Executive summary

M-Future2013 project has proposed the MANUFUTURE 2013 conference with a special focus on expressing the ETP MANU*FUTURE* community's view on the HORIZON 2020 – the EU Framework Programme for Research and Innovation (2014 – 2020). Using the conference as a main tool project aimed to assess the global challenges to manufacturing in Europe and the regional smart specialisations in key enabling technologies, to compare the coherence and complementarity of the funding instruments initiated by the EC and Member States to meet manufacturing industry needs and to reach the consensus with stakeholders on how the synergy between the industrial pillar of Horizon 2020 and the respective initiatives of the Member States could be achieved in pursuing global manufacturing strategies and regional smart specialisations.

The Conference has taken place in Vilnius, Lithuania and has lasted for three days (including the welcome evening). In total, more than five hundred participants from forty different countries have taken part in the Conference. Five plenary sessions have been organised, where 25 plenary speakers have had their presentations. Additionally, nine parallel workshops, four industry tours and the exhibition have been organised to have a more diverse programme of the Conference.

For the first time, the MANUFUTURE Conference has been honoured by the participation of the President of the hosting country – Dalia Grybauskaitė, The President of the Republic of Lithuania. Moreover, in 2013 December 30th the President of the Republic of Lithuania has issued a decree on awarding a memento, which, according to the articles 77 and 85 of the Constitution of the Republic of Lithuania, awards Lithuanian and foreign citizens for the personal contribution towards the Lithuanian Presidency of the Council of the European Union in 2013. The conference OC has been also honoured because the director and the vice-president of the Engineering Industries Association of Lithuania LINPRA and vice president Dr. Henrikas Mykolaitis, LINPRA project manager Dr. Kęstutis Maknys have been among the awarded individuals. This shows the conference being a great success. On the other hand, the project has been also successfully finished with its all objectives accomplished in time.

The project website is available at http://manufuture.europarama.lt/. It can also be accessed from the main MANU*FUTURE* 2013 Conference website at http://www.manufuture2013.eu/organisers-supporting-bodies/supported-by.

1 Project context and the main objectives

M-Future2013 project aimed to create a better synergy between initiatives launched by the European Commission and the Member States to the benefit of the coherence of the overall actions within the field of research and innovation in industrial technologies in FP7-NMP theme and in the subsequent EU Framework Programme for Research and Innovation Horizon 2020. In order to increase the coordination efforts the MANUFUTURE 2013 conference was proposed with a special focus on expressing the ETP MANU*FUTURE* community's view on the Horizon 2020 – the EU Framework Programme for Research and Innovation (2014–2020).

The main objectives for the project and the conference were:

- Assessing the global challenges to manufacturing in Europe and the regional smart specialisations in key enabling technologies underpinning advanced manufacturing with a particular focus on (1) regional specificities in the Baltic area and the Northeast of the EU, namely, creating new jobs and increasing levels of productivity in the key clusterised sectors of the region such as energy, machinery production, metal manufacturing by transferring enabling technologies from high-tech firms specialised in ICT, cleantech and green energy and (2) addressing the gap in industrial R&D.
- Comparing coherence and complementarity of the funding instruments initiated by the EC and the Member States to ensure that manufacturing industry needs are met in supporting capacity building in research infrastructure, skill development and job creation.
- Reaching consensus with stakeholders on how the synergy between the industrial pillar of Horizon 2020 and the respective initiatives of the Member States could be achieved in pursuing global manufacturing strategies and regional smart specialisations.

The event was planned for the second half of Lithuania's Presidency of the Council of the EU (in autumn 2013) at the time when legislative acts on Horizon 2020 had been already adopted by the EU Parliament and Council. Importantly, the conference was under the patronage of Dalia Grybauskaitė, the President of the Republic of Lithuania. The event was serving as a forum of stakeholders from industry, universities, research institutions and government discuss the possibilities on how to better put Horizon 2020 and respective national initiatives into operation.

The manufacturing industry represented by MANU*FUTURE* has significant interest in the EC Regional Policy as a key delivery mechanism for EU 2020 and the pursuit of smart, sustainable and inclusive regional growth. Smart specialisation combines a place-based approach with innovation systems logic and a strong outward orientation towards global value chains aimed at smart, sustainable and inclusive growth in the regions. To achieve smart growth there is a need to mobilise and maximise the innovation capacity of every region through open innovations and the alignment of public and private investment decisions towards a limited number of priorities with the highest development impact. The ways to better transform Horizon 2020 investments into wealth, growth and jobs have been discussed: supporting better coverage of the entire innovation cycle, promoting better alignment with national and regional policies and funding

programmes, and creating framework conditions for growth and jobs to help the European regions stay globally competitive.

At the conference, leaders and specialists from the EU engineering industry and the field of science have been discussing Horizon 2020, the new Framework Programme for Research and Innovation, and the best ways to approach its implementation while promoting innovation of the EU engineering industry, sustainable development and competitiveness in 2014-2020. In the discussions and the speeches made by European Commission, business and science representatives, special attention was given to the increase in efficiency of EU regional and national RTD support tools through their mutual synergy and the national and regional smart specialisation of the countries.

This event is expected to have long-term impact on the future of Lithuania and the EU as a whole. Promoted by the MANU*FUTURE* platform and the DG research of European Commission, an annual conference is organised since 2003 in the country having the EU presidency in the second half of the year. This year it was first time to have more than 500 participants from Europe and around the world in the event, and to have the President of the hosting country for the welcome speech in the MANUFUTURE 2013 conference.

2 Description of the main results/foregrounds

2.1 Key figures of the conference

The conference has taken place in Vilnius, in the Lithuanian Exhibition and Congress Centre LITEXPO. Vilnius, the capital of Lithuania, is one of the most frequently visited cities of Eastern Europe. It draws attention, not only because of its unique architectural character, but also by its cultural events and attractions. Vilnius is the largest city of the country. The population of Vilnius is 560,000 people, which accounts for 17 percent of the total population of the country.

