



## ABOUT ETRA

ETRA, the European Tyre Recycling Association, is the *only* European organisation devoted *exclusively* to tyre recycling. Membership reflects both the public and private sectors involved in environmentally sound tyre management and valorisation. Policy and decision makers as well as those charged with organising and connecting the links in the valorisation chain are represented.

With a focus on material recycling, ETRA members include those who process tyres into standardised materials or use them in an expanding array of applications and products. Support industries eg., collectors, equipment manufacturers, research / training institutions, product developers, governments, NGOs, investors, etc., are also members

As the industry has matured ETRA has worked with members, material users, research bodies and related industries to develop innovative new technologies, materials and products that meet the needs of current and evolving markets.

Since 2013 ETRA has worked with many organisations to introduce and train new professional audiences and familiarise them with the range of benefits from recycled tyre materials, products and applications. In 2014 ETRA joined forces with ANTEL Italy to offer training for municipal engineers via a day-long training seminar in Turin with a follow-up with a session in Venice in 2015. In 2015 ETRA initiated two new relationships: the first with ASTM focusing on pyrolysis and devulcanisation; and the second with the UK Institute of Mechanical Engineering, Transport and Manufacturing sector. It is anticipated that these relationships will help to broaden the base of professionals who use and recommend recycled tyre materials

Recognised by the European Commission and Parliament, ETRA assisted in the Recycling Forum and dialogues on the Thematic Strategy for the prevention and recycling of waste. ETRA was a speaker at the 2006 Parliamentary hearings on Waste Management Policy, and again in January 2008. ETRA contributed to the UN (UNEP) Basel Convention 'Guidelines for the identification and management of used tyres' and participates in missions for the UNOPS.

ETRA works closely with member companies, industries and affiliated organisations to develop innovative concepts into viable, commercialisable projects. Participation takes many forms, from management and operations, to the development of technologies, materials, products and applications. ETRA, ETRA Vice Presidents, and members are currently participating in over twenty projects supported under EU funding schemes, New projects are being developed for funding under Horizon 2020, PIC and other schemes.

## NETWORKING AND DEVELOPMENT

The European thrust towards sustainability and resource efficiency has increasingly focused on the contributions attainable from expanded and improved material recycling. The results are evident in the cost-effectiveness, reduction in carbon emissions and energy usage, as well as the enhanced performance of output materials. Recent tyre recycling innovations have led to the vast expansion of the variety of materials and products available, and the sectors that can be served.

Today, the most basic recycling treatments provide viable outputs of all three of the principal material groups : rubber, steel and textile. More sophisticated, multi-treatment processing has begun to result in new materials that effectively replace a broad range of virgin resources required by diverse markets.

Throughout 2013, ETRA worked closely with three key industry sectors to assess materials, products and applications that are currently used, and to identify others which have the potential to be produced with recycled tyre outputs. With an inventory in hand, product descriptions and use-mapping are being prepared.

In 2014 ETRA launched a new effort to increase opportunities for member companies to network with a range of different sectors - the **Industry to Industry – Business to Business** programme that will provide opportunities to expand awareness and exposure to recycled tyre materials. The initial sectors involved in the programme are : Surface Transport, Sports and Leisure Infrastructure Management, and Alternative Materials, with an on-going focus on Pyrolysis.

In 2015 the initiative has expanded to highlight new and on-going relationships with support programmes and professional organisations. These efforts include the EU EASME, KIC, ASTM, UK Institute of Engineers, Elastopole (France), among others.

The Conference programme is divided into both plenary and break-out sessions to accommodate general presentations as well as focused discussions on issues surrounding a particular sector. The objectives of the programme are : to offer updated information about the activities of the sector today, within and outside of the EU; to provide opportunities for colleagues to meet and to network in informal settings ; to stimulate exchanges of experience and expertise; and to explore potential prospects to work together in a variety research, development, commercial and sectoral activities. We look forward to receiving your feedback about the programme, speakers and activities.

# Smart Management Meeting



**Wednesday 25 March 2015**

The SMART Project was designed to explore the means to optimise the Compression Molding process in order to produce articles and products that use only recycled tyre rubber granulate and powders without binding agents or other additives. A primary outcome of the project is the production of a range of large rubber products by granulating post-consumer tyres and moulding the resulting granulate and powders without the addition of linking agents or virgin rubbers. Ten partner companies and organisations based in seven EU Member States are cooperating over a thirty-six month period (expanded by two months to thirty-eight months) to achieve the project goals. Although the session is open only to project partners, a summary will be made during the Plenary Sessions of the Conference.

## The Programme

### 10.00 Welcome and Introductions

Project Status Overview

Current results

Objectives for post –project period

### 10.30 Exploitation Workshop : Plans for the Consortium

Plans for each SME beneficiary (10 minutes max.)

Tebamix : Wieslaw Wasniowski

GRP : Tomislav Oskorus

ADRIA : Ettore Musacchi

Plans for each Association beneficiary : (10 minutes max)

IASLIM : Joze Jensterle

ND : Hroar Braathen

BPF : Tim Marsden

ETRA : Ettore Musacchi

### 11.30 Future exploitation possibilities

IPRs protection plan

Exploitation of the press equipment (during and beyond the project)

IPRs management : patentable results ?

