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EU INDUSTRY DAY 2018

22-23 February

OVERVIEW

The EU Industry Day 2018 took place in Brussels on 22-23 February, and brought together delegates from across the spectrum of EU industry, along with prominent policy-makers. The event consisted of a mix of plenary sessions, keynote speeches, and more focused panel sessions.

Though the two days focused on a broad range of topics, there were some areas which drew particular attention:

- Artificial intelligence was by far the dominant theme, being mentioned in almost every session. This is unsurprising, as a European Commission Artificial Intelligence Strategy is expected to be published in April 2018. AI is being portrayed as the next “industrial revolution” in Europe, with stakeholders debating its application in industry, as well as the important ethical debates which will come in parallel with its dissemination.
- Skills development was another dominant theme – across all topic areas, the need to invest in skills development was a prominent call from all stakeholders. The key takeaway is that any industrial transformation must go in tandem with upskilling workers, both to guarantee the human capital to exploit new advantages, as well as to mitigate the job losses that will inevitably accompany digital transformation.
- Batteries were also prominent as a new area for exploration for EU industry. The European Commission took the opportunity of the Industry Day to announce a 20-point action plan to establish the EU as the world leader in the field.
- On the future of EU research and innovation funding – the upcoming Framework Programme 9 (FP9) - there were calls across the board for the continuation of a leading role for industry. A key concern was the development of technological solutions that can quickly be brought to the market.
- Key enabling technologies (KETs) were also the focus of much conversation, with the European Commission announcing that artificial intelligence and cybersecurity will from now on be included in the category.
- Although there was surprisingly little mention of the EU Industrial Policy Strategy by name, there was a consistent message throughout the sessions that the EU must ensure its global competitiveness by focusing on certain areas where it can “take the lead” (stakeholders mentioning AI, batteries, and 5G development as potential areas) and invest in its advantages (quality skills base, consumer market). Intellectual property rights should be strengthened to ensure EU knowledge adds value in Europe, and the trade agenda should be oriented not towards protectionism, but towards the establishment of fair, reciprocal relationships with competitors.

This note presents the primary elements of speeches given during the event by four key European Commissioners, followed by summaries of the most relevant panel discussions. Further information on plenary sessions, speakers, and the details of panel discussions can be found in the annexes.

JYRKI KATAINEN (VICE PRESIDENT OF EUROPEAN COMMISSION IN CHARGE OF JOBS, GROWTH AND INVESTMENT)

- The EU Industry Day should help define new opportunities on which legislators should concentrate to create added value, through increased growth, innovation, and competitiveness.
- Primary interests are in artificial intelligence, the circular economy, and the skills agenda. The Commissioner wants an “open call to share best knowledge and practices in order to reinvent Europe”.
- A successful industrial policy is a joint venture, with industry itself having an important role to play. The EU's guiding principle is to be 'big on big things and small on small things'.
- Investment funds, the Capital Markets Union and the Digital Single Market (DSM) are ways the EU has fostered to encourage a competitive and open-looking EU. EU companies are engaged in global value chains, and the EU is the world's biggest destination for FDI. Ensuring a fair, rules-based, and reciprocal trade system is also key to the success of EU industry.
- EU industries are world leaders in providing high added value, low carbon, sophisticated services. Europe must draw on its strengths, particularly its traditions of innovation and high levels of education. For example, the EU is leading the transition to a low carbon and circular economy, and EU companies account for 40 per cent globally of patents when it comes to renewables. AI, robots and bio-economy are hallmarks of the digital economy, but global competitors are ahead of Europe with regards to the take up of research and diffusion of new technologies.
- Priorities should be funding R&D&I to levels which compete with other countries/regions, the upcoming artificial intelligence strategy, and guaranteeing support for SMEs, especially those engaged in innovation based on key enabling technologies (KETs).

