

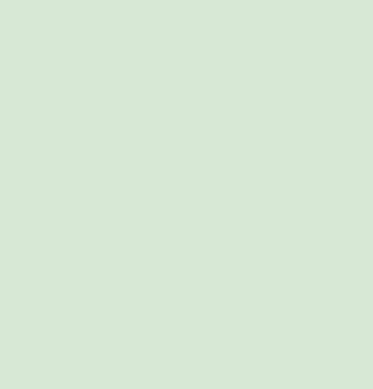


**eco-innovation** |   
WHEN BUSINESS MEETS THE ENVIRONMENT

# BOOSTING GREEN BUSINESS







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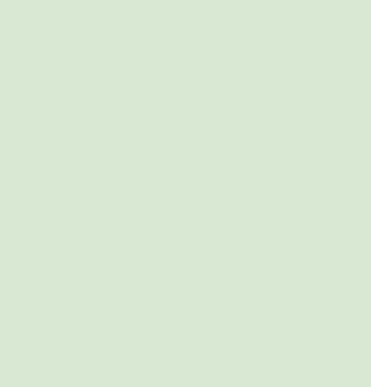
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*“A helping hand to innovative and environmentally friendly products, services and processes.”*

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*“The best Eco-innovation projects are those that can be replicated and multiplied across the EU.”*

## INTRODUCTION

### WHERE EU BUSINESS EMBRACES THE ENVIRONMENT

*In our consumer-driven world, the potentially harmful impact of products and services on the environment has too often been ignored. But that is changing, thanks to a new generation of consumers and businesses determined to marry society’s everyday needs with a cleaner and greener environment.*

*One solution is to introduce innovative products, services and processes that protect the environment – a process known as eco-innovation. The goal is to reduce environmental impacts and make better use of resources.*

*Spearheading the EU’s effort to bridge the gap between research and the market is the Eco-innovation initiative. This is designed to help the EU meet its environmental objectives and boost economic growth, and is managed by the Executive Agency for Competitiveness and Innovation (EACI) in close cooperation with the European Commission’s Environment Directorate-General.*

*The initiative is part of the EU’s Competitiveness and Innovation Framework Programme (CIP). It also contributes to implementation of the Environmental Technologies Action Plan (ETAP), aimed at boosting environmental technologies while strengthening economic growth and competitiveness.*

### FROM PROTOTYPES TO PRODUCTION

*The Eco-innovation initiative is not about research: all ideas must be developed, practical and offer long-term viability to qualify for funding. Nor are projects simply about protecting the environment. What the initiative does is lend a helping hand to innovative and environmentally friendly products, services and processes – moving them along the road to fully fledged commercial prospects, ready for uptake by business and industry.*

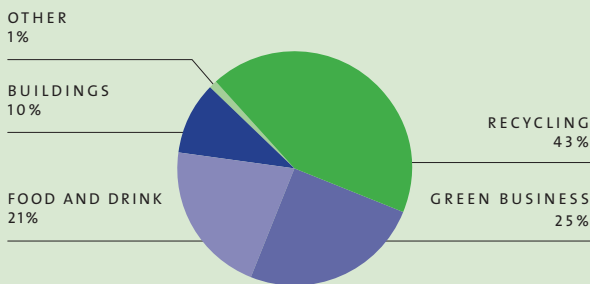
*Exploitation and market replication are key concepts. The EU wants to maximise this initiative’s impact and to get the best possible return on investment for each euro invested in it. The best Eco-innovation projects are those that can be replicated and multiplied across the EU.*





As a cross-cutting initiative, Eco-innovation provides funding for projects in various sectors that mitigate environmental impacts or promote a more efficient use of resources. The latest priority areas include materials recycling, buildings, the food and drink sector, and greener business.

### PROJECTS SELECTED FOR FUNDING IN 2008 AND 2009 BY AREA



Projects selected must be environmentally beneficial, innovative and economically viable in the medium to long-term. Eco-innovation funding is only there to help ideas get off the ground: every project must be able to continue without EU funding.

A multitude of different projects have been supported to date. Successful examples include recyclable-paper milk bottles, eco-friendly materials for shoes, sound environmental advice for small businesses, and organic bio sludge that can be converted into solid construction materials.

### ECO-INNOVATION: SMALL BUSINESSES GEARING UP FOR GROWTH

Environmental products and services have the world at their feet. By one estimate (OECD), they represent around 2.5% of the EU's GDP. Small and innovative businesses across the Community, bursting with great green ideas to share with others, are expected to benefit most from this significant and expanding market.

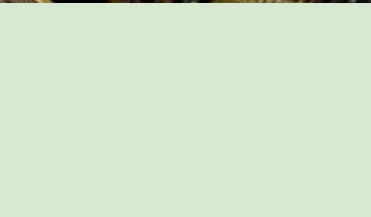
European eco-industries support some 3.4 million jobs, underlining their readiness to step up to tomorrow's environmental challenges. For all these industries, the Eco-innovation initiative is a prime opportunity to reach an EU-wide market with their latest environmentally friendly ideas and solutions.

### EU ECO-INNOVATION GOALS

- ▶ Market uptake and leverage
- ▶ SME focus
- ▶ Substantial environmental benefits
- ▶ European added value

Some €200 million are available for Eco-innovation projects from 2008-13, attracting participants from companies and other organisations. Priority is given to SMEs. Currently they make up 70% of project participants. For all Eco-innovation participants, the goal is clear: boosting Europe's economic growth whilst protecting the environment.





# RECYCLING

## WASTE NOT, WANT NOT

*Recycling barely existed in Europe three decades ago. But today this expanding and innovative sector has a turnover of €24 billion and accounts for half of the world's waste and recycling industries. Its 60 000-plus companies – three-quarters of which are small businesses – have also created jobs for half a million people.*

*Waste management in the EU has improved dramatically, thanks to stricter legislation and enforcement, greater commercialisation of waste streams, and the emergence of new technology to deal with waste and improve its recovery and recycling. But there is no shortage of work for Europe's recycling sector, which faces an uphill struggle to keep pace with the mountains of new waste being generated across the continent.*

*Almost three billion tonnes of waste were generated in the EU-27 in 2006, mainly from mining and quarrying, manufacturing, the construction sector, municipal solid waste, and hazardous waste. That is the equivalent of a staggering six tonnes for every single person in the Community, or 524 kg per capita for municipal waste. While average figures like these vary widely at the Member State level, waste generation across the EU is still increasing and is expected to go on doing so over the next decade.*

*The movement away from landfilling, wherever possible, began when the EU adopted its Waste Framework Directive in 1975. But although recycling and incineration have increased across the EU, some 40% of its municipal waste is still sent to landfills, while only 23% is recycled, 20% incinerated and 17% composted.*

*Thanks to the revised Waste Framework Directive, the EU now has a general waste recycling target, several specific waste targets, and the five-step waste hierarchy (prevention, reuse, recycling, energy recovery and disposal) is part of EU law. However, turning Europe into a 'recycling society' will take more effort. That is the goal of Eco-innovation recycling sector projects, such as a Sweden-based initiative to turn old car tyres into reusable 'eco-rubber', and a trial in Spain aimed at converting animal carcasses into biogas and fertiliser.*





►  
**SORTING AND SAVING  
 ELECTRICAL EQUIPMENT**



**E-AIMS – AUTOMATIC AND INDIVIDUALISED SORTING  
 AND MANAGEMENT PROCESSES OF E-WASTES**

**SUMMARY**

Electrical and electronic equipment is made up of many different materials including glass, metals and plastics, along with dangerous substances such as acids and heavy metals.

Europe generates about 12 million tonnes of waste electronic and electrical equipment (WEEE) every year. Unfortunately it is very difficult to separate waste materials, which means much end-of-life equipment is either dumped or incinerated.

The E-AIMS project intends to provide WEEE managers with an innovative sorting and recovery process. It will run a demonstration at a pilot plant to deal with waste from all categories of WEEE.

**RESULTS**

In addition to devising automation systems to sort waste, the project will be supported by software applications and radio Frequency Identification systems (RFID).

The project aims to increase the rates of material recycling by 35-40% and decrease the amount of waste sent to landfill by 25-30%.



► **DURATION**

36 MONTHS

► **COORDINATOR**

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# 2

## ► USING WASTE FOR NEW CERAMICS

### FRIT-REC – INTEGRATED TECHNOLOGY FOR THE REUSE OF WASTE LIME FROM THE PRODUCTION OF CERAMIC COMPOUNDS

#### SUMMARY

The reuse of waste lime (MFL) from the production of ceramic compounds (frit) and glazes has been hampered as the lime produced does not have a homogeneous composition. Traditional technologies have focussed on end-of-pipe cleaning of gases and fulfilling environmental legislation.

