Construction & digital innovation
ARGE conference
Bonn 5th September 2019
Construction Products Europe

Established in 1988;
Association re-launched in June 2013;
Work towards **consensus** on generic issues;
Membership made up of over 50 national and EU associations.

**Purpose:**
Lobby on CE marking & sustainable construction
European construction industry
Essential facts

Greatly impacted by financial crisis;
Sector employs 6.4% of EU workers;
Construction delivers 8.9% of European GDP;
95% of the companies are SMEs;
Long and very diverse value chain.
Europe & housing: market reality
Protesters denounce gentrification in Lisbon as housing prices soar

Catarina Demory, Goncalo Almeida

LISBON (Reuters) - Anti-gentrification groups from across Europe joined hundreds of Portuguese activists on Saturday in a rally against soaring rent prices in Lisbon as the city experiences the biggest tourism boom in its history.
Why rising rents across Spain are causing a new crisis

26 September 2018
10:06 CEST+02:00

property
rent

Share this article

All photos by by Gabriel Buoyés/ AFP
Berlin backs five-year rent freeze amid housing pressure
18 June 2019
Will you ever be able to afford to buy a home? This is how long it will take you to get on the property ladder

Depending on where you live in the city, you could have a long wait before buying your first home.

Getting on the property ladder is harder than ever.

New data suggests that across Merseyside, the average couple would need to save for around seven years to be able to buy a two-bedroom house.
Irish Times view on housing: No time for political caution

Providing cheap State-owned land for developers will not remedy a broken system

Richard Curran: Real questions over plan to tackle housing crisis with land agency

LANDOWNERS POCKET £13BN PROFIT IN ONE YEAR JUST FOR GETTING PLANNING PERMISSION

'In the face of a disastrous housing crisis, it is clear that the broken housing market is simply not delivering.'
More than one homeless person dies every day in the UK, study finds

'This is a wake-up call to see homelessness as a national emergency,' said Crisis CEO Jon Sparkes

More than one homeless person died every day in the UK over the last 12 months, according to a new study.

A physicist, a former soldier and a travelling musician were among the 449 deaths recorded since October 2017, including 14 in one week alone.

Experts described the statistic as a “national scandal” and placed the blame on welfare cuts, high rents and a lack of social housing.
It’s official, the housing market has cooled off, but it will take some time for it to become a buyers’ market.
NEWS 29/06/2019 07:21 BST

Young Adults 'Half As Likely To Own A Home Now As 20 Years Ago'

Just 11% of people born in 1996 are home-owners, compared with 21% of those born in 1976 who were home-owners at age 22, the Local Government Association (LGA) said.

“Home ownership remains a distant dream for most young people

—Martin Tett, LGA housing spokesman
European Commission
Level(s):  
- voluntary framework to improve the sustainability of buildings;  
- Test phase underway;  
- Conference 18th December, Brussels.
European Commission
DG Energy

- Transposed into national legislation;
- Third attempt to promote energy efficiency in buildings.
EU Adaptation Strategy:

- Resilience to natural disasters;
- Flooding, temperature variation, earthquakes …;
- Evaluation published in November 2018, it outlines how Europe is still vulnerable.
European Commission
DG Connect

Smart cities:
- Promotion of digital & telecommunication technologies.

Artificial intelligence and robotics:
- EU AI development coordinated action plan published on 7th December 2018.
Construction Demolition Waste (CDW) protocol available online

Circular economy principles for designing buildings final draft, to be published soon
What do we build?
Sustainable/green?
Near-zero energy?
Energy efficient?
Energy-positive?
Resilient?
Smart?
Economics & investments

Cutting costs for competitiveness;
New build = 1 to 3% of EU market;
Infrastructure needs;
Investment policies?
Investments & technologies
Once upon a time …

Sears Modern Homes;
Kit houses for sale via online catalogue as of 1908;
These now valued over $1M;
Innovation is nothing new.
In a galaxy (not) so far away …

Bricklaying robot works five times faster than a human
In a galaxy (not) so far away …

Japanese plasterboard robot
In a galaxy (not) so far away ...

Exoskeletons make the wearer stronger and safer
Digital construction investments

$18 billion in cumulative investment over last 5yrs;
$1 billion invested in start-ups 1st half 2018, 30% above 2017;
119 start-ups deals in 2018, up from 104 in 2017 & 97 in 2016;
More M&A activity foreseen as larger software firms acquire co. rather than reinventing the wheel.
Digital investments

New breed of high-tech real estate using algorithms

Zillow started in 2005, 2018 revenue $1.3 billion

Compass $1.5 billion in funding, co. now valued at $6.4 billion, compared to $4.4 billion in 2018. Company’s massive growth: revenues up 250% compared to Q2 2018.
Drone for data collection and more;
3D printing for rapid prototyping, shorter production runs;
Blockchain, first real estate deal in EU Oct. 2018;
Internet Of Things (IoT)

Interconnected devices and sensors that communicate via web; Tools and equipment tracking for servicing and repair; H&S support through connected wearables.

Introducing...
Trimble Connect for HoloLens

Trimble Connect for HoloLens utilizes mixed reality for project coordination by providing precise alignment of holographic data on the job site, enabling workers to review their models overlaid in the context of the physical environment.

With two-way communication to the Trimble Connect cloud, users always have the most up-to-date data on their site, literally.
And also …

Big data explosion driving Artificial intelligence (AI) prompting businesses to track and make use of more and more data;

**Augmented Reality (AR)** integrated into equipment visors and vehicle windshields.
Building Information Modelling (BIM)

A technology - in use for a decade;

A process - spans generation and management of construction project;

An industry - value $11.7 billion by 2022.
Funded by the European Commission
Launched in February 2016
Objective to set up European BIM network for public works
Published BIM handbook for public procurers
Available online in 20 languages
What next?

