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The European Construction Technology Platform

THE European construction sector is faced with ever increasing challenges. With an ageing and growing population, there are higher demands for greater comfort, better mobility and more safety and security. The impact that the construction sector has on the environment and sustainable development is significant, with buildings accounting for 40% of the EU's energy demand. With the construction industry using more raw materials than any other sector, the creation and operation of the built environment accounts for an important consumption of natural resources.

The estimated construction investment reached €1.196Bn in 2006 (EU-27); this represents 10.4% of GDP, 50.5% of gross fixed capital formation, 2.7 million enterprises (EU-27) and 15.2 million or 7.2% of Europe's total employment operatives. This means 30.4% of industrial employment and 26 million workers in the EU depend, directly or indirectly, on the construction sector.

By using the European Construction Technology Platform (ECTP), the aim is to find a clear set of common research priorities between the entire construction sector, in hopes of achieving a European built environment designed, built and maintained by a successful knowledge and demand-driven sector, providing a high quality of life and demonstrating a long-term responsibility to the environment.

A clear strategic set of directions can be established by a research

agenda that is split into three pillars. The first is meeting clients and user requirements by aiming for healthy, safe and accessible indoor environments, an efficient use of underground city space, and mobility and supply through efficient networks.

It also aims to reduce resource consumption, to create a sustainable transport and utilities network, a living cultural heritage and an improvement of safety and security. The ECTP will transform the construction sector by aiming for a new client-driven, knowledge-based construction process with ICT and automation, high added-value construction materials and attractive workplaces.

With the aim of improving its efficiency and the availability of resources for its further activity, the ECTP has set up an executive committee within the decision making body, the High Level Group, who have the task of monitoring the activities of the platform. Members of the High Level Group will be elected by members of the platform. The platform will be financed by a system of fees, with four different levels for companies, research organisations, SME's and associations.

ECTP is cooperating with other technology platforms linked to construction and energy aspects, such as the Steel Technology Platform, Hydrogen and Fuel Cells and Sustainable Chemistry. This collaboration has led to a common

proposal for a lead market pilot action on sustainable construction. The ECTP has also developed strong links with some ERA-NETs, specifically Erabuild and Eracobuild, on the construction and operation of buildings.

The European Construction Technology Platform published an implementation action plan in 2007, in order to develop the strategic research agenda which selects the most important research areas to be addressed over the next five years.

The plan focuses on technologies for accessible and stimulating indoor environments, innovative use of underground space, new technologies and high tech materials for efficient and clean building, and a sustainable management of transport and utilities networks. It also focuses on a living cultural heritage, improved safety and security and new integrated processes within the construction sector, and high added-value construction materials.

The platform has also adopted a proposal for a public-private partnership on energy efficient buildings, which follows the energy policy for Europe package and offers a joint research effort to ensure that the built environment contributes to the targets of 20% energy consumption reduction, 20 % use of renewable energy sources (RES) and 20% reduction in CO₂ emissions.



ECTP: Innovate Built Environment

By Luc Bourdeau, Secretary General of the ECTP

A European Forum Promoting Innovation in the Built Environment

The European Construction Technology Platform (ECTP) was set up in 2004 at the request of the European Commission and is today one of 38 European Technology Platforms (ETPs) - industry-led stakeholders recognised by the European Commission as key players in driving innovation, knowledge transfer and European competitiveness.

The ECTP association gathers around 180 member-organizations from the construction sector and others, and from the whole supply chain of the built environment. The built environment is a place of tightly interconnected private and public infrastructure. Its composition and dynamic is very complex, since it offers and is associated with a lot of various services which support our day-to-day life. The built environment serves a lot of industries and services (transport, energy, cities, etc.). It therefore impacts the performance of many sectors. The built environment is also our major living environment; this is the place (homes, offices, transport infrastructures, cultural places, etc.) where we spent more than 80% of our time. Its quality therefore directly impacts the quality of our life. Last but not least, paramount challenges such as energy, climate change, efficiency, safety and, more generally, sustainability have

become of the utmost importance and very often need to be tackled within an integrated approach.

The main mission of ECTP and its five committees is to develop new research, development and innovation strategies to improve competitiveness, meet societal needs and take up environmental challenges through an innovative built environment. ECTP mobilizes stakeholders to deliver on agreed priorities, share information across the EU, and facilitate industrial exploitation of research results. ECTP is an independent and self-financing entity. It conducts its activities in a transparent manner and is open to new members.

