

Technology for the World, Manufactured in Europe

Vision Paper - 2016 Update



November 2016



Two years into the new European
Commission and European Parliament

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Introduction

In May 2014, right before the election of the new European Parliament and appointment of the new Commission, Orgalime adopted its Vision Paper “Technology for the World – Manufactured in Europe”. This publication highlighted our vision for achieving a stronger and more efficient Europe, where industry and policy makers work together to shape a framework that allows manufacturing companies across the EU to flourish and grow, generating employment in the process. The Vision Paper addressed the many policy areas with a direct impact on manufacturing investment, including technology and the large-scale incorporation of ICT into manufacturing and the wider economy, the internal market framework, R&D and innovation, trade, skills, energy and infrastructures, and environment policy.

Now, as we approach the Commission’s mid-term review, this updated Vision Paper presents Orgalime’s own review of the first two and a half years of the current legislature – analysing the progress that has been made through the adoption of policies and legislation, and commenting on what we see as the way forward. Our focus is and remains on ensuring that the EU once again becomes an attractive destination for manufacturing investment, leading to a reversal of the decline of manufacturing in Europe. Indeed, we in Orgalime believe that Europe – and our sector in particular – has the resources to contribute to a European industrial renaissance and to increase the weight of manufacturing in the EU’s GDP from 14.2% in 2015 to 20% ¹.

Orgalime represents at European level the sector at the heart of the transformation currently taking place in industry, which centres on the massive integration of ICT into manufacturing and the wider economy. This is creating new eco-systems based on the analysis and exploitation of data generated by connected products and production systems, the number of which is growing exponentially.

In 2015, the European mechanical, electrical, electronic and metalworking industries accounted for an annual turnover of €1900 billion (a quarter of the European manufacturing total), employing 10.9 million people and exporting one third of all manufactured goods sold outside of Europe. Moreover, as described in two studies conducted by the Boston Consulting Group ² and McKinsey³, the technologies that are transforming industrial production closely interweave mechanical, electro-technical and IT (hardware and software) elements: the digitisation of European industry first and foremost

¹ European Commission DG GROW, “EU Structural Change 2015”

² Industry 4.0 The Future of Productivity and Growth in Manufacturing Industries, BCG, April 2015

³ McKinsey Digital (2015) Industry 4.0: How to navigate digitization of the manufacturing sector



requires that the European engineering branches adopt digital tools and incorporate them into their business processes, as a means of remaining innovative and competitive. And as an enabler for the other branches of manufacturing, the engineering industries can then help spread innovation and boost competitiveness across the entire manufacturing sector.

As described in our 2014 Vision Paper, Orgalime bases its work on a set of core values, built around the following priorities: the provision of growth, innovation and jobs; the consolidation of the EU internal market around the “four freedoms” and an efficient market surveillance regime; an investment and technology-friendly business environment; sustainable, and therefore simpler, more stable, coherent and more predictable regulation; free and fair trade; and freedom of contract for B2B relations. Above all, we believe in cooperation:

- Cooperation between the Member States within the European Union: a return to a Europe of nation states, each with its own internal rules for its national market, would be hugely disadvantageous to the competitiveness of our industry, which has built its global success on a strong EU internal market.
- Cooperation between industry and policy-makers, regulators and the education communities at national and regional levels to ensure that European policy objectives are achieved in a manner which is sustainable for all – citizens, employees, companies and the environment.
- Cooperation with those organisations in industry and beyond with whom we share the same values and pursue the same goals.



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A

More Europe – better Commission leadership and governance

Our industry has greatly benefitted from the European Union, especially from the internal market. We view an efficient and effective EU that focuses on the right priorities as a cornerstone for the competitiveness of our industry in a globalised world. To succeed, we need the EU institutions to take the lead responsibility in their core areas of competence: a deepened internal market, effective EU trade policy which provides market access, and a regulatory framework which is supportive of fast innovation and industrial competitiveness.

It is with this in mind that we are concerned to see that the Commission, notably under pressure from Member States where we are seeing a surge of economic nationalism, has been relinquishing some of its powers in fundamental areas: the internal market is weakening as Member States are being granted the right to adopt national legislation re-creating technical barriers to trade, EU trade policy is being submitted to the approval of national or even regional decision-makers and the Commission itself is not always following the rules. Yet its legitimacy is built upon the legal basis which underpins the EU.

Orgalime and the industries which we represent would therefore wish to see a European Commission acting as guardian of the treaties, focusing on the areas under its competence with a view to achieving a supportive framework for jobs and growth, strongly standing for the four freedoms as a whole, which are built on shared European values, and which are the foundation for any further development of the EU.



B

Welcome achievements to date

- Renewed focus on support for manufacturing across most EU institutions and policy areas, including setting the goal of 20% share of GDP for manufacturing by 2020.
- Putting the issue of lack of investment in Europe at the top of the EU agenda, with efforts to boost it, notably via the “Juncker Investment Plan”.
- Comprehensive approach towards the digitisation of European industry, building on two action streams –“boosting Europe’s digital innovation capacities” and “boosting digital innovation in all sectors across Europe” – and on promoting infrastructure deployment.
- Support for R&D and innovation through Public Private Partnerships, which are seen by our industry as effective platforms for involving manufacturers in publicly funded R&D, thereby strengthening their competitiveness.
- Prudent use of the regulatory tool for implementation of the Digital Agenda, and cooperation with industry in this context.
- The rapid EU ratification of the Paris Agreement: we would now like to see member states adopt and implement it in order to meet its targets in due time.
- Strengthening the role of technology providers and customers in the Energy Union Strategy.
- Effective dialogue with industry on standardisation policy via the “Joint Initiative”.



C

What still needs to be done – or done differently

- Overall coordination between initiatives: better integrate at a policy level, perhaps through an industrial policy initiative, the dimensions of the internal market, Energy Union, resource efficiency and circular economy, R&D and innovation, investment, digitisation, and international trade.
- Internal market: adopt rules that really are simple for all, based on the mutual recognition principle and the “New Approach” as codified in the New Legislative Framework; improve market surveillance at Member-State level, without increasing the burden on companies with additional compliance procedures; fight any attempt to re-nationalise product and service policies; ensure that waste legislation does not undermine the internal market.
- Overall regulatory framework: focus on those areas where regulation will help to develop the internal market or provide real EU value added. Avoid non-regulatory proposals which end up encouraging the undermining of the internal market such as the Communication accompanying the proposal for regulating conflict minerals.
- Bring the Paris Agreement to life thereby making Europe’s transition to a low carbon economy a reality, including through the implementation of the July 2016 climate package and wider Energy Union Strategy, with a greater focus on energy efficiency, namely through the foreseen revision of the Energy Performance of Buildings Directive (EPBD) and the Energy Efficiency Directive (EED) in tandem with a more demand side driven EU energy market design incorporating more energy efficiency plus more renewable energy sources plus smart, flexible distribution grids. While support finalising the pending eco-design and energy labelling work on already selected product groups, overall the energy efficiency potential of standalone appliances is reaching its technical limits.
- Better use of resources and circular economy: first, build on synergies to be gained from digitisation; avoid using the traditional command-and-control approach and fully ensure the functioning of the internal market for products; improve legislative consistency, notably between EU waste and chemicals policy by applying a risk based approach and by setting minimum quality criteria for secondary raw materials; apply the life-cycle costing principle in public procurement; leave sufficient flexibility for industry to develop and implement the necessary variety of business models to reflect the different products, sectors and companies and their respective challenges.



- Regulatory framework for digitisation: recognise in the definition of platforms that they are business models and not undertakings or industry sectors, and therefore should not be the object of ad-hoc legislation; regarding cloud computing, ensure that any strategy has future-proof implementation in mind and does not prescribe, dictate or promote a specific business model.
- “Open” data: do not oblige companies to grant access to data from their business context.
- Horizon 2020: focus work programmes for the last period (2018-2020) on encouraging European manufacturing companies to modernise their products, production processes and business development, by experimenting and using digitisation.
- Trade: improve the governance for negotiating trade agreements in order to ensure that the EU remains credible, in the absence of progress at the WTO level, as a partner for negotiating free trade agreements. Do not give up on the TTIP; work towards re-establishing the WTO as the central forum for multilateral trade negotiations, and focus on business services, standards and certification procedures, establishing efficient customs procedures, ensuring a faster entry into force of trade agreements; negotiate agreements with the next “game-changer” countries¹.

¹New Mega Trends, Macro to Micro Opportunities on Future Business, Cultures, and Personal Lives, Sarwant Singh, Frost and Sullivan, <https://www.youtube.com/watch?v=iaBWfs7Sx6I>



Chapter I

Digitisation: revolutionising manufacturing – driving economic growth

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Introduction

The economic landscape has changed significantly since Orgalime published its Vision Paper in May 2014. At that time, Europe was dealing with very high unemployment and growing competition from the BRICs in the European market and globally.

Since then, the European economy has recovered from the 2008 crisis: in 2015, output in Orgalime's industry overtook that achieved prior to the 2008 crisis, rising by some €100 billion (+ 1.3%) to €1900 billion, with employment also up to reach 10.9 million (+ 0.7%). The forecast for 2016 is 1.2% growth in output ¹.

Part of this recovery is linked, we believe, to the on-going transformation of the engineering industries through the massive incorporation of ICT tools and processes into manufacturing and the wider economy – creating a new eco-system based on the analysis and exploitation of data generated by connected products and production systems, the number of which is growing exponentially. In fact, while one billion people are expected to be connected by around 2020, the number of devices interacting with each other and with users is expected to rise to 50 billion. This will lead to the creation of new production processes, products and services, business models and value chains.

Growth in the engineering branch is all the more encouraging as the digitisation of industry has a pervasive effect across the entire value chain.

Nevertheless, we also note that not all is going well in the EU. Gaps are growing between generations or between wealthy and poorer parts of the population, and this also negatively affects the attitude of policy-makers towards change.

Yet we believe that the digital transformation offers huge opportunities for European industry to contribute to Europe's industrial renaissance and to move towards bringing the share of industry in the EU's GDP back to 20% – as proposed in the Juncker Commission's ten priorities. We also are convinced that the digital transformation will benefit society more broadly: for example, it can make a major contribution to sustainability, notably regarding climate change (modernisation of electricity networks, decarbonisation of transport systems) and resource efficiency (efficient management of raw materials), to improvements in the workplace, including for the ageing workforce, to health care, and to the management of borders.