Understanding needs and constraints/liability of construction industry;
Mutual benefits/targets;
Common language;
Data ownership;
Standardisation;
Political framework.
EU digital construction initiatives
In June 2018, 23 EU associations including ARGE co-signed digital manifesto;

It recommends that:

- EU take political lead on digital construction;
- To focus new EU budget on digital skills, R&D and deployment of IT infrastructure;
- For data policy regulatory framework.
European standardisation

CEN Technical Committee 442 Building Information Modelling (BIM);
Artificial Intelligence (AI) Focus Group with roadmap and milestones;
Blockchain & Distributed Ledger Technology (DLT) Focus Group which produced White Paper.
EU digital construction platform

European Commission Horizon 2020 funding;
DigiPLACE digital platforms pilot project;
Project duration: 18 months, awaiting contract;
21 partners, including European associations, research institutes, national government officials, BUILDINGSMART and Politecnico di Milano.
Study conducted by Cobuilder on our behalf

In 28 Member States, 93 BIM initiatives and 185 associated software products

All with different geographic influence and work area

Online feedback requested
Smart CE marking

CEN Workshop Agreement
freely available online;
Ready to be implemented;
Not BIM but “gate” to BIM for construction products data.
Smart CE marking …

… is not BIM, but it is BIM compatible
… is beneficial and useful together with BIM
… is beneficial and useful even when BIM is not being used
CEN/TC development based on their expertise

hEN + CEN Workshop Agreement \[\rightarrow\] Essential characteristics \[\rightarrow\] [XML]

Smart CE marking format

hEN specific

XML translation
Manufacturer

XML
Smart CE marking format

Declaration of performance information

XML DoP
Smart CE marking document

XML DoP available online
Purpose of the CWA

The CWA defines the general framework
How to structure
How to code the information

As specific as possible, as general as necessary
Different interpretation → different code possible
CEN/TC agreement
Role of Product TCs

Allow manufacturers to Smart CE mark product
Translate the product standard with the CWA into product specific Smart CE XML templates (Product Data Template)

➔ Prevent leeway for interpretation
Experts from the industry in coordination with CEN/TC are already developing the tables in Excel.

No IT training is needed, only deep understanding of the declaration logic in the standard: test methods, units, classes, restrictions, etc.

Complexity depends on the approach of the standard.

Excel template available
<table>
<thead>
<tr>
<th>Essential characteristic</th>
<th>Property level 1</th>
<th>Property level 2</th>
<th>Declaration</th>
<th>Declaration</th>
<th>Declaration</th>
<th>Additional information Unique?</th>
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</table>

**Appropriate Technical ID**

Appropriate technical documentation
## Table ZA.1

In the relevant harmonised standard

<table>
<thead>
<tr>
<th>Essential Characteristics</th>
<th>Clauses in this European Standard related to essential characteristics</th>
<th>Regulatory levels and/or classes</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Dimensions and dimensional tolerances (for units intended to be used in elements subject to structural requirements) | 5.2.1.1 Dimensions  
5.2.1.2 Dimensional tolerances                                      | None                            | Declared value in mm, and tolerance category                        |
| Configuration (for units intended to be used in elements subject to structural requirements)            | 5.2.2 Configuration                                                     | None                            | Declared configuration as illustrated or described                   |
| Compressive strength (for units intended to be used in elements subject to structural requirements)       | 5.2.4 Compressive strength                                              | None                            | Declared value in N/mm² (with indication of direction of loading category) |
| Dimensional stability (for units intended to be used in elements subject to structural requirements)     | 5.2.9 Moisture movement                                                 | None                            | Declared moisture movement in mm/m                                   |
| Bond strength (for units intended to be used in elements subject to structural requirements)              | 5.2.12 Bond strength                                                    | None                            | Fixed value; or Declared value of initial shear strength, in N/mm² |
| Active soluble salts content (for units intended to be used in elements subject to structural requirements) | 5.2.8 Active soluble salts content                                      | None                            | Declared value of active water soluble salts content on the basis of technical class S0 |
List of essential characteristics in the harmonised standard
Covering all the intended uses (unique format per harmonised standard)
e.g. water absorption is only relevant for unprotected units

<table>
<thead>
<tr>
<th>Essential characteristic</th>
<th>Property level 1</th>
<th>Property level 2</th>
<th>Property level 2</th>
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<td>Configuration</td>
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**Dimensions and dimensional tolerances**
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**Configuration**
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**Bond strength**
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**Active soluble salts content**
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- **template**
- **template**
Increasing demand of information from the regulatory point of view

Useless information if not computer readable
Work in progress

Masonry units industry to publish the document
Windows industry to present the final table to
CEN/TC 33
Insulation industry working on their tables
Glass industry to develop the tables in the coming weeks…
Looking ahead
Summary

Multiple challenges for built environment: extreme weather conditions; rising energy costs, demographic changes…

Specialised jobs/skills to emerge linked to digital transformation;

Surge in investment in digital technology;

Industry spends 1% or less of annual sales on digital tools;
Industry and potentially entire built environment to be reshaped;

Technology for all actors, from architects and owners to workers;

“Digital construction” is 5-10 years off but standardisation required;

Need for (EU) political guidance?
Recommendations

Communication between tech and construction industries
Interoperability/common language
Common goals
Guiding (EU) political framework
Announcement

2020 Digital construction conference
by Construction Products Europe
for industry
Brussels
1Q 2020