



**Research & Innovation Projects relevant to
the Circular Economy Strategy
CALLS 2016 - 2017**

HORIZON 2020

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PREFACE

The European Commission has launched an EU action plan for the Circular Economy¹ which aims to support the transition towards an economy in which valuable materials, products and resources are maintained as long as possible while reducing the generation of waste.

Knowledge, innovation and investments are an essential part of the systemic changes needed for the transition to a more circular economy. In that sense, the Horizon 2020 work programme 2016-2017 included a targeted initiative "Industry 2020 in the circular economy" supporting the objectives of the circular economy and contributing to fostering the industrial competitiveness of the EU. Many other fields of activity within the Horizon 2020 work programme 2016-2017, such as bioeconomy, resource and energy efficiency or SMEs dedicated programmes, are also very relevant to the circular economy action plan.

The objective of the present report is to provide a snapshot of the numerous projects resulting from the calls 2016-2017 that are contributing to the circular economy strategy. Without aiming to be exhaustive or exclusive, the listed projects represent a good sample of actions financed by the Horizon 2020 programme in the different stages of a circular economy (production, consumption and waste). The spectrum of priorities contemplated by the selected projects are very diverse and address more sustainable production in all kind of industrial processes, new bio-based and biodegradable products, substitution or recovery of raw materials, conversion of CO₂, packaging, plastics, etc.

The 156 selected projects are resulting from the calls for proposals² of 2016-2017 in the Horizon 2020 priorities 'Industrial leadership' and 'Societal Challenges'. The present overview do not cover the projects funded by the 'Excellence' part of Horizon 2020. Altogether, the presented 156 projects are mobilising resources totalling around EUR 900 million, of which more than EUR 765 million as EU funding. The projects could last up to 5 years duration.

This presentation is organised per call identifier, year and topic number. Therefore, the projects are grouped in accordance to the objectives of the action and then sorted per acronym in alphabetic order. At the end of the document, there is a group of 25 relevant projects to the circular strategy that are receiving EUR 144 million from the Bio-Based Industries Joint Undertaking, as result of the BBI-JU calls launched in 2016 and 2017.

To **search specific information** on a project or topic, either you use a thematic search following the mentioned structure or a free text search across the entire document using the 'Find' command <Ctrl+F> and introducing free text keywords (e.g. pesticides, rare earth, automotive, ...).

This presentation is a living piece of information subject to changes and updates. We strongly recommend to only use the electronic version of this document (more portable, editable and searchable) and only print it if when really needed and justified.

More about the EU Circular Economy Strategy:

http://ec.europa.eu/environment/circular-economy/index_en.htm

More about research and innovation in the area:

<https://ec.europa.eu/programmes/horizon2020/en/h2020-sections>

Funding opportunities are published in the Participant Portal:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/index.html>

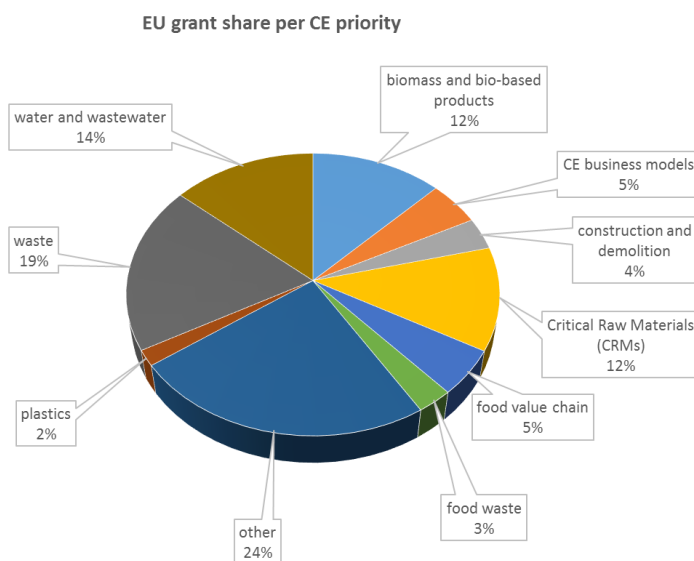
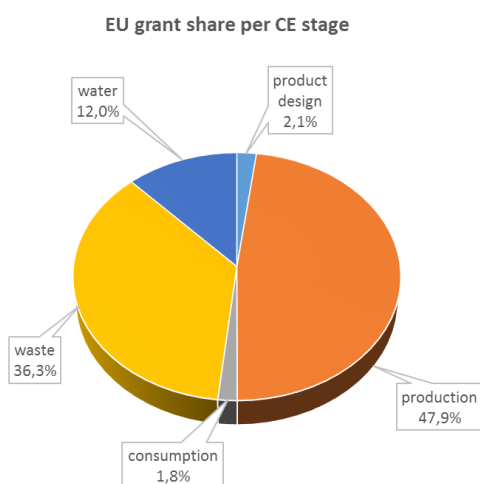
¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614>

² http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2016-17

SOME FACTS AND FIGURES

WP year	Projects (*)	EU grant (EUR)	Project Costs (EUR)
2016	78	366.408.104	423.599.362
2017	78	399.423.792	475.238.173
Total	156	765.831.896	898.837.535

(*) In addition, the Bio-Based Industries Joint Undertaking, which also receives funding from Horizon 2020, is supporting with EUR 144 million some 25 relevant projects to the Circular Economy Strategy, as result of the BBI-JU calls launched in 2016 and 2017.



Type of Action	Projects (*)	EU grant (EUR)	Project Costs (EUR)
CSA	17	19.213.411	19.244.866
ERA-NET-Cofund	1	4.708.842	14.269.217
IA	58	412.127.179	509.253.463
PCP	1	5.000.000	6.190.075
RIA	51	281.178.493	286.761.670
SME-2	28	43.603.971	63.118.244
Total	156	765.831.896	898.837.535

CSA: Coordination and support action

ERA-NET – Cofund: Actions supporting public-public partnerships

IA: Innovation Action

PCP: Pre-commercial procurement

RIA : Research and innovation action

SME-2 : SME instrument – phase 2

CE relevant projects - Horizon 2020 calls 2016-2017

WP Year	Topic code	Nr of projects	EU grant (EUR)
2016	BB-01-2016	1	4.983.872
	BB-06-2016	1	996.056
	BG-01-2016	2	19.734.341
	BIOTEC-02-2016	3	19.144.906
	CIRC-01-2016-2017	8	68.541.423
	CIRC-02-2016-2017	2	12.111.236
	CIRC-03-2016	1	1.742.748
	CIRC-04-2016	1	3.013.475
	CIRC-05-2016	1	2.996.689
	EEB-04-2016	4	18.095.529
	FTIPilot-01-2016	4	6.835.130
	ICT-26-2016	1	3.797.050
	ICT-29-2016	1	3.891.264
	INNOSUP-02-2016	2	160.727
	LCE-19-2016-2017	2	23.723.444
	NMBP-03-2016	4	18.543.259
	NMBP-36-2016	1	1.470.126
	RUR-04-2016	2	9.996.872
	SC5-11-2016	1	2.289.000
	SC5-12-2016	1	1.999.379
	SC5-13-2016-2017	6	40.750.282
	SC5-15-2016-2017	1	2.999.500
	SC5-24-2016	1	285.689
	SC5-25-2016	1	501.280
	SFS-19-2016-2017	1	4.708.842
	SMEInst-03-2016-2017	1	1.469.289
	SMEInst-07-2016-2017	2	2.932.360
	SMEInst-09-2016-2017	2	3.145.321
	SMEInst-10-2016-2017	1	1.470.315
	SMEInst-11-2016-2017	4	6.735.235
	SPIRE-01-2016	3	17.301.501
	SPIRE-02-2016	4	23.196.425
	SPIRE-03-2016	3	16.959.409
	SPIRE-04-2016	3	18.895.320
	SPIRE-05-2016	1	495.748
	SPIRE-06-2016	1	495.065
	TOTAL 2016	78	366.408.104

CE relevant projects - Horizon 2020 calls 2016-2017

WP Year	Topic code	Nr of projects	EU grant (EUR)
2017	BG-07-2017	2	11.652.901
	BIOTEC-05-2017	3	20.798.984
	BIOTEC-06-2017	1	4.362.048
	CIRC-01-2016-2017	7	46.451.069
	CIRC-02-2016-2017	3	29.185.210
	EEB-07-2017	1	5.993.466
	EUB-02-2017	1	1.478.090
	ICT-11-2017	1	1.824.683
	INNOSUP-01-2016-2017	1	4.999.394
	LCE-06-2017	1	3.998.026
	LCE-08-2016-2017	1	5.896.988
	LCE-20-2016-2017	2	20.002.253
	NMBP-05-2017	1	6.590.358
	NMBP-22-2017	3	11.698.688
	SC5-14-2016-2017	4	48.394.215
	SC5-15-2016-2017	2	3.229.630
	SC5-26-2017	1	5.000.000
	SFS-30-2017	2	13.849.846
	SFS-32-2017	2	11.881.975
	SFS-35-2017	3	16.207.237
	SFS-47-2017	1	4.884.494
	SFS-48-2017	1	6.999.999
	SMEInst-01-2016-2017	1	2.477.362
	SMEInst-02-2016-2017	2	2.470.959
	SMEInst-07-2016-2017	3	3.528.370
	SMEInst-08-2016-2017	1	1.146.846
	SMEInst-09-2016-2017	1	2.130.363
	SMEInst-10-2016-2017	1	974.541
	SMEInst-11-2016-2017	9	15.123.012
	SPIRE-07-2017	3	19.911.824
	SPIRE-08-2017	3	21.618.363
	SPIRE-09-2017	4	24.346.039
	SPIRE-10-2017	3	17.768.100
	SPIRE-11-2017	1	499.369
	SPIRE-12-2017	1	999.614
	SPIRE-13-2017	1	1.049.481
	TOTAL 2017	78	399.423.792

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727892	GENIALG	BG-01-2016	IA	GENetic diversity exploitation for Innovative macro-ALGal biorefinery	17
727874	SABANA	BG-01-2016	IA	Sustainable Algae Biorefinery for Agriculture aNd Aquaculture	18
774586	CLAIM	BG-07-2017	IA	Cleaning Litter by developing and Applying Innovative Methods in european seas	19
774499	GoJelly	BG-07-2017	IA	GoJelly - A gelatinous solution to plastic pollution	20
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730378	R2PI	CIRC-04-2016	RIA	TRANSITION FROM LINEAR 2 CIRCULAR: POLICY AND INNOVATION	22
730349	RES URBIS	CIRC-05-2016	RIA	REsources from URban Blo-waStE	23
730423	CIRC-PACK	CIRC-01-2016-2017	IA	Towards circular economy in the plastic packaging value chain	25
730456	ECOBULK	CIRC-01-2016-2017	IA	Circular Process for Eco-Designed Bulky Products and Internal Car Parts	26
730323	FiberEUse	CIRC-01-2016-2017	IA	Large scale demonstration of new circular economy value-chains based on the reuse of end-of-life fiber reinforced composites.	27
730305	PAPERCHAIN	CIRC-01-2016-2017	IA	New market niches for the Pulp and Paper Industry waste based on circular economy approaches	28
730292	PlastiCircle	CIRC-01-2016-2017	IA	Improvement of the plastic packaging waste chain from a circular economy approach	29
730308	PolyCE	CIRC-01-2016-2017	IA	Post-Consumer High-tech Recycled Polymers for a Circular Economy – PolyCE	30
730400	SYSTEMIC	CIRC-01-2016-2017	IA	Systemic large scale eco-innovation to advance circular economy and mineral recovery from organic waste in Europe	31
730390	ZERO BRINE	CIRC-01-2016-2017	IA	Re-designing the value and supply chain of water and minerals: a circular economy approach for the recovery of resources from saline impaired effluent (brine) generated by process industries	32
730285	RUN4LIFE	CIRC-02-2016-2017	IA	RECOVERY AND UTILIZATION OF NUTRIENTS 4 LOW IMPACT FERTILIZER	33
730398	Water2REturn	CIRC-02-2016-2017	IA	REcovery and REcycling of nutrients TURNing wasteWATER into added-value products for a circular economy in agriculture	34
776851	CarE-Service	CIRC-01-2016-2017	IA	Circular Economy Business Models for innovative hybrid and electric mobility through advanced reuse and remanufacturing technologies and services	35
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776503	CIRC4Life	CIRC-01-2016-2017	IA	A circular economy approach for lifecycles of products and services	37
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776708	HOUSEFUL	CIRC-01-2016-2017	IA	Innovative circular solutions and services for new business opportunities in the EU housing sector	40
776577	ReCiPSS	CIRC-01-2016-2017	IA	Resource-efficient Circular Product-Service Systems	41
776643	HYDROUSA	CIRC-02-2016-2017	IA	Demonstration of water loops with innovative regenerative business models for the Mediterranean region	42

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768735	PLUG-N-HARVEST	EEB-07-2017	IA	PLUG-N-play passive and active multi-modal energy HARVESTing systems, circular economy by design, with high replicability for Self-sufficient Districts Near-Zero Buildings	49
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737802	BioDie2020	FTIPilot-01-2016	IA	Demonstration of new, challenging and high FFA waste oil and fat feedstock in biodiesel process with improved costs, conversion and high fuel quality	51
737741	BIOMULCH	FTIPilot-01-2016	IA	Integrated solution for innovative biodegradation control of agricultural plastic mulches	52
760642	NIRSort	FTIPilot-01-2016	IA	Development and Market Replication of novel NIR-transparent polymer colourants to replace carbon black, and allow the sorting of black and coloured polymers from mixed waste streams	53
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731465	AQUARIUS	ICT-29-2016	RIA	BROADBAND TUNABLE QCL BASED SENSOR FOR ONLINE AND INLINE DETECTION OF CONTAMINANTS IN WATER	56
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764675	Heat-To-Fuel	LCE-08-2016-2017	RIA	Biorefinery combining HTL and FT to convert wet and solid organic, industrial wastes into 2nd generation biofuels with highest efficiency	63
789562	BIO4A	LCE-20-2016-2017	IA	Advanced sustainable BIOfuels for Aviation	64
792216	FlexJET	LCE-20-2016-2017	IA	Sustainable Jet Fuel from Flexible Waste Biomass	65
764089	ABC-SALT	LCE-06-2017	RIA	Advanced Biomass Catalytic Conversion to Middle Distillates in Molten Salts	66

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720838	NEOHIRE	NMBP-03-2016	RIA	NEOdymium-Iron-Boron base materials, fabrication techniques and recycling solutions to Highly REduce the consumption of Rare Earths in Permanent Magnets for Wind Energy Application	69
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761112	PRESTIGE	NMBP-05-2017	IA	Design-driven integration of innovative PReinted functional matErialS into inTeraactive hIgh-end and fashion consumer Goods addressing tomorrow's societal challEnges	71
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730480	ITERAMS	SC5-13-2016-2017	RIA	Integrated mineral technologies for more sustainable raw material supply	90
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730105	SCALE	SC5-13-2016-2017	RIA	Production of Scandium compounds and Scandium Aluminum alloys from European metallurgical by- products	92
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776473	CROCODILE	SC5-14-2016-2017	IA	first of a kind commercial Compact system for the efficient Recovery Of CObalt Designed with novel Integrated LEading technologies	99
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776469	RemovAL	SC5-14-2016-2017	IA	Removing the waste streams from the primary Aluminium production and other metal sectors in Europe	101
776559	SecREETs	SC5-14-2016-2017	IA	Secure European Critical Rare Earth Elements	102
727473	SUSFOOD2	SFS-19-2016-2017	ERA-NET-Cofund	ERA-Net Cofund on Sustainable Food production and consumption (SUSFOOD2)	103
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724613	SmartWASTE	SMEInst-10-2016-2017	SME-2	Smart logistics for WASTE and recycling operations in European cities	127
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767333	ALGAMATER	SMEInst-11-2016-2017	SME-2	Using microalgae bioreactor technology to deliver the world's most cost-effective, energy-efficient and adaptable system for the treatment of toxic industrial and landfill wastewater	129
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778742	Propelair	SMEInst-11-2016-2017	SME-2	The refinement, miniaturisation and demonstration of an ultra low flush toilet capable of saving 2.8 billion litres of clean, potable water being unnecessarily wasted in Europe every day.	139
783638	reNEW	SMEInst-11-2016-2017	SME-2	Sustainable cleaning agent and organic fertilizer recovery from sewage sludge	140
756841	RUBSEE	SMEInst-11-2016-2017	SME-2	Extending artificial intelligence revolution in the waste field beyond sorting	141
723702	INSPIREWater	SPIRE-01-2016	IA	Innovative Solutions in the Process Industry for next generation Resource Efficient Water management	142
723729	ReWaCEM	SPIRE-01-2016	IA	Ressource recovery from industrial waste water by cutting edge membrane technologies	143
723577	SPOTVIEW	SPIRE-01-2016	IA	Sustainable Processes and Optimized Technologies for Industrially Efficient Water Usage	144
723661	COCOP	SPIRE-02-2016	RIA	Coordinating Optimisation of Complex Industrial Processes.	145
723575	CoPro	SPIRE-02-2016	RIA	Improved energy and resource efficiency by better coordination of production in the process industries	146
723523	FUDIPO	SPIRE-02-2016	RIA	Future Directions of Production Planning and Optimized Energy- and Process Industries	148
723650	MONSOON	SPIRE-02-2016	RIA	MOdel based coNtrol framework for Site-wide OptmizatiON of data-intensive processes	149
723070	Bio4Products	SPIRE-03-2016	IA	4x4, demonstrating a flexible value chain to utilize biomass functionalities in the processing industry	150

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723268	KARMA2020	SPIRE-03-2016	IA	Industrial Feather Waste Valorisation for Sustainable KeRatin based MATERIALS.	151
723670	REHAP	SPIRE-03-2016	IA	Systemic approach to Reduce Energy demand and CO2 emissions of processes that transform agroforestry waste into High Added value Products.	152
723641	DREAM	SPIRE-04-2016	RIA	Design for Resource and Energy efficiency in cerAMic kilns	153
723706	IMPROOF	SPIRE-04-2016	RIA	INTEGRATED MODEL GUIDED PROCESS OPTIMIZATION OF STEAM CRACKING FURNACES	155
723803	VULKANO	SPIRE-04-2016	RIA	Novel integrated refurbishment solution as a key path towards creating eco-efficient and competitive furnaces	156
723678	CarbonNext	SPIRE-05-2016	CSA	The Next Generation of Carbon for the Process Industry	157
723748	INSPIRE	SPIRE-06-2016	CSA	Towards growth for business by flexible processing in customer-driven value chains	158
767533	ENSUREAL	SPIRE-07-2017	IA	Integrated cross-sectorial approach for environmentally sustainable and resource-efficient alumina production	159
768652	Morse	SPIRE-07-2017	IA	Model-based optimisation for efficient use of resources and energy	160
768612	SUPREME	SPIRE-07-2017	IA	Sustainable and flexible powder metallurgy processes optimization by a holistic reduction of raw material resources and energy consumption.	161
768919	Carbon4PUR	SPIRE-08-2017	RIA	Turning industrial waste gases (mixed CO/CO2 streams) into intermediates for polyurethane plastics for rigid foams/building insulation and coatings	162
768543	ICO2CHEM	SPIRE-08-2017	RIA	From industrial CO2 streams to added value Fischer-Tropsch chemicals	163
768583	RECODE	SPIRE-08-2017	RIA	Recycling carbon dioxide in the cement industry to produce added-value additives: a step towards a CO2 circular economy	164
768573	DEMETO	SPIRE-09-2017	IA	Modular, scalable and high-performance DE-polymerization by MicrowavE TechnolOgy	165
768692	ECCO	SPIRE-09-2017	IA	Energy Efficient Coil Coating Process	166
768604	NOVUM	SPIRE-09-2017	IA	Pilot line based on novel manufacturing technologies for cellulose-based electrical insulation components	167
768905	PORTABLECRAC	SPIRE-09-2017	IA	PORTABLE SOLUTION FOR THE ELECTROCHEMICAL REGENERATION OF ACTIVATED CARBON	168
768789	CO2EXIDE	SPIRE-10-2017	RIA	CO2-based Electrosynthesis of ethylene oXIDE	169
767798	OCEAN	SPIRE-10-2017	RIA	Oxalic acid from CO2 using Eletrochemistry At demonstration scale	170
768788	SIDERWIN	SPIRE-10-2017	RIA	Development of new methodologies for industrial CO2-free steel production by electrowinning	171
767412	SPRING	SPIRE-11-2017	CSA	Setting the framework for the enhanced impact of SPIRE projects	172
768755	HARMONI	SPIRE-12-2017	CSA	Harmonised assessment of regulatory bottlenecks and standardisation needs for the process industry	173
768748	SCALER	SPIRE-13-2017	CSA	Scaling European Resources with Industrial Symbiosis	174
745789	EUCALIVA	BBI-2016-D03	BBI-IA-DEMO	EUCALyptus Lignin Valorisation for Advanced Materials and Carbon Fibres	175
745766	BIOMOTIVE	BBI-2016-D05	BBI-IA-DEMO	Advanced BIObased polyurethanes and fibres for the autoMOTIVE industry with increased environmental sustainability	176
745746	EMBRACED	BBI-2016-D06	BBI-IA-DEMO	Establishing a Multi-purpose Biorefinery for the Recycling of the organic content of AHP waste in a Circular Economy Domain	177
744330	OPTISOCHEM	BBI-2016-D07	BBI-IA-DEMO	OPTimized conversion of residual wheat straw to bio-ISObutene for bio based CHEMicals	178
745591	SYLFEED	BBI-2016-D08	BBI-IA-DEMO	From forest to feed: enable the wood industry to bridge the protein gap	179
744310	AgriChemWhey	BBI-2016-F01	BBI-IA-FLAG	An integrated biorefinery for the conversion of dairy side streams to high value bio-based chemicals	180

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745737	AFTERLIFE	BBI-2016-R01	BBI-RIA	Advanced Filtration TEchnologies for the Recovery and Later converslon of relevant Fractions from wastEwater	181
745586	BioBarr	BBI-2016-R05	BBI-RIA	New bio-based food packaging materials with enhanced barrier properties – BioBarrier	182
745762	BIOSMART	BBI-2016-R05	BBI-RIA	Bio-based smart packaging for enhanced preservation of food quality.	183
745791	REFUCOAT	BBI-2016-R05	BBI-RIA	Full recyclable food package with enhanced gas barrier properties and new functionalities by the use of high performance coatings	184
745578	BARBARA	BBI-2016-R07	BBI-RIA	Biopolymers with advanced functionalities for building and automotive parts processed through additive manufacturing	185
744311	ECOXY	BBI-2016-R07	BBI-RIA	Bio-based recyclable, reshapable and repairable (3R) fibre-reinforced EpOXY composites for automotive and construction sectors.	186
745839	POLYBIOSKIN	BBI-2016-R07	BBI-RIA	High performance functional bio-based polymers for skin-contact products in biomedical, cosmetic and sanitary industry	187
745828	PERCAL	BBI-2016-R08	BBI-RIA	Chemical building blocks from versatile MSW biorefinery	188
792021	SUSFERT	BBI.2017.D4	BBI-IA-DEMO	Sustainable multifunctional fertilizer – combining bio-coatings, probiotics and struvite for phosphorus and iron supply	189
792195	EFFECTIVE	BBI.2017.D5	BBI-IA-DEMO	Advanced Eco-designed Fibres and Films for large consumer products from biobased polyamides and polyesters in a circular EConomy perspecTIVE	190
792049	ReInvent	BBI.2017.D5	BBI-IA-DEMO	Novel Products for Construction and Automotive Industries Based on Bio Materials and Natural Fibres	191
792004	UNRAVEL	BBI.2017.R2	BBI-RIA	UNIQUE Refinery Approach to Valorise European Lignocellulosics	192
790956	AQUABIOPROFIT	BBI.2017.R4	BBI-RIA	AQUAculture and Agriculture BIOMass side stream PROteins and bioactives for Feed, FITness and health promoting nutritional supplements	193
792054	EXCornsEED	BBI.2017.R4	BBI-RIA	Separation, fractionation and isolation of biologically active natural substances from corn oil and other side streams	194
790507	iFermenter	BBI.2017.R4	BBI-RIA	iFERMENTER - CONVERSION OF FORESTRY SUGAR RESIDUAL STREAMS TO ANTIMICROBIAL PROTEINS BY INTELLIGENT FERMENTATION	195
792050	Pro-Enrich	BBI.2017.R4	BBI-RIA	Development of novel functional proteins and bioactive ingredients from rapeseed, olive, tomato and citrus fruit side streams for applications in food, cosmetics, pet food and adhesives	196
790157	Prolific	BBI.2017.R4	BBI-RIA	Integrated cascades of PROcesses for the extraction and valorisation of proteins and bioactive molecules from Legumes, Fungi and Coffee agro-industrial side streams	197
792063	SusBind	BBI.2017.R5	BBI-RIA	Development and pilot production of SUStainable bio BINDer systems for wood based panels	198
792261	NEWPACK	BBI.2017.R6	BBI-RIA	Development of new Competitive and Sustainable Bio-Based Plastics	199

BioReg		727958
Title: Absorbing the Potential of Wood Waste in EU Regions and Industrial Bio-based Ecosystems		
Call Id: H2020-BB-2016-1	Topic: BB-06-2016	Type of Action: CSA
Project start date: 1/1/2017	Duration: 36 months	Unit: REA/B/02
Total costs (€): 996.056,25	EU requested grant (€): 996.056,25	

Free keywords: *bio-based industries, bio-based products, wood waste, wood waste ecosystems, bioenergy*

Abstract:

BioReg project proposes to create a platform of stakeholders who are able to influence and develop their regions towards bio-based industries and products.

Demonstrator case studies have been selected among European regions – Gothenburg, (SE); Karlsruhe, Baden-Wurttemberg (Ge), Lombardy, Emilia-Romagna (IT), North West England (UK) and Vorarlberg and Syria, Austria. Those have set up renewable wood waste-based systems at different stages of the waste wood value chain including different wood waste source, pre-sorting, sorting, collection, recycling and wood waste treatment (to materials, biochemicals or biofuels) as well as the different gradings and regional wood waste composition in each country.

3 recipient regions were selected for this project in regards to their unused waste wood potential: Normandy (France), Lublin (Poland), Andalucia (Spain).

The BioReg platform will function on two levels. On the EU level: best practices in terms of strategies and technologies as well as implementing mechanisms will be shared with the beneficiary recipient regions on the project and disseminated to many other potential regions in the EU (EUBIA). The platform will encourage the collaboration of members and stakeholders on the European level. On the regional level: the best practices will be replicated in the three beneficiary regions. The proposal offers collaboration with regional existing clusters, constructive dialogue with regional authorities and policy makers, industrial and RTD establishments in the recipient regions. It will mobilize the recipient regions to develop the existing potential for industrial innovative projects and build bio-based ecosystems. Industries, regions and investors will be brought together to establish an efficient dialogue so that demand and supply can be aligned and large impact projects can be realized.

The project proposes mechanisms to engage the stakeholders in collaboration also after the EU funding on BioReg is over.

STAR-ProBio		727740
Title: Sustainability Transition Assessment and Research of Bio-based Products		
Call Id: H2020-BB-2016-2	Topic: BB-01-2016	Type of Action: RIA
Project start date: 5/1/2017	Duration: 36 months	Unit: REA/B/02
Total costs (€): 5.306.371,50	EU requested grant (€): 4.983.871,50	

Free keywords: *Fit-for-purpose sustainability scheme; circular economy; end-of-life, indirect land use change*

Abstract:

STAR-ProBio constitutes a multidisciplinary and multi-actor collaborative project that will meet environmental, social and economic challenges, paving the way for a much-needed sustainability transition towards a bio-based economy.

The overall objective of the project is to promote a more efficient and harmonized policy regulation framework, needed to promote the market-pull of bio-based products. This will be achieved by developing a fit-for-purpose sustainability scheme, including standards, labels and certifications for bio-based products. To this aim, an integral part of STAR-ProBio will be the adoption of life-cycle methodologies to assess the roll-out of bio-based products. Environmental assessment will be performed, through LCA, in a circular economy framework (with a focus on end-of-life analysis) looking at issues which emerge upstream and downstream the value chain. This will be complemented by a techno-economic assessment and by a social impact assessment conducted through stakeholder analysis, SLCA, surveys and field experiments. Indirect land use change issues (ILUC) will also be addressed from an environmental, economic and social perspective. Moreover, the analysis of selected case studies on (1) construction materials, (2) bio-based polymers, and (3) fine chemicals, will ensure that the approach is not too broad and theoretic, allowing the benchmarking against non bio-based products.

Hence, STAR-ProBio will integrate scientific and engineering approaches with social sciences and humanities-based approaches in order to formulate guidelines for a common framework promoting the development of regulations and standards to support the adoption of business innovation models in the bio-based products sector.

GENIALG		727892
Title: GENetic diversity exploitation for Innovative macro-ALGal biorefinery		
Call Id: H2020-BG-2016-1	Topic: BG-01-2016	Type of Action: IA
Project start date: 1/1/2017	Duration: 48 months	Unit: REA/B/02
Total costs (€): 12.224.237,50	EU requested grant (€): 10.885.817,25	

Free keywords: *High-yielding seaweeds, large-scale aquaculture, IMTA, biorefinery, marine enzymes, market validation, sustainability, social acceptance*

Abstract:

The GENIALG project aims to boost the Blue Biotechnology Economy (BBE) by increasing the production and sustainable exploitation of two high-yielding species of the EU seaweed biomass: the brown alga *Saccharina latissima* and the green algae *Ulva* spp. GENIALG will demonstrate the economic feasibility and environmental sustainability of cultivating and refining seaweed biomass in multiple use demanded products of marine renewable origin. The consortium integrates available knowledge in algal biotechnology and ready to use reliable eco-friendly tools and methods for selecting and producing high yielding strains in economically feasible quantities and qualities. By cracking the biomass and supplying a wide diversity of chemical compounds for existing as well as new applications and markets, GENIALG will anticipate the economic, social and environmental impacts of such developments in term of economic benefit and job opportunities liable to increase the socio-economic value of the blue biotechnology sector. In a larger frame, conservation and biosafety issues will be addressed as well as more social aspects such as acceptability and competition for space and water regarding other maritime activities. To achieve these objectives GENIALG will foster a trans-sectorial and complementary consortium of scientists and private companies. • GENIALG will involve a diversity of private companies already positioned in the seaweed sector individually for different applications (texturants, feed, agriculture, bioplastics, pharmaceuticals, personal care products...) in order to strengthen interactions for developing a bio-refinery concept and accelerate efficient and sustainable exploitation of seaweed biomass to bring new high-value products on the market.

SABANA		727874
Title: Sustainable Algae Biorefinery for Agriculture aNd Aquaculture		
Call Id: H2020-BG-2016-1	Topic: BG-01-2016	Type of Action: IA
Project start date: 12/1/2016	Duration: 48 months	Unit: REA/B/02
Total costs (€): 10.646.705,00	EU requested grant (€): 8.848.523,75	

Free keywords: *Biorefinery, Microalgae, Marine water, Large Scale, Biopesticides, Biostimulants, Aquafeed, Wastewaters*

Abstract:

SABANA aims at developing a large-scale integrated microalgae-based biorefinery for the production of biostimulants, biopesticides and feed additives, in addition to biofertilizers and aquafeed, using only marine water and nutrients from wastewaters (sewage, centrate and pig manure). The objective is to achieve a zero-waste process at a demonstration scales up to 5 ha sustainable both environmentally and economically. A Demonstration Centre of this biorefinery will be operated to demonstrate the technology, assess the operating characteristics of the system, evaluate environment impacts and collaborate with potential customers for use.

The key advantages of SABANA project are: the sustainability of the process, using marine water and recovering nutrients from wastewaters while minimizing the energy consumption, and the socioeconomic benefits, due to the relevance of the target bioproducts for two major pillars in food production as agriculture and aquaculture. Bioproducts capable of increasing the yield of crops and fish production are highly demanded, whereas recovery of nutrients is a priority issue in the EU. Instead of considering wastewater as an inevitably useless and problematic residue of our society, SABANA acknowledges its potential as an opportunity for economically relevant sectors.

SABANA project includes (i) the utilization of microalgae-bacteria consortia and in co-culture with other algae to control grazing species, (ii) the implementation of efficient thin-layer cascade and raceway, (iii) the scale-up of reactors to ensure stable operation, (iv) to use marine water to increase the sustainability of the process; (v) to recover nutrients from wastewaters, (vi) to develop harvesting processes taking into account the remaining water, (vii) to establish processes for mild/energy efficient extraction of bioproducts, (viii) to process residual biomass to produce biofertilizers and aquafeed in zero-waste schemes, (ix) using robust and sustainable technology

CLAIM		774586
Title: Cleaning Litter by developing and Applying Innovative Methods in european seas		
Call Id: H2020-BG-2017-1	Topic: BG-07-2017	Type of Action: IA
Project start date: 11/1/2017	Duration: 48 months	Unit: REA/B/02
Total costs (€): 6.185.612,75	EU requested grant (€): 5.654.786,01	

Free keywords: *Integrated approach, Visible and invisible coastal pollution, Innovative green technologies, Forecasting tools, Microlitter, Macrolitter*

Abstract:

CLAIM focuses on the development of innovative cleaning technologies and approaches, targeting the prevention and in situ management of visible and invisible marine litter in the Mediterranean and Baltic Sea.

Two innovative technological methods will be developed, a photocatalytic nanocoating device for cleaning microplastics in wastewater treatment plants and a small-scale thermal treatment device for energy recovery from collected litter on board ships and ports. An innovative floating boom for collecting visible litter and a method to measure microlitter on board ships (Ferrybox) will be developed. The proposed cleaning technologies and approaches prevent litter from entering the sea at two main source points, i.e. wastewater treatment plants and river mouths. Effectiveness of developed devices and methods will be demonstrated under real conditions.

Additionally, CLAIM will develop innovative modeling tools to assess the marine visible and invisible plastic pollution at basin and regional scales (Saronikos Gulf, Gulf of Lyon, Ligurian Sea and Belt Sea).

An ecosystems approach will be followed to evaluate the potential benefit from proposed litter cleaning methods to ecosystem services. New business models will be developed to enhance the economic feasibility for upscaling the innovative cleaning technologies, taking into account the existing legal and policy frameworks in the CLAIM countries, as well as acceptance of the new technologies by their end-users and relevant stakeholders.

The data and information produced will be made available to policymakers, stakeholders and end-users in a user-friendly format, both meaningful and tailored to each stakeholder group. CLAIM aims at the same time to raise public awareness with respect to having healthy oceans and seas, clean of litter and pollutants, and hence the importance of reducing marine (macro, micro and nano) pollution in European seas and beyond towards restoring marine ecosystems based on a circular economy.

GoJelly		774499
Title: GoJelly - A gelatinous solution to plastic pollution		
Call Id: H2020-BG-2017-1	Topic: BG-07-2017	Type of Action: IA
Project start date: 1/1/2018	Duration: 48 months	Unit: REA/B/02
Total costs (€): 6.222.816,50	EU requested grant (€): 5.998.114,75	

Free keywords: *Microplastics, Jellyfish, forecasting, waste water treatment, organic farming, cosmetics, nutraceuticals, food science, aquafeed, socioecological systems, trade-offs, blue jobs, circular economy*

Abstract:

The objective of the GoJelly project is to develop, test and promote a gelatinous solution to microplastic pollution by developing a TRL 5-6 prototype microplastics filter (GoJelly) for commercial and public use, where the main raw material is jellyfish mucus. In doing so, the consortium addresses two environmental issues with one approach by removing the commercially and ecologically destructive sea and coastal pollution of both jellyfish and microplastics. This innovative approach will ultimately lead to less plastic in the ocean, municipal demand (and thereby competitive prices) for jellyfish raw material to fill the "mucus-need" by filter developers, and in turn more jobs for commercial fishers in off-seasons. The by-products of the GoJelly biomass have other uses as well, ensuring that GoJelly also delivers a green innovation, resulting in novel, valuable resource for the food and feed industry as well as agro-biological fertilizer for organic farming. The GoJelly prototype products will be tested and demonstrated in three different European seas (Norwegian, Baltic and Mediterranean), by a range of stakeholders, including commercial fishers and industry partners. Tying it together, the project will also ensure the possibilities for broader European promotion and utilization of GoJelly at the local, regional and global level by delivering a socio-ecological methodological toolbox for forming and implementing policies. GoJelly will broadly communicate its results in several formats such as traditional social media, open lab ship cruise, and in the form of an experimental online game depicting different management scenarios under different jellyfish- and microplastics combinations. An interdisciplinary and international consortium consisting of technology developers, business analysts, fishing companies, research institutes, and both natural and social scientists will realize GoJelly, and will ensure the uptake of GoJelly products by industry and policy makers.

SCREEN		730313
Title: Synergic Circular Economy across European Regions		
Call Id: H2020-CIRC-2016OneStage	Topic: CIRC-03-2016	Type of Action: CSA
Project start date: 11/1/2016	Duration: 24 months	Unit: EASME/B/02
Total costs (€): 1.742.747,50	EU requested grant (€): 1.742.747,50	

Free keywords: *synergic use of H2020 and Structural Funds for Circular Economy Initiatives dealing with Smart Specialisation strategies*

Abstract:

SCREEN aims at the definition of a replicable systemic approach towards a transition to Circular Economy in EU regions within the context of the Smart Specialization Strategy, through the identification and implementation of operational synergies between R&I investments from H2020 and the European Structural and Investment Funds, thus contributing to novel future eco-innovative and horizontal business models across different value chains.

The concept of the action is to develop a EU reference framework for establish operational synergies between Horizon 2020 and the European Structural and Investment Funds related to Circular Economy by:

a) Sustaining the regional actors' participation at H2020

The mechanism of the “vouchers”, already adopted in the past, will be reinforced and harmonized, in order to ensure common rules in EU regions and therefore encouraging the composition of international Consortia applying for circular economy projects related to the regional Smart Specialisation.

b) Encouraging the entrepreneurial initiatives based on H2020 project's results

The participating Regions will agree about a specific rule in their Structural Funds giving an advantage for those initiatives targeted to the exploitation of the H2020 project results with a circular economy approach.

c) Investigating the possibility of maximizing the H2020 investment through a “recovery”(fully or partial) of well ranked unfinanced proposals dealing with circular economy

Even if there is a clear presence of several bureaucratic and operational barriers, a possible solution could have an impressive multiplier effect on the H2020 results.

The approach of the action is to leverage on growing industry sectors in EU regions to act as a driver also for the less performing ones, through a circular economy approach, and to support the emergence of new actors in the regional economies leading to new or redesigned value chains.

R2PI		730378
Title: TRANSITION FROM LINEAR 2 CIRCULAR: POLICY AND INNOVATION		
Call Id: H2020-CIRC-2016OneStage	Topic: CIRC-04-2016	Type of Action: RIA
Project start date: 11/1/2016	Duration: 36 months	Unit: EASME/B/02
Total costs (€): 3.013.475,00	EU requested grant (€): 3.013.475,00	

Free keywords: *Circular economy; Sustainability; Business models; CEBM; Transition*

Abstract:

R2 π examines the shift from the broad concept of a Circular Economy (CE) to one of a Circular Economy Business Models (CEBM), by tackling both market failure (business, consumers) and policy failure (conflicts, assumptions, unintended consequence). Its innovation lies in having a strong business-focus, examining stimuli beyond environmental goals (including ICT and eco-innovation), and in examining the role of policy innovation (including the use of policy nudges and of "Policy Packages"). R2 π unfolds in diverse contexts with a strong emphasis on involvement and exchange. The research design employs mixed-methods, with a strong emphasis on case studies but also including desktop research, feasibility assessments (including surveys where applicable), policy formulation & stakeholder involvement. The ultimate goal of the project is to see the widespread implementation of the CE based on successful Business Models to ensure sustained economic development, to minimize environmental impact and to maximize social welfare.

The goal of the R2 π project is therefore to develop sustainable business models that would facilitate the circular economy and to propose "Policy Package" that will support these business models. The R2Pi Consortium consists of 14 partners from 9 Member states and associated countries. The wide range of expertise, knowledge, tools and connections existing among the consortium members will be leveraged to develop innovative practical tools and procedural guidelines that may be widely and systematically applied across many different business sectors in diverse regions and countries, across the spectrum from large established EU countries to newer and smaller member states.. Through these innovative business models and "Policy Packages", the European economy will move into a more sustainable, resource efficient and resilient economic track.

R2 π will position Europe as a world leader in advancing the circular economy model.

RES URBIS		730349
Title: REsources from URban Bio-waSte		
Call Id: H2020-CIRC-2016OneStage	Topic: CIRC-05-2016	Type of Action: RIA
Project start date: 1/1/2017	Duration: 36 months	Unit: REA/B/02
Total costs (€): 3.377.915,00	EU requested grant (€): 2.996.688,75	

Free keywords: *urban bio-waste, biodegradable fraction, municipal solid waste, sewage sludge, wastewater, biorefinery, bio-based products, bioplastics, polyhydroxyalkanoate, PHA, biosolvent, biocomposite*

Abstract:

RES URBIS aims at making it possible to convert several types of urban bio-waste into valuable bio-based products, in an integrated single biowaste biorefinery and by using one main technology chain. This goal will be pursued through:

- collection and analysis of data on urban bio-waste production and present management systems in four territorial clusters that have been selected in different countries and have different characteristics.
- well-targeted experimental activity to solve a number of open technical issues (both process- and product-related), by using the appropriate combination of innovative and catalogue-proven technologies.
- market analysis within several economic scenarios and business models for full exploitation of bio-based products (including a path forward to fill regulatory gaps).

Urban bio-waste include the organic fraction of municipal solid waste (from households, restaurants, caterers and retail premises), excess sludge from urban wastewater treatment, garden and parks waste, selected waste from food-processing (if better recycling options in the food chain are not available), other selected waste streams, i.e. baby nappies.

Bio-based products include polyhydroxyalkanoate (PHA) and related PHA-based bioplastics as well as ancillary productions: biosolvents (to be used in PHA extraction) and fibers (to be used for PHA biocomposites).

Territorial and economic analyses will be done either considering the ex-novo implementation of the biowaste biorefinery or its integration into existing wastewater treatment or anaerobic digestion plants, with reference to clusters and for different production size. The economic analysis will be based on a portfolio of PHA-based bioplastics, which will be produced at pilot scale and tested for applications:

- Biodegradable commodity film

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- Packaging interlayer film
- Speciality durables (such as electronics)
- Premium slow C-release material for ground water remediation

CIRC-PACK		730423
Title: Towards circular economy in the plastic packaging value chain		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 5/1/2017	Duration: 36 months	Unit: EASME/B/02
Total costs (€): 9.252.466,25	EU requested grant (€): 7.308.180,13	

Free keywords: *Plastic, Packaging, Design, biobased, biodegradable, recycling, new business models, organizational innovation, plastics landfill reduction*

Abstract:

CIRC-PACK project aims at more sustainable, efficient, competitive, less fossil fuel dependence, integrated and interconnected plastic packaging value chain. To this end, three case studies will work in developing, testing and validating better system-wide economic and environmental outcomes by i) decoupling the chain from fossil feedstocks, (ii) reducing the negative environmental impact of plastic packaging; and (iii) creating an effective after-use plastics economy. All in all, the work will be supported by non-technological analysis and advanced methodological analysis (including circular economy and industrial symbiosis principles) which will trigger a broadly deployment of the tested solutions. CIRC-PACK project will provide breakthrough biodegradable plastics using alternative biobased raw materials, which will have an instrumental role to play in the subsequence steps of the plastic value chain. In addition, eco-design packaging for improving and end-of-like multilayer and multicomponent packaging will be technologically advanced and adapted also to the new materials produced. Thus these developments will also contribute with a great impact in the packaging footprint, and increasing the biobased content and using compostable materials. Lastly, a multi-sectorial cascaded approach along plastic packaging value chain will be applied with critical impacts in other value chains beyond the targeted plastic packaging value chain. The overall outcome of the project will facilitate the transition from the current linear plastic packaging value chain to circular economy principles.

ECOBULK		730456
Title: Circular Process for Eco-Designed Bulky Products and Internal Car Parts		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2017	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 12.153.947,38	EU requested grant (€): 9.665.562,88	

Free keywords: *Circular economy, design, furniture, automotive, building, recycling, remanufacturing, user engagement, modular*

Abstract:

ECOBULK through a large scale demonstration effort will contribute to “closing the loop” of composite products in the automotive, furniture and building sectors by promoting greater re-use, upgrade, refurbishment and recycle of products, parts, and materials. It will bring opportunities for both the environment and the economy by offering business opportunities along the entire new defined supply and value chains. ECOBULK approach will be based on identifying and promoting commonalities in processes, technologies, products and services ensuring replicability and transferability to other industrial sectors. The ambitious application of the circular economy model in the three selected sectors is justified by the high numbers of synergies, in terms of the design (design for modularity, design for disassembly/dismantling), materials (fibre and particle reinforced plastic composites), manufacturing technology (moulding, extrusion, hot pressing, thermobonding) and business models (leasing, renting, PSS, fix-it shops, etc.). The methodology will embrace and focus on large scale demonstration activities in 7 countries and more than 15 demonstrators to address the key components of the circular economy solutions; rethinking product design to shift towards a Design Circular Framework, validation of material and product manufacturing technologies to ensure technical and economic feasibility, new reverse logistics for the recovery of products and parts from consumers or users and into the supply chain, implementation of Innovative business models exploring C2C, B2C and B2B opportunities, and dissemination to raise awareness and knowledge sharing activities on circular economy solutions. Finally, an end-user and Stakeholder platform linking end users with relevant actors from the early design stages will foster second life, reuse and recycle of product and parts as well as material recovery for reintroduction into a circular production chain.