¹ Orgalime Annual Report 2015-2016 "The digitisation of industry"

Digitising European industry: the journey so far

I

Origin and development in national initiatives

The “Industrie 4.0” concept was born in Germany in April 2013, when the German Science and Industry Research Union published a set of recommendations on implementing the strategic “Industrie 4.0” initiative¹ – described as a fourth industrial revolution. Whereas the first industrial revolution was driven by mechanisation, the second by electrification, and the third by electronics and information technologies, the fourth industrial revolution leverages the systematic production, exchange, analysis and use of data across the entire value chain to constantly adapt it.



From these beginnings, the concept now known as “Industrie 4.0”, “Smart Industry”, “Industrie du Futur” or the “Digitisation of Industry” has spread far and wide and is transforming the entire economy – the engineering industries in particular. The European Commission² has identified some 30 initiatives launched in recent years, both at national and regional levels. A review of those where Orgalime national members are involved can be found in annex 1.

What is now called “Industrie 4.0”, “Smart Industry”, “Industrie du Futur” or the “Digitisation of Industry” is transforming the entire economy and the engineering industries in particular.

These national plans vary quite considerably, due to large differences between Member States regarding the current situation and evolution of the national industry base, and differences in how the concept of industrial policy is understood from country to country.

¹ Recommendations for implementing the strategic initiative INDUSTRIE 4.0, April 2013

² An Action Plan for Digitising European Industry, DG CNECT, December 2015, (draft)

These programmes or plans rarely envisage a European dimension. However, there are a few important exceptions. In April 2016, the French Alliance for the Industry of the Future and the German Platform “Industrie 4.0” agreed a cooperation action plan, and the French and German associations FIEEC and ZVEI adopted a joint declaration and joint position on the digitisation of industry in July 2016. Another example of German-French cooperation is the joint paper agreed between FIM and VDMA in April 2016. Moreover, the Dutch and the Belgian governments have started negotiations on how to combine and leverage their respective programmes, focusing on four key topics: a shared vision on digitising policies, jointly creating field labs and streamlining research agendas, a joint Factory of the Future (FoF) assessment methodology and ‘FoF Awards’ events, and the development of human-centred production.

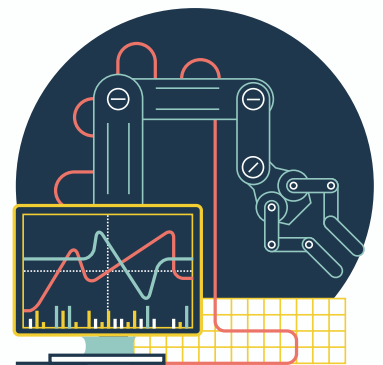
Against this background, Orgalime welcomes the Commission initiative to establish a European platform of national initiatives, aimed at facilitating interaction between national and regional initiatives. We plan to contribute to its success, but underline that it should not create any administrative layer and must remain an exchange of information and good practices.

II

Central role of the European engineering industries

According to a study by the Boston Consulting Group¹, nine technologies are transforming industrial production: big data and analytics, autonomous robots, simulation, horizontal and vertical system integration, the industrial Internet of Things, cybersecurity, cloud-based software, additive manufacturing and augmented reality. For McKinsey, Industry 4.0 is driven by four clusters of disruptive technologies:

- i) data, computational power and connectivity;
- ii) analytics and intelligence;
- iii) human-machine (touch interfaces and augmented reality)
- iv) digital-to-physical conversion (advanced robotics and 3D printing)².



Digitising European industry requires first and foremost the digitisation of the European engineering branch, as an enabling industry for other branches of manufacturing.

Both descriptions indicate a series of technologies that interweave mechanical, electro-technical and IT (hardware and software) elements. Digitising European industry therefore requires first and foremost the digitisation of the European engineering branch, as an enabling industry for other branches of manufacturing.

¹ Industry 4.0 The Future of Productivity and Growth in Manufacturing Industries, BCG, April 2015

² McKinsey Digital (2015) Industry 4.0: How to navigate digitization of the manufacturing sector

Taking action at EU level: where we stand

I

A core priority for the Juncker Commission, to be reinforced

In his Political Guidelines for the new European Commission that took office in November 2014, Commission President Juncker proposed a series of ten priorities for his five-year mandate, including “A Connected Digital Single Market”, “A Resilient Energy Union with a Forward-Looking Climate Change Policy”, and “A Deeper and Fairer Internal Market with a Strengthened Industrial Base”. Significantly, the objective defined by the previous Commission to increase industry’s share of EU GDP to 20% was confirmed, with the engineering branch listed as one of the strategic sectors where Europe should maintain its global leadership.



Such a target might be difficult to reach as it depends on a large number of factors that vary from Member State to Member State, but its inclusion in the EU Commission President’s Political Guidelines demonstrates both the awareness that industry is central to the EU’s economic growth and the willingness to address the decline of manufacturing in Europe.

If the EU is to succeed with its industrial renaissance, it must develop its digitisation strategy as part of an overall coordinated industrial policy.

All ten priorities were confirmed in the Commission Work Programmes for both 2015 and 2016, becoming the central focus of all Commission activities. At the Hanover Fair in April

2015, Commissioner Oettinger delivered a speech entitled “Europe’s future is digital”, in which he outlined the upcoming European Commission Communication on the Digital Single Market and set the objective that “any industry in Europe, wherever it is located,



can make the best use of digital technologies while adapting our workforce to the change”. This was followed in the course of 2015 by two strategic Communications: one designed to enhance the EU Digital Single Market (May) and another, as announced by Commissioner Bieńkowska, aimed at upgrading the Single Market for goods and services (October). In April 2016, a Communication on “Digitising European Industry: Reaping the full benefits of a Digital Single Market” went further by proposing a focus on two streams that should be equally explored and supported: “boosting Europe’s digital innovation capacities” and “boosting digital innovation in all sectors across Europe”.

Orgalime supports this two-pronged strategy: if the EU is to succeed with its industrial renaissance, it must develop its digitisation strategy as part of an overall coordinated industrial policy and build on engineering technologies where Europe is leading – such as embedded and business software, telecommunication equipment, robotics, automation, laser and sensor technologies, electronics for automotive, the security and energy markets. Our strengths are embedded in the physical value chain where the electrical, mechanical, automotive, energy and other manufacturing technologies incorporate ICT tools and solutions developed jointly, offering new solutions for existing and potential markets.

However, at this stage it seems that the Commission is still talking policy issues and not yet deciding on implementation, where the focus should be now. Moreover, it is losing ground in core areas such as the internal market and trade, where Member States are deploying a new economic nationalism or the European Parliament is pushing for national product policy. In this respect, a Commission Communication on Industrial Policy restating all basic principles upon which the EU economic framework is founded would be highly welcome. It should also recall that digitisation is not only a matter for consumers, but has to be part of other EU areas such as the Energy Union or infrastructure policy (where the Connecting Europe Facility can be instrumental in its dissemination).

II

Industrial policy and digitisation have become a high priority for other EU institutions

Orgalime is pleased to note that all institutions have now put the industrial policy issue high on their respective agendas. For example:



- The European Council included the theme of the digitisation of industry in its conclusions on the European Semester both in June 2015 and 2016. In June 2015, it underlined that: “digital technologies bring immense opportunities for innovation, growth and jobs. In order to benefit fully from this technological revolution, we need to tackle market fragmentation, ensure future-proof regulation, build supporting infrastructure, help the digitisation of industry, create conditions to facilitate growth in all sectors and protect our citizens”. In June 2016, it called for the adoption of the various Single Market Strategies to be completed by 2018.



- The European Parliament adopted two comprehensive resolutions: one on the Digital Single Market in January 2016, and one on the Strategy for the Single Market for Goods and Services in May 2016. On 5 October, it adopted in Plenary a resolution on the need for a European reindustrialisation policy.

All institutions have now put the industrial policy issue high on their respective agendas.

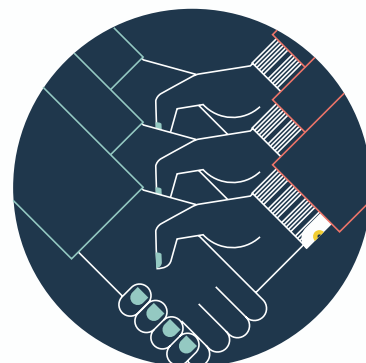
- At Council level, Presidencies were very active to ensure the adoption by the Council of conclusions on the digital transformation of European industry in May 2015, on the Single Market Strategy for Goods and Services in February 2016 and on “Digital Single Market Technologies and Public Services Modernisation” in May 2016. For example, the Dutch Presidency called an informal meeting of the Competitiveness Council in January 2016 and organised a conference on “Creating a smart Europe” in June 2016 where it presented the “Amsterdam declaration – Creating a smart Europe” proposing measures to accelerate digitisation and its uptake, which the Slovak Presidency in its conference on “Re-industrialisation of the European Union” in October 2016 further built upon.
- Also, the European Economic and Social Committee prepared several reports and organised a number of hearings addressing this issue, including an Opinion on the socio-economic consequences of the digitisation of industry and disruptive labour markets in September 2015, and an Opinion on the Commission Communication on Digitising European Industry in July 2016.

A strong, concrete indication of the interest of all EU institutions in the topic was the swift adoption of the regulatory framework putting in place the Commission initiative of November 2014 to set up an investment plan aiming to mobilise €315 billion between 2015 and 2018 – via the establishment of a European Fund for Strategic Investments (EFSI) and of a European Investment Project Portal bringing together project promoters and investors.

III

Interaction with stakeholders

The transformation of our industries is very much ongoing and companies in our branch are in the process of exploring and creating new technologies, new markets and new business concepts in areas where the regulatory framework must still be adapted or even created from scratch. As pointed out by MIT ¹, the manufacturing sector still ranks 16 out of 18 sectors in terms of digital maturity, and the integration of digital tools is a slow process as it involves all aspects of the value chain.



It is therefore necessary to nurture continuous dialogue between industry and public authorities at all levels to ensure that the right balance is found between legal certainty and a reliable framework – essential for building trust – on the one hand, and the flexibility to allow companies to explore, succeed and sometimes fail, on the other.

It is necessary to nurture continuous dialogue between industry and public authorities at all levels to ensure the right balance is found between legal certainty and flexibility.

Orgalime therefore welcomes the fact that industry (and particularly the digital and the engineering industries) was involved in the Commission reflections on this topic: in particular, the Strategic Policy Forum on Digital Entrepreneurship provided a number of reports on the digital transformation of European industry, and Commissioner Oettinger organised several roundtables with industry leaders and leaders of national initiatives to prepare the Commission proposals on the matter. A high-level conference organised by Vice President Katainen and Commissioners Oettinger, Bieńkowska and Moedas in February 2016 was concluded with the adoption of a “Declaration on the digital transformation of European industry and enterprises”.

