

Acronym and Project Title | NGS - New Generation Storage

Lead Entity | DST SOLAR, S.A

Description | The New Generation Storage (NGS) Innovation Pact is completely aligned with the European Union's energy transition strategy until 2040, along with the challenge for the complete electrification of mobility by 2035. Based on a model structured in 8 Work Packages that cover the entire value chain of component production, battery packs and recycling, NGS proposes to add value to each stage of the process, culminating in a common goal: the creation of a new technological ecosystem in the area of batteries that will make the national industry stand out in the global market. Through the cooperation of 47, the aim is to structurally transform the national productive fabric, creating the necessary conditions - at the technological level and human resources - for an industrial ecosystem capable of mass production of innovative technologies, and a complete value chain that allows the management of end-of-life of world reference.

Start Date | 01-01-2022

End Date | 30-06-2026

Investment | 168 140 860,85 €

Goals, Activities and Expected Results

NGS is composed of complementary technological Work Packages (WP), with the capacity to autonomously generate Products, Processes, or Services (PPS) for the international market, incorporating innovative technologies that can increase the value over the life of the project. Individually, each WP can operate independently in a specific area of the value chain. However, together they interconnect and build a meaningful circular chain.

The **WP1 “Advanced Refining and Valorization”** aims to install a large refinery and actions related to sustainable refining and valorization processes, aiming to implement an innovative and improved industrial line for lithium processing, through sustainable technology based on membrane electrolysis.

The **WP2 “Cells, Modules and Components”** aims at the installation and operation of cell/module manufacturing lines and the development of new and safer and more sustainable electrodes, ligands, electrolytes and separators, in close connection with the WP1 and the WP5.

The **WP3 “Battery Assembly”** foresees the installation of three productive assembly lines for stationary battery modules for the automotive industry; It also provides for the integration of cabling, connectors and casings, as well as energy management systems and control electronics, modeling and development of the proposed product.

The **WP4 “Integration and Application”** includes five pilot lines related to: the connection of batteries to the grid for power grid management; the use of batteries for different purposes - residential, commercial and industrial; battery integration into fast charging stations; battery

integration in vehicles. These pilot lines will allow the definition of technology and knowledge that will be applied to the use of batteries in a wide range of situations.

The **WP5 “Recycling and Second Life”** includes lines of action related to the recycling of battery materials and components, battery disassembly and second life batteries. Furthermore, recycling the battery elements will enable the WP1 to be powered, creating a fully closed circular design.

The **WP6 “Advanced Training and Courses”** is transversal to the entire NGS Innovation Pact and aims to train human resources in companies involved in the NGS, as well as provide highly specialized training for future master's and doctoral students, promoting technical and university qualifications in companies.

The **WP7 “Technological Platform and Entrepreneurship”** is also transversal to the entire Innovation Pact and includes lines of action with the objective of developing and implementing a Technological Platform, which will support the national industry to position itself as an important international actor in the sector of batteries. The main objective of this Platform is to support market innovation (from laboratory to factory) for the full development and market adoption of technological solutions, supporting them in all necessary stages of development along the value chain.

The **WP8 “Dissemination and Management”** is structural for the entire project and aims to communicate and disseminate the global objectives and results of the NGS, intending to widely promote this Pact among sector stakeholders (scientific community and market). It also includes the technical management of the NGS Pact.

The NGS pact will deliver **21 PPS**, namely:

PPS1 - Sustainable Technology for Lithium Refinement

PPS2 - Predictive Machine Learning based Platform

PPS3 - New recovery process to value HCl (by-product) for LiCl production

PPS4 - New processes for pilot-production of novel-types of batteries namely, flexible battery cells, thin-film-based solid-state batteries, and structural batteries

PPS5 - New service for research testing and validation of the novel cathode solution developed

PPS6 - New cylindrical and prismatic cell battery modules

PPS7 - New processes for battery testing and certification

PPS8 - New fast charging battery pack technology

PPS9 - Modular Energy Management System

PPS10 - New sustainable processes for recycling of Li-ion batteries

PPS11 - New industrial processes and services for 2nd life applications

PPS12 - New training modules for the battery sector

PPS13 - NGS Platform and Network

PPS14 – Digital energy management systems

PPS15 – Technological validation of an integrated electrochemical process for the production of LiOH monohydrate (LHM) from recycled lithium carbonate sources

PPS16 – Validation of the reduction of greenhouse gas emissions and resource management

PPS17 – Mitigation strategy for technological, environmental, and investment risks for scale-up purposes

PPS18 – Energy management systems on the edge

PPS19 – Coaxial structural batteries with innovative photosensitive coating to maximize solar harvesting

PPS20 – New strategies for post-lithium battery cell materials and architectures

PPS21 – New safe storage facilities and regenerative deep discharge process to obtain high-purity products from end-of-life LiBs**