Training

### 12.00 Informal Discussion

### 13.00 Lunch

Plan for the final activities (April - June 2015)

Follow-up of the project

Contacts

### 13.45 Other business

### 14.00 End of the Meeting

### 18.30 Cocktail Reception followed by Gala Dinner

22nd Annual

# ETRA Conference

## Programme

### THURSDAY 26 March 2015

08.30 Registration and Welcome coffee

09.00 Introduction and Opening Comments

Valerie L. Shulman, Ph.D., ETRA

The 22<sup>nd</sup> ETRA Conference focuses on three principal factors that create the context for successful tyre recycling : accurate data collection and interpretation; focused research, market development and expansion activities; a cadre of trained professionals aware of the benefits and sustainability of the products. In recent years, source identification has become more directed and precise, new materials have been introduced in substitution of virgin resources and used in more sustainable products and applications, and broader professional audiences have become involved. Great strides have been made within the EU – often due to innovations supported under various funding schemes. However, as tyre recycling assumes its role within the global economy, new model have begun to emerge – and are now open to review.

The Conference Programme will be presented in three parts in plenary and breakout sessions. Part I :The context ; Part II : Market Development ; Part III : New Opportunities.

**Dr. Valerie L. Shulman, Ph.D.**, served as Secretary General of ETRA for twenty years. She began to study tyre recycling in the EU in 1989, and developed the Tyre Recycling Project in 1992 which, after initial EU funding, became the nucleus of ETRA. A contributor to the preparation and presentation of the Basel Convention Guidelines on used tyres, she participated in the EU Recycling Forum representing Tyre Recycling. In 2006 she presented at the Waste Policy hearings in Parliament and spoke again in 2008 on the needs of recyclers in a recycling society. She represents European tyre recycling at EU and international conferences. She has published more than 100 articles in EU and international journals, and written or edited more than 10 books on the subject. She has been a delegate in both UNEP and UNOPS on-site missions.

09.15 Keynote address

The SME instruments of Horizon 2020

Dr. Marco Cecchetto, EU EASME

Horizon 2020 is the 8<sup>th</sup> Framework, which will increasingly concentrate efforts on SMEs, innovation and commercialisation. The 80 billion Euro programme over seven years, is the largest publicly funded initiative worldwide and is focused directly to demonstrations and commercialisations of innovative technologies, applications, etc. Horizon 2020 is the financial instrument that is designed to implement the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Dr. Cecchetto will explore some of the relevant opportunities available.

**Dr. Marco Cecchetto** graduated from the Università Degli Studi Di Padova and after a career in the companies AIR LIQUIDE ITALIA (Technical support), Centro Studi Sui Sistemi Di Trasporto (Transport Planner) and Società Delle Autostrade Di Venezia e Padova (Head of sector). Dr. Cecchetto joined the European Commission In Brussels in June 2009. Dr. Cecchetto currently holds the position of Project Manager at the Executive Agency for Small and Medium-Sized Enterprises (EASME) and Executive Agency for Competitiveness and Innovation (EACI)

09.45 Questions and discussion

10.00 Coffee break

## Part I : The Context – Quantifying ELT Arisings

10.15	The EU Conundrum	Peter Taylor, OBE, TRA UK, Chair
10.35	Quantifying EU Arisings data	Neil Hendry, Giti Tyres UK
11.00	Revising expectations in Spain	Ir. Andres Macho Jimenez, Environment Ministry
11.25	ELT and Sustainability in Melbourne	Liam O’Keefe, Project Lead
11.45	REDISIA – A New Concept for South Africa	Hermann Erdmann, CEO Redisa Dr. Chris Crozier Redisa
12.45	Questions and Discussion	

The most crucial element in creating a viable collection and valorisation system for post-consumer tyres is the accurate quantification of the arisings data. Although today, many systems within and outside of the EU appear to rely upon broad ‘guestimates’, others have explored more sophisticated methods to accurately define the problem in order to ensure that there are sufficient tyres available to meet valorisation commitments. The discussions will focus on how management bodies have developed unique systems that reflect national patterns of use and disposal.

**Peter Taylor OBE**, is Director of the Imported Tyre Manufacturers' Association and Secretary General of the TRA. He also sits on the UK’s Government / Industry Scrap Tyre Working Group. He is also co-innovator of the Gulf-Club which brings together EU and North American firms with their counterparts in the Mid-East. In his thirty years of experience in both the domestic and international tyre industry, he has faced up to many diverse market situations and problems which in retrospect he believes were mostly opportunities in the making.

**Neil Hendry** is Commercial Strategy Director for Giti Tire in Europe. He returned to the tyre industry in 2013, having spent the preceding decade in a directorial capacity with some of Europe’s leading business information companies – with his primary focus on assisting major FMCG firms on their distribution and digital transformation strategies. Prior to this, he held a number of senior marketing and corporate development roles for Michelin in Asia. His presentation will provide an overview of the changing size and shape of the European new tyre market, allowing us to contextualise the opportunities for tyre recycling in Europe beyond 2015.

**Ir. Andrés Macho Jimenez** has been the Technical Adviser in the Spanish Ministry of Environment, Coordinator of the National Plan for Post-Consumer Tyres, and the implementation of the Waste Information System since 2001. He was instrumental in developing and implementing the Spanish Road Standard, which is based upon ETRA’s CEN Work shop Agreement. From 1990 to 2001 he was a civil and environmental engineer developing projects for the Spanish Administration of Public Works and the European Commission.