The project aims at developing a new technology and improved production process which will enhance the stability and quality of MFL. This will make it possible to use the lime as a substitute for raw material in frit and enamel production.

#### RESULTS

Development of the technology will benefit the frit and enamel industry along with the producers of ceramics, glass, small domestic appliances and electronics.

By the end of the project the amount of hazardous waste produced will be cut by 90% and CO<sub>2</sub> by 43%. The cost of the final product will be reduced by approximately 4%.

#### ► DURATION

36 MONTHS

#### ► COORDINATOR

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# A NEW LIFE FOR TYRE RUBBER

# 3

## BIG TYRE RECYCLING – TYRES REGENERATING INTO RECLAIM RUBBER AND STEEL WIRE/FIBRES

### SUMMARY

Currently there is no way to recycle big tyres (with a diameter greater than 1.4 metres) and at the end of their lives they are either burned or dumped.

This project aims to develop a recycling process that harnesses ultra-high pressure water jetting to reclaim the tyre rubber and steel fibres.

The recycling process covers three main activities: cleaning, measuring and scanning the tyres; cutting and jetting; drying and sieving the resultant powder.

### RESULTS

The project will build and run the first full-scale continuous process plant for big tyres ever built.

The goal is to recycle 2 000 tonnes of end-of-life tyres in the first year of operation, before increasing production in the following two years by up to 6 000 tonnes/year.

Year one should yield about 1 500 tonnes of reclaimed rubber powders and granulates, which can be used in new compounds and high-value applications.



### ► DURATION

36 MONTHS

### ► COORDINATOR

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# 4

## ► A SECOND LIFE FOR OLD SHOES

### NATURALISTA – POST-USED SHOES RECOVERY IN FOOTWEAR INDUSTRY AND OTHER APPLICATIONS

#### SUMMARY

Europe consumes 2 600 million pairs of footwear products annually, which results in 1.5 million tonnes/year of footwear ending up in urban dumping sites. Additionally, the sector industries contribute 90 000 additional tonnes of waste derived from by-products and rejects.

Naturalista aims to recycle old shoes and footwear industry waste by using a mechanical grinding process that is similar to the one used to recycle tyres.

The grinding process will produce a new compound that can be incorporated as a raw material into various polymeric products, such as sports-pitch surfaces and road safety products. The footwear industry will also be able to use the compound to make new soles and insoles.

#### RESULTS

The aim is to make ecological products from old footwear where rubber soling and other polymers have been used alongside materials like textiles and leather.

The new recycling process will help to decrease the environmental impact of footwear after purchase and during manufacture.

Naturalista will aim to obtain an Eco-label that indicates that a product uses recycled materials from shoes.



#### ► DURATION

24 MONTHS

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# COMPOSTING PACKAGING

# 5

## ECOPACK – IMPROVEMENT ON GREEN LABELS FOR PACKAGING

### SUMMARY

The new EcoPack® certification provides new dimensions to current biodegradability standards related to the direct impact on biodiversity and human health.

Six and half million tonnes of biodegradable packaging a year are currently being landfilled or incinerated in Europe. Despite the application of EU standard EN 13432 for biodegradability, commercial composters are still reluctant to consider food-soiled biodegradable packaging as feedstock for composting.

The second market for the new EcoPack® certification is polymers that are used as fertiliser or mulch films, corresponding to about 112 000 tonnes of soiled agricultures plastics that remain in the soil because they are not collected.

### RESULTS

EcoPack® certification will reduce the amount of biodegradable municipal waste landfilled by promoting food packaging residues and other food contact materials soiled by food as valuable feedstock for composting. This will contribute to a reduction of the greenhouse gases (CO<sub>2</sub> and CH<sub>4</sub>), saving annually up to between 570 and 454 000 tonnes respectively.

A recognised industry standard that is a guarantee of safety will become a significant marketing tool for food brands and manufacturers of packaging and agricultural plastics.



### ► DURATION

36 MONTHS

### ► COORDINATOR

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# 6

## ▶ NEW FURNITURE FROM OLD PLASTIC

**PROWASTE – EFFICIENT UTILIZATION OF PLASTIC WASTE THROUGH PRODUCT DESIGN AND PROCESS INNOVATION**

### SUMMARY

Currently only a small percentage of plastic waste is mechanically recycled to make beams – also called plastic lumbers – for the urban/outdoor furniture market.

Plastic beams could be used more widely to make all sorts of products such as seats, benches, gazebos, planters and fencing. Unfortunately, the mix of polymers present in plastic scrap, along with contamination from other materials, results in a plastic beam that is weak or over-dimensioned, leading to heavy and unattractive products.

Prowaste aims to solve this problem by using pultruded rods made from composite materials and glass fibre to reinforce beams developed from recycled plastic. The result will be a lighter, stronger product capable of making more environmentally-friendly, aesthetically pleasing outdoor furniture.

### RESULTS

The project will design and validate a range of furniture with a view to large-scale production and commercialisation.

Wider benefits will include a reduction in unsorted plastic waste going to landfill, incineration or energy recovery.



### ▶ DURATION

36 MONTHS

### ▶ COORDINATOR

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# FEEDING WASTE BACK INTO CARPET PRODUCTION

# 7

## EUROC2C CARPETCHAINS – TOWARDS CLOSED LOOP CHAINS IN EUROPE

### SUMMARY

The manufacturing of carpets and floor tiles is, traditionally, linear – raw materials are transformed and used to make carpets which are finally sent to landfill, municipal waste or cement kilns.

Partners involved in this initiative are making cradle-to-cradle manufacturing a key part of the carpet value chain, putting in place an appropriate take-back system in six EU countries through sorting and separating carpet waste into light and heavy fraction.

The light fraction is clean enough for the depolymerisation of nylon 6 into material which can then be made into yarns for new carpets. The heavy fraction will be recycled for the construction of road surfaces.

### RESULTS

The initiative seeks to engage more partners in the replication and up-scaling of the project and intends to be processing 4% of the EU's contract market in year three, i.e. 16 000 tonnes.

By doing this they will reduce the use of virgin materials by 8 000 tonnes, avoid the production of 8 400 tonnes of CO<sub>2</sub> and enable the reduction of energy by the equivalent of the average consumption of 1 600 households a year.



### ► DURATION

36 MONTHS

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▶  
**ECO - RUBBER  
 FOR NEW MARKETS**

**ACE – ADVANCED PRE-COMMERCIALIZATION  
 OF ECO RUBBER**

**SUMMARY**

Mountains of old tyres are still being generated in the EU – this initiative sets out to reuse, annually, 190 tonnes of rubber and plastic from recycled tyres through the use of a new technology partners have patented.

The technique generates copolymers for the use in thermoplastic rubber, resulting in the initiatives' new 'eco-rubber'. This is rubber in powder form which is mixed with reclaimed plastic to create a chemical reaction that binds and strengthens the components.

The project focuses on two markets, construction and automotive, and has the overall objective of dismantling some key barriers in the pre-commercialisation phase.

**RESULTS**

The project embraces raw materials suppliers, innovators, market intermediaries and user-groups in an attempt to boost product uptake.

Success will mean the identification of 20 possible customers in three geographical markets in two sectors worth at least €5 million and the decreased consumption of new rubber, by 190 tonnes, and of oil, by 1 700 tonnes a year.



▶ **DURATION**

36 MONTHS

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►  
**ADDING VALUE  
 TO CNT WASTE**

9

**RECYTUBE – INCREASING THE USE OF RECYCLED CARBON NANOTUBE (CNT) COMPOUNDS FOR APPLICATIONS**

**SUMMARY**

The production of carbon nano tube (CNT) masterbatch and the compounding of CNT and injection moulding production processes all result in CNT waste. This is mixed in with thermoplastic materials at differing proportions.

As things are now, a lack of cost effective recycling techniques and industrial level processing means these scraps are considered useless, although the actual cost of CNT is close to €150 per kilo.

The initiative aims to develop a fast, in situ characterisation of the scraps, during the production process, which will measure physical, thermal, mechanical and electrical properties. The goal is to obtain new polymer nanocomposites with good electrical properties.

Since the machine needed to introduce the scrap into the production chain is the same as that used in recycling plastics, no extra investment is needed.

**RESULTS**

CNT based masterbatch production will benefit from an improved environmental and economical profile. Plastic compounds will be cheaper and injection moulding companies will be able to use costly material that is now sent to landfill.



