

**COLLABORATIONS FOR A CIRCULAR ECONOMY –
Knowledge Transfer Network**

THE REBus PROJECT – Resource Efficient Business Models

THE POSSE PROJECT – Intelligent Transport Systems

THE IFORE PROJECT – Eco Retrofitting for Social Housing



CONTENTS - *CLICK ON THE LINKS*

[COLLABORATIONS FOR A CIRCULAR ECONOMY -
KNOWLEDGE TRANSFER NETWORK](#)

[DEVELOPING RESOURCE EFFICIENT BUSINESS MODELS \(REBUS\)](#)

[THE POSSE PROJECT – TRAFFIC MANAGEMENT](#)

[THE IFORE PROJECT - ECO-RETROFITTING FOR SOCIAL HOUSING](#)

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European funded projects bring lots of benefits – and not only for the project partners. They leave a legacy of research, case studies and good practice which is freely available to everyone.

We report on three examples in this issue:

- *REBus - the advancement of resource efficient business models.*
- *POSSE - Open Specifications and Standards for Intelligent Transport Systems (ITS) as applied to urban road traffic management.*
- *IFORE - Eco-retrofitting for social housing*

Also we look at the work of the Knowledge Transfer Network (KTN) in helping businesses get their circular economy vision off the ground.

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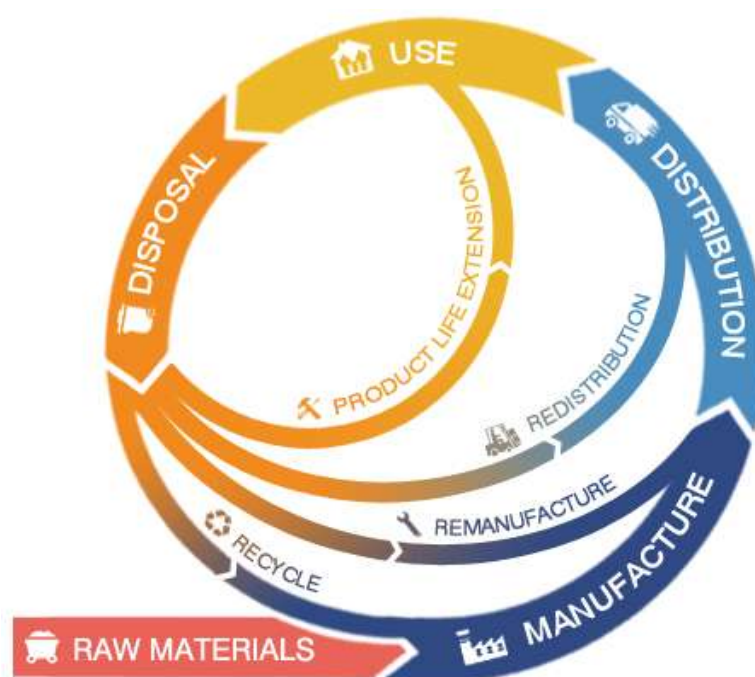
Collaborations for a Circular Economy

By Catherine Joce
Circular Economy Lead at the Knowledge Transfer

The Knowledge Transfer Network's (KTN's) [Collaborations for a Circular Economy Community](#) is building new value networks, identifying the innovation gaps and incubating the new partnerships that will help deliver future generations of circular economy products and services.

Providing free, tailored support to the innovation communities, the KTN is helping businesses get their circular economy vision off the ground. This support often involves supporting businesses developing collaborations and funding proposals.

The Collaborations for a Circular Economy Community



Join the [Collaborations for a Circular Economy Community](#) today to receive:

- Updates on the latest funding available to support business innovation for a circular economy
- News on the latest events
- Online discussion, networking and collaboration building
- Case studies from like-minded businesses

Innovate UK (formerly The Technology Strategy Board) has invested in a series of competitions to help businesses develop circular economy products and services. The first focused on unlocking the potential of design in developing products fit for circular business models.