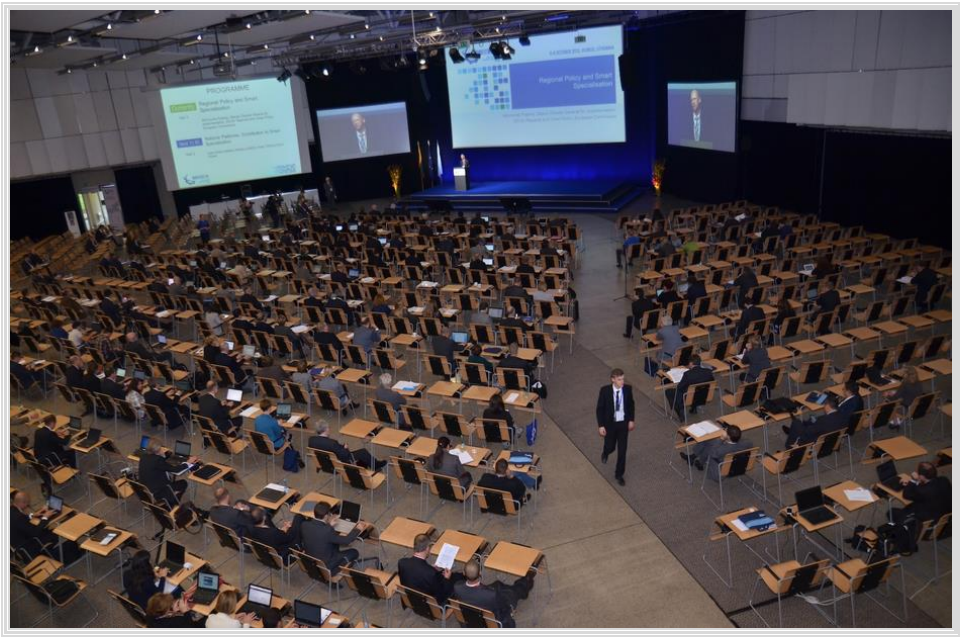

Figure 1: Main conference hall at LITEXPO

LITEXPO complex consists of 9 exhibition halls, total exhibiting area of which amounts to 17.6 thousand square meters, and external grounds that cover 15.1 thousand square meters. All in all, total exhibiting area reaches 32.7 thousand square meters. Currently LITEXPO is the largest exhibition and convention centre in the Baltic States by the number of events it organises and the income index, as well as by the exposition area supplied with up-to-date equipment and offers flexible meeting spaces of the highest quality.

607 participants have registered to the conference and 502 persons have attended it. Participants have represented 40 countries (among them 24 guests from Eastern Europe outside EU and 14 guests from other countries worldwide). More than 100 guests have been female participants. 40 participants have registered to the brokerage event B2B Meetings and total of 64 meetings have been registered in the registration platform. Finally, 57 have taken place during the event. Also, 44 participants have registered to the brokerage event Round Tables for Preparation of FoF proposals. At the opening session four speakers have held initial speeches. Within the 2 conference days 5 plenary sessions have been held, where 25 plenary speakers have had their lectures. During the conference 9 parallel workshops have taken place where invited speakers expressed their opinion on the workshop subjects. Conference participants have visited 10 manufacturing companies during industry visits. 26 organisations have presented themselves in

the exhibition.

