”) ecosystem within the construction industry over the past decade so that they can set the grounds for future strategy development.



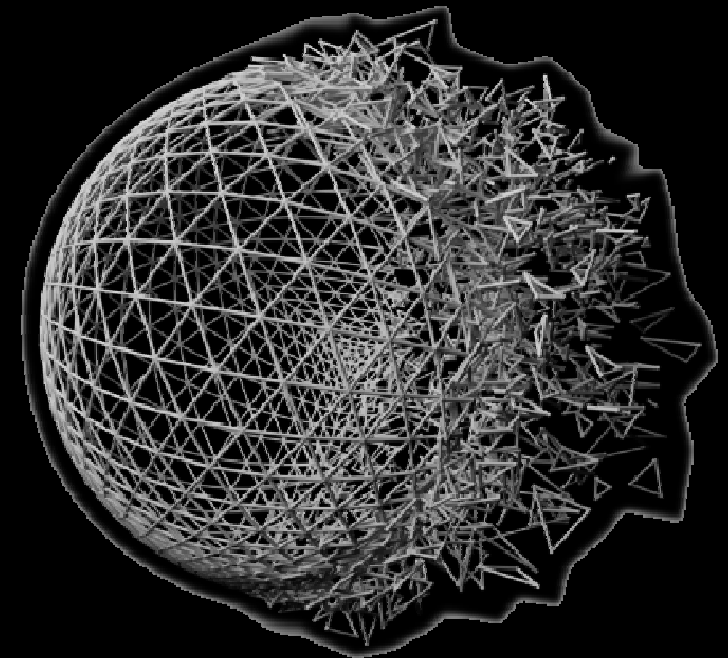
The Contech ecosystem explained

A number of new **tech markets** have appeared in recent years with names like **fintech**, **insurtech** and **healthtech**.

Contech, short for construction technology, doesn't quite sound familiar yet. Contech incorporates technologies used in construction, such as solutions primarily for the concept, design, engineering and building phases of the construction process.

Within the ecosystem, **Proptech**, for its part, tends to adopt more of a real estate perspective. Thus, proptech primarily includes solutions for use in the operation and maintenance of an existing building.

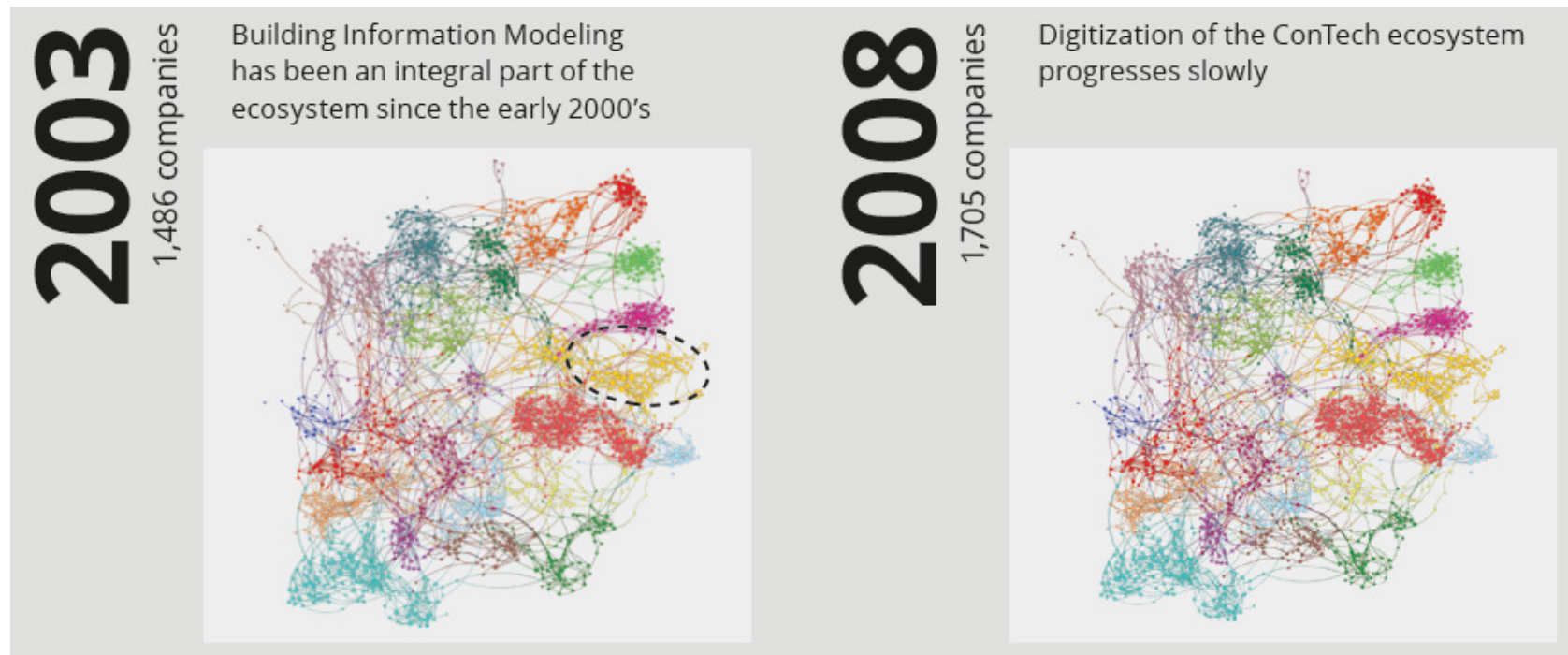
“The Contech ecosystem shows the interconnectedness of all facets involved in construction and several ways in which digitalization is shaping the industry.”