Energy Efficient Buildings Committee

Energy efficiency in buildings is a crucial challenge for Europe, since existing buildings are representing the highest amount of energy consumed in the EU (about 40%) and this sector is also the main contributor to greenhouse gas (GHG) emissions (about 36% of the EU's total CO₂ emissions).

Indeed, new buildings constructed today are very energy efficient thanks to new technologies and systems which can lead in practice to nearly zero energy buildings, or even to buildings which can produce more energy than they consume. However, addressing the refurbishment of

existing buildings (including historic ones) is critical in order to fulfil the decarbonisation goal of the European economy, if we consider that by 2050 more than half of the existing building stock will still be operational.

This is posing tough technical challenges requiring innovative approaches and solutions, which are addressed as core objectives of the EeB cPPP, supported by EC with €600M funding within H2020.

Infrastructure and Mobility Committee

Green, smart and cost-effective infrastructure should be developed in order to further increase the performance of multimodal transport. How to reduce the environmental footprint of infrastructure, how to improve its resilience while maintaining its overall performance, how infrastructure may contribute to alternatively fuelled vehicles and how to promote the implementation of infrastructure, are some of the issues to be solved. Continuous, efficient and resilient quality of service will indeed make infrastructure a major contributor to improving the transport system, but its impact on the environment and on energy consumption should be reconsidered and adequate measures should be implemented to reduce the negatives and increase a positive contribution.



Kickstart – an initiative paving the way to enhanced technology transfer and mass-market development for innovative materials, components, systems and processes supporting the pan-European generalization of advanced multimodal infrastructures – is the long-term ambition of the Committee.

Materials and Sustainability Committee

Materials constitute the basic element to construct the various components of the built environment. Durability, environmental impact, comfort of living are some of the keywords considered by the Committee to tackle the sustainability issues related to materials.

Material durability is a key element to improve the performance and the life span of buildings and infrastructures. Durable materials contribute to increasing energy and resource efficiency, and reducing GHG emissions and overall life time costs.

Improvements in raw material and energy consumption, utilization of construction and demolition waste and other waste offer a huge potential to minimize the environmental burden of the construction industry.

Lastly, health, hygiene and aesthetics are paramount regarding the future generations' requirements for the

buildings and structures we live and work in. The knowledge on these issues is insufficient and research and innovation are needed in order to fulfil these requirements.

Heritage and Regeneration Committee

Built cultural heritage has a high societal importance. Quality of life in cities, and the feeling of social safety and cultural identity are closely related with the presence of heritage buildings. It improves welfare and wellbeing of people in urban areas. Built monuments constitute an important value in the context of urban development and constitute an important source of economic revenues through cultural tourism and creative economy.

The Committee promotes new sustainable and preventive strategies, concepts, methodologies and techniques for the conservation and restoration of cultural heritage, in order to promote economic development and improve the quality of life of citizens and the attractiveness of Europe – particularly its cities, buildings, monuments and landscapes.

It follows a knowledge-based and interdisciplinary approach for the sustainable protection of cultural heritage underpinned by the principles of safety, authenticity and compatibility to ensure minimal

intervention. It also includes the integration of cultural heritage into the natural and urban environment to tackle a common management of the whole environment.

Active Ageing and Design Committee

The demographic shift is a matter of global concern that needs little introduction. The number of people aged 60 years or older will rise from 900 million to two billion between 2015 and 2050 (moving from 12% to 22% of the total global population). The built environment, enriched with new opportunities of digital innovation, matters crucially in enabling new forms of support and creative expression for all ages.

The Committee takes a fresh look at innovation and scale of smarter new built and retro-fit built environments. It sets up a research, innovation and valorisation agenda, in close alignment with the European Reference Framework for Age-friendly Housing, to help unlock the social and economic potential of providing inclusive smart built environments across the Union. It currently supports the EC's Roadshow for Age-friendly Housing with expertise, dissemination and facilitation activities, including the co-hosting of two national innovation workshops about age-friendly housing.



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European Commission prepares for digital

THE European Commission has officially unveiled plans to assist the industry, SMEs, researchers and public authorities across the continent in their uptake of innovative new technologies.