This interaction is moving forward, notably with the creation – announced in the Commission Communication “Digitising European Industry” – of a High-Level Roundtable to be held twice a year by Commissioners Oettinger, Bieńkowska and Moedas, and of a European Stakeholders’ Forum, set to meet once a year. Orgalime is pleased to be actively participating in and contributing to the discussions here.

¹ The 2015 Digital Business Global Executive Study and Research Project by MIT Sloan Management Review

I / C

Digitisation: promoting growth, employment and social change

I

Contribution to Europe's industrial renaissance (20% GDP target)

The digitisation of European industry will contribute to the renaissance of industry in the EU – which we believe is essential for its economic and social development – while solving a number of societal challenges confronting our continent.

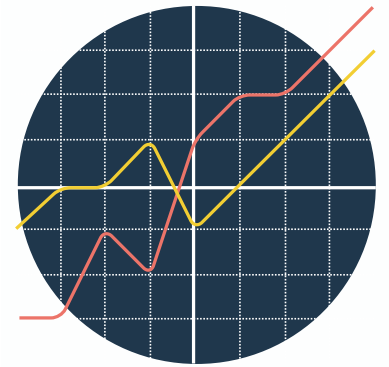
As summarised in the European Commission's report "EU Structural Change 2015", the contraction of manufacturing undermines the export and innovation potential of the economy, which are major drivers of long-term growth and higher living standards. The negative impact of a decline in manufacturing on the overall economy can be attributed to three factors:

- i) services depend on a strong manufacturing base, not only for the supply of equipment and material input, but more importantly as a customer base for business services,
- ii) services are less tradeable than goods and do not have the same export potential (40% of EU exports come from manufacturing, even though it contributes to less than 16% of the EU GDP), and
- iii) around two thirds of R&D takes place in manufacturing.

The contraction of manufacturing undermines the export and innovation potential of the economy, which are major drivers of long-term growth.

Against this background, the 20% target is absolutely vital – not only for European industry, but for the EU as a whole.

In its "Industry 4.0" report of April 2015, the Boston Consulting Group¹ estimated that in Germany alone, the digitisation of industry would lead to a 1% increase in GDP between



¹ Industry 4.0 The Future of Productivity and Growth in Manufacturing Industries, BCG, April 2015

2015 and 2025, create 390,000 jobs and add € 250 billion to manufacturing investment (or 1 to 1.5% of manufacturers' revenue). For the French Federation of Electrical, Electronic and Communication Industries (FIEEC), the sector could create up to 90,000 direct and indirect jobs in France by 2020¹. In terms of efficiency, a 2014 study conducted by consulting firm PwC forecasts an increase of 18% within the next five years (including higher productivity and resource efficiency). The same study forecasts that digitised products and services could generate some €110 billion of additional revenue per year for European industry.

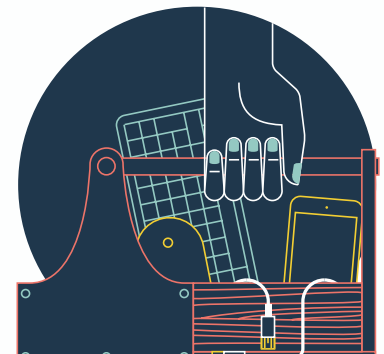
A further important aspect of the digitisation of industry is that it enables mass production of customised products – a huge source of potential markets.

II Employment

As with any fundamental technological change, the impact on employment is giving rise to concerns and debate as some scholars believe that many jobs, even highly skilled positions, are threatened by the digitisation of industry and the economy as a whole.

However, as pointed out by a study conducted by think tank “La Fabrique de l’industrie”², the impact of production automation on employment depends on four factors:

- a) work performed by employees may be substituted by equipment on the production unit, leading to a fall in employment if production remains at the same level,
- b) production may increase if the company becomes more competitive and acquires market shares, meaning a rise in employment,
- c) jobs may be created linked to the maintenance of new equipment and possibly – outside the company – to the manufacture of automation equipment, and
- d) free time and revenue may increase, generating new activities and new jobs.



While this cannot lead to any definitive conclusions on the ultimate impact of digitisation, looking back to the beginning of the industrial era it is clear that many more jobs, in entirely new industrial sectors, have been generated than lost since the mid-1750s. A recent example of job creation in such new sectors is given in a report from March 2016 published by the Strategic Policy Forum on Digital Entrepreneurship “Accelerating the Digital Transformation of European Industry and Enterprises”: in the EU, 1.3 million employees are working directly in the area of digital platforms.

¹ FIEEC, Les industries électrotechnologiques au service de la société

² Automatisation, emploi et travail, “Les synthèses de la Fabrique”, Décembre 2015

III

Solutions to EU societal challenges

In 2011, consulting company Roland Berger identified a number of megatrends¹ that have considerable impact and drive structural changes across nearly all manufacturing sectors. This forward-looking work has largely inspired the definition of the societal challenges that are targeted by the R&D funding granted by the EU's Horizon 2020 programme.



These megatrends can be identified as:

- Changing demographics (growing world population, ageing societies, increasing urbanisation)
- Globalisation and future markets (BRIC and beyond)
- Scarcity of resources (energy, water, other commodities)
- The challenge of climate change (increasing CO₂, global warming, ecosystem at risk)
- Dynamic technology and innovation (ICT and virtualisation, technology diffusion, the age of life science, ubiquitous connectivity, sensing and digitisation)
- Global knowledge society (know-how base, gender gap, war for talent, multiplication of data and information)
- Mass customisation (personalised customisation)
- Sharing global responsibility (shift to global cooperation, growing power of NGOs, increasing philanthropy)

Most of these megatrends or societal challenges can be addressed by the development and deployment of technology solutions (products and services, and a combination of both).

Most of these megatrends or societal challenges can be addressed by the development and deployment of technology solutions (products and services, and a combination of both). In a document on the electro-technology industries serving society², the FIEEC

illustrates and provides examples of five areas of industry that propose solutions to these challenges:

- Digital and energy infrastructures: high-performance, secure digital networks and related infrastructures (data centres) and services (for example, via cloud computing) are the lifeblood of a digitised industry. They interact with energy (notably electricity) networks to increase the integration of renewables and improve the energy efficiency of the networks.

¹ Roland Berger strategy consultants Megatrend Compendium 2030

² FIEEC, Les industries électrotechnologiques au service de la société



- Buildings and how they interact with transport, energy and communication infrastructures: many new services can be offered such as eco-design for buildings, including regarding energy efficiency and production/storage of energy, quality of air, noise levels, security, and communication with service providers, including for elderly people.
- Mobility: this includes the “connected car”, the electric car, infrastructure management (fluidity, safety) and new practices of car-sharing or car-pooling.
- Security/digital trust: improvement of security in networks (notably critical installations) and connected objects will increase trust and may contribute to dematerialisation trends.
- Connected objects: this is a huge market as these objects can provide solutions in areas such as nutrition, transport, sports, health (including home care) and security – but also with regards to environmental factors (air quality control, waste management, energy consumption and reparability of the object itself).

Another aspect that can be added is the area of “physical security”: technological solutions can help to address growing threats of a criminal, geopolitical or terrorist nature, or the need to better organise the flow of migrating populations.

Altogether, the World Economic Forum estimates that the digital transformation could deliver an estimated 26 billion metric tonnes of net avoided CO₂ emissions between 2016 and 2025, which would by then correspond to 8.5% of total emissions. In the electricity sector, if smart asset planning and management and energy storage integration became universal, 8.8 billion metric tons could be saved¹.

Last, but by no means least, digitisation is today a major, if not the major enabler of productivity gains issuing from energy and resource efficiency: in April 2016 Orgalime published a position paper on the European Commission Communication on the Circular Economy, in which it outlines a number of real-life examples of how digitised products and services boost productivity, save energy resources and enhance cost efficiency at the same time. A number of these examples are given in Appendix 2.

¹ World Economic Forum White paper Digital Transformation of Industries – Societal Implications

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Introduction

The digitisation of manufacturing and the wider economy is certainly a game changer. However, to fully tap into the benefits, other policy areas must also integrate this dimension into their agendas. This will allow the EU to maximise the opportunities offered by digitisation in both the internal and export markets. To deliver a policy and regulatory framework that promotes the digitisation of European industry in all its dimensions, a coherent and consistent EU approach is necessary. As stated earlier, in the conclusions of its June 2016 meeting the European Council issued a request for “the different Single Market strategies, including on energy, and action plans proposed by the Commission, to be completed and implemented by 2018”¹.

While supporting this call, Orgalime emphasises the need to follow an integrated approach. Digitising European industry will fundamentally change the way we create wealth, and this includes dimensions relating to energy and the circular economy. At present, we believe that the European Commission’s approach remains too fragmented. A coordinated approach, in contrast, would help make the benefits of digitisation for the entire economy a reality – providing a foundation for a competitive European industry with the resources to create jobs and growth. This applies, in particular, to the need to integrate the Energy Union, the circular economy and the digitisation agendas.

At the same time, and especially in this fast-moving, innovative environment, our general advice to the EU institutions is “do not overregulate”.

¹ Orgalime Annual Report 2015-2016 “The digitisation of industry”

II / A

Ensuring that the regulatory framework is fit for digitisation

I

REFIT and Innov-REFIT

In general, Orgalime underlines the importance for the EU to have a general “fit-for-future” check for legislation when it comes to digitisation.

The Juncker Commission has established the principle of “better regulation” as a systematic way of preparing its legislative and regulatory work, by charging its First Vice-President Mr Timmermans with “coordinating the work on better regulation within the Commission, ensuring that every proposal respects the principles of subsidiarity and proportionality, which are at the heart of the Commission's work”¹. A comprehensive review of the REFIT (Regulatory Fitness and Performance Programme) was tabled in May 2015.



A regulatory framework is a good way to guarantee a free market economy, provided that it is robust but not burdensome.

This principle of “better regulation” is of clear importance for Orgalime: a regulatory framework is a good way to guarantee a free market economy, provided that it is robust but not burdensome. Obviously, the EU’s internal market concept – which aims to replace 28 national pieces of legislation with the principle of mutual recognition or a single harmonising text when required – can be an excellent tool to strengthen our industry in Europe and on international markets.

For Orgalime, the following underlying principles should guide the preparation of any EU regulation or policy, complementing the principles of proportionality and subsidiarity enshrined in the EU Treaties:

- Regulation is adopted only when needed; that is, when the market is failing to adapt to clear and agreed policy objectives.