FiberEUse		730323
Title: Large scale demonstration of new circular economy value-chains based on the reuse of end-of-life fiber reinforced composites.		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2017	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 11.943.963,75	EU requested grant (€): 9.793.548,75	

Free keywords: *Composite Re-use, Remanufacturing and Recycling. New Business Model. Systemic Solution.*

Abstract:

Glass and carbon fiber reinforced polymer composites (GFRP and CFRP) are increasingly used as structural materials in many manufacturing sectors like transport, constructions and energy due to their better lightweight and corrosion resistance compared to metals. Composite recycling is a challenging task. Although mechanical grinding and pyrolysis reached a quite high TRL, landfilling of EoL composites is still widespread since no significant added value in the re-use and remanufacturing of composites is demonstrated.

The FiberEUse project aims at integrating in a holistic approach different innovation actions aimed at enhancing the profitability of composite recycling and reuse in value-added products.

The project is based on the realization of three macro use-cases, further detailed in eight demonstrators:

Use-case 1: Mechanical recycling of short GFRP and re-use in added-value customized applications, including furniture, sport and creative products. Emerging manufacturing technologies like UV-assisted 3D-printing and metallization by Physical Vapor Deposition will be used.

Use-case 2: Thermal recycling of long fibers (glass and carbon) and re-use in high-tech, high-resistance applications. The input product will be EoL wind turbine and aerospace components. The re-use of composites in automotive (aesthetical and structural components) and building will be demonstrated by applying controlled pyrolysis and custom remanufacturing.

Use-case 3: Inspection, repair and remanufacturing for EoL CFRP products in high-tech applications. Adaptive design and manufacturing criteria will be implemented to allow for a complete circular economy demonstration in the automotive sector.

Through new cloud-based ICT solutions for value-chain integration, scouting of new markets, analysis of legislation barriers, life cycle assessment for different reverse logistic options, FiberEUse will support industry in the transition to a circular economy model for composites.

PAPERCHAIN		730305
Title: New market niches for the Pulp and Paper Industry waste based on circular economy approaches		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2017	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 9.217.196,20	EU requested grant (€): 7.826.080,89	

Free keywords: *Industrial symbiosis, Pulp and Paper Industry, Construction Sector, Mining Industry, Chemical Industry, Secondary Raw Materials*

Abstract:

Europe is the second world producer of pulp and paper, manufacturing 130 million tonnes in 2014 and representing 23% of world production. The EU pulp and paper manufacturing and converting industries generate an annual turnover of €180 billion, representing 1,26% of the European GDP. In particular, the Pulp and Paper industry (PPI) has a turnover of €75 billion, comprises 920 plants and provides 180,000 jobs in Europe directly, and 1.5 million in the value chain. This sector is resource intensive and produces 11 million tonnes of waste yearly . It has been found that 25-40% of municipal solid waste generated each year worldwide is paper-related. Furthermore, Europe is nowadays facing the challenge of resource scarcity and more efficient use. If managed in a sustainable manner, PPI waste can become a valuable raw material for other resource intensive industries such as the construction (i.e 5,4 billion tonnes of raw material consumption) or the chemical industry (1 billion tonnes). Mining industry waste generation is estimated at up to 20.000 million tons of solid waste yearly, and relevant part of this waste needs to be kept in environmental safety conditions, which in turn implies additional use of resources (e.g borrow materials). New widespread markets are needed to extend the valorisation operations, reduce the landfilling rates and increase the competitiveness of the PPIs creating new added value markets for their inorganic waste.

The overall objective of PAPERCHAIN is to deploy five novel circular economy models centred in the valorisation of the waste streams generated by the PPI as secondary raw material for a number of resource intensive sectors: construction sector, mining sector and chemical industry. PAPERCHAIN aims to unlock the potential of a resource efficient model based on industrial symbiosis which will demonstrate the potential of the major non-hazardous waste streams generated by the PPI as valuable secondary raw material.

PlastiCircle		730292
Title: Improvement of the plastic packaging waste chain from a circular economy approach		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2017	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 8.674.540,89	EU requested grant (€): 7.774.016,75	

Free keywords: *plastic waste, circular economy, urban areas, collection, transport, sorting, valorization*

Abstract:

The European plastic market is not currently aligned with the circular economy. More than 25.8 million tonnes of plastic waste are produced per year in the EU28 being recycled only 29.7%. This represents a clear loss in the plastic market loop (losses of €10.56bn). Moreover, this goes against the EU legislation on waste (high environmental impact; 23.8 Mt of CO₂).

Low recycling rates of plastic are mainly due to the situation of packaging waste (i.e. main plastic waste fraction), since it is mainly domestic residue and consequently the quality of the material collected depends on the system of segregation available and the environmental awareness of citizens.

PlastiCircle aims to develop and implement a holistic process to increase recycling rates of packaging waste in Europe. This will allow to reprocess again plastic waste in the same value chain (i.e. Circular economy; closure of plastic loop). This process is based on four axes: collection (to increase quantity of packaging collected), transport (to reduce costs of recovered plastic), sorting (to increase quality of recovered plastic), and valorization in value-added products (i.e. foam boards, automotive parts like engine covers/bumpers/dashboards, bituminous roofing membranes, garbage bags, asphalt sheets/roofing felts and urban furniture like fences/benches/protection walls).

The target is to increase collection from 81.7% to 87% and valorization in a 9.8%. The implementation of PlastiCircle approach in Europe have the potential to increase collected plastic in 861,250t (reaching 14.14 Mt) and valorization in 1.59Mt. The valorization of this new material, represents a market value of €2.86bn-€7.95bn. Taking into account current figures of the plastic sector (turnover €350bn, 62,000 companies, 1.45M employees), this could imply creation of 500-1400 new companies and the generation of 11,900-33,000 new jobs in the medium to long term if PlastiCircle approach is extended in a EU level.

PolyCE		730308
Title: Post-Consumer High-tech Recycled Polymers for a Circular Economy – PolyCE		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2017	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 9.452.964,59	EU requested grant (€): 8.321.995,72	

Free keywords: *WEEE, post-consumer recycled plastics, technical requirements, grade systems for recycled plastics, standardisation, supply and value chain, dematerialisation, new business models*

Abstract:

Various activities address the WEEE value chain in order to reduce waste generation and enhance the sustainable resource management through use of recycled materials instead of their virgin counterparts. While the system for metals recycling is already well established, the rising volumes of waste plastics point to stalemates in the current plastics economy, which hamper its shift to a more circular model. Although there are individual efforts to improve the collection and recycling of WEEE plastics, the plastics value chain is still too fragmented and WEEE recycled plastics seem unattractive material for the end-user. To shift towards circular economy a systematic transformation is required, involving all actors in the value chain and encompassing the entire lifecycle of plastic materials.

While substantially reducing the WEEE plastics generation and enhancing the use of recycled plastics in new applications, PolyCE will demonstrate the feasibility of circular plastics supply and value chain. In particular, PolyCE will elaborate harmonized set of technical requirements addressing the entire value chain and develop grade system for recycled plastics according to their material properties and final application suitability. Accordingly, PolyCE will strengthen the market for recycled plastics through an online platform integrating the different plastic grades. In parallel, the technical and economic feasibility as well as environmental benefits of using recycled plastics will be validated in several electronics demonstrators. In addition, PolyCE will provide Guidelines for designing new electronics products with recycled plastics. The project's impact will be scaled up by involving target cities and their green public procurement initiatives; by EU-wide information and awareness raising campaigns. PolyCE will establish a feedback loop from the research activities, provide policy input regarding technical feasibilities and policy conflicts from technical perspective

SYSTEMIC		730400
Title: Systemic large scale eco-innovation to advance circular economy and mineral recovery from organic waste in Europe		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2017	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 9.723.586,25	EU requested grant (€): 7.859.828,75	

Free keywords: *Waste valorisation, nutrient recovery, demonstration plant, biobased industries, biochemicals, biogas, secondary raw materials*

Abstract:

SYSTEMIC will reach a break-through to re-enter recovered nutrients from organic waste into the production cycle. Consequently, this will offer solutions for pressing environmental issues and to reduce the import of P as finite irreplaceable resource in mines.

The SYSTEMIC project aims to shift the European Biomass treatment practice to the next level. Departing from existing business cases and a new ground-breaking large scale demonstration plant, the future of anaerobic digestion (AD) value chains will be investigated and demonstrated. The result will help existing and future AD-operators to maximise their performance: produce and sell more quality products, generate more energy and be independent on subsidies. By the market driven leadership, the SYSTEMIC-project will finally turn biomass waste into valuable products while reducing water pollution, greenhouse gas emission and creating quality jobs in rural areas.

The planned demonstration plant will allow innovative combinations of modules to elaborate possible optimizations for increasing the production quantity and quality of new mineral products, and the integration of these products into a circular economy. Reflecting the experiences from the demonstration plant with a set of 4 mirror cases in different members states allow systemic innovation including end-user driven (a) specific technical development and (b) the cost efficient investigation of real world circular economy business cases and (c) operational, regulatory, institutional and contextual barriers to overcome.

Using partial funding from the EC, the SYSTEMIC industry-driven consortium will validate for the first time the technical and economic viability of a fully integrated, multistep approach in an operational environment. The successful practical demonstration will put the European sector in a leading position to offer efficient mineral recovery technologies.

ZERO BRINE		730390
Title: Re-designing the value and supply chain of water and minerals: a circular economy approach for the recovery of resources from saline impaired effluent (brine) generated by process industries		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2017	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 11.081.972,78	EU requested grant (€): 9.992.209,11	

Free keywords: *Brine effluent, Water recovery, Minerals recovery, Salt, Magnesium recovery, Waste Heat, Industrial Symbiosis, Circular Economy, Closing-the-loop*

Abstract:

This project aims to facilitate the implementation of the Circular Economy package and the SPIRE Roadmap in various process industries by developing the necessary concepts, technological solutions and business models to re-design the value and supply chains of minerals (including magnesium) and water, while dealing with present organic compounds in a way that allows their subsequent recovery.

This is achieved by demonstrating new configurations to recover these resources from saline impaired effluents (brines) generated by process industry, while eliminating wastewater discharge and minimising environmental impact of industrial operations through brines (ZERO BRINE). The project will bring together and integrate several existing and innovative technologies aiming to recover end-products of high quality and sufficient purity with good market value. It will be carried out by large Process Industries, SMEs with disruptive technologies and a Brine Consortium of technology suppliers across EU, while world-class research centres ensure strong scientific capacity and inter-disciplinary coordination to account for social, economic and environmental considerations, including LCA.

A large scale demonstration will be developed in the Energy Port and Petrochemical cluster of Rotterdam Port, involving local large industries. Two demo plants will be able to treat part of the brine effluents generated by one process industry (EVIDES), while the waste heat will be sourced by neighbouring factories. The quality of the recovered end-products will be aimed to meet local market specifications. The involvement of representatives covering the whole supply chain will provide an excellent opportunity to showcase Circular Economy in Rotterdam Port, at large scale. Finally, three large-scale pilot plants will be developed in other process industries, providing the potential for immediate replication and uptake of the project results after its successful completion.

RUN4LIFE		730285
Title: RECOVERY AND UTILIZATION OF NUTRIENTS 4 LOW IMPACT FERTILIZER		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-02-2016-2017	Type of Action: IA
Project start date: 6/1/2017	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 7.720.900,61	EU requested grant (€): 6.239.340,65	

Free keywords: *Nutrient recovery, Water reuse, social acceptance, Source separation*

Abstract:

Domestic wastewater (WW) is an important carrier of nutrients usually wasted away by current decentralised WW treatments (WWT). Run4Life proposes an alternative strategy for improving nutrient recovery rates and material qualities, based on a decentralised treatment of segregated black water (BW), kitchen waste and grey water combining existing WWT with innovative ultra-low water flushing vacuum toilets for concentrating BW, hyper-thermophilic anaerobic digestion as one-step process for fertilisers production and bio-electrochemical systems for nitrogen recovery. It is foreseen up to 100% nutrient (NPK) recovery (2 and >15 times current P and N recovery rates) and >90% water reuse.

Obtained products will be >90% reused thanks to prospective end-users in the consortium and a new Business model based on a cooperative financial scheme. Run4Life impacts will be evaluated on safety and security (Risk Assessment), from an environmental point of view (Life Cycle Assessment and Environmental Technical Verification), on the economy (Benefit Cost Analysis) and considering Social Risk Perception. Active measures will be developed with the support of a Stakeholders and Exploitation Panel for achieving institutional, legal and social acceptance. Different parts of Run4Life will be large scale demonstrated at 4 demo-sites in Belgium, Spain, Netherlands and Sweden, adapting the concept to different scenarios (market, society, legislation). Performance tests will be carried out with obtained products (compared to commercial fertilisers) with close collaboration with fertiliser companies. Process will be optimised by on-line monitoring key performance indicators (nutrient concentration, pathogens, micropollutants). The information obtained in the 4 demo-sites will be used for process simulation to conceive a unified Run4Life model which will be applied in a fifth demo-site in Czech Republic, allowing new business opportunities and providing data for critical raw material policies.

Water2REturn		730398
Title: REcovery and REcycling of nutrients TURNing wasteWATER into added-value products for a circular economy in agriculture		
Call Id: H2020-CIRC-2016TwoStage	Topic: CIRC-02-2016-2017	Type of Action: IA
Project start date: 7/1/2017	Duration: 42 months	Unit: EASME/B/02
Total costs (€): 7.129.322,50	EU requested grant (€): 5.871.895,76	

Free keywords: *water reuse, high added value products, bioestimulants, algae production, circular economy*

Abstract:

Water2REturn proposes a full-scale demonstration process for integrated nutrients recovery from wastewater from the slaughterhouse industry using biochemical and physical technologies and a positive balance in energy footprint. The project will not only produce a nitrates and phosphate concentrate available for use as organic fertiliser in agriculture, but its novelty rests on the use of an innovative fermentative process designed for sludge valorisation which results in a hydrolysed sludge (with a multiplied Biomethane Potential) and biostimulants products, with low development costs and high added value in plant nutrition and agriculture.

This process is complemented by proven technologies such as biological aeration systems, membrane technologies, anaerobic processes for bio-methane production and algal technologies, all combined in a zero-waste-emission and an integrated monitoring control tool that will improve the quality of data on nutrient flows. The project will close the loop by demonstrating the benefits associated with nutrients recycling through the implementation of different business models for each final product. This will be done with a systemic and replicable approach that considers economic, governance and social acceptance aspects through the whole chain of water and targets essentially two market demands: 1) Demand for more efficient and sustainable production methods in the meat industry; and 2) Demand for new recycled products as a nutrient source for agriculture.

As a summary, Water2REturn project adopts a Circular Economy approach where nutrients present in wastewaters from the meat industry can be recycled and injected back into the agricultural system as new raw materials. The project foster synergies between the food and sustainable agriculture industries and propose innovative business models for the resulting products that will open new market opportunities for the European industries and SMEs in two key economic sectors.

CarE-Service		776851
Title: Circular Economy Business Models for innovative hybrid and electric mobility through advanced reuse and remanufacturing technologies and services		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2018	Duration: 36 months	Unit: EASME/B/02
Total costs (€): 7.722.365,75	EU requested grant (€): 6.229.505,01	

Free keywords:**Abstract:**

Electric and Hybrid Electric Vehicles (E&HEVs) will be an opportunity to drastically innovate mobility products and services in the direction of sustainability and of higher accessibility for customers. If coupled with innovative services offered by car manufacturers in a network of well coordinated partners supporting extensive and efficient End-Of-Life operations, the advent of E&HEVs could revolution the current mobility consumption uses of people and preserve the environment much more than the only substitution of traditional cars with E&HEVs could do. In particular, non-ownership based models of E&HEVs with additional added-value services (leasing or renting contracts with periodic upgrade through remanufacturing, pay per use, etc.), would give OEMs the possibility to establish long-term customers relationships on one hand, and of setting-up innovative supply chains that performs systematic remanufacturing and reuse of E&HEVs parts in order to maximize the residual value of components and materials on the other. Remanufacturing, reuse and recycling would become the strategies upon which car manufacturers would base future competitiveness, leveraging on the benefits of costs saving and, at the same time, guaranteeing environmental benefits and superior performances to customers.

However, there are substantial barriers to implement these new business models. The main one is developing adequate capabilities to remanufacture and reuse E&HEVs' components and materials in order to provide customers with added value. This is significantly difficult especially from the technological point of view, since E&HEVs determine a fundamental transformation in vehicles design, featuring a substantial evolution in the critical components and materials.

The CarE-Service project will demonstrate new enabling technologies and service to systematically perform innovative reuse and remanufacturing as key-processes to provide value to customers and, at the same time, to minimize environmental impacts.

CINDERELA		776751
Title: New Circular Economy Business Model for More Sustainable Urban Construction		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 7.635.365,25	EU requested grant (€): 6.729.219,00	

Free keywords: *circular economy business model, CinderOSS, secondary raw material based construction products, industrial symbiosis, urban construction*

Abstract:

The EU-28 total waste generation in 2014 was 2598M tones, the highest since 2004, 33.5% of which was from the construction sector, being also one of the larger consumers of inorganic raw materials. Construction activities are mainly localized in urban areas where by 2050 about 86% of the developed world is expected to live. CINDERELLA project aims to develop a new Circular Economy Business Model (CEBM) for use of secondary raw materials (SRM) in urban areas, connecting different industries, the construction sector and municipal services, decision makers and the general public with the support of CinderOSS, a “One-Stop-Shop” service, articulated in (i) an on-line ICT platform for tracking and modelling the urban waste-to-product flows, on-line marketing and sharing knowledge and information along the value chain (ii) production and marketing of (SRM) based construction products and (iii) building with SRM based construction products supported by building information modelling (BIM). Different streams of waste will be exploited in the project, i.e. construction and demolition waste, industrial wastes, heavy fraction from municipal solid waste and sewage sludge, mostly of them currently landfilled and/or incinerated. Their suitability for use for building materials will be demonstrated through large scale demonstration activities in Slovenia, Croatia and Spain while the ICT platform will be demonstrated in Slovenia, Croatia, Spain, Poland, Italy and The Netherlands. The project will contribute to 20% reduction of environmental impacts along the value and supply chain, reducing virgin material exploitation and converting wastes to products. Sustainability of CEBM will be proven with the environmental, economic and social assessment through whole life (LCA, LCC and S-LCA). The pre-feasibility analysis of the proposed CEBM indicates an increase of recycling by 30% of CDW, 13% of industrial waste, 100% of heavy fraction and 25% of sewage sludge with a net profit of 18%.

CIRC4Life		776503
Title: A circular economy approach for lifecycles of products and services		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 5/1/2018	Duration: 36 months	Unit: EASME/B/02
Total costs (€): 7.228.773,75	EU requested grant (€): 6.294.033,39	

Free keywords:**Abstract:**

This project aims to develop and implement a circular economy approach for sustainable products and services through their value and supply chains. Three new circular economy business models will be developed including (i) co-creation of products and services, (ii) sustainable consumption, and (iii) collaborative recycling and reuse.

The Co-creation of Products/Services model will bring end-users closer to the design and manufacturing phases by identifying consumer preferences via Big-data online mining product reviews and evaluating product specifications and prototypes via Living Lab to customise the end-user requirements. Benefited from the co-creation features, sets of sustainable production methods will be implemented and new products/services will be created.

The Sustainable Consumption model will develop a method to calculate the eco-points of products based on the outcome of FP7 myEcoCost project, assess product environment footprints (PEF), provide a traceability solution to monitor product's sustainability along the value chain, and support end-users and stakeholders to actively implement the circular economy via awareness raising and knowledge sharing activities.

The Collaborative Recycling/Reuse model will develop a system for stakeholders to interact with each other to facilitate the use/reuse of end-of-life products and reduce waste, and implement the eco-credits awarding scheme to encourage people to recycle/reuse.

This project will be demonstrated at a large scale in electrical and electronic products and farming/agri-foods sectors, provide an effective means to communicate with wide communities to disseminate the project outcome, and involve a large number of stakeholders along value and supply chains throughout the project lifetime, including end-users, producers, researchers and civil society.

An ICT platform will be developed to support the development, implementation, demonstration, communication and dissemination.

CIRCUSOL		776680
Title: Circular business models for the solar power industry		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 8.255.590,00	EU requested grant (€): 7.014.892,76	

Free keywords: *Circular economy, business model, large-scale demonstrator, product-service systems, resource efficiency, solar power, photovoltaic, battery, innovation methodology, second-life products, co-creation*

Abstract:

Solar power generates nearly 4% (and still growing) of Europe's electricity demand. In 2021, the 200 GW of capacity installed in Europe will result in saving of 219 million CO₂ tons/year. By 2030, 8 mill tons of PV panels are expected.

Resource efficiency is a critical success factor for the solar power sustainable growth. Performance-based, third-party ownership Product-Service System (PSS) has been widely seen as a key circular economic model to stimulate resource efficiency and reduce waste generation. CIRCUSOL aims to establish solar power as a spearhead sector to demonstrate a path driven by PSS business models towards a circular economy in Europe.

Through a co-creative approach with end-users and the entire value chain, CIRCUSOL will develop two main blocks of a circular PSS model: circular product management with re-use/refurbish/remanufacture ("second-life") paths in addition to recycling, and value-added new product-services for residential, commercial and utility end-users. Five large-scale, real-life demonstrators will be set up in these 3 market segments, in 3 European countries (FR, BE and CH) to validate market acceptance, business viability and resource efficiency benefits.

CIRCUSOL will deliver tangible innovation for the solar power industry with market-validated PSS business models, 2nd-life PV/battery labelling/certification protocols and cost/application analysis, and an info-sharing ICT platform. The results will be exploited in FR, BE and CH and prepared for replication in Europe (Letters of Support of stakeholders attached). CIRCUSOL will also deliver verified circular business innovation methodologies for broader use by other industries, sustainability professionals and academia; plus evidence-based knowledge in circular economy implementation for policy makers. All together, CIRCUSOL will contribute to a more resource efficient Europe, while reducing GHG emissions and creating new business opportunities and jobs.

C-SERVEES		776714
Title: Activating Circular Services in the Electric and Electronic Sector		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 5/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 8.034.707,31	EU requested grant (€): 6.349.067,37	

Free keywords: *Customization; Electric and electronic sector; Ecodesign; Electrical and electronic Equipment (EEE); Waste of electrical and electronic equipment (WEEE); Ecoleasing; Eco-innovatives; NGOs; Large Demos*

Abstract:

C-SERVEES aims to boost a resource-efficient circular economy in the electrical and electronic (E&E) sector through the development, testing, validation and transfer of new circular economic business models (CEBMs) based on systemic eco-innovative services that include: (1) eco-leasing of EEE, (2) product customization, (3) improved WEEE management, and (4) ICT services to support the other eco-services. ICT tools (relying on QR codes) will be developed as the driver of the proposed eco-innovative services to take full advantage of the potential and synergies of two major revolutions of our time: the circular economy and the Industry 4.0. The project will thus contribute to transform the E&E sector into circular and 4.0, raising new opportunities for end-users (such as their involvement in design or the access to a product as a service) and for social and solidarity economy (conducted by NGOs, like EMAUS, which employ people at risk of social exclusion to repair and prepare WEEE for re-use). The techno-economic, environmental and social viability of the new CEBMs will be validated through demonstrations dealing with four target products belonging to different EEE categories: large household appliances, IT equipment, telecommunications equipment, and consumer equipment. These EEE categories together account for 77% of WEEE collected in the EU.

The project will result in an estimated economic benefit of 57.03 M€ over the period 2022-2026, which taking into account the project budget (8.03 M€) yields a ROI ~ 7.1. Specifically, the project will generate in the mid-term an economic benefit of 28.4 M€/year, with about 355 green employees (including direct and indirect jobs) and a total reduction of 2,620 tonnes CO₂ eq/year.

C-SERVEES (10 Member States and Turkey, including industry, end-users and researchers, ensures that strategic, design and implementation decisions) will be in line with business realities and set the foundation for realistic market-ready solutions.

HOUSEFUL		776708
Title: Innovative circular solutions and services for new business opportunities in the EU housing sector		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 5/1/2018	Duration: 54 months	Unit: EASME/B/02
Total costs (€): 8.535.247,50	EU requested grant (€): 6.997.228,50	

Free keywords: *Social innovation, systemic service, housing sector, construction, water re-use, bio-waste treatment, biogas production, wastewater, co-creation, circular economy business opportunities*

Abstract:

The housing sector is a major contributor to current global problems of resource depletion and climate change, representing one of the most important consuming sectors at EU level: 50% of all extracted materials, 40% of final energy consumption, 33% of water consumption and 33% of all produced waste. The lock-in to the linear business models of today is causing many environmental problems and is one of the major barriers in transition towards a circular economy. HOUSEFUL project proposes an innovative paradigm shift towards a circular economy for the housing sector by demonstrating the feasibility of an integrated systemic service composed of 11 circular solutions. HOUSEFUL will introduce solutions to become more resource efficient throughout the lifecycle of a building, taking into account an integrated circular approach where energy, materials, waste and water aspects are considered. This approach fosters new forms of co-creation, increasing the collaboration among stakeholders of the housing value chain to develop new circular solutions and services. HOUSEFUL concept will be large scale demonstrated at 4 demo-sites in Austria and Spain, adapting the concept to different scenarios, including in social housing buildings. HOUSEFUL solutions will be evaluated from an environmental (Life Cycle Assessment), economic (Life Cycle Cost) and social (Social Assessment) point of view. The results obtained will be used to define an integrated HOUSEFUL service which will be driven and promoted through a SaaS (Software as a Service). The SaaS will integrate a Circularity Tool to quantify the circularity level of buildings and will include different circular solutions to be offered as services, encouraging the housing value chain to redesign traditional business models towards circular ones. 10 EU Follower buildings will be engaged with the support of a Collaborative Community of Housing Experts to replicate HOUSEFUL results and maximise the impact of the project.

ReCiPSS		776577
Title: Resource-efficient Circular Product-Service Systems		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-01-2016-2017	Type of Action: IA
Project start date: 6/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 8.833.302,10	EU requested grant (€): 6.837.122,50	

Free keywords: *white goods, washing machines, automotive parts, product-service systems*

Abstract:

The overall goal of ReCiPSS is to explore success factors for circular manufacturing systems in two cases where OEMs have different levels control over their value chains: one case with full control, and one case with partial control. The project will achieve this goal through two industry-driven large-scale demonstrators of circular manufacturing systems in two key industries

The white goods demonstrator relates to a tightly connected value chain and will demonstrate the successful implementation of circular manufacturing systems where the OEM (Gorenje) is in full control of the entire product throughout all stages (i.e. design, manufacturing, forward supply chain, customer use phase, reverse supply chain, recovery activities and re-distribution). The demonstrator will develop and implement a pay-per-wash offering for 300 washing machines, using co-creation methods. Each washing machine will be refurbished twice and serve over 3 life cycles of 5 years. The generalization of this new business model should lead to additional revenues of €150M per year.

The automotive spare parts demonstrator relates to a more complex value chain where the OEM (Bosch) does not have full control of the product throughout all stages. In order to demonstrate how third-party automotive remanufacturers can be effectively integrated in circular supply chains while keeping their independence from the OEM, the demonstrator will streamline the reverse logistics flow for 80,000 cores, enabling aftermarket stakeholders to close the loop by using a single service provider for reverse logistics. Cores will be identified and evaluated only once and then directly shipped to the final destination (remanufacturer), allowing cost savings of €5 per core i.e. potential savings of €175M per year if generalized throughout the industry. Co-creation workshops with stakeholders will ensure that the way the used cores are identified and transported is optimally aligned with the needs of all parties involved.

HYDROUSA		776643
Title: Demonstration of water loops with innovative regenerative business models for the Mediterranean region		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-02-2016-2017	Type of Action: IA
Project start date: 7/1/2018	Duration: 54 months	Unit: EASME/B/02
Total costs (€): 12.015.448,75	EU requested grant (€): 9.958.706,88	

Free keywords: *Closing water loops*

Abstract:

HYDROUSA will provide innovative, regenerative and circular solutions for (1) nature-based water management of Mediterranean coastal areas, closing water loops; (2) nutrient management, boosting the agricultural and energy profile; and (3) local economies, based on circular value chains. The services provided lead to a win-win-win situation for the economy, environment and community within the water-energy-food-employment nexus.

HYDROUSA water loops will include water from non-conventional sources including wastewater, rainwater, seawater, groundwater and vapour water, all resulting in recovered and marketable products. HYDROUSA will demonstrate at large scale the feasibility and sustainability of innovative, low-cost water treatment technologies to recover freshwater, nutrients and energy from wastewater, salt and freshwater from seawater, and freshwater from atmospheric water vapour. Water conservation solutions including aquifer storage and sustainable agricultural practices including fertigation will be applied. The solutions will be demonstrated on 3 major touristic islands in Greece. Detailed technical and financial deployment plans will be established for replication in additional 25 locations worldwide. Through the on-site water loops of HYDROUSA, complex supply chains for resource recovery are not required, as producers are directly involved as consumers of derived products. HYDROUSA will combine traditional skilled workmanship with modern ICT integration in beautiful and smart automation systems. HYDROUSA will revolutionise water value chains in Mediterranean areas and beyond, from water abstraction to sewage treatment and reuse. The proposed HYDROUSA solutions show massive potential to change the way humans interact with water, food and energy.

NextGen		776541
Title: Towards a next generation of water systems and services for the circular economy.		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-02-2016-2017	Type of Action: IA
Project start date: 7/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 11.389.106,04	EU requested grant (€): 9.965.230,51	

Free keywords: *Circular water systems; Water reuse; energy recovery; materials recycling; large scale demonstration; business models; Energy recovery; Knowledge co-creation; Marketplace; Evidence Base*

Abstract:

The NextGen initiative will evaluate and champion innovative and transformational circular economy solutions and systems that challenge embedded thinking and practices around resource use in the water sector. We will produce new understandings to underpin the exploitation of techniques and technologies that enhance our ability to recover, refine, reuse, repurpose, capture value from, and extend the use-life of, an ever-increasing range of resources and products, thereby projecting the European water and allied sectors as global circular economy pioneers. NextGen will demonstrate innovative technological, business and governance solutions for water in the circular economy in ten high-profile, large-scale, demonstration cases across Europe, and we will develop the necessary approaches, tools and partnerships, to transfer and upscale.

The circular economy transition to be driven by NextGen encompasses a wide range of water-embedded resources: water itself (reuse at multiple scales supported by nature-based storage, optimal management strategies, advanced treatment technologies, engineered ecosystems and compact/mobile/scalable systems); energy (combined water-energy management, treatment plants as energy factories, water-enabled heat transfer, storage and recovery for allied industries and commercial sectors) and materials (nutrient mining and reuse, manufacturing new products from waste streams, regenerating and repurposing membranes to reduce water reuse costs, and producing activated carbon from sludge to minimise costs of micro-pollutant removal).

The project mobilises a strong partnership of water companies, industry, specialised SMEs, applied research institutes, technology platforms, city and regional authorities and builds on an impressive portfolio of past research and innovation projects, leveraging multiple European and global networks guaranteeing real impact.

Project O		776816
Title: Project Ô: demonstration of planning and technology tools for a circular, integrated and symbiotic use of water		
Call Id: H2020-CIRC-2017TwoStage	Topic: CIRC-02-2016-2017	Type of Action: IA
Project start date: 6/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 10.692.937,68	EU requested grant (€): 9.261.272,38	

Free keywords: *Water Footprint; Advanced Oxidation Processes; Nanoadsorption; Modularisation; Demosntration activities; Industrial Symbiosis; Textile finishing; Food processing; Agriculture; Aquaculture*

Abstract:

Project Ô intends to demonstrate approaches and technologies to drive an integrated and symbiotic use of water within a specific area, putting together the needs of different users and waste water producers, involving regulators, service providers, civil society, industry and agriculture. The project seeks to apply the pillars of integrated water management (IWM) as a model for “water planning” (akin to spatial planning) and to demonstrate low cost, modular technologies that can be easily retrofitted into any water management infrastructure at district/plant level, hence enabling even small communities and SMEs to implement virtuous practices. Technologies and planning instruments complement each other as the first make possible the second and the latter can provide as example or even prescribe the former (and similar technologies allowing virtuous water use practices). Indeed the technologies support the regulators in implementing policy instruments, as foreseen by IWM, for convincing stakeholders (like developers and industry) to implement water efficiency strategies and could include instruments for e.g. rewarding virtuous behaviours (for example: advantageous water tariffs), planning regulations that award planning consent more swiftly or even prescribe the use of water from alternative sources (including recycling). Project Ô has in summary the overall objective of providing stakeholders (everybody using or regulating the use of water in an area) with a toolkit that enables them to plan the use of and utilise the resource water whatever its history and provenance, obtaining significant energy savings in terms of avoided treatment of water and waste water and release of pressure (quantity abstracted and pollution released) over green water sources. This overall objective will be demonstrated in up to four sites each in different Countries of Europe and in Israel, involving industries, aquaculture and agriculture as well as local authorities of different sizes.

55GREEN INSTRUCT		723825
Title: Green Integrated Structural Elements for Retrofitting and New Construction of Buildings		
Call Id: H2020-EEB-2016	Topic: EEB-04-2016	Type of Action: RIA
Project start date: 10/1/2016	Duration: 42 months	Unit: RTD/D/02
Total costs (€): 4.996.626,25	EU requested grant (€): 4.996.626,25	

Free keywords: *BIM, CFD, Construction & demolition waste, Energy efficient buildings, Extrusion, Geopolymer, Green wall, Magnesium oxychloride cement, Phase-change material, Polyurethane, Prefabricate, Rheology*

Abstract:

The Green INSTRUCT project will develop a prefabricated modular structural building block that is superior to conventional precast reinforced concrete panels by virtue of its reduced weight, improved acoustic and thermal performance and multiple functionalities. The Green INSTRUCT block consists of over 70% of CDW in weight.

The Green INSTRUCT project will: (i) achieve sustainability and cost savings through CDW sourced materials and C2C, (ii) develop efficient, robust, eco-friendly and replicable processes, (iii) to enable novel cost efficient products and new supply chains, (iv) develop a building block that renders refurbished or new buildings safe and energy efficient and (v) safeguard a comfortable, healthy and productive environment. They can be achieved by defining the structural, thermal and acoustic performance of our final product to be competitive to similar products in the market. The types and sources of CDW are carefully identified, selected and processed while the supply chain from the sources, processing, fabrication units to assembly site of the whole modular panel will be optimized. The project is guided by a holistic view through building information modelling and optimal overall performance. This includes considering the life cycle analysis, weight, structural performance, thermal and acoustic insulation, connectivity among modular panels and other structural/non-structural components as well as the compatibility of different internal parts of the each modular panel. In order to homogenize the production process, all individual elements are fabricated by extrusion which is a proven cost effective, reliable, scalable and high yield manufacturing technique. The concept, viability and performance of developed modular panels will be verified and demonstrated in two field trials in test cells.

InnoWEE		723916
Title: Innovative pre-fabricated components including different waste construction materials reducing building energy and minimising environmental impacts		
Call Id: H2020-EEB-2016	Topic: EEB-04-2016	Type of Action: RIA
Project start date: 10/1/2016	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 3.361.000,00	EU requested grant (€): 3.361.000,00	

Free keywords: *Construction and Demolition Waste, prefabricated panels, geopolymers, insulating panel, radiating panel*

Abstract:

The basic idea is to embed the waste from building demolition (fragmented bricks, fragmented plaster or concrete, fragmented glasses, machined wood from windows frame or from wood beams after demolition etc.) in a geopolymer matrix to produce prefabricated panels for different use.

The main objective of InnoWEE is in fact the development of an optimized reuse of Construction and Demolition Waste (CDW) materials producing high add value prefabricated insulating and radiating panels to be used in energy efficient buildings.

The proposal is based on:

- 1) Recovery, selection and disassembling of CDW that will be characterized and eventually treated to yield suitable raw materials to be used for production of prefabricated components.
- 2) Development of new high performance prefabricated insulating geopolymeric panels for building walls envelopes and radiating panels for indoor wall and ceilings with low environmental impact, low embodied energy, low CO2 emissions, high thermal performance. Panels will be fabricated recycling cement, bricks, mortars, glass and wood reaching at least 30% of CDW.
- 3) To install the panels in demo sites characterized by different climate to evaluate their performance in terms of reducing energy use and minimizing environmental impacts.
- 4) To use an integrated design process and a holistic approach for the whole life cycle of the materials and components and produce a material that is cost effective, competitive, robust, reliable and low maintenance.
- 5) To create practical and sustainable building solutions that are easy to integrate into building designs, easy to install, take in consideration the needs of the stakeholders that strongly influence the market, and have been tested to meet all the current standards.

RE4		723583
Title: REuse and REcycling of CDW materials and structures in energy efficient pREfabricated elements for building REfurbishment and construction		
Call Id: H2020-EEB-2016	Topic: EEB-04-2016	Type of Action: RIA
Project start date: 9/1/2016	Duration: 42 months	Unit: RTD/D/02
Total costs (€): 5.117.523,75	EU requested grant (€): 4.808.148,75	

Free keywords: *Construction and demolition*

Abstract:

The overall goal of the RE4-Project is to promote new technological solutions for the design and development of structural and non-structural pre-fabricated elements with high degree of recycled materials and reused structures from partial or total demolition of buildings. The developed technology will aim at energy efficient new construction and refurbishment, thus minimizing environmental impacts. The RE4-Project targets the demonstration of suitable design concepts and building elements produced from CDW in an industrial environment, considering perspective issues for the market uptake of the developed solutions. The technical activities will be supported by LCA and LCC analyses, certification and standardization procedures, demonstration activities, professional training, dissemination, commercialisation and exploitation strategy definition, business modelling and business plans.

The overarching purpose is to develop a RE4-prefabricated energy-efficient building concept that can be easily assembled and disassembled for future reuse, containing up to 65% in weight of recycled materials from CDW (ranging from 50% for the medium replacement of the mineral fraction, up to 65% for insulating panels and concrete products with medium mineral replacement coupled with the geopolymers binder). The reusable structures will range from 15-20% for existing buildings to 80-90% for the RE4-prefabricated building concept.

VEEP		723582
Title: Cost-Effective Recycling of CDW in High Added Value Energy Efficient Prefabricated Concrete Components for Massive Retrofitting of our Built Environment		
Call Id: H2020-EEB-2016	Topic: EEB-04-2016	Type of Action: RIA
Project start date: 10/1/2016	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 4.929.753,75	EU requested grant (€): 4.929.753,75	

Free keywords: *Circular economy, Construction and Demolition waste recycling, Insulated wall panels*

Abstract:

Around 461 million ton/year of C&DW are generated in EU28. Recent studies on the characterization of C&DW samples at European level revealed a predominant fraction of concrete (52% average). Over the last years, novel technology has been developed aiming to guarantee high quality recycled concrete aggregates for use in new concrete, thereby closing the concrete loop. The most advanced concrete recycling technologies currently produce coarse (>4mm) recycled concrete aggregates by removing cement paste from the surface of the aggregates. However, the fine (0-4 mm) fraction, ca. 40% of the concrete waste, still faces technical barriers to be incorporated into new concrete and consequently, is often down-cycled. At the other extreme, there are minor (e.g. glass) and emerging (e.g. mineral wool) C&DW materials, currently accounting for 0.7% of the total, but revealing growing rates as consequence of European regulations. Those emerging C&DW streams have not yet found technological and business solutions, being mostly landfilled. On the other hand, concrete is the most widely used material in building, with a growing trend towards prefabrication. The European precast concrete sector faces diverse needs for resource efficiency improvement (reduction in natural resource consumption and metabolization of waste materials, reduction in carbon footprint and embodied energy, design for reuse, increase in process efficiency and waste minimization, lighter solutions, enhanced thermal performance through novel cost-effective insulating materials). Aiming at facing these challenges, VEEP main objective is to eco-design, develop and demonstrate new cost-effective technological solutions that will lead to novel closed-loop circular approaches for C&DW recycling into novel multilayer precast concrete elements (for both new buildings and refurbishment) incorporating new concretes as well as superinsulation material produced by using at least 75% (by weight) of C&DW recycled materials.

PLUG-N-HARVEST		768735
Title: PLUG-N-play passive and active multi-modal energy HARVESTing systems, circular economy by design, with high replicability for Self-sufficient Districts Near-Zero Buildings		
Call Id: H2020-EEB-2017	Topic: EEB-07-2017	Type of Action: IA
Project start date: 9/1/2017	Duration: 51 months	Unit: RTD/D/02
Total costs (€): 6.896.147,50	EU requested grant (€): 5.993.466,25	

Free keywords: *Adaptive dynamic building envelopes, building control, energy management/harvesting in building and district level*

Abstract:

Conventional Retrofitting (CR) can result in high energy use reductions at the expense of high installation costs and, usually, without being able to directly perform harvesting from Renewable Energy Sources (RES). Building Automation (BA) systems, as compared to CR, can result in medium energy use reductions and in low or medium harvesting from RES at the expense of medium installation costs and medium operational costs. Recently, the concept of Adaptable/Dynamic Building Envelopes (ADBE) - such as Multifunctional Façade Modules - has been proposed towards overcoming many of the shortcomings of CR and BA. ADBE systems can result in high energy use reductions and high harvesting from RES at the expense of medium-to-high installation costs and medium operational costs. The main strategic goal of the PLUG-N-HARVEST proposal is to design, develop, demonstrate and exploit a new modular, plug-n-play concept/product for ADBE - deployable to both residential and non-residential buildings - which is able to provide high (maximum possible) energy use reductions and high (maximum possible) energy harvesting from RES both at the single-building and the district scale while requiring medium-to-low installation costs and almost-zero operational costs. Moreover, by appropriately exploiting its attributes, the PLUG-N-HARVEST system will be designed and implemented considering circular economy principles, which will allow implementing new business models based on leasing and renting modes and, by this, leaving the door open to massive implementations. Four different multi-building Pilots – in Germany, Spain, Greece and the U.K. - will be used for demonstrating the use of the integrated PLUG-N-HARVEST system in full-scale, on a 24/7 basis and for a long period. The Pilots involve buildings with all different kinds of energetic, thermal and occupants' interactions, home occupants of highly diverse behaviour and background and include both residential and non-residential buildings.

SWAMP		777112
Title: Smart Water Management Platform		
Call Id: H2020-EUB-2017	Topic: EUB-02-2017	Type of Action: RIA
Project start date: 11/1/2017	Duration: 36 months	Unit: CNECT/E/04
Total costs (€): 1.478.090,00	EU requested grant (€): 1.478.090,00	

Free keywords: *Internet of Things, Water Management, Autonomous devices*

Abstract:

The SWAMP project develops IoT based methods and approaches for smart water management in precision irrigation domain, and pilots them in Italy, Spain, and Brazil (2).

Water is vital for ensuring food security to the world's population, and agriculture is the biggest consumer amounting for 70% of freshwater. The water wastages are caused mainly by leakages in distribution and irrigation systems, and in the field application methods. The most common technique, surface irrigation wastes a high percentage of the water by wetting areas where no plants benefit from it. Localized irrigation can use water more efficiently and effectively, avoiding both under-irrigation and over-irrigation. However, in an attempt to avoid under-irrigation, farmers feed more water than is needed resulting not only to productivity losses, but also water is wasted. Therefore, technology should be developed and deployed for sensing the level of water needed by the plantation and for flowing the water to places where and when needed. The SWAMP project addresses these issues by use of the Internet of Things (IoT), data analytics, autonomous devices and other related technologies.

The challenges addressed by SWAMP project are following: 1) Reducing effort in software development for IoT-based smart applications. 2) Automating advanced platforms and integrating different technologies and components. 3) The integration of heterogeneous and advanced sensors, particularly flying sensors (drones) providing precision in the water supply for irrigation. 4) The use of a Software Platform together with technologies such as IoT, Big Data, Cloud/Fog and drones for the deployment of pilot applications for smart water management. 5) Proposing, testing and validating new business models for using IoT in smart water management settings. 6) Technological components must be flexible and adaptable enough in order to adapt to different contexts and to be replicable to different locations and contexts.