CARLOS MOEDAS (EUROPEAN COMMISSIONER FOR RESEARCH, SCIENCE, AND INNOVATION)

- Driving the future of innovation in the EU is like the propeller of a plane, with three strong blades:
 1. Science to develop the new ideas and technologies of the future.
 2. Start-ups and SMEs to develop the breakthrough innovations. Combining technologies and new business models.
 3. Industry to scale up innovations and create economic and social impact.
- This logic must shape FP9, which must focus on supporting science, but include industry – Horizon2020 provides a blueprint here, more than 20 billion euro directly in industry, more than ever before, and nine out of ten of the collaborative projects include at least one private sector partner.
- Public Private Partnerships (PPPs) and other collaborative projects have been a success. However, the following changes should be made:
 1. Many people get confused by the number of different types of partnerships (cPPPs, JTIs, ETPs, JPIs, ERA Nets, FET, KICs...). There should be simplification.
 2. Partnerships more open – in terms of both entrants and funders. For example, open PPPs to investments by Member States, by regions, and by foundations.
 3. Increased flexibility is key.
- Key Enabling Technologies (KETs) are essential building blocks which underpin EU global leadership in many industries. Following the recommendations of the High Level Strategy Group on KETs, which called on the EU to simplify and merge some of the existing Key Enabling Technologies and introduce two new fields; artificial intelligence, and security and connectivity.
- The European Innovation Council should be the link between start-ups and the large companies by helping start-ups to access partners across value chains. The EIC has already come into existence under the 6 prizes announced under the 2018-20 Horizon 2020 Work Programme. Today, the EIC Horizon Prize on Innovative Batteries for e-Vehicles is announced, which will award 10 million euro for developing a safe and sustainable battery for electric vehicles.

MAROS SEFCOVIC (VICE PRESIDENT OF THE EUROPEAN COMMISSION IN CHARGE OF THE ENERGY UNION)

- The EU has become a leader on clean energy. The Commission can take some credit - the Clean Energy Package has been a great success – but industry must take ownership of the issues and drive the solution themselves. Batteries are key to the clean energy – especially mobility-related – of the future. The Battery Alliance was characterised as the “first Commission start-up”, but the sector overall will require investment to the tune of €20bn.
- A Clean Mobility Package will be presented in May.
- The EU is making progress on the issue of renewables. However, ambitious EU targets go hand and hand with big challenges for the EU and the global market. Fierce competition means the EU must be ready to lead on innovation in this sector.
- Interaction with local level actors is essential: for example, this must happen in the construction sector, especially if green procurement is to become a reality in EU cities.
- On human capital and the issue of skills, the EU needs to widen its funding and push member states to make commitments.
- On the social impact of the industry, technology must be linked with what is most important for the EU: how can we strengthen economy, create jobs, or even make the energy transition easier.

ELZBIĘTA BIEŃKOWSKA (EUROPEAN COMMISSIONER FOR INTERNAL MARKET, INDUSTRY, ENTREPRENEURSHIP AND SMES)

- The uptake of digital technologies like big data and the Internet of Things (IoT) is increasing across most Member States, but this is not happening in a uniform manner.
- There is a need for action if EU industry is to remain competitive on a global scale. The three areas of focus should be:
 - o Key enabling technologies (KETs), where industry uptake must go hand-in-hand with research and development. The EC also wants to facilitate investment in large-scale projects such as batteries and micro-chips that enable electric vehicles. Cooperation – public-private and pan-European – will be key to achieving leadership on KETs.
 - o Artificial intelligence – the EU must nurture the already existing ecosystem in e.g. robotics, and must incentivise the uptake of AI by SMEs in particular.
 - o Skills – technological change must be accompanied by the creation of “replacement” jobs, and the training of people to fill them. The EC Digital Education and Training Action Plan (January 2018) and the Blueprint for sectoral cooperation on skills (June 2016) are just some EC actions to stimulate this change.
- Industrial transformation must go in parallel with the building of a true Single Market – there is no point in creating new products and technologies when their sale is restricted by fragmentation. Key moves to ensure this are the “E-card” to help SMEs overcome administrative burdens, the possibility of a Supplementary Protection Certificate (“SPC”) manufacturing waiver to protect EU generics from unfair competition from overseas, and more broadly, the Goods Package, which should provide faster mutual recognition and stronger enforcement. Unfortunately, it is often Member States who hinder processes towards the Single Market by “watering down” EC proposals.