¹ President Juncker Mission Letter to First Vice-President, in charge of Better Regulation, Interinstitutional Relations, the Rule of Law and the Charter of Fundamental Rights



- Policies are goal-oriented and do not prescribe technologies, but rather promote innovation.
- Regulation is stable and predictable, reflecting manufacturing and product investment cycles (typically 10 years or more in the engineering industries) and taking into account the need for manufacturers to have the time to recover investments.
- The impact of new proposed regulation is assessed in advance – including during the legislative process – by each of the policy-making institutions, taking into account the cumulative costs of legislation and the competitive international environment.
- Regulation is simple, clear and pragmatic, bearing in mind that many of its addressees are SMEs. The model for the EU should be the New Legislative Framework, at least in all areas where products are concerned, and particularly in the environmental field.
- Regulation must be applied in the same way throughout the EU, without the addition of national or regional requirements that undermine the internal market.
- Once adopted, regulation must be respected by all stakeholders; this requires a strong reinforcement of market surveillance by competent national authorities.
- Ex-post evaluation of implemented legislation must become the norm and should also apply to international trade agreements.

These principles are especially crucial should regulation in the future need to be adapted to support the digitisation of industry; at the present time our industry feels that it is too early to make moves towards any change.

Orgalime nevertheless trusts that the European Commission will, in due time, be open to launching a structured, forward-looking dialogue with the relevant industrial sectors, in order to see to what extent and in which areas an overall update of the Single Market “acquis” or existing guidance might be needed, whether to remove barriers that hinder the development of new products, services and business models or to deal with issues arising at a regulatory level.

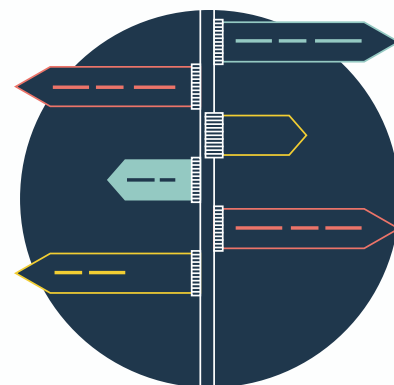
II

Deployment of new business models

In May 2016, the Commission presented four measures aimed at stimulating cross border e-commerce, including action to fight unjustified geo-blocking and cross-border parcel delivery obstacles. In May/June, it tabled a Communication on online platforms and a “European agenda for the collaborative economy”, defined as business models where activities are facilitated by collaborative platforms that create an open marketplace for the temporary usage of goods or services often provided by private individuals. The focus here is largely on C2C or B2C models.



For Orgalime, whose constituency essentially focuses on the B2B area, special attention must be given to allowing new business models to develop. Discussions on these new business models must firstly take into account the fact that it is becoming more and more difficult in the engineering industries to distinguish between the “traditional” and the “collaborative” economy: business models often combine elements of both, or have parallel approaches.



Companies must enjoy the flexibility to explore new technologies and business models, while at the same time benefitting from legal certainty and a reliable framework.

Moreover, the digitisation of industry is an on-going process which might develop in different ways and not necessarily follow the path of the collaborative economy. As such, companies must enjoy the flexibility to explore new technologies and business models, while at the same time benefitting from legal certainty and a reliable framework. No new piece of legislation should be introduced before it is made clear that the issues it aims at tackling cannot be dealt with under the current regime or by contractual means.

In particular, in the B2B context:

- On the definition of platforms, Orgalime maintains that they should be seen as business models and not as an undertaking or an industry sector – and therefore should not be the object of ad-hoc legislation.
- On competition rules, the development of B2B search, sales or intermediation platforms is in its early stages: it needs to be ensured that emerging innovative business models are not unduly hindered. Regarding online platforms, particular attention must be paid to the risk of abuse of dominant position, as this may have negative effects on the entire value chain and hamper the development of new business models. The current legal framework is/should be sufficient to address this issue; however, should additional legislation be proposed, the likely impact on the global competitiveness of the EU industry should be carefully assessed.
- On contract law, the principle should be “freedom of contract”. This is based on our assessment that in business relations, there is generally no need to grant particular protection to one party – unlike in the case of consumer law. In B2B contracts, the parties are from the outset always assumed to negotiate under conditions of equal information, terms and preferences.
- On cloud computing, any strategy must be defined with future-proof implementation in mind, without prescribing, dictating or promoting a specific business model: all kinds of cloud services, including infrastructures and software as a service, should remain available. Orgalime looks forward to the Cloud Code of Conduct currently being finalised between industry and the Commission. This voluntary instrument will help restore trust and confidence in these services and harmonise their quality and availability throughout the EU.

II / B

Free circulation of goods and services in the Single Market: keep it smart and simple

In October 2015, the Commission issued a Communication on “Upgrading the Single Market: more opportunities for people and business” (COM (2015) 550 final), and, in June 2016, an agenda for its delivery (Communication COM (2016) 361 on “Delivering the Single Market Agenda for Jobs, Growth and Investment”).

Orgalime supports a Single Market that would be based on simple and smart rules for all.



Orgalime supports a Single Market that would be based on:

- Simple and smart rules for all, based on the “New Approach” as codified in the New Legislative Framework (Regulation EU 785/2008 and Decision 768/2008/EU), with the following principles in mind: first try a better application of rules before creating new ones; think small first by really keeping rules simple; think global and in terms of global competitiveness when considering new rules; harmonise fully without providing a gateway for additional national rules.
- Mutual recognition for products that are not covered in full by EU harmonisation legislation, with a focus on examining and eliminating excessive trade barriers caused by national legislation; introducing a fast track dispute resolution procedure for non-harmonised products, and reducing third-party certification requirements in non-harmonised areas.
- Smarter market surveillance, to be improved at Member-State level. Member States should intensify physical controls at ports, borders and in the market, accept electronic transmission of technical files and other compliance documents, and cooperate better and mutualise resources, with the support of stakeholders’ intelligence. However, companies should not be burdened with additional compliance procedures such as online registers or labels. The creation of databases containing huge amounts of technical data must be avoided, as any breach would provide access to business secrets with devastating consequences.
- The extension to services of the obligation for Member States to notify national rules affecting products: while the Commission has proposed a “Service Passport”, a tool that can help facilitate administrative procedures, this should be accompanied by determined and consistent enforcement of the Services Directive, and a notification procedure for services comparable to Directive (EU) 2015/1535 on the notification of technical regulations and of rules on Information Society Services.

II / C

Standards by industry, for industry

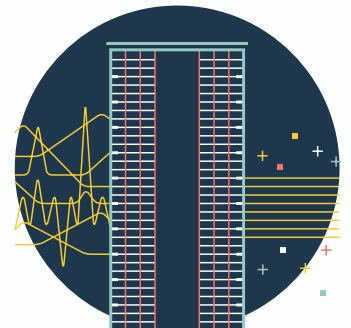
As part of its October 2015 Communication on “Upgrading the Single Market”, the European Commission announced the creation of a Joint Initiative on Standardisation, signed in June 2016 between the Commission, the Council Presidency, industry stakeholders – including Orgalime – and standardisation organisations. Such an attempt to nurture the dialogue between industry and EU policy makers, in the absence of industry being acknowledged as a stakeholder in the sense of Regulation 1025/2012 on European standardisation, is welcome – particularly the set-up of a Standards Market Relevance Roundtable (“SMARRT”) to improve the exchange of information and dialogue with industry. In our view, this is the best way at present to ensure that future European Commission requests for standardisation work in support of the application of European policies and legislation will be market-relevant.

I

General approach

The European engineering industries are the “chief contributor” to standardisation work and the main users of standards. As such, we believe that standardisation should be built on the following principles:

- Support the competitiveness of European industry: mandated standards should always be market relevant and based on consensus, and not just reflect EU public policy priorities.
- Support innovation and growth: the positions of the intended users of mandated standards should always be considered and the use of mandated standards should always be voluntary.



The principle of better regulation should guide the European Commission in the administration and follow-up of standardisation policy and mandates.

- Foster inclusiveness: industry should be consulted on standardisation policy issues.
- Reduce red tape: the principle of better regulation should guide the European Commission in the administration and follow-up of standardisation policy and mandates.
- Facilitate global trade: standardisation mandates should always take the global perspective of standardisation into account.

Finally, it is of crucial importance that the Commission should respect the process laid down in Regulation 1025/2012 and comitology procedures when it plans to withdraw a standard. It is only reasonable to expect that the Commission should do this and that industry should be able to rely on the predictability of the process.

II

Standards for the digitisation of industry

In its Communication on “Digitising European Industry”, the European Commission puts a strong emphasis on standardisation, particularly in a specific Communication on “Priorities for ICT Standardisation for the Digital Single Market”, identifying as priority areas for ICT standardisation: 5G communications, cloud computing, the Internet of Things (IoT), (big) data technologies and cybersecurity.



Orgalime welcomes the Commission’s supportive approach but we note that when it comes to relevant ICT standards that can support future interoperable applications, many standards tailored to the needs of our industry sub-sectors already exist at international level. For our industry, with its global value chains, it is essential to consider the international dimension of ICT standardisation. Where ICT standards needed by our industry do not yet exist, they will no doubt be developed in close cooperation with existing standardisation bodies as well as industrial Internet standardisation fora and consortia, which can offer the necessary speed and agility in what is a fast-moving area.

II / D

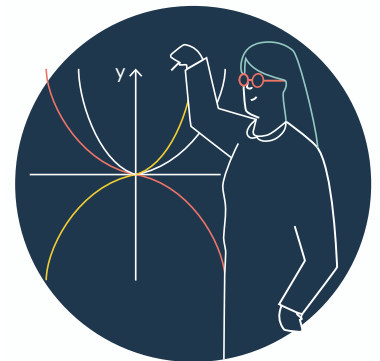
Supporting the workforce in making the transition

There are concerns that the digitisation of industry may lead to net job destruction. It will – and has already started to – require major adjustments between companies, sectors and countries. The main issue will be to adapt companies, including management and the workforce, to new technologies, new markets and new business model requirements. Successful adaptation will generate new businesses and jobs not only within the digital and advanced manufacturing sectors, but also in the more traditional sectors of industry and services – even if it will probably require the adaptation of a number of professions currently protected by specific access regulations.

Education

In June 2016, the European Commission presented a Communication on “A New Skills Agenda for Europe”, (COM(2016) 381 final) which proposes a number of initiatives, including one focusing on digital skills.

While we very much welcome the Commission’s encouragement to Member States to focus much more on the area of digital skills, we can acknowledge that education (general, technical and vocational) is a competence of the Member States or of their component parts. Nevertheless, Orgalime believes that the EU should focus on delivering results where it has competences, such as providing overall analysis, encouraging benchmarking and organising and financing exchange programmes in the area of education and training.



Successful adaptation will generate new businesses and jobs not only in digital and advanced manufacturing, but also in the more traditional sectors of industry and services.