► **DURATION**

30 MONTHS

► **COORDINATOR**

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# 10

## ▶ BRINGING DARK PLASTIC TO LIGHT

### BP SORTING – BLACK POLYMER SORTING

#### SUMMARY

Most black plastics end up being incinerated or bailed into landfill. This initiative aims to optimise hyperspectral imaging sensors, HELIOS SWIR (short wave infrared), to raise the annual recovery of dark and almost dark plastics by one million tonnes, worldwide, within the first two years of the project's implementation.

Black polymers are used in the automotive, electrical and electronics industries along with the packaging and construction industries. However, recycling is hampered by the current inability to identify homogenous fractions of plastic.

The proposed solution will be able to identify, classify and sort black plastics through the integration of short wave infrared in sorting machines.

#### RESULTS

Partners hope to set up forty installations a year, greatly relieving the pressure on landfill and cutting back the amount of material incinerated.

Reusing this plastic will also save oil and energy, resulting in the saving of 0.5 million tonnes of CO<sub>2</sub> a year with an ultimate target of a reduction of 5 million tonnes a year, worldwide.



#### ▶ DURATION

24 MONTHS

#### ▶ COORDINATOR

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# NEW WAYS TO SORT ALUMINIUM

11

## PARILAS – QUALITY ALUMINIUM RECYCLING

### SUMMARY

This initiative will harness inline laser identification to demonstrate the next generation of high performance aluminium recycling. Light metal shredder scrap is a mixture of wrought and cast aluminium alloys and recycling is only achievable if this can be separated out. Being able to do this will open a new market in material specific recycling.

A pilot sorting line is planned consisting of a belt conveyor to transport the shredded scrap and a laser identification unit which will measure chemical composition at a rate of 40 pieces a second.

A pneumatic valve will blow pieces into one of four, different boxes according to their respective chemical composition.

### RESULTS

One installation of the PARILAS system could replace 10 000 tn/year of new aluminium. The expected purity of the sorted material fractions will be > 95% with a throughput of > 3t/h.

The estimated economic impact (on the basis scrap prices in August 2009) is an average gain of about 125 €/tonne for an alloy grade sorted fraction compared to a mixed aluminium fraction.



### ► DURATION

24 MONTHS

### ► COORDINATOR

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# 12

## ▶ A NEW LIFE FOR PLASTIC WINDSCREENS

### WS-REC – DESIGN AND CONSTRUCTION OF A WINDSCREEN RECYCLING LINE

#### SUMMARY

Glass and polyvinyl butyral (PVB) are used to make laminated safety glass for vehicle windscreens. Current processes can only recover the glass from end-of-life windscreens, which means the PVB is disposed of as waste, either in landfill or through incineration.

WS-REC aims to improve matters by constructing a pre-competitive scale windscreen recycling plant that can recover both glass and PVB.

The project will also develop a purification system that can remove glass and other substances that adhere to the PVB.

In addition, glass recovery will be made more efficient.

#### RESULTS

Pure recycled PVB commands a high price (€7-8 per kg), which makes the recycling process a profitable proposition. What is more, the development of a high-quality, commercially valuable product will lead to less PVB being dumped as waste.

The WS-REC line will also contribute to EU targets for the recovery and recycling of old and unwanted vehicles and parts.



#### ▶ DURATION

36 MONTHS

#### ▶ COORDINATOR

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# ► REDUCING NAPPY WASTE

13

## THE DIAPERS PROJECT – A ZERO EMISSION GREEN PLANT

### SUMMARY

In Europe, an estimated 36.25 billion disposable nappies are used every year, One baby produces approximately one tonne of used nappies. 4.5 million tonnes of used nappies end up in landfills and incinerators.

Recycling plastics with organic contamination is complicated because of the lack of a separate collection system, the high energy consumption of the process itself and the uncertainty about the market possibilities of the recycled material. The Diapers Project aims to set up an industrial sorting and recycling process that will recycle nappies in a cost efficient and environmentally friendly way, leading the way for recycling of other organically contaminated plastics, also known as “forgotten” waste.

### RESULTS

The project will demonstrate that recycling disposable nappies and reducing household waste can be profitable.

The three-year project will treat 70 000 tonnes of nappies, and thus cut 56 000 tonnes of CO<sub>2</sub> – an 80% reduction on incinerated nappies.



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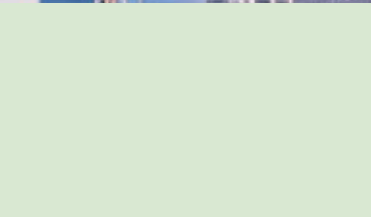




►

# BUILDING & CONSTRUCTION

## NEW FOUNDATIONS FOR A GREENER EUROPE



*Building and construction are a key part of the EU's economy. The sector makes up some 10% of gross domestic product and more than 7% of total employment – and these figures only take into account new construction, buildings renovation and on-site civil engineering. Some 26 million jobs depend directly or indirectly on the sector, while direct employment in the construction materials and building products industry is estimated at 2.5 million jobs.*



*Due to its size and numerous related activities, the sector has a huge impact on the environment. Above all, it is an avid consumer of resources – with more than half of all materials extracted from the earth being turned into construction materials and products. Furthermore, in many countries waste generation from construction and demolition activities has increased in recent years.*



*The sector also consumes vast amounts of energy and generates significant emissions to the air, soil and water. The heating and lighting of buildings alone account for around 42% of energy use and some 35% of greenhouse gas emissions. And while energy use per household has remained constant since 1985, the EU's total energy consumption has increased in line with the expansion of our towns and cities.*

*Tackling these environmental and sustainability challenges is tough, due to the uniqueness of the building and construction sector. It is, for example, highly regulated at the national level, making it harder to introduce innovative technologies or new standards such as Ecocodes at Community level. Other constraints to change and innovation include the public sector's dominance as a client, the long service life of buildings, and a complex and fragmented supply chain.*



*The Eco-innovation initiative supports several projects that aim to change the way buildings are designed, constructed, refurbished and demolished, with an eye on reducing the amount of raw materials and energy used. Projects under way include an Italian system to detect water leaks in city networks, and the testing in Serbia of the potential of organic waste or 'biosludge' to create composite building material.*



►  
**BUILDING  
 WITH BIOSLUDGE**

14

**BACOM – SUSTAINABLE PRODUCTION  
 OF COMPOSITE CONSTRUCTION MATERIALS**

**SUMMARY**

The organic biosludge produced by Europe’s 50 000 plus waste water treatment plants has traditionally been disposed of in landfill or been incinerated. However, the landfill option has been banned in the EU since 15 July 2009.

This initiative sets out to rethink the problem of biosludge waste radically, considering it as potential composite building material rather than as waste. The project uses material from a wide range of sectors such as ports, public waterways, water treatment plants, lime production and smelting plants, to name but a few.

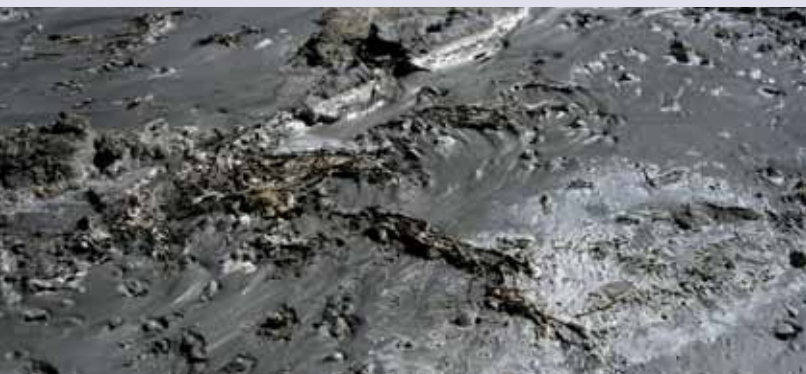
The first step is to upgrade the existing pilot production line in Slovenia and set up others in Slovakia, Greece and Poland.

**RESULTS**

Anticipated results include the reduction of green house gasses at EU level by 1 460 000 tonnes of CO<sub>2</sub> a year within ten years of the project’s kick off.

A reduction in costs of waste management and in environmental taxes will make biosolid producers more competitive.

The use of biosolids and sludge as construction materials will generate both environmental and economic benefits.