Envisioned as a significant first step towards the creation of a Digital Single Market, the newly-announced measures will support and link national initiatives for the digitisation of the industry, while boosting investment and opportunity through strategic partnerships and networks.

The Commission will also seek to hasten the development of common standards across priority areas, such as 5G communication networks or cybersecurity, and modernise public services.

Furthermore, a European cloud - the Commission's first objective - will provide Europe's 1.7 million researchers and 70 million science and technology professionals with a virtual environment to store, manage, and reuse large amounts of data.

Andrus Ansip, Vice-President for the Digital Single Market, explained the Commission's rationale: "The industrial revolution of our time is digital. We need the right scale for technologies

such as cloud computing, data-driven science and the Internet of Things to reach their full potential. As companies aim to scale up across the single market, public e-services should also meet today's needs: be digital, open and cross-border by design. The EU is the right scale for the digital times."

Emphasising the overriding importance of digitisation, Günther H Oettinger - Commissioner for the Digital Economy and Society - said: "Europe has a very competitive industrial base and is a global leader in important sectors. But Europe will only be able to maintain its leading role if the digitisation of its industry is successful and reached fast. Our proposals aim to ensure that this happens. It requires a joint effort across Europe to attract the investments we need for growth in the digital economy."

Elżbieta Bieńkowska - Commissioner for Internal Market, Industry, Entrepreneurship and SMEs - concluded: "The digital economy merges with the real economy. We need leadership and investment in digital technologies in areas like advanced manufacturing, smart energy, automated driving or e-health."

Though much of the economy has embraced digital technology and process, European industry - regardless of sector or size - is being urged to pursue digital opportunities to their fullest so as to remain globally competitive. Traditional sectors - such as construction, agro-food, textiles or steel - and SMEs are seen to be particularly at risk of falling behind however.

In the Digital Single Market, billions of connected devices will be able to communicate safely and seamlessly, irrespective of manufacturer, technical specification or country of origin. The Commission's recent plans are vital as they will help to speed up the necessary standard setting process.

It is estimated that the digitisation of products and services will generate more than £110Bn of revenue per annum over the next five years. While a number of EU member states have already launched strategies to support this transition, the Commission has also stressed that a comprehensive, joined-up approach at European level is needed to avoid market fragmentation and reap the benefits of such digital innovations as the Internet of Things and Building Information Modelling.

EEA emphasise importance of the floodplain

THE European Environment Agency (EEA) has authored an innovative new report which investigates flood patterns over a 30 year period and emphasises the importance of floodplains for effective flood protection, water management and nature conservation.

Entitled 'Flood risks and environmental vulnerability - Exploring the synergies between floodplain restoration, water policies and thematic policies' - the EEA's analysis builds upon information previously published in the European flood impact database, which documents flood incidents between 1980 and 2010.

In total, 37 European countries registered 3,563 floods during this period. This figure peaked in 2010 with 321 separate incidents reported that year. Worryingly, this upward trend of extreme flooding is likely to continue.

The EEA expects annual flood losses to rise fivefold by 2050 and an astonishing 17-fold by 2080. In their analysis, the Agency attributes the majority (70% - 90%) of this increase to socio-economic development as the economic value of assets on the floodplain grows. Climate change accounts for the remaining 10% - 30%.

For the uninitiated, floodplains sit beside riverbeds. In times of high discharge, these expanses are able to accommodate excess flow from neighbouring watercourses. In doing so, floodplains act as a much-needed buffer, retaining water and safeguarding the economies and communities downstream from the threat of flood damage.

Natural floodplains are under increasing pressure from urbanisation, infrastructure investment and agricultural development however. Indeed, up to 90% of Europe's natural floodplains have been lost, meaning that they can no longer reduce flood risk or function as biodiverse ecosystems.

The repercussions of this are widespread. In Italy alone, 6.7 million people - 11% of the population - live on former floodplains that are still prone to flooding.

The EEA has therefore proposed the restoration of these ecosystems, through the Natura 2000 networks for instance. Where 'hard' flood defences, such as dykes, are necessary - those measures should also be complemented by a long-term nature-based solution,

such as a restored floodplain.

Flood risk management is situational however and, as the report notes, any strategies should be tailored to suit the specifics of the location so that there are no negative consequences downstream.

