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Acronym and Project Title | R2UTechnologies | modular system

Lead Entity | DOMINGOS DA SILVA TEIXEIRA S.A.

Description | The Innovation Pact “R2UTechnologies | modular system” consists of the development and industrialization of a new disruptive concept of modular construction. This concept will be developed in order to be able to respond to the growing needs of the market and the new challenges of the sector, particularly in terms of sustainability and environmental protection. As a result, the Pact will empower the business sector, the academic sector and HR themselves with the means, knowledge and key skills to create, on national soil, a cluster for the global supply of the modular construction sector, thus envisaging the launch of 18 PPS with a tradable and internationalize profile at the end of the project.

Start Date | 01-01-2022

End Date | 31-12-2025

Investment | 177 414 466,61 €

Goals, Activities and Expected Results

The R2U Technologies is structured into **7 Work Packages**, each focused on a different segment of the construction sector's value chain, from the design phase to the operation and maintenance of the building throughout its life cycle. The WPs aim to respond to the current and future needs of the sector, with the purpose of creating a synergistic network between partners and relevant players, minimizing dependence on external markets.

The **WP1 “Principles of Modular Construction”** aims to explore different technical engineering and design concepts associated with modular construction for the development of sustainable, efficient, intelligent, and high-performance modular construction systems, based on a customizable and scalable matrix, in accordance with the requirements and challenges of different functional programs. The knowledge generated in this WP will be crucial to guide the designs and developments to be carried out in the remaining WPs and to validate the respective results.

The **WP2 “Materials”** aims to promote in-depth and multidisciplinary research for the development of new materials for modular construction, enabling the creation of high-performance solutions that respect the constraints and demands of this industry. Based on these results, which are expected to be innovative and have a high degree of technological maturity, the respective industrialization processes will be carried out for its manufacturing and internationalization processes to promote its introduction into the world market.

The **WP3 “Products”** focuses on the exploration and development of finished products relating to different components or specialized areas of the construction process, namely framing systems, variable geometry panels, modular facade systems, sanitary solutions, air conditioning systems, walls, and ceilings, prefabricated concrete structures and energy production systems. Based on these results, their respective industrialization processes will be carried out for their

manufacturing and internationalization processes to promote their introduction into the world market.

The **WP4 “Industrial Equipment”** aims to operationalize the manufacturing and assembly process of final modular construction solutions, through the creation of new specialized and integrated industrial units, equipped with advanced technology and autonomous systems, in line with the paradigm of Industry 4.0.

The **WP5 “Digital, Collaborative Services and IoT Systems”** aims to create a digital collaborative work environment, capable of gathering and sharing critical information between different actors and between different stages of the production process, facilitating the existence of greater vertical alignment in the supply chain. value and the development of construction solutions that are better suited to market needs. An additional goal is to create and verticalize IoT systems and respective digital services to create modular buildings with customizable intelligent monitoring and control capabilities.

The **WP6 “Training”** comprises a diverse set of actions that aim to promote the training and training of human resources involved in disciplinary themes involving modular construction, aimed at the entire national construction industry, creating conditions for a change in the specialization profile of the industry. Additionally, the aim is to develop a multidisciplinary curricular plan for different qualification levels. It is also intended to promote the creation of a new Skills Center, dedicated to advanced training of new skills in critical areas.

The **WP7 “Coordination and Dissemination”** aims to ensure the communication, promotion, dissemination and demonstration of results of the R2U Technologies project. It also aims at global technical, administrative, and financial management.

The R2U Technologies Pact will deliver **18 PPS** technologically innovative with high added value, with a strong commercialization and internationalization profile, namely:

- PPS1 - High performance bathroom solutions for modular construction
- PPS2 - Innovative wall coverings for modular construction application
- PPS3 - High performance prefabricated structural systems for modular construction
- PPS4 - High performance ecological concretes and cements
- PPS5 - High performance glass surfaces
- PPS6 - Modular Facade Systems
- PPS7 - Minimal Window Frames
- PPS8 - Variable Geometry Panels
- PPS9 - Facades with laser welding
- PPS10 - Wall and Ceiling Solutions
- PPS11 - High performance AVAC unit for modular construction
- PPS12 - Flexible BIPV modules for modular construction application
- PPS13 - Customizable technologically advanced modular building units
- PPS14 – Digital energy management systems
- PPS15 - 2D Hybrid modular elements

- PPS16 - Innovative digital services, applications, and systems for all phases of modular construction
- PPS17 - Digital Twin
- PPS18 - Multidisciplinary curriculum plan for specialization in Modular Construction and related fields

Beneficiary entities | Eligible Investment (Beneficiary)