BioDie2020		737802
Title: Demonstration of new, challenging and high FFA waste oil and fat feedstock in biodiesel process with improved costs, conversion and high fuel quality		
Call Id: H2020-FTIPilot-2016-1	Topic: FTIPilot-01-2016	Type of Action: IA
Project start date: 12/1/2016	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.825.586,25	EU requested grant (€): 2.119.087,01	

Free keywords: *biodiesel, demonstration, waste, feedstock, oils and fats, FOG, high FFA, conversion, energy efficiency, fuel quality, closed loop business model, commercialisation, biofuel, circular economy,*

Abstract:

BioDie2020 will recover unconventional, degraded waste oils & fats, notably from Water Company infrastructures, and demonstrate the conversion of these wastes as a sustainable feedstock for biodiesel production. This break-through & beneficial pathway will maximise the use of waste oils & fats on a large scale for the 1st time on the biodiesel market, leading to lower transport carbon emissions. BioDie2020 FTI combines 5 top EU players in an agile & direct value-chain, working on this industry-wide milestone which will improve costs & conversion, achieving high fuel quality. Project coordinator Argent (UK, INDUS), a forward-thinking biofuel leader, will thus demonstrate biodiesel production in a closed-loop business model. 2 key process improvements will go from TRL6 to 7 at Argent's biodiesel plant (site at Stanlow, UK): i) biofuel technology provider BDI (Austria, SME) will deliver Sulphur reduction in the biodiesel process; ii) microwave technology provider LJMU (UK, Uni) will integrate their bespoke microwave unit to improve pre-treatment of challenging feedstocks. Stagecoach (UK, INDUS), a leading EU captive bus fleet service provider, will perform field trials of final biodiesel. Quantis (France, SME), an ambitious EU SME will perform LCA & LCC analysis of the overall process, ensuring sustainability objectives are achieved. BioDie2020 partners own IP on each technical brick, giving pathways to market & business opportunities. Argent will save ~€5 million/year on feedstock costs, improving ROIC from 12% to 18% by 2019. Demo of BDI's new process will confer a competitive edge on the retrofit market, giving them a ~25% sales increase by 2020. BioDie2020 will deliver 17 direct jobs and ~100 indirect jobs created or sustained in the EU by 2020. Argent's ultimate aim is to invest in biofuel deployment via this reproducible waste-to-biodiesel plant (embedded in a closed-loop business model) with market replication by 2020 via commissioning or acquisition & retrofit.

BIOMULCH		737741
Title: Integrated solution for innovative biodegradation control of agricultural plastic mulches		
Call Id: H2020-FTIPilot-2016-1	Topic: FTIPilot-01-2016	Type of Action: IA
Project start date: 12/1/2016	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.976.993,75	EU requested grant (€): 1.613.667,50	

Free keywords: *biodegradation, bioplastic, mulch-films, agriculture, plasticulture, resource-efficiency, soil-protection.*

Abstract:

Nowadays, mulching is an essential technique used in agriculture to satisfy the worldwide growing demand for agricultural products. It consists of covering the soil surface in order to modify climate conditions and favouring the crops. Conventional mulch is made of polyethylene plastic with important limitations: the plastic has to be removed after the harvest (time consuming, expensive & 10-20% remaining at soil) and it is difficult to be recycled due to its high contamination by ground, stones or waste, being the most part (45.2%) placed in landfills. Therefore, plastic mulches cause serious problems of environmental and economic concerns. Other developed mulch alternatives are not sufficient: oxodegradable (based on polyethylene, are a risk of accumulation in environment) and biodegradable (do not guarantee total degradation under uncontrolled conditions and they are three times more expensive).

There is a market demand to find alternatives. Our innovative product, BIOMULCH, will be a biobased mulch with controlled biodegradation (independent from temperature, humidity and soil conditions) and being cost competitive (€1,100/ha respect to €3,000/ha of polyethylene, €2,078/ha of oxodegradable and €2,150/ha of biodegradable), covering the current agriculture market needs. BIOMULCH will be commercialised as a kit and will guarantee the farmers the complete mulch film biodegradation when is exactly required by them. The mulch film will be fully degraded in a 30-40 days period with our innovative mulching technique.

As a result, it is expected an important growth for consortium companies, obtaining a total turnover above €354M in 2018-2022. Also it is expected an important benefit for UE, above 759M euros by 2022, derived from savings for farmers and waste savings. BIOMULCH counts already with letters of support of prestigious companies which are very interested in its business model.

NIRSort		760642
Title: Development and Market Replication of novel NIR-transparent polymer colourants to replace carbon black, and allow the sorting of black and coloured polymers from mixed waste streams		
Call Id: H2020-FTIPilot-2016-1	Topic: FTIPilot-01-2016	Type of Action: IA
Project start date: 6/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.474.375,00	EU requested grant (€): 1.005.762,50	

Free keywords: *near infra-red sorting black coloured plastic recycling pigment carbon black*

Abstract:

Currently, around 25 million tonnes of plastic waste is created each year across Europe, primarily from three sources – consumer packaging, WEEE disposal and vehicle dismantling. The requirements for sorting and segregation of polymer types within waste streams are intensifying - more stringent targets for recycling are forcing recyclers to segregate more difficult materials that they could formerly lose as scrap; increased volumes and high labour costs force the industry to reduce manual segregation and increase shredding; this requires more automation of sorting facilities; producer regulations increase the responsibility for the supply side to ensure identifiability of the materials they provide, through to the point of recycling. Automated sorting operations are all based on Near Infra-Red spectroscopy, which can rapidly recognize the NIR signature of different polymers, and activate sorting equipment to segregate the polymer types. NIR is the only technique that is fast enough, powerful enough and robust enough to be usable on a recycling line. BUT the NIR technique fails to “see” black materials and some colours, because the carbon black pigment used also absorbs the NIR beam and prevents the reflection of the polymer’s characteristic spectrum back to the sensor. This project, based on our successful previous work, will develop a range of “NIR transparent” alternatives to carbon black, to enable the NIR sorting operations to segregate black and coloured plastic where they have been unable to before, to a purity that will be usable in high value recycled engineering polymers. We will base our market entry strategy on a “spiral economy” approach, where the packaging industry uses virgin detectable polymer to make their packaging, and this, with its product life of under one year, is recycled into high quality engineering plastics for the manufacturers of automotive and consumer durables to use without waiting for returns from their own end-of-life materials.

SILENT RUBBER PAVE		760564
Title: Accelerate the commercialization of RARX technology process in the global markets of ECOLOGICALLY FRIENDLY SILENT RUBBER PAVEMENTS		
Call Id: H2020-FTIPilot-2016-1	Topic: FTIPilot-01-2016	Type of Action: IA
Project start date: 4/1/2017	Duration: 36 months	Unit: EASME/A/02
Total costs (€): 2.995.161,25	EU requested grant (€): 2.096.612,88	

Free keywords: *Rubber pavements, crumb rubber, reuse of the end-of-life tires*

Abstract:

Paving industry sector faces nowadays different challenges as the need for less maintenance, more silent and more environmental friendly pavements. The use of crumb rubber (CR) derived from end-of-life tires (ELTs) in bituminous mixtures replies to all these needs however its wide implementation has not been extended due mainly of the following barriers that prevent its wide implementation are:

- i. A crumb rubber alone cannot be placed directly into the mixes (dry method) because it will swell and absorb the bitumen causing raveling in the roads
- ii. The wet method works well but requires that every contractor buys expensive equipment
- iii. If crumb rubber is used in terminal blends it is essentially a waste of product because over time it becomes all digested

The solution proposed in this initiative to overcome these barriers is the use of use of reacted and activated rubber that it can be used directly into the plugmill of a contractor's plant. The SILENT RUBBER PAVEMENTS project main goal is to market uptake and achieve a wider deployment of the RARX technology, based in a patent of CONSULALPV, that has the best of both methods:

- Easy to apply and use as in the "dry method"
- Performance and cost effectiveness beyond that of the "wet method"

To enter in the global market, two large companies (Valoriza SM- Composan) have made an agreement with a specialized SME (Consulpav, a first industrial applicant) who has developed and patented the RARX technology to exploit at European level. SACYR, a multinational pavement construction company present in more than 20 countries, will be the responsible for the pilot construction in different climate and evaluation. Our distributor in Italy, FHL group will assist the consortia in internationalizing our commercialization strategy.

IMAGINE		731761
Title: Robots Understanding Their Actions by Imagining Their Effects		
Call Id: H2020-ICT-2016-1	Topic: ICT-26-2016	Type of Action: RIA
Project start date: 1/1/2017	Duration: 48 months	Unit: CNECT/A/01
Total costs (€): 3.797.050,00	EU requested grant (€): 3.797.050,00	

Free keywords:**Abstract:**

Today's robots are good at executing programmed motions, but they do not understand their actions in the sense that they could automatically generalize them to novel situations or recover from failures. IMAGINE seeks to enable robots to understand the structure of their environment and how it is affected by its actions. "Understanding" here means the ability of the robot (a) to determine the applicability of an action along with parameters to achieve the desired effect, and (b) to discern to what extent an action succeeded, and to infer possible causes of failure and generate recovery actions.

The core functional element is a generative model based on an association engine and a physics simulator. "Understanding" is given by the robot's ability to predict the effects of its actions, before and during their execution. This allows the robot to choose actions and parameters based on their simulated performance, and to monitor their progress by comparing observed to simulated behavior.

This scientific objective is pursued in the context of recycling of electromechanical appliances. Current recycling practices do not automate disassembly, which exposes humans to hazardous materials, encourages illegal disposal, and creates significant threats to environment and health, often in third countries. IMAGINE will develop a TRL-5 prototype that can autonomously disassemble prototypical classes of devices, generate and execute disassembly actions for unseen instances of similar devices, and recover from certain failures. For robotic disassembly, IMAGINE will develop a multi-functional gripper capable of multiple types of manipulation without tool changes.

IMAGINE raises the ability level of robotic systems in core areas of the work programme, including adaptability, manipulation, perception, decisional autonomy, and cognitive ability. Since only one-third of EU e-waste is currently recovered, IMAGINE addresses an area of high economical and ecological impact.

AQUARIUS		731465
Title: BROADBAND TUNABLE QCL BASED SENSOR FOR ONLINE AND INLINE DETECTION OF CONTAMINANTS IN WATER		
Call Id: H2020-ICT-2016-1	Topic: ICT-29-2016	Type of Action: RIA
Project start date: 1/1/2017	Duration: 36 months	Unit: CNECT/A/04
Total costs (€): 3.891.263,75	EU requested grant (€): 3.891.263,75	

Free keywords: *quantum cascade laser, external cavity, μ EC-QCL, MOEMS, waveguide, infrared spectroscopy, hydrocarbon monitoring, water sensing, waste water, drinking water, online, inline, Microoptics, Photonics*

Abstract:

AQUARIUS proposes disruptive improvements in laser based water sensing employing MIR quantum cascade lasers (QCLs). It is motivated by

- i) the EC Water Framework Directive (2000/60/EC) where hydrocarbons are identified as priority hazardous substances,
- ii) the industrial and regulatory need for fast and continuous detection of contaminants and
- iii) the current state-of-the-art of measuring these substances using QCLs as defined by project partner QuantaRed Technologies and described in ASTM D7678.

AQUARIUS will improve this offline method by developing pervasive online and inline sensing strategies based on advanced photonic structures. For improved specificity a broadly (200 cm⁻¹) tunable MOEMS based μ EC-QCL source will be developed into a core spectrometer. High power, mode-hop free operation and unprecedentedly fast data acquisition (1000 spectra/s) will assure high S/N-ratios and thus high sensitivity. The system for online sensing (LOD: 1ppm) is based on automated liquid-liquid extraction and will be validated by project partner OMV for process and waste water monitoring. It will also be tested for identifying different sources of contaminations by project partner KWR in their water treatment and purification facilities. The system for inline sensing will be based on integrated optical circuits (IOC) including waveguides for evanescent wave sensing. Switching between individual waveguides of the IOC will enable quasi-simultaneous sample and background measurement and thus assure excellent long-term stability. By enrichment of analytes in polymer layers LODs as required for drinking (0.5ppb) and groundwater (50ppb) will be reached.

AQUARIUS covers the supply chain from research institutes to system integrator and end users. It will push the online system from TRL 3 to 7 and the inline system from TRL 2 to 4 and thus reinforce the industrial leadership of the project partners regarding QCL based liquid sensing and photonic components (source, detector and IOCs).

PTwist		780121
Title: PTwist: An open platform for plastics lifecycle awareness, monetization, and sustainable innovation		
Call Id: H2020-ICT-2017-1	Topic: ICT-11-2017	Type of Action: IA
Project start date: 1/1/2018	Duration: 24 months	Unit: CNECT/E/03
Total costs (€): 2.178.353,75	EU requested grant (€): 1.824.683,38	

Free keywords: *blockchain technologies, gamification, plastics reuse inventions, environment, circular economy, market innovation, communities empowerment, rewarding mechanisms*

Abstract:

PTwist aims to design, deploy, and validate an open platform which will twist plastic reuse practices, by boosting citizens awareness, circular economy practices, and sustainable innovation inline with the new plastics economy vision. This will be achieved by offering : a) crowdsourcing tools to enable generation of an evolving plastic materials reuse taxonomy and an open plastic reuse machinery designs repository; b) a monetary system of PCoins and PWallets maintained by a blockchain based architecture which will safeguard trusted plastics reuse transactions among citizens and inventors (such as fablabs); c) a citizens and communities rewarding and engagement experiences by interactive and collaborative gamification which embeds Pcoins crediting; d) a virtual marketplace for exhibiting and commercializing of PTwist inspired plastics reuse products monetized in the proposed PCoins unit. Cutting edge gamification, analytics, and circular economy mechanisms will be integrated under an open platform to be validated and stress tested under a common use cases methodology. Three local and globally synchronized pilots will intensify all stakeholders (citizens communities, inventors, innovators, and entrepreneurs) involvement and engagement, with emphasis on the social gains and sustainability potential. PTwist will largely impact : citizens and grassroots groups co-creation, innovative and trusted collaboration and knowledge transfer by increasing all stakeholders awareness; plastics as an asset potential due to increasing its circular economy re-entering; and blockchain based novel routes to markets. Innovation activities in PTwist will be based upon existing open source, blockchain, gaming, crowdsourcing components, open data solutions and developments to the largest possible extent.

C-VoUCHER		777773
Title: Circularize ValUe CHains across European Regional Innovation Strategies		
Call Id: H2020-INNOSUP-01-2017-twoStage	Topic: INNOSUP-01-2016-2017	Type of Action: IA
Project start date: 4/1/2018	Duration: 36 months	Unit: EASME/A/01
Total costs (€): 5.210.220,64	EU requested grant (€): 4.999.393,50	

Free keywords: *circular economy, disruptive SMEs, key enabling technologies, vouchers, circularization, rooted industries, adoptive SMEs, sustainability,*

Abstract:

C-VoUCHER aims to develop new circular (cradle to cradle) value chains, disrupting traditional linear (cradle to waste) business models by means of cross-fertilization with Design Thinking experts and Circular Disruptors.

This approach is empowered by 6 Regional entities (2 leading ones from SE and DK and 4 learning ones from ES, FR, PL and RO), which together with their 41 clusters representing 5,763 SMEs (linked as 3rd Parties, including 11 gold, 4 silver and 7 bronze label ones) will work, at cross-border level, on embedding circular economy (CE) model in their Smart Specialization Strategies.

C-VoUCHER is the proof-of-concept framework where 24 selected Classic SMEs from traditional industries (Agro-Food, Health, Sea, Textile, and Manufacturing), will be offered an innovative 4-phase Circularity Program to develop 12 Circularity Solutions, to be then introduced in 42 Adopter SMEs with similar challenges. The regional CE Champions will be showcased to create 'school' at Regional Level and beyond. The project will leverage €6M of complementary funding for CE Champions and Adopters (provided by private and public investors). Also, a 'Circular Design Toolkit for Regions' will be produced to mainstream the methodology in the other EU Regions.

The project will be coordinated by FBA, the European leader in Financial Support to Third Parties and supported by BLUMORPHO (Business and LEAN Innovation Accelerator) and Fundingbox Communities (expert in online marketing and community building). Industry actors: MADE (representing manufacturing companies), ARLA (biggest Scandinavian dairy producer), Green Ship of the Future (private partnership working for cleaner maritime industry), Neuca (Polish entity from Health sector), Lifestyle & Design Cluster (specializing in Textiles), will help to define the industry challenges.

C-VoUCHER will demonstrate how Europe can disrupt traditional value chains and become the Europe of entrepreneurial regions.

BRINE MINING		739507
Title: Applying circular economy solutions in industrial wastewater management: request of SME Associate to develop the necessary energy simulation tools for recovery of waste heat from industrial operations		
Call Id: H2020-INNOSUP-02-2016	Topic: INNOSUP-02-2016	Type of Action: CSA
Project start date: 9/1/2017	Duration: 12 months	Unit: EASME/A/01
Total costs (€): 82.000,00	EU requested grant (€): 82.000,00	

Free keywords: *brine; management; waste heat; simulation; energy recovery; circular economy; resource efficiency;*

Abstract:

Global competition for water is increasing and is expected to lead to social, economic, environmental and geo-political

consequences. Desalination provides a promising solution for the water crisis. However, current desalination technologies cause serious environmental impacts, due to the wastewater effluent called "brine". At the same time, this brine contains valuable materials which can, if recovered, create significant value and job opportunities for our economies. BRINE-MINING project aims to develop the 1st Circular Economy Plan for closing the loop of desalination wastewater, by applying an eco-innovative technology developed in previous EU projects in industrial environment, while exploiting waste heat available. The company is commercializing an eco-innovative technology that was demonstrated successfully at pilot scale, within the European project SOL-BRINE (BEST LIFE 2015 ENVIRONMENT project). The research was further advanced through a second EU funding, to elaborate a feasibility study (SME Project No. 674455).

To do so, our company needs expertise in advanced simulation tools that will allow integration of our technology in the industrial environment, by making optimal use of the waste heat available. This is expected to reduce drastically the operating expenditure of the solution provided, achieving competitive prices and thus empowering our unique selling proposition. The ultimate goal will be to recruit a talented researcher in the position of Senior Software Development Engineer, who will be able to apply his expertise in order to realize our innovation potential. This is expected to contribute significantly to the growth of our company, creating approximately 6 new job positions and the possibility to collaborate with the SME Associate on a permanent basis towards our game changing path of making desalination circular.

CRNPE		739775
Title: Chemical Recycling for the New Plastic Economy		
Call Id: H2020-INNOSUP-02-2016	Topic: INNOSUP-02-2016	Type of Action: CSA
Project start date: 10/12/2017	Duration: 12 months	Unit: EASME/A/01
Total costs (€): 78.727,50	EU requested grant (€): 78.727,00	

Free keywords: *plastic waste, plastic, gas filtration, research, waste management, fuel, chemical engineering*

Abstract:

Global production for plastic has grown to over 300Mt/year and rising. However, only 14% of plastic packaging is collected for recycling, and plastic packaging with an economic value of €70-110 billion is lost annually to the economy after just a short use. The vast majority of plastic is still disposed of by incineration or landfill, with in excess of 8Mt leaking into the oceans each year. It is estimated that by 2050 there will be more plastic than fish in the ocean.

Recycling Technologies Ltd. has developed a process that recycles end-of-life mixed plastic waste [MPW] into a commercially valuable hydrocarbon called Plaxx. The technology is capable of processing varied types of MPW. Plaxx produced by the process can be used as a substitute for Heavy Fuel Oil but with the advantage of being very low sulphur.

However, rigid food containers and items such as drinks cartons etc., use laminates of differing polymers. The widespread use of dyes, fillers and other additives, alongside contamination from the contents of the original packaging, presents challenges for our process. Currently, our process is designed to process MPW with low levels of contamination. Capability to process a higher level of contamination through our process opens up markets 2-3 times bigger than at present. Therefore the aim of this project is to further develop the gas filtration system of the technology, and the recruitment of an Associate with the level of expertise to realise this innovation opportunity is therefore essential. During the project, the Associate will research on widely used gas filtration technologies and recommend the ones which are suitable and scalable for our process.

The success of this project underpins RT's vision - to establish a commercially attractive process that will ultimately eliminate landfilling, incineration and the leakage of plastics into the oceans.

Torero		745810
Title: TORrefying wood with Ethanol as a Renewable Output: large-scale demonstration		
Call Id: H2020-LCE-2016-RES-IA	Topic: LCE-19-2016-2017	Type of Action: IA
Project start date: 5/1/2017	Duration: 36 months	Unit: INEA/H/01
Total costs (€): 15.849.490,00	EU requested grant (€): 11.472.915,63	

Free keywords: *torrefied wood biomass feedstock for bioethanol*

Abstract:

Torero will demonstrate a cost-, resource-, and energy-efficient technology concept for producing bioethanol from a wood waste feedstock, fully integrated in a large-scale, industrially functional steel mill:

- Wood waste is converted to biocoal by torrefaction
- Biocoal replaces fossil powdered coal in a steel mill blast furnace
- Carbon monoxide in blast furnace exhaust fumes is microbially fermented to bioethanol
- Material and energy loops of the process are closed to a very large degree

Every steel mill that implements this concept will be able to produce at least 80 million litres of bioethanol per year. This project creates a value chain for wood waste, which currently has no attractive applications. The technology concept is open ended: in the future, stakeholders may replicate the concept with other feedstocks and for producing other types of fuels.

The business case the Torero project will produce a competitive process for non-food feedstock bioethanol production. Compared with the current first generation production based cellulosic bio-ethanol solution the Torero innovation the OPEX of Torero is 1/3 lower with a same CAPEX. This will allow scale up of torrefaction technology when successfully demonstrated.

Most importantly, together with sister project Steelanol, Torero will be the only H2020 project to demonstrate a biofuel production process that is integrated in an existing, fully functional large-scale industrial facility. All other H2020 solutions will need to be newly built if they ever reach full industrial scale. Torero is add-on technology that can be used to upgrade existing facilities of the steel sector, an industry that is actively scouting for technological solutions to make its production processes more sustainable. The consortium consist of full value chain, industry ArcelorMittal and Van Gansewinkel, two expert research organisations Joanneum Research and Chalmers Technical University and torrefaction technology supplier Torr-Coal.

TO-SYN-FUEL		745749
Title: The Demonstration of Waste Biomass to Synthetic Fuels and Green Hydrogen		
Call Id: H2020-LCE-2016-RES-IA	Topic: LCE-19-2016-2017	Type of Action: IA
Project start date: 5/1/2017	Duration: 48 months	Unit: INEA/H/01
Total costs (€): 14.511.922,50	EU requested grant (€): 12.250.528,13	

Free keywords: *Organic Waste, Thermal Conversion, Fuel Upgrading, Hydro De.Oxygenation, Green Hydrogen*

Abstract:

TO-SYN-FUEL will demonstrate the conversion of organic waste biomass (Sewage Sludge) into biofuels. The project implements a new integrated process combining Thermo-Catalytic Reforming (TCR®), with hydrogen separation through pressure swing adsorption (PSA), and hydro deoxygenation (HDO), to produce a fully equivalent gasoline and diesel substitute (compliant with EN228 and EN590 European Standards) and green hydrogen for use in transport . The TO-SYN-FUEL project consortium has undoubtedly brought together the leading researchers, industrial technology providers and renewable energy experts from across Europe, in a combined, committed and dedicated research effort to deliver the overarching ambition. Building and extending from previous framework funding this project is designed to set the benchmark for future sustainable development and growth within Europe and will provide a real example to the rest of the world of how sustainable energy, economic, social and environmental needs can successfully be addressed. This project will be the platform for deployment of a subsequent commercial scale facility. This will be the first of its kind to be built anywhere in the world, processing organic industrial wastes directly into transportation grade biofuels fuels which will be a demonstration showcase for future sustainable investment and economic growth across Europe. This project will mark the first pre-commercial scale deployment of the technology processing up to 2100 tonnes per year of dried sewage sludge into 210,000 litres per year of liquid biofuels and up to 30,000 kg of green hydrogen. The scale up of 100 of such plants installed throughout Europe would be sufficient to convert up to 32 million tonnes per year of organic wastes into sustainable biofuels, contributing towards 35 million tonnes of GHG savings and diversion of organic wastes from landfill. This proposal is responding to the European Innovation Call LCE-19.

Heat-To-Fuel		764675
Title: Biorefinery combining HTL and FT to convert wet and solid organic, industrial wastes into 2nd generation biofuels with highest efficiency		
Call Id: H2020-LCE-2017-RES-CCS-RIA	Topic: LCE-08-2016-2017	Type of Action: RIA
Project start date: 9/1/2017	Duration: 48 months	Unit: INEA/H/01
Total costs (€): 5.896.987,50	EU requested grant (€): 5.896.987,50	

Free keywords:**Abstract:**

Heat-to-Fuel will deliver the next generation of biofuel production technologies towards the decarbonisation of the transportation sector. Heat-to-fuel will achieve competitive prices for biofuel technologies (<1€/l) while delivering higher fuel qualities and significantly reduced life-cycle GHG reductions. Heat-to-fuel will result in increased Energy production savings (>20%) and enhanced EU's energy security by the use of local feedstocks which in turn ensured local jobs are preserved and increased. The benefit of combining technologies like in Heat-to-Fuel is, that the drawbacks of the single technologies are balanced. FT and APR are promising technologies for the efficient production of 2nd generation fuels. But currently the economic border conditions don't allow the implementation, similar to many other biofuel technologies. The radical innovation of combining an APR with a FT reactor is the basis to overcome this barrier. The large organic wastes (from HTL or other streams) can be conveniently treated with APR to produce H₂. Both dry and wet organic wastes can be integrated, with mutual advantages, i.e. steam production for gasification, HTL and APR preheating; FT heat cooling without external utilities. Using the synergies between these technologies maximizes the total process efficiency. Heat-to-fuel aims will be met thanks to the diversification of the feedstock for biofuels production, reducing the supply costs and upgrading the efficiencies of promising and flexible conversion.

BIO4A		789562
Title: Advanced sustainable BIOfuels for Aviation		
Call Id: H2020-LCE-2017-RES-IA	Topic: LCE-20-2016-2017	Type of Action: IA
Project start date: 5/1/2018	Duration: 48 months	Unit: INEA/H/01
Total costs (€): 16.860.911,25	EU requested grant (€): 10.002.520,13	

Free keywords: *Biojet, aviation, sustainable alternative fuels, GHGs, green aviation, targets, production capacity*

Abstract:

Decarbonising & reducing aviation dependence on fossil fuel requires biofuels. BIO4A will produce at least kt of sustainable biojet for its use in aviation at commercial scale for accelerating its deployment within the aviation sector, increasing their attractiveness and contributing to the achievement of the EU targets. BIO4A targets HEFA pathway from wastes, aiming to move the full value chain from TLR 6 to 7. BIO4A will demonstrate the full value chain, enabling a production capacity of 2-300 kt/y of biojet in a First Of A Kind new biorefinery in France. The fuel will be distributed using the existing infrastructures and conventional aircraft fuelling systems for commercial flights. Special attention will be directed to the supply of sustainable feedstock, focusing on waste streams (UCO). In parallel, long-term R&D work will address marginal land in EU MED (low ILUC biofuels). Relevant environmental (inc. GHG and energy balance), economic and social data (inc. health and safety issues, impacts and benefits) will be assessed against targets. Since the current main barrier to the commercial production of biojet is the price gap, BIO4A will explicitly address performance and cost targets vs. relevant key performance indicators. The final goal is to prove the business case, identifying potential issues of public acceptance, market or regulatory risks and barriers (feedstock, technological, business, process) along the entire value chain, taking advantage of previous projects and proposing potential mitigation solutions. Offtake agreements have been signed with KLM and Airfrance. Additional off-take agreements could also be signed to open the participation to more airlines. Regulatory framework is also limiting today the development of the sector and an additional goal is recommendations to policies makers. The proposal will be defined at EU/National level, involving the major sector stakeholders and opening with a profitable dialogue with Member States and the EC.

FlexJET		792216
Title: Sustainable Jet Fuel from Flexible Waste Biomass		
Call Id: H2020-LCE-2017-RES-IA	Topic: LCE-20-2016-2017	Type of Action: IA
Project start date: 4/1/2018	Duration: 48 months	Unit: INEA/H/01
Total costs (€): 15.033.205,00	EU requested grant (€): 9.999.732,51	

Free keywords:**Abstract:**

FlexJet will build a pre-commercial demonstration plant for the production of advanced aviation biofuel (jet fuel) from waste vegetable oil and organic solid waste biomass (food waste), successfully demonstrating the SABR-TCR technology (traditional transesterification (TRANS) and Thermo-Catalytic Reforming (TCR) combined with hydrogen separation through pressure swing adsorption (PSA), and hydro deoxygenation (HDO) and hydro cracking/ isomerisation (HC)) to produce a fully equivalent jet fuel (compliant with ASTM D7566 Standards). This project will deliver respective environmental and social sustainability mapping and it will validate a comprehensive exploitation business plan, building on already established end user interest with existing offtake agreements already in place with British Airways. The project plant installed at the source of where the waste arises in BIGA Energie at Hohenstein (Germany) will produce 1,200 ton of jet fuel from 3,482 tonnes of dried organic waste and 1,153 tonnes of waste vegetable oil per year. A subsequent scale-up first commercial plant would be constructed immediately after the project end to produce 25,000 tonnes per year of aviation fuel. The FlexJet project consortium has undoubtedly bought together the leading researchers, industrial technology providers including airline off takers and renewable energy experts from across Europe, in a combined, committed and dedicated research effort to deliver the overarching ambition. Building and extending from previous framework funding this project is designed to set the benchmark for future sustainable aviation fuel development and growth within Europe and will provide a real example to the rest of the world of how sustainable aviation biofuels can be produced at both large and decentralised scales economically whilst simultaneously addressing social and environmental needs.

ABC-SALT		764089
Title: Advanced Biomass Catalytic Conversion to Middle Distillates in Molten Salts		
Call Id: H2020-LCE-2017-RES-RIA-TwoStage	Topic: LCE-06-2017	Type of Action: RIA
Project start date: 4/1/2018	Duration: 48 months	Unit: INEA/H/01
Total costs (€): 3.998.025,50	EU requested grant (€): 3.998.025,50	

Free keywords: *middle distillate, biofuels, lignocellulosic waste, molten salts, hydropyrolysis, hydrodeoxygenation, TRL4, techno-economic assessment, ecological evaluation, LCA, biomass-to-liquid, social impact*

Abstract:

ABC-SALT will validate at lab scale a novel route to produce sustainable liquid biofuels (middle distillates (MD)) from various lignocellulosic waste streams for the transport industry, both on roads (biodiesel) and in air (jet fuel), targeting a yield over 35 wt% in the middle distillate range, based on the biomass dry input, and a carbon yield of 55 %.

ABC-SALT will solve the following technical challenges: liquefaction and subsequent catalytic hydro-pyrolysis of the biomass in a molten salt environment, followed by the catalytic hydro-deoxygenation of the vapour phase using suitable catalysts to obtain a hydrocarbon product suitable for use as a MD biofuel. ABC-SALT will then operate an integrated lab scale reactor during over 100 hours to provide lab-scale validation of the whole process, bringing this technology to TRL 4.

The project includes technical aspects (such as substrate flexibility, biomass liquefaction and hydro-pyrolysis in molten salts and subsequent hydro-deoxygenation and their integration), but also a socio- and techno-economic viability study of the technology (substrate availability and supply chain, future end-users and economic sustainability of the process). This will ensure the future deployment of this new technology considering its social related issues, such as acceptance or modification of the perception of transport induced by such sustainable fuels. Such a holistic approach considering the full value chain, combined to communication with stakeholders during the course of the project, will provide valuable input for scale up and industry-oriented research after this project, maximizing the impact, amongst other in the biomass, biofuel and transport industry.

To reach its objectives, the project covers the whole value chain, from feedstock supplier to end-users (knowledge users (RUG, UG, AU, NMBU, DLR), technology users (BTG, Innventia), and middle distillates users (through DLR)), as well as an entity dedicated to SSH aspects (CIRPA).

AMPHIBIAN		720853
Title: Anisometric permanent hybrid magnets based on inexpensive and non-critical materials		
Call Id: H2020-NMBP-2016-two-stage	Topic: NMBP-03-2016	Type of Action: RIA
Project start date: 1/1/2017	Duration: 36 months	Unit: RTD/D/03
Total costs (€): 4.948.707,50	EU requested grant (€): 4.948.707,50	

Free keywords: *permanent magnets, ferrites, energy product, rare-earth substitution*

Abstract:

Permanent magnets are crucial in modern technology as they allow storing, delivering and converting energy. They are able to transform electrical energy into mechanical and vice versa, which means that improving their performance entails transforming energy in a more efficient and sustainable way.

The best magnets are based on rare-earths (RE), however, their status as a Critical Raw Material (CRM) has brought forward the realization that it is of great strategic, geographic, environmental and socio-economic importance to consider alternative magnets that present a reduced amount (or absence) of RE. One of the most sought approaches towards this goal consists on constructing composite magnetic materials magnetically coupled at the interface.

In the framework of the success of a previous European Project (FP7-SMALL-NANOPYME-310516), focused on improving ferrite-based magnets, we developed a low-cost novel approach (Patent P201600092) that exploits the magnetostatic interactions within these composites and that yielded extremely promising results in the form of an experimental proof-of-concept.

The goal of this project is to implement up-scalable and cost-efficient methods for fabrication of ferrite-based dense anisotropic magnets with a 40% enhanced magnetic performance (energy products above 55 kJ/m³) with respect to commercial ferrites. We aim at producing improved magnets that retain the advantages of ferrites –availability, sustainability, cost, recyclability, eco-friendliness- and which have the potential to substitute currently used RE magnets (CRM) in the electric power system.

Our targeted application is an electric energy storage device: we will substitute RE magnets by AMPHIBIAN ones in a demonstrator of a flywheel and evaluate its performance against cost, eco-friendliness and resource efficiency criteria.

CREATE		721065
Title: Critical Raw materials Elimination by a top-down Approach To hydrogen and Electricity generation		
Call Id: H2020-NMBP-2016-two-stage	Topic: NMBP-03-2016	Type of Action: RIA
Project start date: 1/1/2017	Duration: 42 months	Unit: RTD/D/03
Total costs (€): 4.480.978,02	EU requested grant (€): 4.318.478,02	

Free keywords: *Fuel cell, electrolysis, anion exchange membrane, bipolar membrane, electrochemistry, electrocatalysis*

Abstract:

CREATE aims at developing innovative membrane electrode assemblies for low-temperature polymer-electrolyte fuel cell (FC) and electrolyzer (EL) with much reduced cost. This will be achieved via elimination or drastic reduction of critical raw materials in their catalysts, in particular platinum group metals (PGM).

Key issues with present low-temperature FC & EL are the high contents of PGM in devices based on proton-exchange-membrane (PEM) and the need for liquid electrolytes in alkaline FC and EL. To overcome this, we will shift from PEM-based cells to 1) pure anion-conducting polymer-electrolytes and 2) to bipolar-membrane polymer electrolytes. The latter comprises anion and proton conducting ionomers and a junction. Bipolar membranes allow adapting the pH at each electrode, thereby opening the door to improved performance or PGM-free catalysts. Both strategies carry the potentiality to eliminate or drastically reduce the need for PGM while maintaining the advantages of PEM-based devices.

In strategy 1, novel anion-exchange ionomers and membranes will be developed and interfaced with catalysts based on Earth-abundant metal oxides or metal-carbon composites for the oxygen reactions, and with ultralow PGM or PGM-free catalysts for the hydrogen reactions.

In strategy 2, novel bipolar membrane designs, or designs unexplored for FC & EL, will be developed and interfaced with catalysts for the oxygen reactions (high pH side of the bipolar membrane) and with catalysts for the hydrogen reactions (low pH side). The ionomers and oxygen reaction catalysts developed in strategy 1 will be equally useful for strategy 2, while identified PGM-free and ultralow-PGM catalysts will be implemented for the hydrogen reactions on the acidic side.

Polymer-electrolyte FC & EL based on those concepts will be evaluated for targeted applications, i.e. photovoltaic electricity storage, off-grid back-up power and H₂ production. The targeted market is distributed small-scale systems.

NEOHIRE		720838
Title: NEOdymium-Iron-Boron base materials, fabrication techniques and recycling solutions to Highly REduce the consumption of Rare Earths in Permanent Magnets for Wind Energy Application		
Call Id: H2020-NMBP-2016-two-stage	Topic: NMBP-03-2016	Type of Action: RIA
Project start date: 2/1/2017	Duration: 36 months	Unit: RTD/D/03
Total costs (€): 4.532.638,75	EU requested grant (€): 4.443.888,75	

Free keywords: *Permanent magnets, sintered magnets, bonded magnets, neodinium, CRM, wind turbines, Rare earth elements, REE, dysprosium, wind turbine generator, wind power*

Abstract:

Regarding NdFeB PM technology for WT, it is still necessary to break through 3 important barriers: Strong dependence on China for supply and high price of REE present in PM, high difficulty of substitution of REE in PM, and technical and economic barriers that avoid establishing commercially viable, large-scale REE recycling framework.

In this context, NEOHIRE main objective is to reduce the use of REE, and Co and Ga, in WTG. This objective is mainly achieved through the development of: a) New concept of bonded NdFeB magnets able to substitute the present state-of-the-art sintered magnets for WT, and b) New recycling techniques for these CRM from the future and current PM wastes. In this way, the EU external demand of REE and CRM for PM in WTG will be reduced in a 50%.

The specific objectives are: i) To develop a new NdFeB material solution that reduces the use REE and CRM amount in PM for WTG (100% of HRE, 30% of LRE Nd/Pr, and 100% of CRM Co and Ga), ii) To increase the deliverable electric power in wind power electric generators from current 2.74 MW to 3.56 MW per 1Tn of REE owing to novel electric machine designs, iii) To research and develop two recycling processes to highly increase the CRM recycling rates in NdFeB PM wastes for sintered PM from current WT (increase from 0 to 70% the recovered Nd, separate 100% of Dy and recover 90% of Co) and novel Bonded NEOHIRE PM (recycling almost 95% of Nd), iv) To achieve an economic and technically feasible large-scale framework for NdFeB PM commercial recycling, and v) To ensure the economic and technical sustainability of NdFeB resin-bonded PM developed technologies.

NEOHIRE will count on PM material RTD experts (CEIT, UOB), material recycling experts (UOB, KU LEUVEN), material characterisation RTD experts (CEIT, UPV, LBF), JP Powder manufacturer (AICHI), PM manufacturer (KOLEKTOR), LCA experts (UNIFI) and WT manufacturer (INDAR). AICHI (Japan) will be involved by providing advice and raw materials to the project.

STARCELL		720907
Title: Advanced strategies for substitution of critical raw materials in photovoltaics		
Call Id: H2020-NMBP-2016-two-stage	Topic: NMBP-03-2016	Type of Action: RIA
Project start date: 1/1/2017	Duration: 36 months	Unit: RTD/D/03
Total costs (€): 6.009.798,75	EU requested grant (€): 4.832.185,00	

Free keywords: *kesterite, CZTS, solar cells, In, Ga, sustainable, thin film PV*

Abstract:

STARCELL proposes the substitution of CRM's in thin film PV by the development and demonstration of a cost effective solution based on kesterite CZTS ($\text{Cu}_2\text{ZnSn}(\text{S,Se})_4$) materials. Kesterites are only formed by elements abundant in the earth crust with low toxicity offering a secure supply chain and minimizing recycling costs and risks, and are compatible with massive sustainable deployment of electricity production at TeraWatt levels. Optimisation of the kesterite bulk properties together with redesign and optimization of the device interfaces and the cell architecture will be developed for the achievement of a challenging increase in the device efficiency up to 18% at cell level and targeting 16% efficiency at mini-module level, in line with the efficiency targets established at the SET Plan for 2020. These efficiencies will allow initiating the transfer of kesterite based processes to pre-industrial stages. These innovations will give to STARCELL the opportunity to demonstrate CRM free thin film PV devices with manufacturing costs ≤ 0.30 €/Wp, making first detailed studies on the stability and durability of the kesterite devices under accelerated test analysis conditions and developing suitable recycling processes for efficient re-use of material waste. The project will join for the first time the 3 leading research teams that have achieved the highest efficiencies for kesterite in Europe (EMPA, IMRA and IREC) together with the group of the world record holder David Mitzi (Duke University) and NREL (a reference research centre in renewable energies worldwide) in USA, and AIST (the most renewed Japanese research centre in Energy and Environment) in Japan. These groups have during the last years specialised in different aspects of the solar cell optimisation and build the forefront of kesterite research. The synergies of their joined efforts will allow raising the efficiency of kesterite solar cells and mini-modules to values never attained for this technology.

PRESTIGE		761112
Title: Design-driven integration of innovative PReinted functional matERials into inTeractive high-end and fashion consumer Goods addressing tomorrow's societal challEnges		
Call Id: H2020-NMBP-2017-two-stage	Topic: NMBP-05-2017	Type of Action: IA
Project start date: 11/1/2017	Duration: 36 months	Unit: RTD/D/03
Total costs (€): 7.783.352,00	EU requested grant (€): 6.590.357,91	

Free keywords: *design-thinking, user-centred innovation, artistic expression, printed materials, electroactive polymers, organic photovoltaics, printed batteries, haptic effect, energy harvesting, smart packaging*

Abstract:

Design thinking has become crucial for high added-value product development, especially in the field of creative industries (automotive, art, fashion, luxury, sports...). More specifically, in the context of globalisation, consumers demand greater variety and customization in product offering such as higher aesthetics, functionalities, integrability, reconfigurability or sustainability. Advanced materials and manufacturing processes are key enabling technologies to answer these requirements.

The PRESTIGE project aims at bringing together design-thinking innovation strategies with advanced printed functional materials developments (electroactive fluorinated polymers, photoactive materials, electroactive organic moieties, fluorinated relaxor terpolymers, tailor-made polymers for overmoulding and organo-mineral coating) and integration to demonstrate high-end interactive and aesthetics final products at TRL7 tackling tomorrow's societal challenges.

Five demonstrators will be developed and disseminated. Three business cases : (i) a haptic steering wheel for enhanced driving-experience (answering safe mobility challenge), (ii) energy harvesting and storage capacities for wearables (answering health, well-being and fashion challenges), (iii) e-plastic labels and oleophobic coatings for a more sustainable multi-use packaging (answering waste management: a major environmental challenge). Moreover, an artistic case (iv) to reach a wide audience of societal stakeholders and a design showcase (v) to increase awareness of designers about new materials.

In PRESTIGE a consortium of 16 partners all along the value chain from designers, material and process scientists, material suppliers, manufacturers, systems integrators, end-users to artists and societal stakeholders has been set-up to stand as a unique European reference in the future fostering design-driven innovation in creative industries and beyond, by promoting their achievements through an SME-oriented cluster of excellence.

FBD_BModel		761122
Title: A Knowledge-based business model for small series fashion products by integrating customized innovative services in big data environment (Fashion Big Data Business Model)		
Call Id: H2020-NMBP-2017-two-stage	Topic: NMBP-22-2017	Type of Action: RIA
Project start date: 12/1/2017	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 3.763.474,00	EU requested grant (€): 3.747.374,00	

Free keywords: *interactive design platform, productioun and supply chain management platform, data-based services, knowledge-based business model*

Abstract:

FBD_BModel aims at creating a digital technology platform for delivering small series innovative functional garment products through a European Union-based local textile supply chain, meeting consumers' personalized requirements in terms of fashion and functional performances. This new supply chain will permit to get through the information channel from fabric materials to consumers via various processes, in order to dynamically organize design and production in the big data environment. This technology platform will integrate two interconnected knowledge-based sub-systems (an Interactive Design System (IDS) and a Supply Chain and Production Management System (SCPMS)). The platform will provide a range of data-based services (product and design recommendation, supplier selection, dynamic tasks planning, production simulation, ...) dedicated to consumers and concerned professionals (producers, designers, retailers, ...) of the supply chain. An extended virtual space will be created for visually displaying and evaluating fashion and functional performances (thermal comfort, skin touch comfort and skin pressure comfort in relation to body movements) of designed products in order to integrate consumers' lifestyle into the product design process. This platform will enable the direct connection of the professional networks of producers, designers and retailers and optimize all activities of the supply chain. Based on this platform, a novel B2B2C business model will be built by establishing the economic viability and overall exploitation strategy, developing a detailed business plan, along with a full exploitation strategy and associated risk analysis, and performing a series of extensive pilot operations and market replication actions. This business model will be helpful for creating customized textile production in Europe, promoting material innovations of European SMEs with connected professional networks, and preserving and updating professional knowledge in Europe.

FENIX		760792
Title: Future business models for the Efficient recovery of Natural and Industrial secondary resources in eXtended supply chains contexts		
Call Id: H2020-NMBP-2017-two-stage	Topic: NMBP-22-2017	Type of Action: RIA
Project start date: 1/1/2018	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 3.995.125,00	EU requested grant (€): 3.995.125,00	

Free keywords: *Circular Economy, Secondary Resources, Added-Value Product-Service Systems, Additive Manufacturing, Demanufacturing, Biometallurgy, Digitalization, End User Engagement, Sustainability*

Abstract:

The European Union faces several challenges caused by globalization. Both the delocalization of production plants (leading to more imported products) and the instability characterizing several industrial sectors force economies to re-think their business models and re-adapt them in a new context, where the sustainability of products and processes is more relevant. Within this overall framework, the need to think about innovative business models and industrial strategies, able to answer to these new requirements is mandatory. One chance is the exploitation of digital technologies. Another is the exploitation of secondary (and critical) resources that, currently, are wasted without any recovery. The project FENIX wants to consider both these issues and their potential at the same time, proposing something that could allow Europe to re-appropriate its pertaining position in the global market. The idea is to study innovative business models and industrial strategies (based on the circular economy paradigm) enabling the development of new product-services through the definition of novel supply chains, resulting from an unconventional mix of current ones. This could allow the easy re-use, reconfiguration and modularization of production systems, the exploitation of overcapacity and the renaissance of industrial poles all over the Europe. Furthermore, the circular economy driven business models and industrial strategies proposed by project FENIX will be demonstrated in existing pilot plants, adequately reconfigured and integrated based circular economy needs.