KEY TAKEAWAYS FROM PANEL SESSIONS

SUCCESS STORIES: HOW COMPANIES IMPLEMENT INDUSTRY 4.0

(Participants: EFFRA, VTT, Produktion 2030, Renault, Bosch)

Various speakers representing industry and R&I centres shared their success stories linked to **the development of PPPs in the field of Industry 4.0**. The workshop was organised by EFFRA which is the European Factories of the Future Research Association. Success stories were almost all characterised by the

following: collaboration between researchers and industry, the sharing of solutions and best practices (either nationally or across business units of a company), forward-planning, skills development among employees, and the challenges of inappropriate regulatory frameworks (e.g. separating collaborative robots from workers).

ARTIFICIAL INTELLIGENCE: BALANCING BUSINESS AND OPPORTUNITY WITH ETHICS AND RESPONSIBILITY

(Participants: DG CNECT, European Parliament, INRIA, CEPS, Orange, Google, Thales, Snips, IBM, IndustriAll)

This workshop brought together representatives of academia, EU institutions, trade unions, and industry to discuss artificial intelligence in terms of definitions, business applications, and ethical considerations. Participants disagreed on whether or not the EU lagged behind on AI, but acknowledged that it would herald the next wave of industrial change in the EU – therefore, skills in particular must be a focus of investment, as well as building an ecosystem where AI uptake is widespread. Ethical considerations are profound, as AI will change the way data is used, necessitating legal clarity on privacy and liability. Participants again disagreed, however, on whether regulation should happen now or later. The legal, moral, and ethical obligations attached to AI-human relations will also have to be debated and defined.

ARTIFICIAL INTELLIGENCE FOR INDUSTRIAL TRANSFORMATION

(Participants: European Commission, Seedlink, CEPS, SAP, vyz Voice, European Investment Fund)

This panel brought together representatives of large and small-scale industry, funders, and institutional stakeholders, with a consensus that the EU is behind China and the USA on AI, but has an advantage in its skills base. Nonetheless, labour mobility should still be prioritised. In terms of a successful application of AI for industrial transformation, numerous issues need to be addressed: the jobs impact of optimisation should be offset by customer growth, companies require guidance on privacy rules in order to make the best use of data, the AI implications of technology must be considered at all stages of the value chain, and liability issues must be clarified. Again, the role of SMEs and startups in the AI ecosystem was emphasised.

CLEAN ENERGY INDUSTRIAL FORUM – CONSTRUCTION

(Participants: DG GROW, CityConsult, Better Home, ECTP Energy Efficient Building Partnership, European Mortgage Federation)

In this workshop, speakers from the private sector and public authorities noted the role that construction has to play in the clean energy transformation. Financing of €50-60bn per year will be necessary to aid this change, and private investment has an important role to play. Buildings must be designed with consumers in mind, and must use recyclable materials to meet circular economy goals.

CLEAN ENERGY INDUSTRIAL FORUM – CROSS-CUTTING

(Participants: JRC, Covenant of Mayors, European University Institute)

Key challenges noted by participants included the materials value chain (here, the EU's dependency on resources means that disruption is the biggest risk), education and skills, social innovation, digitalisation, social innovation, and global change. Also, 3 waves of innovation were identified: decarbonisation, digitalisation, and artificial intelligence. Consequently, a pure technology push doesn't work anymore, and industry must embrace a consumer-driven reality. At the local level, cities must develop sustainability strategies.

CLEAN ENERGY INDUSTRIAL FORUM: BATTERIES

(Participants: European Commission, EIB, InnoEnergy, SAFT, TerraE, Northvolt)

This panel brought together representatives of the newly-dynamised EU battery sector, which is fast becoming a major focus area through the formation of the Battery Alliance, as well as access to financing through the European Investment Bank. Overall, contributors emphasised the need for specialised financial tools, as there is a high risk in investment in batteries. Also, batteries should form part of a larger ecosystem – they cannot be considered commodities on their own, but rather part of a larger push towards clean energy and clean mobility (on the latter, the European Commission will publish a package in May). At least €20bn in investment will be necessary, but a market worth €250bn awaits – already, innovative SMEs are driving demand and leading to shortages, but this demand will skyrocket over the coming years as entire value chains require component change.