► **DURATION**

36 MONTHS

► **COORDINATOR**

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# 15

## ► A LOWER CARBON FOOTPRINT FOR CONCRETE

### SUSTCON-EPV – FRANCHISE MARKETING OF A SUSTAINABILITY INDEX AND ECO LABEL FOR CONCRETE

#### SUMMARY

Concrete is the world’s most common construction material but the production of cement used to bind it is a key source of CO<sub>2</sub> emissions.

The use of more sustainable types of concrete is hindered by the prescription based standards and regulation that are currently in use. The project provides the technical and marketing structure that will facilitate the access to the market of sustainable concrete products. Its sustainability index and environmental technology verification protocol are based on the performance of these products rather than their composition.

#### RESULTS

The Sustcon-EPV project aims to encourage the uptake of sustainable concrete technology via a new sustainability index and the so-called environmental performance protocol.

It will encourage the cross-border use of sustainable concrete, reduce raw material production and lead to a decrease of CO<sub>2</sub> emissions of 50 to 250 kg per m<sup>3</sup> of sustainable concrete.



#### ► DURATION

24 MONTHS

#### ► COORDINATOR

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# ► WALL PANELS FROM WASTE

16

## ECOWALL – NOVEL COMPOSITE CONCRETE INSULATED BUILDING MATERIALS OPTIMISED

### SUMMARY

Many family homes are built with bricks and concrete block walls – a process which needs a lot of energy and raw materials.

EcoWall aims to reduce those requirements and associated environmental impacts by producing modular composite concrete panels that offer savings in construction costs and improved thermal insulation.

EcoWall will use industrial waste materials and recycled concrete aggregates to make the panels. Foamed concrete will provide insulation, which in turn will save energy.

The objective is to produce a long-lasting and durable product which retains the attractive appearance of traditional materials.

### RESULTS

The project will establish a pilot plant in Estonia to start production. Initially, the plant will make 100 000 m<sup>2</sup> of wall panels annually.

Taking account of construction and use over a 50-year period, a single family home built using the EcoWall panels can expect to achieve energy savings of more than 1 840 GJ and a reduction in CO<sub>2</sub> of 111 tonnes.



### ► DURATION

36 MONTHS

### ► COORDINATOR

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### ► PARTNERS

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# 17

## ▶ A GREENER GLUE FOR WOOD FLOORING

ECBP – ECOLABELLED CHEMICAL BUILDING PRODUCTS.  
NEW ADHESIVES FOR WOOD-FLOORING

### SUMMARY

The European wood flooring (parquet) market produces over 100 million square metres per year. Approximately 70% of these wood floors are installed using a bonding process that requires specialised adhesives. Estimated consumption of these adhesives is 70 million litres per year – but they contain volatile organic compounds (VOCs) which are harmful to human health and the environment.

ECBP aims to introduce onto the market new environmentally friendly adhesives for wood-flooring installation, certified by the Nordic Ecolabel.

The innovative prepolymers were developed and have already been demonstrated by NPT. The project focuses on increasing and optimising production capacity.

Efforts will be made to involve other European countries in order to find local distributors. The main targets will be flooring companies and stores selling wood flooring.

### RESULTS

By completion, the project intends to produce 0.7 million kilos of adhesive that have zero methanol emissions and no harmful substances such as tin and isocyanates. Two years after the project has finished, NPT aims to achieve a production capacity of 1.5 million kilos of adhesive per year.



### ▶ DURATION

32 MONTHS

### ▶ COORDINATOR

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## GLASS WALLS REDUCE WASTE

# 18

### SANGUSS – WALL-FILLING MATERIAL

#### SUMMARY

The Sanguss project is using a novel technology to fill wall panels which can incorporate piping to carry sewage and water.

The wall-filling material is made from a special foam glass which is produced from glass which can no longer be used in the conventional glass recycling process and which is thus useless waste material (e.g., finest glass fractions). This waste is at present often deposited in landfill. Sanguss walls will offer clear advantages in terms of waste reduction, hygiene, noise reduction, fire protection and structural stability. The end product should also be cheap and easy to use.

Wall construction integrates a range of different building professions such as bricklaying, pipe-laying, plumbing and plastering. The project will work with these professions in order to try and ensure a wide market uptake.

#### RESULTS

The project is aiming for a quick and sustainable penetration of the market. The initial goal is to deliver a market share of 5% in the two years after the project has ended.

Preparation for market introduction will include 3rd party certification and preparation of equipment, materials, tools, pumps and the build up of a training network.



#### ► DURATION

36 MONTHS

#### ► COORDINATOR

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# 19

## ▶ DECORATING WITH WASTE

WAP-WIR – WALL PANEL WITHOUT RESIN - REPLACEMENT OF POLYESTER RESINS, VOLATILE SOLVENTS AND HAZARDOUS PIGMENTS WITH NATURAL STONE AND GLASS POWDERS

### SUMMARY

Decorative wall panels are traditionally made using polyester resins, volatile solvents and hazardous pigments, which cause air and water pollution. The WAP-WIR project aims to substitute these materials with natural stone and glass powders, obtained from waste.

The project will develop a production line that can manufacture these panels and therefore create an innovative environmentally-friendly, low-energy process.

WAP-WIR will use fine and coarse powders – such as cuts of natural stone, milled glass and iron oxide spheres – which have been recovered from other manufacturing activities.

### RESULTS

The new manufacturing process will bring about the following main benefits:

- ▶ Methane savings of approx. 100.000 m<sup>3</sup>/year;
- ▶ Discontinuation of the use of toxic or harmful volatile solvents, polymeric resins and pigments (saving approximately 1 450 tonnes/year);
- ▶ 60% reduction in the quantity of water used (saving approximately 1 million litres/year);
- ▶ 25% reduction in energy consumption during production (corresponding to 300.000 kWh/year);
- ▶ A product that can be recycled both in its semi-finished and finished state and even after installation.



### ▶ DURATION

36 MONTHS

### ▶ COORDINATOR

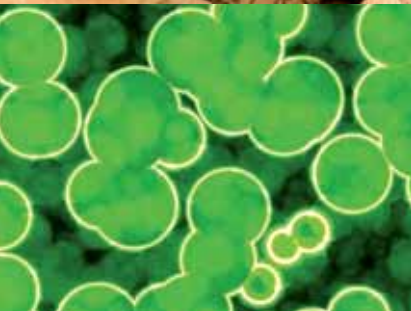
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# FOOD AND DRINK

## FROM FARM TO FORK: A HUNGER FOR INNOVATION



*The food and drink industry is one of Europe's crown jewels, with a turnover of more than €965 billion. It processes some 70% of the EU's agricultural raw materials and employs over four million people – almost all in small or medium-sized businesses.*

*Much of the sector's success stems from harnessing Europe's rich cultural and culinary diversity and traditions. Among them are speciality meat, dairy and confectionery products, as well as numerous different wines and spirits enjoyed all over the world.*

*However, the sector's share of the global food and drink market is in decline, as a result of increased competition from emerging economies such as China, India and Brazil. Experts say that Europe can no longer compete on price in this field, so will in future have to add value by offering healthier and more innovative produce.*

*One of the sector's main weaknesses is extreme fragmentation. More than 99% of the companies are SMEs, which means they struggle to compete with larger players, such as retail companies, in terms of market and bargaining power. In addition, compared to other industries, innovation expenditure is very low (0.37%) as a proportion of turnover.*

*The sector has enjoyed good economic growth. But food and drink have been assessed as still having the greatest environmental impact in their lifecycle, ahead even of private transport and housing.*

*New and greener technologies and processes can make this European sector more competitive and dynamic. Some are being trialled today under the Eco-innovation initiative. They include new wastewater treatment solutions, bio-waste transformation into new valuable products and new food packaging solutions.*



# 20

►  
GREENING  
OUR MENUS

ECOFOOD-SME – CLUSTER METHODOLOGIES  
TO GREEN BUSINESS, PRODUCTS AND SERVICES  
OF AGRO-FOOD SMES

## SUMMARY

SMEs make up about 99% of businesses in the agro-food sector, but they often lack the resources to boost their own eco-credentials.

This project aims to change this situation by clustering the sector's SMEs to 'green' their businesses, products and services. A geographical cluster in Spain and a breweries cluster in Germany will improve the ecological status of their products.

## RESULTS

Forty companies will undergo an initial assessment. Then the project team will develop methodologies that take account of each company's features along with the general characteristics of the sector.

Changes will be implemented for half of the companies that have been assessed. This should help the SMEs concerned achieve EMAS III certification or to obtain EN 16001 energy management certification.

Indirect impacts are expected on raw material consumption, greenhouse gas emissions, odours, the need for hazardous chemicals, amount of waste produced and on the consumption of water.