In the engineering industries branch with its global markets, skilled staff are indeed our most valued asset, as our industries are exposed to international competition from regions with lower wages, cheaper raw materials and lower energy costs. It is for this reason that companies in our industry are increasingly investing resources into the area of skilling staff.

II / E

Unlocking the potential of data - with the right framework

For Orgalime, digitising European industry requires an innovation-friendly framework for the flow of non-personal data within the European Union. This is also a prerequisite for making the EU a competitive location for new data-based business models. This free flow covers several aspects, including data “ownership”, protection of know-how and intellectual property rights, and “open” data.

As a principle, Orgalime believes that freedom of contract should naturally be the basis of B2B relations concerning data exchange and flow of data overall. This principle is indeed a fundamental rule of contract law in all European legal systems. It applies to business-to-business transactions and is the foundation of a free market economy.

More particularly, as regards:

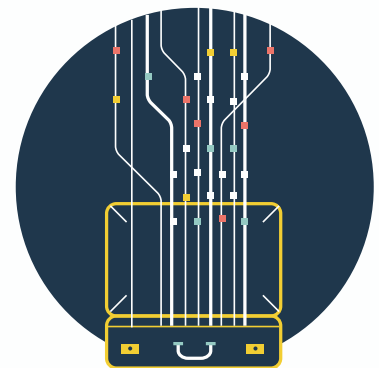
I

Data ownership

Orgalime welcomes the European Commission’s intention to first clarify issues before potentially proposing any new legislation that will need to take into account the fact that the concept of ownership in European legal systems was developed with regard to physical objects.

Orgalime believes that the EU Directive on protection of databases (96/9/EC) may be sufficient to protect arrangements on data. We would propose investigating whether adjustments to the Directive are needed to better address a database consisting of big data as an individual sui generis object.

Likewise, laws on contracts, protection of trade secrets, unfair business practices, competition, consumer protection and personal data protection render special data ownership legislation redundant. Additional regulation would create legal uncertainty and lead to excessive legal and transaction costs, especially for SMEs.



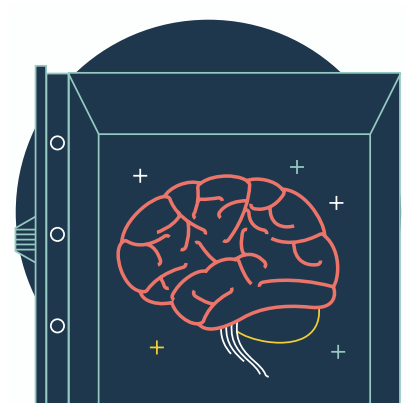
Freedom of contract should naturally be the basis of B2B relations concerning data exchange and flow of data overall.

Indeed, the most suitable way of promoting a data-driven economy would be to leave it up to companies to find appropriate agreements on data handling. This would minimise risks and transaction costs for companies to engage in data-related business.

II

Protection of know-how and intellectual property rights

The digitisation of industry requires that companies trust that their know-how is protected – both in the offline world, in day-to-day business with their suppliers and customers, and in the online world when dealing with Internet, cloud and platform services. The recently adopted trade secrets Directive (Directive 2016/943) will play an important role in this respect as, in an industrial context, data is not simply a raw material but represents real-world business cases. The implications are manifold: industrial data may contain trade secrets, may be relevant for the operational safety of machines, or be linked to personal data of employees and customers.



While intellectual property protection plays a crucial role in the modern digital environment, it is also important to avoid an overly wide interpretation of the scope of intellectual property protection so as not to hinder the possibilities of the data-driven economy. Intellectual property protection, particularly copyright, should not be expanded in a way that might impact on the possibilities to conduct text and data mining.

III

“Open” data

The Communication on Digitising European Industry is accompanied by a Communication on the European Cloud Initiative. Its proposal to open up “by default” as of 2017 all scientific data produced by future projects under Horizon 2020 is of deep concern to our industry. The distinction between ‘ideas’ and ‘knowledge’ proposed by the European Commission is not enough if a company participating in a project is not allowed to protect what it considers as being an idea.



Using regulation or Horizon 2020 conditions to “open” scientific data by force is bound to discourage collaboration between the private sector and the scientific research community, on the one hand, and the international cooperation of European researchers with others, on the other. As such, excessive openness requirements would damage the competitiveness of European industry and research.

In any case, outside the domain of pre-competitive research, policy makers must refrain from obliging enterprises to grant access to data from their business context. In industrial value networks, enterprises must be able to decide and to negotiate to what extent and under which conditions they share data, so as to avoid interference with already growing data ecosystems, sensitive trade secrets exposure, and legal uncertainty on investments in connected factories and data-driven business models. In a context of global competition, the protection of intellectual property rights remains a fundamental principle for companies in Europe.

IV Cybersecurity

In July 2016, the Commission presented a Communication on “Strengthening Europe’s Cyber Resilience System and Fostering a Competitive and Innovative Cybersecurity Industry” (COM (2016) 410 final), accompanied by a decision establishing a PPP on cybersecurity industrial research and innovation.

Orgalime welcomes these developments: the digitisation of industry can only be implemented within a secure systems environment for data, as companies constantly face the risk of technical incidents or cybercrime that cost hundreds of billions of euros each year. Indeed, we consider that at least two aspects should be included in the EU cybersecurity strategy:

- Close monitoring by the European Commission of the harmonised transposition and implementation of the Directive on Network and Information Security (NIS) adopted in July 2016; we are pleased to see that the Commission wants to make the best use of its cooperation mechanisms and further organise cooperation and exchange of information between the Member States.
- The set-up of a contractual Public-Private Partnership (cPPP) on cybersecurity, covering both aspects of the cybersecurity issues and the cybersecurity markets in terms of products and services.





The digitisation of industry can only be implemented within a secure systems environment for data, as companies constantly face the risk of technical incidents or cybercrime.

Orgalime welcomes that the Commission Communication addresses both aspects of the topic. A significant number of European companies are active and innovative in the cybersecurity sector. The European cybersecurity market, however, is very fragmented on the provider side. As a consequence, some of these small companies are not competitive enough at international level. Good European products exist, but in niche markets. Europe lacks the big platform and system providers that exist in the USA. For European start-ups, it is difficult to find a first (reference) client. A possible solution would be to encourage more risk-taking in public procurement, so that public projects can serve as reference projects. Europe should draw up a plan defining which sectors are strategic and so worth supporting with adequate means. Support must be concentrated – it makes no sense to try to cover all fields. Finally, there is a risk of burden at standardisation and certification levels: it is essential that the interests of solution providers and consumers be balanced.

For the future, the industrial Internet will be the key driver of our industry. Interconnected factories are expected to be the next big stimulus for growth, productivity and better jobs. The fact of that matter is that enterprises will only allow the transition to interconnected factories if they can be sure that this architecture is safe. With regards to cybersecurity, it is worth noting that appropriate solutions to protect the smooth transition to interconnected factories must therefore already be in place at the time of their deployment. It is not enough, if as in other domains, these solutions are being developed incrementally at a later stage.

In the current discussion on cyber security, fraud in cyberspace and the safety of payment systems are predominant issues. As important as they are, however, recent developments, such as the widespread electricity outages in Ukraine in December 2015 caused by hackers, has proven the importance to make industrial infrastructure secure at any time. As such, if interconnected factories become standard, these must – as the main lifeline of any modern industrialised society – take centre stage in future cybersecurity discussions.

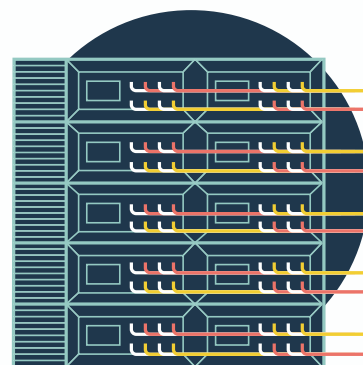
The European Commission, together with other bodies such as ENISA, is already running several sectorial dialogues in order to significantly improve cyber security for particular sectors. The security concepts now elaborated to make the electricity supply safer all over Europe are a good example of this. However, there is no one-size-fits-all security solution for all sectors of the economy.

II / F

Powerful, secure network infrastructures: the foundation for the future

Very high-speed networks deployment (and 5G)

In September 2016, the European Commission presented a “connectivity package” outlining three objectives to be achieved by 2025: access to extremely high connectivity (gigabit level) for all main socio-economic drivers, access to a download speed of 100 Mbps for all EU households, and uninterrupted access to 5G in all urban areas and major roads and railways. To boost the massive investments required by such objectives (estimated at €500 billion over the decade), the Commission proposes to modernise the EU telecoms rules with a new Electronic Communications Code, to deploy a 5G action plan aiming at commercial launch in 2020, and to provide a financial incentive to some 6,000 to 8,000 local authorities to offer free Wi-Fi connections in public areas.



A good 5G network is essential for the further development of industry sectors such as ‘factories of the future’, automotive, health, energy and media and entertainment.

Orgalime welcomes and supports these initiatives. The roll-out of fixed and mobile broadband networks is a precondition for adapting infrastructures to the data-driven economy. Reliable, high-performance communication infrastructures are also a precondition for effective M2M communication and, most essentially, for providing SMEs and mid-cap companies with equal starting conditions in the digital economy. The development of mobile and fixed high-speed broadband infrastructures will become even more important in the light of estimates predicting that the number of connected devices (such as sensors, machines, etc.) will far outweigh the number of persons connected – by a factor of 50:1 by 2020, we expect.

This is why physical infrastructures must be ready for the implementation of the data-driven economy. Orgalime stresses the need for the EU institutions, and the Commission in particular, to consider as part of their digitisation strategy close monitoring of all telecommunication-related policies and legislation, including Directive 2014/61/EU on



“measures to reduce the cost of deploying high-speed electronic communications networks”, and the NIS “concerning measures for a high common level of security of network and information systems”, adopted in July 2016.

Additionally, a good 5G network is essential for the further development of industry sectors such as ‘factories of the future’, automotive, health, energy and media and entertainment¹. Orgalime welcomes and supports the EU’s allocation of €700 million in funding and the setup of a PPP on 5G, which should help an emerging European industry developing technologies for this new generation of networks.