EU LEADERSHIP IN CLEAN ENERGY AND CLEAN MOBILITY TECHNOLOGIES - THE STRATEGIC ROLE OF ADVANCED MATERIALS

(Participants: i2-4c Association, Umicore, Solvay, Dow Chemical, AGC Glass, Arcelor Mittal)

This panel brought together representatives of industry producing advanced materials – batteries, advanced glass, chemicals, plastics, and steel. Participants called upon policymakers to develop an industrial strategy which signposts targets for companies, and gives them the space to develop solutions. It was also made clear that the EU is leading on R&D&I and that FP9 would need to continue to encourage the development of marketable solutions. Furthermore, it was clear that clean energy and mobility technologies need to be integrated into all aspects of the industrial chain, including more traditional sectors such as manufacturing, and in upgrading more traditional materials such as steel and glass.

TECHNOLOGIES OF THE FUTURE

(Participants: European Commission, De Proeffabriek, Novamont, Nokia, DigitalEurope, Philips, CEA Liten, NANO futures)

The highlight of this panel was the announcement of a further €6.6bn to be invested in Key Enabling Technologies (KETs) over the last years of the current MFF, as well as the expansion of the definition of KETs to include artificial intelligence. Participants were agreed that government support for R&D&I was essential, especially for the semi-conductor industry, where a tradition of strong government support in competing geographies means the EU must follow suit. Similarly, skills development is an area where government must take the lead. However, government cannot do it alone, with the private sector having a very important role in terms of infrastructure development, and incorporating the use of KETs throughout the value chain. Lastly, government support – for example in investment – should not come with over-regulation attached; a soft touch approach is most beneficial.

INVESTING IN STRATEGIC VALUE CHAINS FOR EUROPE

(Participants: Swedish Ministry for Enterprise and innovation, Italian Ministry for Economic Development, Infineon Technologies, SNCF, EARTO)

During this panel, member state government representatives met with voices from industry and research to discuss the emergence of strategic value chains in Europe. Collaboration was a key theme, whether between industrial sectors, cross-border, or between research and industry. Generally, KETs were seen as key to the EU's competitiveness, and almost all called for a particular focus on KETs in FP9.

DIGITAL MEETS ENERGY UNION MEETS CIRCULAR ECONOMY

(Participants: DG ENER, BEUC, IndustriALL, Orgalime, VDMA, Electrolux)

This panel saw representatives of industry and institutions discuss moves towards enabling the circular economy to emerge, particular in the digitalisation of how we consume energy. The consumer was truly at the centre of the discussion, in that consumers drive demand for change (e.g. in how buildings are designed, and how and when appliances are made smarter), must be included in the innovation process (so that it is driven by their needs) and must be empowered (through, for example, dynamic pricing for energy). Also, participants discussed the need to be vigilant on the potentially negative impact of digitalisation on consumers, in the spheres of personal safety (e.g. fire hazards of appliances) and rights (e.g. privacy).

DIGITAL INNOVATION HUBS (DIH)– FROM CONCEPT TO DEPLOYMENT

(Participants: DG CNECT, Ile-de-France Region, CEA LIST, Hewlett Packard Enterprise, GAIN, Siemens, EIT Digital)

This panel, organised by the Ile-de-France region with CEA LIST, aimed to present the existing European Digital Innovation Hubs (DIH), their state of play and practical examples of how they operate and help SMEs embrace digital transformation; how they interact with regional, national and EU ecosystems; as well as how to improve their impact through coordinated EU, national and regional funding. Participants called for a continued focus on DIHs in FP9, and for the building of an EU-wide DIH ecosystem.

FUTURE OF WORK; AUTOMATION OR CO-CREATION?