Figure 2: Plenary session at MANUFUTURE 2013

Figure 3: Exhibition area at the conference

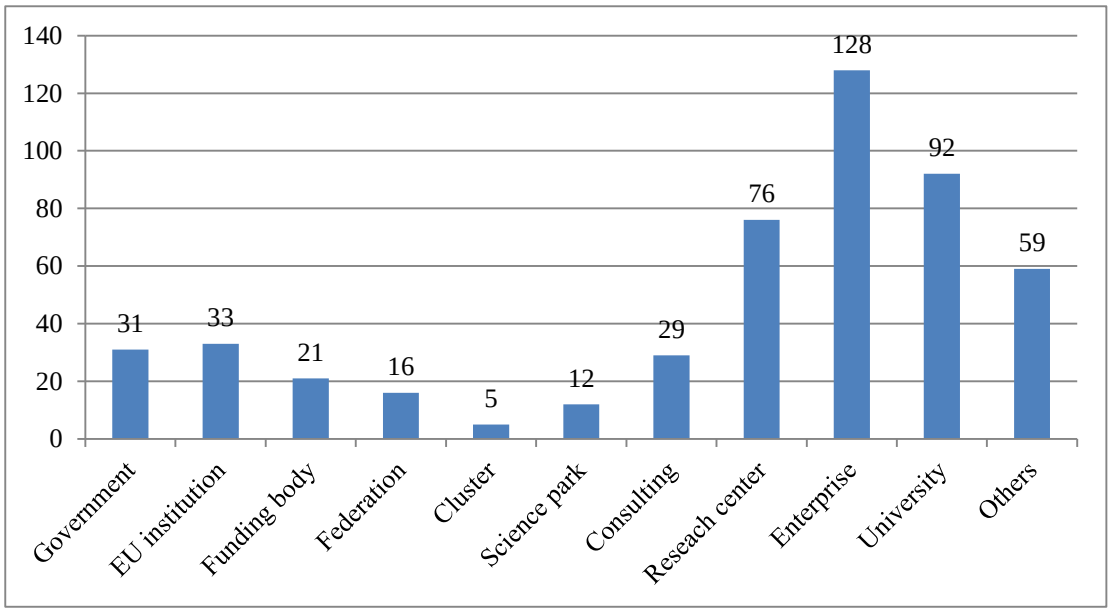

Figure 4: Distribution of the conference participants by organisation type

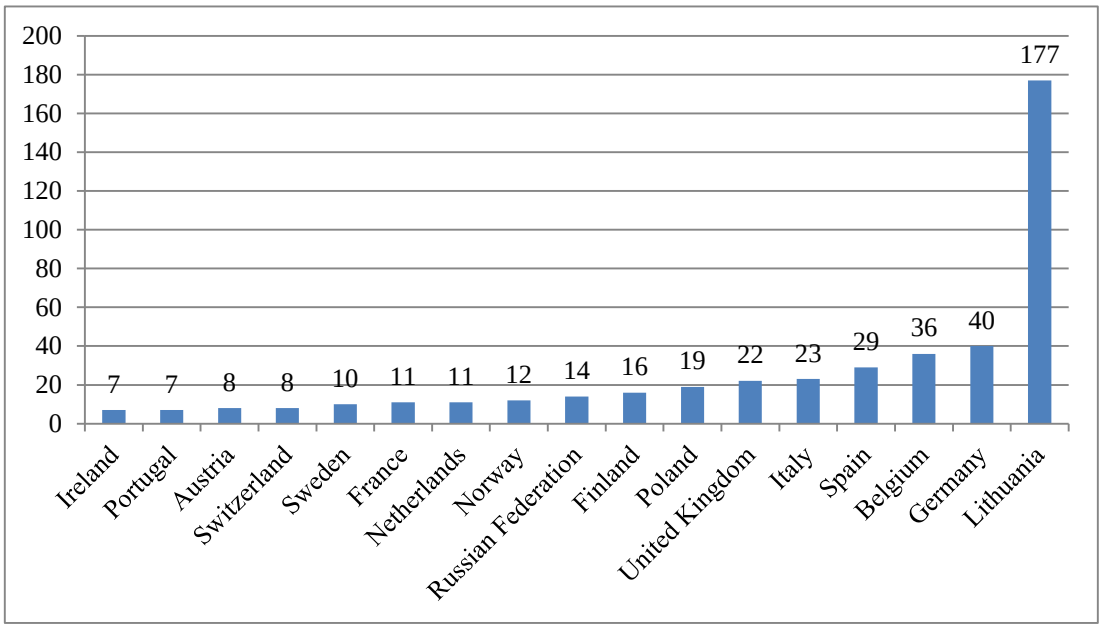

Figure 5: Distribution of the conference participants by country

To imagine how large human capital and infrastructure has been engaged to handle the conference:

- 4 leading persons from LINPRA;
- 2 persons from EP;
- 50 volunteers (in some cases reaching 65) – mainly students of VGTU, VU, LEU and KTU;

- 60 persons of catering, protection and medical service;
- 2 simultaneous translators (from Lithuanian to English) during the plenary sessions;
- 10 large buses and 4 small buses for transport purposes;
- 295 rooms for guests booked in 7 hotels.

2.2 Programme of the conference

On the first conference evening, 6th October 2013 on 5 p.m., International Advisory Committee meeting took place in Vilnius University. The main goal of the meeting was to present the final program of the conference. Next, on 7.30 p.m., a welcome reception for the MANUFUTURE 2013 has been organised at the Palace of the Grand Dukes of Lithuania.

On 7th October 2013 at 9 a.m. the Conference has been officially opened by the President of the Republic of Lithuania Dalia Grybauskaitė. The President Dalia Grybauskaitė has welcomed conference participants and emphasised that the European ambition to be an innovation union may not be enough if we want to attract investment and talents to our countries because Europe is facing competitors with a cheaper energy recourses and suppliers of cheaper labour force. European manufacturing industries can only remain credible for investors and attractive to retailers and customers if they combine the best practices what Europe can offer. Our key to re-manufacturing of Europe should be developed by the collaborative efforts of private public partnerships and based on research in advanced innovative technologies.

Her speech has been followed by the video welcome from European Commissioner for the Research, Innovation and Science Máire Geoghegan-Quinn and by the speech of Minister of Education and Science of the Republic of Lithuania Prof. Dainius Pavalkis.

Máire Geoghegan-Quinn has observed that the manufacturing sector is of course one of the key building blocks in innovation system. This pillar has three specific objectives: leadership in enabling and industrial technologies, better access to the risk finance and more innovation in SMEs. The new programme HORIZON 2020 also identifies advanced manufacturing systems as one of the EU key enabling technologies.

Prof. Dainius Pavalkis has stressed on the importance of the development of diversified and competitive industrial base. He claims, the 21st century suggests advancing of manufacturing consequently stimulating innovation performance to address sustainability changes for Europe. Audience is offered to keep in mind that investment in people, not only in technological advancement of manufacturing process or product, should remain the principle element of the states' or companies' philosophy.

Then, three plenary sessions and one parallel workshop session with five different subjects have been planned for that day:

- P1: HORIZON 2020: Context and vision for the European manufacturing and research has been chaired by Dr. Massimo Mattucci, the Co-Chairman of organisation EFFRA and the Senior Corporate VP of Comau Group;

- P2: HORIZON 2020: Roadmaps for manufacturing has been chaired by Adrian Harris who sir the Director General of ORGALIME organisation;
- P3: FP7 Results and outlook for HORIZON 2020: Research & innovation for sustainable industrial competitiveness has been chaired by Prof. José-Lorenzo Vallés, the Head of Unit at European Commission and DG for Research & innovation.
- Parallel workshop W1: Factories of the Future (FoF): FP7 Projects and initiatives – Results and business opportunities. The five separate workshops have been chaired by separate persons:
    - Neophytos Neophytou, Research Programme Officer, European Commission, DG for Research & Innovation;
    - Prof. Tullio Antonio Maria Tolio, Directo of Insitutte of Industrial Technolgies and Automation, National Research Council of Italy (CNR);
    - Engelbert Westkamper, Em. Director, Fraunhofer IPA / IFF and GSaME, University of Stuttgart;
    - Prof. Johan Stahre, Professor at Chalmers University of Technology, Head of division, Co-director of Charmers' Production Area of Advance;
    - Dr. Rikardo Bueno, Director for the Programmes Area, TECNALIA.

