“Challenges and needs for the actors in the construction industries”

The perspectives of a precast company

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**TesiSystem** is a precast company of the **Grigolin Group** sited in nord-east of Italy with 3 production sites with more then 160,000m² production, fully dedicated to various products such as **panels, pillars, truss, shingles of different dimensions**

**TesiSystem** has 60 employee and around 50 million euro turnover (2018)

Reference market: **Italy**

Average daily concrete capacity production: +/- **600m³**
Starting point

MARKET MUST
• Flexibility in the operations
• Fast production, delivery and installation process
• «Cheap» prices
• High performances, always

INNOVATION IN THE PAST
• Investment in available technologies/equipments
  • low commitment to test new materials
• Low commitment to sustainability, just selling
  • «price centric» production aproach

NTS TURNOVER

<table>
<thead>
<tr>
<th>Turnover IT (M€)</th>
<th>Turnover EU (M€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>+120%</td>
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The projects have received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement Nº760839, 760824 and 761072
Market trends

MARKET DEMANDS

- **Reducing construction costs and contributing to more affordable housing**
  
  **Our challenge:** buildings costs are critical for billions of people worldwide. We must offer affordable and cost-effective building solutions to our customers and end-users.

- **Improving energy efficiency of buildings**
  
  **Our challenge:** providing highly efficient insulating solutions for builders.

- **Improving aesthetics & strength to create unique structures**
  
  **Our challenge:** meeting the needs of architects and engineers by providing a building solution with qualities of resistance to compression, ductility, longevity, eco-efficiency, insulation and aesthetics.

- **Minimizing our environmental footprint through process innovation**
  
  **Our challenge:** cooperate in reducing the CO₂ emissions resulting from cement manufacturing to minimize our impact on climate change.
What we are doing to answer to market:

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>TOPIC</th>
<th>Focus</th>
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<tbody>
<tr>
<td>ECO-BINDER (GA 637138)</td>
<td>The main objective is to replace Ordinary Portland Cement and OPC based concrete (products) with new products based on the innovative low-CO2 binders. ECO-Binder aims to address the vast market for envelope retrofitting. Reduction of 40% of the casting time.</td>
<td>Reduction of CO2 emission in a cement production</td>
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<tr>
<td>EeB-01-2014:</td>
<td>--&gt;VIDEO EURONEWS</td>
<td></td>
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<tr>
<td>VEEP (GA 72358)</td>
<td>New technologies and strategies for the development of pre-fabricated elements through the reuse and recycling of construction materials and structures. Developments of new lightweight panel made by 75% CDW materials.</td>
<td>Valorization of CDW materials in a panel production</td>
</tr>
<tr>
<td>ENDURCRETE (GA 760639)</td>
<td>The project aims to develop a new cost-effective sustainable reinforced concrete for long lasting and added value applications. The final result will be an high resistant panel for application in aggressive enviroments</td>
<td>Reduction of CO2 emission in panel production</td>
</tr>
<tr>
<td>H2020</td>
<td></td>
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</tr>
<tr>
<td>LIGHTCOCE (GA 814632)</td>
<td>Building an Ecosystem for the up-scaling of lightweight multi-functional concrete and ceramic materials and structures. The final product will be a panel with self sensing materials for the monitoring of the product life cycle</td>
<td>New product with self sensing material</td>
</tr>
<tr>
<td>H2020</td>
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How the innovation impacted on TesiSystem

SKILLS

- Knowledge of binder performance in application and new concrete mix design
- Knowledge of use of new insulation materials
- Knowledge of production process for the panels
- New finishing multifunctional material
- New methods to characterize the innovative concrete/binders
- Production process optimization

OPPORTUNITIES

- Possibility to demonstrate the concepts in different part of EU supported by official monitoring data
- Improve the social acceptance of concrete/precast products and its sustainability in the life cycle
- Introduce circular economy and reuse concepts in product design
- Improve workers skills and their commitment on daily job
- Access to international consortium and TT logics
- Access to business opportunity abroad
- Better understanding of “who is doing what” across Europe
- Visibility and marketing opportunities
Needs

**Work together for COST-EFFECTIVE SOLUTIONS not just SOLUTIONS**

- Improve the cooperation along the supply chain
- Sustainability in the production process and in new business models
- Requirements and standards
- Access to further source of finance/incentives
- Enhance the cooperation with scientific partners

Precast market is a very competitive market, innovation in new products should consider the final cost of the solution as key point to innovate

"*United we stand, divided we fall*“ - sensibilization

Improve sustainability strategy for the future according with other companies

We need to work more together -> standards review in order to introduce new ranges and tolerances -> new products

Innovation costs!

Technology transfer is the way to innovate easily

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Tesi System srl
Future steps and challenges

- Sustainability isn’t a cost, but an opportunity!
  - Develop new load-bearing panels for new residential concept; (Eurocode 2 EN 1992)
  - Think to Geometry and weight reduction of the structures though the creation of hiperstatic joints (Eurocode 2 EN 1992)
  - Development of lightweight panels with high insulation properties, improved durability, service life, features
  - Adopt regularly LCA approach for the recycling of the materials and the use of sustainable resources (EN ISO 14040 - EN ISO 14044)
  - Investigate offsite manufacturing: intelligence platform for the coordination of the precast manufacturing process and on site actions (BIM/Digital Twin along supply chain)
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Thank you!

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