The report also underscores the benefit of an integrated approach to flood risk management. According to the EEA, the coordinated implementation of EU legislation - such as the Water Framework Directive, the Birds and Habitats Directives, and the Floods Directive - through coherent measures and actions, would greatly enhance the effectiveness of each policy.

By 'greening the grey' the EEA hopes to nurture a network of green infrastructure, able to alleviate flood risk while also providing flora and fauna with natural habitats and ecosystems.

'Flood risks and environmental vulnerability - Exploring the synergies between floodplain restoration, water policies and thematic policies' can be viewed [here](#).





AquaFence Flood Protection Barrier Technology

AquaFence is a certified (FM approval) and tested US Army Corp of Engineers tested flood protection barrier that can be:

- Rapidly deployed when there is a recognized danger of flooding.
- Easily dismantled and stored ready for the next flood.
- Deployed 100 times faster than sandbags and tested to be significantly more effective.
- There is no special skill or heavy machinery required.
- AquaFence comes in protection heights ranging from 4' to 8'.

Invented and patented in Norway in 1999, the mission at AquaFence has always been to offer state of the art flood barriers that can be available in an emergency situation, but out of sight at all other times.

The AquaFence is engineered so that the application of floodwater pressure consolidates and strengthens the system rather than weakening it.

Originally developed in cooperation with multiple international flood protection programs as well as global insurance companies, AquaFence is now protecting municipalities, transportation hubs, industrial buildings and significant real estate worldwide.

THE SYSTEMS

The **Perimeter Flood Barrier** system is comprised of multiple panels that connect to form a wall around a structure or area in need of protection. Each panel is individually stabilized on its own, the system is designed to cover properties that range in size from a single plot of land, to an entire city.

The **Integrated Flood Shield** system is comprised of a customized solution that uses the core AquaFence technology to integrate into the building and hardscape. The panels are adapted to protect specific openings or areas of exposure on a building and designed to be put into place when a storm is approaching. Existing building integration with no structural alterations.

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Sustainable Cities and Communities

THE European Innovation Partnership on Smart Cities and Communities (EIP-SCC) aims to improve urban life through more sustainable integrated solutions by bringing together cities, industry and citizens.

The partnership follows the Smart Cities and Communities Initiative which was launched in 2011, which covered energy, with a budget of €81M. This budget has since been extended to €365M and includes the transport and ICT sector, following the launch of the Partnership in 2012.

The EIP-SCC combines Information Communication Technologies (ICT), energy management and transport management, to research and introduce innovative solutions to challenges facing European cities today in regards to the environment, society and health.

The solutions are aimed at contributing to the EU's 20/20/20 climate action goals, which helps to reduce high energy consumption, greenhouse gas emissions, bad air quality and congestion on roads. The European Innovation Partnership for Smart Cities and Communities

includes the High Level Group, which consists of high level representatives from the industry, research and cities and is supported by its Sherpa Group, and the Smart Cities Stakeholder platform. High level members are supported by an associate from their company/organisation. The Sherpa Group is formed from these associates and a set of additional associated members outside of the High Level Group.

Together, the partnerships are responsible for the Strategic Implementation Plan (SIP), which helps decide how concepts promoting smart cities are put into practise. It also considers how in the future the European Commission can support these measures during the next Research Framework Programme – Horizon 2020.

The Smart Cities Stakeholder Platform is a tool which is used for sharing knowledge of Smart Cities and Communities by collecting and analysing data from stakeholders in order to give advice to the High Level Group - which is then fed into the Strategic Implementation Plan - and also provides detailed feedback to

stakeholders who can use it to create their own activities and projects.

The term Lighthouse Projects is used to describe the funding of large scale projects, which can be funded through a number of different channels, including Horizon 2020 and structural funds. The projects come from policy recommendations in the Strategic Implementation Plan, which are specifically designed to raise awareness of the Partnership and give it increased visibility, with impact and replicability as key features.

Other projects and activities are put in place by stakeholders and members of the Partnership, guided by the platform's feedback and funded by private, local and regional funds coming from cities, regions, banks etc. They make up a significant and crucial contribution in working towards the smart urban systems of tomorrow.

Boundary conditions for both types of projects are set by the Strategic Implementation Plan by triggering regulatory issues, standards, business models and public procurement schemes.



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