MANU-SQUARE		761145
Title: MANU facturing ecoSystem of QUALified Resources Exchange		
Call Id: H2020-NMBP-2017-two-stage	Topic: NMBP-22-2017	Type of Action: RIA
Project start date: 1/1/2018	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 3.956.188,75	EU requested grant (€): 3.956.188,75	

Free keywords: *Marketplace, Servitisation, Resource-efficiency, Start-ups*

Abstract:

The MANU-SQUARE project creates a European platform-enabled responsible ecosystem acting as a virtual marketplace, bringing available manufacturing capacity closer to production demand to achieve their optimal matching thus fostering, on the one hand, fast and efficient creation of local and distributed value networks for innovative providers of product-services and, on the other hand, reintroduction and optimization in the loop of unused capacity that would be wasted otherwise.

In a wider perspective the MANU-SQUARE project pursues a paradigm shift that disrupts the traditional static supply chain model and establishes dynamic value networks that can be arranged on-demand to couple the needs of buyers and the availability of sellers of manufacturing capacity. In so doing, this latter becomes an easily and efficiently tradable commodity towards lowered production costs for European companies and improved manufacturing ecosystem actual productivity.

DAFIA		720770
Title: Biomacromolecules from municipal solid bio-waste fractions and fish waste for high added value applications.		
Call Id: H2020-NMBP-BIO-2016	Topic: BIOTEC-02-2016	Type of Action: RIA
Project start date: 1/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 6.430.196,25	EU requested grant (€): 6.430.196,25	

Free keywords: *Municipal solids waste, Marine rest, fermentation, microbial, dicarboxylic acid, diamines, polyamides, nucleic acid, flame retardant, coating, gelatine, green chemistry.*

Abstract:

Municipal solids waste (MSW) are collected by municipalities and represents more than 500 kg/capita (EU-27 average), 300 million tonnes overall every year in the EU-32. Currently, approximately 50% of this volume is landfilled. More than 1.3 million tonnes of Marine rest raw material (MRRM) are generated in Europe each year. Some countries, such as Norway and Denmark, have traditionally for animal feed. It will therefore be a challenge for the industry to develop methods to turn fish viscera and skin, currently considered as undesirable raw materials for hydrolysis and human consumption, into profitable products.

DAFIA will exploit MSW and MRRM as feedstocks for high value products. The parallel exploitation of the two feedstocks may create synergies. This expertise will be utilised in process development from MSW, while at the same time, new added-value products may be identified from both feed stocks.

The main objective of the DAFIA project is to explore the conversion routes of municipal solid waste (MSW), and marine rest raw-materials (MRRM) from the fish processing industries, to obtain high added value products, i.e. flame retardants, edible/barrier coatings and chemical building blocks (dicarboxylic acids and diamine) to produce polyamides and polyesters for a wide range industrial applications.

Different value-chains and products will be selected and explored based on the potential commercial value and the technical feasibility including new microbial strains and processes for conversion of major feedstock fractions, enzymatic and chemical modifications of components isolated from the feedstock or produced in microbial processes.

Up to four cost-effective molecule groups suitable for the final selected applications will be targeted (nucleic acids, dicarboxylic acids, diamines and gelatine), & two value-chains (MSW & MRRM) will be evaluated at pilot scale to reach TRL5.

FALCON		720918
Title: Fuel and chemicals from lignin through enzymatic and chemical conversion		
Call Id: H2020-NMBP-BIO-2016	Topic: BIOTEC-02-2016	Type of Action: RIA
Project start date: 1/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 6.555.883,75	EU requested grant (€): 6.148.783,75	

Free keywords:**Abstract:**

The transition to a biobased economy puts strong challenges on researchers and industry to develop sustainable processes. 2G biofuel plants use waste streams as substrates, but themselves generate a new waste stream of lignin-rich sludge that is left after saccharification of the carbohydrates. This waste stream is expected to exponentially increase with an increasing number of 2G bioethanol plants being built, according to a report of the International Energy Agency.

FALCON aims to convert this lignin-rich industrial waste of 2G biofuel plants to higher value products, in particular shipping fuels, fuel additives and chemical building blocks. This would be the next consecutive step in turning waste to products, thus minimizing waste and simultaneously providing new alternatives for fossil resource based processes. The FALCON process is based on enzymatic and mild chemical conversion of the lignin waste stream, providing a more environmentally friendly approach to the production of fuels and chemical building blocks.

FALCON takes full advantage of the lessons learned over the last 150 years in the petrochemical industry with respect to design of the processes. This implies an initial treatment at the 2G bioethanol plant, converting the waste to a lignin oil that can be more easily transported and also directly used as a low sulphur shipping fuel. It will be further converted into fuel additives and chemical building blocks in centralized facilities.

To achieve this, FALCON has formed a consortium of industry (3), SME (4) and academics (2) covering the whole value chain from a 2G biofuel plant delivering the lignin waste to enzyme producers, chemists and process engineers to depolymerize the lignin to oil. End-users are a fuel and chemicals producer and a ship engine developer. This unique combination of expertise and infrastructure will ensure the development of three new value chains with a strong emphasis on the economical sustainability.

VOLATILE		720777
Title: Biowaste derived volatile fatty acid platform for biopolymers, bioactive compounds and chemical building blocks		
Call Id: H2020-NMBP-BIO-2016	Topic: BIOTEC-02-2016	Type of Action: RIA
Project start date: 12/1/2016	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 6.565.926,25	EU requested grant (€): 6.565.926,25	

Free keywords: *Biowaste, Volatile Fatty Acids, Biopolymer, Single Cell Oil, Bioactive compounds*

Abstract:

VOLATILE aims in the development of an innovative Volatile Fatty Acids Platform for the bioconversion of municipal solid bio-waste fraction and sludgy biowaste from other industries. The platform will be integrated in anaerobic digestion. The volatile fatty acids will be recovered continuously using sophisticated membrane technology and will be provided as feedstock / carbon source for value added fermentation approaches such as biopolymer PHA to be tested in material applications, single cell oil as precursor for oleochemical industry as well as long chain unsaturated health-promoting Omega-3 fatty acids to be used as food ingredient or nutraceutical. PHA will be obtained by bacterial fermentations, single cell oil from yeast cultivation and Omega-3 fatty acids via heterotrophic microalgae. The process development will be accompanied with sophisticated LCA study in order to ensure environmental friendly process design.

The project will also work on solutions to typical barriers beside others such as quality requirements, continuous and sufficient feedstock supply or interaction between members of value chain using agent-based modelling. Also the effect of legal stimuli and restrictions and subsidies and taxes will be studied and a link between product requirements and markets will be established. VOLATILE will prepare a Roadmap indicating future research needs but also giving suggestion for legislative improvements. A CEN workshop will be initiated to discuss with external stakeholders rules for the VFAP & to set up standard requirements in the form of a CEN workshop Agreement.

BIOCONCO2		761042
Title: BIOTEchnological processes based on microbial platforms for the CONversion of CO2 from ironsteel industry into commodities for chemicals and plastics		
Call Id: H2020-NMBP-BIO-2017	Topic: BIOTEC-05-2017	Type of Action: RIA
Project start date: 1/1/2018	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 6.999.886,25	EU requested grant (€): 6.999.886,25	

Free keywords: *CO2 reuse, Microbial Cell Factories, biotechnology , fermentation, Biocatalytic processes, low-energy, ,3-butanediol, 3-hydroxypropionic acid, formic acid, lactic acid , Clostridium, Acetobacter*

Abstract:

The main objective of BIOCON-CO2 is to develop and validate in industrially relevant environment a flexible platform to biologically transform CO2 into added-value chemicals and plastics. The versatility and flexibility of the platform, based on 3 main stages (CO2 solubilization, bioprocess and downstream) will be proved by developing several technologies and strategies for each stage that will be combined as puzzle pieces. BIOCON-CO2 will develop 4 MCFs based on low-energy biotechnological processes using CO2 from iron&steel industry as a direct feedstock to produce 4 commodities with application in chemicals and plastics sectors using 3 different biological systems: anaerobic microorganisms (C3-C6 alcohols by Clostridia), aerobic microorganisms (3-hydroxypropionic acid by Acetobacter) and enzymes (formic acid by recombinant resting E. coli cells and lactic acid by multi-enzymatic system). The technologic, socio-economic and environmental feasibility of the processes will be assessed to ensure their future industrial implementation, replicability and transfer to other CO2 sources, such as gas streams from cement and electricity generation industries. BIOCON-CO2 will overcome the current challenges of the industrial scale implementation of the biotechnologies routes for CO2 reuse by developing engineered enzymes, immobilization in nanomaterials, genetic and metabolic approaches, strain acclimatization, engineered carbonic anhydrases, pressurized fermentation, trickle bed reactor using advanced materials and electrofermentation. The project aims to capture at least 4% of the total market share at medium term (1.4Mtonnes CO2/year) and 10% at long term (3.5Mtonnes CO2/year) contributing to reduce EU dependency from fuel oils and support the EU leadership in CO2 reuse technologies. Policy recommendations and public perception and acceptance will be explored and a commercialization strategy will be executed by a detailed exploitation plan and technology transfer.

BioRECO2VER		760431
Title: Biological routes for CO₂ conversion into chemical building blocks		
Call Id: H2020-NMBP-BIO-2017	Topic: BIOTEC-05-2017	Type of Action: RIA
Project start date: 1/1/2018	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 6.990.937,56	EU requested grant (€): 6.812.187,50	

Free keywords: *CO₂ conversion, enzymatic capture, microbial platforms, new reactor concepts*

Abstract:

The high-level goal of BioRECO2VER is to demonstrate the technical feasibility of more energy efficient and sustainable non-photosynthetic anaerobic and micro-aerobic biotechnological processes for the capture and conversion of CO₂ from industrial point sources into 2 valuable platform chemicals, i.e. isobutene and lactate. To overcome several of the existing technical and economic barriers for CO₂ conversion by industrial biotechnology, the project will focus on minimizing gas pretreatment costs, maximizing gas transfer in bioreactors, preventing product inhibition, minimizing product recovery costs, reducing footprint and improving scalability. To this end, a hybrid enzymatic process will be investigated for CO₂ capture from industrial point sources and conversion of captured CO₂ into the targeted end-products will be realized through 3 different proprietary microbial platforms which are representative of a much wider range of products and applications. Bioprocess development and optimization will occur along 2 lines: fermentation and bioelectrochemical systems. The 3 microbial platforms will be advanced to TRL 4, and the most promising solution for each target product will be validated at TRL 5 on real off gases. To prepare for industrial implementation and contribute to public acceptance, the technological activities will be complemented with virtual plant design, economic and sustainability assessments and extensive dissemination.

All activities will be executed by a well-balanced and experienced group of 2 Research and Technology Organizations, 2 universities, 4 SMEs and 4 large industries.

ENGICOIN		760994
Title: Engineered microbial factories for CO₂ exploitation in an integrated waste treatment platform		
Call Id: H2020-NMBP-BIO-2017	Topic: BIOTEC-05-2017	Type of Action: RIA
Project start date: 1/1/2018	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 6.986.910,00	EU requested grant (€): 6.986.910,00	

Free keywords: *biogas, CO₂, hydrogen, lactic acid, PHA, acetone*

Abstract:

The ENGICOIN proposal aims at the development, from TRL3 to TRL5, of three new microbial factories (MFs), integrated in an organic waste anaerobic digestion (AD) platform, based on engineered strains exploiting CO₂ sources and renewable solar radiation or H₂ for the production of value-added chemicals, namely:

MF.1) the cyanobacteria *Synechocystis* to produce lactic acid from either biogas combustion flue gases (CO₂ concentration ~ 15%) or pure and costless CO₂ streams from biogas-to-biomethane purification.

MF.2) the aerobic and toxic metal tolerant *Ralstonia eutropha* to produce PHA bioplastics from biogas combustion flue gases and complementary carbon sources derived from the AD digestate.

MF.3) the anaerobic *Acetobacterium woodii* to produce acetone from the CO₂ stream from biogas-to-biomethane purification.

High process integration will be guaranteed by taking advantage of low-grade heat sources (e.g. from cogenerative biogas-fired engine or an tailored PEM electrolyser), exploitable side gas streams (e.g. O₂ from electrolysis, CO₂ from biomethane purification), low-price electricity produced during night-time by a biogas-fired-engine cogeneration unit or even intensified operation conditions (e.g. up to 10 bars pressure for the anaerobic acetone production bioreactor; led-integrated photo-bioreactor). This is an essential feature, alongside with the high conversion rates enabled by synthetic and systems biology on the above microorganisms, to achieve competitive selling prices for the key target products (1.45 €/kg for lactic acid; 3.5 €/kg for PHA; 1 €/kg for acetone).

Notwithstanding the key application platform (anaerobic biorefinery based on organic wastes) the innovative production processes developed have a great exploitation potential in other application contexts: flue gases from different combustion appliances (e.g. cement kilns), alcoholic fermentation CO₂ streams (e.g. lignocellulosic biorefineries, breweries), etc.

BioCatPolymers		760802
Title: Sustainable and efficient bio-chemical catalytic cascade conversion of residual biomass to high quality biopolymers		
Call Id: H2020-NMBP-BIO-2017	Topic: BIOTEC-06-2017	Type of Action: IA
Project start date: 1/1/2018	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 5.351.985,08	EU requested grant (€): 4.362.047,56	

Free keywords: *mevalonate; bio-monomers; isoprene; 3-methyl 1,5-pentanediol; bio-polymers; fermentation; hybrid bio-chemocatalytic process*

Abstract:

The overall objective of BioCatPolymers is to demonstrate a sustainable and efficient technological route to convert low quality residual biomass to high added-value biopolymers. The technology is based on an integrated hybrid bio-thermochemical process combining the best features of both. The biological step consists of the efficient conversion of biomass-derived sugars to mevalonolactone (MVL). MVL can be then converted to bio-monomers via highly selective chemocatalytic processes. BioCatPolymers is specifically aiming at the efficient and economic production of isoprene and 3-methyl 1,5-pentanediol (3MPD), two monomers with very large markets that can be further processed in the existing infrastructure for fossil-based polymers for the production of elastomers and polyurethanes, respectively.

This ambitious target will be attained by optimizing and demonstrating the entire value chain on 0.5 ton of biomass/day scale, starting from the pretreatment of lignocellulosic biomass to hydrolysis and biological fermentation to MVL, separation of MVL from fermentation broth, selective catalytic conversion to the targeted monomer and finally purification to polymer grade quality. The novel approach we propose in this project surpasses the impediments of traditional solely bio-based approaches. It aims at producing bio-isoprene at 50% cost reduction and 3MPD at 70% cost reduction compared to average market prices, by optimizing the platform cell factories and all downstream processes and integrating the process modules, thereby increasing the competitiveness of biological processes in terms of economics.

The BioCatPolymers consortium consists of highly qualified and experienced researchers with complementary expertise. Trans-disciplinary considerations are strongly involved in the project. The strong industrial leadership-driven innovation potential is reflected through the fact that the large majority of the partners are from industry.

FUTURING		723633
Title: Futuring European Industry		
Call Id: H2020-NMBP-CSA-2016	Topic: NMBP-36-2016	Type of Action: CSA
Project start date: 9/1/2016	Duration: 18 months	Unit: RTD/D/01
Total costs (€): 1.470.126,25	EU requested grant (€): 1.470.126,25	

Free keywords: *Reindustrialization*

Abstract:

FUTURING aims at contributing to define the strategy for the re-industrialization of Europe, by focusing on the role of Research and Innovation within the framework of other dimensions – Economy, Society, Environment, Globalization, geopolitics– and incoming paradigms such as Circular Economy.

It explores 2030 future scenarios, concerning EU Industry, through the use of foresight and other Policy Intelligence tools, to identify critical factors on which action should be taken in order to overcome barriers and to foster opportunities for the EU re-industrialization process.

A large variety of experts and stakeholders, both directly as partners and externals, representing the main dimensions of the landscape in which the EU re-industrialization is going to take place, are participating.

Given the number of participants, their location in different countries of Europe, it is expected that the output of the project will be widely disseminated among relevant stakeholders throughout Europe. In particular, Recommendations will provide Policy Makers, at European, National and Regional level, guidelines for future Research and Innovation activities.

FAirWAY		727984
Title: Farm systems that produce good Water quality for drinking water supplies		
Call Id: H2020-RUR-2016-2	Topic: RUR-04-2016	Type of Action: RIA
Project start date: 6/1/2017	Duration: 48 months	Unit: REA/B/02
Total costs (€): 4.999.865,00	EU requested grant (€): 4.999.865,00	

Free keywords: *Farm management, nitrate, pesticides, drinking water, governance models, best management practices*

Abstract:

Safe drinking water is vital for human health. Diffuse pollution of nitrogen and pesticides from agriculture is the main obstacle to meet drinking water quality targets. Policies to protect drinking water resources have not achieved a consistent effectiveness in all member states. The objective of FAIRWAY is to review policy, governance and farm water management approaches to protect drinking water resources in the EU and to identify and further develop innovative measures and governance approaches which will simultaneously increase the sustainability of agriculture. The FAIRWAY partners form a unique blend of researchers, farm advisers and consultancies and is built on 13 case studies ('living labs') in 11 different EU countries, which will form the core of a multi-actor platform, underpinning all FAIRWAY work packages. Equally important is the upscaling of successful practices from case studies to the regional, national, and EU scales, emphasising the role of effective communication and extension tools developed in FAIRWAY. The outputs will provide a blueprint for multi-actor engagement across different scales, which will allow agriculture and water policies to be addressed in a more integrated way. FAIRWAY will i) increase the scientific understanding of the relationship between agriculture and drinking water protection, ii) increase the understanding for the social, technical and economic barriers to practical implementing of measures (iii) deliver innovative measures and tools to overcome these barriers, iv) develop protocols and data-sets for monitoring of farming practices and water quality, v) develop effective governance approaches for small to large water supplies, and vi) increase awareness and involvement of farmers and other citizens in the monitoring and governance of water supplies. The FAIRWAY results will be widely disseminated to a range of targeted audiences using state-of-the-art technologies, social media and workshops.

WATERPROTECT		727450
Title: Innovative tools enabling drinking WATER PROTECTioN in rural and urban environments		
Call Id: H2020-RUR-2016-2	Topic: RUR-04-2016	Type of Action: RIA
Project start date: 6/1/2017	Duration: 36 months	Unit: REA/B/02
Total costs (€): 4.997.006,50	EU requested grant (€): 4.997.006,50	

Free keywords: *Water governance*

Abstract:

High-quality, safe, and sufficient drinking water is essential for life: we use it for drinking, food preparation and cleaning. Agriculture is the biggest source of pesticides and nitrate pollution in European fresh waters. The overarching objective of WATERPROTECT is to contribute to effective uptake and realisation of management practices and mitigation measures to protect drinking water resources. Therefore WATERPROTECT will create an integrative multi-actor participatory framework including innovative instruments that enable actors to monitor, to finance and to effectively implement management practices and measures for the protection of water sources. We propose seven case studies involving multiple actors in implementing good practices (land management, farming, product stewardship, point source pollution prevention) to ensure safe drinking water supply. The seven case studies cover different pedo-climatic conditions, different types of farming systems, different legal frameworks, larger and smaller water collection areas across the EU. In close cooperation with actors in the field in the case studies (farmers associations, local authorities, water producing companies, private water companies, consumer organisations) and other stakeholders (fertilizer and plant protection industry, environment agencies, nature conservation agencies, agricultural administrations) at local and EU level, WATERPROTECT will develop innovative water governance models investigating alternative pathways from focusing on the 'costs of water treatment' to 'rewarding water quality delivering farming systems'. Water governance structures will be built upon cost-efficiency analysis related to mitigation and cost-benefit analysis for society, and will be supported by spatially explicit GIS analyses and predictive models that account for temporal and spatial scaling issues. The outcome will be improved participatory methods and public policy instruments to protect drinking water resources.

4PRIMA		724060
Title: Partnership for Research and Innovation in the Mediterranean Area		
Call Id: H2020-SC5-2016-OneStageA	Topic: SC5-12-2016	Type of Action: CSA
Project start date: 5/1/2016	Duration: 22 months	Unit: RTD/I/02
Total costs (€): 1.999.378,75	EU requested grant (€): 1.999.378,75	

Free keywords: *food systems and water resources, partnership for research and innovation, Strategic Research and Innovation Agenda, implementation plan, cooperation between EU and Mediterranean Partner Countries*

Abstract:

The 4PRIMA Coordination and Support Action will create the bases and will develop a set of activities aimed at supporting the establishment of a long-term, well-structured and integrated partnership for research and innovation (R&I) on food systems and water resources, among countries from both sides of the Mediterranean Sea ("PRIMA Initiative"). In order to enable a sustainable development in this area, 4PRIMA will facilitate the establishment of favourable and stable conditions for a reinforced international cooperation on food systems and water research, based on a better coordination, collective ownership of R&I programmes and, consequently, clear and tangible mutual benefits.

4PRIMA will develop a Strategic Research and Innovation Agenda (SRIA) and an associated implementation plan, as a result of an extensive participatory process that will target a critical mass of key players at international level and all relevant stakeholders of the food and water sectors. To achieve this main objective, 4PRIMA will take advantage of a wide portfolio of results and relationship generated in previous and on-going EU projects, as well as it will seek cooperation between EU and Mediterranean Partner Countries (MPCs), in coherence with the activities of the Strategic Forum for International Cooperation.

Given the strategic relevance of an appropriate development and uptake of the SRIA to establish a long lasting partnership in the region, 4PRIMA science diplomacy actions will be essential to ensure the support to R&I policy dialogue addressing sensitive challenges between EU and MPCs. Moreover, in order to maximise its expected impact, 4PRIMA project will explore avenues for awareness raising and development of strategic alliances with key stakeholders, including EU, AC and MPCs countries that did not take part to the PRIMA joint programming process, with the goal to enlarge the participation to the "PRIMA Initiative".

T2gE		724052
Title: Transition to the Green Economy		
Call Id: H2020-SC5-2016-OneStageA	Topic: SC5-24-2016	Type of Action: CSA
Project start date: 6/1/2016	Duration: 9 months	Unit: EASME/B/02
Total costs (€): 317.143,96	EU requested grant (€): 285.688,96	

Free keywords: *Presidency event, policy options, recommendations.*

Abstract:

The main objective of the project is to contribute to a transition towards a green economy in Europe through organization of the international conference “Transition to a green economy” (T2gE). This international conference will be an event of major strategic nature during the Slovak Presidency of the European Council. Conference will bring together a broad spectrum of stakeholders. Its ambition is to improve understanding of the green economy concept, identify conclusions and pathways for transition as well as to involve and mobilise various actors and stakeholders in the discussions of possible future actions. The conference also aims to strengthen synergy among various recent initiatives and programmes launched by the European Commission (i.e 7EAP, Circular economy package, Energy Union, Juncker Commission’s priorities etc) and by the Member States, to the benefit of the overall coherence.

The conference will aim to bring together policymakers from various EU countries, as well as a range of stakeholders from international organizations, academia, business, and civil society and encourage an open debate around key green economy issues. At the end of the conference, draft conclusions, for both the national and the European level, will be approved which will be useful tool for implementation of policy in the field of green economy. Parallel breakout sessions will be devoted to various relevant subjects with the involvement of representatives from civil society, policymakers, business, science and innovations, and regional and local authorities. The participants will present examples of the green economy approaches from successful countries, which will be discussed and reflected in the conclusions to ensure that green economy policy conclusions are relevant to countries’ needs. Part of the conference will be oriented on practical demonstration of Slovak examples of green/circular economy – field trip.

IC4WATER		730264
Title: Tackling Water Challenges in the International Context		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-11-2016	Type of Action: CSA
Project start date: 1/1/2017	Duration: 60 months	Unit: RTD/I/02
Total costs (€): 2.289.000,00	EU requested grant (€): 2.289.000,00	

Free keywords: *international cooperation; mapping; UN SDGs; cooperation models; water challenges*

Abstract:

The Joint Programming Initiative Water Challenges for a Changing World, the Water JPI, is an intergovernmental initiative which strives to achieve sustainable water systems for a sustainable economy in Europe and abroad.

IC4WATER's objectives include supporting agencies in stepping up international cooperation: through the sharing of best practices, networking, closer coordination of existing activities, and the establishment of new relationships to facilitate multidisciplinary networking across the water challenges at a wider scale, both with respect to research and geographical areas. A mapping of the existing research cooperation models (mainly bilateral – between a Member State or the European Commission and some Beyond Europe countries) and a comparative analysis of existing cooperation models will be issued to identify barriers and challenges to transnational collaboration, and formulate successful mechanisms for working together efficiently beyond this bilateral approach.

In order to become more than a 'network of networks' and a dialogue platform for research programmes and to bring genuine added value to the current cooperation models, IC4WATER will be focusing on key topics of the Water JPI Strategic Research & Innovation Agenda. As an initial focus, the Water JPI Governing Board, which endorsed the IC4Water concept in November 2015, has agreed a plan to pilot new principles of international transnational cooperation through concrete joint programming, focusing on the theme of UN Sustainable Development Goals related to Water challenges. A shortlist of key 'UN SDG thematic' RDI areas will be scoped in more detail and will serve as recommendations for joint activities (opportunities for cooperation with funding RDI governmental institutions or for RDI support for market development, first domains of development of the Water JPI knowledge hub, joint transnational call with partners willing to commit additional national / regional funds for RDI projects).

CHROMIC		730471
Title: effiCient mineral processing and Hydrometallurgical RecOvery of by-product Metals from low-grade metal contalning seCondary raw materials		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-13-2016-2017	Type of Action: RIA
Project start date: 11/1/2016	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 4.869.687,50	EU requested grant (€): 4.869.687,50	

Free keywords: *critical and by-product metals, cost-/energy-/material-efficiency*

Abstract:

Europe is faced with the challenge of sustaining a secure supply of by-product metals, which play a fundamental role in the competitiveness of the manufacturing sector and innovations in high-tech sectors. To loosen the growth restrictions imposed by the inflexible supply from primary mining, alternative sources for these metals must be explored. At the same time a wealth of metals is entrapped within the vast amounts of secondary resources still being landfilled or used in applications where their intrinsic value is not fully utilized. To unlock the potential of these resources, a radically new approach to metal recovery must be deployed. Crucial factor within this new value chain is the zero-waste approach, which captures not only the contained metals but also valorises the residual matrix (often >95% of the bulk material). Such an approach requires the development of innovative, highly selective metal recovery technologies that fully capture the metal-value without impairing the properties of the residual matrix material for valorisation.

CHROMIC aims to develop such new recovery processes for critical (Cr, Nb) and economically valuable (Mo, V) by-product metals from secondary resources, based on the smart integration of enhanced pre-treatment, selective alkaline leaching and highly selective metal recovery across the value chain. An overarching assessment of the related economic, environmental and health and safety aspects will be carried out in an iterative way to ensure that the developed technologies meet the requirements of the circular economy whilst being in line with current market demand. The technology will be developed for two models streams (stainless steel slags and ferrochrome slags) with the potential of replication to numerous industrial residues across Europe. Involvement of society from early on will smooth the path towards implementation, so that the CHROMIC processes can contribute to securing Europe's supply of critical raw materials.

IMPACT		730411
Title: Integrated Modular Plant and Containerised Tools for Selective, Low-impact Mining of Small High-grade Deposits		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-13-2016-2017	Type of Action: RIA
Project start date: 12/1/2016	Duration: 42 months	Unit: EASME/B/02
Total costs (€): 6.991.820,00	EU requested grant (€): 6.991.820,00	

Free keywords: *rapid sustainable and innovative mining solutions*

Abstract:

The current mining paradigm promotes extraction from large ‘world-class’ deposits that have required innovations in mining techniques to deal with low grades, large infrastructure to deal with high throughputs and large feasibility studies to prove long-term commercial viability. High investment in operations is no longer available in the current economic climate and many small companies have ceased to trade, concentrating production and limiting the ability of the raw materials market to respond to increased demand for raw materials or shortages in raw material supply. The problem is most extreme for critical raw materials that are produced in small quantities relative to traditional metal commodities because the potential return on investment is too low. The IMPACT project proposes a solution that develops a new switch on-switch off (SOSO) mining paradigm to improve the viability of many critical metal and other small complex deposits.

The whole systems approach that we have adopted to realise the SOSO mining paradigm centres around technological innovations in mining equipment design and mine planning that would reduce the feasibility studies required, throughput of extracted material, infrastructure, land use, resource consumption and waste. Successful business models for SOSO mining require that mining and processing technologies can be adapted to multiple deposits and commodities. Risks that are associated with the approach concern geological uncertainty, metallurgical variability and social acceptance. The work programme aims to develop the proof-of-concept of total and sustainable mining and processing solutions using case studies in the West Balkans, and subsequently to examine the step-changes that would be required for the technology to be applied globally. The companies involved in the project intend to commercialise the results. Dissemination activities include feedback to European and national policy makers, and the mining industry in general.

ITERAMS		730480
Title: Integrated mineral technologies for more sustainable raw material supply		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-13-2016-2017	Type of Action: RIA
Project start date: 6/1/2017	Duration: 36 months	Unit: EASME/B/02
Total costs (€): 7.915.364,25	EU requested grant (€): 7.915.364,25	

Free keywords: *water quality, geopolymerization*

Abstract:

The aim of ITERAMS is to develop a proof of concept for more environmentally friendly and economic mine site operations, in Europe and globally. For that, the ITERAMS project focuses on the isolation of process waters completely from the adjacent water systems. This will require development of new methods for optimising and controlling water qualities at each process step. As a bonus, this will also facilitate the recovery of additional valuable constituents.

The ITERAMS project will develop research and dimensioning protocols suitable for use at the mines processing different ores. In this context, validation of the concepts will have an essential role. In the planned project, it will be performed at selected mine sites processing sulphide ores, although the concepts will be generic and thus also suitable for other types of ores like gold, rare earth, and phosphate ores.

The closure of water cycles at each process stage will inevitably increase their thermodynamical and kinetic instability (as is also the case with conventional tailing ponds). In addition, water temperatures will also increase, causing higher bacterial growth, especially for iron and sulphur oxidising species. This will result in a dynamic situation that has never so far been worked on. The ITERAMS project will create new academic and industrial knowledge and capabilities to tackle such questions. The tightly closed water cycles can be realised only if the tailings can be filtered and stacked dry. ITERAMS will demonstrate the use of geopolymerisation to create water and oxygen tight covers on the deposited tailings. For that, the tailings streams will be modified for their easier geopolymerisation.

The ITERAMS water and waste efficient methods will be validated at mine sites in Finland, in Portugal and additionally either in Chile or South Africa.

PLATIRUS		730224
Title: PLATInum group metals Recovery Using Secondary raw materials		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-13-2016-2017	Type of Action: RIA
Project start date: 11/1/2016	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 6.994.210,00	EU requested grant (€): 6.994.210,00	

Free keywords: *PGM recovery, metallurgy, hydrometallurgy, solvometallurgy, ionometallurgy*

Abstract:

The PLATIRUS project aims at reducing the European deficit of Platinum Group Metals (PGMs), by upscaling to industrial relevant levels a novel cost-efficient and miniaturised PGMs recovery and raw material production process. The targeted secondary raw materials will be autocatalysts, electronic waste (WEEE) and tailings and slags from nickel and copper smelters, opening-up an important range of alternative sources of these critical raw materials, with the potential to substitute a large amount of primary raw materials which are becoming more and more scarce in Europe.

For the first time five of the major research centres in Europe will collaborate in developing and fine tuning the most advanced recovery processes for PGMs. This joint effort will lead to a unique exchange of know-how and best practices between researchers all over Europe, aiming at the selection of the recycling process and the preparation of the Blueprint Process Design that will set the basis for a new PGM supply chain in the EU.

Two primary and secondary material producers with a consolidated business model will carry out validation of the innovative recovery processes in an industrially relevant environment by installing and testing them in an industrially relevant environment and benchmarking with the currently adopted recovery processes. A recycling company will provide a link to market introduction by manufacturing autocatalysts with second-life PGMs obtained via the PLATIRUS technology. Two large automotive companies will validate the material produced through the new recovery process, and ensure end-user industry driven value chains for recovered PGM materials. LCA, economic and environment assessment of the whole process will be led by a specialized consultancy company. Finally, the PLATIRUS project will be linked to European and extra-European relevant stakeholders, research activities and industries, with a solid dissemination, communication and exploitation plan.

SCALE		730105
Title: Production of Scandium compounds and Scandium Aluminum alloys from European metallurgical by- products		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-13-2016-2017	Type of Action: RIA
Project start date: 12/1/2016	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 7.706.625,00	EU requested grant (€): 7.000.000,00	

Free keywords: *Scandium production, Bauxite Residue, TiO2 Acid waste, REE, CRM, AL-SC ALLOY*

Abstract:

Scandium (Sc) is one of the highest valued elements in the periodic table and an element which is usually grouped in REEs as it shares many characteristics with Yttrium. Scandium technological applications are unique, as it is a key component in producing Solid Oxide Fuel Cells (Scandia-Stabilized-Zirconia solid electrolyte layer) or high strength Aluminum alloys used in aerospace and 3D printing applications (SCALMALLOY®). Yet Scandium supply is limited due to its scarcity and the high cost of its production, which currently takes place in Asia and Russia.

Europe has no production of Scandium, but is home to many Sc industrial end-users (Airbus, II-VI, KBM Affilips and others). In fact end-users like Airbus, are not deploying their Sc applications due to the lack of a secure Sc supply. The SCALE project sets about to develop and secure a European Sc supply chain through the development of technological innovations which will allow the extraction of Sc from European industrial residues.

Bauxite Residues from alumina production (5 Million tons on dry basis per year in Europe) and acid wastes from TiO2 pigment production (1.4 Million tons on dry basis per year in Europe) have Sc concentrations which are considered exploitable, given a viable extraction technology. SCALE develops and demonstrates the value chain starting from residue and finishing to high tech end-product. In more detail:

- SCALE develops innovative technologies that can extract economically and sustainably Sc from dilute mediums (<100 mg/L) and upgrade them to pure oxides, metals and alloys at lower energy or material cost.
- SCALE extracts along with Sc all other REEs found in the by-products (AoG's BR on an annual base contain 10% of the European REE raw material imports)

The industrially driven SCALE consortium covers the entire Sc value chain with 7 major European industries and further features 8 academic and research institutes and 4 engineering companies with track records in RTD.

SLIM		730294
Title: Sustainable Low Impact Mining solution for exploitation of small mineral deposits based on advanced rock blasting and environmental technologies		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-13-2016-2017	Type of Action: RIA
Project start date: 11/1/2016	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 6.979.200,00	EU requested grant (€): 6.979.200,00	

Free keywords: *Small mining, Complex ore, Rock fragmentation, Rock Blasting, Low impact mining.*

Abstract:

The main economic, technological and environmental challenges of small mining include reducing high investment costs, reducing generation of waste and large tailings, identifying and addressing environmental impacts, and improving flexibility, automation and safety of operations. However, at the moment, there is no quick-fix available to reduce the environmental impact from mines, and it is neither realistic to expect production solutions very distant from today's technologies. Considering that the present mining technology is based on rock blasting and mobile mining equipment for loading and transportation, the major challenge is to generate a new sustainable systemic solution that affects positively the relevant mining value chain.

SLIM aims to develop a cost-effective and sustainable selective low impact mining solution based on non-linear rock mass fragmentation by blasting models, airborne particulate matter, vibration affections and nitrate leaching mitigation actions for exploitation of small mineral deposits (including those with chemically complex ore-forming phases) through a new generation of explosives and an advanced automatic blast design software based on improved rock mass characterisation and fragmentation models for optimum fragmentation and minimum rock damage and far-field vibrations.

SLIM consortium is led by UPM (es), with LTU (se), MUL (at) and TUG (at) as Research Institutions, 3GSM (at - Rock fragmentation and blasting software), MAXAM (es - Explosives), ORGIVA (es - Fluorite mine) and ERZBERG (at - Iron mine) and ARNO (es - Quarry) as validators in relevant environment. BRGM (fr), INVESTORNET (dk), MINPOL (at), and ZABALA (es) complement the Environmental and Economic assessments, the Communication and Dissemination activities and Social Awareness actions.

SLIM addresses the following issue: a) Sustainable selective low impact mining (2016), it has a planned duration of 48 months and a budget of €6,979,200 requesting €6,979,200 of EU funding.

SCRREEN		730227
Title: Solutions for CRITICAL Raw materials - a European Expert Network		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-15-2016-2017	Type of Action: CSA
Project start date: 11/1/2016	Duration: 30 months	Unit: EASME/B/02
Total costs (€): 2.999.500,00	EU requested grant (€): 2.999.500,00	

Free keywords: *critical raw materials*

Abstract:

Since the publication of the first list of Critical Raw Materials (CRM) in 2010 by the Ad-hoc Working Group on CRM, numerous European projects have addressed (part of) the CRMs value and several initiatives have contributed to gather (part of) the related community into clusters and associations. This led to the production of important knowledge, unfortunately disseminated. Numerous databases have also been developed, sometimes as duplicates.

For the first time in the history, SCRREEN aims at gathering European initiatives, associations, clusters, and projects working on CRMs into along lasting Expert Network on Critical Raw Materials, including the stakeholders, public authorities and civil society representatives.

SCRREEN will contribute to improve the CRM strategy in Europe by (i) mapping primary and secondary resources as well as substitutes of CRMs, (ii) estimating the expected demand of various CRMs in the future and identifying major trends, (iii) providing policy and technology recommendations for actions improving the production and the potential substitution of CRM, (iv) addressing specifically WEEE and other EOL products issues related to their mapping and treatment standardization and (vi) identifying the knowledge gained over the last years and easing the access to these data beyond the project.

The project consortium also acknowledges the challenges posed by the disruptions required to develop new CRM strategies, which is why stakeholder dialogue is at the core of SCRREEN: policy, society, R&D and industrial decision-makers are involved to facilitate strategic knowledge-based decisions making to be carried out by these groups. A specific attention will also be brought on informing the general public on our strong dependence on imported raw materials, on the need to replace rare materials with substitutes and on the need to set up innovative and clean actions for exploration, extraction, processing and recycling.

CIRCULAR IMPACTS		730316
Title: Measuring the IMPACTS of the transition to the CIRCULAR economy		
Call Id: H2020-SC5-2016-OneStageB	Topic: SC5-25-2016	Type of Action: CSA
Project start date: 10/1/2016	Duration: 24 months	Unit: EASME/B/02
Total costs (€): 501.280,00	EU requested grant (€): 501.280,00	

Free keywords: *Circular Economy, Transition, Impact assessment*

Abstract:

The EU 2020 targets of the European Union and international commitments of the EU make it mandatory for the EU to reduce its environmental impact while at the same time to make its economy more productive and more competitive. One important pathway to achieve both objectives is making the European economy more circular, meaning that the use of non renewable material resources is reduced, while at the same time the European economy is further developed and more jobs are created.

CIRCULAR IMPACTS aims to provide European policy makers with the knowledge to guide and foster the transition to a more circular economy by developing an overarching impact assessment of that transition and at the same time make the evidence base available for policy makers to develop impact assessment for their own specific policy proposals. As the circular economy is an ambition with a very wide and not precisely defined application area, CIRCULAR IMPACTS will start by defining the circular economy, identifying the most important application areas, understanding the policy needs of the area and developing a methodology for assessing the macroeconomic and societal impacts. It will then focus on assembling the available evidence for impact assessments and make this evidence base available for policy makers and the project itself with a web based search tool. This search tool will also help to make several relevant information collections funded by past EU research framework programs visible again, by connecting their evidence base to the circular economy agenda. The project will then collect missing information in case studies in order to understand the processes of the circular economy and the processes it might replace in more detail. To achieve that CIRCULAR IMPACTS has already assembled a Steering group of industry experts which will be able to provide the connections and the industry knowledge to the impact assessment.

COLLECTORS		776745
Title: waste COLLECTiOn systems assessed and good pRacticeS identified		
Call Id: H2020-SC5-2017-OneStageB	Topic: SC5-15-2016-2017	Type of Action: CSA
Project start date: 12/1/2017	Duration: 31 months	Unit: EASME/B/02
Total costs (€): 1.498.400,00	EU requested grant (€): 1.498.400,00	

Free keywords: *Waste collection systems; paper and packaging waste; WEEE; construction & demolition; extended producer responsibility; raw materials*

Abstract:

Five tonnes of waste per capita are generated every year in the EU. These annual 2.5 billion tonnes of waste contain large volumes of valuable materials for Europe's industrial base. Proper collection of waste is a pre-condition for their optimal recovery. The current trend of increasing higher collection rates is promising, but progress is uneven between Members States and between regions.

Good regional practices have the potential to serve as good practice examples for other regions. So far, however, results of existing studies and good practices have not been effective enough in supporting the implementation of better-performing systems elsewhere. The main objective of the COLLECTORS project is to overcome this situation and to support decision-makers in shifting to better-performing collection system.

COLLECTORS will therefore:

- (1) Increase awareness of the collection potential by compiling, harmonizing and presenting information on systems for packaging and paper waste, WEEE and construction products via an online information platform.
- (2) Improve decision-making on waste collection by the assessment of twelve good practices on their performance on: (1) quality of collected waste; (2) economics; (3) environment; (4) societal acceptance.
- (3) Stimulate successful implementation by capacity-building and policy support methods that will increase the technical and operational expertise of decision-makers on waste collection.
- (4) Engage citizens, decision-makers and other stakeholders throughout the project for validation of project results and to ensure the usability of COLLECTORS-output.

The COLLECTORS consortium is well-equipped to achieve these impacts as it is directly connected to more than 30 PROS and 2000+ authorities spread across the EU. In addition, the project is embedded in the full secondary raw material value chain ensuring alignment with waste management, recyclers and producers.

ORAMA		776517
Title: Optimising quality of information in RAw Materials data collection across Europe		
Call Id: H2020-SC5-2017-OneStageB	Topic: SC5-15-2016-2017	Type of Action: CSA
Project start date: 12/1/2017	Duration: 24 months	Unit: EASME/B/02
Total costs (€): 1.731.230,00	EU requested grant (€): 1.731.230,00	

Free keywords: *Data collection, Critical Raw Materials, Primary Raw Materials, Mining waste, Secondary Raw Materials, End of Life Vehicles, Batteries, Waste Electrical and Electronic Equipment, INSPIRE, RMIS*

Abstract:

The ORAMA project focuses on optimising data collection for primary and secondary raw materials in Member States. A cornerstone to the EIP on Raw Materials is the development of the EU knowledge base on primary and secondary raw materials, commenced by a series of European-funded projects. As the next iteration, ORAMA addresses specific challenges related to data availability, geographical coverage, accessibility, standardisation, harmonisation, interoperability, quality, and thematic coverage in Member States.

ORAMA will analyse data collection methods and recommendations from past and ongoing projects to identify best practices, develop practical guidelines and provide training to meet specific needs. These actions will demonstrate how to improve datasets for mineral occurrences, minerals intelligence data, economic, technical, environmental and social data for primary and secondary raw materials.

For primary raw materials, the focus is on harmonisation and improved coverage of spatial and statistical data, ensuring compliance with the INSPIRE Directive where appropriate. For Mining Waste, Waste Electrical and Electronic Equipment, End of Life Vehicles and Batteries, the focus is on developing 'INSPIRE-alike' protocols. The unified data model from the Minerals4EU and ProSUM projects will be applied to the datasets and outcomes will be combined with primary raw materials data. ORAMA will demonstrate how to create more robust Material Systems Analysis studies and reliable Sankey diagrams for stocks and flows of specific raw materials. Information is made accessible and compatible with the JRC's Raw Materials Information System to feed, for instance, future Raw Materials Scoreboard and Criticality Assessment studies.

In the long term, ORAMA empowers the wider EU raw materials community with necessary facts to support policy decisions and sustainable investments in the primary and secondary raw material industries.

POSIDON		776838
Title: POlluted Site DecontaminatiON - PCP		
Call Id: H2020-SC5-2017-OneStageB	Topic: SC5-26-2017	Type of Action: PCP
Project start date: 2/1/2018	Duration: 50 months	Unit: EASME/B/02
Total costs (€): 6.190.075,00	EU requested grant (€): 5.000.000,00	

Free keywords: *buyer group enlargement network, PCP, soil decontamination*

Abstract:

POSIDON gathers 5 European procurers facing similar problems in the sites they manage, affected by analogous pollutants (2 front-runners-Trieste, IT and Bilbao, ES-and 3 observers - Spaque, BE; Vitoria Gasteiz, ES; Baja do Tejo, PT), leveraging public demand to identify fit-for-purpose and cost-effective innovative and sustainable solutions to soil contamination.

The common challenge faced by the buyers' group is identifying a new, life-cycle cost-effective technology for soil and groundwater remediation, capable of decontaminating heterogeneous anthropic soils in brownfields with a mixture of industrial waste (blast furnace slags, construction & demolition waste, filling soils polluted by petroleum hydrocarbons) and soils consisting of clays and sands of marine origin, highly polluted by petroleum hydrocarbons (TPHs and PAHs) and heavy metals (arsenic and lead). Studies on the state of the art, patent analysis, foresight scanning and early market engagement meetings, show that no available technology can meet all identified needs, thus appropriate remediation technologies cannot be acquired through traditional off-the-shelf procurement. With PCP, procurers aim to achieve ambitious improvements in terms of quality and effectiveness, efficiency and sustainability of new technology to bring to the market.

R&D will be split into three phases: solution design, prototyping, original development and testing of 2 prototypes. Evaluations after each phase progressively identify solutions offering the best value for money. This phased approach allows successful contractors to improve their offers for the next phase based on feedback from procurers.