¹ 5G empowering vertical industries, 5G PPP

II / G

Supporting R&D and facilitating market access for innovation

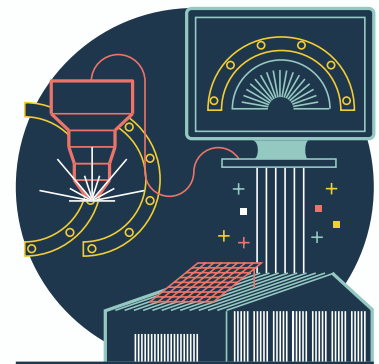
While focusing on investments (Investment Plan and European Fund for Strategic Investments), the Juncker Commission's R&D and innovation policy builds on the Horizon 2020 Framework Programme, which was allocated the largest budget since the beginnings of EU investment in R&D (close to €80 billion for the period 2014-2020). This is an area where Orgalime feels the Commission is helping manufacturing to achieve tangible results and should continue to do so. It is not for nothing that we dominate world markets in many machinery and electrical engineering technologies. For capital goods, the innovators are most often existing companies with a brand, with a client network, etc. If they did not innovate they would fail. This performance is built on manufacturing know-how and ecosystems that:

- Have specificities - manufacturing skills, clusters...
- Absorb R&D&I developments and research results arising from applied research.
- Include companies that work with public research programmes where these are best and locate their R&D&I centres accordingly.
- Are close to the customer.

Horizon 2020 has considerably improved the matching of EU research programmes to industry needs, notably via the further development of Public-Private Partnerships.

Orgalime appreciates the added value in terms of publicly co-funded research and innovation brought about with Horizon 2020, as it aims to build on European strengths: the European engineering industry has a strong tradition of delivering high quality solutions and innovations both in the EU and worldwide. Many manufacturing companies are nested in a local environment where they have responsibilities towards local citizens and local economic life. We trust that the EU understands this and should ensure European citizens can continue to have jobs in a sustainable society by supporting innovation in industry.

Horizon 2020 has considerably improved the matching of EU research programmes to industry needs, notably via the further development of Public-Private Partnerships (PPPs), both JTIs and cPPPs, and other instruments facilitating access of industry to these





programmes. JTIs are moreover being co-financed by Member States, thereby – at least in principle – establishing a cooperative means of financing research programmes aimed at generating economic and social benefits. Also, IPCEIs provide an interesting tool for Member States to cooperate and support industrial innovation.

In general, Orgalime recommends that EU innovation policy should be based on the following elements:

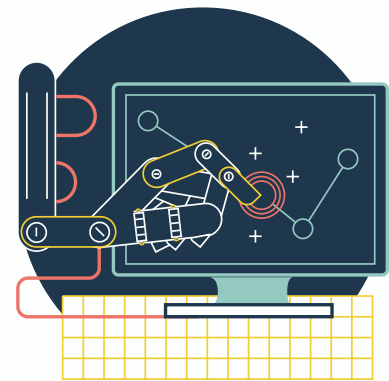
- EU-funded research and innovation programmes should act as a multiplier to the investments that companies are prepared to make.
- The right balance must be kept in the long run between R&D on the one hand, and innovation on the other hand: the Horizon 2020 budget approach must be maintained, especially in the area of Leadership in Enabling and Industrial Technologies (LEIT). Going back to an approach which favours fundamental research would in our view undermine support to the competitiveness of industry, thus contradicting the provisions of article 179.1 TFEU of the Treaty on the Functioning of the EU and EU Council Conclusions requiring that industry's competitiveness should be mainstreamed in all EU policies.
- While focusing on the competitiveness of existing companies, the Commission should promote tools that have already proven their usefulness and effectiveness, notably the PPPs, demo and test-bed facilities. It should maintain the three-pillar arrangements of Horizon 2020 and not attempt to merge them in the future FP9.
- All levels of public authorities (European, national, regional) should commit to and follow up on an innovation strategy that is comprehensive, well thought-out and progressive, with clear milestones; they should also commit to coordinate among various instruments.
- EU framework programmes should generate European added-value and focus on activities where national initiatives cannot have an impact (lack of scale and lack of cross-border cooperation).
- The European Commission should treat all aspects of innovation equally as companies can gain a competitive advantage both from a change in the production process and from product innovation. Engineering companies are innovators by nature.
- Demand-side innovation would also help foster innovation at all stages of the innovation cycle. This entails supporting the market launch and diffusion of products incorporating emerging technologies. Public procurement for product innovation (not only IT) should be developed.
- Integration of RDI as part of industrial policies is required: innovation in processes and products are closely intertwined. However industrial policy should not prescribe the use of specific technologies through public research and innovation programmes.
- In terms of financing and funding, there is a need to discuss how public R&I management and the EU funding systems could themselves innovate, and how public funding reaches the real-life economy.
- If a European Innovation Council (EIC) is to be established, it should be set up as a platform to enable an in-depth discussion on what is missing and therefore needed to

improve the EU innovation landscape and to maintain the position of industry in Europe. To do this, it would be necessary that industry stakeholders represent a significant majority of EIC members, so that the focus remains on innovation and its relationship to the market, and not on inventions.

Orgalime recommends building on activities for transferring R&D results to the market and translating them into new business.

Finally, in this context, it is essential to stress that stimulating innovation is not only about funding, but also about the entire regulatory framework.

With regards to the digitisation of industry, the proposal to devote €500 million from the Horizon 2020 budget to “Digital Innovation Hubs” as described in the Communication on “Digitising European Industry”, to be reinforced or developed in all regions, is in line with Orgalime’s vision of an interconnected European economy that benefits the most from one of its biggest assets: a strong manufacturing industry, often embedded in regional clusters that are world-leading. This is why we believe it is so important that digitisation finds its way into every region and throughout the entire production value chain, from SMEs to big global players.



Orgalime also recommends building on activities for transferring R&D results to the market and translating them into new business, such as new services for manufacturing and new opportunities for companies. These activities would likewise communicate the needs of companies to R&D centres, so that commercial interests are understood and direction is given to R&D. This would help to support SMEs and midcaps to adapt to new technologies. The broad implementation of results from research and innovation projects in industry is crucial. This can be put into action directly in companies (including start-ups and SMEs) and can involve university incubators, science parks or research institutes, test-beds and demonstrators. A very good start has already been developed in recent years with the very first hubs launched within the Factories of the Future PPP, namely the FoF-I4MS instrument. These activities, jointly implemented by stakeholders and the European Commission, have led to the creation of several hubs providing services to manufacturing SMEs. Many more regions would like to profit from this instrument.

We support further stimulation of innovation through PPPs and similar initiatives, as long as stakeholders and regulators work together. From Orgalime’s point of view, the connected Smart Factory, connected and automated transport, and the horizontal Internet of things (IoT) are the most pressing sectors where coordination and support would be helpful.



With regards to the Horizon 2020 work programmes for the last period (2018-2020), Orgalime would propose that more is done to attract engineering companies in the entire NMBP programme (Nanotechnologies, Advanced Materials, Biotechnology, Advanced Manufacturing and Processing) and Biotechnology, and not only the Factory of the Future PPP. More generally, Orgalime believes that European manufacturing companies should be encouraged to modernise (including digitisation) their products, production processes and business development in order to better respond to the customer's demands.

Orgalime would welcome it if more areas of the NMPB programme were to integrate the digital dimension in their strategic work. This would go beyond Horizon 2020, as a strategic, long-term focus on supporting companies in embracing the digital dimension will help create the right conditions and opportunities for innovation and technological breakthrough for our engineering industries in Europe.

Finally, the upcoming set up by the European Institute of Technology of a new KIC on added-value manufacturing by the end of 2016 could provide an opportunity to complement the current framework.

II / H

Supporting R&D and facilitating market access for innovation

In July 2015, the Commission published its Climate Package, which Orgalime welcomes. It consists of:

- A Communication “Accelerating Europe’s transition to a Low Carbon Economy”,
- A legislative Proposal for the EU Effort Sharing Regulation in the Non-ETS sectors,
- A Strategy on Low-Emission Mobility and
- A proposal for a Regulation to integrate the land use sector in the EU 2030 Climate and Energy Framework.

With the EU’s ratification of the Paris Agreement in record time and its expected entry into force beginning of November 2016, the necessary framework for making Europe’s transition to a low carbon economy a reality is now in place.

It is now therefore time to build upon the Energy Union Strategy proposed by the European Commission in May 2015, with its five overarching objectives: security of supply, a fully integrated internal energy market, energy efficiency reduction of greenhouse gas emissions (climate change policy), and research and innovation.

To support Member States in meeting their 2030 obligations and effort sharing commitments, we recommend enabling EU measures, and in particular:

- Tapping into energy system savings potential through the reviews of Directives 2012/27/EU and 2010/31/EU (“Energy Efficiency Package”) to come, and thereby carrying forward the success of the Eco-design and Energy Labelling Directives that has been achieved at the level of standalone appliances into the systems to which they are integrated, notably buildings, the energy system itself, the transport and wider industry sectors, since the energy efficiency savings potential of standalone appliances is reaching technical and economic limits.
- Implementing the three no regret options of “more energy efficiency plus more renewable energy sources plus smart, flexible distribution grids” in the EU energy market design and governance proposals to come. This is, in our view, indispensable for successfully managing the future coexistence of decentralised and centralised energy production and the need for a smarter distribution grid to accommodate them.
- Boosting a gradual decarbonisation of the entire transport system through the Strategy on Low-Emission Mobility, a rapid as well as ambitious implementation of Directive 2014/94/EU on Alternative Fuels Infrastructure Deployment and pushing for digital

solutions through the forthcoming Commission Communication “A Master Plan for the Deployment of Interoperable Cooperative Intelligent Transport Systems (C-ITS) in the EU”.

- Promoting investment into waste management infrastructure and driving cleaner waste streams and cleaner secondary raw materials through further implementation of the Industrial Emissions Directive coupled with a strict landfill, waste shipment policy and ambitious EU recycling targets.

More specifically, we develop our views on these different policy strands as follows:

I

Transport policy and infrastructure

A European strategy for digital industrial leadership must also embrace the digitisation of transportation networks – an area where the technological strengths of the European engineering industries can simultaneously address societal challenges, create many jobs and successfully compete on international markets. This is why Orgalime supports the creation of lead markets for high-tech infrastructures across Europe, including particularly transportation and energy networks.



In the area of smart mobility, Intelligent Transport Systems (ITS) and Cooperative Intelligent Transport Systems (C-ITS), our sector represents manufacturers of key technologies such as microelectronics, system integrators, which provide technical consulting and auditing, basic and detail engineering, manufacturing, installation, operation and management of turnkey solutions for the transport (ITS) and environmental (Supply Chain Management) sectors.

However, we believe that Europe clearly lags behind in terms of deploying and making use of ITS compared to other world regions, despite the fact that deployment of these systems will create major business opportunities and has the potential to increase safety, security, health and convenience for passengers and drivers.

A European strategy for digital industrial leadership must also embrace the digitisation of transportation networks.