An evening program has started after the third plenary session. Participants have also had time to visit an exhibition. The performers of the evening have been:

- Donatas Paužuolis - World champion of radio controlled models;
- Ensemble "Žuvėdra" - seven times World champions of sports dancing.

On the second day of the conference Participants have been free to decide what to choose for the morning - either a tour or participate in face-to-face meetings e.g. for preparation of FoF 2014 proposals or B2B match-making meetings for business or partnering purposes. In addition, the conference has offered four alternative parallel discussion workshops: participants could have chosen to discuss about the funding opportunities of the European Research Council (ERC), the work and opportunities of existing European Technology Platforms which are closely cooperating with the MANU*FUTURE* Platform or the Future Oriented Activities (FLA) which are the key factor for describing the possible scenarios for future economic development and sustainability of the Eurozone. Two plenary sessions and one parallel workshop session has been organised for that day:

- P4: HORIZON 2020 and Regional Dimension has been chaired by Prof. Edward Chlebus, the Dean of Mechanical Engineering Faculty, Wroclaw University of Technology.
- P5: HORIZON 2020 and International Dimension has been chaired by Herbert von Bose, the Director of Directorate G – Industrial Technologies, European Commission, DG for Research & Innovation.

- Parallel workshop W2: B2B and Future –Oriented Activities within HORIZON 2020. Session has consisted of workshop-industry visits, face-to-face meetings and four discussion workshops. The four separate discussion workshops have been chaired by separate persons:
    - Dr. Claudia Marenco, Scientific Officer, European Research Council Executive Agency;
    - Annamalai Arun Junai, EU Manager, TNO industrial innovation;
    - Dr. Augusta Maria Paci, Technologist Director of Chemical Science and Materials Technology Department, National Research Council of Italy (CNR);
    - Dr. Rolf Riemmenschneider, Research Programme Officer, European Commission, DG for Communications Networks, Content & Technology.

2.3 Outcome and overall conference evaluation

The MANUFUTURE 2013 Conference served as a forum for stakeholders from industry, universities, research institutions and government giving a consolidated EU Vision of manufacturing and discussing outcomes and learnings from the previous frame programme as well as the possibilities on how to better put HORIZON 2020 and respective national initiatives into operation. The conference discussed HORIZON 2020, the new Framework Programme for Research and Innovation, and the best ways to approach its implementation while promoting innovation of the EU engineering industry, sustainable development and competitiveness in 2014-2020.

According to the conference participants MANUFUTURE 2013 was an excellently organised conference which gave important information about the past and ongoing R&D activities and the planned directions, actions and funding instruments of the new HORIZON 2020 programme to tackle the current and future challenges of the European manufacturing sector. There were valuable presentations and discussions on the ways to better transform HORIZON 2020 investments into wealth, growth and jobs and how to support better coverage of the entire innovation cycle, promote better alignment with national and regional policies and funding programmes, and create framework conditions for growth and jobs to help the European regions stay globally competitive.

The MANUFUTURE 2013 conference clarified and highlighted the challenges and needs related to manufacturing and manufacturing-related research and development in Europe, and provided input for possible future actions, highlighting the importance of research and development in the area of manufacturing and enabling technologies. One important outcome of this event was discussion on facilitation of the development and consolidation of the socio-technical environment – constituted through years – that stimulate the demand-side context for manufacturing companies and the related research communities keeping pace with innovation based on European research.

The event promoted the importance of HORIZON 2020 programme in areas close to

manufacturing and especially the Factories of the Future public-private-partnership (PPP) and its calls and outcomes of the already funded projects. The conference also opened opportunities for Baltic and Eastern Europe Partnership as well as new networking with interesting parties. The participants had also a good opportunity to see at the exhibition the work made in different European countries and the interesting innovations of the hosting country Lithuania.

The conference was a good forum for networking and for starting concrete exchange of ideas for new joint research projects with potential partners. An additional outcome was that the event supported each delegate to reach a synthesis where strategic thinking and implementation initiatives can be met with legal instruments, operational plans and technological results.

The answers of the questionnaire about the organisation of face-to-face meetings have also been positive. The general outcomes of it are as follows:

- 90 % of participants evaluated the website as excellent or good.
- 100 % of participants evaluated that assistance before and during the event was excellent or good.
- 87 % of participants evaluated the location as excellent or good.
- 100 % of participants evaluated the general organisation of the conference as excellent or good.
- 87 % of participants evaluated that management of the appointments was excellent or good.
- 60 % of participants evaluate that quality of profiles as excellent or good.
- 65 % of participants evaluated that relevance of the meetings was excellent or good.
- 74 % of participants have agreed that their expectations have been met.

The outcomes of the conference were well encapsulated in the MANUFUTURE Vilnius Declaration which was presented in the closing session of the conference.

Conference has been positively evaluated not only by conference participants from industry companies, but also by the participants representing various international platforms, organisations and even national political institutions. It is important to mention that event was highly recognised by the President of the Republic of Lithuania as well.

In 2013 December 30th the President of the Republic of Lithuania Dalia Grybauskaitė has invited people who have contributed for the Lithuanian Presidency of the EU Council to participate in the reception in Vilnius University Library. The President emphasised that the smooth Lithuanian presidency in the EU Council showed maturity of the country and the ability to deal with political challenges.

In 2013 December 30th the President of the Republic of Lithuania has issued a decree on awarding a memento, which, according to the articles 77 and 85 of the Constitution of the Republic of Lithuania, awards Lithuanian and foreign citizens for the personal contribution towards the Lithuanian Presidency of the Council of the European Union in 2013. The

conference OC has been also honoured because the director and the vice-president of the Engineering Industries Association of Lithuania LINPRA and vice president Dr. Henrikas Mykolaitis, LINPRA project manager Dr. Kęstutis Maknys have been among the awarded individuals. This shows the conference being a great success.