## ► DURATION

24 MONTHS

## ► COORDINATOR

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►  
**A GREENER WAY  
 TO STERILISE**

21

**STERILIS – REDUCTION OF WATER AND ENERGY  
 CONSUMPTION IN THE FOOD INDUSTRY:  
 INNOVATIVE STERILISATION EQUIPMENT**

**SUMMARY**

The company behind this project has developed and built a prototype retort, which is sterilisation equipment that can be used by the food and drinks industry.

The goal of Sterilis project is to harness this technology by using a machine under ‘real-life’ conditions and at industrial scale at a customer’s factory.

**RESULTS**

Sterilis will provide innovation in the field by offering a process of continuous sterilisation. What is more, the project team expects its machine will save water, electricity, chemicals – and produce less waste. For example, water consumption could be reduced by up to 30%.

With this first implementation and a strong exploitation strategy, the company will build new machines to be sold commercially.



► **DURATION**

36 MONTHS

► **COORDINATOR**

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# 22

## ▶ REDUCING FOOD WASTE

ENBED – ENVIRONMENTAL BENEFITS THROUGH THE DECREASE OF FOOD PRODUCTS LOSS AND WASTE

### SUMMARY

Perishable foods need keeping at the correct temperature and in the right environmental conditions.

However, up to 33% of perishable goods are lost during storage and transportation, and the food industry is stuck with high energy costs to keep its products fresh.

The ENBED project aims to optimise the entire production and distribution chain by ensuring that products are kept in the right conditions. Its solution will be based on wireless sensors and GPRS cellular communication.

The objective is to develop a system that offers real-time monitoring of conditions and the ability to make corrective actions that can avoid energy wastage and loss of product quality.

### RESULTS

ENBED intends to provide at least two companies that produce dairy products with a system that is ready to use commercially.

Once the system is commercialised on a European scale it should offer billions of euros in gas, fuel and water savings each year.



### ▶ DURATION

24 MONTHS

### ▶ COORDINATOR

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# ENERGY FROM ANIMAL CARCASSES

APRE – MANAGEMENT OF ORGANIC WASTE USING ANAEROBIC CO-DIGESTION FOR ITS RECYCLING AS ORGANIC FERTILISER

# 23

## SUMMARY

The agro-food industry disposes of animal by-products mainly through rendering and incineration or landfill actions which have high environmental impacts.

APRE aims to develop a more sustainable approach to the management of animal by-products and dead animals through the anaerobic digestion of carcasses to produce a high-quality fertiliser and bio-gas.

The project therefore offers an innovative way to use waste to produce useful products that have high economic and environmental benefits.

## RESULTS

The APRE process can treat 11 tonnes of dead animals every day, which will produce 4 000 m<sup>3</sup> of bio-gas (60% of which is methane) and 44 tonnes of liquid fertiliser. The heat generated will be turned into electric power which can be used in production or sold on.

The fertiliser will be used on land for corn crops. The corn grains will be sold as fodder, while the leaves and stalks are co-digested to optimise the APRE process.



## ► DURATION

36 MONTHS

## ► COORDINATOR

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 BIG – BIGADAN A/S, DENMARK  
 PURAL – PURINES ALMAZÁN S.L., SPAIN



# 24

## ▶ MAKING ESSENTIAL FATTY ACIDS FROM ALGAE

PHOBIOR – AN INNOVATIVE PHOTO-BIOREACTOR FOR THE PRODUCTION OF MICRO ALGAE WITH HIGH AMOUNTS OF OMEGA-3 FATTY ACIDS

### SUMMARY

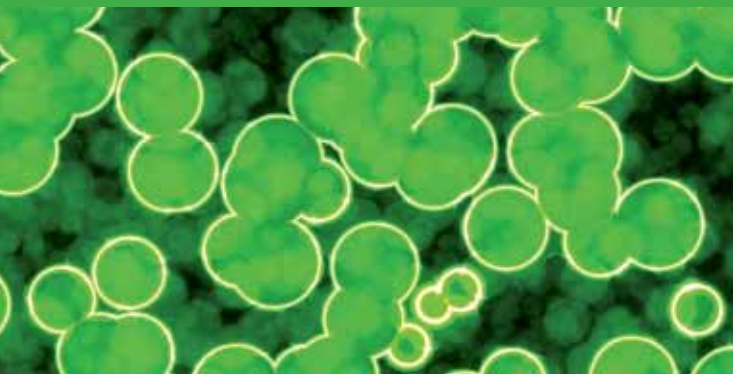
Omega-3 fatty acids are essential to the human metabolism. But most nutritional supplements containing them are made of fish oil, despite the hazards raised by overfishing and mercury contamination.

Phobior aims to use algae biomass to produce omega-3 fatty acids by commercialising an innovative photo-bioreactor.

### RESULTS

The first industrial-sized photo-bioreactor for the production of high-quality omega-3 fatty acids from algae will be built at the Energiepark Bruck in Austria. The bioreactor's ingenious design will have several positive impacts: instead of using extra energy, CO<sub>2</sub> will move the algae through the system, at the same time nourishing it and generating oxygen. Phosphate will be reused as well as all water. The system's design also optimises space and sunlight to stimulate algae growth. It will also require less pest control additives.

Costs will be low while producing top-range, uncontaminated products.



### ▶ DURATION

36 MONTHS

### ▶ COORDINATOR

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## THE EDIBLE LABEL

LASER MARK – CREATING MARKET DEMAND FOR FRUITS LABELLED ECOLOGICALLY WITH INNOVATIVE LASER TECHNOLOGIES

# 25

### SUMMARY

Under EU regulations, fruit and vegetables have to be labelled to let consumers know product specifics. Currently this is done through the use of adhesive, laminated stickers requiring the use of natural resources (wood, energy and water) along with chemicals (glue and ink production).

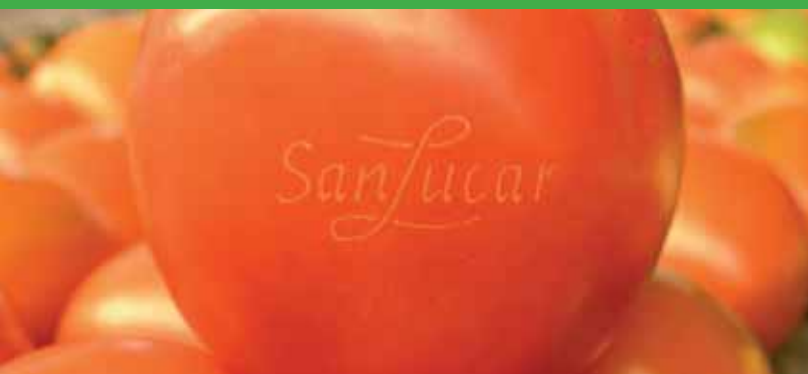
This initiative sets forward the use of laser marking to replace stickers. This consists of marking the produce with edible contrast substance which appears when activated by a laser, revealing such information as identifying numbers, country of origin and other useful information.

Six installations will pilot the technology in Valencia and the UK, aiming to overcome the barriers to market uptake by proving reliability and cost effectiveness.

### RESULTS

Partners are committed to decreasing the use of natural resources and their process will have the following positive impacts:

- Up to 35% reduction in energy consumption due to the elimination of paper and polythene stickers.
- Innovative process completely eliminates the production, use and residues of glue and ink used in traditional process as the information is marked directly on the fruit or vegetable.



### ► DURATION

36 MONTHS

### ► COORDINATOR

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# 26

## A GREENER CATCH

### ECOBIONET – INDUSTRIAL IMPLEMENTATION OF BIODEGRADABLE AND COMPOSTABLE PACKAGING NETS FOR AGRICULTURAL AND SHELLFISH PRODUCTS

#### SUMMARY

Large supermarket chains increasingly ask their suppliers to use biodegradable packaging material. This also affects suppliers of products packed in nets, such as potatoes, garlic and mussels. Biodegradable nets are normally produced by a knitting process that involves a 25% waste loss.

The ECOBIONET project industrialises the production of different types of biodegradable nets by a more sophisticated and reliable extrusion melt spinning process. The nets must have good physical and mechanical properties, be completely biodegradable and be cost-competitive with other solutions in the market. The packaging nets will be tested for use as a packaging of agricultural products and shellfish. The project will broaden the use of compostable biopolymers to other applications that require high melt strength and high viscosity during the manufacturing process, such as bottles and containers.

#### RESULTS

Ecobionet involves the industrialisation of four biodegradable packaging nets and their testing for strength, weight and cost efficiency. They will be commercialised after compostability tests.