POSIDON intends to create a critical mass through the consolidation of a pan-European network of procurers who, sharing their needs and efforts, can enable the development - through PCP - and subsequent deployment - through a PPI - of novel technologies aimed to cover bigger market challenges in areas of common European interest

CROCODILE		776473
Title: first of a kind commercial Compact system for the efficient Recovery Of CObalt Designed with novel Integrated LEading technologies		
Call Id: H2020-SC5-2017-TwoStage	Topic: SC5-14-2016-2017	Type of Action: IA
Project start date: 6/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 14.890.408,75	EU requested grant (€): 11.625.289,01	

Free keywords: *cobalt, critical raw material, batteries recycling, bioleaching, solvometallurgy, ionometallurgy, pyrometallurgy, hydrometallurgy, electrochemistry*

Abstract:

The CROCODILE project will showcase innovative metallurgical systems based on advanced pyro-, hydro-, bio-, iono- and electrometallurgy technologies for the recovery of cobalt and the production of cobalt metal and upstream products from a wide variety of secondary and primary European resources. CROCODILE will demonstrate the synergetic approaches and the integration of the innovative metallurgical systems within existing recovery processes of cobalt from primary and secondary sources at different locations in Europe, to enhance their efficiency, improve their economic and environmental values, and will provide a zero-waste strategy for important waste streams rich in cobalt such as batteries. Additionally, CROCODILE will produce a first of a kind economically and environmentally viable mobile commercial metallurgical system based on advanced hydrometallurgical and electrochemical technologies able to produce cobalt metal from black mass containing cobalt from different sources of waste streams such as spent batteries and catalysts. The new established value chain in this project will bring together for the first time major players who have the potential of supplying 10,000 ton of cobalt annually in the mid-term range from European resources, corresponding to about 65% of the current overall EU industrial demand. Therefore, the project will reduce drastically the very high supply risk of cobalt for Europe, provide SMEs with novel business opportunities, and consolidate the business of large refineries with economically and environmentally friendly technologies and decouple their business from currently unstable supply of feedstocks.

NEMO		776846
Title: Near-zero-waste recycling of low-grade sulphidic mining waste for critical-metal, mineral and construction raw-material production in a circular economy		
Call Id: H2020-SC5-2017-TwoStage	Topic: SC5-14-2016-2017	Type of Action: IA
Project start date: 5/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 14.941.396,50	EU requested grant (€): 12.407.294,63	

Free keywords: *secondary ore, bioleaching, alkaline leaching, cementitious materials, REE, metal recovery*

Abstract:

With an estimated volume of 600 Mtonne/yr and a historic stockpile of 28,000 Mtonne, sulphidic mining waste from the production of Cu, Pb, Zn and Ni, represents the largest volume of extractive waste in Europe. When poorly managed, these “tailings” may cause major environmental problems such as acid mine drainage. In 2016 EIP Raw Materials launched a “call to arms” to transform the “extractive-waste problem” into a “resource-recovery opportunity”, as “tailings” still contain valuable & critical metals. Using a “4 PILOTS – 2 case-studies” concept NEMO develops, demonstrates and exploits, therefore, new ways to valorise sulphidic tailings. The 2 cases are the Sotkamo Ni-Cu-Zn-REE/Sc mine in Finland and the Las Cruces Cu-mine in Spain; the 4 PILOTS are located at key points in the near-zero-waste flowsheet, encompassing the recovery of valuable & critical metals, the safe concentration of hazardous elements, the removal of sulphur as sulphate salts, while using the residual mineral fraction in cement, concrete and construction products. NEMO has established an interdisciplinary consortium, including 8 industrial partners (2 mining, 4 engineering, 1 machine manufacturing & 1 construction material company), 4 research institutes, 2 universities and 1 civil society group. NEMO’s near-zero-waste technology will provide the EU with both direct and long-term, indirect advantages. The former range from new resources (e.g. base metals: Cu, Zn, Ni, Pb; critical metals: Sc, Nd, Y, Sb; SCM and aggregates etc.), CO₂ savings from metal recovery and the replacement of Ordinary Portland Cement), new job creation (> 150 FTEs), new revenues (> 200 M€/yr) while the latter represent the multiplication of the former benefits (cf. 28,000 Mtonne of these tailings), while eradicating acid-mine drainage and other environmental issues, and ensuring an enhanced dialogue (framework) between industry and civil society, to obtain and maintain the License to Operate mines in EU.

RemovAL		776469
Title: Removing the waste streams from the primary Aluminium production and other metal sectors in Europe		
Call Id: H2020-SC5-2017-TwoStage	Topic: SC5-14-2016-2017	Type of Action: IA
Project start date: 5/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 14.658.966,25	EU requested grant (€): 11.481.599,13	

Free keywords: *Bauxite Residue, red mud, SPL, Ga, REE, Fe-Si, construction materials*

Abstract:

The answer to the current Raw Material supply challenge faced today in Europe, lies in technological innovations that increase the efficiency of resource utilization and allow the exploitation of yet untapped resources such as industrial waste streams and metallurgical by-products. One of the key industrial residues which is currently not or poorly valorised is Bauxite Residue (BR, more commonly known as “red mud”) from alumina refineries. Bauxite residue reuse solutions do exist as stand-alone but pooling them together in an integrated manner is the only way to render bauxite residue reuse viable from an economical point of view and acceptable for the industry

The RemovAl project will combine, optimize and scale-up developed processing technologies for extracting base and critical metals from such industrial residues and valorising the remaining processing residues in the construction sector.

In term of technological aspects, RemovAl will process several by-products from the aluminium sector and from other metallurgical sectors in Europe (SiO₂ by-products, SPL, fly ash, and others). The different waste streams will be combined to allow for optimal and viable processing in different technological pilot nodes. The technologies and pilots in most cases have already been developed in previous or ongoing projects and through RemovAl they will be pooled together and utilized in a European industrial symbiosis network.

In term of societal or non-technological aspects, RemovAl will gather key sectors like the non-ferrous metal and cement sectors in order to secure a true industrial symbiosis through a top-down approach considering also legislation and standardisation at European level in order to facilitate the implementation of the most promising technical solutions.

SecREEs		776559
Title: Secure European Critical Rare Earth Elements		
Call Id: H2020-SC5-2017-TwoStage	Topic: SC5-14-2016-2017	Type of Action: IA
Project start date: 6/1/2018	Duration: 48 months	Unit: EASME/B/02
Total costs (€): 17.224.132,31	EU requested grant (€): 12.880.031,87	

Free keywords: *Rare earth elements, permanent magnets,*

Abstract:

Rare Earth Elements (REEs) are critical and non-substitutable raw materials with high economic importance for European industry, as they are crucial components for a broad range of advanced products. The main goal of the SecREEs project is to establish a stable and secure supply of critical REEs based on sustainable extraction from European apatite sources used in fertiliser production. Pilot processes will be developed for the innovative extraction, separation and transformation of REEs. Rare Earth (RE) metals will be supplied to application areas like electric vehicles, industrial motors and wind turbines. Replication potential will be demonstrated in medical diagnostics, Fluid Catalytic Cracking and consumer products. The main objective of the project is to demonstrate a new integrated value chain for the optimal extraction, refining and production of REEs in Europe. This will be achieved through the development and demonstration of a number of innovative technologies:

- Utilise efficiently a novel industrial sidestream process in fertiliser production to extract the REEs
- Separate REEs by a novel chromatographic process into distinct nitrate salts
- Realise electrochemical production of metals and alloys from the above targeted RE oxides
- Demonstrate the market value and relevance of the produced RE metals in permanent magnets and its downstream products
- Validate market acceptance of the RE oxides not processed to metals
- Create an industrial symbiosis between two value chains
- Demonstrate the economic, environmental and societal sustainability as well as safety of the pilot units

SecREEs pilots will focus on Pr, Nd and Dy metals used in permanent magnets as these are extremely critical for the European economy. Industrial implementation of the pilots developed in SecREEs will lead to a supply of at least 3000 tonnes annually of REEs to European industries in 2023, with 75 M€ in estimated value.

SUSFOOD2		727473
Title: ERA-Net Cofund on Sustainable Food production and consumption (SUSFOOD2)		
Call Id: H2020-SFS-2016-1	Topic: SFS-19-2016-2017	Type of Action: ERA-NET-Cofund
Project start date: 1/1/2017	Duration: 60 months	Unit: REA/B/02
Total costs (€): 14.269.217,00	EU requested grant (€): 4.708.841,61	

Free keywords: *Sustainability, Food production, Consumption, food chain, Food processing, loss, waste, environment, consumer, agribusiness,*

Abstract:

The aim of SUSFOOD2 is to foster research and innovation in the field of sustainable food systems through enhanced cooperation and coordination between EU member and associated states. It will thereby contribute to the overall EU objective of building the European Research Area as well as a newly emerging Food Research Area.

Major challenges will influence future food chains asking for innovative solutions to

- respond to increased demand for food by increasing production sustainably (Food and Nutrition Security)
- make optimal use of resources while mitigating impact on the environment
- reducing losses and waste
- follow a whole food chain approach from production to consumption
- improving competitiveness of the European agri-food-business

SUSFOOD2 focusses on sustainability in post-harvest food production, thus covering relevant fields from natural sciences to food engineering and social sciences.

Building on the achievements of its predecessor in FP7, SUSFOOD2 Cofund will strengthen efforts to support and fund excellent research in the food area by one co-funded call of around 14 Mio. €. The consortium also aims at implementing other additional activities in a three-fold approach:

- i) strengthening networking and knowledge transfer among various stakeholders (i.e. by workshops, stakeholder events etc.)
- ii) additional funding activities without EU co-fund (preferably linked with other initiatives)
- iii) implementation and further advancement of the SUSFOOD SRA (developed in FP7)

With the outlined approach SUSFOOD2 will contribute to

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- maximizing impact of transnational cooperation pooling resources (material and intellectual) and implementing best practice
- using synergies and reducing overlap by interacting with related (international) initiatives (especially JPIs HDHL and FACCE)
- Promoting the outputs of SUSFOOD2 network and funded projects via targeted dissemination thus sharing common vision and creating awareness for the field of food sustainability.

GLOPACK		773375
Title: Granting society with LOw environmental impact innovative PACKaging		
Call Id: H2020-SFS-2017-1	Topic: SFS-35-2017	Type of Action: IA
Project start date: 6/1/2018	Duration: 36 months	Unit: REA/B/02
Total costs (€): 6.658.650,36	EU requested grant (€): 5.560.785,48	

Free keywords: *Packed Food Sustainability, active and intelligent packaging, biodegradable packaging materials, food environmental footprint*

Abstract:

GLOPACK proposes a cutting-edge strategy addressing the technical and societal barriers to spread in our social system, innovative eco-efficient packaging able to reduce food environmental footprint.

Focusing on accelerating the transition to a circular economy concept, GLOPACK aims to support users and consumers' access to innovative packaging solutions enabling the reduction and circular management of agro-food, including packaging, wastes. Building from existing key enabling but simply applicable technologies, GLOPACK will focus on increasing the TRL of the three main promising advances in the food packaging area: (1) bio-circular (biodegradable materials issued from agro-food residues conversion) packaging materials, (2) active packaging to improve food preservation and shelf-life without additives and (3) RFID enabled wireless food spoilage indicator as new generation of self-adjusting food date label.

GLOPACK strategy will tackle the diffusion of these innovation through the whole stakeholders chains, from the researcher up to the consumer, i.e. the uptake by packaging industry through pilot and large-scale processing for the selected technologies, by food companies through the deployment of a software tool for decision making and for providing proof of usefulness to all stakeholders, by others users (e.g. retailers) and consumer through user-driven adoption strategies, cost-benefit analysis and validation and retro-active adjustment in close to real conditions. Validation of the solutions including compliance with legal requirements, economic feasibility and environmental impact will push forward the three technologies tested and the related decision-making tool from TRL 3-4 to 7 for a rapid and easy market uptake contributing therefore to strengthen European companies' competitiveness in an always more globalised and connected world.

MYPACK		774265
Title: Best markets for the exploitation of innovative sustainable food packaging solutions		
Call Id: H2020-SFS-2017-1	Topic: SFS-35-2017	Type of Action: IA
Project start date: 11/1/2017	Duration: 42 months	Unit: REA/B/02
Total costs (€): 5.709.892,50	EU requested grant (€): 4.649.860,91	

Free keywords: *BIODEGRADABLE AND COMPOSTABLE PACKAGING, PACKAGING FROM RENEWABLE RESSOURCES, ELABORATED (HIGH BARRIER AND ACTIVE) PACKAGING TECHNOLOGIES*

Abstract:

Mypack general objective is to help sustainable food packaging technologies to reach or to extend their market. It will provide general guidelines to select the best market for a new technology and to ensure the best commercial development, through (i) the best environmental efficiency (direct impacts of packaging, food waste impacts, optimized recycling composting combusting end life, preserved consumer health), (ii) the best consumer acceptability, and (iii) an optimized industrial feasibility.

In order to do so, 3 ambitious SMART key objectives with associated KPIs will be considered during the Mypack project to promote the commercial development of:

- Biodegradable and compostable packaging.
- Packaging from renewable resources.
- Elaborated (high barrier and active) packaging technologies.

Barriers and challenges are clearly identified and solutions to overcome them are presented.

7 innovative sustainable food packaging solutions are considered of which 5 will be developed and exploited. The sustainable food packaging state of the art is comprehensively described and it is made clear how Mypack solutions will extend beyond it.

Appropriate measures, in line with the work program, were selected to maximize the impact of the project.

Mypack project targets the scope of the call throughout this proposal and is thus fully in line with the call objectives. A convincing exploitation plan is presented in the form of 7 work packages, 5 of which are technical in nature. Appropriate milestones and risks are considered in order to complete the project objectives in the due time.

The Mypack consortium is composed of 18 partners, covering the academic, scientific and industrial world, including SMEs. Major stakeholders have provided letters of intent, showing their interest in the Mypack approach which will have essential impact in order to define the best markets for the exploitation of innovative sustainable food packaging solutions.

YPACK		773872
Title: HIGH PERFORMANCE POLYHYDROXYALKANOATES BASED PACKAGING TO MINIMISE FOOD WASTE		
Call Id: H2020-SFS-2017-1	Topic: SFS-35-2017	Type of Action: IA
Project start date: 11/1/2017	Duration: 36 months	Unit: REA/B/02
Total costs (€): 7.277.671,25	EU requested grant (€): 5.996.591,02	

Free keywords: *Food waste; PHA; PHBV; Prototyping; Environment, resources and sustainability; Food safety; Sustainable design; Life Cycle analysis; Piloting; Sustainable innovation; Market uptake assessment.*

Abstract:

The main objective of YPACK is the pre-industrial scale up and validation of two innovative food packaging solutions (thermoformed tray and flow pack bag) based on PHA, with active and passive barrier properties. New packaging will use food industry by-products (cheese whey and almond shells), assure the biodegradability and recyclability, and reduce food waste, in the frame of the EU Circular Economy strategy.

YPACK will use a holistic approach and methodology involving different knowledge areas: Development of packaging solutions (Production of PHBV layers, compounding, prototyping, Industrial Validation), Product Validation (Quality / Shelf life), Social approach (Customer profiling, Dissemination, Policies & Regulatory) and Market Assessment (Business study and Risk assessment). YPACK is aligned with the EU Circular Economy strategy, including the use of raw bio-based food industry by-products, LCA studies, recyclability & biodegradability of packaging and trying to reduce Food Waste. The project is constructed in line with the Responsible Research and Innovation guidelines of the European Commission.

The project has a total duration of 36 months. Several processes related to the production of multilayered passive and active systems based on raw PHBV will be optimised and scaled up to pre-industrial size to validate the production of the proposed packaging solutions for extend the shelf life of selected food products. They consist in:

- i) a multilayer tray involving an inner active layer, and
- ii) a multilayer flow pack with improved barrier properties. A consumer profiling and market study will be performed at the first stage of the project in order to identify consumers' preferences, market needs and match them with the new EU regulations and packaging materials breakthroughs.

SiEUGreen		774233
Title: Sino-European innovative green and smart cities		
Call Id: H2020-SFS-2017-1	Topic: SFS-48-2017	Type of Action: IA
Project start date: 1/1/2018	Duration: 48 months	Unit: REA/B/02
Total costs (€): 8.377.867,50	EU requested grant (€): 6.999.999,38	

Free keywords: *Resilience, smart cities, inclusion, social innovation, EU-China cooperation, food security, food literacy, resource efficiency, land use, urban design, environmental and economic impact*

Abstract:

SiEUGreen aspires to enhance the EU-China cooperation in promoting urban agriculture for food security, resource efficiency and smart, resilient cities. Building on the model of zero-waste and circular economy, it will demonstrate how technological and societal innovation in urban agriculture can have a positive impact on society and economy, by applying novel resource-efficient agricultural techniques in urban and peri-urban areas, developing innovative approaches for social engagement and empowerment and investigating the economic, environmental and social benefits of urban agriculture. In order to achieve its objectives, SiEUGreen brings together a multi-disciplinary Consortium of European and Chinese researchers, technology providers, SMEs, financiers, local and regional authorities and citizen communities. The project consists in the preparation, deployment and evaluation of showcases in 5 selected European and Chinese urban and peri-urban areas: a previous hospital site in Norway, community gardens in Denmark, previously unused municipal areas with dense refugee population in Turkey, big urban community farms in Beijing and Central China. Throughout SiEUGreen's implementation, EU and China will share technologies and experiences, thus contributing to the future developments of urban agriculture and urban resilience in both continents. The impact measurement during and especially beyond the project period is a key component in the project's design. Information and results obtained from the project will be disseminated through diverse communication and dissemination tools including, social media, an innovative app enhancing urban co-design, stakeholder conferences, hand-on training workshops, showcase demonstration forums, municipality events. A sustainable business model allowing SiEUGreen to live beyond the project period is planned by joining forces of private investors, governmental policy makers, communities of citizens, academia and technology providers.

Circular Agronomics		773649
Title: CIRCULAR AGRONOMICS - Efficient Carbon, Nitrogen and Phosphorus cycling in the European Agri-food System and related up- and down-stream processes to mitigate emissions		
Call Id: H2020-SFS-2017-2	Topic: SFS-30-2017	Type of Action: RIA
Project start date: 9/1/2018	Duration: 48 months	Unit: REA/B/02
Total costs (€): 7.032.749,04	EU requested grant (€): 6.999.795,50	

Free keywords: *Agri-food chain; Greenhouse Gas Emissions; Nutrient recycling; Manure; Nitrate; Agriculture; Food waste; Climate change; Life Cycle Assessment; Bioenergy; Carbon management; Policy Briefing*

Abstract:

Circular Agronomics (CA) provides a comprehensive synthesis of practical solutions to improve the current Carbon (C), Nitrogen (N) and Phosphorus (P) cycling in European agro-ecosystems and related up- and down-stream processes within the value-chain of food production. The proposed solutions would constitute a further step towards making agriculture an integral part of a circular economy by increasing resource efficiency while simultaneously addressing associated environmental challenges such as greenhouse gas and ammonia emissions as well as eutrophication of water bodies. Along 7 work packages and 6 case-studies, representing locations with different biogeographic conditions and environmental challenges typical for the European agricultural sector, the objective of CA is to contribute to a development towards sustainable, resilient and inclusive economies that are part of circular and zero-waste societies. The involved multi-actor and international consortium aims (i) To increase the understanding of C, N, P flows and the related potential to reduce environmental impacts at farm and regional level under different biogeographical conditions; (ii) To close loops within cropland farming, from livestock to cropland farming and to increase the reuse of waste/wastewater from food-industry to improve soil fertility and to increase nutrient use efficiency; (iii) To highlight the performance of different prototypes of agro-ecological systems and increase sustainability of food production in the EU; and (iv) To contribute to the improvement of the European Agricultural Policies by providing evidence based, farmer led and consumer relevant recommendations for the agri-food chain. Cross-cutting social, economic and environmental evaluation ensure the overall sustainability of the investigated solution.

Nutri2Cycle		773682
Title: Transition towards a more carbon and nutrient efficient agriculture in Europe		
Call Id: H2020-SFS-2017-2	Topic: SFS-30-2017	Type of Action: RIA
Project start date: 10/1/2018	Duration: 48 months	Unit: REA/B/02
Total costs (€): 7.048.003,75	EU requested grant (€): 6.850.050,50	

Free keywords: *GHG abatement, agriculture, nutrient recycling, agro processing, demonstration, soil OC*

Abstract:

NUTRI2CYCLE will use an integrated approach to enable the transition from the current (suboptimal) nutrient household in European agriculture to the next-generation of agronomic practices, characterized by an improved upcycling of nutrients and organic carbon.

The project is deeply rooted in previous national and European projects, in which the consortium members were actively involved. The underlying principle is that Nutrient Use Efficiency can be significantly improved by integrating on-farm techniques and systems that allow better reconnection between 1) animal husbandry provided flows and 2) plant production requirements. At the same time this reconnection itself will serve a better C-return to soil and GHG-reduction by avoided emissions optionally combined with energy production for self-consumption on-farm.

UTRI2CYCLE aims to (i) benchmark mass flows of nutrients, organic carbon and GHG-footprint, (ii) provide an assessment frame (toolbox) for evaluating potential impact of proposed innovations, (iii) actively support concepts, techniques and scenarios put forward in EIP-Operational Groups, (iv) optimize these (+ in-consortium developed) scenarios using the toolbox, (v) showcase the most promising developments via prototypes and demos. Finally, using the experience gained at a local/regional scale, NUTRI2CYCLE will elaborate strategic scenarios to identify the effect of these innovations at European scale.

NUTRI2CYCLE brings together the extensive expertise of leading experts in the field of nutrient cycling. This collaboration originates from the EIP-Focus Group on Nutrient Recycling, closely interacting with the EIP Operational Groups in the individual EU member states. Better nutrient stewardship engaging all actors across the value chain as envisaged in NUTRI2CYCLE will increase the C, N and P recycling rate significantly and will improve the overall sustainability and innovation capacity of European agricultural systems.

GAIN		773330
Title: Green Aquaculture Intensification in Europe		
Call Id: H2020-SFS-2017-2	Topic: SFS-32-2017	Type of Action: RIA
Project start date: 5/1/2018	Duration: 42 months	Unit: REA/B/02
Total costs (€): 6.109.648,75	EU requested grant (€): 5.998.795,00	

Free keywords: *Ecological intensification, Circular economy, Management optimisation*

Abstract:

GAIN is designed to support the ecological intensification of aquaculture in the European Union (EU) and the European Economic Area (EEA), with the dual objectives of increasing production and competitiveness of the industry, while ensuring sustainability and compliance with EU regulations on food safety and environment. Eco-intensification of European aquaculture is a transdisciplinary challenge that requires the integration of scientific and technical innovations, new policies and economic instruments, as well as the mitigation of social constraints. Successful eco-intensification of aquaculture will provide more and better aquatic products, more jobs, and improve trade balance by reducing imports.

GAIN, besides looking at innovative ways of integrating cultured species, will seek integration with other sectors, in order to promote the implementation of the principles of circular economy in Aquaculture. The GAIN Consortium includes a wide range of complementary expertise and a well blended mix of research institutes and industrial partners, which will ensure the achievement of the following specific objectives:

- (i) Develop and optimize sustainable feeds, without increasing the pressure on land and fish stocks;
- (ii) Add value to cultivation, by means of innovative processes, which turn both by-products and side-streams into valuable secondary materials, thus increasing profits and minimizing the environmental footprint;
- (ii) Improve the management of finfish and shellfish farms, in terms of FCR, fish welfare and reduction of wastes, through the use of sensors, biomarkers, Big Data, IoT (Internet of Things) and predictive mathematical models;
- (iv) Support integrated policies and address current barriers to the implementation of the principles of circular economy in aquatic production.

IMPAQT		774109
Title: Intelligent management system for integrated multi-trophic aquaculture		
Call Id: H2020-SFS-2017-2	Topic: SFS-32-2017	Type of Action: RIA
Project start date: 5/1/2018	Duration: 36 months	Unit: REA/B/02
Total costs (€): 6.218.180,00	EU requested grant (€): 5.883.180,00	

Free keywords: *Integrated Multi-Trophic Aquaculture (IMTA) concept; multi-purpose, multi-sensing and multi-functional monitoring system; IMTA management system; Semantic Aquaculture; Fish and seafood quality*

Abstract:

The Integrated Multi-Trophic Aquaculture (IMTA) is acknowledged as a promising solution for the sustainable development of aquaculture. However, IMTA has been only tested at very small scale in Europe, while management of large-scale IMTA areas remains difficult.

The high level ambition of Impaqt project is to drive a paradigm shift in the EU Industry and its , paving the way to both a more environmentally friendly and more efficient/higher yielding European Industry. To that respect, Impaqt proposes an intelligent management platform for IMTA. Impaqt will develop and deploy novel sensors and data sources, together with smart systems required for long term autonomous monitoring in the field. An advanced IMTA model will be provided which yields spatially explicit information on how the different farm components interact with the environment on the scale of an ecosystem and that can be used for planning decisions by both farmers and regulators. Last but not least, an integrated management system, operating at the scale of an IMTA farm and comprising analytics and decision support functionalities, will be developed to enable enhanced operational decisions for animal welfare, production optimization, environmental protection and food quality assessment.

Impaqt systems and models will be validated in 6 pilots (Scotland, The Netherlands, Ireland, Turkey and China), addressing inland, coastal and offshore aquaculture. Impaqt will demonstrate the eco-intensification of EU aquaculture, by demonstrating the eco-efficiency and the environmental impacts minimized, the socioeconomic benefits and ecosystem services enabled, as well as the transition towards a circular economy business model. Impaqt brings together a considerable range of partners including 14 academic/research organizations, 4 SMEs and 3 large industries, all leaders in their respective fields/business, while aims to effectively transfer the project's results to relevant stakeholders through training activities.

SHui		773903
Title: Soil Hydrology research platform underpinning innovation to manage water scarcity in European and Chinese cropping systems		
Call Id: H2020-SFS-2017-2	Topic: SFS-47-2017	Type of Action: RIA
Project start date: 9/1/2018	Duration: 48 months	Unit: REA/B/02
Total costs (€): 5.562.745,00	EU requested grant (€): 4.884.493,75	

Free keywords: *Research platform, stakeholders, socioeconomics, ecosystem services, sustainable intensification*

Abstract:

SHui is conceived as a network integrating long-term experiments of its 19 academic and SME partners across different environmental conditions and cropping systems in the EU and China. It provides a platform for research on soil-water resources management under water scarce conditions, to better understand the linkages between agricultural soil hydrology and sustainability and for a systematic assessment of adaptation and mitigation methods. It will develop and implement new strategies to increase water use efficiency and yield, based on sustainable intensification through integrated use of soil and water across different spatial scales. At farm level, this includes digital agriculture solutions integrating in situ and remote sensors and simulation models to exploit an improved understanding of the relationship between crop yield variability and soil hydraulic properties, optimizing circular approaches to re-use water and using waste water sources. These technical approaches are reliant on optimum data utilization and transdisciplinary research with multiple stakeholders. At regional scales, the aggregation of biophysical and socioeconomic variables in dynamic models will evaluate the impact of different policy strategies, to support decision makers to evaluate different scenarios of land-use dynamics, economic context and current and future climate in EU and China, including assessments of water and carbon footprint. SHui will exploit scientific, technological and social innovations by disseminating and communicating these to multiple stakeholders, and implementing novel technological packages from farm to large regional scales. It aims to make a significant contribution to the EU and China Research Agenda for Agriculture in providing food security and optimum use of scarce soil and water resources. Training a cohort of early career scientists in soil conservation and water-saving practices, SHui's legacy will extend beyond the project duration.

Madaster		779024
Title: Towards a circular economy: Eliminate waste through an open platform that facilitates material passports		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-01-2016-2017	Type of Action: SME-2
Project start date: 5/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 3.539.089,16	EU requested grant (€): 2.477.362,41	

Free keywords: *construction, real-estate, Material Passport, circular economy, platform, ICT, BIM, architecture, sustainable building*

Abstract:

Our planet is a closed system with finite resources. The current economic system is strongly based on consuming and discarding these materials and products. Combined with the growing population and strong economic growth this leads to a rapid depletion of the earth's valuable resources while creating huge amounts of waste. To overcome this, it is essential to change our current linear economy and move towards a sustainable circular economy in which resources are reused and recycled while eliminating the production of waste.

Many circular initiatives have failed to create sustainable material cycles due to a lack of usable information on material contents. This information is of utmost importance to allow re-use and recycling of materials and thus, to maintain the material's value. Consequently, this will result in the thoughtful deconstruction of products, maintaining their valuable materials and subsequent re-use or recycling, minimizing waste.

To facilitate this highly needed information exchange and to facilitate the vital transition towards a circular economy, Madaster Services BV and Winvision BV have developed the disruptive Madaster ICT Platform which, for the first time, is able to precisely document and store material-related information of products. This innovative solution specifically focusses on the construction sector with the strong ambition to eliminate waste.

The following project objectives are defined:

1. Produce Material Passports of construction objects in an operational setting;
2. Develop protocols for data extraction and integration of resource-related information of construction;
3. Create an open-standard IT infrastructure to enhance interoperability with other systems that will make use of the resource-related information of construction objects in the database;
4. Develop a clearly defined business strategy for the Madaster Platform, the Material Passport and data services

CGM		805997
Title: A next generation nano media tailored to capture and recycle hazardous micropollutants in contaminated industrial wastewater.		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-02-2016-2017	Type of Action: SME-2
Project start date: 4/1/2018	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.953.701,25	EU requested grant (€): 1.367.590,88	

Free keywords: *micropollutants; contaminants; heavy metals; clean water*

Abstract:

Customem Ltd is a company founded with the long term vision to harness nature's capacity to make biomaterials to promote human health in alignment with sustainable development goals. A next generation nanomedia that can be tailored to capture and recycle specific micropollutants in contaminated industrial wastewater. Lack of access to clean water is predicted to affect 47% of the world's population by 2030. Contamination of water supplies by micropollutants such as metal ions, pesticides and pharmaceuticals is a major contributor to this water stress. These pollutants are released by industrial processes in the textile and manufacturing industries. Existing water treatment removes 99.96% of contaminants, but does not remove the 0.04% of micropollutants. Although the remaining contaminants seem small, they are a major problem as they are exceptionally difficult to capture but also highly toxic to humans and animals. CustoMem have developed a customisable selective nanocellulose media called CustoMem Granular Media (CGM) that is bioengineered to capture and remove all micropollutants including the 0.04% that cannot currently be removed. Customers benefit from a simple, low cost, low energy solution that is low maintenance. It allows removal of all micropollutants resulting in clean water supplies. The company is headquartered in the Imperial College Incubator UK and currently has 6 employees. The company is currently in talks with companies in the EU who have shown an active interest in the project. The Phase 2 project will allow CustoMem to finalise CGM development and accelerate its market introduction.

Cronogard		783696
Title: HIGH PERFORMING ADVANCED MATERIAL PLATFORM FOR ACTIVE AND INTELLIGENT FOOD PACKAGING: CRONOGARD™		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-02-2016-2017	Type of Action: SME-2
Project start date: 10/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.576.240,00	EU requested grant (€): 1.103.368,00	

Free keywords: *active and intelligent packaging; disposable; coating; biodegradable; food safety; shelf life;*

biocompatibility; environmental sustainability.

Abstract:

Nice Filler (NF) is working to introduce on the market for food packaging solutions an innovative advanced material technology platform (cronogard) based on an organic-inorganic active filler, edible and biocompatible, characterized by a lamellar structure able to intercalate with ionic bonds active molecules (antimicrobial, antioxidant, antibacterial), capable of maintain or improving the quality of food and to extend the food shelf life. Indeed, cronogard can be applied with different techniques (coating, injection molding, spray dying) to all kind of food packaging solutions (boxes, trays, cans, films) thus bringing value to the entire value chain, from the packaging industry, to the food industry, to the large organized distribution, to the final consumer of fresh goods.

The market for active and intelligent packaging is enormous and based on large volumes. In Europe it is expected to grow from \$17.28 billion in 2014 to \$19.68 billion by the end of 2020 at a CAGR of 2.19%. NF, with its proprietary and patented technology, aims at becoming a leader in the provision of the filler for all kind of packaging solutions, dealing with the most relevant players to offer an extraordinarily performing packaging solution, to the benefit of the European food industry, which is traditionally rich of fresh, high-quality products (dairy, fruits, meat).

Once the project activities will be completed and cronogard will enter the market, NF is expected to grow significantly through sales of the filler and to reach estimated revenues in the range of 40 M € in 2022, with an international reach, a 46% enticing EBITDA, and an ambitious hiring plan for over 20 qualified professionals. Through control of the production facilities and the related know-how, the company will retain a competitive edge and a leadership position in Europe and abroad, proudly concurring to the economic growth, but also the reduction of food waste in a world of changing food consumption habits.

INDALG		733718
Title: Development of an innovative algae based tertiary wastewater treatment and value recovery system		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-03-2016-2017	Type of Action: SME-2
Project start date: 10/1/2016	Duration: 30 months	Unit: EASME/A/02
Total costs (€): 2.098.983,75	EU requested grant (€): 1.469.288,63	

Free keywords: *Sustainable; Wastewater treatment; Material recovery; Algae; Biotechnology; Water; Chemical*

free

Abstract:

Industrial Phycology (IPHYC) has developed a wastewater treatment (WWT) process to meet tightening discharge consents for the concentration of nitrogen (N), phosphorus (P) and other materials in wastewater (WW) effluents. These nutrients & materials are linked to adverse environmental events e.g. eutrophication. WWT operators require a sustainable treatment process to remove / recover these materials to meet legislation.

IPHYC's novel patented WWT process uses microalgae (MA) to remove nutrients from WW effluents. MA reproduce rapidly when sufficient nutrients, light & CO₂ are supplied. The MA consume nutrients in the WW until depleted cleaning the effluent to the legislated discharge consent concentrations, allowing the operator to meet its statutory commitments & not risk financial penalties. The biomass is retained for reactor seeding or harvested for valorisation e.g. use for anaerobic digestion, animal feed, feedstock for bio-based industries.

The process has been validated by I-PHYC in a recent field trial at Wessex Water's Avonmouth WWT plant & a supporting feasibility study carried out through SME instrument phase 1 support. Through the phase 1 project, IPHYC engaged with the UK water industry to understand the market & end-user needs. From this IPHYC has worked with industry partners to identify the work required to prove its technology & develop its process to commercial readiness. IPHYC is applying for funding to enable it to achieve this by; building a commercial demonstrator of its process for the treatment of municipal wastewaters; optimising its process for the treatment of industrial effluents (e.g. mines); develop methods of recovering value from the algal biomass; further engage with key industry companies, decision makers and potential future customers; develop its commercial strategy for the delivering the technology to market. This outcomes of the project will enable IPHYC to enter the market with a credible and proven disruptive technology.

Green-DROP		793325
Title: Precise subarea specific irrigation and fertilization system		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-07-2016-2017	Type of Action: SME-2
Project start date: 4/1/2018	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.384.237,50	EU requested grant (€): 968.966,25	

Free keywords: *Automatic system, fertigation, efficient use of resources, water savings, sensors, precise farming, low-cost, waste reuse, increase productivity, state-of-the-art technologies*

Abstract:

Competitive global markets, rising fertilizer and energy costs, and growing uncertainties in water availability, due to a more and more uneven rainfall distribution, impose serious challenges on the European agricultural producers. Besides, wastes from farms with high nutrient availability as manure from animals, digestate from biogas plants and sewage sludge are becoming difficult and expensive to dispose.

In response to these challenges and in order to achieve an efficient application of resources more and more farmers are introducing approaches of “precision agriculture” technologies for farming practices, such as Green-DROP. Green-DROP uses a number of georeferenced layers with different information: crop type, topography, weather distribution, field capacity, soil type, etc. This information gives the precise and specific requirements of water and nutrients for each subarea of the holding to be fertigated. Green-DROP makes possible to meet the exact fertilizer and water demands for all types of soils and crops. Thus, Green-DROP enables the farmer to increase productivity, resource efficiency, compliance and competitiveness in the production of raw materials, while mitigating environmental impacts from water abstractions and fertilizer application. Additionally, Green-DROP project will recover nutrients from farming wastes, and will use them as input for the fertilization of the land to close the nutrient cycle (Nutrients in waste-Nutrients as fertilizers-Nutrients in plants). Green-DROP reduces water and fertilizers consumption by 20 % making the agricultural sector more independent and profitable. It is designed for farms of all sizes but it will focus on holdings and agricultural cooperatives with at least 50 ha of surface area.

HYDROBLOOD		766747
Title: Innovative processing plant for optimal production of Decolourised Hydrolysed Protein (DHP). A secure, cost-effective and eco-friendly blood by-product solution.		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-07-2016-2017	Type of Action: SME-2
Project start date: 5/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.854.416,25	EU requested grant (€): 1.998.091,38	

Free keywords: *animal by-products, animal blood, animal protein, hydrolysed protein, feed, feed additives, slaughterhouse, rendering plant, waste treatment, processing plant, blood rendering, blood processing.*

Abstract:

Blood is a common by-product of the meat industry, which is obtained in large volumes especially in industrial slaughterhouses. Approximately 1,452 million pigs were processed worldwide for their meat in 2013. The annual available blood supply exceeds 4.35 million tonnes worldwide. Taking into account a typical protein content around 18%, 783k tonnes of protein could be produced worldwide.

In spite of the significance of this sum, an important part of the collected blood is not considered but a waste. The reason lies in the lack of suitable facilities in the slaughterhouses to properly collect and handle blood. Hence, a high percentage of the abovementioned amount of protein becomes a waste, which requires expensive decontamination treatments and large amounts of water. On the other hand, the collection of blood in most of the slaughterhouses where it is considered a by-product is carried out together with other by-products, treated un-specifically in large digesters. This process avoids part of the costs of elimination because it excludes the decontamination treatments, but the obtained end-product does not have a remarkable added value and the possibility of valorisation remains unexploited.

From TALLERES AZUARA we have identified the business opportunity behind this market weaknesses, and we have developed the HYDROBLOOD processing plant to solve all of them, which is a secure, cost-effective and eco-friendly system for blood collection and processing. With current technologies available into the market, only around 35% of the protein contained in blood can be recovered as an added-value by-product. With our innovative HYDROBLOOD processing plant, the 100% of protein content can be recovered from animal's blood, and converted into a high added-value product: The Decolourised Hydrolysed Protein (DHP). This will make a big impact within the European Protein Market, valued at 2,547,000 Mt in 2013, and estimated to increase by more than 40% the next 10 years.

INFARM		739479
Title: The vertical farming revolution, urban Farming as a Service.		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-07-2016-2017	Type of Action: SME-2
Project start date: 11/1/2016	Duration: 18 months	Unit: EASME/A/02
Total costs (€): 2.759.835,00	EU requested grant (€): 1.931.884,50	

Free keywords: *urban farming*

Abstract:

The global population is projected to reach 9.8 billion by 2050. National populations are expected to more than double in 40 countries. The global life expectancy is 73 years for women and 69 years for men—there are more people in the world and we are living longer. While industrial agriculture produces enough food to feed the world as a whole (2790 kcal/person/day in 2006-08), 32% of all food produced is wasted. The logistics of food production and transportation are largely to blame although in developed countries a substantial amount of food is wasted at the point of consumption. As a result, overall global food availability is lower than it would otherwise be, requiring the planet's agricultural system to produce additional food to compensate for the wasted food production. Consequently, The United Nations Food and Agriculture Organization estimates 795 million of the 7.3 billion people in the world, or one person in nine, suffer from chronic undernourishment.

In order to feed the population in 2050, we need to produce an additional 6,000 trillion kcal per year.

However, conventional industrial agriculture is not sustainable. It is one of the most harmful industries to our planet, responsible for:

- 70% of the planet's water use
- up to 24% of greenhouse gas emissions
- degradation of soil and groundwater pollution

Continual ploughing of fields, combined with heavy use of fertilizers, has degraded soils across the world to the point where arable land is now lost at the alarming rate of over 100,000 square kilometres every year, far outstripping the pace of the natural processes that replace diminished soil.

Thus, nearly a third of worldwide adequate or high-quality food-producing land has been lost.

Our solution to the problems with sustainable agriculture is to use hydroponics and proprietary lighting algorithms combined with indoor vertical farming and our patented 'growth trays' to create an incredibly efficient growing environment—the Microfarm.

MILQAS		726665
Title: Milk quality antibiotics sensor		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-07-2016-2017	Type of Action: SME-2
Project start date: 5/1/2016	Duration: 35 months	Unit: EASME/A/02
Total costs (€): 1.429.250,00	EU requested grant (€): 1.000.475,00	

Free keywords: *Food waste, biosensor, agriculture, antibiotics detection, in line testing*

Abstract:

With the project MILQAS (Milk quality antibiotics sensor), PlastiSens ApS brings a patented biosensor on the market. A novel testing device that meets a major need for reducing the waste of raw milk in the value chain. Every day truckloads of milk are spoilt by cross-contamination with antibiotic-polluted milk. Today, milk in tankers is analyzed upon arrival at the dairy in a lengthy 1--2 hour process. By then, milk from several farms has already been mixed in the same tank. PlastiSens' technology can in 1-2 minutes, analyze antibiotics in milk before it is loaded onto the truck, thereby potentially saving 80-90% of the cargo from cross contamination.

The dairy industry is very strong in Europe, and will therefore be the first target market. The dairy segment alone constitutes a market volume of € 500M. PlastiSens technology can also be adapted to for testing for other contaminants in both liquid and solid samples, and also for analyzing antibiotics in complex samples as milk. The MILQAS project will enable PlastiSens to create a solid revenue stream of nearly € 6M with the sale of analysis instruments and single-use test kits (chips) within two years after conclusion of the project. Arla A/S, the 7th largest dairy company in the world, has agreed to test our technology on milk trucks and at selected milk producing farms. We use selected subcontractors for 3th party validation and expect that the project will create an extra 50 full time jobs. 30 jobs will be created at PlastiSens and about 20 at our European sub-suppliers. Ten years from now, we envisage revenues around € 100M and 80-100 employees.

VegeaTextile		805055
Title: Innovative biomaterials production from wine industry waste		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-07-2016-2017	Type of Action: SME-2
Project start date: 3/1/2018	Duration: 18 months	Unit: EASME/A/02
Total costs (€): 801.875,00	EU requested grant (€): 561.312,00	

Free keywords: *Bio-based products; Agricultural waste recovery, Green leather, Circular Economy*

Abstract:

Vegea is a young start-up with a solid chemical background with long experience in natural polymers and industrial processes, constituted by researchers coming from the academy with a strong entrepreneurial inclination. It has already received several awards recognizing the value of its disruptive innovation, such as Start&Cup Award-2015, Start&Re-Start-2016, and H&M Global Change Award-2016 for a total funding of more than €300.000. The main scope of VegeaTextile project is the deployment of an absolute breakthrough innovation demonstrating a novel, cost-effective and eco-friendly process for the production of organic textile and introducing in the European leather goods market a new kind of bio-textile using a non-animal and renewable raw material, considered up today an agricultural waste: the grape marc. In fact, the production process can be classified “low impact” for the environment since it makes minimal use of chemical reagents or additional water, and at the contrary, it produces reusable water from the grape marc exsiccation (60% w/w). Our innovation will allow leather goods manufacturers to answer to the increasing customers’ awareness about environmentalist and animalist concerns, to propose a new product with same quality of common leather and, at the same time, to find an alternative and renewable raw material, helping them to overcome stringent regulations about animal treats and tanning processes. Upon project length we aim at industrializing the process production by 2022, reaching a forecasted production capability of 4.5 million m²/yr, the ambitious business objectives of € 8,64 million net profits over 4 yrs of commercialization (2022), and consequently a greater-than-market ROI (26%) and profitability (22%). For the launch of VegeaTextile by 2019, we foresee a total investment of more than €900.000, of which €801.875 budgeted for the Phase-2.

ULTRAFISH		767839
Title: ECO-INNOVATIVE PROCESSING TECHNOLOGY FOR BETTER QUALITY AND SHELF LIFE OF FISH PRODUCTS		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-08-2016-2017	Type of Action: SME-2
Project start date: 6/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.638.351,25	EU requested grant (€): 1.146.845,88	

Free keywords:

ultrasound technology, shelf life, food preservation, microbial inactivation, blue growth, fish processing industry, marine resources, management of fish stocks

Abstract:

Fish stock management in European waters is becoming increasingly important, as it is necessary to ensure the long-term sustainability of fish catch and conserve marine resources. The fish processing industry plays a key role in this strategy, being responsible for ensuring proper handling and preservation of fish products to retain its quality and to increase its shelf life in the market. Aligned with the "Blue Growth Strategy" (COM (2012) 494), Scanfisk, a Spanish company based in Zaragoza specialised in fish processing of fresh & frozen products, has developed ULTRAFISH. The project aims at improving today's processes related to handling and processing of fishery products (fresh and primary processed) by applying a green and innovative technique based on the use of ultrasound to eliminate the use of chemical additives for microbial inactivation. This safe and environmentally friendly processing technique will be implemented at different water-based stages to reduce the processing times and water waste generated in these stages in a cost-effective manner.

By implementing ULTRAFISH, Scanfisk will lower their costs and time of their processes, able to save time, money and energy, and to produce fishery products with longer commercial shelf life. This will enable them to increase their margin and market share, and to enter new markets which to date were not considered. The EU market will benefit from higher value-added products, to cope with increasing consumer demands, and it will be provided with a novel food treatment technology that significantly contributes to the sustainable management of fish stocks.