3 Description of the potential impact

3.1 Position Paper and the expected impact on the MANU*FUTURE sector*

One of project partners TTY-SAATIO have been gathering the information about the conference and have prepared the consolidated and interpreted document with the main position outlined during the conference. The content of it is based on discussion with conference speakers and participants and presentations and statements of the speakers. This official position expresses the expected impact on the European manufacturing sector according to various aspects.

3.1.1 Horizon 2020: Context and Vision for the European Manufacturing and Research

The EU needs more research and innovation for a sustainable, competitive EU industry which is able to create new jobs, boost economic growth and competitiveness and make people´s lives better. HORIZON 2020 (H2020), the new EU Framework Programme for Research and Innovation running from 2014 to 2020, can contribute to creating sustainable economic growth and jobs and reinforcing Europe's international competitiveness. The industrial leadership pillar of H2020 will bridge the gap between research and the market. With the focus on industrial leadership, it's possible to speed up the development of the technologies and innovations that will underpin tomorrow's businesses and help innovative SMEs to grow into world-leading companies.

Industry is the cornerstone of the economy and central to re-industrialisation in Europe. Without industry, an economy loses its capacity to innovate and to create jobs. For each job in the manufacturing sector, an additional job is created in the related services sector. Manufacturing accounts for 75% of EU exports and for 80% of innovation. The revamped EU strategy is targeting to boost industry and reverse the manufacturing decline. Advanced manufacturing technologies are one of the priority areas for such investment. New technologies have the potential to change the industrial landscape and make Europe more competitive. Horizon 2020 will provide substantial funding opportunities along the whole innovation chain. The public-private partnerships ensure that R&D efforts follow the needs of industry. In addition to R&D investments Europe needs to eliminate the obstacles for the market uptake of advanced manufacturing technologies.

Sustainable growth is one of key targets of the Europe 2020 strategy, i.e. a strategy for smart, sustainable and inclusive growth. Sustainable development means that the development meets the needs of the present but without compromising the ability of future generations to meet their own needs. The manufacturing industry is in key role to achieve growth and jobs in Europe. It needs to work for economic growth but also take care of resource efficiency and reduced environmental impacts, as well as the workforce and company's social responsibilities.

SMEs are the backbone of the manufacturing industry in Europe. Micro, small and medium enterprises provide around 45% of the value added by manufacturing while they provide around

59% of manufacturing employment. Manufacturing is an indispensable element of the innovation chain enabling technological innovations to be applied in goods and services, which are marketable in the marketplace and is key to making new products affordable and accessible so as to multiply their societal and economic benefits and achieve the desired impacts. Manufacturing is an R&D&I intensive activity and it's critical for emerging markets: new markets driven by advances in science & innovation will revolutionise Europe's capability to expand manufacturing across traditional and new industries.

Europe's strengths in global trade are in knowledge-intensive goods such as machine tools, automobiles, aircrafts, medical devices, as well as pharmaceuticals and chemicals. Only competitive companies can success in the global markets. It's also necessary that the products meet proactively customers' needs. This requires constant innovation in order to be always one step ahead of competitors. Therefore Europe needs to invest strongly in research and innovation. The vision of "Sustainable globalisation" adopted by the MANU*FUTURE* community is a good guideline for the development of future technologies, products and processes. Europe is in front of an industrial revolution and re-industrialisation, where cleaner technologies fundamentally change production patterns and also the global value chain. The manufacturing sector is of vital importance as a source of value creation, sustainable growth, job creation and prosperity.

Investments in manufacturing are still stagnating in Europe. For ensuring private investment, coming from both inside and outside Europe, we need to create attractive framework conditions in Europe. This includes a favourable regulatory framework, for example: less legislation and more stable and predictable legislation, flexible labour markets, greater legal predictability and stability, better access to energy at competitive market conditions and more. Also instruments and funding for research and innovation activities are no doubt one very important element in the policy-mix for attracting investments. The framework conditions under which companies operate make or break the future development of the engineering industry in Europe. Some of these framework conditions will change with Horizon 2020 entering into force. The European Institutions have decided that in future the European Programmes will focus much more than in the past on the link between research and innovation. This is expected to make Horizon 2020 more interesting also to SMEs which form the backbone of European industry.

3.1.2 Horizon 2020: Roadmaps for Manufacturing

Four years on from the launch of the 'Factories of the Future' public-private partnership by European Commission President José Manuel Barroso, the MANU*FUTURE* community looks with confidence at a record of success. Four research calls have resulted in 140 projects across multiple sectors with the participation of approximately 1,000 organisations throughout Europe. Such participation has resulted in a reversal of the trend of decline in industrial participation and an increased participation by SMEs. The experiences and results are encouraging and guiding the manufacturing community forward on the way to the ambitious goals of Horizon 2020 and the Europe 2020 strategy.

The new strategic research roadmap of the 'Factories of the Future' public-private partnership –

'Factories of the Future 2020' – identifies and realises the transformations by pursuing a set of research priorities along six research and innovation domains. These are 1) Advanced manufacturing processes, 2) Adaptive and smart manufacturing, 3) Digital, virtual and resource efficient factories, 4) Collaborative and mobile enterprises, 5) Human-centered manufacturing, and 6) Customer-focused manufacturing. Each of these domains embodies a particular aspect of the required transformations towards the factories of the future. The research and innovation activities undertaken within the domains should focus on a concrete and measurable set of targets, described as the manufacturing challenges and opportunities. Addressing these challenges and opportunities is at the core of what the Factories of the Future PPP is targeting to achieve.