#### ► DURATION

30 MONTHS

#### ► COORDINATOR

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# ▶ GETTING THE MOST OUT OF MEAT WASTE

MINIAD – A SMALL SCALE ANAEROBIC DIGESTER BY MEAT PROCESSORS TO ENABLE WIDER MARKET REPLICATION ACROSS EUROPE

# 27

## SUMMARY

A system based on processing techniques currently used by the pharmaceutical and chemical industries and advanced state-of-the-art anaerobic digestion will be harnessed to deal with category 3 meat waste – waste made up of parts of slaughtered animals not intended for human consumption.

This initiative seeks to scale down the technology to enable on site operation. Challenges include:

- ▶ maintaining feedstock quality;
- ▶ nutrient balance;
- ▶ ensuring a solids level under 12%, and
- ▶ minimising contamination.

A plant will be built and run for two years with two brief periods of downtime when it is demounted and moved to two more sites.

## RESULTS

Project partners hope to use the miniAD to turn meat processing waste into agricultural fertiliser, potable water and renewable energy at one treatment site and two meat processors. The system will also reduce CO<sub>2</sub>, methane and NO<sub>x</sub>/N<sub>2</sub>O emissions by the diversion of category 3 animal by-products from landfill.

The production unit will have an annual throughput of up to 5 000 tonnes. Operational life will be over 20 years and will require no external source of power to operate. Finally, the return on investment will be achievable in less than two years.



## ▶ DURATION

36 MONTHS

## ▶ COORDINATOR

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# 28

►  
CLEANING UP  
FOOD HYGIENE

ECO3CIP – OZONE CLEANING-IN-PLACE SYSTEM  
FOR FOOD FACTORIES

## SUMMARY

The food processing industry must maintain high standards of hygiene at all times.

Cleaning-in-Place (CIP) systems are commonly used to wash process vessels, tanks and pipes at food factories. These use a lot of water, chemicals and disinfectants, which are then discharged into sewage systems.

A demonstration project has already shown the value of using ozone for CIPs. Trials revealed that the use of ozonated water led to significant reductions in water consumption and organic load in waste water while maintaining efficient levels of hygiene.

This project aims to develop the first industrial application of an ozone CIP system.

## RESULTS

Implementation will be carried out at a dairy company. The project team will upscale and optimize the system which can be integrated into a conventional cleaning system.

The project partners will also draw up plans to commercialise the system.



## ► DURATION

36 MONTHS

## ► COORDINATOR

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▶

# LETTING OFF STEAM, SAVING WATER

# 29

## RECOWATER – RETORT COOLING WATER RECYCLING

### SUMMARY

Retort food production uses steam to achieve commercial sterility. Once cooled, the water is discharged or kept in the retort. Reuse is sensitive due to possible re-infection.

Mars has developed a recirculation system that allows 95% reduction of potable water used for cooling. Waste water is also down by 95% and gas by 35% through the use of an innovative treatment method which keeps the water stable microbiologically.

### RESULTS

Mars Petcare will change the existing retort primary cooling water circuits from a “run-through” to a “recycling” method in three of its factories, France, Lithuania and UK.

Mars will effectively disseminate the process results and share data.



### ▶ DURATION

36 MONTHS

### ▶ COORDINATOR

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### ▶ PARTNERS

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# 30

▶  
CLEANING UP  
OLIVE OIL

OMIWAT – OLIVE MILL WASTEWATER TREATMENT

SUMMARY

Untreated waste water from olive mills poses an environmental hazard due to its high organic load. One to two litres of waste water are produced per litre of olive oil, depending on the mill in question.

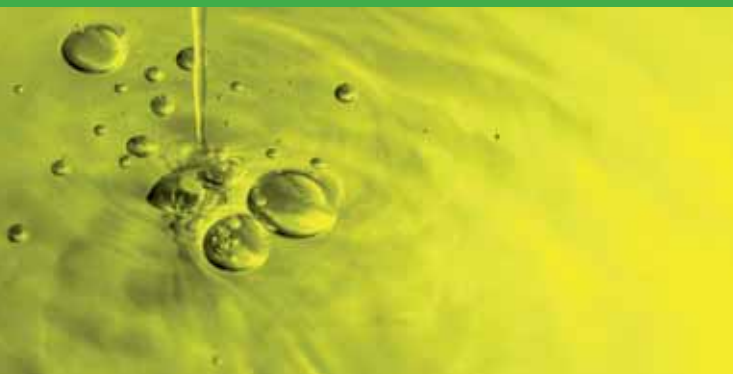
The Omiwat project aims to develop an innovative integrated filtering system capable of treating waste water in a way that leaves no harmful by-products and recovers high added value products.

Waste water is rich in polyphenols – a form of anti-oxidant that may have a number of health, nutritional and industrial uses.

RESULTS

The project will establish a system capable of treating 1 000 tonnes of waste water, which is the entire production of a medium-sized mill.

The main output will be the isolated phenols (which have a high commercial value), a valuable fertilizer, clean water for irrigation and environmentally sustainable timber.



▶ DURATION

24 MONTHS

▶ COORDINATOR

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BIONATURE – BIONATURE E.A. LTD, CYPRUS





# ► POPPING A NEW KIND OF CORK

31

**PLACOTOP – PLASTIC-CORK COMPOSITES:  
AN INNOVATIVE SUSTAINABLE MATERIAL FOR STOPPERS**

## SUMMARY

Every year plastic stoppers gain market share over cork since they are cheaper and there are chemical problems that arise from the use of cork. 20 billion stoppers are made a year and 12% of these are plastic – rising, according to the WWF, to more than 50% of the market in ten years.

But they too have their drawbacks: their production depends on fossil fuel resources and their use is forcing cork oak forests in Southern Europe into extinction. So the project has started to develop plastic-cork composites as an innovative, sustainable material for stoppers.

Cheaper than cork, less dense than plastic and part biomass, these stoppers have been developed to replace plastic, not cork. Processing currently adversely affects the mechanical performance of the stoppers so the project sets out to optimise conditions.

## RESULTS

Moulding conditions will be adjusted and optimised in order to obtain the best possible product properties, such as extraction force and capping stability. If this composite was used in 2% of the plastic stopper market it would reduce the use of fossil fuel based plastic by 50 tonnes a year and result in market sales of €3 million.



## ► DURATION

30 MONTHS

## ► COORDINATOR

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# 32

▶  
**A BETTER USE  
 OF BLOOD**

**ECOBLOOD – ECOLOGICAL TREATMENT  
 OF BLOOD IN SLAUGHTERHOUSES**

**S U M M A R Y**

The slaughtering of animals produces by-products not intended for human consumption such as blood, bones, hides, fats and so on. Under Regulation 1774/2002/EC these are handled by the animal by-product processing (ABP) industry, which places an increased emphasis on hygiene.

The ECOBLOOD initiative aims to provide a cost-effective and environmentally friendly solution to the processing of blood within slaughterhouses using a blood separator/coagulator machine and a membrane filtration system.

The equipment improves the treatment of the blood serum produced by the slaughtered animals – the output is blood meal which can be used to generate biogas, and treated water which, although non potable, can be recycled within the abattoir.

**R E S U L T S**

The application will be carried out at a medium sized Italian slaughterhouse, and following that, will be installed at the premises of future clients for trial periods. This will entail market research and the development of business strategies including information dissemination activities.