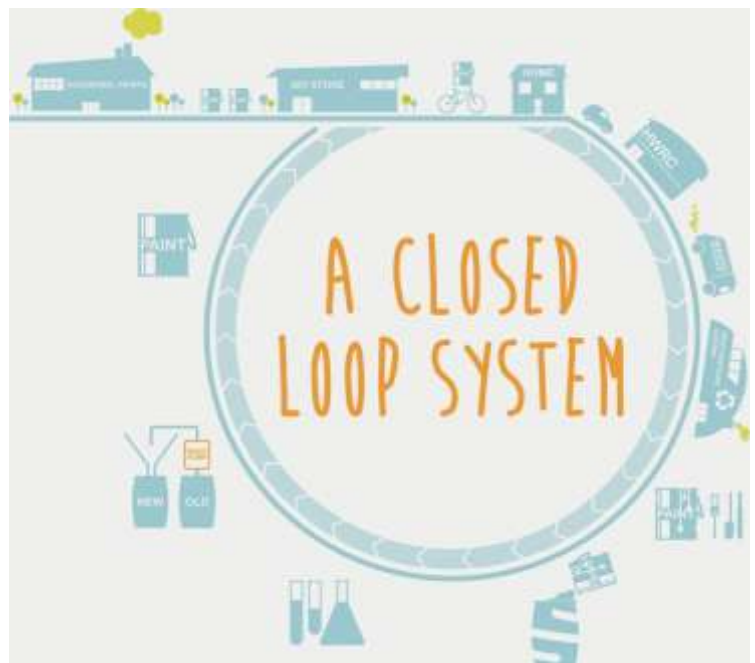
"New Designs for a Circular Economy" funded 40 feasibility studies featuring novel design and business partnerships, supported by the ongoing "[Great Recovery](#)" project. Demonstrating the huge potential for circular business models, businesses won funding to investigate redesign of products ranging from electric vehicle batteries, to powertools to re-usable construction materials.

Case study: New Life from Old Paint - Seymourpowell and AkzoNobel Decorative Paints

337 million litres of paint are sold annually in the UK but 56 million litres of household paint go unused every year. Innovative SMEs such as Newlife Paints in West Sussex and Castle Repaint in Scotland have developed methods to reprocess paint into a quality recycled product with a 50% lower carbon footprint compared to paint manufactured from virgin materials.

A collaboration between Seymourpowell and AkzoNobel Decorative Paints sought to understand the challenges involved in creating a business model for paint preprocessing. Currently only 1% of waste paint gets collected. Technical challenges, such as contamination, design of the tin and poor yield extracting paint from the tin, also need to be overcome. But if successful, the project estimates the potential to unlock a £175M opportunity for the UK alone.

Project Recover has since won further support from Innovate UK in the Supply Chain Innovation towards a Circular Economy competition. Phase two of the project aims to develop technologies to more efficiently extract paint from old, used tins; identify technologies for more effective colour matching of recycled paint; and work with end-customers to design new propositions and business models that help enhance the value and perception of recycled paint.



Case study: Sustainable Retail Design – 4G Design



4G Design won Innovate UK funding to develop prototype retail fixtures, designed for better end-of-life outcomes. 4G demonstrated that intelligent design, combined with informed decisions can deliver products, such as supermarket shelving systems, storage cabinets, signage and display units that are 100% recyclable whilst simultaneously reducing manufacturing costs.

Product design approaches included dematerialisation, reducing the number of parts and introduction of recycled and recyclable materials. Traditional wooden shop cabinets are generally made from MDF or laminate, which almost always goes to landfill.

A prototype cabinet was built entirely from a novel material called Ecosheet™. Ecosheet is manufactured in the UK from 100% recycled rigid plastic and can be recycled in a closed loop process. Apart from its environmental credentials, the material boasts a range of favourable characteristics: it is lightweight, easy to machine and durable.

Critically, the product design and the material characteristics enable the cabinet to be manufactured without traditional metal fixtures, drastically reducing the number of different materials in the product, reducing complexity, cost and facilitating recycling. Each cabinet is fitted with an E-badge, which can be scanned with a smartphone app to access information on the materials contained and deconstruction details, to maximise the product's chance of achieving a good end-of-life outcome.

The New Designs for a Circular Economy competition, in combination with subsequent Innovate UK competitions, Design Challenges for a Circular Economy and Supply Chain Innovation towards a Circular Economy have supported 50 projects with a total value of £6.8M and a potential value generated of £86M for the UK economy.

Innovate UK is continuing support UK businesses in their quest to become more sustainable and profitable with a current competition focused on [Recovering Valuable Materials from Waste](#).