In Horizon 2020 the European process industry is targeting to improve its resource- and energy-efficiency with strong Public-Private Partnership created by eight world-leading European industry sectors (chemical, steel, engineering, minerals, non-ferrous metals, cement, ceramics and water). The process industry sees that Europe can achieve sustainable growth through a strong and innovative reshaping of its industrial base. The European process industry is uniquely positioned to drive the work towards the objectives of the Europe 2020 strategy. The process industry represents the economic roots of the European economy by transforming raw materials into intermediate and end-user products, and thus sits at the core of most industrial value chains via discrete manufacturing into e.g. automotive and housing sectors. This industry sector is strongly dependent on resources, i.e. energy, raw materials and water but has set ambitious targets in order to achieve radically improved resource and energy efficiency and long-term sustainability. Within the 2030 time horizon the process industry is targeting to a reduction in fossil energy intensity of up to 30% from current levels, and up to 20% reduction in non-renewable, primary raw material intensity compared to current levels.

The European Union has taken the next big step in improving its capacity to innovate, educate and grow by expanding the European Institute of Innovation and Technology (EIT). Since its founding in 2008, the EIT has moved from idea to reality by forming three far-reaching partnerships for innovation, called as Knowledge and Innovation Communities (KICs). The KICs are excellence-driven partnerships that act as EIT's main operation arms. EIT is expected to launch a call for a Knowledge and Innovation Community (KIC) on Added Value Manufacturing (AVM). Combined with the existing KICs in energy, climate change and information and communications technologies, EIT will recruit in 2014 two new KICs (healthy living and active ageing, and raw materials), and by 2016 two additional KICs in food4future and added value manufacturing will join the EIT family. Added Value Manufacturing strengthens high value (or added-value) manufacturing industry to guarantee Europe's competitive position, and create value by delivering product and service innovation, establishing process excellence, achieving high brand recognition and contributing to a sustainable society.

The EIT KIC on Added Value Manufacturing would have strong role in the re-industrialisation of Europe. By connecting European manufacturing business and research, businesses stand to gain as they will be given fresh opportunities to commercialise the most up-to-date and relevant research findings, with the aim of giving Europe first-mover advantage in the latest technological

and non-technological fields as well as in open innovation. In return, research organisations will benefit from additional resources, an enhanced networking capacity, and new research perspectives stressing interdisciplinary approaches in areas with strong societal and economic importance. By adding higher education into the mix, businesses will be able to take advantage of a workforce with skills tailored to their needs able to drive their market share forwards; and students will benefit from an education that will make them more attractive to future employers and also more apt at contributing to the development of those employers' businesses.

3.1.3 Learning and Outcomes of the Factories of the Future PPP Programme in FP7 and Outlook to Horizon 2020

Since the launch of the Factories of the Future public-private partnership the public and private parties have invested in total €1 billion in 140 projects involving more than 1,000 participating organisations. The parallel sessions of the MANUFUTURE 2013 conference discussed the experiences of more than 30 FP7 FoF-projects. Most of the projects have already resulted in interesting developments as well as in demonstration activities to implement, test and verify the research results. The presentations and discussions were grouped under five themes: 1) Flexible and High Performance Manufacturing, 2) Supply Chains for Customised Products, 3) Digital and Smart Factories, 4) Social and Environmental Sustainability, and 5) Manufacturing as the Enabler for the Integration of Technologies. According to the experiences it's obvious that interaction and networking or clustering among the projects help to identify business opportunities and facilitate the routes to commercialisation.

Several examples of concepts beyond the state of the art in the domain of intelligent and easily reconfigurable plug-and-produce components, modules and systems were given targeting to e.g. better quality, accuracy, productivity and reliability or zero defects, error-free products and processes or intelligent fault correction and self-optimisation.

Recent market changes force companies to address individual customer requirements and to put more emphasis on the service levels, by reducing response times and increasing quality. This confluence of trends has led managers to move from a traditional functional focus into a more holistic approach where strategic collaborations both at horizontal and vertical level enhance the capability of entering into new markets and prospering in the existing ones. It's important to understand which level of customisation is possible thanks to innovative models of manufacturing aimed at increasing the capability of addressing multiple needs of market niches. Modelling, designing and configuring the combination of processes, functions, activities, relationships and paths along which products, services and information flow in and among companies are more and more in important role.

Information and communication technologies (ICT) are key enablers of manufacturing systems and factories of the future. ICT for manufacturing has been one of the main topics in the MANU*FUTURE* Visions and roadmaps. Future Visions are influenced by the innovations of ICT and applications in the technical development for manufacturing systems. Information is available everywhere and at any time and can be presented in a virtual system so, that even

complex technical solutions are to understand in shortest time. Digital products are a computerised representation of products. They are embedded in Product-Life-Cycle – Management Systems, which support all operations from begin to end of life. We can consider factories as products which leads to digital factories, which represent all objects of factories in digital models. Factory data management systems support operations along the life-cycle of factories and their technical equipment. New IT-systems change the architecture by flexible and networking systems based on internet-technologies. New platforms for communication allow the federation of dislocated information sources, flexible workflows and flexible configuration of the tools. A smart factory has more automation and better control and optimisation of factory processes enabling e.g. less waste, less energy use, faster time-to-market and better quality.

Socially sustainable factories are crucial to the success of European manufacturing industry. Demographic problems and competence requirements on employees in future advanced European manufacturing will need increased knowledge on how to create socially sustainable workplaces and factories. A new support action (Socially Sustainable Manufacturing for the Factories of the Future) aims to establish research roadmaps and guidelines for the social well-being of the employees for the Factories of the Future, addressing new forms of interaction between process, machinery and human beings in new kind of socially, economically and environmentally sustainable workplaces. It's important to understand how the factories of the future can operate profitably while at the same time providing a stimulating environment for the employees.