▶ **DURATION**

36 MONTHS

▶ **COORDINATOR**

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# GREEN BUSINESS

## GREEN BUSINESS IS SMART BUSINESS

*Eco-friendly products and services for the 'green revolution' are becoming a necessity for the EU's 20 million small firms, which make up 99% of all firms operating in the Union. Indeed today small firms, key drivers of the EU's economy, must meet the challenges of climate change, reduce consumption of energy and resources, and above all seize the market opportunities afforded by greening their business.*

*The EU is becoming more efficient at managing material resources, but the continuous growth of overall consumption and production keeps increasing the pressure exerted on the environment. As a result, in the past 30 years the EU's ecological pressure on the planet has doubled and today it uses ecological services twice as fast as Europe can renew them. Each European citizen annually uses some 16 tonnes of material resources and generates six tonnes of waste. Clearly, despite past achievements, a sustainable Europe is not just around the corner.*

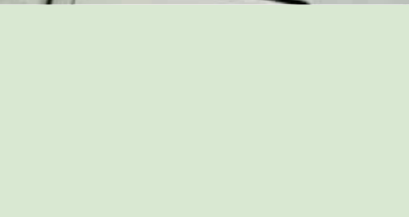
*European enterprises are increasingly aware of the environmental impact of their products and services. They must comply with ever-stricter environmental protection regulation at the EU and national level, and they need to meet the expectations of consumers who demand greener products, supplied by cleaner and more sustainable business models.*

*Helping these enterprises is the EU's Eco-innovation initiative, which focuses on the prevention or reduction of environmental impacts and on making optimal use of resources. One of its four priority areas is specifically addressed to help them green their business and make greener products more successful in the marketplace.*

*Green business means innovative products to decrease environmental impacts and use fewer resources, as well as services that facilitate a better match between supply and demand of eco-innovative solutions and help eco-innovation into the market. Eco-innovation can also come from non-technological changes, including innovative services and new business models.*

*A further goal is the greening of production and clean production processes. The ceramics, leather and textile sectors, for example, are represented among Eco-innovation projects, by imaginative new processes, aiming to use fewer resources and reduce waste through innovation.*

*Green business also pursues eco-innovation through remanufacturing mechanisms and innovative repair services, as well as the substitution of materials with innovative ones. Biomaterials, for instance, reduce environmental impacts and offer higher resource efficiency. Eco-innovation projects in the area of green business include new bio-dyes for the textile industry, biodegradable shoes, the Ecolabel e-store, and milk bottles made of recycled paper and plastics.*



# 33

►  
**NEW DYES FOR  
 GREENER TEXTILES**

**BISCOL – BIOPROCESSING FOR SUSTAINABLE  
 PRODUCTION OF COLOURED TEXTILES**

**SUMMARY**

Europe’s textile industry is a vital source of employment and income for many EU countries. However, environmental and production costs are among the factors that hamper Europe’s competitiveness in the globalised market place.

The Biscol project aims to address these issues by developing a new, environmentally friendly dyeing process.

Biological compounds will replace polluting chemicals to produce bio-dyes. These bio-dyes and auxiliaries have a lower environmental impact and will be synthesised on an industrial scale. In addition, the project’s dyeing process will be optimised to use lower temperatures and reduce treatment times.

**RESULTS**

The new dyeing process promises to benefit high-tech SMEs in terms of improved competitiveness, innovation and sustainable practices.

It will also offer reductions in greenhouse gases, the use of raw materials and the production of waste while providing greater protection for water resources.



► **DURATION**

36 MONTHS

► **COORDINATOR**

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►

# A GREEN MARKETPLACE FOR USED PALLETS

# 34

## GREENPAL – GREEN PALLET EXCHANGE SOLUTION

### SUMMARY

Every day, large numbers of empty pallets are transported over long distances to supply companies that need them. Other pallets are discarded, although they are in good enough condition to be used again. This adds costs to already overpriced pallets and has a considerable environmental impact.

GREENPAL aims to establish a new green electronic market place for the trade in EUR pallets that will significantly reduce costs and update the business by reusing old pallets and reducing the transport of empty pallets.

### RESULTS

If 500 000 less truck transports of empty pallets take place by 2013, this will reduce CO<sub>2</sub> emissions by 26 000 tonnes/year. It would also reduce yearly diesel consumption by 10 million litres. Increased use of existing pallets will result in 30 000 m<sup>3</sup> less wood for new pallets. The commercial goal is for the new system to handle 10% of all European pallet exchange by 2015.



### ► DURATION

33 MONTHS

### ► COORDINATOR

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# 35

## ► IMPROVING THE ECO-CREDENTIALS OF TOURISM

### INTOUR – SUSTAINABLE TOUR OPERATOR SUPPLY CHAIN

#### SUMMARY

European travel companies have agreed to apply industry-wide environmental management standards to most sectors of the tourism industry. The main focus is on climate and biodiversity.

The new Intour project will use the EU Eco-Management and Audit Scheme EMAS and the EU Ecolabel to provide credibility and direction to these efforts at improving environmental performance of travel agencies and tour operators.

#### RESULTS

This EU monitored system will encourage tour operators, travel agencies and hotels to improve their environmental credentials. It will be applied to more than 1 000 tour operators and travel agencies in the Netherlands, the UK, Belgium, Italy and Germany, among other EU countries. Some 5 000 hotels are planning to acquire eco-certification. INTOUR will substantially reduce the use of water (~30%), chemical substances (~70%) and energy (~25%), and will also cut waste (~30%). These impacts will be multiplied thanks to the influence of participating associations.



#### ► DURATION

36 MONTHS

#### ► COORDINATOR

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# ENVIRONMENTALLY-FRIENDLY PRINTING

# 36

PROSPEC – PROMOTING EMAS IN CLUSTERS OF PRINTING SMEs

## SUMMARY

SMEs working in the printing industry would greatly benefit from using the Eco-Management and Audit Scheme EMAS, and employees would see their job satisfaction increase, along with their awareness of environmental issues. However, only a negligible number of these SMEs are aiming for this certification.

Five printing firms – two in the UK and three in Greece – will adopt the EMAS III standards, using a cluster approach. The firms are all members of the Prospec consortium aiming to break down the barriers to EMAS certification.

## RESULTS

PROSPEC will facilitate the adoption of EMAS III through clusters of SMEs by facilitating the procedures and minimizing the costs and effort required from a firm to obtain and maintain the EMAS III certification. The starting points are two printing clusters in the UK and Greece, with 17 cluster members in the UK and 13 in Greece by the end of the project.

Implementation of EMAS III will help printing SMEs achieve reductions in greenhouse gas emissions (20-30%), nitrous oxide (20%), mutagenic/carcinogenic substances (95%), waste paper (30%) and water consumption (20%).



## ► DURATION

27 MONTHS

## ► COORDINATOR

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 TOUBIS – MICHALIS TOUBIS SA, GREECE  
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 PROOM – THE PRINTROOM (UK) LTD, THE UNITED KINGDOM



# 37

▶  
A CLEANER  
TREAD

ECOTPU – PLASTICS FROM RENEWABLE  
SOURCES APPLIED IN FOOTWEAR

SUMMARY

The use of responsibly farmed bio resources, such as bio-based plastic (ecoTPU), can lead to substantial environmental benefits both in terms of reduction of the CO<sub>2</sub> emissions associated with the use of oil and non-renewable raw material consumption.

The ECOTPU initiative will create:

- ▶ Initial product: the ecoTPU itself. This is the main purpose of the project and a 5 000 tonnes/year production line will be started up;
- ▶ Intermediate products: soles and shoe stiffeners made of ecoTPU, and
- ▶ Final products: shoes made with ecoTPU soles and stiffeners.

Marketing this solution will imply a reduction in the environmental impact of the footwear industry.

RESULTS

The initiative sets out to create:

- ▶ An ecoTPU production line working with an estimated production capacity of 5 000 t/year;
- ▶ Samples of at least two kinds of ecoTPU, one for soles and one for stiffeners;
- ▶ Reduction of non-renewable energy demand of about 480 toe per year for the estimated production capacity (toe=tonnes of oil equivalent, 1 toe=42 GJ), and
- ▶ Reduction of global warming impact of about 50 000 tonnes of CO<sub>2</sub> per year for the estimated production cap.



▶ DURATION

24 MONTHS

▶ COORDINATOR

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# ► MAKING MILK GREEN

# 38

## GREENBOTTLE – A NOVEL GREEN MILK BOTTLE

### SUMMARY

Approximately 2.2 million tonnes of plastic in plastic bottles each year is produced within the EU – Greenbottle puts forward an alternative with a 25% reduction in plastic used and a 50% reduction in carbon generated.

Aimed primarily at the milk industry, the bottles are a combination of a shell made from molded, recycled paper and a thin, plastic inner lining. These separate out easily and are then recycled by consumers using current systems.

The initiative has a proven track record on a small scale, using hand assembly, and partners aim to roll out high speed/high volume, automated production.

### RESULTS

To do this the project will identify a consistent source of recycled paper from offices, take production rates from five to 80 bottles a minute, recycle over 5 520 tonnes of paper in the first year and reduce costs by 50%.

By the end of 2012 the initiative will be using 6 000 tonnes of paper and will have reduced the use of plastic by around 4 440 tonnes a year.



### ► DURATION

12 MONTHS

### ► COORDINATOR

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# 39

## ► CLEANING UP OUR FOOTPRINT

### TILELEATHER – ECOFRIENDLY LEATHER TANNED WITH TITANIUM

#### SUMMARY

More than 90% of the leather tanned worldwide uses chrome, specifically trivalent chromium which, under certain conditions, can oxidise to hexavalent chromium. This is a proven carcinogen that can leach into water supplies and cause harm to humans and the environment.