Technical barriers are not the only hurdle for businesses making this transition. Commercial innovation (doing business in new ways) will arguably be even more important and hence Innovate UK is £800k in feasibility studies into the business case for retaining value in durable goods through reuse, remanufacture or leasing/maintenance. The "[Circular Economy: Business Models](#)" competition will be launched on 3rd March 2015 at the [Resource Event](#).

resource

REALISING THE OPPORTUNITIES OF A CIRCULAR ECONOMY

3-5 March 2015, ExCeL London

Resource 2015 combines exhibition, workshop and conference to form the world's largest gathering of circular economy pioneers. As supporters of Resource, Innovate UK and the Knowledge Transfer Network will be providing a range of activities including:

- an interactive circular economy business models mindmap exercise
- partner searching on the networking wall
- scheduling of 1:1 meetings with Resource delegates
- advice and support from the KTN team
- a series of SME speakers on the 'SME soapbox'
- workshops for potential competition applicants.

Register for free to attend Resource: www.resource-event.com

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Developing Resource Efficient Business Models (*REBus*)

The REBus project brings together a unique partnership of expertise and knowledge to enable the advancement of resource efficient business models. REBus is led by WRAP, working in partnership with Rijkswaterstaat (Dutch Ministry of Infrastructure & Environment), Aldersgate Group, the Knowledge Transfer Network Ltd (KTN) and the University of Northampton.

REBus has secured €3.1m funding from the European Commission's LIFE+ fund, UK governments and project partners.



The REBus project will be holding a workshop at the Resource 2015 event at the Excel Centre: 3rd March

www.resource-event.com

Join the REBus workshop to hear from businesses that have already started their journey towards a more circular business model; hear of their successes and challenges and our lessons learnt so far from our EU Life + project; learn more about the next steps, tools and guidance that is available. We have already recruited 20 companies to start their very own

journey. WRAP (the lead organisation for REBus) will have a stand at Resource where you can find someone to talk about REBus too if you miss the workshop.

Business concerns about energy costs and material security and scarcity issues are commonplace and rising. The concept and value of a 'circular economy' is likewise becoming more well known and gaining traction with major organisations across the world.

Re-defining, developing or creating resource efficient and commercially attractive business models can help businesses to manage these issues, take advantage of opportunities afforded by resource efficiency and a 'circular economy' and address future supply chain risks. REBMs can also transform a business's relationships with its customers and supply chain.

REBus is a collaborative European programme that will demonstrate how businesses and their supply chains can implement resource efficient business models (REBMs). The programme brings together some of the leading resource efficiency experts and networks in the UK and Europe and provides fully funded, commercially confidential support to both large and small businesses.

1. What are our aspirations?

The overall aim of the REBus programme is to make a significant contribution towards two key European Union resource efficiency indicators and targets, namely a 30% reduction in domestic material use by 2020 and a 20% reduction in greenhouse gas emissions.

Our specific focus is to help participant businesses to achieving significant reductions in resource use along with the following cumulative benefits per annum:

- 5 k tonnes direct material savings per annum
- 20 k tonnes of GHG emissions savings
- €12 million financial benefit

2. What are REBMs?

Resource Efficient Business Models (REBMs) encompass a broad range of innovative approaches that provide products and services in ways that substantially reduce the overall amount of materials required compared to how these goods are typically provided. These approaches enable more use and more value to be earned from each product by using commercially attractive ways to extend the life of products and recover products for re-use. Examples include:

- **Extending Product Life** - Meeting consumer expectations for domestic appliances and clothing through design, guarantees and repair services.
- **Asset Management** - Replacing the traditional 'buy-use-dispose' approach, with a model of redeployment, refurbishment and repair where commercially viable.
- **Providing products as services** - For example, renting a set of tools needed for a complete DIY projects alongside the sale of materials, or selling performance (e.g. lighting output, engine performance) rather than product.
- **Buy-back for re-sale** - Introducing opportunities for consumers to trade in unwanted electronics and fashion clothing after an agreed period, enabling re-sale into other markets.



3. Pilot projects with businesses we are supporting

The REBus programme provides fully funded support to both large and small businesses across (10 large and 20 SME organisations).

Key sectors supported are electrical and electronic products, clothing, furniture and construction products.

Participant organisations benefit from a range of expert support, including the development of a detailed business case, which consider:

- Market analysis and customer appraisal.
- Development of REBM concept and offering.
- How a REBM will be implemented.
- Financial analysis and development of key performance indicators.

Support is provided to evaluate business impacts and to disseminate and promote the findings.



See www.rebus.eu.com for 19 major companies/ organisations with whom we are working on pilot projects. Details are provided on the outcomes.

4. Why take part?

The benefits for participating companies are anticipated to include:

- Developing efficient, resilient, profitable business models
- Developing new markets and new products
- Reducing supply chain risks
- Realising more turnover per tonne of material
- Reduced risk by developing a bespoke commercial case for your business
- Reduced dependency on physical resources
- Positioning as an industry leader in the development and adoption of resource efficient business models.