**Liam O’Keefe** coordinates Australian and Victorian government tyre related product stewardship activities in his role as the Tyres Project Lead for the Victorian Government statutory authority, Sustainability Victoria. He actively works with the recently formed Tyre Stewardship Australia to facilitate a collaborative approach between government and industry to foster the development of more viable markets for end of life tyres in Australia. Based in Melbourne, previous to working in government on tyres, Liam has ran his own sustainability consulting company for 8 years and lectured at RMIT University in Sustainability and Media and Communications.

**Hermann Erdmann**, CEO of REDISA NPC, is an entrepreneur with extensive experience in manufacturing and retailing, having served on a number of industry related boards. His interest in sustainable leadership, drive for senior management to focus on environmental sustainability as part of a company’s strategy, and passion for transformation and empowerment of the previously disadvantaged, resulted in the establishment of REDISA and development of the first approved Integrated Industry Waste Management Plan. For nine years he owned Wadeville Tyres Ltd and Erdmann Property Holdings Ltd, but gave up all other business interests to avoid potential conflict of interest with REDISA and implementation of the Integrated Industry Waste Management Plan. In the past, he was Group Managing Director and Shareholder of Supreme Industrial Holdings, as well as Marketing Manager at Kreepy Krauly South Africa.

**Dr. Chris Crozier** is CEO of Kusaga Taka Consulting which performs the operational and administrative functions under contract to REDISA to execute the Waste Tyre Management Plan. During his long career, he was Deputy CEO and Chief Technology Officer of Garmin Distribution Africa and Garmap, (which shared a management team), GDA is the exclusive distributor for South Africa of Garmin GPS devices (except aviation). He was Director and co-founder of

Cirrus Techvue a specialist software company involved in electronic messaging, emergency notification systems and secure payment processing; consultant to Cameo Group for strategic communications, marketing, etc., as well as Technical Director and co-founder of Venture Computer (Lexmark South Africa). He managed a team at the Chamber of Mines Research Laboratories investigating methods of monitoring micro-seismic events to help predict rock bursts.

13.00 LUNCH

## Part II : The Future – Market Development

14.00 The Knowledge Innovation Community on Raw Materials

Dr. Dario della Sala. ENEA

**Dr. Dario Della Sala** graduated from “La sapienza” in Rome in 1983 joining Eniricerche S.p.A. (ENI) in 1987 and ENEA, (Italian National Agency for New Technologies, Environment and Sustainable Economic Development) in 1990 where he became Head of Laboratory and Head of Project in the Research Centres of Naples and Rome, committed to develop semiconductor-based device technologies, laboratories and equipment for solar cells, sensor, organic-LEDs, culminated with the foundation of the public-private laboratory “TRIPODE” in Naples. He is in charge of coordinating the Strategic Project Management from materials technologies and fostered the creation of the Italian Community for raw materials and related actions with relevant national organisations (Union camere, Confindustria, Alliance for Materials-Italy) and is on the board of CAMPEC (R&D consortium for development of polymer applications) and the Regional Centre of Competence on new technologies in Campania. He is Council Member of the Italian Association for Industrial Research.

KIC – Knowledge Innovation Community – is an EU initiative that, in this instance, focuses on raw materials, their production, and recycling. A crucial benefit of KIC is that it brings together a broad array of service providers from critical sectors including education, technology, research, business and entrepreneurship – which carries with it – investment potential. Together these sectors can create new businesses with cadres of trained personnel – available to implement new ideas and technologies to provide a sustainable flow of materials and products – at viable profit margins.

### 14.30 – 16.00 International standards, competitiveness, new technologies

Facilitating the system

Dr. Claude Janin, Chair

ASTM International : Helping the world work better

Dr. Sara Gobbi, Dr. Joe Koury, ASTM

ELASTOPOLE : Rubber and polymers Cluster

Ing. Antoine Hubault, Elastapole

Expanding Engineering Opportunities

Mir. Philippa Oldham, UK Institute of Engineers

Questions and Discussion

As markets have become increasingly global, the quality and consistency of materials, products and applications and the technologies that produce them have also become crucially important. Today, international standards and opportunities for competitiveness are the aim of material producers, manufacturers and consumers. Professional preparation and training are essential to taking advantage of new opportunities.

**Dr. Claude Janin** focused his doctoral research on the polymerisation and the properties of the ladder polyphenylsiloxane. He joined Michelin in 1972 where he was responsible for research, development and industrialisation of synthetic rubber from 1983 until 1992. He became Director of Research, Development and Industrialisation for Tire materials of the Michelin Group until his retirement in 2007. He is currently Scientific Advisor for Laboratoire de Recherche et de Control des Caoutchoucs et Plastiques (LRCCP and President of the Scientific Council of French Competitivity Pole ELASTOPOLE. IISRP is an international not-for-profit trade association with over 50 corporate members domiciled in 21 countries, who produce 80percent of the world's supply of synthetic rubber. Incorporated in 1960 and headquartered in Houston, Texas, the Institute supports regional offices in Milan, Tokyo and Beijing.

**Dr. Sara Gobbi**, Director of EU AFFAIRS with ASTM International in Brussels, is an attorney educated in Paris and Milano, after which she joined SACCHI CONSULTING as lawyer associate. In 2010, she joined NORMAPME as Standardisation Project Manager and in January 2013 she was appointed Director of EU Affairs, ASTM International in Brussels. ASTM International was formerly known as the American Society for Testing Materials (ASTM). It is a globally recognized leader in the development and delivery of international voluntary consensus standards .Today, 12,000 ASTM standards are used around the world to improve product quality, enhance safety, facilitate market access and trade, and build consumer confidence .