The initiative seeks to offer an alternative, producing leather under the label Sanotan, which will be sold both as unmade up leather and as shoes.

#### RESULTS

The goal is to have a production line with the capacity of 1 200 000 feet<sup>2</sup> a year providing enough chrome-free leather to ensure safety footwear, children's shoes and town footwear reach EU markets.

Rendering the tanning process entirely chrome-free will result in:

Reduction of wastewater contamination:

- Chlorides by 39.4%;
- Chemical Oxygen Demand by 37.5%;
- Chrome VI by 100%;
- Total Chrome by 100%;
- Reduction of the CO<sub>2</sub> emitted during the production process.
- Reduction of the energy consumption and combustibles consumption.



#### ► DURATION

24 MONTHS

#### ► COORDINATOR

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## ► A CLEANER POLISH FOR CERAMICS

# 40

ECO-BULL NOSE V2.0 – A NEW ECO-PROCESS  
FOR THE FINISHING OF HIGH QUALITY CERAMIC

### SUMMARY

Waste generated during traditional cutting methods using diamond tools takes the form of water-based sludge.

With the aid of a new partnership with a leading tile manufacturer this initiative builds on the LIFE05 project 'Eco bull-nose' to reduce the generation of polishing and grinding sludge.

Sludge resulting from the cutting of tiles will be collected and re-distributed in the production system. Sieved sludge becomes progressively enriched with the diamond particles used in abrasion which can be recycled. Particles of tile become smaller and rounder and can be separated from the flow of water.

### RESULTS

The new process will allow a reduction of 40% of the sludge produced and the multiple re-use of abrasive materials. The resource efficiency of the system is not limited to abrasive materials but also to water that will be recovered up to 95%. The remaining waste will only consist of inert ceramic powder and minimal concentration of abrasive compounds.



### ► DURATION

34 MONTHS

### ► COORDINATOR

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# 41

## FROM TVS TO TILES

### GLASS PLUS – GLASS PLUS PROJECT- SUSTAINABLE CERAMIC TILES FROM CATHODE RAY TUBE

#### SUMMARY

Television sets have changed dramatically in recent years with the introduction of ‘flat-screen’ LCD, plasma and LED monitors.

These new technologies do away with the need for cathode ray tubes (CRTs). CRTs contain dangerous materials – including lead and phosphor – which means they need specific treatment at the end of their lifecycles.

This project intends to use CRT glass recovered from recycling plants as a raw material for the production of ceramic tiles that are compliant with the Leadership in Energy and Environmental Design (LEED) certification system.

#### RESULTS

Glass Plus will establish plants for the pre-processing of CRT glass and for the production of atomised powders.

The project seeks to implement an innovative production process beginning with the recycling of CRTs through to the development and marketing of the ceramic tiles.

The work should produce more than 7.4 million square metres of product in three years. This will help reduce the amount of CRT going into landfill by about 37 000 tonnes.



#### ► DURATION

15 MONTHS

#### ► COORDINATOR

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# ► A GREENER WAY TO HANDLE FREIGHT

# 42

## ECO-STEVEDORING – GREENING THE BUSINESS OF EUROPEAN STEVEDORING COMPANIES

### SUMMARY

The 5 000 stevedoring companies in charge of loading and unloading freight in Europe's ports are mostly SMEs. Although operations can cause major greenhouse gas emissions, waste and excessive use of energy and natural resources, only few companies are greening their business by signing up to EMAS.

The project will use a cluster approach to green the SMEs involved. Innovative software enables companies to have an environmental warning and control system and shows savings and profits.

### RESULTS

15 companies will be involved across the EU at first, followed by 140 more within seven years of the project's end.

Environmental improvements include:

- Reduction of greenhouse emissions by 5 to 40%
- Reduction of resources used by 5 to 40% (chemicals, water, energy)
- Optimised waste management
- 25 to 50% reductions in costs



### ► DURATION

36 MONTHS

### ► COORDINATOR

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# 43

►  
SHAKING THE DUST  
OFF CERAMIC TILES

CFT – A CLEAN CUT OF THE CERAMIC FLOOR TILE

## SUMMARY

Ceramic tiles, when cut, produce dust which turns into mud when the water used to cool the process is added. The dumped mud has an environmental impact and has to be disposed off carefully.

The initiative's objectives are to adopt a dry cycle system by blocking the product in a predetermined fixed position, engraving the cutting guideline and then bombarding the outline ultrasonically in order to cut the tiles.

## RESULTS

Doing so will result in the complete elimination of ceramic mud during cutting and an 85% reduction at the grinding phase, leading to an overall reduction in manufacturing discards of 90%. The consumption of electricity will also be dramatically reduced, the initiative estimates by 98%, and no water will be needed.

But it is not just the environment that stands to benefit, the noise during the production process will be reduced from -3 to -5dB leading to a significant improvement in working conditions.



## ► DURATION

36 MONTHS

## ► COORDINATOR

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# ► REDESIGNING THE MOTORCYCLE

HI-REACH – HIGHLY RECYCLABLE  
INTEGRATED ALUMINIUM CHASSIS COMPOUNDS  
AND PRODUCTION TECHNOLOGY

# 44

## SUMMARY

This initiative sets out a threefold, innovative solution for the production and processing of aluminium chassis parts for the motorcycle industry, which has already been welcomed by Honda Italia.

Whereas current rear suspensions are constructed out of three, independently developed components, partners have produced a prototype in which these are integrated into one compound made of aluminium.

Functional prototypes constructed in non-industrialised manner have proved the technical feasibility of the system and partners are now intending to pursue product certification, business development and market integration.

## RESULTS

The environmental performance of the integrated chassis is a marked improvement on current systems in the following ways: reduced consumption of raw materials, more efficient recycling since the product is made of aluminium, complete recycling of the casting sand cores and the elimination of harmful substances such as binders in the sand dies. The negative impact of welding and chroming are also eliminated.



## ► DURATION

24 MONTHS

## ► COORDINATOR

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# 45

►  
**SWEET MUSIC  
 FROM SUGARBEET**

**PLA OPTICAL DISC – A GREEN OPTICAL STORAGE  
 MEDIUM FOR A GREENER EUROPE**

**SUMMARY**

CD/DVDs are made from polycarbonate, a petroleum based polymer. However, research and development has produced prototypes of biodegradable optical storage media which meet electrical and optical specifications in most parameters.

This initiative sets out to bring a European Green Media Product to market, and promote its associated trademark, in a two year time frame.

A leading European bioplastic company has developed methods to get the product to meet thermal specifications and the present application focuses on final product improvement. CD/DVD producers participating in the project will set up a full production line equipped to produce CDs and DVDs with the new plastic.

**RESULTS**

20% of the production site of the participants shall be converted to the new bioplastics by the end of the project.

It is hoped that the initiative will result in the production and sale of the green product at current market prices.

A viable, biodegradable alternative to polycarbonate discs would reduce CO<sub>2</sub> generation by up to 43% and would also reduce waste processing.



► **DURATION**

24 MONTHS

► **COORDINATOR**

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## ► ECO-FRIENDLY CAR SEATS

GREEN UP – RECYCLING POLYESTER AND LEATHER  
TANNING PROCESSES FOR AUTOMOTIVE  
RECYCLABLE UPHOLSTERY

# 46

### SUMMARY

Greenup aims to develop eco-friendly upholstery products for the automotive industry by reducing waste and by recycling and re-using certain key materials.

The project promises to improve the efficiency of leather production by introducing new cutting and tanning techniques which will reduce wastage and consumption of raw materials. Greenup will also recycle all waste generated by the spinning and weaving of polyester yarn. The 'waste' will then be spun again to produce a 100% recycled yarn.

Greenup will develop 3D textile structures with the recycled yarn which can be applied directly on to upholstery and which can be combined with leather.

### RESULTS

The major outputs and results for the GREENUP project are:

1. To produce the recycled chip in order to reach 100% recycled yarn and fabric matching automotive and upholstery standards.
2. Implementation of a new efficient tanning and cutting process for waste reduction and manufacturing cost minimisation.
3. Reduction of 25% of water and chemical products; reduction of 40-50% fossil resource consumption; reduction of 50-60% of CO<sub>2</sub> emissions (recycled PET).



### ► DURATION

30 MONTHS

### ► COORDINATOR

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**ECO-INNOVATION** |   
WHEN BUSINESS MEETS THE ENVIRONMENT

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