To sign up for the REBus newsletter – bottom of the REBus home page: www.rebus.eu.com

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THE POSSE PROJECT – TRAFFIC MANAGEMENT

Promotion of Open Specifications and Standards in Europe

POSSE has developed good practice guidelines covering the processes and considerations required for the definition and implementation of open ITS systems specifications and standards, drawing on lessons learnt and tips from two existing Open Specification frameworks, namely UTMC and OCIT/OTS.

ITS covers a wide range of systems and services and the communications between them which are available to the network manager. Examples can vary from traffic signal controllers, roadside variable message signs and CCTV through to open data services for real time data.

There are two principal ways in which technical standards can be developed. One (“de jure”) is through formal, statutory Standards Delivery Organisations (SDOs), operating nationally or internationally (eg CEN). This approach is robust but can be time-consuming. Another (“de facto”) is through more informal processes, for example under the control of an industry association. This approach is less robust but may be quicker and cheaper.



As the term “standard” is sometimes reserved for those published by SDOs, the phrase “Open Specification” is often used to cover the broader sense of de facto, industry-developed protocols. POSSE technical partners make use of both. In the UK, the UTMC initiative has strong input from industry and can therefore make effective use of de facto standardisation. Within the German OTS-Initiative, the OCA involves mainly the public sector, and focuses more strongly on de jure standards.

The POSSE project has undertaken a range of activities to facilitate the exchange and sharing of knowledge and experience on how to develop, implement and maintain Open Specifications and Standards for Intelligent Transport Systems (ITS) as applied to urban road traffic management.

POSSE has 10 project partners and is led by UK's [Reading Borough Council](#)

POSSE is a 3 year INTERREG IVC funded knowledge-transfer project which commenced in January 2012.

What are the benefits of Open Specifications and Standards?

Benefits accrue for the customer (i.e. transport authority), the supplier (i.e. industry), as well as the road user. But there are also challenges for all.

Most users agree that the main rationale behind UTMC and OCIT/OTS of creating a mixed vendor environment and reducing costs have been beneficial. However, in addition they also point to a number of other benefits including:



- more efficient traffic operations,
- simplified procurement,
- improved customer supplier relations, and
- future proofing investments.

It should be highlighted that not all benefits have been experienced by both UTMC and OCIT/OTS. This is mainly due to the different starting points, driving forces and market culture behind the respective initiatives.

Promoting innovation

- Open systems can open up opportunities for the market to grow and for new players to enter the market with innovative products and new business areas.
- An open systems framework provides a simple structure for the addition of new technology.
- By working together, local authorities can create enough market pull to drive industry developments, which is not achievable alone, except in the case of very large authorities.

More efficient traffic operations

Open Specifications and Standards allow a better integration of ITS which enable:

- A more holistic view of the traffic situation,
- A greater use of automatic responses during key events (concerts, football matches etc),
- A better understanding of how systems work together and how to resolve problems as they occur (introduction of distributed systems, avoidance of traffic information silos, etc), and
- Greater flexibility in terms of mixing and matching solutions.

Cost reductions

The impact of adopting open standards has been measured in financial terms within the OCIT/OTS community. A reduction in the cost of buying traffic signals of up to 80% has been recorded in the beginning in recent years. Typical savings are up to around 40%.



Within the UTMC community, savings on capital investments and annual revenue costs have been estimated as follows:

- Capital investment saving per authority for establishment of the core regional UTMC system is in the region of 30%,
- Ongoing annual revenue saving per authority for maintenance of a UTMC system of around 40%, and
- Potential staff saving for operations in the region of 1.5-3.5 persons.

Simplified and structured procurement

- The technical specifications are open and readily available for use in procurement, which can simplify greatly the tendering procedures.
- Tendering procedures are common to all; therefore, an authority can, with approval, use another authority's specifications and tendering document.

Greater marketplace stability and investment safeguards

- Open interfaces support the future proofing of systems and overcome the risk of legacy systems for the traffic authorities.
- Integrating products into client systems is easier as well as upgrading existing compliant products.
- The risks in deployment and integration have lowered significantly for suppliers.

Better customer-supplier relationship

- Traffic managers know what is technically reasonable and available and can better articulate the solutions sought from industry.
- Industry has a better understanding of the traffic managers' needs.
- Clarity of technical requirements helps dialogue between buyer and suppliers – they can talk the same language in procurement specifications.