**Dr Joe Koury** is Manager of Standards Development at ASTM INTERNATIONAL. In 1998 he joined Fernley and Fernley as Communication Director and was appointed Manager of Standards Development in 2002. He is Manager of 10 Technical Committees which develop international voluntary consensus standards, particularly committee D24 (carbon black), D11(rubber) and E 28 (mechanical testing). He is also Acting liaison between technical committee members and various government agencies, associations and other standards working closely with government regulators and law makers to enforce the continued use of ASTM standards as well as responsible for internal projects to increase efficiency of operations and improve services to the Society's members

**Ing. Antoine Hubault** joined ELASTOPÔLE, the French Rubber and Polymer Competitiveness Cluster, in 2013 after a short experience of entrepreneurship in software innovation consultancy. Graduated with two Master degrees in Competitiveness Intelligence and International Relations of Lyon 3 University, he is in charge of information survey, international relations and specially European actions, and communication manager for the Cluster. He is based at cluster headquarters in Orléans, France.

**Ir. Philippa Oldham** CEng MIMechE, is Head of Transport and Manufacturing at the Institution of Mechanical Engineering and a Chartered Mechanical Engineer with a background working within the defence, aerospace and automotive sectors. She has a full understanding of the importance of Research and Development and New Product Introduction. She joined the Institution in May 2011 as Head of Transport and Manufacturing. Acting as a voice for the Institution on behalf of their 105,000 international members, she aims to help raise the profile of engineers so that they can develop safe and efficient transport systems with less congestion and emissions, while creating employment within our manufacturing sector. Policy statements and reports include Life Cycle Analysis, Manufacturing a successful economy, Intelligent Transport, Intelligent Society and Energy options for our transport modes and Women in Engineering.

**16.00 Coffee break**

## **16.15 – 18.15 New Opportunities for concrete and aggregates**

**An Introduction to Anagennisi**

**Dr. Kypros Pilakoutas, Univ. of Sheffield**

**Tyre rubber in concrete**

**Dr. Panos Papastergiou, Univ. of Sheffield**

**Tyre steel in concrete**

**Dr. Harris Angelakopoulos, Twincon Ltd**

**Tyre polymer fibers in concrete**

**Dr. Martina Pezer, Univ. Zagreb**

**Dr. Ana Baricevic, Univ. Zagreb**

**Neoballast : a product for the future**

**Ir. Valenti Fontseré, COMSA**

**RTR in cementitious composites**

**Ir. Gregorio Ossola, Univ. College, London**

**Questions and Discussion**

Anagennisi illustrates the extent to which post-consumer tyres can be valorised into three separate material streams, reducing reliance upon virgin resources. The traditional recycled tyre rubber material is demonstrated as a concrete additive for a variety of products and applications. Recycled rubber is also used as a coating material, in this instance, for aggregates. Formatted tyre steel (wire) is used as a replacement for vast quantities of virgin and or recycled steel from other sources. Fibres are also an evolving market. Together – the valorisation of these three materials reduce not only material costs, but the energy used in production.

**Prof. Kypros Pilakoutas** is a leading expert in construction innovation and the Manager of the Concrete and Centre for Cement and Concrete at the USFD. He has over 20 years of research experience in structural concrete, concrete reinforcements, repair, analysis and design, experimental techniques. He has published over 200 referred papers and co-authored one book. As co-ordinator or primary investigator, he has participated in national, European and international research projects in excess of €12M and has over 20 patents for concrete reinforcements. He is a member of national, EU and international committees on structural concrete. His expertise is recognised internationally and he is regularly invited as keynote speaker. He has been involved in several strategic panels, including the European Construction Forum (Platform), CEN/Star/ Norbuild and International Research on Advanced Composites in Construction.

**Dr. Panos Papastergiou** (structural concrete, experimental techniques, fibre-reinforced concrete and advanced composites) has 10 years of highly relevant research experience to this project. This has included work on advanced composites, sprayed concrete reinforced with steel cord fibres derived from post-consumer tyres, a laboratory study

on roller compacted concrete reinforced with steel industrial and recycled fibres under the Ecolanes project, and most recently, undertaking extensive testing and data processing on flexural testing on fibre reinforced concrete using both industrial and recycled tyre steel fibres.

**Dr. Harris Angelakopoulos** has 7 years of research experience in the broad area structural concrete, experimental techniques, fibre-reinforced concrete and sustainability. He has been involved in several national and international network groups and collaborative projects. He has research experience in diverse thematic areas ranging from Fibre Reinforced Polymers in concrete (Encore EU research project) to Fibre Reinforced Concrete (EcoLanes EU STREP project) and tyre wire in concrete (Twincletoes EU Eco-innovation project). He is the recipient of a 3 year Marie-Curie research fellowship and a prize from the Royal Academy of Engineering on urban regeneration. Currently he is the manager of the Twincletoes project.

**Dr. Ana Baricevic** is a researcher and teaching assistant at Department of Materials on Faculty of Civil Engineering University of Zagreb where she received a PhD in 2014 in Materials Science. Her research interests include sustainable concrete technologies, especially waste materials, fibre reinforced concrete, durability of materials and destructive and non-destructive testing methods of construction materials. She was actively involved in FP6 STREP – ARCHES, CIP Eco-innovation 2010 : RUCONBAR, Development of New Materials and Concrete Structure Protection Systems, Croatia Slab track system – ECOTRACK and Self-compacting concrete, and ANAGENISIS.