DOMINGOS DA SILVA TEIXEIRA S.A. 43.163.378,93 €
VIEIRA & LOPES LDA 1.812.987,56 €
ECOSTEEL, S.A 18.758.948,27 €
UNIVERSIDADE DO PORTO 2.227.904,07 €
AMORIM CORK INSULATION, S.A. 215.402,33 €
ARCH, S.A 896.902,50 €
CENTITVC - CENTRO DE NANOTECNOLOGIA E MATERIAIS TÉCNICOS, FUNCIONAIS E INTELIGENTES 4.176.873,03 €
CIÊNCIA VIVA – ANCCT 940.510,11 €
INEGI - INSTITUTO DE CIÊNCIA E INOVAÇÃO EM ENGENHARIA MECÂNICA E ENGENHARIA INDUSTRIAL 724.363,74 €
LABORATÓRIO IBÉRICO INTERNACIONAL DE NANOTECNOLOGIA (LIN) 8.679.558,37 €
ITECONS - INSTITUTO DE INVESTIGAÇÃO E DESENVOLVIMENTO TECNOLÓGICO PARA A CONSTRUÇÃO, ENERGIA, AMBIENTE E SUSTENTABILIDADE 2.076.322,51 €
PORTILAME - ENGENHARIA E MADEIRA LDA 8.068.528,49 €
RANGEL INTERNACIONAL - AÉREA E MARÍTIMA, S.A 360.000,00 €
RANGEL INVEST - INVESTIMENTOS LOGISTICOS, S.A. 1.309.983,00 €
TMG - TECIDOS PLASTIFICADOS E OUTROS REVESTIMENTOS PARA A INDÚSTRIA AUTOMÓVEL, S.A 5.131.017,38 €
VIGOBLOCO - PRÉ FABRICADOS S.A 4.476.763,72 €
BUILDING INFORMATION MODELING +, S.A. 582.856,18 €
BYSTEEL, S.A. 6.397.703,28 €
BYSTEEL FS, S.A. 18.680.277,04 €
UNIVERSIDADE NOVA DE LISBOA 1.831.727,61 €
CITEVE - CENTRO TECNOLÓGICO DAS INDÚSTRIAS TÊXTIL E DO VESTUÁRIO DE PORTUGAL 531.062,50 €
DST SOLAR, S.A. 520.724,63 €
DTE, INSTALAÇÕES ESPECIAIS, S.A. 2.922.281,23 €

ASSOCIAÇÃO LABORATÓRIO COLABORATIVO EM TRANSFORMAÇÃO DIGITAL – DTx 6.057.360,00 €
ASSOCIAÇÃO FIBRENAMICS - INSTITUTO DE INOVAÇÃO EM MATERIAIS FIBROSOS E COMPÓSITOS 1.016.594,64 €
FIBRAUTO - FABRICO DE OBJECTOS EM POLYESTER LDA 2.197.992,29 €
INSTITUTO ELETROTÉCNICO PORTUGUÊS 515.834,96 €
INNOVATION POINT - INVESTIGAÇÃO E DESENVOLVIMENTO S.A. 2.122.275,50 €
INOVA+ - INNOVATION SERVICES, S.A. 585.000,00 €
LABORATÓRIO NACIONAL DE ENGENHARIA CIVIL, I.P. 1.670.302,10 €
LNEG - LABORATÓRIO NACIONAL DE ENERGIA E GEOLOGIA I.P. 1.805.615,48 €
METALURGICA CENTRAL DA TROFA LDA 1.347.626,00 €
UNIVERSIDADE DO MINHO 3.822.598,32€
INSTITUTO SUPERIOR TECNICO 2.892.627,03 €
DVM GLOBAL, S.A. 2.499.530,26 €
CONFORMETAL - INDÚSTRIA TRANSFORMADORA DE CHAPAS LDA 5.924.256,00 €
CIMPOR - INDÚSTRIA DE CIMENTOS, S.A. 802,857,82 €
UNIVERSIDADE DE COIMBRA 3.326.301,82 €
DISPLAX, S.A. 543.856,25 €
ABER HYDRAULICS, S.A. 741.098,98 €
FARIA & MOROUÇO, S.A. 558.860,83 €
FAVORITANSWER CONSULTORIA EM ENGENHARIA LDA 715.123,56 €
SARKKIS - ROBOTICS, LDA 763.751,89 €
ENGENHARIA JOSE FIGUEIRA, LDA 195.229,60 €
VLB TEC, UNIPessoal LDA 942.564,09 €
PIEP - PÓLO DE INOVAÇÃO EM ENGENHARIA DE POLÍMEROS 1.694.610,25 €
IDMEC - INSTITUTO DE ENGENHARIA MECANICA 186.522,56 €