There were two good practice partners in the project – OCA and UTMC. OCA is a voluntary organisation of local authorities from Germany, Austria and Switzerland with the aim of promoting the use of Open Specifications and Standards for public procurements. It has contributed to the development of the OCIT standard and has facilitated the development of new standards (OTS).

UTMC is a UK-based initiative which has developed an open technical framework for traffic and transport management systems. It is managed by a publicly-owned, non-profit company, UTMC Ltd, and driven by a community group (the "UTMC Development Group", UDG) which represents local and national highways authorities, systems suppliers, and central Government.

Other partners were Reading Borough Council (Lead UK), Burgos (Spain) Municipality of Klaipeda (Lithuania), CDV (Czech Transport Research Centre), La Spezia Municipality (Italy), NPRA (Norwegian Public Roads Administration), Pisa (Italy) and Polis network of European Cities,

"We have found that the opportunity to exchange knowledge between project partners with a very wide range of ITS systems, experiences and challenges has been very beneficial to all parties. Not only has it benefited the transfer sites but has also given ideas to the good practice initiatives on how they could develop in the future."

Simon Beasley, Network Manager

Case studies, good practice guidance and the final project report are all available on the website:

<http://www.posse-openits.eu/>



THE IFORE PROJECT

Eco-retrofitting for social housing



IFORE has been searching for the most efficient low-carbon methods by trialling different systems in 100 homes at Rushenden on the Isle of Sheppey, and in houses at Outreau near Boulogne on the northern coast of France. The houses have been retrofitted and then monitored to measure their relative energy consumption before and after the interventions.

The study has investigated householders' interaction with the technologies and involvement with the process. The importance of engaging with these behavioural aspects has been a major outcome of the project.

This large-scale study has paved the way for the introduction, and industrialisation, of low carbon solutions, it is guiding the future retrofit of 10,000 dwellings, out of a total of 66,000 homes for both housing associations at the project's completion.

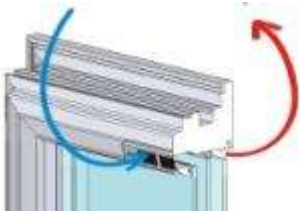
IFORE has been something of a pathfinder, bridging the gap between the one-off retrofits of a few years ago and the hoped-for transformation of Europe's stock of housing.

"What is apparent from IFORE is that changing the behaviour of the residents is very important and is the key to being able to achieve the 80% carbon reduction which is our joint commitment. Getting residents involved and committed to a 'green' ethos saves a great deal of money for a social housing provider."
Mike McEvoy, Project Leader, Professor at the University of Brighton

The Anglo French IFORE project, launched in July 2010, was developed by four partner organisations : two housing associations, Pas-de-Calais habitat (based in Arras, France) and AmicusHorizon (Kent), and two universities: lead partner, University of Brighton and Université d'Artois in Béthune.

The aim of this programme is to incorporate technologies within social housing in France and the UK that will quarter energy consumption. The €6.3 million project is 50% funded by the Interreg IVA ERDF (European Regional Development

The aim of the project was to see improvements in household fuel bills, and the reduction of fuel poverty throughout the community not just at the level of individual households. Social activities, reaching otherwise 'hard to reach' households has formed an important part of this strategy so residents have attended trade fairs, and a variety of information meetings and environmental workshops, entailing trips across the Channel.



The important issue of ventilation is particular shared interest of the academic teams. Making houses more air-tight to cut down on draughts and wasted energy is a conventional approach for retrofit projects. Too often however this results in poor indoor air quality with implications for condensation, mould growth and the health of occupants. The technology of 'supply air' windows has been researched by both universities and is an example of the innovative approaches that have emerged from IFORE.

Also, the Université d'Artois has long experience in the design and analysis of 'trombe walls' - a passive solar technology that provides free heat to homes. As a result a trombe wall has been built and is currently under test at Manor Close in Rushenden.

Working with local partners has had a positive impact on the local economy. At both Outreau and Rushenden retrofitting the housing stock has been an opportunity for a boost to the local economy and through the involvement of local enterprises to generate employment.

The Anglo-French dimension has been important in making the project special for the residents, and thereby increasing its impact in the long-term. As one resident from Rushenden who made an exchange trip to France observed:



'I think both communities have a lot to learn from each other. The shared experiences have been fantastic for French/English relationships. The exchange of ideas and working toward one goal of saving energy has been a very positive experience'



The FINAL REPORT for the project has now been published and is available on the project website along with other academic and technical reports:

<http://www.ifore.eu/>



