

Cutting a dash

Professor Sandra Bischof Vukusic describes how the Faculty of Textile Technology at the University of Zagreb, Croatia, has become a world-class research institution, thanks in no small part to EU funding

What is the main function and objectives of the FP7-REGPOT project, 'Unlocking the Croatian Textile Research Potentials' (T-Pot)?

The overall objective of T-Pot is to unlock and upgrade the research potential of the Faculty of Textile Technology (TTF), particularly its Textile Science Research Centre (TSRC). We aim to enable enhanced participation of Croatian textile organisations in research activities at the European level, in order to support the integration of Croatian textile entities into the European Research Area.

When I started in 2006, the FP7-REGPOT scheme was rather new, and at that time I was not even sure if Croatia would even be eligible to be a coordinator or be accepted as the EU convergence region. But in 2007 I took my chances and applied for funding as this scheme seemed perfect for my institution.

What kind of technologies does the TTF produce?

The TTF is the only Higher Education institution in the Republic of Croatia that performs research in the field of textile science and technology. It consists of seven departments: Textile Chemistry and Ecology; Materials, Fibres and Textile Testing; Projection and Management of Textiles; Clothing Technology; Fashion Design; Applied Chemistry; and Basic Natural and Technical Sciences. It has 88 research teaching staff supervising 1,000 students at all educational levels. Scientific expertise of the Department for Textile Chemistry and Ecology, where I work, is concerned with such issues as textile pre-treatment, dyeing and printing, colour management, textile finishing, textile care and recycling, considered from an environmental perspective.



How do you propose to reinforce the research potential of the TTF? Which areas of the TSRC require significant upgrades?

The reinforcement of TTF's research potential is done through the strengthening of human and material potential, as well as the research infrastructure. One of T-Pot's highest priorities has been the improvement of scientific infrastructure in order to reduce the gap between our present state and EU standards. Investing in equipment has boosted the development of applied research, methods, technologies and new products.

At the moment, the acquisition of the chosen equipment (a microscope with EDS detector for chemical analyses, and a set of instruments for spectroscopic and thermal analyses FTIR, HPLC, DSC, TGA, TG-IR and MCC) is contributing to the reinforcement of Croatian internal scientific and technical capacities. The expected final results will be shared with the wider community and developing services, in support of business and innovation. The recently established TSRC

has been upgraded to become one of the components of national innovation. Primarily through its portal, TSRC is offering cooperation with RTDs and SMEs through joint initiatives and projects.

How will you be increasing the support and mobility of people and materials at the TTF? What advantages will this afford?

The mobility of people has been significantly upgraded by the measures of T-Pot. Three PhD students have been funded by the T-Pot project for up to six month secondments, primarily at partnering institutions. Other TTF researchers gained funding for 14 months of research secondments. There are two possibilities: short secondments (up to two weeks), and longer ones (up to six months). This measure has been mostly used by our PhD students, who used this opportunity to use equipment we don't have, and more importantly, gain experience and contacts in their new research environment. In the second part of the project, researchers from our partnering institutions are coming to work at our premises, in particular on our recently purchased equipment. This is very important for us, as we can now really consider our institution as an international one, capable of conducting world-class research.

What are the greatest successes of both T-Pot and the TTF to date?

The greatest success of T-Pot is the upgrading of human and material resources. Two new laboratories were equipped with modern instrumentation for surface characterisation and thermal analyses and they are at the disposal of both the academy and SMEs. Another accomplishment was winning third place in the prestigious IMB Innovation Award in 2009 in the category of Research and Development.

Tailored to perfection

T-Pot is a scheme aiming to resurrect the Croatian textile industry by boosting innovation and fostering its integration into the ERA

HISTORICALLY, THE TEXTILE sector was one of Croatia's major industries, employing over 90,000 workers. In recent years this figure has declined rapidly, and today the sector employs only 20,000 people. The companies that have survived this decline have now started to invest in new and innovative products to help the industry. The aim is to cover initial investment and yield greater profits.

The textile industry is a typical example of a traditional sector with a high labour intensity and high decline in industrial activities in Europe. Building a strong knowledge-based industry is the only way this downward trend can be reversed. The Croatian textile industry is learning a great deal through the expertise of experienced researchers from the academic sector, represented by the Faculty of Textile Technology (TTF) at the University of Zagreb. As such, modernisation and a creation of new knowledge-driven SMEs depends on constant reinforcement and development of the TTF's research potential.

The T-Pot initiative has been set up to unlock and upgrade the research potential of the TTF,

enabling enhanced participation of the Croatian textile organisations in research activities at the European level, in order to support the harmonisation and integration process of Croatian textile entities into the European Research Area (ERA).

THE POTENTIAL OF THE TTF

TTF is a research body with activities in nanosciences, nanotechnologies, materials and new production technologies (NMP). The main NMP objective is to improve the competitiveness of European industry and ensure its transformation from a resource-intensive to a knowledge-intensive sphere.