**Martina Pezer** is a PhD candidate and teaching assistant at Department of Materials on Faculty of Civil Engineering University of Zagreb from which she graduated in 2012. Her research is in the fields of construction materials, fibre reinforced concrete, waste management and sustainability. She is actively involved in implementation of FP7 project Innovative Reuse of all Tyre Components In Concrete – Anagennisis.

**Ir. Valenti Fontserè**, is an engineer who from 2002 is the Technical and R&D Director at COMSA-EMTE, a leading Spanish Group working in the Civil Engineering and building sector. He is Member of the EFRTC (European Federation of European Trackworks Contractors), and a Member of the CEN Working Group developing the EN14.969 standard – Qualification of Trackworks Contractors. He participated in FP-7 UE funded R&D railways projects Inno-Track and Urbantrack and ECO-Innovation project Ecotrack. He is currently involved in other UE funded railway projects (FP 7: *Mainline, Maxbe and CAPACITY4Rail*; LIFE+ call: *GAIN*; H2020: *IN2Rail*). He contributed to the book “Slab track versus Ballasted Track. Technical&Economical criteria” Aula Carlos Roa, Madrid (2007).

**Ir. Gregorio Ossola** is currently completing a PhD in the department of Mechanical Engineering at University College London (UCL). For the past five years has worked in the field of material science, with particular focus on rubber-cement composites. He is involved with identifying techniques to modify rubber compounds for use in cementitious mixtures and is investigating novel surface treatment methods to achieve an effective compound from incorporating recycled tyre rubber into cement. The current research suggests that via two subsequent surface treatments, the tyre rubber may be incorporated within cement with minimal reduction in the mechanical properties of the resulting composite, ultimately leading to the possibility of utilising the composite for structural purposes in the constructing industry.

18.30 Cocktail

## FRIDAY 27 March 2015

08.30 Registration

09.00 Opening comments

### Part III : New Opportunities

#### 9.15 – 11.15 Opportunities in the Urban environment

Chair

The Public Administration Market

Opportunities in the Urban environment

Innovative and Sustainable Road Pavements

Rubber in roofing and pavements

#### Breakout Session A

Dott. Ettore Musacchi, A.D.R.I.A.

Geom. Bruno Marabotto, City of Turin

Ir. Andres Macho Jimenez, Env Ministry Spain

Ing. Marco Benso, City of Turin

Dr. Davide Lo Presti, Univ. Nottingham

**Rubberised concrete : partial rubber coating**

**Dr. Nelson Flores Medina, Univ. Poli. Madrid**

**Noise barriers using recycled rubber**

**Dr. Jose Sanchez Dehesa, Univ. Poli. Valencia**

**A broader view**

**Dr. Serji Amirkhanian, the World**

**Questions and Discussion**

**Ewan Scott, UK**

The urban environment opens many market opportunities for the tyre recycling industries. Central cities with their school yards, parks and playgrounds. Bridges, tunnels and tollways within cities, as well as their entry ramps (and exits) used to escape. The urban environment has become a vast market for recycled tyre materials because of their performance – which meet the needs of a bustling urban center. Transport – means roads, rails and trams – with less than deafening noise and jarring vibrations. Production – means factories with safer, quieter more stable equipment use. Construction – means tremor absorbing gaskets and absorbers, insulation, and water repellant membranes (among others). Again and – many more.

**Geom. Bruno Marabotto** has worked since 1982 in the Sports Plant branch of the Turino Town Council. Today, he is responsible for the design and construction of sports fields. From 2001 to 2003 he took care of the maintenance of city stadium (delle alpi). In 2002 he developed a plan to transform 30 clay sports surfaces with artificial turf. He recently transformed the Winter Olympic Stadium into a football stadium for the two local clubs: Turin and Juventus. The municipality has been Awarded as the European Capital of Sports for 2015.

**Ing. Marco Benso** graduated in Civil Engineering with a geotechnical specialisation from the Politecnico of Turin. He began his career as an independent professional in the field of civil engineering and is a consul-tant in the the geo-technical sector and rock mechanics, tunnel design and slope sabilitation. Since 2001 he has been the engineer for the Turin Metropolitan City (former Province of Turin), in charge of the Design and Work Execution Service, focused mainly on design, Work Direction, public work safety, etc. with particular attention on infrastructure viability. He partici-pates in the Technical Committee of the TyRec4Life project coordinated by Tutin funded under the EU.

**Dr. Davide Lo Presti** (Euro-PhD) is a Senior Scientist and International Research Project manager inves-tigating new solutions for a Sustainable Development of Civil Engineering with specific focus on Transport Infrastructures. His expertise is twofold: Technology development with incorporation of waste materials (i.e. recycled tyre rubber, reclaimed asphalt) and development of metrics, tools and methodologies for a sustain-ability assessment of infra-structure, mainly road pavements and railways. He has been involved in collabor-ative projects between the EU and the USA since 2010 and is currently involved in five collaborative research projects aiming at defining a viable strategy for the use of tyre rubber as a secondary materials in civil engineering.