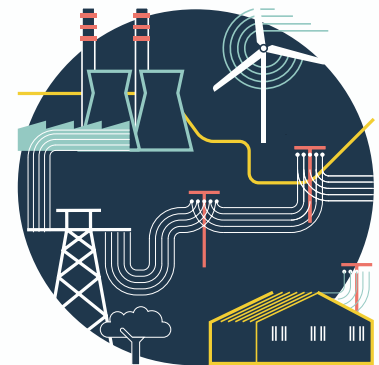
The European Commission is about to issue a Communication on “A Master Plan for the Deployment of Interoperable Cooperative Intelligent Transport Systems in the EU”. Orgalime recommends that an EU policy in this area should:

- Send a clear political signal to drive significant deployment and encourage further development and manufacturing of the relevant technologies. This should include a commitment to coordinate Member States' efforts with a common European vision based on existing strategies and initiatives to ensure interoperability and facilitate cross-border deployment.
- Define a coherent roadmap for deployment across the EU, including an ambitious target to deploy the available ITS technologies and services by 2019.
- Fully implement and enforce the ITS Directive and ITS Action Plan in Member States.
- Support the development of international and EU harmonised standards.
- Ensure that public data is provided by public services and municipalities to allow users and business to fully reap the benefits of ITS systems, and acknowledge that the use of in-vehicle data for the aftermarket must be made possible.

II

Energy policy

Considering that by 2030, it can be expected that the electricity system will be based on around 50% centralised energy production and 50% distributed production from renewable energy sources¹ (with solar farms and wind parks being one pillar, private photovoltaic installations being a second pillar and further storage capacities to develop), the challenge in future will be to successfully manage this co-existence of decentralised and centralised energy production and the need for a smarter distribution grid to accommodate them.



Moreover, the digitisation of the energy system, which for some time has already been a reality at electricity generation and transmission levels, is developing rapidly and now offers tremendous opportunities (with professional and private consumers at the core), for example:

- By increasing levels of automation and control to better manage processes,
- By increasing the use of software and data analytics (“big data”) to increase overall efficiencies, or
- At the energy retail level, by empowering consumers so that they can be efficient, manage their own energy consumption and optimise their overall carbon and environmental performance.

The energy market design proposal should implement the three no regret options of “more RES plus more energy efficiency plus more flexible, smart distribution grids”, including through:

¹ Fraunhofer IWES (2015): The European Power System in 2030 – Flexibility Challenges and Integration Benefits



- Setting in place a market driven and competitive market, where price peaks function as investment signals rewarding flexible, clean and “fast delivery” technology solutions.
- We support price signals reflecting actual scarcity and the market needs to value flexibility at a fair price through dynamic retail tariffs.
- Granting demand side resources access to all markets (wholesale, balancing, ancillary services) at all timeframes.
- Empowering the consumer by codifying the right to self-generate, to self-consume, to trade and sell energy and to aggregate.
- Rewarding consumers (industrial and private) for their flexibility and introducing a new obligation to remunerate customers for the flexibility.
- Introducing more performance based remuneration of DSOs (rather than CAPEX based remuneration) to incentivise DSOs to invest in smart distribution grids, since 90-95% of RES are/have to be integrated at that level.
- Regarding capacity mechanisms, progress should be made on the assessment of the adequacy of the power system: Common methods and a common European approach are necessary. The strong focus on generation capacity in the context of the generation adequacy debate requires balancing – the different options of ensuring capacity (including energy efficiency and demand side flexibility) should be able to compete at equal level.

The challenge in future will be to successfully manage this co-existence of decentralised and centralised energy production and the need for a smarter distribution grid.

A core factor in the energy transition is of course energy efficiency. Until now, the focus of energy efficiency efforts has been on products and product labelling. There has been limited focus on energy efficiency in areas such as buildings – and that is where the most unexploited potential for energy savings remains. Indeed, the 2016 IEA Energy Efficiency Market analysis now confirms that policies to increase energy efficiency and decarbonising energy supply will be the major drivers for global reduction in emissions of key local air pollutants between now and 2040.

At a regulatory level, the foreseen revision of the Energy Performance of Buildings Directive (EPBD) of 2010 and the Energy Efficiency Directive (EED) of 2012 is highly welcome. The limits of what can usefully be attained by product regulation and the Eco-design Directive are close to being reached. To achieve further significant gains, the emphasis needs to shift from products to the productivity engendered by digitisation and to a systems approach that is best stimulated by a focus on the market, such as that which the EPBD and EED have attempted to foster. This will be essential to achieving the EU's own targets and international commitments.

The EED review should:

- Establish “energy efficiency” as an energy source in its own right that can compete with generation capacity on equal level (article 1 EED).
- Carry forward the success of the Eco-design and Energy Labelling Directives at the level of standalone appliances to the systems to which they are integrated, notably buildings, the energy system itself, transport and wider industry sectors (articles 3, 7 and 8 EED), since the energy efficiency potential of standalone appliances are reaching their technical and economic limits.
- Strive for combining energy efficiency with demand flexibility (articles 12-15, annex XI EED and articles 9-11 EED) to optimise and better manage European energy infrastructures with more RES in the system, to reduce energy losses, to increase the overall efficiency of the energy system while empowering energy users and decreasing Europe’s energy import dependence.

The EPBD review should:

- Strengthen renovation requirements of existing buildings.
- Tap into the significant potential in building systems and the operation of systems, where the Commission's evaluation has demonstrated the poor performance of the Directive today.

Therefore:

- Strengthen the integrated approach (beyond the building envelope) and enable “smart buildings” that provide integrated management and control domains with ever more holistic performance coverage and more decentralised energy production through RES, and
- Drive the concept towards “connected buildings” and appliances inside (link “digitalisation”) and thus buildings connected to smart and flexible distribution grids.

11

Better use of resources and the circular economy

In December 2015, the Commission presented a Communication on “Closing the loop – An EU action plan for the Circular Economy” (COM(2015) 614 final). For Orgalime, the application of the circular economy to the engineering sector goes hand in hand with the digitisation of industry as a driver of Europe’s industrial renaissance (see list of examples in appendix 2).



First, these policy synergies should be exploited when implementing the Circular Economy Action Plan. Then, the following steps can support a better use of resources and a circular economy:

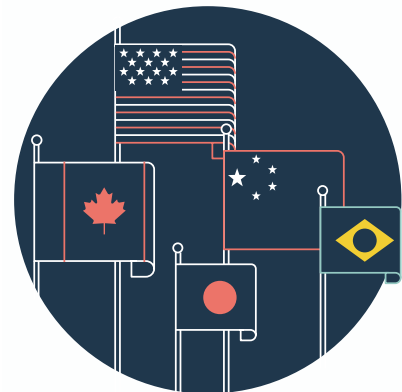


- As a starting action at the end-of-life stage where the loop will have to be closed in practice; specifically, we call for:
 - A landfill ban of recyclable waste.
 - Stopping illegal shipments of waste electrical and electronic equipment.
 - Complementing producer responsibility with “shared responsibility obligations” for all actors in all steps of the waste management chain (“EPR”).
 - Not using the traditional command-and-control approach and fully ensuring the functioning of the internal market for products: overlaps and conflicting requirements with the Eco-design Directive need to be avoided.
 - The implementation of the Industrial Emissions Directive, including on the waste sector.
- Setting minimum quality criteria for secondary raw materials based on ISO or EN standards to stimulate a long-term market for recycled materials: in order to make the use of secondary raw materials more attractive, what matters is not only the availability of sufficient quantities and delivery reliability, but also intelligent collection and modern sorting equipment to maintain clean streams as far as possible.
- Improving legislative consistency, notably between EU waste and chemicals policy by applying a risk-based approach to preserve Europe’s high level of human health and environmental protection.
- Applying the life-cycle costing principle in public procurement.
- Better recognising industrial symbiosis, promoting remanufacturing and making better use of the Industrial Emissions Directive and EU standards for the deployment of existing sustainable technologies.
- Leaving sufficient flexibility for industry to develop and implement the necessary variety of business models to reflect the different products, sectors and companies and their respective challenges.

II / I

Time for the EU to take the reins in trade policy

In October 2015, the Commission presented a Communication on “Trade for all: towards a more responsible trade and investment policy” (COM(2015) 497 final). Moreover, President Juncker has made the conclusion of “a reasonable and balanced free trade agreement with the USA” one of the priorities of his mandate.



For Orgalime, trade is an essential element of any economic and industrial policy: the European engineering industries are strongly – and increasingly – export-oriented, representing a third of the EU’s manufactured exports. This is why we welcomed the Commission plan to push the agenda for trade liberalisation, at bilateral, plurilateral and multilateral/WTO levels.

The loss of the EU’s voice as a major influencer on the world trade framework can only lead to other regions becoming even more influential.

However, by accepting to submit the trade agreement with Canada (CETA) to Member-State signature and ratification after having deemed it a mixed agreement for purely political reasons, and by allowing increasing controversy to develop around major trade agreements without putting forward strong counter-arguments, the Commission is losing ground in a core area of its competence. The loss of the EU’s voice as a major influencer on the world trade framework can only lead to other regions becoming even more influential, thereby undermining the EU’s prominence in trade policy. This is extremely worrying.

For Orgalime, priority should be given to the following aspects:

- Re-establishment of the WTO as the central forum for multilateral trade negotiations, by concluding the Doha Agenda and preparing a new WTO work programme.
- Inclusion of business services in trade negotiations, as these are inextricably intertwined with the provision of products in the engineering branch.



- Action on standards and certification procedures, which vary considerably in different parts of the world and act as technical barriers to trade, creating an immense and costly administrative burden to companies, especially SMEs. Regulatory cooperation in this area should be strongly developed.
- Efforts to establish efficient customs procedures, taking into account that engineering industries are part of a global value chain where costs could be decreased via simplified or even uniform rules of origin, allowing a free flow of goods at lower costs.
- Specific attention to be given to SMEs, notably by providing them with information on access to the benefits of trade agreements.
- Exploration of opportunities to negotiate agreements with the next “game changer” countries¹.
- Faster entry into force of trade agreements.
- Better follow up of implementation of existing trade agreements so as to ensure that their full potential is attained.

With regards to the digitisation of industry in particular, the extension of the product scope of the existing Information Technology Agreement is highly welcome.

The negotiations for a Transatlantic Trade and Investment Partnership between the EU and the USA must reach a balanced agreement. Orgalime supports the EU’s position asking for an opening of American public procurement processes and on a sectoral approach for the mechanical, electrical, and electronic sectors. ISO, IEC and ITU should be supported as the central platforms for international standards, to guarantee the compatibility of standards not only between the EU and the US, but also with other important trading partners. This would also help to improve regulatory cooperation between both sides, and to overcome two important types of technical barriers to trade: differing technical standards (and their use to ensure compliance with regulatory requirements) and the lack of mandatory recognition of test results by Nationally Recognised Testing Laboratories in the US. Such technical barriers to trade cannot be removed by a “simple” mutual recognition of standards.