Related to social sustainability one of the main problems manufacturing companies are facing today is the recruitment of the proper workforce. In the report "The Future of Manufacturing" published in April 2012 by the World Economic Forum, the responded CEOs recognised 'talent-driven innovation' as the top priorities for the competitiveness of the companies, and even more important than the labour cost, material and energy. Manufacturing is still considered in the eyes of young talents a non-attractive environment and a not promising job. The work environment in today's factories has, however, changed dramatically. Instead of having the workers carrying out repetitious tasks, the focus is on cognitive interaction with the work environment through ICT. The challenge is to change the image of manufacturing and make it attractive to young talents. In order to guarantee this fundamental resource to manufacturing concrete actions are needed both from the policy makers and companies at global level.

3.1.4 Horizon 2020 and Regional Dimension

Manufacturing has typically its roots in the regional community and infrastructure, incl. education, research, communication, health, transport, energy, water, services etc. The regional dimension is a key to Europe's sustainable growth agenda and to tackle the re-industrialisation challenges of Europe. That's why EU Regional Policy has focused on innovation and smart specialisation. The European Commission launched the "smart specialisation platform" in June 2011 to support regions and Member States in defining better their research and innovation strategies. Smart Specialisation is a strategic approach to economic development through targeted support to Research and Innovation (R&I). It will be the basis for Structural Fund

investments in R&I as part of the future Cohesion Policy's contribution to the Europe 2020 jobs and growth agenda.

Smart specialisation aims at helping regions to fully tap their innovation potential and focus the investments on economic transformation and micro-economic competitiveness, incl. business support. Smart specialisation fosters industrial renewal by upgrading manufacturing and helping to translate scientific leadership into industrial advantages. It promotes synergies between the relevant European funding instruments such as Horizon 2020 and the Structural Funds. Smart specialisation also offers important opportunities for roadmap alignment and the identification of co-investment opportunities, including with European-level PPPs, such as the Technology Platforms.

The mature correlation between the EU, regional and national demands with the country's or region's R&D and innovation as well as business potential and societal challenges in general vary between countries and regions. Investments in R&D and innovation are crucial but it's as important for the country or region to prioritise those investments. This means that there is a need for searching a consensus between academia, industry and political decision-makers. Widening of the partnerships over the European Union or even globally makes the decision making even more complex.

Since the beginning of the MANU*FUTURE* platform, the regional dimension has been considered crucial to achieve its objectives and impact, namely the engagement of actors and mobilisation of resources. Since 2004 the MANU*FUTURE* community built a network of national and regional platforms (NRTP), gathering currently 28 platforms and involving 2,000 direct members. While policy-making can be done at European level, implementation always happens at national and regional level, the companies and businesses are embedded in the national or regional environment. This network of NRTPs is capable of supporting the design and implementation of policies, programmes and initiatives, at national or regional level, complementing and aligned with the EU framework to cover the entire innovation cycle.

Dissemination of the available knowledge and existing applications can be done via examples, case studies and demonstrators. There is still potential for improving cross fertilisation by promoting further exploitation and reutilisation of R&D results and by creating a European network of demonstrators and pilot lines, incl. the existing ones. Existing and new clusters can play a major role in all these processes. The new funding instruments improve the possibilities to close the gap between R&D and exploitation and cover the entire innovation cycle in one project by aligning and combining different and complementary funding sources, e.g. Horizon, structural funds, national, regional, private and public.

The European Union Strategy for the Baltic Sea Region (EUSBSR) was put in place in 2009 being the first macro-regional strategy in Europe. The Strategy brings together initiatives in different sectors and promotes cooperation between stakeholders in the Baltic Sea Region. This framework allows the European Union and Member States to identify needs and match them to the available resources by coordinating of appropriate policies, thus enabling the Baltic Sea Region to achieve a sustainable environment and optimal economic and social development. The

new EUSBSR objectives and priorities are fully aligned with the Europe 2020 strategy and the EU cohesion policy. Facilitation of trans-national networks, partnerships and strategic alliances between cluster organisations, companies, universities and public authorities will lead to innovation-driven new business, commercialised applications, products and services, new firms and jobs.

Manufacturing industry is a significant employer in the Baltic Sea Region, and so the success of the branch has a great social influence. The region involves 9 countries, 8 of them already having national MANU*FUTURE* platforms and networks. The target of the BSR Manufacturing Belt initiative is to promote research and innovation strategies for smart specialisation, raising scientific and technological excellence and strengthening competitiveness and innovation in manufacturing all over the BSR countries, and to attract more private investments for research and innovation in the region. BSR includes countries both on the top and in the bottom in innovation performance. This would give the region a perfect situation for knowledge and technology transfer and for building a staircase to excellence also in less advanced countries.

Participation of CEE countries in the calls launched under the Public Private Partnership "Factories of the Future" (FoF) initiative for the manufacturing sector has been very low. Only 2-5% of the budget went to the participants from CEE countries in the winning consortia, despite the fact that those countries have the largest workforce in the manufacturing sector in Europe and is in need of maintaining those jobs by increasing productivity rates through research and innovation activities. It seems that one reason for the participation pattern largely mirrors the overall capacity of economy in individual countries and sectors and that the low participation shows the lack of interest in industrial R&D by the manufacturing industry in CEE countries. The new programme period and new funding instruments and EU policies give, however, better opportunities also to CEE countries to participate in European consortia which is necessary in order to achieve e.g. the ambitious targets Horizon 2020 and Europe 2020 strategy.

Launched in 2007 was set up by the European Investment Bank (EIB) and financially supported by the EU, in order to foster additional investment in RDI (Research, Development & Innovation) in the EU and the Seventh Framework Programme's (FP7) Associated Countries (AC), as well as to address the markets' failure in allocating sufficient resources to RDI. The Risk Sharing Finance Facility (RSFF) also includes the Risk Sharing Instrument (RSI), a guarantee instrument handled by the European Investment Fund (EIF) under mandate from EIB, targeting e.g. innovative SMEs and medium-sized corporations. Overall the programme has fostered more than EUR 40bn of new RDI investments in Europe. Based on this success, the Commission and the EIB are working together closely on blended risk-sharing instruments leveraging the EU budget with the EIB lending capacity. The new financial instrument being developed under Horizon 2020 will cover a broad range of products targeting SMEs (via Venture Capital/Equity and Guarantees/Counter-Guarantees), as well as medium-sized corporations and larger entities including research infrastructures via EIB investment loans. Like the current RSFF, the new products will target RDI investments promoted mainly by sub-investment grade promoters, with a strong focus on developing European industrial capabilities e.g. in Key Enabling Technologies.