**Dr. Nelson Flores Medina** graduated as an Architect from the Universidad de Las Palmas de Gran Canaria in 2003 and until 2015 was a freelance architect, specialising in materials design (concrete and binders), structures, reinforce-ment of structures, and rehabilitation. In 2009 he earned a dcoctorate in Architecture from Universidad de Las Palmas de Gran Canaria. He has worked on numerous research projects and publications and is currently a Reviewer for scientific journals including : Waste Management; Construction and Building Materials; Materials and Structures.

**Dr. José Sánchez-Dehesa** earned his PhD degree in Physics from the Autonomous University of Madrid. Since 2003 he is a full professor at the Dept. of Electronic Engineering in the Universitat Politècnica de València and director of the Wave Phenomena Group. He has worked on different topics in the theory of semiconductors, low dimensional structures and optical devices with a recent interest is focused in the propagation of sound through artificial structures named acoustic metamaterials. He has developed novel structures for acoustic cloaking and for sound attenuation using lattices of absorbing units made of rubber crumb and microperforated shells. His research has been supported by national and international agencies e.g., Office of Naval Research (USA), the Spanish Ministry of Economy and the European Union. He is the coauthor of 200 articles published in international journals and books and his h-index is 35.

**Dr. Serji Amirkhanian** is a Professor of Civil Engineering at University of Alabama, Tuscaloosa. He was the Mays Professor of Transportation at Civil Engineering Department of Clemson University until he started his international consulting activities starting June 2010. He is Co-Director of International Recycling Rubber Products Initiative at UNLV and has conducting research in the area of asphalt mixtures, recycling, and polymers for more than 30 years. Having published over 250 research papers and reports, he has presen-ted his research team findings in conferences around the country and the world. He has led research proj-ects for federal, private, and state organizations. He is a member of many professional organizations and guest Professor at Wuhan University of Technology (China) and Adjunct Professor at IIT Madras, India.



11.15 Coffee break

## 11.30 – 13.30 From Project to Market

Evolution of a Project

SMART project : Overview and results

Testing and evaluation of SMART products

Anti-vibration pads – for SMART

Choosing the right technology or systems for recycling

Regenerated rubber

What's in the concrete : Rubber, textile and steel

Recycled tyre materials as raw material for manufacturing

And where are the markets ?

Questions and Discussion

'Projects' are key among the arsenal of EU economic development tools. Used by various DGs to stimulate creativity, innovation and growth towards specific goals, they are also among the tools wielded by SMEs, public and private research and development bodies, universities, and investors. For SMEs and their partners, 'projects' provide critical economic incentive and support for pioneering research – otherwise left undone. The benefits are real – to SMEs, to industry and to the public at large. Projects are often repaid by improved infrastructure ; safer, quieter roads and rails, even factories and equipment, more resilient sport surfaces – and much more that benefits from quieter, safer, more elastic surfaces. However, on the broadest community level – among the greatest gain are the long-term increased employment of local citizens and the improved local economy.

**Dott. Ettore Musacchi** has been involved in tyre recycling for almost 20 years. He is Managing Director of ADRIA Abruzzo, producers of raw materials and civil engineering products. He is President of ETRA and President of ARGO, the Italian Tyre Recyclers Association, which operates either independently or, within wider organisations. ARGO was an affiliate for more than ten years, of FISE-UNIRE, the broader Italian association of recycling companies. He was the initiator and an official representative of UNI, the CEN National Standards Body and managed its candidacy as Secretariat of the Task Force for a Technical Specification for tyre recycling. He is a member of the Ministry of Health Commission on Artificial Turf Commission.

**Dr. Fabrizio Quadrini** graduated from Naples University in Material Engineering. Since 2002, he is a researcher at the University of Rome 'Tor Vergata'. He collaborates with industrial partners to design and optimise new processes and products, the main industrial partners are Federal Mogul, Electrolux and Sycorex. Among his most recent contributions are studies on coatings, thermoplastics, foams, nanocomposites, recycling technologies, and measurement techniques. He is the author of about 100 papers accepted in international journals and conferences. He is referee for several International journals and has participated in scientific committees of International conferences.

**Ir. Wiesław Waśniowski**, Eng. M.Sc. Chemistry (Cracow University of Technology) is Chairman of the Board, Managing Director of Tebamix, and was Manager of the Technology Department in "STOMIL for over 30 years of experience in rubber industry with rubber compounding and processing technology. TEBAMIX Sp. z o.o. was established in 1992. It developed the ability to produce rubber compounds becoming and is a supplier of specialist rubber compounds and products particularly for SME's in the automotive industry. The company introduced Quality Management System ISO-9001 2000 and was certificated by RW TÜV ESSEN (TÜV CERT) in 2002. TEBAMIX is a supplier of rubber compounds (NR, IR, BR, CR, IIR, SBR, NBR, EPDM) mainly for the automotive industry. It produces small press moulded rubber articles and in the well equipped laboratory. The R&D department provides technological consulting.

**Ir. Lisa Schwarz** holds an M.Sc degree in Chemical Engineering specialising in material technology, especially polymeric materials, from Chalmers University of Technology, Sweden. She has 10 years of experience in EU RTD projects, working as a Project Manager for TI since 2006 and with product development with a special focus on material technology and improving polymer based products. She is and has been the project manager of several EU funded

## Breakout Session A

**Dott. Ettore Musacchi**, Italy

**Dr. Fabrizio Quadrini**, Italy

**Ir. Lisa Schwarz**, Sweden

**Ir. Wiesław Wasniowski**, Poland

**It. Renzo Taffarello**, Italy

**Marc Gruffat**, France

**Dr. Kypros Pilakoutas**, UK

**Dr. Fabrizio Quadrini**, Italy

**Joze Jensterle**, Slovenia

**Ewan Scott**

projects and is experienced in working in complex international research and development projects. She has been involved in many Research for SMEs/Research for SME Associations projects including Cleancloth, PyroXTyre and EscapeProofNet to name a few.