BIOGASTIGER		783727
Title: BIOGASTIGER® system – turning global organic waste streams into smart and clean energy		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-09-2016-2017	Type of Action: SME-2
Project start date: 11/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 3.043.375,00	EU requested grant (€): 2.130.362,50	

Free keywords: *CO2 reduction using biogenic residual materials for gaining renewable and flexibel energy,*

biogas machine, stable energy supply

Abstract:

The world's population is growing continuously - and waste generation too. In all areas where people live, enormous amounts of biogenic organic waste are generated (household waste, by-products food production, agriculture). In case rotting/composting is not under control, the emission of climate-damaging gases, e.g. CO₂, is 50% higher than under controlled anaerobic fermentation.

The production of biogas is one of the most promising forms of energetic use of biomass. Biogas plants can make a significant contribution to a sustainable energy system, while at the same time significantly reducing the emissions of anthropogenic greenhouse gases in agriculture. However, the conversion of biomass to biogas currently represents a very high technical and financial expense. Today, the predominant plant technology is characterized by individual concepts which have a very negative impact on the quality and safety of the biogas plants.

The solution to these problems is a completely new plant concept for the use of biomass. BIOGASTIGER® (TRL7) is a modular compact biogas plant in a transportable container construction. All components are standardized and industrially premanufactured in series, tested for quality before delivery and on site installed and commissioned with short assembly times. Our concept leads to the best cost to efficiency ratio, to the highest flexibility and stable energy supply on request.

With BIOGASTIGER® we address target customers from agriculture, the food industry and energy supplier. It is a continuously growing high-volume market with more than € 300 million turnover per year.

BIOGASTIGER® was conceived by F&W (experience in mechanical engineering, project management) in cooperation with FWE GmbH (highly experienced with energy concepts). With the global problem of not used organic waste streams and our innovative solution to produce safe, clean and carbon neutral energy, we want to make the world cleaner and safer.

BIOGASTIGER®-the biogas machine.

PigHeat		738874
Title: Utilizing Pig By-products as Heat Source to Save Recycling and Energy Cost.		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-09-2016-2017	Type of Action: SME-2
Project start date: 11/1/2016	Duration: 22 months	Unit: EASME/A/02
Total costs (€): 1.984.566,25	EU requested grant (€): 1.389.196,38	

Free keywords: *Pig hair, Pig fur, Roughing, Valorisation, Circular economy, Biomass, Environment, Environmentalfriendly, CO2 neutral, process efficiency, meat-sector, renewable Energy, animal byproduct.*

Abstract:

BIGAS ALSINA, a family owned company specialized on machinery manufacturing for the Food sector, aims to commercialize PigHeat, a novel technology that allows processing pig fur and pig roughing. Right now, pig fur and roughing are simply dried in order to reduce weight and volume, and used as fertilizer in landfills. In other words, pig meat processing means that there is a waste that actually needs to be disposed of, which is the least desirable effect of waste. Not only does pig meat processing incur waste disposal, it also implies an important investment in energy to remove water as well as removal cost. This cost is directly paid by the slaughterhouse.

Through the proposed PigHeat processes, pig fur and roughing can be used as an alternative source of fuel that creates steam and service water instead of using gas, diesel or electricity. The meat processing industry consumes high amounts of energy. By using pig fur and roughing as fuel, an environmental waste problem is transformed into an important way to save 15% of heating energy, while promoting waste valorization and a circular economy within the sector.

This is achieved in 4-steps: i) homogenization, ii) hydrolysis, iii) drying and iv) combustion. The obtained product is a Co2 neutral biomass with exceptionally high heating value (even higher than wood pellets) that can be used in the daily operations of the same installation.

Due to the stringent waste regulations, the 1,700 medium sized slaughterhouses in Europe are looking for a solution. Not only that, they are operating on very low margins and PigHeat will allow them to cut energy expenses, thereby increasing profits. Buying PigHeat implies certain costs for slaughterhouses, however the savings will fully have paid for the machinery in less than two years. Offering attractive payment modules, our innovative solution is likely to conquer the market swiftly.

SHEPHERD		731695
Title: Energy-Efficient Activated Sludge Monitoring for Wastewater Treatment Plants		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-09-2016-2017	Type of Action: SME-2
Project start date: 8/1/2016	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.508.750,00	EU requested grant (€): 1.756.125,00	

Free keywords: *activated sludge, closed-loop monitoring, wastewater, microbial respirometer*

Abstract:

The aeration of activated sludge accounts for 60% of the running cost of wastewater treatment plants, a staggering 2% of all electricity generated at country-level. The project will improve upon an existing prototype of on-line microbial respirometer with near real-time capability for monitoring the activity of the microbial population (biomass) in activated sludge, and suitable for industrial and municipal wastewater applications, with the following environmental and financial benefits:

- 20% reduction of greenhouse gas emission related to the aeration process (lower energy consumption)
- 5% reduction of nitrous oxide emission related to the denitrification process (better process parameters)
- 25 % reduction of energy costs and maintenance costs (better online monitoring of the process)

The solution reduces the costs and improves the reliability of the measurements, allowing small and midsize WWTPs to monitor the biological activity of the process. The integration with existing hardware sensors and SCADA systems, allows the system to control the plant automatically within design operating parameters and reacting in real-time to variable (diurnal and seasonal) loading or toxic events. The cloud-based implementation creates a central data repository accessible for operational purposes (remote access, alerts) and management purposes (benchmarking, continuous improvement, and design of new installations). The original prototype (TRL6) was tested in Anglian Water's Milton (Cambridge) wastewater treatment plant and gave operators information about the status of the active component (biomass) so that manual interventions could be made to improve efficiency. The project aims to take the technology forward, automate the process to a higher degree and demonstrate the solution in a large-scale pilot with four wastewater utilities over 10 plants across Europe and the USA (TRL 8). The project duration is 24 months and the requested EC funding 1.75M Euros.

SmartWASTE		724613
Title: Smart logistics for WASTE and recycling operations in European cities		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-10-2016-2017	Type of Action: SME-2
Project start date: 6/1/2016	Duration: 36 months	Unit: EASME/A/02
Total costs (€): 2.100.449,56	EU requested grant (€): 1.470.314,70	

Free keywords: *waste management, waste collection, smart logistics, recycling, route planning, routing, fill level monitoring, fleet optimization*

Abstract:

The key problem in waste collection today is static routes and schedules: truck drivers are driving “blindly” from bin to bin and collecting containers that are either half empty or over filled. This adds up to a large amount of unnecessary costs, such as time spent, gas consumption and greenhouse gas emissions. Globally, over 400 million waste containers are being served by millions of trucks every day, and 50 % of the value in the market is in the logistics. Enevo is a growing Finnish technology company that aims to capitalise on this 12-billion-euro business opportunity and become the #1 supply chain platform company for waste and recycling operations worldwide.

As waste management plays a central role in the circular economy, Enevo is a key player in developing more efficient waste collection and management systems. Enevo helps its customers make their waste and recycling operations more efficient, leading to a more sustainable world. Enevo’s vision is to turn all waste in the world into a valued resource.

SmartWASTE project is addressing two significant EU-wide challenges:

- 1) optimising transport operations and tackling the environmental and logistical challenges that the European transport sector is facing
- 2) waste management in the circular economy context.

The objective of SmartWASTE proposal is to scale-up and expand the service into new European regions by piloting the solution with potential customers in 10 large scale pilots. Through piloting, Enevo gains important feedback that is provided back to product development to improve Enevo's offering and operations to be better suited for large scale regional expansion.

The proposal’s activities aim at creating a solid foundation for Enevo’s successful business in European market and accelerate its expansion globally. Enevo is targeting, by 2021, to generate a revenue of 916 M€ and employ 1 500 people globally of which 1 000 will be in Europe.

TRANSAFELOAD		778897
Title: The European Leader Equipment for Packaging Testing		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-10-2016-2017	Type of Action: SME-2
Project start date: 10/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.392.200,71	EU requested grant (€): 974.540,50	

Free keywords: *packaging, impact and stability testing, vibration simulation, compression testing*

Abstract:

Nowadays big brand owners, packaging manufacturers and logistic companies faces losses of €50.000 million/year worldwide due to goods damages during transportation. At the same time, governments across the world are implementing rigorous guidelines to ensure quality of packed goods and safety during their delivery. Packaging testing is an integral part of these initiatives as it simulates the risk damages experienced by the packed goods (boxes, pallets or loads) during their distribution. In Europe, the European Commission has established the directive 2014/47/EU for safe shipment of goods. Next year, in 2017, this directive will force all the transport players to ensure the stability and safety of the loads from detrimental movements. In spite of the European concerns, currently in the market there is a lack of accurate and price competitive simulation equipment supporting the European goals. In the race to achieve "0 fatalities in road transport by 2050", established by 2011 Transport White Paper, we only find few American innovative technologies. Our solution is the first European tool to reproduce the transportation risks events such as drops, impacts, vibration and compression for packed goods. With TranSafeLoad we aim to launch to the market an integral solution 30% more price-competitive, with the broadest load range for packaging test simulation (from small boxes to 2 Ton loads) and able to reproduce real 3D movements, thanks to its patented mechanism. Furthermore, aligned with the environmental European regulatory D1994/62/CE for packaging waste reduction, our system will help the optimization of packaging material, reducing the extra material from the current 30% to 10% and saving at least €800 million/year.

ALGAMATER		767333
Title: Using microalgae bioreactor technology to deliver the world's most cost-effective, energy-efficient and adaptable system for the treatment of toxic industrial and landfill wastewater		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 6/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.906.000,00	EU requested grant (€): 2.034.200,00	

Free keywords: *Wastewater treatment plant; microalgae, biological treatment processes*

Abstract:

Bluemater CEO Nuno Gomes conceived this project inspired by the words of the inventor and author Buckminster Fuller: "Nature has no pollution. This is a word coined in human ignorance regarding the presence of the right chemicals being released in the wrong places..." While high concentrations of compounds such as ammonium, phosphates and sulphates can be deadly for aquatic ecosystems and their inhabitants, they are nutrients for algae and plants. This project harnesses components found in highly concentrated wastewaters to feed microalgae, which grow especially quickly by transforming ammonium and phosphates into proteins and other organic matter.

Since 2008 we have been developing this challenging concept into a viable commercial system for wastewater treatment at landfills and in industry. Following extensive testing at diverse wastewater treatment plants (WWTPs), and guided by feedback from target clients, our breakthrough microalgae technology – the first of its kind - was integrated with Bluemater's next-generation wastewater management systems in its current configuration. In these pilot tests, Algamater demonstrated decreased energy costs in wastewater treatment by more than 60% and lowered operational costs by more than 40% compared to traditional wastewater treatment plants. We are proud to introduce the Algamater Wastewater Treatment Plant: the world's most robust, flexible, cost-effective, and eco-friendly wastewater treatment system. Algamater is currently at a prototype stage (TRL7). In this project we will upgrade, scale up and integrate the Algamater components into a full-scale wastewater treatment plant capable of demonstrating our game-changing technology at an industrial level.

With the commercialization of Algamater we forecast strong, consistent growth for Bluemater, notable employment creation both inside our company and out, and significantly reduced environmental hazards in the wastewater treatment sector.

ARENA		726618
Title: The first on-site mobile solution for complete synthetic grass recycling and materials reuse		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 7/1/2016	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.527.383,75	EU requested grant (€): 1.619.887,50	

Free keywords: *Synthetic grass, artificial grass, recycling, reuse, EOL management*

Abstract:

Boom in synthetic grass sporting fields in EU and USA in the last 15-years has led to huge environmental problem. 600 000 tonnes of rubber, sand and plastics mixed wastes are generated from used fields each year in EU alone. Based on the current market trends, the total wastes will increase by 5-times by 2030, leading to over 3 million tonnes of mixed wastes annually.

Despite the growing popularity of synthetic grass both in major football leagues and school grounds, there are no unified regulations or effective technologies for its sustainable EOL management. Current solutions enable only limited used grass recycling and materials reclaim and thus field owners currently landfill 90% of the used grass without any recycling.

ASIE, company with over 20-years of experience in synthetic grass fields, has developed the first on-site recycling solution that enables complete used synthetic grass recycling and materials reuse for environmental and economic sustainability. Compared to alternatives, we ensure:

- Used grass and infill high-quality re-installation
- 100% infill reclaim, separation, cleaning and sanitary treatment
- 4x faster old turf removal and 2x faster full field renewal
- 50% cost reduction of old field utilization and 50% savings from new installation

We aim to achieve a zero-waste concept and improve the environmental sustainability of synthetic grass installations. Our unique ARENA concept enables to eliminate current landfilling and reuse 100% of the materials in new fields or as recycled raw materials in other industries. As a result, we:

- Prevent 1 million tonnes of mixed wastes from landfilling annually
- Reduce field renewal transportation need by 10-times, leading to 95% less CO2 emissions

Our total targeted market in Europe is €350m annually, with very high growth potential in the next years. As a result of the innovation project, we will generate €125m total sales revenue and create 350 new jobs by 2023.

CLEANTECHBLOCK2		766614
Title: Market maturation of CleanTechBlock technology		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 6/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.572.500,00	EU requested grant (€): 1.100.750,00	

Free keywords: *Construction material; Sandwich-block; Clay; Foamed recycled glass; Environmental sustainability; Thermal insulation.*

Abstract:

Clay bricks are one of the preferred building materials in Europe, but they are facing numerous threats due tightened regulations on buildings' energy and raw material consumption levels and CO2 emissions. These threats together with market trends such as increasing environmental conscience, preference for green materials and an excellent clay bricks' public image creates a major market opportunity that Gråsten Brickworks (GB) aims to pursuit through the development of an innovative building component which will enable a paradigm change within the construction market and recycling in Europe.

GB vision is to take the final steps of commercial and technical development and product maturation towards the commercialization of CleanTechBlock (CTB) – a patented multifunctional sandwich-block based on the combination of two clay brick shells and foamed recycled glass. CTB's advantages over bricks are compelling as the insulation, strength properties and construction price are similar and it offers: an overall increase in the living area (3-5%), a reduction in the overall house wall construction time (5x faster), while reducing maintenance requirements and transportation costs. It also contributes to the mitigation of environmental problems due to an increase of glass waste recycling, decrease of raw material (clay) and energy consumption and CO2 emissions.

CLEANTECHBLOCK2 project is expected to significantly enhance the profitability and competitiveness of GB, with an expected sales turnover of €67M and profits of €15M, 6 years after commercialization in the environmentally conscious construction segment (both residential and non-residential) of primary targeted markets – Denmark, Sweden and Germany.

Besides giving to GB a technological leap with the consequent competitive advantage and export potential, CLEANTECHBLOCK2 will assist Europe in achieving objectives for environmental and energy policy.

ECOSHEET-PRO		766649
Title: An Eco-Innovative Alternative to Plywood		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 6/1/2017	Duration: 22 months	Unit: EASME/A/02
Total costs (€): 3.183.977,50	EU requested grant (€): 2.228.784,25	

Free keywords: *Mixed waste plastics, recycling, eco-innovation, feedstock preparation, extrusion, construction formworks*

Abstract:

ECOSHEET-PRO is an eco-innovative and cost effective alternative to plywood made from mixed plastic waste, suitable for high strength applications in the construction industry. This project will tackle two significant environmental challenges facing Europe, whilst also offering added value to the construction industry.

The first issue addressed is that of mixed plastic waste. In Europe, in 2014, 18 million tonnes of post-consumer waste plastics were landfilled or incinerated, as they could not be easily separated and recycled. Alternative uses for such waste must be found.

The second issue is the growth in the use of plywood, typically manufactured from slow-growing, tropical hardwoods. This material is a key, high volume commodity in construction industry formworks and an area the size of Madrid is deforested each year to meet Europe's demand.

ECOSHEET-PRO transforms mixed plastic that would otherwise be wasted into a competitive, reusable, plywood replacement. Previous attempts to create such boards have failed to deliver the required strength or cost effectiveness required by industry. We have overcome these barriers through an innovative manufacturing process, which will be scaled up and refined during this project.

ECOSHEET-PRO has the potential to re-define the €1.8 billion European plywood industry and help Europe meet its demanding plastic recycling targets, contributing to the circular economy. Our success stems from bringing together the complementary expertise of two eco-innovative SMEs from Italy and the UK, both with a strong ambition to grow and internationalise.

Across a network of 13 facilities in 2023, ECOSHEET-PRO will create 77 jobs, generate annual revenues of over €76.5 million, annual profits of €26.8 million, and transform >221,000 tonnes of waste into valuable products.

HOMEBIOGAS		777770
Title: Turning food industry's organic wastw into value		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 8/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.292.500,00	EU requested grant (€): 1.604.750,00	

Free keywords:

Biogas, anaerobic digestion, digester, organic waste, food waste, clean energy, waste valorisation, resource efficiency, food industry

Abstract:

HOMEBIOGAS LTD develops and markets advanced biogas systems that reduce our clients' waste management fees, energy expenses and environmental footprint by converting organic waste into biogas, a clean energy source. Since 2016, we commercialise HOMEBIOGAS TG1, an advanced, cost-effective household biogas system. So far we have sold more than 540 units in 46 countries, generating over €400,000 in revenues. We have been financed by private investors (€2.5 million) and government funding (€700,000) while a successful crowdfunding campaign has demonstrated an ample public interest in our products by collecting 219% of the targeted funding. We participate as editors of the ISO TC255/WG3 Domestic Biogas International Standard.

There are more than 2.32 million food service and retail businesses in the EU, which annually generate over 15 million tonnes of food and kitchen waste . Waste management carries significant costs for them while public concern on the environmental impact generated by unsustainable waste management practices is growing. We aim to leverage the success of our household systems by offering these companies an affordable (€10,000), high performance biogas solution to fulfil their specific necessities: HOMEBIOGAS TG6 will convert their organic waste (100 kg per day) into free clean energy (120 kWh per day), generating important savings (over €5,000 per year) and improving their environmental footprint and corporate image. HOMEBIOGAS TG6 has been demonstrated at TRL6 through the successful development and commercialisation of our TG1 system and the development and trial of two different large (200-250 kg per day) business-to-business pilots. Thanks to HOMEBIOGAS TG6, we will increase our profit by €31.7 million and hire 36 new employees by 2023.

MUBIC		778065
Title: Mushroom and biogas production in a circular economy		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 8/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 4.185.022,50	EU requested grant (€): 2.499.999,00	

Free keywords: *Degasified biomass conversion to substrate, circular economy, waste to energy to food, sustainable raw materials, environment, resources and sustainability*

Abstract:

The problems: Biogas is important for the European renewable energy transition as it turns waste streams such as manure and sewage into biogas, and provides CO₂-neutral energy. But the efficiency is low because the methane producing bacteria in the biogas digester have trouble accessing the energy locked in fibrous materials such as cellulose and lignin. This fraction passes through the biogas plant unused and is incinerated or spread on agricultural land. At the same time, mushroom producers must buy substrate to grow mushrooms and pay to discard it after use.

The solution: The AST technology creates a resource cycle between biogas production and mushroom production, reducing costs of mushroom production by up to 50% and utilizing also the fibrous fraction in biogas plants. The innovation is a technology where the fibrous fraction from biogas is used for growing mushrooms, and then returned to the biogas plant, offering improved economy as well as significant environmental benefits to both the mushroom and biogas industry.

The project: The AST concept has already been proven in pilot scale, and the next step is a full scale demonstration plant. In this project two AST plants are scaled up and integrated with mushroom production facilities and a biogas plant, respectively. It is essential for the market introduction and thus the commercial success to demonstrate such commercial operation for customers to invest in such plants.

Impact: The project will increase the competitiveness of the European mushroom industry currently under strong pressure from China, as well as the biogas industry, suffering from high operational costs.

The market: Biogas plants are rapidly being established to support the renewable energy transition with more than 15,000 plants currently in operation in Europe. The European mushroom industry uses about 3 m tons of substrate annually and grows with 10%. The market for the innovation is large, has a growing trend and strong drivers.

nanoHPcs		756165
Title: Sustainable nanoHVOF and nanoaxialPlasma coating solutions against wear problems of extrusion machines allowing an eco-efficient use of materials and the increase of recycling in the plastics industry		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 3/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.773.694,75	EU requested grant (€): 1.941.586,32	

Free keywords: *plastics industry, plastics waste, plastics extrusion, coating technology, thermal spraying technology, resource-efficiency in production, recycling of plastics materials*

Abstract:

Company Thermico has developed the first technology that enables to highly increase the share of recycling in the EU plastics industry. This cost-effective coating technology – called nanoHPcs – solves wear and corrosion problems in critical components of plastics extrusion machines. Today, plastics and fibre-reinforced plastics have become the first material of use in many sectors (construction, automotive, aviation, etc.), being in many cases lighter, cheaper, more resistant and recyclable than metal. This highly affects the production equipment, as for plastics extrusion, machines must cope with increasing production amounts and requirements. Even more challenging is the extrusion of waste materials and of plastics aggregates with abrasive metal, ceramic, glass and wooden particles. The challenge in this industry is to make recycled plastics as pricely attractive as raw plastics material. Since recycled plastic is much more abrasive, extrusion machines must not lose any performance through incorporating the recycled material. Compared to conventional coating methods, nanoHPcs can enhance the share of plastics recycling in the industry by at least 10%, displaying a fantastic price-performance ratio, a reduction of more than 50% of production costs of critical components and of up to 70% of coating manufacturing and finish processing costs. With help of the SME-Instrument, Thermico expects by 2023 a turnover increase from currently €5.3 million to €40.2 million, a staff increase of 132 employees and a market share in its calculated addressable market of 15%. To guarantee a successful market introduction, Thermico will build strong references through numerous field tests at customers. Thermico could therefore acquire 4 launching customers: 1 OEM, 2 repairers and retailers of extruder components and 1 plastics producer. Introduction of the solution in the plastics extrusion market will occur in several steps: DACH countries, the EU and, later, North America and Asia.

NUOVOpb		777780
Title: A unique Lead Acid Battery (LAB) recycling technology to reduce CO2 emissions by 89%, reduce waste by 81%, and transform the battery recycling industry		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 8/1/2017	Duration: 18 months	Unit: EASME/A/02
Total costs (€): 1.863.000,00	EU requested grant (€): 1.304.100,00	

Free keywords: *lead acid batteries; hydrometallurgy; lead oxide; recycling; resource efficiency; circular economy*

Abstract:

Lead Acid Batteries (LABs) are a vital and widely-used technology. The global LAB market is expected to grow by 59% to €71.6 billion by 2022 with Europe accounting for the second largest market share.

Waste LAB recycling rates are as high as 95% in Europe, but the current recycling process – smelting waste LABs in a furnace – consumes vast quantities of energy, is highly polluting, wasteful, large scale and expensive. Furthermore, smelted lead must be further processed to produce the essential LAB ingredient: the active lead oxide paste.

A new lead recycling process is needed that is energy efficient, non-polluting, low cost, scalable and produces LAB-ready lead products. Such process would meet EC priorities by addressing resource efficiency, the sustainable supply of raw materials and drive the circular economy.

AEL has developed a novel hydrometallurgical process technology to recycle waste LABs in a highly energy efficient, non-polluting and cost effective way. NUOVOpb's commercial appeal lies in its low cost and scalability, and our ground-breaking ability to produce LAB-ready products that exceed the performance of current products on the market. Our LAB-ready paste can create new LABs with 22% greater energy capacity and 50% longer life.

The technology has the potential to transform the global battery recycling industry, which has an expected value of €9.5 billion in 2024. 5 years post project, we expect to be operating 18 NUOVOpb facilities across the world. These will be processing 490,000 tonnes of waste LABs (6% of the global waste LAB market) and avoiding 196,000 tonnes CO2 emissions every year. In doing so, AEL will secure annual revenues of €206 million, profits of €54 million, and will have created 200 jobs within AEL.

NUOVOpb is the most complete closed-loop recycling system in the world, providing significant commercial opportunities for businesses in both the LAB recycling and LAB manufacturing supply chain, globally.

PFS		804453
Title: A cost- energy-efficient treatment technology to remove pharmaceutical pollutants from water		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 3/1/2018	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.962.500,00	EU requested grant (€): 2.073.750,00	

Free keywords: *wastewater, water treatment, WWTP, pharmaceuticals*

Abstract:

Widely used pharmaceuticals (synthetic or natural chemicals found in prescription medicines, over-the-counter therapeutic drugs & veterinary drugs) are finding their way into the drinking water supply via wastewater treatment facilities, posing serious threats to public health globally. The problem is that modern wastewater treatment facilities are not designed for effective removal of pharmaceuticals or similar organic compounds. Upcoming EU legislation will make such removal mandatory.

Pharem Biotech brings to market PFS—the first patented enzyme-carrying filtration system capable of removing a large range of organic pollutants (pharmaceuticals and other biological active compounds such as bisphenol A, antibiotics, hormone disruptors, etc.). PFS is a filtration solution that can be easily installed at most of wastewater treatment facilities. Its compact size makes it particularly useful for urban wastewater treatment plants.

PFS is based on modified enzymes which are 200 times more effective than native enzymes, resistant to low temperature, resistant to low pH and with high levels of stability and activity. Compared to alternative purification methods, PFS is very cost-efficient, and requires no energy to run.

As the total EU yearly investments in its wastewater treatment facilities and related infrastructure are expected to reach €25bn per year in 2015-2020, Pharem Biotech is addressing the market of 70,000 facilities in EU processing 100bn litres of water per day in total.

During a successful Phase 1 project, Pharem Biotech validated the market and commercial feasibility of PFS, and selected the trial cases to validate the technology as well as key target markets to approach.

In this Phase 2 project Pharem Biotech will industrialize PFS, validate it in trial cases and prepare for commercial roll out with the objective is to deploy 50 PFS systems before 2020 and reach revenue of €34m.

The requested EC contribution is €2.07m.

PHOSave		724586
Title: Innovative solution for phosphate recovery from exhausted extinguishing powders		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 7/1/2016	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 2.733.767,50	EU requested grant (€): 1.913.637,25	

Free keywords: *Recovery of exhausted extinguishing powder, Phosphorus, Industrial pilot plant, Agriculture and wood sector, Specialty fertilizers*

Abstract:

The aim of the PHOSave project is the recovery of exhausted extinguishing powder (polyvalent powder) via an eco-innovative, chemical/physical, solubilisation process. In particular, PHOSave aims at developing a system for the recovering of phosphate contained in exhausted extinguishing powder, in order to develop new products to use in fields such as the agriculture and wood sector.

The PHOSave specific objectives are:

- 1) Developing an innovative eco-compatible method for removing the powders' oil component that is nowadays an unsolved industrial and environmental problem;
- 2) Implementing a pilot plant for the treatment of the exhausted extinguishing powder recovering phosphate included in them;
- 3) Contributing to the implementation of new eco-sustainable waste management methods, recovering a high added-value non-renewable raw material (phosphate) and being the first industrial level plant constructed in the world;
- 4) Obtaining fundamental raw materials for the formulation of specialty fertilizers for agricultural use achieving further environmental benefits in term of reduced greenhouse gas emissions;
- 5) The recovery of raw material will fit also into an already mature market: flame retardant chemicals and chipboard panel.

The widespread use of PHOSave technology will maximize profits and environmental aspects. The following goals will be achieved: a solution to the problem of exhausted extinguishing powder (which is a special waste); the reduction of CO₂ in the industrial chain and the recovery of raw materials in an almost pure form (phosphorus obtained at 95% at lab scale).

The project has already received several expressions of interest, also for the plant replication, from relevant international organizations in the field of fertilizers, agrochemicals and flame retardants for the wood panelling sector. The PHOSave strategic business plan will have a strong impact on the SMEs competitiveness and job growth in the market of waste management and disposal.

Propelair		778742
Title: The refinement, miniaturisation and demonstration of an ultra low flush toilet capable of saving 2.8 billion litres of clean, potable water being unnecessarily wasted in Europe every day.		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 10/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.271.786,50	EU requested grant (€): 890.250,00	

Free keywords: *Toilet, WC, water saving, Propelair, waste water, ultra, low, flush,*

Abstract:

As reported by the European Environment Agency, 70million people in Europe are living in water stressed areas. In the Mediterranean region that figure rises to 53%. Water shortages affect almost every country in Europe and the problem is getting worse. Water consumption per person is increasing significantly; by 55% in the last 25 years.

European flushing toilets (WCs) waste valuable, potable water on an unprecedented scale. The 392m installed base of toilets across the EU currently 'flush' away 102bn litres of clean water every day. That is enough to drain Lake Geneva every 20 hours.

There is clearly a pressing need for a novel technology to reduce the volume of water used in flushing toilets.

Existing toilets including the latest ultra low, dual flush units, do not offer the level of water reduction required. Since water volume is integral to their operational mode, they are compromised and all require significant flush volumes to clean effectively.

This project will demonstrate and bring to market readiness a 1.5L ultralow flush toilet that will reduce average toilet water consumption by 75% and directly save 2.8bn litres of water being unnecessarily wasted per day.

Propelair also provides attractive economic benefits and rapid payback to customers. It reduces water bills on average by 60%, (typically €344 per unit p.a.) delivering a payback within just 1.2 years.

This Dedicated SME Instrument project is essential for us to refine, miniaturise, demonstrate and cost reduce our prototype to overcome current barriers to market, including purchase price and lack of a proven long term demonstration.

A successful project delivery will allow us to achieve cumulative sales of €80.7m and an EBITDA of €31.5m by 2023. At a modest 0.5% market penetration, we will our save customers 2.8bn litres of water day or 1.04bn m3 p.a. worth over €1.98bn.

This proposal builds upon a previous proposal 755830 which scored 13.66 and received a Seal of Excellence.

reNEW		783638
Title: Sustainable cleaning agent and organic fertilizer recovery from sewage sludge		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 11/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.980.613,75	EU requested grant (€): 1.386.429,00	

Free keywords: *Waste Water Treatment (WWT), compound recovery, sustainable WWTP operation*

Abstract:

UTB Envirotec Zrt, is one of the Central European market leaders in engineering services for wastewater and organic waste treatment. In the past few years, we have developed a technology for sustainable valorisation of sewage sludge. The treatment of this sludge represents one of the biggest problems for small and medium sized wastewater treatment plants (WWTP) in Europe. In our process, called reNEW, the sewage sludge is biologically transformed into volatile fatty acids (VFA) and valuable nutrients (NPK), which are recovered. These products represent important market value: VFA as raw material for eco labelled cleaning agents, and NPK as fertilizer. With the aim of exploitation of the reNEW technology, we formed a spin-off company, Renew Technologies Ltd (RNT) in the UK. Our final aim is to roll-out the technology and widely implement it all over Europe, enabling the growth of our companies. We aim to realise the reNEW project in cooperation of the two companies: RNT being the technology owner and responsible for commercial exploitation, while UTB being the technology provider (design, building and implementation of plants). This initiative has received funding in the Horizon 2020 SME Instrument Phase 1, project number: 728932, duration: 01/07/2016-31/12/2016. We have successfully completed the feasibility study. We verified the technological feasibility as well as the economic viability of the project and further improved our business concept. We demonstrated the efficiency and economic value of the two products, VFA and NPK, respectively and made a scale-up design of our pilot operating currently at our premises (TRL=6). We have improved the proposal and discussed it with our clients, technical partners, and the Enterprise Europe Network (EEN). These discussions and the results of the feasibility assessment have reassured us regarding its merit.

RUBSEE		756841
Title: Extending artificial intelligence revolution in the waste field beyond sorting		
Call Id: H2020-SMEINST-2-2016-2017	Topic: SMEInst-11-2016-2017	Type of Action: SME-2
Project start date: 2/1/2017	Duration: 24 months	Unit: EASME/A/02
Total costs (€): 1.800.176,75	EU requested grant (€): 1.260.123,73	

Free keywords: *Computer vision; artificial intelligence; detection; high-value waste recovery; PET; HDPE; municipal solid waste, Circular economy, Turning waste into money*

Abstract:

Current WTPs (Waste Treatment Plants) aren't able to recover all the valuable waste they process, indeed more valuable materials are lost and landfilled or incinerated. The reason of this wasteful spending is clear: current methods do not allow an increase in material recuperation in a cost-effective way: the incremental cost of recovering more materials is bigger than the market value of the additional materials recovered. Losses can reach 2,5M€/yr of high-value waste PET/HDPE plastics, cans, cartons). Current technologies aren't enough to meet EU regulations like directive 2008/98/EC, which requires that 50% of household waste is recovered by 2020.

Based in our 1st product (Wall-B), SADA KO has developed RUBSEE, a disruptive real-time monitoring system (using Computer vision+Artificial intelligence) of waste flows in a WTP in order to optimize the performance/operation thereof and the recovery of different materials. RUBSEE will allow waste industry improve its economic, regulatory compliance and environmental performance with a solution that is cost efficient and complementary to actual solutions. In order to address present industry need, our goal is to scale from detecting just PET to HDPE, Cans and Bricks, increase/reach detection levels for each material up to >95%, and boost its TRL from 6 to 9.

An average WTP plant, processes 7tn/h of urban waste with 39% content of PET, HDPE and Cans and recovers 6000 tn/year of PET, HDPE & Cans. Thanks to RUBSEE data, current equipment performance can be improved up to 20% by adapting their parameters to the variability of the waste flow on real time. This means 1200 Tn/year, increasing revenues up to 421,200€/yr for an average customer. Assuming that the complete RUBSEE installation cost amounts 142,000 € (10 RUBSEE units + 6000 €/yr Maintenance costs), the investment payback will be 4.2 months for our clients.

Thanks to this RUBSEE project, we expect a boost of the incomes (NET profit associated to RUBSEE: 2,3M€ in 2022)

INSPIREWater		723702
Title: Innovative Solutions in the Process Industry for next generation Resource Efficient Water management		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-01-2016	Type of Action: IA
Project start date: 10/1/2016	Duration: 42 months	Unit: RTD/D/02
Total costs (€): 7.621.135,00	EU requested grant (€): 5.396.274,75	

Free keywords: *water treatment, resource efficiency, holistic approach, membrane technology, catalyst, magnetic separator, innovation management,*

Abstract:

INSPIREWATER demonstrates a holistic approach for water management in the process industry using innovative technology solutions from European companies to increase water and resource efficiency in the process industry. This will put Europe as a leader on the world market for segments in industrial water treatment which will create new high skilled jobs in Europe.

With extended collaboration between technology providers including innovative SME's, world-wide active companies in the chemical and steel industries and research organizations, this project also contributes to the aims of the SPIRE SRA, the European Innovation Partnership (EIP) on 'Water' and to the aims of the Commission's Roadmap on Resource efficiency, supporting effective implementation of European directives and policies in the water management area.

INSPIREWATER addresses non-technical barriers as well as technical, as innovation needs both components and demonstrates them in the steel and chemical industry. A flexible system for water management in industries that can be integrated to existing systems is worked out and demonstrated to facilitate implementation of technical innovations. Technical innovations in the area of selected membrane technologies, strong field magnetic particle separator, and a catalyst to prevent biofouling are demonstrated, including valorisation of waste heat. This will increase process water efficiency as well as resource, water and energy savings in the process industry.

The development and demonstration work is combined with a strong emphasis on exploitation and dissemination. Specific exploitation strategies are developed for the different solutions in INSPIREWATER. Dissemination targets different target groups: Stakeholders in different process industry also beyond the involved ones, e.g. Pulp and paper, but also policy makers based on the findings of the project.

ReWaCEM		723729
Title: Ressource recovery from industrial waste water by cutting edge membrane technologies		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-01-2016	Type of Action: IA
Project start date: 10/1/2016	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 5.781.631,25	EU requested grant (€): 5.041.866,76	

Free keywords: *Recovery of process water, Recovery of valuable salts, metals and minerals, Closed loop processes, energy efficiency, Metal industry, Metal plating industry*

Abstract:

The ReWaCEM project aims at reducing water use, wastewater production, energy use, valuable metal resource recovery and water footprint by between 30-90% in the metal plating, galvanizing and printed circuit board industry. In order to achieve these goals, ReWaCem will adopt two cutting edge membrane technologies suitable for the requirements of closed material cycles approaches and recovery concepts in metal processing industry: Diffusion Dialysis (DD) and Membrane Distillation (MD) as an integrated hybrid process. This combination of existing technologies will be adapted to fit the requirements of 4 pilot demonstration sites in representative industrial applications of the metallurgical industry in order to evaluate the accomplishment of the ReWaCEM goals. Through the evaluation of the demonstration a highly attractive technological solution for low energy wastewater treatment will be available to be entered into the large and growing market of metal processing. This market will profit significantly from the technological outcome of the innovation action, with cost savings and environmental benefits as relevant rewards. In order to maximise impact, the project consortium was selected carefully to represent all relevant stakeholders in the quadrant of end users, scientific partners, associations and decision makers and SMEs. The consortium will establish a dissemination & exploitation board that will create a substantial network of interest groups from agencies, industry, research SMEs and research centres as well as universities. The successful exploitation of the results will lead to a post project up-scaling of the technology and a step by step market introduction. Part of ReWaCEM will be to mobilise all relevant stakeholders into promoting innovative membrane solutions for industrial water and resources management, leading to the effective implementation of European directives and policies while creating market opportunities for European industry and SMEs.

SPOTVIEW		723577
Title: Sustainable Processes and Optimized Technologies for Industrially Efficient Water Usage		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-01-2016	Type of Action: IA
Project start date: 10/3/2016	Duration: 42 months	Unit: RTD/D/02
Total costs (€): 8.515.940,00	EU requested grant (€): 6.863.359,63	

Free keywords: *separation technologies, deionization, ultrafiltration, water reuse, heat pump; valuable substances recovery, microbial control, modelling, water footprint, Life Cycle Assessment, competitiveness*

Abstract:

The objective of the SPOTVIEW project is to develop and demonstrate innovative, sustainable and efficient processes and technology components, in order to optimize the use of natural resources, especially water, in three industrial sectors (Dairy, Pulp and Paper and Steel) contributing to 44% of industrial water usage in EU. This resource optimization (including water, energy, raw materials and additives) is a key issue to maintain production competitiveness and sustainability. A total of 14 existing and new technologies will be assessed during the project, including solid/liquid separation, ultrafiltration, deionization, biological treatment, disinfection and chemical heat pump. The technology components will be assessed in simulated or operational environment for 9 new water management practices in the three industrial sectors. Up to 7 selected technologies demonstrators are planned in real industrial environment. The implemented process and technology will be evaluated in terms of environmental impacts and benefits, generated by achieving the SPOTVIEW targets (20% to 90% reduction of water usage, wastewater emissions, chemicals and energy use). The SPOTVIEW consortium covers the whole value chain, from technology development, assessment, supply and industrial applications in each targeted sector. Economic exploitation of the proposed technologies is pursued through a well described business case scenario and market penetration strategy. The market opportunities for future services and technology products beyond the SPOTVIEW project will generate up to 2800 new equipment and 7000 new jobs in Europe. The expected gains for the industrial sectors generated by the recovery of by-products and by energy, chemicals and additives savings represent annually 1.53b€ for Europe. The generated production capacity increase by companies has been estimated at 22.8b€. Dissemination and training activities are planned to maximize the impact of the project.

COCOP		723661
Title: Coordinating Optimisation of Complex Industrial Processes.		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-02-2016	Type of Action: RIA
Project start date: 10/1/2016	Duration: 42 months	Unit: RTD/D/02
Total costs (€): 5.898.913,75	EU requested grant (€): 5.898.913,75	

Free keywords: *process control, distributed control, model-predictive control, optimal scheduling, data analysis, decomposition, coordination, optimisation, co-creation, gamification, process automation*

Abstract:

The vision of COCOP is that complex process-industry plants are optimally run by operators with the guidance of a coordinating, real-time optimisation system. COCOP will strengthen the global position of the European process industry, which represents 20 per cent of the European manufacturing base with around 450,000 companies generating €1.6 billion in turnover and 6.8 million jobs.

The project's objective is to enable plant-wide monitoring and control by using the model-based, predictive, coordinating optimisation concept in integration with plant's automation systems. This ambitious approach will be developed and verified in co-operation of European universities, research institutes and industry. The Consortium comprises two universities, three research organisations, the leading copper-plant technology provider, two large companies from the process industry (steel and special chemicals) and four SMEs providing automation solutions.

Technical objective is to define, design and implement a concept that integrates existing industrial control systems with efficient data management and optimisation methods and provides means to monitor and control large industrial production processes. The plant-wide monitoring and control comprehend computationally intensive data analysis and large scale optimisation. The social objective is to improve operator plant-wide awareness and reduce mental workload.

COCOP will liaise with standardisation bodies (automation) to ensure a sustained impact of the project's results. Commercialisation of the solution by its process-automation industry partners will allow plant operators to approach optimal production and result in reduced energy and resource consumption, and decreased on-site material handling time and greenhouse gas emissions.

CoPro		723575
Title: Improved energy and resource efficiency by better coordination of production in the process industries		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-02-2016	Type of Action: RIA
Project start date: 11/1/2016	Duration: 42 months	Unit: RTD/D/02
Total costs (€): 6.537.270,00	EU requested grant (€): 6.059.645,00	

Free keywords: *Plant-wide control, plant monitoring, site-wide coordination, inter-company coordination, efficient model development, integrated scheduling and control, IT integration platform, advanced HMI*

Abstract:

The goal of CoPro is to develop and to demonstrate methods and tools for process monitoring and optimal dynamic planning, scheduling and control of plants, industrial sites and clusters under dynamic market conditions. CoPro will provide decision support to operators and managers and develop closed-loop solutions to achieve an optimally energy and resource efficient production.

In most plants of the process industries, the energy and resource efficiency of the production depends critically on discrete decisions on the use of equipment, shutdowns, product changeovers and cleaning or regeneration of equipment. CoPro will consider these discrete decisions in plant-wide dynamic optimization and develop integrated scheduling and control solutions. Advanced online data analytics will be developed for plant health and product quality monitoring. The detection of anomalies will trigger fast re-scheduling and re-optimization.

CoPro will demonstrate advanced plant-wide and site-wide coordination and control in five typical use cases that cover a wide range of sectors of the process industries, and the whole value chain:

- Petrochemical production site
- Base chemicals and polymer production site
- Recycling system in cellulose production
- Consumer product formulation and packaging plant
- Food processing plant

In addition, CoPro will develop methods for the coordination of plants in industrial parks that belong to different companies, thus providing a basis for future industrial symbiosis.

CoPro pays special attention to the role of operators and managers in plant-wide control solutions and to the deployment of advanced solutions in industrial sites with a heterogeneous IT environment. As the effort required for the development and maintenance of accurate plant models is the bottleneck for the development and long-term operation of advanced control and scheduling

solutions, CoPro will develop methods for efficient modelling and for model quality monitoring and model adaption

FUDIPO		723523
Title: Future Directions of Production Planning and Optimized Energy- and Process Industries		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-02-2016	Type of Action: RIA
Project start date: 10/1/2016	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 5.740.676,25	EU requested grant (€): 5.740.676,25	

Free keywords: *Robust, Learning systems, Modelling, Diagnostics, Optimization, Planning, Energy, Resource,*

Efficiency, Improvements

Abstract:

Machine learning have revolutionized the way we use computers and is a key technology in the analysis of large data sets. The FUDIPO project will integrate machine learning functions on a wide scale into several critical process industries, showcasing radical improvements in energy and resource efficiency and increasing the competitiveness of European industry. The project will develop three larger site-wide system demonstrators as well as two small-scale technology demonstrators. For this aim, FUDIPO brings together five end-user industries within the pulp and paper, refinery and power production sectors, one automation industry (LE), two research institutes and one university. A direct output is a set of tools for diagnostics, data reconciliation, and decision support, production planning and process optimization including model-based control. The approach is to construct physical process models, which then are continuously adapted using “good data” while “bad data” is used for fault diagnostics. After learning, classification of data can be automated. Further, statistical models are built from measurements with several new types of sensors combined with standard process sensors. Operators and process engineers are interacting with the system to both learn and to improve the system performance. There are three new sensors included (TOM, FOM and RF) and new functionality of one (NIR). The platform will have an open platform as the base functionality, as well as more advanced functions as add-ons. The base platform can be linked to major automation platforms and data bases. The model library also is used to evaluate impact of process modifications. By using well proven simulation models with new components and connect to the process optimization system developed we can get a good picture of the actual operations of the modified plant, and hereby get concurrent engineering – process design together with development of process automation.

MONSOON		723650
Title: MOdel based coNtrol framework for Site-wide OptmizatiON of data-intensive processes		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-02-2016	Type of Action: RIA
Project start date: 10/1/2016	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 5.497.190,00	EU requested grant (€): 5.497.190,00	

Free keywords: *process industry, data driven methodologies, multiscale model based predictive control, big data analytics, process management, life cycle management, integrated training, development environment*

Abstract:

The MONSOON vision is to provide Process Industries with dependable tools to help achieving improvements in the efficient use and re-use of raw resources and energy.

MONSOON aims at establishing a data-driven methodology supporting the exploitation of optimization potentials by applying multi-scale model based predictive controls in production processes.

MONSOON features harmonized site-wide dynamic models and builds upon the concept of the cross-sectorial data lab, a collaborative environment where high amounts of data from multiple sites are collected and processed in a scalable way. The data lab enables multidisciplinary collaboration of experts allowing teams to jointly model, develop and evaluate distributed controls in rapid and cost-effective way. Hybrid simulation and seamless integration techniques are adopted for rapid prototyping and deployment in real conditions.

MONSOON will be developed and evaluated in two sites from the aluminium and plastics domains. The aluminium scenario will be focused on predictive monitoring of potlines, targeting early detection of anomalies and identification of potential optimization gains. Aluminium cases will be implemented in the plant with the highest primary aluminium production in the EU-28, namely the AP Dunkerque smelter, France. The plastics scenario will focus on fusing data from data-intensive in-mould sensors with information from higher SCADA levels, enabling early and precise identification of potential issues. This use case will be implemented in the GLN plant in Maceira-Leiria.