3.1.5 Horizon 2020 and International Dimension

Manufacturing Industry is the foundation of national and international economies. It accounts for approximately 16% of global GDP and 14% of employment. Manufacturing is critically important to both developing and developed countries. Current globalisation – enabled by manufacturing and affecting it - has brought many advantages to new developing countries, but also created many large-scale problems in developed countries. By 2025 the majority of production and consumption will take place in developing economies. Meanwhile, in established markets, product demand will be almost steady, but highly differentiated. A new global equilibrium must be pursued. A new paradigm - Competitive Sustainable Globalisation – could be based on two complementary components, interacting within global value chains, i.e. 1) Competitive sustainable global manufacturing, constituted of global manufacturing industries with factories located in countries with competitive advantage (tax, labor cost, etc.), and 2) Competitive sustainable local manufacturing, focusing on establishing local competitive and sustainable manufacturing industries.

To respond from a globalising world perspective to the grand economic, social, environmental challenges, the developed countries foster re-industrialisation by investing in local manufacturing, and the European Union is promoting and supporting such a process. The European initiative fostering regional smart specialisation strategies could provide the right political and financial environment to promote and support competitive sustainable local manufacturing. Industry, universities and research institutions, fostered by MANU*FUTURE*, could play a revolutionary role in this.

IMS (Intelligent Manufacturing Systems, www.ims.org) is an industry-led, international business innovation and research and development program established to develop the next generation of manufacturing and processing technologies through multi-lateral collaboration. IMS provides global services to institutions from the supported regions, incl. the European Union, Mexico, and the United States of America. Other Regions are encouraged to join the IMS program. IMS offers international consortium building and coaching services provided at no charge to researchers from member countries, a listing of projects seeking partners, and a project database with valuable research information. IMS is also a premier sponsor of the World Manufacturing Forum where high-level government officials and industry executives discuss issues and solutions to challenges in manufacturing.

The European Union has sponsored a roadmap project titled “IMS2020” with the objective to strengthen international co-operation under IMS, to provide an effective interface with ongoing European road-mapping activities, and to create research synergies through the establishment of international manufacturing communities in key areas. The IMS 2020 roadmap for future manufacturing research provides a list of topics suitable to IMS cooperation and defines five main areas for concerted future research actions, i.e. 1) Technologies for Sustainability (Holistic view of product cycles in the manufacturing industry and life-cycle-optimisation of manufacturing systems, products and services), 2) Scarce Resources Management (Material reuse optimisation, reducing global consumption of engineering materials such as hydrocarbon

fuels and metals and polymers), 3) Sustainable Lifecycle of products and production systems (Performance and Quality of products, services and processes, and safety of people, but also of the related facilities and infrastructure), 4) Sustainable Product and Production (Contribution towards modernisation of industry by improving the quality of product information and ease of access to information at the design, production, utilisation and end of life stages), and 5) Sustainable Businesses (Managing all the conflicting aspects of sustainability in an integrated manner, focusing not only on environmental or social performances but also on sustainability of business).

Further action after the roadmap project include identification of new schemes and frameworks to support IMS research by enhancing and favouring inter-regional cooperation projects, identification of specific measures to increase SME participation in international R&D collaborative projects in IMS, and building and consolidating a number of international and inter-regional communities in the five defined IMS Manufacturing Technology Platform (MTP) thematic areas ensuring an effective exchange of results and knowledge. Collaboration with IMS offers access to the IMS network and government channels/activities across the partner regions providing government level visibility and credibility in the areas of interest. IMS can also provide an exploitation and/or dissemination multiplier for the research activities and expand knowledge and supply chains via the new global networks.

3.2 Impact on ethical and gender issues

Throughout the duration of the project, there were no known ethical or gender issues and, considering project subject, it is not likely to occur in the future. Although equality of rights is not directly expressed in project objectives and tasks, equal rights are ensured between all project Partners for both male and female participants, disregarding their social status, religion, race, physical or mental disorder and any other characteristic.

3.3 The Consortium

The project consortium has brought together a wealth of different competences, organisations that are providing services in a professional way. The partnership has involvd three types of partners. The first type of partnership involves local partners representing a Triple Helix in industrial engineering (LINPRA – industry association, KTU – major technical university in the country and FIMTP – a science and technology park which has attracted a risk capital into one of the start-ups in semiconductor manufacturing services). Nevertheless the teams have been coordinating their activities through common International Advisory Committee and Organising Committee. The second type of partnership has involved DPIN and TUT representing European Technology Platform MANU*FUTURE*. The third type of partnership is represented by EP – a Lithuanian based Dutch-Lithuanian Consultancy Company having excellent expertise both in FP project coordination and management.

The coordinator plays the overarching role in all partnerships: EP is a partner organisation for LINPRA, LINPRA has a joint partnership with KTU and FIMTP in a number of projects cofounded by the EU Structural Funds and also shares membership of the European Technology

Platform MANU*FUTURE* with representatives from DPIN and TUT who are participating in this consortium. Both Prof. Edward Chlebus and Prof. Reijo Tuokko (TUT) are members of the High-Level Expert Group MANU*FUTURE*, while also both Dr. Jaroslaw Chrobot and Dr. Henrikas Mykolaitis are members of the National and Regional Technology Platform Group of MANU*FUTURE*.

4 Public website

The information about the Conference can be accessed through the website http://www.manufuture2013.eu/, and the information about the project can be accessed through the website http://manufuture.europarama.lt/.