Beneficiary entities | Eligible Investment (Beneficiary)

DST SOLAR, S.A.	3 138 582,25
ADDVOLT, S.A.	2 344 395,58
BONDALTI CHEMICALS, S.A.	1 737 482,73
UNIVERSIDADE DO MINHO	2 983 139,19
ATEC - ASSOCIAÇÃO DE FORMAÇÃO PARA A INDÚSTRIA	509 350,00
BETA-I COLLABORATIVE INNOVATION, LDA	542 750,00
CENTITVC - CENTRO DE NANOTECNOLOGIA E MATERIAIS TECNICOS FUNCIONAIS E INTELIGENTES	9 580 735,43
COOPERATIVA ELÉCTRICA DO VALE D' ESTE, CRL	413 811,00
CLEANWATTS DIGITAL, S.A.	4 118 166,83
DOMINGOS DA SILVA TEIXEIRA S.A.	757 063,66
ASSOCIAÇÃO LABORATÓRIO COLABORATIVO EM TRANSFORMAÇÃO DIGITAL - DTX	2 227 750,00
EDMTECH, LDA	8 291 640,00
ENFORCE - ENGENHARIA DA ENERGIA S.A.	2 855 159,33
UNIVERSIDADE NOVA DE LISBOA	3 369 293,24
UNIVERSIDADE DO PORTO	2 450 052,12
GLNPLAST, S.A.	1 209 941,12
INNOVATION POINT - INVESTIGAÇÃO E DESENVOLVIMENTO S.A.	1 489 463,35
INSTITUTO ELECTROTÉCNICO PORTUGUÊS	5 965 031,29
INEGI - INSTITUTO DE CIÊNCIA E INOVAÇÃO EM ENGENHARIA MECÂNICA E ENGENHARIA INDUSTRIAL	3 131 500,00
INESC MICROSISTEMAS E NANOTECNOLOGIAS - INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES PARA OS MICROSISTEMAS E AS NANOTECNOLOGIAS	831 250,00
INESC TEC - INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES, TECNOLOGIA E CIÊNCIA	1 509 325,05
LABORATÓRIO IBÉRICO INTERNACIONAL DE NANOTECNOLOGIA (LIN)	14 508 043,62
INOVA+ - INNOVATION SERVICES, S.A.	726 342,13
INSTITUTO SUPERIOR DE ENGENHARIA DO PORTO	3 086 841,59
IST-ID, ASSOCIAÇÃO DO INSTITUTO SUPERIOR TÉCNICO PARA A INVESTIGAÇÃO E O DESENVOLVIMENTO	1 324 925,00
ITECONS - INSTITUTO DE INVESTIGAÇÃO E DESENVOLVIMENTO TECNOLÓGICO PARA A CONSTRUÇÃO, ENERGIA, AMBIENTE E SUSTENTABILIDADE	525 043,75
ENERGYKEME, LDA	2 445 297,50
LNEG - LABORATÓRIO NACIONAL DE ENERGIA E GEOLOGIA I.P.	928 282,04
LUX OPTIMEYES ENERGY, LDA	8 161 491,74
MANUEL DA CONCEIÇÃO GRAÇA, LIMITADA	308 907,50
PACT - PARQUE DO ALENTEJO DE CIÊNCIA E TECNOLOGIA, S.A.	2 768 647,50
PALMIRESÍDUOS - COMBUSTÍVEIS E RESÍDUOS LDA	3 539 046,19
PIEP ASSOCIAÇÃO - PÓLO DE INOVAÇÃO EM ENGENHARIA DE POLIMEROS	683 216,81
APA - ADMINISTRAÇÃO DO PORTO DE AVEIRO, S.A.	111 621,80
PRIO ENERGY, S.A.	192 279,62
CENTRO DE INVESTIGAÇÃO EM ENERGIA REN - STATE GRID, S.A.	562 476,89

UNIVERSIDADE DE AVEIRO	2 154 082,86
UNIVERSIDADE DE ÉVORA	395 682,20
VALORCAR - SOCIEDADE DE GESTÃO DE VEÍCULOS EM FIM DE VIDA, UNIPessoal LDA	4 696,92
VASCO DA GAMA COLAB - ENERGY STORAGE - ASSOCIAÇÃO	1 819 662,46
VISTA ALEGRE ATLANTIS, S.A.	396 250
VOLTALIA PORTUGAL, S.A.	2 587 881,24
WATT-IS, S.A.	494 703,75
BATTERY CLUSTER - BAT, ASSOCIAÇÃO PORTUGUESA	547 500
CENTRO TECNOLÓGICO DA CERÂMICA E DO VIDRO(CTCV)	219 187,5
B AGAIN, S.A.	7 786 250,61
ISQ&CTAG AUTOMOTIVE TECHNOLOGIES, S.A.	1 342 250
LIFTHIUM ENERGY, S.A.	51 064 367,46