MONSOON addresses the SPIRE vision, providing advantages for the European industry competitiveness and sustainability through the realization of an overarching monitoring and control infrastructure. MONSOON aims at creating synergies within and between the process industry sectors, boosting European industry in the worldwide race for competitiveness and sustainability.

Bio4Products		723070
Title: 4x4, demonstrating a flexible value chain to utilize biomass functionalities in the processing industry		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-03-2016	Type of Action: IA
Project start date: 9/1/2016	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 6.129.830,00	EU requested grant (€): 4.335.393,00	

Free keywords: *Bio-resources, optimal utilisation, flexible value chain, demonstration, key functionalities, process industry, pyrolysis, lignin, sugars*

Abstract:

Biomass is a valuable, sustainable feedstock for the production of high added value chemicals and materials, and will play an important role in the transition of the European Process Industry to a Sustainable Process Industry. However, for the optimal utilization of these bio-resources the fractionation of the biomass on basis of functionalities is required. The innovative approach of BIO4PRODUCTS is to apply a short thermal treatment at elevated temperature enabling the fractionation of the bio-resource, but keeping the key chemical functionalities in separate, depolymerized fractions. Within the project the process will be demonstrated in a 3 t/d demo-plant. Subsequently, BIO4PRODUCTS will demonstrate the use of the resulting intermediate processing streams for the production of wood preservation products, furanic resins, phenolic resins and roofing material as cost-effective renewable alternatives for fossil resources in the conventional products (30-100% substitution). Each of the steps in the whole chain has at least been proven on bench-scale (TRL5) and should reach TRL 6-7 by execution of this project. The feedstock flexibility will be shown by demonstrating the complete chain for 4 different biomass resources representative for the majority of biomass resources available in Europe. Integral topics covered by the project are the techno-economic and environmental assessments as well as the development of business plans for subsequent commercialization of the individual product lines and the overall value chain.

The BIO4PRODUCTS consortium consists of 2 large industries and 4 SME's and 1 one non-profit organization covering the whole chain from biomass collection, primary and secondary conversion, and final use in end products. Additionally, specific expertise is included on environmental evaluation and the market introduction of sustainable products.

KARMA2020		723268
Title: Industrial Feather Waste Valorisation for Sustainable KeRatin based MAterials.		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-03-2016	Type of Action: IA
Project start date: 1/1/2017	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 6.679.744,39	EU requested grant (€): 5.880.471,38	

Free keywords: *Keratin, bioplastics, feathers*

Abstract:

According to European Commission, 13.1 million tons of poultry meat was produced only in the European Union (EU-28) in 2014 with an estimated generation of 3.1 million tons feather waste. At present the majority of poultry feathers are converted into low nutritional value animal food or disposed in landfills, causing environmental and health hazards. In this context, the overall objective of KaRMA2020 is the industrial exploitation of such underutilized waste to obtain added value raw materials for the chemical sector: keratin, bioplastics, flame retardant coatings, non-woven and thermoset biobased resins. This will be accomplished through either: i) innovative and sustainable approaches (already patented by some of KaRMA2020 partners), or ii) conventional and economic techniques. The obtained raw materials will be manufactured at industrial scale and further used for the production of novel bio-based products such as: slow release fertilizers, biodegradable food packaging plastics, flame retardant coated textiles and flame retardant thermoset biobased composites. The sustainability of the new raw materials and end-products will be evaluated through LCA assessment. Additionally, an integrated waste management plan will be elaborated to minimize environmental impacts generated by wastes.

Communication and knowledge transfer as well as a detailed business plan will allow maximizing overall profitability of KaRMA2020 results.

The well balanced composition of the consortium including industry, RTD performers and academia give KaRMA2020 the maximum chance of success.

REHAP		723670
Title: Systemic approach to Reduce Energy demand and CO2 emissions of processes that transform agroforestry waste into High Added value Products.		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-03-2016	Type of Action: IA
Project start date: 10/1/2016	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 8.224.644,99	EU requested grant (€): 6.743.545,00	

Free keywords: *lignocellulose waste, lignin, tannins, sugars, building blocks, up-scaling, process engineering, construction sector, bioresins, bioadhesives, bio-insulation foam, biosuperplastificant, revalorization*

Abstract:

Europe's position in the production of biochemicals from biomass and by-products is limited to a few compounds, while their demand is among the largest in the world. However, Europe has a lot of world leader chemical companies. On the other hand, lignocellulosic waste constitutes one of the most abundant resources without competing with food chain.

REHAP's 16 partners aim at revalorizing agricultural (wheat straw) and forestry (bark) waste through its recovery, and primary (sugars, lignin, tannins) and secondary (sugar acids, carboxylic acids, aromatics and resins) processing to turn them into novel materials, and considering Green Building as business case. The project will provide reductions in utilization of fossil resources of 80-100%, and energy utilization and CO2 emissions above 30%.

Specifically, building blocks (1,4 and 2,3-Butanediol, estherpolyols), materials (PUs, phenolic resins, modified hydrolysis lignin) and products (wooden boards, insulation foams, cement, adhesive) will be obtained:

- Isolation of tannins and carbohydrates from forestry waste to turn them into bio-phenolic resins for wooden panels and isocyanate-free polyurethanes (PU) for insulating foams, respectively.
- Isolation of lignin and carbohydrates from agricultural waste to turn them into bio-phenolic resins for wooden panels and biosuperplasticizers for cement, and estherpolyol PU for adhesives, respectively.
- Fire retardant lignin and sugar-based additives will be also developed.

Developed processing technologies (chemo/thermo/enzymatic and fermentation) will be optimized at pilot scale (TRL6-7) for further exploitation and replication of results. All products will be integrated in a prototype to demonstrate industrial applicability into the Green Construction sector.

Throughout the project, Life Cycle and Cost Assessment, market analysis, business plan, waste management strategy and measures for future standardization will be implemented using a systemic perspective approach.

DREAM		723641
Title: Design for Resource and Energy efficiency in cerAMic kilns		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-04-2016	Type of Action: RIA
Project start date: 10/1/2016	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 5.076.105,00	EU requested grant (€): 5.076.105,00	

Free keywords: *Ceramic Kilns, Refractory Materials, Simulation, Heat Pipes, Ceramic Tile Manufacturing*

Abstract:

The DREAM project aims to design, develop and demonstrate a radically improved architecture for ceramic industrial furnaces, characterised by optimised energy consumption, reduced emissions, and lower operating costs compared to currently available technological solutions. This will be obtained by substantially enhancing specific furnace parts (control system, refractories, emissions abatement system) and by adding new modules and sub-systems (CHP unit, heat pipes) to the current furnace architecture.

DREAM Specific objectives will be:

O1 – To design innovative hardware furnace components improving energy efficiency (biofuel-fed CHP unit, heat pipes, emission abatement system)

O2 – To introduce substantial improvements on current hardware-software kiln parts (kiln control tool, refractory materials)

O3 – To test the DREAM solutions in a variety of industrial settings (retrofitting and pilot kiln demonstrators)

O4 – To pave the way for a full seizure of DREAM related market opportunities (dissemination, exploitation within the ceramic sector and market replication)

DREAM will develop and demonstrate technologies enabling a significant advancement in the sustainability of ceramics processes, implementing 5 synergic lines of research and 3 industrial demonstrators, which will act as technological showcases for market deployment. Such approach will enable to advance, in the five lines of research, from TRL4 to TRL6.

DREAM will strongly contribute to both the sustainability and competitiveness of the European ceramics and process industries. In particular, the DREAM technologies will earn an overall 20% OPEX and energy consumption reduction for industrial furnaces, with an average investment payback time for end users lower than 3 years.

The DREAM coordinator and industrial partners are technology and market leaders in the ceramics equipment field, and this will streamline the translation of the DREAM research results into successful products and services.

IMPROOF		723706
Title: INTEGRATED MODEL GUIDED PROCESS OPTIMIZATION OF STEAM CRACKING FURNACES		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-04-2016	Type of Action: RIA
Project start date: 9/1/2016	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 6.878.401,25	EU requested grant (€): 6.878.401,25	

Free keywords: *steam cracking furnace, light olefin production, high emissivity material, 3D reactor designs, renewable fuels, high performance computing, model based optimization*

Abstract:

The objective of the project IMPROOF is to drastically improve the energy efficiency of steam cracking furnaces by at least 20%, in a cost effective way, while simultaneously reducing emissions of greenhouse gasses and NOx per ton ethylene produced by at least 25%. One important way to reduce the energy input in steam cracking furnaces is to reduce coke formation on the reactor wall. The use of either advanced coil materials, combined with 3D reactor designs, improved process control, and more uniform heat transfer will increase run lengths, reducing simultaneously CO2 emissions and the lifetime of the furnaces. Biogas and bio-oil will be used as alternative fuels because they are considered renewable, and hence, decrease net CO2 production.

Application of high emissivity coatings on the external surface of the radiant coils will further substantially improve the energy consumption. Less firing is required to reach the same process temperatures in the radiant coils. This will reduce fuel gas consumption and CO2 emissions by 10 to 15%.

IMPROOF will demonstrate the advantage of combining all these technological innovations with an anticipated increase of the time on stream with a factor 3.

To select the correct technologies for sustainable implementation in complex plant-wide and industrial data-intensive process systems, all the technology will be implanted in real-plant conditions at TRL6 in DOW.

The strongly industrial oriented consortium is composed of 7 industrial partners, including 2 SME completed by 2 RTO and 2 university. This partnership shows a clear and strong path to the industrial and economical world with the involvement of all actors of the furnaces business.

The financial resources mobilized by the partners represent a total grant of 6 878 401,25 € with a global effort of 538 person.month.

VULKANO		723803
Title: Novel integrated refurbishment solution as a key path towards creating eco-efficient and competitive furnaces		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-04-2016	Type of Action: RIA
Project start date: 7/1/2016	Duration: 42 months	Unit: RTD/D/02
Total costs (€): 6.940.813,75	EU requested grant (€): 6.940.813,75	

Free keywords: *retrofitting, industrial furnace, refractory, PCM, control system, co-firing, energy efficiency, steel sector, ceramic sector*

Abstract:

The main goal of VULKANO is the retrofitting of two types of industrial furnaces, namely preheating and melting, applied on three energy-intensive sectors (steel, ceramic and aluminium) with a huge number of potential users in Europe. Thus, this project aims to design, implement and validate an advanced retrofitting integrated solution to increase the energy and environmental efficiency in existing industrial furnaces fed with NG; through the combined implementation of new solutions based on high temperature phase change materials, new refractories, optimised co-firing of NG and syngas from biomass or process gas, an advanced monitoring and control system and an holistic in-house predictive tool. All together will achieve a 20% increase in the energy efficiency of furnaces.

On top of that, the realistic and powerful holistic tool will also be able to optimize the integration of the solution with upstream/downstream perspective, following a life cycle and cost thinking. This predictive tool will support plant operators and decision makers to select most suitable retrofitting strategy for their plants, fostering overall efficiency, increase in competitiveness and circular economy and reducing the environmental impact of the product value chain from an LCA and LCC perspective.

The retrofitting solutions will be tested at TRL 7 in two real facilities in Ceramic (Spain) and Steel (Slovenia) sector, validating the replicability of such solutions in a third sector (Aluminium-Turkey). VULKANO addresses the main challenge when facing furnaces retrofitting, which is tackling the problem from an overall and cost thinking perspective, which will enable overcoming the barriers for energy efficiency improvements. A well balanced consortium formed by end-users, technology solutions providers and research organizations ensures successful achievement of objectives, which will allow a wide spreading replication strategy towards furnaces retrofitting towards modern and efficient designs

CarbonNext		723678
Title: The Next Generation of Carbon for the Process Industry		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-05-2016	Type of Action: CSA
Project start date: 9/1/2016	Duration: 24 months	Unit: RTD/D/02
Total costs (€): 495.747,50	EU requested grant (€): 495.747,50	

Free keywords: *Carbon sources*

Abstract:

The process industries and other crude oil consuming sectors are heavily dependent on fossil inputs for both carbon feedstock and energy, with the consequential CO₂ emission problems and import dependency as a result. To be prepared for a future with significantly reduced emissions they are seeking alternative carbon sources to replace traditional fossil fuels.

The objective of the CarbonNext project is to evaluate the potential use of CO₂/CO and non-conventional fossil natural resources as feedstock for the process industry in Europe. The work will examine the existing and expected sources of CO₂ and CO as well as non-conventional fossil natural resources such as shale gas, tar sands, coal bed methane, gas to liquid, and coal to liquid technologies.

Results of the project will include the identification of value chains within processes and where industrial symbiosis can be valuable (chemistry, cement, steel, etc.). The CarbonNext project will inform, as a basis for decision-making, Europe's SME's, large industry and policymakers with an enhanced understanding of the impact and opportunities for new sources of carbon for the processing industry. CarbonNext will primarily focus on new sources of carbon as a feedstock and secondarily the impact on energy availability, price and emissions.

The CarbonNext consortium brings together three of the leading organisations in the field of carbon dioxide/carbon monoxide utilisation. The knowledge base that each member brings is as a leader in the field and is therefore exemplary. CarbonNext will build on the project team achievements in the FP7 project SCOT (Smart CO₂ Transformations), the BMBF funded coordination project CO₂Net, the CO₂Chem network and many climate and energy related projects in Europe and for the European Commission.

INSPIRE		723748
Title: Towards growth for business by flexible processing in customer-driven value chains		
Call Id: H2020-SPIRE-2016	Topic: SPIRE-06-2016	Type of Action: CSA
Project start date: 9/1/2016	Duration: 24 months	Unit: RTD/D/02
Total costs (€): 495.065,00	EU requested grant (€): 495.065,00	

Free keywords: *Flexible processing; customer-driven value chains; innovative business models; manufacturing, Factories of the Future; SPIRE community; SMEs; scenarios & validation*

Abstract:

INSPIRE aims at increasing the competitiveness of European manufacturing which depends on producing differentiated and high added value products in an efficient and sustainable manner, with reduced production costs, increased product quality, minimised time to market and optimized strategies towards resource efficiency. The main focus of this project is the development of innovative business models creating flexible networks through the use of intensified processing that would promote more local production in Europe within the 5 years after the end of this study. The project takes an interesting and valuable approach by bringing together the (downstream) manufacturing ("Factory of the Future") community with the (upstream) process industry (SPIRE) community, as well as regional industrial clusters (parks) to study required changes of business models in Europe, due to a.o. 1) further integration of these industries in the value chain leading to more flexible and demand driven business operation and 2) increased trends towards resource sharing and optimization across multiple process industries (e.g. through industrial symbiosis within regional contexts such as industrial parks). Special attention will also be given to how this approach would be responding to the needs of SMEs as partners in value chains. Expected outcome of this project would be the description of the current European landscape and link between intensified processing and flexibility, development of innovative business models for different sectors in general, and providing a guideline to measure the performance of such novel models under different scenarios.

ENSUREAL		767533
Title: Integrated cross-sectorial approach for environmentally sustainable and resource-efficient alumina production		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-07-2017	Type of Action: IA
Project start date: 10/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 8.971.037,50	EU requested grant (€): 7.251.488,89	

Free keywords: *Pedersen, sustainable process industries, circular economy*

Abstract:

Global alumina production capacity is forecast to grow by 30% over the next ten years. Unfortunately, Europe cannot keep the competition and is highly dependent on imported alumina and bauxite. ENSUREAL project's main objective is to decrease this dependence and characterise all the streams of the alumina industry in order to valorise them and make the European aluminium industry more competitive at a global scale.

In order to do so, ENSUREAL addresses the production of alumina of the aluminium production sector, through the introduction of a new technology (Pedersen process) that improves the process' yield and its energy and environmental performance. Moreover, ENSUREAL's consortium proposes a new value chain that takes into account all the streams as valorisable products across the aluminium supply chain and introduces the foundry and the agricultural sector. A call for transparency (no-more-black-boxes) and thus a deeply cross-sectorial initiative.

More specifically, ENSUREAL brings together the aluminium sector (Aluminium of Greece), the foundry sector (Odlownie Polskie S.A., Poland), the agricultural sector (Luvena S.A., Poland) and lime producers (CaO Hellas, Belgium), in order to demonstrate the new technologies and approaches proposed. The innovative character of the project is brought by major players in R&D, such as SINTEF, NTUA and NTNU. Outotec and SMS group bring outstanding engineering and process expertise. Furthermore, 3 SMEs will help define and optimise the bauxite scenario in Europe (AdMiRIS), develop ENSUREAL's business case (ITRB) and study the upscaling of the process for future commercial prospects (KON Chem). Last but not least, clustering with other EU initiatives, including other SPIRE projects, will be paid special attention in order to promote a transparent approach of development that show the aluminium producers in Europe all the benefits of implementing the ENSUREAL process once it is demonstrated.

Morse		768652
Title: Model-based optimisation for efficient use of resources and energy		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-07-2017	Type of Action: IA
Project start date: 10/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 5.791.410,00	EU requested grant (€): 4.700.692,50	

Free keywords: *Trough process optimisation, process industry, software framework, process model, production*

coordination, process monitoring, resource and energy efficiency, process control, model predictive control

Abstract:

The process industry is continuously looking for new ways to improve resource efficiency due to high dependence on resources (energy, raw materials and utilities). In large scale production even small changes in using raw materials and in energy can significantly improve process efficiency. The MORSE approach is to adopt new software tools for model-based predictive control, multi-criterial through process optimisation and quality management with overall process coordination. The application of these new software tools will lead to process improvements - reducing the use of raw material and energy while increasing the high quality and production rates.

The Morse project aims to further develop and to integrate a set of software tools that have partly already been validated in different process steps in steel industries. These software prototype tools and models were developed and evaluated by six R&D partners of the consortium in collaboration with three process industry partners. With the enhanced Morse tools companies of the process industry will be enabled to optimise the use of raw materials and energy by coordinated prediction and control of resource input and product quality along the entire process route from raw material and energy intake to customer delivery.

The mission of the Morse project is to develop model-based, predictive raw material and energy optimisation tools for the whole process route. This approach will be demonstrated in steel industry, to increase yield and product quality in production of high-strength carbon steels, stainless steels and cast steels.

SUPREME		768612
Title: Sustainable and flexible powder metallurgy processes optimization by a holistic reduction of raw material resources and energy consumption.		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-07-2017	Type of Action: IA
Project start date: 9/1/2017	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 9.810.118,75	EU requested grant (€): 7.959.642,89	

Free keywords: *powder metallurgy, additive manufacturing, near-net shape, water atomization, gas atomization, ball milling, ferrous metal, non-ferrous metals, mineral concentration, process control*

Abstract:

SUPREME aims at optimizing powder metallurgy processes throughout the supply chain. It will focus on a combination of fast-growing industrial production routes and advanced ferrous and non-ferrous metals. By offering more integrated, flexible and sustainable processes for powders manufacturing and metallic parts fabrication, SUPREME enables the reduction of the raw material resources (minerals, metal powder, gas and water) losses while improving energy efficiency, production rate and CO2 emissions, into sustainable processes and towards a circular economy. To achieve this goal, an ambitious cross-sectorial integration and optimization has been designed between several powder metallurgy processes: gas and water atomization as well as ball milling for metal powder production, additive manufacturing and near-net shape technologies for end-parts fabrication. Quality and process control will be developed to monitor KPI, based on eco-innovation approach, to demonstrate the optimization of material and energy use. 4 demonstrators will be proposed at each step of the value chain in real industrial setting and ready for business exploitation at TRL 7: mineral concentration, metal powder manufacturing, metal part manufacturing and end-product that will validate a global optimization of more than 25% on material yield losses, more than 10% on energy efficiency, more than 10% on production rate and beyond 30% of CO2 emissions. SUPREME has gathered an outstanding consortium of 17 partners from 8 countries, represented by 11 companies including 6 SMEs that will ensure a successful implementation towards market applications. 5 applications sectors are targeted: automotive, aeronautics, cutting tools, molding tools and medical. The process key differentiation advantages will bring modularity, flexibility and sustainability to powder metallurgy and will reduce the total cost breakdown of these technologies, boosting their adoption by industry.

Carbon4PUR		768919
Title: Turning industrial waste gases (mixed CO/CO₂ streams) into intermediates for polyurethane plastics for rigid foams/building insulation and coatings		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-08-2017	Type of Action: RIA
Project start date: 10/1/2017	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 7.765.358,75	EU requested grant (€): 7.765.358,75	

Free keywords: *Flue gas mixture conversion, CO₂/CO mixture, chemical building blocks, polyurethanes, lactones, cyclic carbonates, polymer intermediates, rigid foams, coatings, catalysis, decarbonisation, CCR, CCU*

Abstract:

The EU process industry needs to become less dependent of fossils as source of carbon, and – at the same time - to reduce the greenhouse effect by decarbonizing the economy. Carbon4PUR will tackle the two challenges at the same time by transforming the CO₂/CO containing flue gas streams of the energy-intensive industry into higher value intermediates for market-oriented consumer products. The industrially driven, multidisciplinary consortium will develop and demonstrate a novel process based on direct chemical flue gas mixture conversion, avoiding expensive physical separation, thus substantially reducing the carbon footprint, and also contributing to high monetary savings.

Both the consortium and the work are organized along the full value chain starting with the provision and conditioning of industrial emissions from a steel to a chemical company in line with the concept of industrial symbiosis, going through the transformation into chemical building blocks – lactones and cyclic carbonates – which both will be further transformed into polymer intermediates and flow into desired sustainable polyurethane applications of rigid foams and coatings. LCA and technology evaluation will be done and replication strategies to transfer the technology to other applications will be elaborated. The distinctive feature of the developed process is avoiding resource-intensive separation of the gas components before the synthesis, and developing a chemo-catalytic process to deal directly with the gas mixture instead. The challenge and innovation is coming up with an adjustable process in terms of on-purpose and demand tailor-made production of required products, taking into account all variables at the same time: the available flue gases characteristic from the steel plant, material and process parameters, and the market requirements for the end product, thus flexibly involving the whole value chain with best results and possibly lower the prices.

ICO2CHEM		768543
Title: From industrial CO₂ streams to added value Fischer-Tropsch chemicals		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-08-2017	Type of Action: RIA
Project start date: 10/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 5.948.588,75	EU requested grant (€): 5.948.588,75	

Free keywords: *Chemicals from CO₂, Fischer-Tropsch, white oils, high molecular weight waxes, coatings sealants, greenhouse gas reduction, carbon capture and utilisation, heat exchanger reactor, RWGS, CVD*

Abstract:

The overall aim of the project is to develop a new production concept for converting CO₂ to white oils and aliphatic high molecular weight waxes. The products are used for wax emulsions and white oils to be used in coatings and sealant materials. The properties of the raw materials will be tested against current fossil based materials. The main raw material for the process is CO₂ which is available from processes currently operating at a large industrial site with significant annual CO₂ emissions. H₂ is obtained as by product from a chlor-alkali plant on the site. Currently H₂ is produced in excess and it is used mainly for energy production. Currently at this chemical production site about 2 million tons/a of CO₂ is vented to the atmosphere, creating a huge GHG emission reduction potential. The core of this project is a combination of reverse water gas shift (RWGS) coupled with advanced, modular Fischer-Tropsch (FT) technology. The RWGS-step converts CO₂ with H₂ to carbon monoxide. The following FT-reaction step will be carried out in a novel intensified reactor recently developed and patented by Ineratec. Over 1500 kg of white oils and high-molecular weight wax will be manufactured using a container-sized microstructured reactor system. Techno-economic and environmental assessments will be carried out to demonstrate the potential of the new concept in different locations and integration sites. A business plan will be formulated in the project for a follow-up of a commercial industrial demonstration project.

RECODE		768583
Title: Recycling carbon dioxide in the cement industry to produce added-value additives: a step towards a CO2 circular economy		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-08-2017	Type of Action: RIA
Project start date: 8/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 7.904.415,00	EU requested grant (€): 7.904.415,00	

Free keywords: *Ionic liquids, calcium carbonate nanoparticles, carboxylic acids, cement industry, CO2 purification, CO2 utilization*

Abstract:

CO₂ from the flue gases of a rotary kiln in a cement industry (CO₂: 25 vol%) will be used for the production of value-added chemicals (acid additives for cement formulations) and materials (CaCO₃ nanoparticles to be used as concrete fillers). A circular-economy-approach is enabled: the CO₂ produced by cement manufacturing is re-used in a significant part within the plant itself to produce better cement-related products entailing less energy intensity and related CO₂ emissions by a quadratic effect.

Ionic liquids (bare or amine-functionalised) will be the key technological playground for the efficient and cost-effective (<30 €/ton) purification of CO₂ to a purity grade sufficient for the above mentioned utilisation paths. A dedicated pilot plant (flue gas flow rate: 50 Nm³/h) will be developed, based on the knowledge-based selection of the best ionic-liquids composition and operating conditions.

Within a final TRL 6 integrated system demo campaign, the thereby derived CO₂ will be utilised in parallel to:

- promote the precipitation of nano-CaCO₃ powders which act as strength enhancer and accelerator of the hydration rate.
- synthesize through electrocatalytic and catalytic pathways formic acid, oxalic acid and glycine to be used as hardening acceleration promoters, grinding aids or ionic liquids additives, respectively.

Distinctive features of the RECODE approach are the high process intensification and scale-up-ability; the use of low-grade heat sources; the meaningful reduction of CO₂ emissions (>20% accounting for direct and indirect means) and the good market potential of their products at a mass production scale.

The first two years of the project will be focused on the development of key functional materials and process units at TRL 4-5, the third year on the assembly of single-process lines certified at TRL 5-6, and the fourth year on the assembly and testing at a cement manufacturing site (TITAN) of the TRL 6 integrated CO₂ process.

DEMETO		768573
Title: Modular, scalable and high-performance DE-polymerization by MicrowavE TechnolOgy		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-09-2017	Type of Action: IA
Project start date: 9/1/2017	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 9.890.857,14	EU requested grant (€): 7.808.937,50	

Free keywords: *depolymerization, PET, recycling, circular economy, microwaves, plastics, polyester, waste2resource*

Abstract:

Based on an internationally patented technology, the project foresees to bring at industrial level (through a completely functional pilot plant) the usage of microwaves as Process Intensification approach (through an electromagnetic catalytical effect) of the well-known alkaline hydrolysis depolymerization reaction. Such reaction was, up to know, economically unfeasible due to a certain number of technological constraints that DEMETO finally solves.

Coordinated by PROCESSI INNOVATIVI, R&D company of a large EPC (Engineering, Procurement and Construction) group, but supported by a large basis of SMEs that will bring the most innovative aspects of the project technology, DEMETO's Consortium is composed by highly skilled members, which can guarantee the appropriate exploitation of the project business case, also thanks to the involvement of all the major commercial stakeholders of the PET value chain, including the most relevant Customer Segments.

In fact, having followed all previous steps from lab-level testing (TRL3) to industrial demonstration of the core reactor (TRL6), we are now in the position to further move the technology towards its market deployment, by building a pilot plant (containing a full reactive unit) that would act as industrial demonstration of the performances of DEMETO's de-polymerization approach to the market.

One of the project major strengths is in fact that the market is ready to accept DEMETO's technology. The existing value chain of post-consumer recovery of PET plastic waste is perfectly apt to accept the introduction of a new "ring of the chain", that would close the loop into a circular economy model, acting either at the end of the chain (mechanical recyclers) or at its beginning (PET producers). This gives us a total addressable market of about 60 plants in Europe (270 worldwide), for a value of around €1.2bn (€5.4bn worldwide).

ECCO		768692
Title: Energy Efficient Coil Coating Process		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-09-2017	Type of Action: IA
Project start date: 10/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 9.803.316,25	EU requested grant (€): 7.850.029,38	

Free keywords: *coil coating, radiant burners, solvents, high temperature ceramics, catalytic coating*

Abstract:

Coil coating is an important industrial process applied in a major part of industrial steel and metal alloy production and associated with big facilities and large primary energy consumption. A major part of the overall plant size and the energy demand of coil coating facilities is associated with the drying/curing process that occur inside a curing oven, which is the bottleneck concerning the increase of the production capacity. In this drying/curing process, organic solvents are vaporized from the applied liquid coating film and since they are flammable, the usually applied curing ovens with convective air drying technology have to be operated far below the Low Explosive Limit (LEL), due to safety constraints. ECCO proposes a novel solution for the curing oven operation, which can not only drastically increase the compactness and energetic efficiency of the system, but leads to an increased production flexibility due to a fuel-flexible, modular and potentially energetically self-sustainable process. The main idea is to heat the metal strip by IR-radiation and operate the curing oven well above the Upper Explosive Limit (UEL), thus, performing the drying and curing process in an atmosphere mainly consisting of the solvent vapours, which are used as fuel in IR radiant porous burners. This solution leads to a size/ production capacity ratio reduction of 70% and a reduction of investment and operating costs of at least 40% each. Starting from previous activities at TRL 4, an interdisciplinary approach is foreseen, based on advanced-materials, combustion technology and prediction tools for system design/optimization, with active participation of key industrial stakeholders, to bring this technology to TRL 6 and realize a prototype furnace at industrially relevant size and environment.

NOVUM		768604
Title: Pilot line based on novel manufacturing technologies for cellulose-based electrical insulation components		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-09-2017	Type of Action: IA
Project start date: 10/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 8.491.018,75	EU requested grant (€): 6.480.353,13	

Free keywords: *electrical insulation components, cellulose, thermoplastic, 3D printing, foam forming, thermoforming*

Abstract:

Production of electrical insulation components is globally a B\$1.19 business. Cellulose is one commonly used raw material for insulation components. State-of-the-art production methods for high quality electrical insulation products are typically labour intensive and slow.

The main objective of NOVUM is to develop and demonstrate a compact and feasible pilot line concept based on novel processing technologies for rapid, design driven production of advanced cellulose-based electrical insulation components. This new pilot line will result in significant efficiency improvement and higher productivity and flexibility, while ensuring lower operational costs as compared with the state-of-the-art process. Manual production will be replaced by an automated manufacturing concept with increased resource efficiency, including 40% reduction in labour time and 60% reduction in waste generation, 20% lower energy consumption and 40% decrease in operating costs.

Processing technologies in the focus of NOVUM are 3D printing of cellulose-based materials having thermoplastic features as well as foam forming and thermoforming of cellulose fibres. These three technologies will be developed in parallel to each other, together with the cellulose materials, in order to reach optimal combination for the pilot line concept. Besides technical feasibility, the decision on the pilot line concept will be based on the end use requirements as well as on economic, social and environmental impacts including circular economy considerations.

The novel manufacturing concept will also enable exploitation of the full potential of design in generating form and thus novel functionalities to cellulose-based electrical insulation components. In addition, the concept will be based on multipliable technologies, enabling their transition and wide adoption for cellulose-based materials across the process industry and for applications beyond NOVUM for other industrial areas.

PORTABLECRAC		768905
Title: PORTABLE SOLUTION FOR THE ELECTROCHEMICAL REGENERATION OF ACTIVATED CARBON		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-09-2017	Type of Action: IA
Project start date: 10/1/2017	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 2.883.012,50	EU requested grant (€): 2.206.718,75	

Free keywords: *Activated carbon, electrochemical regeneration, reactivation, portable technology, flexible maintenance, in situ, cost savings, CO2 reduction*

Abstract:

Activated carbon is manufactured overseas (30% of production occurs in CHINA). As an example, in 2016, 12% of worldwide AC demand (0.23 million of tons) corresponded to Western Europe . A Europe import about 80% of their internal consumption of AC. PORTABLECRAC provides a successful business case to reduce overseas imports with negative competitive and environmental impacts in key industries in Europe. Furthermore, great exploitation and replication opportunities for circular-local economy development, at business and environmental perspectives, will be pursued and exploitation path assessed as key implementation task after feasibility analysis is completed. However, due to continuous use, EXHAUSTION of AC filters is a common issue with the consequent high cost in producing virgin filters again. Indeed, there is a side problem related to the manipulation and management of exhausted AC that has to be considered as highly contaminant waste and can vary at regional-national level. Accordingly, the viability of AC use at industrial level roots in the regeneration and reactivation of exhausted AC.

AC can be regenerated (large facilities i.e. do it at this moment), reducing costs by about 50%. Regeneration of spent AC is mainly done by thermal regeneration (as is the case of EMIVASA). However, it requires off-site service, high energy input and carbon losses with negative environmental impacts against the solution provide by PORTABLECRAC as the key value proposition (Table 1) shows.

PORTABLECRAC brings a sustainable and long term solution creating a direct and indirect employment in the “service-sector” from UE. PORTABLECRAC KEY VALUE PROPOSITION is to provide a solution to water treatment with 86% reduction in cost per kg/AC and 4 times reduction in CO2 emissions. Business model will be assessed and validated during the scope of the project, based on traditional key drivers for industry market penetration as cost reduction and legislation framework

CO2EXIDE		768789
Title: CO2-based Electrosynthesis of ethylene oXIDE		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-10-2017	Type of Action: RIA
Project start date: 1/1/2018	Duration: 36 months	Unit: RTD/D/02
Total costs (€): 5.420.113,25	EU requested grant (€): 5.420.113,25	

Free keywords: *CO2 capture, PEM electrolyser, electrochemical CO2 reduction, electrochemical water oxidation, gas separation, ethylene, hydrogen peroxide, chemical catalysis, cascade reactor, ethylene oxide*

Abstract:

The CO2EXIDE project aims at the development of a combined electrochemical-chemical technology for the simultaneous “200%” conversion of CO2 to ethylene at the cathode, water oxidation to hydrogen peroxide at the anode and a subsequent chemical conversion of both intermediates to ethylene oxide and oligo-/polyethylene glycol in a cascade, boosting this technology from TRL4 to TRL6. The CO2EXIDE technology combines a modular nature for the feasibility of a decentralised application, a high energy and material efficiency/yield and the substitution of fossil based production of ethylene oxide. The CO2EXIDE technology will be combinable with renewables and allows for the direct creation of products, which can be integrated into the existing supply chain. The reactions will be operated at low temperatures and pressures and forecast significant improvements in energy and resource efficiency combined with an enormous reduction of GHG emissions. All improvements will be quantitated using Life Cycle Assessment.

The CO2EXIDE approach will bring together physicists, chemists, engineers and dissemination and exploitation experts from 5 universities/research institutions, 3 SMEs and 2 industries, innovatively joining their key technologies to develop and exploit an unprecedented process based on CO2, renewable energy and water to combine the chemical and energy sector.

Within 36 months project duration, the CO2EXIDE technology will undergo a thorough material and component R&D programme. A 1kW PEM electrolyser for CO2-reduction and water oxidation in combination with an ethylene enrichment unit and subsequent chemical conversion cascade reactor will be manufactured to produce ethylene oxide as intermediate for oligo-/polyethylene glycol synthesis. This will prove the achievement of the quantified techno-economic targets of CO2EXIDE.

OCEAN		767798
Title: Oxalic acid from CO₂ using Eletrochemistry At demonstration scale		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-10-2017	Type of Action: RIA
Project start date: 10/1/2017	Duration: 48 months	Unit: RTD/D/02
Total costs (€): 5.523.650,00	EU requested grant (€): 5.523.650,00	

Free keywords: *electrochemistry, CO₂, oxalic acid, polymers, glycolic acid*

Abstract:

The OCEAN project aims to develop an integrated process for the production of high-value C₂ chemicals from carbon dioxide using electrochemistry. This will be achieved by: 1) improving and optimizing a TRL5 technology that can convert carbon dioxide to formate, to TRL6. OCEAN will bring this technology just one-step away from commercialization, by demonstrating this technology at the site of an industrial electricity provider, converting 250 g of CO₂ per hour at 1.5 kA/m². The energy efficiency will be improved by coupling the cathodic reaction to the oxidation of glucose at the anode, using a novel technology to match the kinetics of the reactions at both electrodes. The obtained formate can be converted to oxalate. 2) Developing new electrochemical methodologies to further convert formate and oxalate to formic acid and oxalic acid, respectively. Novel salt-splitting will be investigated using bipolar membranes. Again, this allows for direct coupling with an electrosynthesis step at the anode and/or cathode. 3) Developing new electrochemical methodologies by converting oxalic acid to glycolic acid and other high-value C₂-products, these will be benchmarked with conventional hydrogenation. 4) Integrating the TRL6 and new (TRL4-5) electrochemical technologies in an industrial process, aimed at the production of high-value C₂ products and polymers thereof by developing the process steps needed to produce oxalate, C₂ products and polymers. 5) Demonstrating the economic feasibility by performing a market analysis and making a business case and exploitation strategy. Overall, OCEAN aims at addressing the critical elements that are currently hindering new electrochemical processes by targeting high value products that have the corresponding production margin to introduce this technology on the market, lower the power costs by combining oxidation and reduction, and a trans-disciplinary approach that is needed for the introduction of these advanced technologies.

SIDERWIN		768788
Title: Development of new methodologies for industrial CO₂-free steel production by electrowinning		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-10-2017	Type of Action: RIA
Project start date: 10/1/2017	Duration: 60 months	Unit: RTD/D/02
Total costs (€): 6.824.336,25	EU requested grant (€): 6.824.336,25	

Free keywords: *Electrowinning, Steelmaking, Electrolysis, Renewable energies, By-products valorisation,*

Abstract:

For the time being, there are no economically feasible steelmaking technologies available having the potential to meet the EU's climate and energy targets for 2030. At best, a 15% decrease in the overall CO₂ intensity of the sector could be achieved throughout the widespread dissemination of technologies that could reasonably become cost-effective in the future. Therefore, breakthrough technologies are urgent and indispensable.

SIDERWIN project proposes to develop a breakthrough innovation compared to the actual steel production process bringing together steel making with electrochemical process. The electrolysis process using renewable energies will transform any iron oxide, including those inside the by-products from other metallurgies, into steel plate with a significant reduction of energy use. This process decomposes under mild conditions but at intense reaction rate naturally occurring iron oxides such as hematite into iron metal and oxygen gas. By offering a CO₂-free steel production process, the project will contribute to the reduction of the total greenhouse gas emissions.

Compared to traditional steelmaking plants, this innovative technology has several positive impacts such as: a reduction by 87% of the direct CO₂ emissions; a reduction by 31% of the direct energy use; the ability to produce steel from by-products rich in iron oxides from non-ferrous metallurgy residues; an increased integration with renewable energies with a more flexible process.

The project is led by ArcelorMittal the world's leading steel and mining company. The company has been working for 12 years on the development of the technology to bring it from the TRL 0 to TRL 4 through the manufacturing of 5 different pilots, proving the potential of the technology. With this solid background, ArcelorMittal surrounded by 11 additional innovative European partners, aims at developing a 3 metre-long new experimental pilot to validate the technology at TRL 6.

SPRING		767412
Title: Setting the framework for the enhanced impact of SPIRE projects		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-11-2017	Type of Action: CSA
Project start date: 9/1/2017	Duration: 24 months	Unit: RTD/D/02
Total costs (€): 499.368,75	EU requested grant (€): 499.368,75	

Free keywords: *Enhancing impact of SPIRE projects*

Abstract:

Increasing industrial uptake of project findings is at the heart of project SPRING. It is the essential building block for ensuring greater impact of SPIRE projects and therefore progress towards the SPIRE roadmap goals of increased resource and energy efficiency in the EU process industries.

Instead of focusing on a small cluster of projects, SPRING has been developed to provide the mechanism to enhance the impact of all SPIRE projects.

Project SPRING's objective is to increase progress towards the SPIRE goals and enhance return on investment in projects by addressing the needs of those who make the decisions to adopt process innovations in industry and barriers to their adoption. It will do this by providing guidance to project participants, decision makers in industry and broader SPIRE stakeholders, enabling them collectively to:

1. Improve the articulation of the value of project exploitable outputs
2. Improve the articulation of industry needs and barriers-to-uptake of exploitable outputs
3. Improve the mapping of project value to industry needs
4. Identify policy gaps and recommendations to improve project impact

To address these objectives, the project will deliver six sets of exploitable outputs:

A – Guidance on best practice of how to measure progress, impact and success of SPIRE projects.

B – Frameworks for getting different levels of project results to the right audience through the spire2030.eu portal

C – A model for mapping project outputs to industry needs, through thematic, interactive industry workshops, expert input and technology scanning methods.

D – Guidance for understanding business barriers to uptake, including best practice for enabling good decision making when evaluating project outputs.

E – A package of training and network groups to upskill SPIRE project participants

F – Identification of policy gaps and future SPIRE needs

HARMONI		768755
Title: Harmonised assessment of regulatory bottlenecks and standardisation needs for the process industry		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-12-2017	Type of Action: CSA
Project start date: 8/1/2017	Duration: 27 months	Unit: RTD/D/02
Total costs (€): 999.613,75	EU requested grant (€): 999.613,75	

Free keywords: *Regulation, Standards, Innovation, Technology transfer, Process Industry, Cross-Sector, SPIRE*

Abstract:

HARMONI aims at bringing together all the relevant stakeholders of the process industry to jointly identify, analyse and propose solutions to the regulatory bottlenecks and standardization needs that hamper their innovation processes and the market uptake of their results, necessary to move towards a more sustainable and competitive European process industry. In order to achieve HARMONI's overarching goal, the consortium will develop and apply a methodology for ensuring an effective collaboration of the 8 sectors involved in SPIRE PPP to elaborate the solutions to the common challenges they face due to non-technological barriers, such as regulatory issues or the lack of European Standards when trying to improve their resource efficiency. In addition, HARMONI will analyse, compare and propose recommendations to trigger the transferability of technical solutions among and beyond the SPIRE sectors. The methodology will include the utilisation of the existing SPIRE Knowledge platform and the creation of another platform to be linked with CEN/CENELEC STAIR WG for the coordination of the project's standardization activities. The project activities will result in an optimized EU regulatory and standardization framework that facilitates and supports innovation in the process industry; a better participation of the SPIRE community in the EU regulatory and procedures, thus providing the most adequate input to the regulatory authorities; an earlier and more active involvement of the SPIRE community in the EU standardization process; and an overall better environment to maximize transferability rates of technologies across SPIRE sectors. HARMONI consortium includes 3 SPIRE sectorial associations (chemicals, cement and equipment), A.SPIRE, 2 RTDs coming from two SPIRE sectors (steel, ceramic), 1 National Standardization body (DIN) and an experienced RTO to coordinate them (CIRCE). In addition, an Advisory Board will involve the other 5 SPIRE sectorial associations and CEN/CENELEC

SCALER		768748
Title: Scaling European Resources with Industrial Symbiosis		
Call Id: H2020-SPIRE-2017	Topic: SPIRE-13-2017	Type of Action: CSA
Project start date: 11/1/2017	Duration: 30 months	Unit: RTD/D/02
Total costs (€): 1.049.481,25	EU requested grant (€): 1.049.481,25	

Free keywords: *Industrial Symbiosis, Circular Economy, Process Industries, European Resources, Eco-efficiency*

Abstract:

Industrial symbiosis promotes sharing of physical resources (energy, water, residues and recycled materials, etc.) between different industrial processes, increasing business opportunities and creating new jobs while reducing environmental impacts. Neither self-organization nor the few government co-ordinated mechanisms have delivered mass implementation of Industrial Symbiosis. Given the great potential for triple-bottom line benefits this failure must be understood and addressed. SCALER aims to massively increase the implementation of industrial symbiosis, by developing mechanisms to retain the embedded value of European resources, thus, enabling the circular economy to achieve higher resource efficiency through systemic innovations led by intensified industrial symbiosis initiatives and enhanced by cross-sectorial collaboration and, to support the development of a roadmap to improve the adoption of industrial symbiosis in the European process industry at regional / national / European level. SCALER will use new and advanced practices in identifying value opportunities, use new methods to create a larger market for available resources, and use new methods to measure and manage the implementation and sustaining of new relationships. SCALER brings together qualitative and quantitative tools and methods to support self-organised initiatives on industrial symbiosis and to enhance facilitation processes and coordination actions. The creation of new spaces for interaction, collaboration and cooperation and the engagement of a broader set of stakeholders are crucial elements of the multiplier effect in industrial symbiosis implementation. SCALER provides a comprehensive solution for understanding, assessing and intensifying the potential of industrial symbiosis in Europe.

EUCALIVA		745789
Title: EUCAllyptus Lignin VALorisation for Advanced Materials and Carbon Fibres		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-D03	Type of Action: BBI-IA-DEMO
Project start date: 9/1/2017	Duration: 42 months	Unit:
Total costs (€): 2.419.871,25	EU requested grant (€): 1.795.009,88	

Free keywords: *Lignin, carbon fibres, elctrospinning*

Abstract:

Natural resources are being exhausted due to the great demand of their services and the insufficient actions taken for their preservation. Against this background, the use of waste components from industrial activities as raw materials to obtain high value-added products is of great relevance.