¹ New Mega Trends, Macro to Micro Opportunities on Future Business, Cultures, and Personal Lives, Sarwant Singh, Frost and Sullivan, <https://www.youtube.com/watch?v=iaBWfs7Sx6I>



The way forward and conclusions

As pointed out by Klaus Schwab at the 2016 World Economic Forum in Davos, “there has never been a time of greater promise, or greater peril”.

In particular, the European Union, and the European construction project itself, is confronted with immense challenges – not only at its external borders, but also internally, with developments such as Brexit posing a threat to the EU’s existence and purpose. What is often described as a bureaucratic system is perhaps not equipped to deal with political times, when reason is often replaced by passions.

However, if Europeans want to continue to enjoy the same or an even better and more sustainable standard of living, one promising path could be the determined pursuit of an industrial renaissance supported by all stakeholders – including policy makers at EU, national and local level, and all economic, social and societal actors in the industry value chain: companies, trade unions, environmental and consumer NGOs, academia, and standardisation bodies.

EU industry has to and can build on its own strengths: while it may not have nurtured the development of the international champions of the digital industry, it has all the capabilities to capture the immense opportunities offered by the fourth industrial revolution and leverage them for its manufacturing sectors – making it possible to offer new products, new services and new solutions that will address the societal challenges confronting the world today, with climate change being one of the most crucial.

In December 2015, a landmark agreement on climate change was signed in Paris – an EU capital. This has shown that Europe is capable of convincing most regions of the world that a determined and comprehensive international action plan is very urgently needed to tackle this huge challenge. It is also important that this agreement is enshrined within the framework of the United Nations, at a time when bi- or plurilateral agreements tend to be preferred to the WTO.

Before the end of 2016, the Commission will present a proposal for a mid-term review of the EU’s Multi-Annual Financial Framework. As indicated in the Commission Roadmap ¹, “the review is an opportunity to continue reforms and implement political priorities agreed for the MFF 2014-2020, to stimulate growth and economic recovery in the EU, as well as addressing the internal and external challenges the EU is facing today”, and “the Commission shall present a review of the functioning of the MFF taking full account of the

¹ Roadmap on a Commission Communication and proposal for a Council regulation on the mid-term review of the MFF 2014-2020



economic situation at that time as well as the latest macroeconomic projections". This review offers a very good opportunity to reflect on an integrated EU industrial policy.

This document offers Orgalime's reflections on the European engineering industries' priorities for an integrated and ambitious industrial policy at EU level. We would be glad to discuss these topics with EU and national policy makers to further contribute to its shaping.



APPENDIX 1

Review of some relevant national initiatives

I

Industrie 4.0 – Germany

This initial set of recommendations was followed up by the creation by industry associations Bitkom, VDMA and ZVEI of an Industry 4.0 Platform. This aims to promote the vision of Industrie 4.0 throughout the branch, to pursue a strategy to promote the manufacture of intelligent production technologies, and to reinforce the competitiveness of industry through cooperation between manufacturers and users.

Outside of Germany, many national and regional initiatives have been launched in recent years. This demonstrates the keen interest and awareness of many European industry leaders and policy stakeholders at all levels that a solid manufacturing industry contributes as least as much as the financial and services sectors to the consolidation of Europe's economic recovery following the deep crisis of 2008 – and so is worth being strategically supported.

II

Industry of the Future – France

Presented in April 2015 and building on the “Factory of the Future”, this initiative aims to help companies transform their business models, organisational methods, and design and marketing approaches. It is built on five pillars: develop cutting edge technologies, help companies adapt to the new paradigm, employee training, strengthen international cooperation around standards, and promote the industry of the future. It is supported both by public authorities and by industry, cooperating within the framework of the Alliance for the Industry of the Future – of which FIEEC, FIM and some of their trade associations are founding members.



III

Smart Industries – The Netherlands

In Spring 2014, Dutch industry stakeholders presented a report “Smart Industry, Dutch industry fit for the future” which led to an action agenda focusing on a) capitalising on existing knowledge, b) deploying ten “field labs” in which companies and knowledge organisations cooperate to develop, test and implement effective smart industry solutions, and c) reinforcing the foundations of areas such as knowledge, skills and legal and ICT parameters.

IV

Made in Sweden 2030 – Sweden

In April 2013, a vision for 2030 on sustainable production in Sweden was presented. Building on an analysis of the major global megatrends facing production, it proposed action in six areas, including: environmentally sustainable production, flexible manufacturing processes, virtual production development and simulation, human-centred production systems, product- and production-based services and integrated product and production development.

V

DIMECC (PPP) and Industrial Internet Forum – Finland

DIMECC Ltd. is the innovation hub for digitising industry in Finland. The hub combines the competencies of 400 organisations and 2,000 people. The international public-private-partnership platform leads customer companies to cross-disciplinary and cross-industry innovations and new business.

The Finnish Industrial Internet Forum (FIIF) is a networking node and joint acceleration lane to the industrial Internet. It connects ICT and software companies, including start-ups, to industrial value chains in the areas of manufacturing industry, traffic and energy systems, drives the renewal and growth of industry through digitisation, and links research results with industry needs.

VI

Cluster “Fabbrica Intelligente” – Italy

This national cluster builds on the Italian plan implementing the European Factories of the Future Programme: with a budget of €47 million (2013), it aims to finance research projects over three years, developing results stemming from the Factory of the Future programme while creating areas for regional cooperation and specialisation.



On 21 September 2016, an Industry 4.0 national stimulus plan was launched by the government, which marks a departure from allocating public funds, instead inviting bids from start-ups and others in the private sector. The scheme is built on horizontal tax incentives, on extending the time limit on the government's super amortisation programme for companies investing in capital goods, and on making sure that all companies have access to Internet and broadband technology.

VII

Catapult – United Kingdom

The British “Industrial Strategy” groups together a number of actions in the area of future manufacturing, including the “Catapult” plan that aims to accelerate the transfer of research results to the market. Two of the nine axes of this plan concern high-value manufacturing and digital. In the area of R&D, public funding is providing support to eight emerging technologies, including robotics, autonomous systems and big data.

VIII

Made Different – Belgium

The Made Different action plan was developed back in 2009, using seven key changes that transform manufacturing businesses into genuine Factories of the Future. A Factory of the Future excels in how it handles energy and materials. Creative, involved workers use smart, sustainable production processes in state-of-the-art facilities. The result: agile, future-proof businesses that manufacture products with high added value. By mid-2016, 11 manufacturing companies had already been certified and received the Factory of the Future Award. Moreover, almost 300 other Belgian companies (of which over 60% are SMEs) are heavily investing money and human resources in at least one of the seven Made Different transformation areas.

IX

Stakeholders panels – Denmark

The Danish government established in October 2014 a panel consisting of both business and trade union representatives whose task was to formulate recommendations on how to make sure that Denmark stays an attractive country for manufacturing. The panel delivered its recommendations on 13 May 2015. In June 2016, the Danish government announced the establishment of a new panel devoted to digital and technological transformation of Danish businesses with a special focus on SMEs. This panel is expected to present its recommendation in April 2017.



X

Industrie 2025 – Switzerland

Launched in mid-2015 by four national industry associations, the Swiss initiative Industrie 2025 aims primarily at informing and sensitising the manufacturing industry in Switzerland on the topic of Industrie 4.0. In view of the current challenges for the export-intensive and dependent manufacturing location, the concept of Industrie 4.0 offers huge opportunities for Swiss companies. Collaborative platforms for the players in the field have been started. An additional focus is on interlinking the R&D&I players in Switzerland. SMEs welcome the Swiss initiative and Swissmem managed to provide a good service to its member companies.



APPENDIX II

Digitisation – enabler of resource & energy efficiency: examples

I

More green energy and less waste through use of sensors and data analytics

A Danish producer of wind turbines increases the efficiency of 25,000 wind turbines through predictive maintenance: each of the turbines is equipped with sensors. These 25,000 turbines send their performance and diagnostic data, which allows the producer to precisely plan maintenance and inspection. These may then be carried out during times of lower demand and according to weather conditions. Wind turbine down-times are reduced considerably. The lifetime of parts is increased; the need for spare parts reduced; less waste is generated and staff benefits from improved planning.

II

Less fertiliser use due to increased use of ICT in agriculture equipment

Precision farming is increasingly used to ensure optimal growth and quality of crops. Instead of a uniform application of fertilisers, which does not reflect the natural variation of nutrients already in the soil, a more advanced method is used: A real-time nitrogen-sensor, installed at the front of the tractor, measures automatically the exact amount of nitrogen in the leaves, be it day or night. Its computer then tells the fertiliser spreader (or sprayer, for liquid fertiliser) at the back of the tractor to deliver the optimal quantity of fertiliser. Fertiliser savings of up to 14% and an average productivity increase of up to 6% result in a direct benefit to the farmer while preserving the environment.



III

Less water and energy use through sensors and data analytics

The Austrian skiing resort Mayrhofen has equipped its snow groomers with sensors. In combination with GPS and a detailed, electronic map, this system measures the exact height of the snow coverage when operational on the slopes during the night. This system is interconnected with the operation system of the snow generators. The precise data transmitted allows the ski resort to produce less additional snow, under ideal metrological conditions and precisely at the places where it is needed. Besides saving on capital through less equipment and a better maintenance schedule, the ski resort managed to save per season up to 25% of the water and electricity previously used for snow production. Cash savings in Year 1: €7 million.

IV

Resource savings through the use of ICT in manufacturing

A Hungarian manufacturer did an internal analysis of its production facilities. They put sensors throughout the plant and found multiple sources of savings, including in the heating and cooling systems. By connecting the compressor cooling system to the hot water system for workers' showers, energy savings were realised that translated into some €100,000 annual cost savings.

V

Resource savings through the use of ICT in manufacturing

VA major automobile manufacturer analysed in detail where they use energy. 4% is used for compressed air and vacuum production. The company managed to save 37% of these costs in one plant. Now it is going to apply the solution across the group to realise energy savings.

VI

Resource savings through the use of ICT in manufacturing

Wheel manufacture: the air tightness of wheel rims is tested under helium, which used to be wasted. Now around 98% of it is recovered through vacuum pumps, generating resource savings.

VII

Resource savings through the use of ICT in manufacturing

Through the use of digital technologies (cloud based service lead for optimising logistics of trucks, personnel and fuel), a Finnish company reduced costs and the environmental burden for waste collection and transport in cities by 50%.



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Editeur responsable:
Adrian Harris, Director General

**The European Engineering
Industries Association**

Diamant Building
Boulevard A. Reyers 80 - 1030 Brussels
Tel. +32 2 206 68 83
secretariat@orgalime.org