**Dr. Renzo Taffarello** Dr. Eng, Mba has more than 20 years of experience on international markets working for companies and institutions on sustainable economy, high tech and green business. He graduated with an electronic engineering degree from Padova University, Italy, then obtained an MBA from Clemson University, USA. He has worked with Stanford Research Institute International, Alenia Aerospace, Andersen Consulting, and currently is managing the international business development for companies with special focus on technology and services. As a contract professor he held courses at Venice Univ., Ca Foscari on Applied Economics and Information Management Systems. He is a member of the board of directors of the European Branch of CIMBA Univ., USA for 5 years. He is currently focused on projects related to the green technology and solutions, green building, clean tech energy and recycling (tires, plastics, e-scrap, waste).

**Marc Gruffat** is CEO of Phenix-Technologies. With almost 40 years of experience in material recycling, he has focused his career towards providing innovative solutions to cope with client needs. He holds a Degree in Physics and has established the Phenix Technologies Company as a strategic partner for rubber processing technologies with a high quality profile in the rubber industry. Most of his experience has been abroad, indifferent European countries. He has developed: rubber grinding machines, granulators, pulverizers, micronizers, which remain among the best performing in the market in terms of capacity and energy efficiency. He has just been appointed as board member of the Elastopole Competitiveness Cluster who had labeled his project of devulcanisation in June 2013 .

**Joze Jensterle** is Managing Director of the International Association of Sport and Leisure Infrastructure Management (IASLIM), a consortium for the sustainable development of the sport, leisure industries. IASLIM works closely with both the public and private sectors to ensure that sports and playing fields, indoor arenas, etc. are well-managed and maintained. The association It assists in the design and maintenance of sports venues, providing conferences and workshops, distant education, training and consulting programs and services. It has members throughout the EU and beyond, as well as North and South America and Asia. Representatives provide seminars and workshops on materials, products, applications and maintenance.

**Dr. Kypros Pilakoutas, The University of Sheffield, UK (page 6)**

## **09.15 – 13.30 Pyrolysis Forum**

**Co-Chair**

**Standard activities in Reclaim Carbon Black**

**Tyre pyrolysis with molten zinc**

**Tyre recovery through rotating drum slow pyrolysis**

**Flexible 10tonne batch pyrolysis**

**r-Carbon Black from dispersion to reinforcement**

**Pyrolysis – the Swedish way**

**Market development for recycled Carbon Black**

**Latest developments : Biogreen continuous system**

**Discussants : C.Janin, B. Brosteneau, C. D’Emal, S. Da Silva, M. Gruffat, D. Margana, C. A. Maggiolo, F. Retailleau, D. Rosenfeld, J. van Kranenburg**

## **Break out Session B**

**Dr. C. Gisele Jung, Ir. Jean-Paul Bouysset**

**Dr. Tony Thornton, Dr. Joe Koury ASTM**

**Dr. France Riedewald**

**Ing. Francesco Berti**

**Sedky Chayata**

**Ir. Francois Terrade**

**Ir. Bengt-Sture Ershag**

**Martin von Wolersdorff**

**Gerard Markerink**

Research is presently performed to upgrade the char to ensure specific physical and chemical properties of the issued carbon products. Tests in laboratories are suggested to ensure the quality of the products for specific applications. Until very recently, tyre recovery treatments focused on benefiting from either the material or the energy outputs. However, today, due to recent technological advances coupled with a reconceptualization of how best to exploit both the material and the energy potential, new generation of technologies, treatments and materials have evolved.

**Ing. Francesco Berti** is Business Development Manager of Fapico AG. After his degree in Chemical Engineering at Politecnico di Milano, he joined ENEL R&D Department where, after some experiences in environmental catalysis and combustion, he was Manager of the Distributed Generation Research Area and Project Leader of one of the first European micro-CHP projects based on innovative technologies. After these experiences he acted as Energy Consultant with a focus on solid fuels gasification and pyrolysis with strong involvement in new technology development.

**Ir. Jean-Paul Bouysset**, a member of AFICEP, and ASTM is director of Consulting Partners (France) which is principally involved in consulting to the rubber, plastic and ink industries. In 1995 he became interested in the growing potential for the use of refined carbon materials produced by pyrolysis as an alternative raw material for a range of different products which utilise carbon black. Subsequently, he became active in the development of several pyrolysis new-ventures and was the coordinator for funded projects to develop products which could utilise carbon materials derived from pyrolysis. He participated in the TYGRE team.

**Sedki Chayata** is CEO of the Tunisian Investment Group / Petrochemical Company. He is a young businessman and holds an MBA degree from ESA 3) After 8 years as CEO of TUNISIAN GLOBAL PLASTURGY he joined the TUNISIAN INVESTMENT GRP as CEO in 2008. He is involved in Plastics and Rubber Recycling and has initiated the first project for post consumers tyres pyrolysis In Africa .