Lignin from pulping process is present all over Europe and represents a big source of underexploited material. There is an estimated 70 million tonnes of lignin available from pulping processes worldwide, but much of this is not isolated but burned onsite to provide steam for heat and power production. Until now only about 2% of the lignins available in the pulp and paper industry is commercially used comprising of about 1,000,000 tons/year lignosulphonates originating from sulphite pulping and 104,000 tons/year of kraft lignins produced in the kraft process

BIOMOTIVE		745766
Title: Advanced BIObased polyurethanes and fibres for the autoMOTIVE industry with increased environmental sustainability		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-D05	Type of Action: BBI-IA-DEMO
Project start date: 6/1/2017	Duration: 48 months	Unit:
Total costs (€): 15.186.325,05	EU requested grant (€): 10.659.352,50	

Free keywords: *automotive, regenerated fibres, thermoplastic polyurethane, polyurethane foam, 1,4 butanediol, azelaic acid, furan di-carboxylic acid, biocomposite*

Abstract:

Vehicles are composed by different materials and a noticeable and fundamental fraction of them (20% w/w) is constituted by plastic material, among which polyurethanes. PU is fundamental since, thanks to its properties, it enables to reduce the overall weight of the car, resulting also in a lower fuel consumption. More and more vehicles' manufacturers and suppliers are betting on biobased alternatives derived from renewable raw materials, but a biobased plastic able to mimic technical properties of PUs as well as to provide the required aesthetics and haptics has not been developed yet. The BIOMOTIVE project will pave the ground towards the production and subsequent market penetration of biobased automotive interior parts with enhanced technical performance, improved environmental profile and economic competitiveness, with the aim of replacing the fossil-based, non-biodegradable counterparts. Within the project, innovative and advanced biobased materials with an increased biobased content (60-80%), i.e. thermoplastic polyurethanes, 2-components thermoset polyurethane foams and regenerated natural fibres, will be produced starting from renewable biomass feedstock not in competition with food and feed, leveraging innovative production techniques. Such materials will be validated into cars' interior parts (door handles and automotive seats) demonstrating advanced properties in terms of resistance to fire, mechanical strength and flexibility as well as improved recyclability of the end-of-life products. The project will also aim at demonstrating an innovative process for the production of 100% biobased NIPUs, with moisture-repellant properties. The involvement of external industrial players thorough targeted dissemination events will pave the ground to the widening of the market applications of the developed biomaterials: regenerated fibres from paper-grade wood pulp into textile production and biobased TPUs in nature based solutions within the construction sector.

EMBRACED		745746
Title: Establishing a Multi-purpose Biorefinery for the Recycling of the organic content of AHP waste in a Circular Economy Domain		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-D06	Type of Action: BBI-IA-DEMO
Project start date: 6/1/2017	Duration: 60 months	Unit:
Total costs (€): 17.334.553,75	EU requested grant (€): 10.695.211,13	

Free keywords: *Multi-purpose Biorefinery, Circular Economy, Post-Consumer Absorbent Hygiene Products Waste*

Abstract:

A sizeable category in terms of organic content within MSW is represented by Absorbent Hygiene Products (AHPs; e.g. nappies, adult incontinence products, feminine hygiene items, wipes, etc.) waste, which is currently considered as non-recyclable fraction of MSW and finds its way to landfills or incineration, leading to important environmental concerns. Indeed, each year 8,500,000 tons of such waste are incinerated or landfilled in Europe (the equivalent of almost 30 landfills every year), and over 30,000,000 tons in the world. AHP are mainly composed of a mix of natural fibres (cellulose) and polymers (PP/PE and superabsorbent polymer), valuable materials that currently don't find a proper valorization. Within EMBRACED project, a first-of-its-kind multi-purpose integrated biorefinery will be established in order to valorize in a relevant environment scenario the cellulosic fractions obtained from AHP waste towards the production of bio-products of significant commercial interest, and – concurrently – high added-value co-products, such polyolefinic plastics and SAP (superabsorbent polymers).

This innovative biorefinery model will involve all the main actors of the whole value chain, from AHP consumers and local population to waste management and logistic companies, leading AHP producers and bioprocess developers, as well as final products developers. In a view of circular economy, all the fractions obtained from the processed AHP waste will be reused through valorization into final products, and in particular the high-quality cellulosic fraction of AHP (ca. 1,275,000 ton/y in Europe), which has significant advantages vs. traditional 2nd generation lignocellulosic feedstocks in terms of homogeneity and downstream bioprocessing costs, will be converted and valorized in two parallel value chains, leading to the production of biobased building blocks, polymers and fertilizers.

OPTISOCEM		744330
Title: OPTimized conversion of residual wheat straw to bio-ISObutene for bio based CHEMicals		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-D07	Type of Action: BBI-IA-DEMO
Project start date: 6/1/2017	Duration: 48 months	Unit:
Total costs (€): 16.376.816,83	EU requested grant (€): 9.755.493,63	

Free keywords:**Abstract:**

OPTISOCEM goal is to demonstrate the performances, reliability as well as environmental and socio-economic sustainability of the entire value chains, for the transformation of excess wheat straw into bio-Isobutene (bio-IBN) derivatives. To achieve these goals a team of 6 partners, leaders in their field, originating from 4 EU-member states, will join efforts.

OPTISOCEM consists in showcasing the technical accessibility and economical sustainability of the value chains, from wheat straw to 2 different families of chemicals derived from bio-based IBN.

These compounds, oligomers (DIB, TIB, TeIB) and polyisobutylenes (PIBs) are currently used in a wide range of applications such as lubricants, adhesives, sealants, flavors & fragrances and substituted phenols.

This large market is today supplied entirely by products derived from fossil-based isobutene. Products derived from bio-based IBN, using the same process as fossil-based IBN, and with at least as good performances, would provide a renewable supply.

OPTISOCEM includes the development & up-scaling of bio-IBN production from wheat straw, followed by the production and validation at relevant scale -representative of commercial, established processes- of the bio-based derivatives. To this end, four ambitious objectives were defined:

- Demonstrate the production of wheat straw hydrolysate (WSH) and establish a quality standard to feed the IBN fermentation unit,
- Demonstrate the production of bio-IBN from WSH at pre-commercial scale,
- Demonstrate the quality of end products obtained with bio-IBN as a feedstock and using traditional commercial processes designed for fossil based IBN,
- Determine and validate the targeted technical, economic as well as environmental/social sustainability performances to be achieved for a commercial plant project.

Related Work packages, tasks, milestones and risks are considered in order to achieve these objectives.

OPTISOCEM project is fully aligned with the call topic.

SYLFEED		745591
Title: From forest to feed: enable the wood industry to bridge the protein gap		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-D08	Type of Action: BBI-IA-DEMO
Project start date: 9/1/2017	Duration: 48 months	Unit:
Total costs (€): 15.579.450,58	EU requested grant (€): 10.892.598,89	

Free keywords: *Wood, Lignocellulose, Demonstration Plant, Biorefinery, Pre-treatment, Hydrolysis, Enzyme, 2G Sugars, Single-Cell Protein, Fish Feed, Sustainable, Cross-sectorial Technology, Competitive Value Chain*

Abstract:

For decades, Europe has been facing a huge protein deficit (more than 70% is imported). Today, the objective is to initiate ways to sustainably produce proteins in Europe, by creating new cross-sectorial businesses.

Partners within the consortium have been developing a bio-refinery concept allowing transformation of woody biomass into high-value Single Cell Protein (SCP) to be used as animal feed.

The SYLFEED project consists in upscaling the bio-refinery process to a demonstration plant with a capacity to process up to 5t/day of lignocellulose into SCP for use in aquaculture. SYLFEED will demonstrate the synergies between forestry industry and protein fish feed market, creating new high value opportunities for the former and an alternative, sustainable, protein source for the latter. Wood residues are abundant and highly sustainable and SCP present an amino-acid profile close to that of the fishes, making them an excellent raw material in fish feed formulation (there is room for more than 50 lignocellulose bio-refineries in Europe, leading to the production of at least 1.4 Mt of proteins and a significant reduction of the protein gap).

SYLFEED spans across the full value chain: from biomass stakeholder to fish feed sellers (future buyers of SYLFEED proteins), including biomass-to-SCP technology developer/ experts.

SYLFEED's ambition is threefold:

- To respond to strategic needs of protein production in Europe to increase self-sufficiency.
- To improve the local economy (forest industry), save jobs in important industrial sectors and create new ones in the bio-economy.
- To produce proteins for fish feed in a way that addresses local and global environmental issues (oceans over-exploitation and negative effects of plant's culture – soybean, corn...).

To do so, the grand challenge of the SYLFEED demonstration project is to upscale from pilot scale and validate the bio-refinery process that converts lignocellulose into SCP suitable to formulate fish feed.

AgriChemWhey		744310
Title: An integrated biorefinery for the conversion of dairy side streams to high value bio-based chemicals		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-F01	Type of Action: BBI-IA-FLAG
Project start date: 1/1/2018	Duration: 48 months	Unit:
Total costs (€): 29.949.323,00	EU requested grant (€): 22.007.931,38	

Free keywords: *BioEconomy, Milk, Circular Economy, Industrial Symbiosis*

Abstract:

Whey Permeate (WP) and De-lactosed Whey Permeate (DLP) are major side-streams of dairy processing and represent a key challenge for the dairy industry due to a lack of reliability in current disposal routes and represent a sustainability bottleneck for the expansion of milk production in Europe in the “post-milk-quota era”. AgriChemWhey will build a first-of-a-kind, industrial-scale biorefinery with integrated symbiotic industrial and agricultural value chains that will valorise over 25,000 tonnes (100% dry matter) per annum of excess WP and DLP to several added value products for growing global markets including lactic acid, polylactic acid, minerals for human nutrition and bio-based fertilisers. This will be achieved through a coordinated investment process and development path to realise the Flagship plant, representing the first major industrial venture to convert residues from food processing, as second generation feedstocks, to value added bio-based products. The Flagship will prove the techno-economic viability of the innovative WP/DLP-to-lactic acid biorefinery technology and will establish a new value chain for industrial symbiosis with other local actors for the production of high value sustainable food and feed (including high quality mushrooms) products from other side streams, as an enhanced circular bioeconomy approach to agriculture and agri-food waste. This offers society and industry the opportunity for greater resource efficiency - less food waste, more products from the same starting material (milk), and integration of food and non-food material production. AgriChemWhey will also develop a blueprint of an economic sustainability concept and replication plans for other regions across Europe, thus maximising both short and long term impacts, contributing towards the development of the European bioeconomy to promote rural growth, competitiveness and job creation, and aligning with European sustainability targets.

AFTERLIFE		745737
Title: Advanced Filtration TEchnologies for the Recovery and Later conversion of relevant Fractions from wastEwater		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-R01	Type of Action: BBI-RIA
Project start date: 9/1/2017	Duration: 48 months	Unit:
Total costs (€): 4.180.166,38	EU requested grant (€): 3.890.593,13	

Free keywords: *Membrane filtration, polyhydroxyalkanoates, food industry*

Abstract:

AFTERLIFE proposes a flexible, cost- and resource-efficient process framed in the zero-waste and circular economy approach for the recovery and valorisation of the relevant fractions from wastewater. The first step of such process is an initial step consisting of a cascade of membrane filtration units for the separation of the totally of solids in wastewater. Then, the concentrates recovered in each unit will be treated to obtain high-pure extracts and metabolites or, alternatively, to be converted into value-added biopolymers (polyhydroxyalkanoates). Moreover, the outflow of the process is an ultra-pure water stream that can be directly reused.

The outcomes of the project will be focused on:

- Demonstration of an integrated pilot using real wastewater from three water intensive food processing industries (fruit processing, cheese and sweets manufacturing)
- Demonstration of the applicability of the recovered compounds and the value added bioproducts in manufacturing environments

The design and optimisation of the AFTERLIFE process following a holistic approach will contribute to improve performance and reduce the costs associated to wastewater treatment by maximising the value recovery.

BioBarr		745586
Title: New bio-based food packaging materials with enhanced barrier properties – BioBarrier		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-R05	Type of Action: BBI-RIA
Project start date: 6/1/2017	Duration: 48 months	Unit:
Total costs (€): 3.784.375,00	EU requested grant (€): 3.253.437,50	

Free keywords: *Functional properties, gas barrier, moisture barrier, surface treatments, polyhydroxyalkanoates, biodegradable, compostable, new materials*

Abstract:

BioBarr concerns the development of new bio-based and biodegradable food packaging materials by enhancing barrier functionalities to the biopolymer PHAs (polyhydroxyalkanoates) and by validating the new material in the food industry environment.

PHAs is potential substitute for conventional polymers, since they possess similar properties; respect to polylactic acid (the most widespread biobased/biodegradable material), PHAs show higher biodegradability and better functional properties and mechanical strength.

However, applications of PHAs as food packaging materials are subjected to some limitations. PHA shows medium values of O₂ and H₂O transmittance while many the most critical factors for some foods (such dry products as bakeries) in relation to packaging are moisture uptake leading to loss of crispiness and oxidation of fats.

For overcoming this limiting factor in PHA food applications, BioBarr aims to enhance PHA vapour and gas barrier properties through material functionalization.

In the first research line, the approach consists of the use of biodegradable materials with adequate properties to be compounded in multi-layer structures specific for the food product category to be packed, in order to optimize functional properties. The innovation consists of laminating PHA with PLA (polylactic acid).

The second challenging research line in BioBarr is surface treatments (nanoform metallization with AlO_x or SiO_x or metallization Aluminum process) of PHA films.

New materials will be validated on a restricted number of food products in the sector of bakery, representative of different shelf-life requirements and duration, with the purpose to increase shelf-life at least by 10%.

Final impact will be the creation of a new biobased value chain. Proposal takes into account the needs and the growth opportunities of actors operating in each value chain step: bioplastic producer, extrusion and filming actors, converter, inks producers, food industries end-users

BIOSMART		745762
Title: Bio-based smart packaging for enhanced preservation of food quality.		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-R05	Type of Action: BBI-RIA
Project start date: 5/1/2017	Duration: 48 months	Unit:
Total costs (€): 4.950.560,00	EU requested grant (€): 3.610.866,25	

Free keywords: *Texturing, sol-gel, barrier layers, UV protective, superhydrophobic surfaces, microencapsulated phase change materials, barrier coatings, sensing devices, bio-active antimicrobial, volatile amine s*

Abstract:

The BIOSMART project proposal has the ambition to develop active and smart bio-based and compostable packages addressing the needs of fresh and pretreated food applications. Moreover, the novel packaging system will form the basis for tailoring performance and functionality to specific flexible and rigid food packages in diverse market segments. A holistic ecosystem approach is pursued by offering solutions that bring enhanced performance and acceptable economics to the value chain and facilitate implementation and large-scale commercialization. Critical issues that differentiate the present packages from the future all-bio-based and compostable ones are enhanced active and smart functionalities that make possible: light weighting, reduced food residues, shelf life monitoring and longer shelf life, easier consumer waste handling, and all this at a competitive cost to the incumbent. The BIOSMART project proposal develops thus encompasses an approach for selectively integrating superhydrophobic surfaces, microencapsulated phase change materials, barrier coatings, sensing devices, and new bio-active antimicrobial and antioxidants, into all-bio-based multilayer flexible plastic packages. Three generic packaging systems are selected with specific performance needs as defined by current multi-material (eg. pouches, terrines and cardboard/thin film tray). The associate life cycle assessments for the different possible scenarios include the economic feasibility. Ultimately, this consolidated knowledge is captured in a material selection and packaging performance simulation App. through optimization of all possible variables to meet selected key performance indicators (KPI).

REFUCOAT		745791
Title: Full recyclable food package with enhanced gas barrier properties and new functionalities by the use of high performance coatings		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-R05	Type of Action: BBI-RIA
Project start date: 6/1/2017	Duration: 36 months	Unit:
Total costs (€): 3.234.338,50	EU requested grant (€): 2.300.735,30	

Free keywords: *Bio-based, food packaging, hybrid, barrier and active coatings, mcl-polyhydroxyalkanoates, polyglycolic acid*

Abstract:

RefuCoat project aims to develop hybrid bio-based high oxygen/water barrier and active coatings to be used in a monolayer bio-based food packages (films and trays) as alternative to current metallised and modified atmosphere (MAP) packages to avoid the use of non-renewable materials in multilayer structures that currently lead to complex and expensive recycling steps.

Hybrid coating formulations will combine cost-efficiently produced polyglycolic acid (PGA) and modified silica oxide. Fully biodegradable packages for fresh food products will be obtained with middle chain modified PHAs. PGA and PHA based hybrid coatings with high gas barrier properties will be further improved with active substances for improved shelf-life. Furthermore, new packages based on bio-PET and bio-PE combined with hybrid and active

coatings will be developed. The generated products will be validated and compared to current metallised, non bio-based alternatives in industrial products, in performance, shelf-life and biodegradability. Safety and regulatory compliance, environmental and economic sustainability will be specifically addressed. RefuCoat consortium is formed by 12 synergistic partners, 7 of them BIC members, reunites all actors in the value chain, SME partners (MIPLAST and IRIS), industrial partners (UNILEVER, MANOR, DACSA and

BIOPOLIS), and RTO Partners (THUNEN, CIB, AIMPLAS, EUFIC, Fraunhofer and AINIA). The project maximizes exploitation within the Consortium, promoting a circular economy concept, but also considers dissemination and communication in order to maximize the value of the project outcomes. maximizes exploitation within the consortium, promoting a circular economy concept, but also considers dissemination and communication in order to maximize the value of the project outcomes. Refucoat main impacts are expected in the improved performance of food packages, reduction of landfilling waste, cost-and environmental effectiveness in processing by Life Cycle and Techno-Economic Assessment, improved preservation of food products, new markets and contribution to KPI of BBI-JI. RefuCoat aims at a significant contribution in more than 880 jobs.

BARBARA		745578
Title: Biopolymers with advanced functionalities for building and automotive parts processed through additive manufacturing		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-R07	Type of Action: BBI-RIA
Project start date: 5/1/2017	Duration: 36 months	Unit:
Total costs (€): 2.711.375,00	EU requested grant (€): 2.603.861,25	

Free keywords: *Additive Manufacturing, Fused Filament Fabrication, agrowaste revalorization, polyssacharides, natural dyes, functional additives, automotive, building, hybrid manufacturing, RTM mould*

Abstract:

The project aims at the valorisation of side-stream fractions and residues from agro-food production into novel polysaccharides and functional additives. These raw materials have been selected based on the advanced functionalities that provides to the polymeric matrixes. The extracted polysaccharides will be compatibilised with polyesters and polyamides and reinforced with extracted, modified and functionalised additives to obtain engineering bioplastic formulations adapted to current Fused Filament Fabrication (FFF) processes. The target of BARBARA project is the development of novel bio-based engineering bioplastic materials to validate in functional prototypes with advanced properties for building and automotive sectors.

The main functionalities developed under the BARBARA approach will permit the improvement of mechanical, thermal, aesthetical and well-being properties of novel biobased engineering polymers. Selected demonstrators of direct final parts for the automotive sector and moulds and tools for hybrid manufacturing for advanced building applications. Innovations in FFF will be validated during the project in order to enhance the performance of BARBARA biobased materials through this technology and fulfil the high-requirements of the industrial sectors.

BARBARA project will directly contribute to achieve SIRA's objective in KPI 5 (4 new advanced biobased materials) and KPI 6 (3 validated consumer products through 2 novel value chains for FFF).

The BARBARA consortium involves 11 partners (5 RTD, 3 SME and 3 Large Companies) accounting to 1 BIC full member, 1 in process of engaged and 3 associated, in 36-months project with a budget of 2,770,750€.

ECOXY		744311
Title: Bio-based recyclable, reshapable and repairable (3R) fibre-reinforced EpOXY composites for automotive and construction sectors.		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-R07	Type of Action: BBI-RIA
Project start date: 6/1/2017	Duration: 42 months	Unit:
Total costs (€): 4.850.960,00	EU requested grant (€): 4.850.960,00	

Free keywords: *Bio-based resins; Bio-based fibres; Reprocessability; Repairability; Recyclability; Fiber-reinforced composites; Biorefinery; Flame-retardancy; Self-healing; LCA; Automotive; Construction.*

Abstract:

Fibre reinforced thermoset composites (FRTCs) are attractive materials for high demanding sectors, such as automotive or construction, due to their lightweight and excellent mechanical properties. However, the lack of reprocessability and difficulty for repairing and recycling significantly increases the overall material cost and causes grave environmental concerns. Additionally, the vast majority of polymer matrices and fibres used in their manufacturing are non-renewable fossil-derived materials or require high amounts of energy for their production.

Aiming at addressing those limitations by involving the European bio-based industry, ECOXY will develop innovative bio-based epoxy resins and fibre reinforcements to produce new sustainable and techno-economically competitive FRTCs by targeting advanced functionalities: reparability, reprocessability and recyclability (3R). The 3R functionalities will be achieved by using new resin formulations replacing commonly used curing agents by dynamic hardeners, which under certain operational makes possible to: 1) repair fibre/matrix delamination and matrix micro-cracks, 2) reprocess cured laminates could be reprocessed to create new 3D parts (impossible with traditional FRTCs), 3) mechanical and chemical recycling.

Thus, ECOXY will develop: 1) tailor-made bio-based epoxy monomers (including biorefinery products), 2) upgraded and functional bio-based fibres (natural and PLA), 3) specific formulations for FRTCs manufacturing processes (RTM, wet compression moulding and pultrusion) and 4) additional functionalities such as flame-retardancy for 3R resin and self healing for fibres.

The selected prototypes will be validated for automotive and construction sectors using relevant standards and applicable certifications. Besides, an environmental (LCA) and socio-economic assessment of the results will be carried out.

The well balanced composition of the consortium, 6 SME, 6 RTO and 1 academia gives ECOXY the maximum chance of succ

POLYBIOSKIN		745839
Title: High performance functional bio-based polymers for skin-contact products in biomedical, cosmetic and sanitary industry		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-R07	Type of Action: BBI-RIA
Project start date: 6/1/2017	Duration: 36 months	Unit:
Total costs (€): 4.058.359,38	EU requested grant (€): 3.438.047,50	

Free keywords: *biopolymers, biopolyesters, biopolysaccharides, bio-based, skin, diapers, wound dressing, anti-microbial, functionalities, anti-oxidant, personal care, sanitary, cosmetics, biomedical*

Abstract:

Personal care, Cosmetic and biomedical industries deal with high-value and/or large volume consumption of polymer-based products which are often derived from fossil sources. Although a number of alternative bio-based polymers is the subject of recent research, more effort is still needed to increase their specific functionalities and performances in order to proceed with their true translation into market. PolyBioSkin aims at developing skin-contact biopolymer-based product parts with increased performance and functionality, such as parts of diapers, cosmetic pads and wound dressings. Indeed, PolyBioSkin will focus on two main classes of bio-based polymers relevant for next generation bio-based industry: biopolyesters (polylactic acid and polyhydroxyalkanoates) because fully renewable, biocompatible and biodegradable and available at an industrial scale, and natural polysaccharides (cellulose/starch and chitin/chitosan), derived from biomass and food waste, for their peculiar properties, such as absorbency and anti-infectivity.

Films and textiles will be produced starting from these polymers and their combinations to prove that key products and/or product parts in sanitary, cosmetic and biomedical industry can be effectively translated from a fossil-derived to bio-based polymer production. PolyBioSkin will provide to skin-contact products a much more environmentally friendly end of life than the current accumulation in landfills or incineration, thanks to their biodegradability allowing the organic recycling.

PERCAL		745828
Title: Chemical building blocks from versatile MSW biorefinery		
Call Id: H2020-BBI-JTI-2016	Topic: BBI-2016-R08	Type of Action: BBI-RIA
Project start date: 7/1/2017	Duration: 36 months	Unit:
Total costs (€): 3.394.181,26	EU requested grant (€): 2.518.517,64	

Free keywords: *Bioethanol, Municipal Solid Waste, Succinic acid, Lactic acid, surfactants, adhesives, solvents, polyester polyols, fermentation, membrane electrolysis, enzymatic hydrolysis*

Abstract:

PERCAL will exploit Municipal Solid Waste (MSW) as feedstock to develop intermediate chemical products at high yield and low impurity level with huge industrial interest. These will be complementary to the bioethanol (current PERSEO technology), to achieve a cascade valorisation of the MSW components, i.e.:

- Lactic acid (LA) to produce: 1) Eco-friendly ethyl lactate solvents by reactive distillation from lactic acid & bio-ethanol to be used in cleaning products and inks and 2) hot-melt adhesives for cardboard and other non-food applications in combination with maleic anhydride by reactive extrusion.
- Succinic acid (SA) as an intermediate building blocks to production of polyols for the polyurethane industry.
- Biosurfactants by chemical and/or microbiological modification of protein and lipid fraction from remaining fraction of MSW fermentation.

In order to minimize the MSW heterogeneous composition (due to seasonal and origin variability driven by local economic, social and climate conditions) limitations as a fermentation feedstock, four main innovations will be proposed: i) New enzymatic cocktails to maximize hydrolysis of fermentable organic matter with low inhibitors production, ii) the use of high yield, specific and robust strains for each selected acid, iii) the extraction of fermentation by-products acting as inhibitors to succinic acid production via novel membrane electrolysis employing an integrated continuous fermentation coupled with simultaneous organic acid removal in comparison with SA sequential fermentation followed by its separation using an electrodialysis-based and iv) optimize simultaneous saccharification and fermentation for lactic acid production followed by a downstream separation process based on membrane electrodialysis. To maximize the yield and purity of target organic acids, continuous and single step fermentation process will be prioritized in order to allow their integration in the PERSEO plant.

SUSFERT		792021
Title: Sustainable multifunctional fertilizer – combining bio-coatings, probiotics and struvite for phosphorus and iron supply		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.D4	Type of Action: BBI-IA-DEMO
Project start date: 5/1/2018	Duration: 60 months	Unit:
Total costs (€): 9.364.590,27	EU requested grant (€): 6.554.978,57	

Free keywords: *Probiotics, iron fertilizer, phosphorus fertilizer, struvite, lignin coatings, sustainable*

Abstract:

SUSFERT addresses the massive usage of mineral fertilisers in EU agriculture, which are largely based on non-renewable resources, but are required in intensive crop production for meeting demands for food and feed. SUSFERT will develop multifunctional fertilisers for phosphorus (P) and iron (Fe) supply, which will fit into existing production processes and common EU agricultural practice.

The SUSFERT innovation combines bio-based and biodegradable coatings, probiotics, and the renewable P-source struvite in at least four novel sustainable P and Fe fertiliser products, which may partly or fully replace unsustainable and resource-intense conventional ones. SUSFERT will test novel organic formulations, microgranules, granules, and liquid fertilizer products in field trials, evaluate them regarding economic potential and environmental sustainability, ensure regulatory compliance and establish industry-scale production processes (TRL 7-8). Technological concepts include 1) probiotics based on P and Fe solubilizing Bacilli and Actinobacteria; 2) microbial siderophore (Fe chelator) produced in a demonstration plant; 3) enzymatic modification of the by-product lignin for cost effective, biodegradable controlled release coatings and product stabilization and 4) demonstration of struvite, a renewable P-source from wastewater, as a partial substitute of mineral P. Five industrial, three SME and three academic partners will contribute expertise along the whole value chain in biotechnology, microbiology, large-scale fermentation, fertilizer production and sales. We will fit the SUSFERT products into the regulatory and policy context for conventional and organic agriculture in various pedo-climatic conditions in Europe and prepare rapid market entry post-project.

EFFECTIVE		792195
Title: Advanced Eco-designed Fibres and Films for large consumer products from biobased polyamides and polyesters in a circular EConomy perspective		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.D5	Type of Action: BBI-IA-DEMO
Project start date: 6/1/2018	Duration: 48 months	Unit:
Total costs (€): 11.869.647,57	EU requested grant (€): 7.171.906,64	

Free keywords: *Biobased caprolactam, azelaic acid, long chain dicarboxylic acids, polyamides, polyesters, eco-design, large consumer products, regeneration, recycling, composting, biobased economy, circular economy*

Abstract:

The EFFECTIVE project intends to demonstrate first of its kind and economically viable routes for the production of biobased polyamides and polyesters from sustainable renewable feedstock for the obtaining of fibres and films with enhanced properties, market competitiveness and increased sustainability. Such materials will be applied into eco-designed large consumer products targeting different markets, i.e. construction, automotive, primary and secondary packaging and textile and with the potential of being applied into many other markets (fishing, engineering plastics, agriculture, hygiene and personal care).

Following a circular economy approach, the sustainability of the value chains will be further enhanced by the demonstration of an improved end-of-life of the developed eco-designed biobased solutions through the application of monomer regeneration, recycling (for polyamides based fibres and films) and composting/anaerobic digestion (for polyesters based films) processes. The idea that “the end is a new beginning” will indeed drive the products design and realization.

The project covers the whole value chain: feedstock production, conversion into innovative biobased building blocks through biotechnological and chemical processes, formulation of innovative biobased polymers (polyesters and polyamides), final products development, end-of-life products management and processing.

The project intends to represent a key milestone towards the future industrialization of biobased fibres and films production in Europe foreseeing the mobilization of relevant investments by involved industry partners and fostering the adoption of multi-stakeholders collaboration models to demonstrate effective ways to develop new cases of biobased economy interconnected with circular regenerative economy joining environmental sustainability and economic profitability.

ReInvent		792049
Title: Novel Products for Construction and Automotive Industries Based on Bio Materials and Natural Fibres		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.D5	Type of Action: BBI-IA-DEMO
Project start date: 6/1/2018	Duration: 48 months	Unit:
Total costs (€): 9.592.782,49	EU requested grant (€): 6.525.275,00	

Free keywords: *bio-materials; natural fibres; foams*

Abstract:

In view of moving towards a post-petroleum society, the communication of the European Commission on 13 February 2012 entitled "Innovating for Sustainable Growth: A Bioeconomy for Europe", and in particular its Action Plan, aims to integrate better biomass producing and processing sectors in order to reconcile food security, natural resource scarcity and environmental objectives with the use of biomass for industrial and energy purposes. Among others, construction and automotive industries have high potential for effective implementation of the strategy of European Bioeconomy in terms of more efficient use of biomass and industrial by products for development of bio-based value added products.

Reinvent project will answer these needs by developing and combining bio based materials and fibres for replacing the petroleum based polyurethane (PUR) insulation products used in buildings and soft foams for vehicles interior products. Polyols, natural cellulose fibres and nanocrystals, and biomass derived nanoparticles (NPs) will be derived by advanced technologies from sustainable wood-based and agro-based sources to develop and validate:

- i) Novel bio based rigid moulded and spraying insulation foam systems for the construction industry, e.g. composite bridge decks, spraying building insulations and insulating sandwich structures, and
- ii) Novel bio based soft and semi-rigid foams for the automotive industry, e.g. sub-layers for car ceilings, dashboards and seat covers.

These customer products will be validated for their enhanced properties, sustainability and low cost, and compared to currently available petroleum- and bio-based counterparts used in the construction and automotive industries, respectively. To enhance the sustainability of these products and materials, new energy and cost-efficient recycling technologies for the bio-based products will be developed.

UNRAVEL		792004
Title: UNique Refinery Approach to Valorise European Lignocellulosics		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.R2	Type of Action: BBI-RIA
Project start date: 6/1/2018	Duration: 48 months	Unit:
Total costs (€): 3.995.800,75	EU requested grant (€): 3.603.545,00	

Free keywords: *pre-treatment, fractionation, lignocellulosic, lignin, polyurethane, bitumen, enzymatic hydrolysis, scale up, pilot plant*

Abstract:

UNRAVEL aims to develop advanced pre-treatment, separation and conversion technologies for complex lignocellulosic biomass to produce usable lignin fragments, and monomeric sugars from the cellulose and hemicellulose fraction suitable for biochemical conversions. The technologies will be scaled up from lab (TRL 3) to pilot plant (TRL 5). UNRAVEL will achieve a breakthrough in the valorisation of lignocellulosic biomass by:

- Utilizing complex lignocellulosic biomass sources such as forest residues, bark, straw, and nut shells
- Recovering valuable components by feedstock pre-extraction prior to fractionation
- Achieving at least 80% lignin yield, 90% glucan recovery from the cellulose and 80% yield of monomeric hemicellulose sugars by utilizing the ECN FABIOLATM low temperature, energy-efficient acetone based fractionation process
- Purifying the hemicellulose hydrolysate and qualifying it for fermentation into chemical building blocks
- Developing lignin depolymerisation technologies
- Establishing high-value lignin applications through the production of lignin-based PUR & PIR foams and lignin-based additives in bitumen for roofing applications
- Demonstrating a 30% OPEX and 15 % carbon footprint reduction of the pre-treatment

UNRAVEL will develop an integrated cross-sector value chain by bringing together specialists with expertise on feedstock composition, chemical pulping and pre-treatment, enzymes production, polymer chemistry, separation and reactor engineering, techno-economic and sustainability assessments and knowledge dissemination and exploitation and communication. The active involvement of three SME's and two large enterprises, active in wood pulping and the production of lignin-based building materials, strengthens a market-driven approach and commercial exploitation and implementation of the results generated in the UNRAVEL project.

AQUABIOPROFIT		790956
Title: AQUAculture and Agriculture BIOMass side stream PROteins and bioactives for Feed, FITness and health promoting nutritional supplements		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.R4	Type of Action: BBI-RIA
Project start date: 4/1/2018	Duration: 48 months	Unit:
Total costs (€): 4.163.240,00	EU requested grant (€): 3.349.527,00	

Free keywords: *aquaculture, fisheries, agriculture, nutrition, side streams, residues, valuable ingredients*

Abstract:

The AQUABIOPRO-FIT main objective is to promote efficient utilisation of European aquaculture, fisheries and agriculture side streams in feeds and nutritional supplement products promoting fitness and health. To this end, we will develop side stream biomass processing technologies to up-concentrate nutrients and bioactives maintaining product quality and minimising waste. The safety, bioactivity and acceptance of the developed ingredients and products will be documented through cell, animal, taste panel and intervention studies with humans, namely athletes and patient groups. Technical, marketing, economic and environmental studies will complement the documentation portfolio of the AQUABIOPRO-FIT concepts and products. The developed knowledge and principles will be further systematised in net-based training modules, which will follow the intellectual property rights of the developed methods and products. Information material will be created for educating the public and raise awareness of the importance of circular economy and promote acceptance for side stream bio-based products in end markets.

EXCornsEED		792054
Title: Separation, fractionation and isolation of biologically active natural substances from corn oil and other side streams		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.R4	Type of Action: BBI-RIA
Project start date: 6/1/2018	Duration: 42 months	Unit:
Total costs (€): 7.215.843,75	EU requested grant (€): 4.259.297,00	

Free keywords: *valorization; corn oil; thin stillage; rapeseed meal; proteins; bioactives; characterization; upscale; cosmetics; food; specialty chemicals; market validation*

Abstract:

The EXCornsEED project aims to exploit the convergence between science, chemistry, biology, engineering and biotechnology tools for the creation of new knowledge and innovative applications, with the main goal to develop and validate an integrated process of innovative and highly sustainable extraction/purification/concentration technologies to be applied to bio-refineries side streams (i.e. corn oil, thin stillage from bio-ethanol and rapeseed meal from biodiesel production) for the recovery of proteins and several other bio-active compounds (i.e. polyphenols, amino acids, fibers, lipid compounds, alkaloids and tannins, etc.) and characterization/preparation of these as ingredients for food, specialty chemicals, and cosmetics markets. A three-step approach will upscale the EXCornsEED process from lab level (few grams, TRL3) up to industrial pilot in ENV premises (1t/d capacity, TRL5).

The project stems from a sound industrial vision set by ENV and other industrial partners to transform traditional bioethanol production in future biorefinery concept, fully in line with EU strategies for a bio-based economy. The concurrent presence of biotech producer ENV (project initiator) technology experts SAP, CEL and ICE, and product companies SIAL, NUT, BZN and DRL will guarantee the commitment towards a real market-driven project. A synergistic approach will be used with the collaboration of other partners CREA, CTA, INNEN, HC and TEC, in order to define a self-sustainable system and have an outcome that is in accordance with the principles of the circular economy.

iFermenter		790507
Title: iFERMENTER - CONVERSION OF FORESTRY SUGAR RESIDUAL STREAMS TO ANTIMICROBIAL PROTEINS BY INTELLIGENT FERMENTATION		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.R4	Type of Action: BBI-RIA
Project start date: 5/1/2018	Duration: 48 months	Unit:
Total costs (€): 5.360.381,25	EU requested grant (€): 3.997.825,00	

Free keywords: *Synthetic biology; biorefinery residual stream; sugar conversion; sugar recovery; antimicrobial proteins*

Abstract:

Plant dry matter, so-called lignocellulosic biomass, is the largest renewable biomass feedstock on Earth. Europe has over 14 mill tons of sugar residuals from biorefineries, which could be converted to profitable products and contribute to a sustainable bioeconomy. Unfortunately, existing biorefineries struggle with technical issues and low profitability due to the lack of adequate fermentation processes. Therefore, these sugars are either incinerated to generate energy or at best converted to ethanol (€0.6 /kg) but not to higher value chemicals.

Current concepts that aim to establish fermentation processes to convert residual sugar streams to high value products face challenges including inefficient sugar utilization by microorganisms and inhibitors in the residual streams, leading to low productivity and yields.

Our project aims to recover high value compounds from sugar residuals, and to turn fermentation processes converting these residual to antimicrobials cost effective. We will recover the high value sugar galactose (€40-200 /kg) from residual streams as part of their treatment process. By genome editing technique, we will design cell factories that consume the remaining residuals and produce nisin (€50-150 /kg), an industrially important commercial food/feed preservative. Additionally, we will develop an affordable, online feedback add-on system that will allow to intelligently change residual mixture during fermentation of these cell factories to optimize production online during the process. In a 150 L industrial bioreactor, we will demonstrate that our add-on invention iFermenter

- increases the yields of nisin by over 2 fold
- increases the nisin production by over 50% compared to what is possible today,
- and reduce at least 20% in CO2 footprint with this process compared to existing solutions.

Thus, iFermenter will render production of high value products with residual sugar stream highly efficient and cost-effective contributing to circular economy.

Pro-Enrich		792050
Title: Development of novel functional proteins and bioactive ingredients from rapeseed, olive, tomato and citrus fruit side streams for applications in food, cosmetics, pet food and adhesives		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.R4	Type of Action: BBI-RIA
Project start date: 5/1/2018	Duration: 36 months	Unit:
Total costs (€): 3.956.640,86	EU requested grant (€): 3.312.890,86	

Free keywords: *Proteins, bioactives, food ingredients, polyphenols, carbohydrates, fractionation, downstream purification, antioxidants, pilot scale, biorefinery system, prebiotics, side-streams, adhesives*

Abstract:

Pro-Enrich will develop a flexible biorefinery approach capable of processing a range of agricultural residues (rapeseed meal, olives, tomatoes and citrus fruits) in response to the increasing global demand for alternative sources of protein and phenolic product streams, tailored to the cross sectoral requirements of industry.

Pro-Enrich will optimise existing biomass fractionation technologies and validate novel extraction approaches beyond the current state of the art (from TRL2 through to TRL 4/5) to isolate and purify proteins, polyphenols, dietary fibres and pigments. The products being targeted are food ingredients, pet food, cosmetics and adhesives. These will be developed through an iterative process of feedstock mapping, laboratory process development, functionality/performance testing of samples by industry and pilot upscaling.

Pro-Enrich gathers the expertise of 16 partners from 7 countries, covering the entire biorefinery value chain and consisting of 8 SMEs, 5 large enterprises, 2 RTOs and 1 university.

The project facilitates supply chain building across different sectors, including biomass production and logistics; materials handling and processing, through to end-users. The project will engage and collaborate with key industry stakeholders from farming and biomass supply, processors and brand name owners.

Pro-Enrich produces detailed life-cycle, socio-economic and safety assessments to facilitate policy and decision-making by industry and the EU, inform and guide consumer acceptance and assist with regulatory compliance.

The outcome of Pro-Enrich will have a huge economical impact on the involved partners especially the industries and generate a large number of new job positions. However, the impact goes beyond the consortium by contributing to the BBI's strategy for zero-waste processing in the biobased products sector, by addressing technical, commercial and environmental impact across the whole supply chain.

Prolific		790157
Title: Integrated cascades of PROcesses for the extraction and valorisation of proteins and bioactive molecules from Legumes, Fungi and Coffee agro-industrial side streams		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.R4	Type of Action: BBI-RIA
Project start date: 9/1/2018	Duration: 48 months	Unit:
Total costs (€): 5.342.470,45	EU requested grant (€): 4.672.382,75	

Free keywords: *Legumes, fungi, coffee, prototypes, extraction, enzymatic hydrolysis, bio-active, ingredients*

Abstract:

Agro-industrial residual biomass, side streams and food production by-products like legumes, fungi and coffee are potential sources of valuable ingredients even though the routes for their exploitation are still at an early stage.

Pursuing the ambition of achieving prolific valorization of untapped biomass streams, the project R%D&I activities and partners of Prolific have been positioned around a central innovation cycle that is mainly driven by industrial end-users who exactly know the needs of their customers and the technical constraints and industrial environment in their respective sector.

The PROLIFIC project will apply a range of processing technologies to recover significant amounts of proteins/peptides and other value added compounds (e.g. carotenoids, phenols, caffeine and fibers) from industrial processing residues of legumes (seeds of peas, beans and chickpea), fungi (cuttings and mycelia of different species) and coffee (silver skin residue and not compliant roasted seeds). The economically and environmentally sustainable extraction, enzymatic modification, and conditioning techniques will be upscaled in industrially relevant environment. This will enable the production of consequent amounts of compounds and fractions necessary for the production of 16 product prototypes for the food, feed, packaging and cosmetic sectors.

The Prolific project will assess the environmental, societal, ethical, safety, and regulatory issues at each step of the targeted value chains. SME and large companies strive at achieving competitive biomass exploitation and attracting when needed additional investors. The industrial partners business strategies for the future market penetration starts with the clear identification of the customer needs and goes up to the preparation of give-aways of food and cosmetics prototyped products as a reward for filling in questionnaires about the Prolific products along with intensive dissemination and communication.

SusBind		792063
Title: Development and pilot production of SUsustainable bio BINDers systems for wood based panels		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.R5	Type of Action: BBI-RIA
Project start date: 5/1/2018	Duration: 48 months	Unit:
Total costs (€): 5.480.220,00	EU requested grant (€): 4.414.418,75	

Free keywords: *Bio precursor, Bio based resins and binders, wood based panel boards, furniture*

Abstract:

The overall objective of the SusBind project is to produce and test, in an industrially relevant environment (TRL5), bio-based binders as alternative to formaldehyde based binder currently used in the production of wood-based panel board (abbreviated as wood board). A lot has been done on this subject, but so far a bio-based binder able to compete at industrial scale with incumbent chemicals, does not exist. The reason to believe on the success of this project is backed: on the selection of the partners, which involves actors across the whole supply chain, and their extensive technological background developed during the last years.

The SusBind project intends to build on these success factors by:

- i. Selecting more adequate feedstocks from existing European Bio-refineries;
- ii. Applying new and greener conversion technologies for the production of binders and intermediates, including novel epoxidizing enzymes (peroxygenases) developed in the project IndOx (FP7-KBBE; www.indoxproject.eu);
- iii. Producing and validating these new bio-based binders with leading wood board manufacturers for two product types: P2 Particle Board (PB) and Medium Density Fibreboard (MDF) and;
- iv. Involving the world leading brand owner, producer and retailer of mass market furniture.

The SusBind resulting binder system will prove better performance in PB and MDF in terms of 50 - 75% reduction of formaldehyde emissions than current fossil- and formaldehyde-based wood boards. The active participation of industry and a consumer brand owner secures post-project scale up into existing plants. On the basis of cost analyses performed, an economically viable and better performing precursor will increase the marketability of bio-based furniture products concerned. The results of SusBind will not only benefit consumer health and help mitigate climate change, but also strengthen the European furniture industry by providing a cost efficient, bio-based alternative to formaldehyde-based binders.

NEWPACK		792261
Title: Development of new Competitive and Sustainable Bio-Based Plastics		
Call Id: H2020-BBI-JTI-2017	Topic: BBI.2017.R6	Type of Action: BBI-RIA
Project start date: 6/1/2018	Duration: 36 months	Unit:
Total costs (€): 5.324.525,00	EU requested grant (€): 4.274.587,00	

Free keywords: *Circular economy, sustainable design, environment, resources, sustainability, technological innovation, bioplastic*

Abstract:

The objective of NEWPACK is to validate in industrial setting the production of at least two new bioplastics based on PHB- PLA blends with improved sustainability performance, obtained by the addition of natural extracts with antioxidant/antibacterial properties and nanoadditives from cellulose and chitin. A new circular economy value chain will be generated from agro-food wastes that will be exploited for the production of PHB, while designing and validating the process up to pilot scale. Blending of PLA and PHB will be validated at pilot scale to achieve specific final product requirements based on targeted products. New bioplastic properties and functionalities will be achieved through incorporation of nanocellulose or nanochitin additives (to improve typical problems of processability and mechanical properties of PLA-PHB), antioxidant and antimicrobial additives. The ability to extend the functionalities will be validated in real industrial environments. NEWPACK activities are underpinned by the prior experience and results (already validated at TRL 3-4) of the partners in order to achieve advanced TRLs (5-6) for the developed technologies, including PHB production from potato peels/sweet corn residues; co-blending of PHB with PLA; nanocellulose extraction from wheat straw and incorporation into PHB-PLA blends and encapsulation of natural antioxidants/antimicrobials for addition to PHB-PLA. Great emphasis will be on assessing technical and economic feasibility of the processes; demonstrating the biodegradability of solutions; ensuring the compliance to the market and regulatory requirements; LCA evaluation; preparing for future scale-up of the processes to achieve a pre-industrial production and identification of stakeholders perceptions, attitudes and expectations towards bioplastics. The NEWPACK consortium has 13 partners with academic research organizations and small and large industries which cover the whole innovation, production and final use value chain.