The strengthening of human and material potential will reinforce the TTF's research potential, as well as the research infrastructure. The recently established Textile Science Research Centre (TRSC) will be upgraded to become one of the components of national innovation. This will attract scientists to the country for knowledge exchange and will also help guide Croatian textile manufacturers. TSRC is fully equipped with modern instruments for textile characterisation, based across five laboratories: scanning electron microscopy (SEM), spectrophotometry, thermal analysis and flame retardancy testing, textile finishing and textile care.

The TTF is contributing to the promotion of the European Technology Platform Future of Textile and Clothing (FTC) and assisting SMEs in their future participation in EU funding

schemes, and integration in the ERA. Its direct contribution is noticeable in joint projects with Croatian SMEs from the textile sector.

PROTECTING THE FUTURE

Protective textiles offer great potential for innovation, economic growth and employment for the EU and Croatia. The TSRC – upgraded to enhance its research potential – is becoming an important regional research centre through its support for industry. The aim of the TTF is to produce applied research results and highly educated experts in the field, supplemented by the formation of the TSRC.

The Research group of textile finishing at the TSRC has a new focus on protective textiles, taking into account morphology characteristics (determined with SEM) and thermal characteristics (determined with DSC and TGA), purchased by the T-Pot project. Goals have been set to develop the capacity for breakthrough research, leading to innovative textile and textile related products, contributing to the industry, both nationally and regionally. The group is collaborating with several SMEs, such as Jadran (functional finishing of stockings), Čateks (finishing of military fabrics), Galeb (flame retardant knitwear) and HEMCO (thermal characterisation of protective clothing).

The research group of textile care within the TSRC is very active in industrial-driven research, such as for the hosiery factory Jadran (laundering resistance of encapsulated products containing fragrances), Labud and Saponia (improving detergents formulations), P&G (textile surface characterisation), and for various laundry companies. Most Croatian laundry sector SMEs are clustered in the Croatian Chamber of Crafts and Trades and/or the Croatian Chamber of Economy.

However, one problem T-Pot is facing is in finding stable positions at the Faculty for the researchers hired by

Protective textiles offer great potential for innovation,
economic growth and employment for the EU and Croatia

the project.
The only solution seen
so far is funding a new project, which
will enable maintaining the equipment and
retaining the successful research group.

WEAVING NEW PARTNERSHIPS

At its inception, T-Pot aimed to initiate new strategic partnerships with at least three partnering institutions. The goal of this was to speed up integration of the TTF and TRSC into the ERA, and broaden the knowledge base of the TTF, as well as the entire Croatian scientific community. The most important collaborators at T-Pot currently are: the Saxon Textile Research Institute in Germany; the Institute for Natural Fibres and Medicinal Plants, Poland; the Leitat Technological Centre, Spain; and the Grado Zero Espace, Italy.

Each of the partnering institutions has organised workshops at their premises, presenting their expertise and offering further cooperation within the field. The T-Pot collaborators from the partnering institutions have participated at two international conferences organised by the TTF: Textile Science and Economy and the International Textile, Clothing and Design Conference: The Magic World of Science. Research secondments have been organised in both directions, contributing to a mutual exchange of knowledge. After only one year of extensive cooperation, new project consortiums have already been established and the T-Pot project is now in the process of submitting a new FP7 project.

T-Pot has enabled better cooperation with the University of Georgia, where two researchers have been seconded for highly specialised research on the equipment that the TTF lacks. Collaboration with Georgia's Department of Textiles, Merchandising and Interiors was organised by Professor Charles Q Yang, one of

the world's leading experts in the area of flame retardant materials. T-Pot has established further scientific cooperation with the Swiss Federal Laboratories for Materials Testing and Research (EMPA), where one of T-Pot's PhD students has been seconded for a year. Two researchers from EMPA are mentoring a dissertation entitled: Modification of PLA to achieve antimicrobial properties. T-Pot has also enabled cooperation with the School of Chemical and Physical Sciences, Victoria University, New Zealand and The University of Leeds, Department of Colour Science.

Furthermore, part of the T-Pot collaboration is included in a consortium of new EU projects, within the NMP scheme. This project is an excellent example of further extension of the scientific cooperation, including the new partnering institutions such as DITF (Germany) and Centexbell (Belgium). Each of the developed cooperations has a significant benefit to T-Pot's research.

DISSEMINATION

T-Pot has disseminated the results of its scientific research through various media, including the T-Pot website, the TSRC Portal, participation at conferences, and the publication of scientific and informative papers in journals and magazines. Three books are in the process of being published by T-Pot: Young Scientists in the Protective Textiles Research; Functional Protective Textiles and T-Pot monograph.

The project is due to conclude in February 2012, and by then it is hoped that T-Pot's work will help sustain the integration of the Croatian textile sector into EU framework programmes.

INTELLIGENCE

T-POT

UNLOCKING THE CROATIAN TEXTILE RESEARCH POTENTIAL

OBJECTIVES

T-Pot aims to reinforce research potentials of the Faculty of Textile Technology of the University of Zagreb (TTF) in order to strengthen the university sector to become one of the components of the national innovation system in Croatia. The goals are to develop the capacity for breakthrough research, leading to innovative textile and related products.

KEY COLLABORATORS

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