**Ir. Bengt Sture Ershag** is the Technical Director of Scandinavian Environment Systems. He has been with the company from its creation twenty years ago with 20 years of Research and Development experience. He is the developer of the CFC system and holds several patents on different aspects of the system and material outputs. The SES pyrolysis system is the first commercial plant in Sweden, opening in 2013.

**Dr. C. Gisèle Jung**, (Chemistry) is Senior Research Fellow in the research center “*Centre Emile Bernheim*” of the Solvay Brussels School of Economy and Management and in the Faculty of Applied Sciences, “*4MAT*” at the Université Libre de Bruxelles (ULB). Her research concerns general problems of material and energy valorisation of carbon containing waste. Her research focuses on the scientific development of carbon products issued from solid waste thermal, more specifically for the valorisation of biomass and post-consumer tyres regarding their economic, social and environmental aspects. She is lecturer in international Universities, author of more than 80 articles, reports and an active speaker in Conferences, referee for articles and consultant as expert to promote pyrolysis/ gasification for specific solid waste. The objective of her research is the evaluation of existing technologies to promote treatments for selected solid waste to help in the decision of the best solution for material and energy valorisation of issued products.

**Gerard Markerink** is Global Sales Director for Biogreen Pyrolysis, an ETIA Company based in Compiègne, France since 2008. Biogreen® is an innovative, patented process for the thermochemical conversion process that uses biomass, plastic and waste, including tyres as input materials – in order to output the essential elements of oil, char and gas. The process includes an exclusive and patented pyrolysis system that extracts useful substances to be used as a source of energy or a renewable products for green chemical applications.

**Daniel Rosenfeld** is an advisor in Innovation and Industrialisation management, associate at Knowledge Management Consulting in Lausanne (Switzerland). He holds a Master degree in Physics from the University of Neuchâtel and a PhD from EPFL. He spent over 20 years working with or for high-tech companies across different fields (Machine Industry, Semiconductor, Watch Industry, Optics, Medtech, Sensors, Renewable energies) on an international level. He developed a network in micro and nanotechnology with the major Swiss universities and managed numerous R&D projects with different research organisations. He is helping small and large companies to explore emerging technologies, new fields of applications and to accelerate the validation and industrialization of new products or technologies.

**Ir. Francois Terrade** is a Chemical Engineer from Bordeaux France (ENSCP), has acquired along 40 years a huge knowledge of the Carbon Black Manufacturing, working for *Phillips Petroleum*, *Continental Carbon*, *Deutsch Degussa*, *Columbian Chemicals* and *Cabot Corporation*. In 2011 he founded *PRO<sup>2ACT</sup> MANAGEMENT™* near Paris (France). He became a technical bridge between the Oil industry, the Carbon Black Manufacturing and the recovered Carbon Black with customers in these three fields.

**Dr Anthony Thornton** is director of Products Integrity and Performance and ASTM International board of directors. After earning his BS in analytical chemistry from Emory University (GA) he joined Micromeritics as a research chemist. His current responsibilities as Director of senior product scientists include monitoring adherence to product development procedures to ensure that all new products and up-dates meet customer requirement specifications. He also provides product application and operational support, delivers technical training, represents Micromeritics in various standard development groups and participates in product development performance testing. He was recently elected to serve a three-year term on the ASTM board of Directors. ASTM International, formerly the American Society for

Testing Materials (ASTM) is a globally recognized leader in the development and delivery of international voluntary consensus standards. Today some 12,000 standards are used around the world to enhance safety, facilitate market access and trade, and build consumer confidence.

**Ir. Frank Riedewald** is Managing Director of Composite Recycling Ltd located in Cork, Ireland. His company developed a whole tyre recycling process based on molten zinc. He holds a Dipl.-Ing. degree from the Technische Universität Berlin and a PhD from University College Cork, both in chemical engineering.

**Ir. Martin von Wolfersdorff** is an independent advisor to the chemical industry. He has 20 years experience in global chemical industries with vast experience in titanium dioxide pigment, custom colour master-batch for fibres, artificial turf, packaging and automotive interiors and carbon black for tyre and rubber applications. Since becoming an independent advisor in 2014, he has worked with the global tyre pyrolysis industry on market and product development of recycled carbon black. He has also specialised in sales leadership, effectiveness and commercial excellence including accelerated business development, key account management, pricing and sales process optimisation. He holds a German "Diplom Ingenieur", master degree in chemical and process engineering from Friedrich Alexander University, and did his thesis at the University of Surrey in collaboration with Imperial Chemical Industries.

**Dr. Claude Janin, Dr. Sara Gobbi, Ing. Antoine Hubault, Dr. Joe Koury**, (see page 5)

13.30 Lunch

## **14.45 – 16.15 Recyclers' Forum : An open discussion -**

**Peter Taylor, OBE and Valerie L. Shulman, Ph.D.**

Where we are –

Where next

16.15 A Twenty year programme

**Dr. Gisele Jung, Ir. Jean-Paul Bouysset**

16.45 Summary and Closing comments

We hope that you enjoyed the 22nd ETRA Conference

The Board and members of ETRA wish to thank the following people for their efforts in making this conference a success :

**Dr. C. Gisele Jung and Ir. Jean – Paul Bouysset**

**The ETRA Pyrolysis Forum  
20 years of Pyrolysis : A Compendium**

**Ir. Andres Macho Jiminez , on his retirement**

**Ms. Isabella D'Alimonte for her work and devotion**

*We would appreciate it if you would leave the Conference Evaluation Form with an ETRA representative before leaving the venue*