The Contech space is picking up speed ^(1/2)

In 2003, BIM became an integral part of the Contech ecosystem. Back then the most dominant clusters were machinery, components & assembly, general contracting, and construction management software.

A node in the figure equals one company. Each color in the ecosystem represents a different “cluster” of Contech companies.

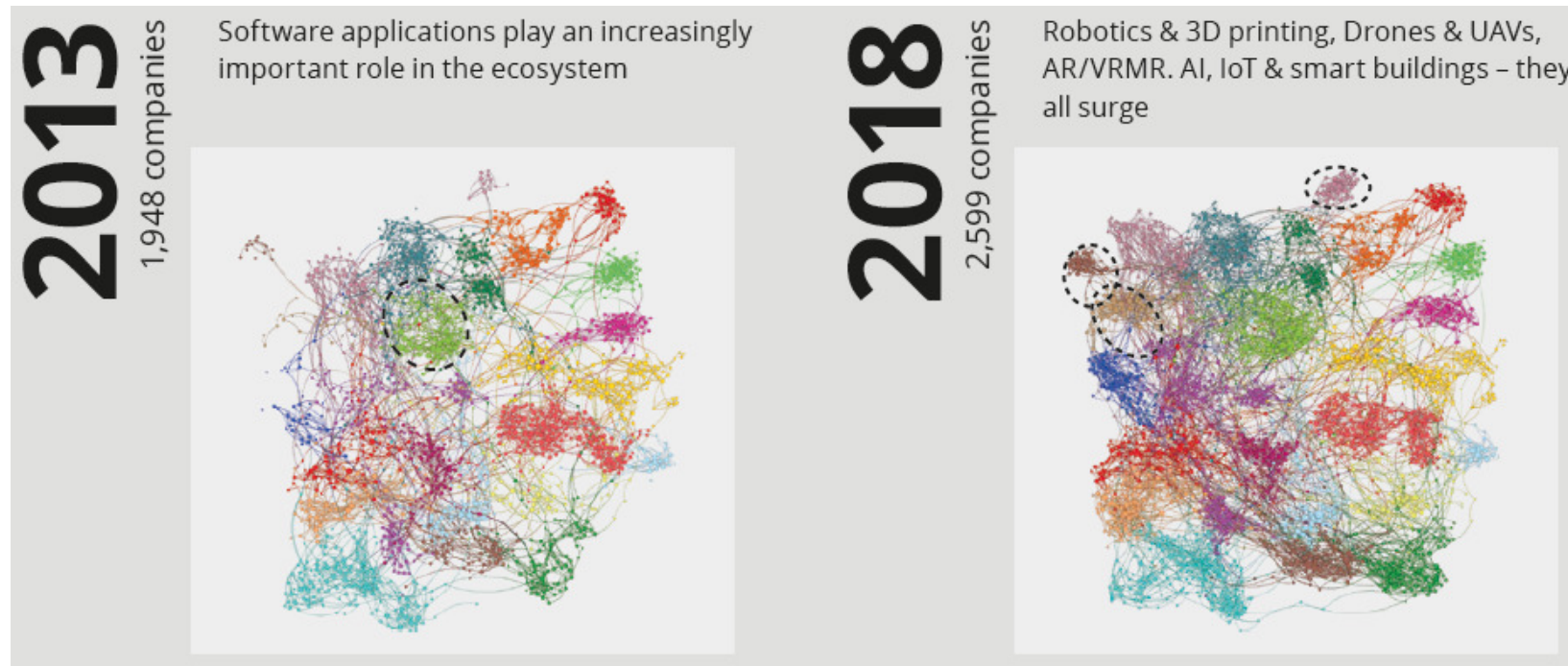


Fonte: Quid, CapitalIQ, Crunchbase, Análise Deloitte

The Contech space is picking up speed (2/2)

Around 2013, the growth of the Contech ecosystem had not accelerated. However, software applications are increasingly playing an important role within the ecosystem.

The ecosystem showed an accelerated growth over the past five years, mainly driven by the surge of robotics and 3D-printing, AI, IoT and smart buildings



Fonte: Quid, CapitalIQ, Crunchbase, Análise Deloitte

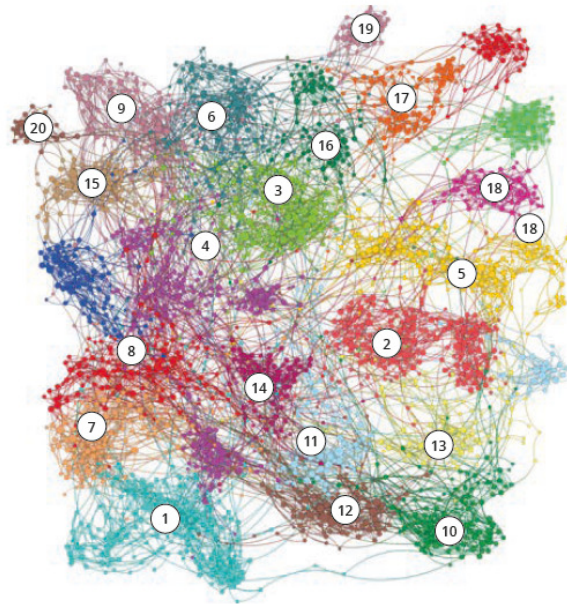
The Contech ecosystem today

The growth of these innovations within the construction industry indicates that finally a solid foundation of software applications and BIM is in place that allows the disruption of the industry by Contech innovations.



2019

3,000+ dedicated companies worldwide digitalizing the AEC sector!



Fonte: Quid, CapitalIQ, Crunchbase, Análise Deloitte

Cluster		Share
1	Machinery, components & assembly	8%
2	General contracting	7%
3	Construction management software	7%
4	Robotics & 3D printing	6%
5	Building Information Modelling	6%
6	Consulting	6%
7	Construction materials and technologies	6%
8	Trading & investments	5%
9	Networks, cable & fiber	5%
10	Landscape construction, environment, waste & water	5%
11	Oil & gas	4%
12	Engineering & technology	4%
13	Road & railway, structural engineering	4%
14	Solar energy	3%
15	Artificial Intelligence, IoT, smart buildings	3%
16	Cad, surveying, laser	3%
17	Staffing employment & HR	3%
18	Plumbing & HVAC	2%
19	Drones & UAVs	1%
20	AR/VR/MR	1%

The AEC Cluster is ambidextrous

To get Portuguese Contechs up and running the Cluster needs to do somethings different



Traditional business model being disrupted

By a combination of ever more demanding and **expectant clients** and **new competitors**.

Need to adapt to current market forces

By bringing **technology to the fore** and solve business problems.

Adjust business to remain competitive

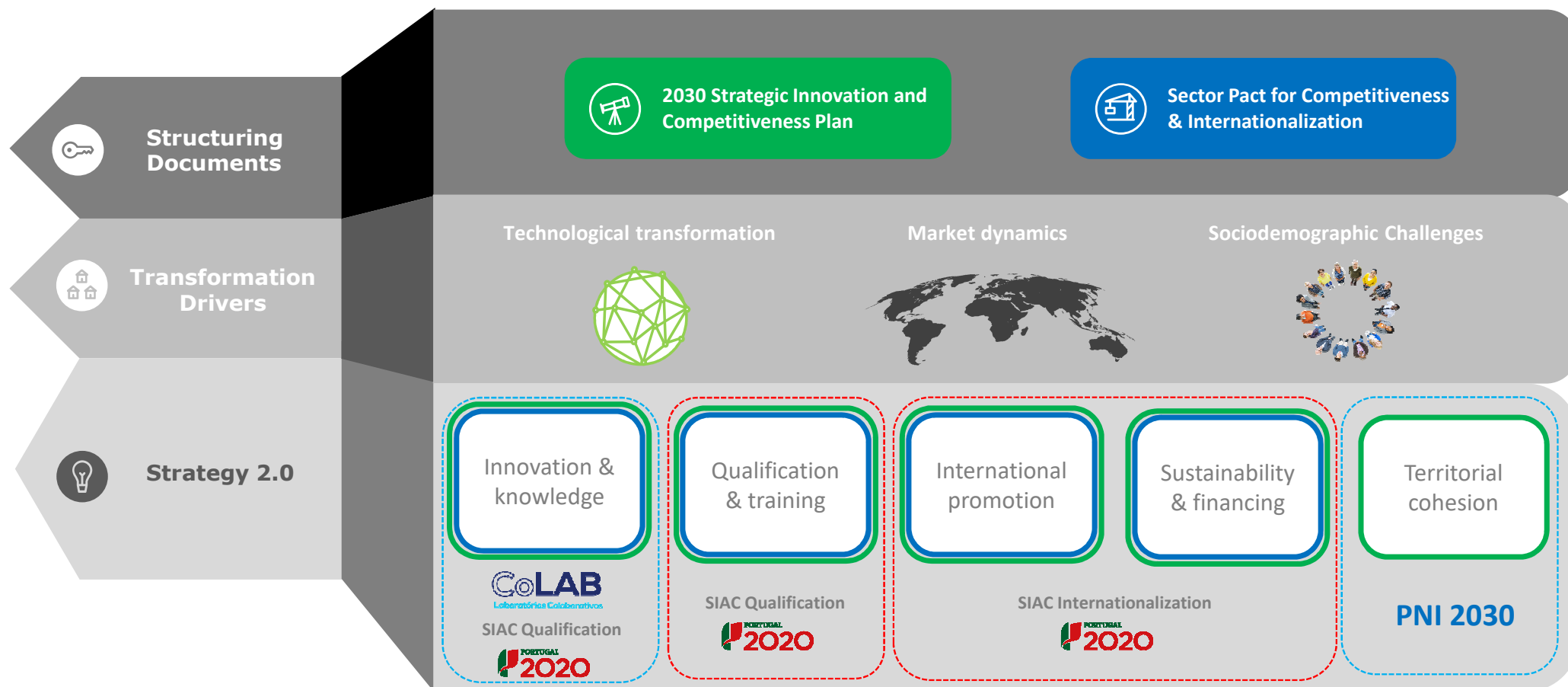
Making technology assets core to businesses, shifting to a **value based pricing** strategy.

Becoming an asset enabled Cluster

By launching a **Business Construction Technology Incubator**, the Cluster will embed this way of thinking **across the sector**.

Shaping the future of construction

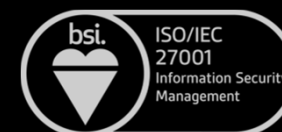
Cluster AEC 2030





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