- Jadwiga Emilewicz (Minister of Entrepreneurship and Technology of Poland) focused on the challenges faced by industrial change. Entrepreneurs need to use skills that are available and should focus on how to learn fast, and how to adjust – especially as customers demand tailored products. The EU needs to promote modern digital tools. For example, augmented realities tools would improve the production and the skills of labour forces.
- Luc Triangle (General Secretary of IndustriALL Europe) noted that the EU needs to find solutions for all workers, and not only about digitalisation, energy transition, and climate change. There is a double impact of digitalisation on work: (1) there will be a replacement of human work by intelligent machines, and (2) the remaining tasks will profoundly change – investments in education need to happen now to address the this. We also need to discuss the question of working hours – we can no longer replace fewer worked hours with higher consumption. Perhaps tasks should be shared amongst workers on a democratic basis.
- Pekka Ala-Pietilä (Chairman of Huhtamaki) referred to artificial intelligence as the electric revolution of our age, which will change companies, the public sector and society at large. We must embrace these new technologies, but through creating ecosystems. Key to this is that the secondary use of data should be made available for companies so they can use AI.
- Christel Heydemann (Executive Vice President of France Operations, Schneider Electric) believes that the EU needs to be more ambitious in its energy innovation. At company level, they have always had to reinvent themselves – this already happened when they automated to remain competitive, and now they must ask how to train their employees to keep up with innovation.
- Caroline Jenner (CEO, JA Europe) believes that solving the generational skills gap can be achieved through focusing on the “soft skills” category: problem solving, leadership, creativity, adaptability etc. The EU needs to discuss how to get a high-quality education which prioritises entrepreneurial competences. Visits to industry would be a valuable element of this.
- Claudia Olsson (CEO and Founder, Exponential A) noted the trend for jobs to become more and more flexible (part time, entrepreneurs, independent working etc) which is perceived as positive, but the EU shouldn't forget that the global work force is impacted and business models transformed. Companies should adjust their recruitment processes to reflect new jobs and new skills.

ROAD TO 2030 – THE FUTURE OF EU INDUSTRY IN THE GLOBAL ECONOMY

- Saori Dubourg (Member of Executive Board, BASF) believes, that the EU needs to pay attention to what is happening globally (rise of China as an industrial player in particular), and how to move from a volume driven economy to a more value driven economy – key aspects will be digitalisation (where infrastructures must be prioritised) and making sure that industry focuses on societal value as well as profit-making.
- Ulrike Rabmer-Koller (Managing Director, Rabmer Group and President of UEAPME) underlines the importance of SMEs as drivers of innovation and technological development – the EU should incentivise the take-up of new technologies. He agrees on monitoring changes outside the EU to maintain global competitiveness. Industrial policy must also be coherent with other policy frameworks.
- Martha Rehnberg (CEO, DareDisrupt) stated that aside from paying attention to the development of new technologies per se, industry and policy makers should pay attention to who develops them, and for which purpose. Considering that we are squeezed between the US and China our strength will rely on our entrepreneurs – the latter need particular support considering that new technology makes more and more consumer products free. She also warned about the social effects of “dematerialisation”.
- Heinz Lehmann (Vice-President of the Committee of the Regions) believes that everything turns out to be local: for a mayor perspective, what is needed is to have qualified jobs in the territory to increase quality of life. It is also essential that cohesion policy continues to address regional disparities in the EU.

- Renato Pacheco Neto (Chairman, Worldwide Network of EU Chambers of Commerce and Industry) highlighted the importance of partnership between the EU and third countries, as the decline of EU industrial leadership is inevitable. EU added value should be concentrated on quality of life improvements.
- Leida Rijnhout (Steering Group Member of SDG Watch Europe) decried the lack of civil society representation in the Industry Day, and believes that the EU should level the economic growth model to restrain the damages done to society, the people and the planet.
- The Moderator identified seven different trends: digitalisation, demography, decarbonisation, decentralisation (regions, SMEs etc.), dematerialisation, deflation, disturb or be disturbed phenomenon

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SUCCESS STORIES: HOW COMPANIES IMPLEMENT INDUSTRY 4.0

- Riika Virkunen (Research manager in digitalizing industries at VTT) presented two key projects from Finland which have helped the digitalisation of Finnish industry: [The Finnish Internet Forum](#) is a national forum where companies share their experiences and issues with digitalisation and [Reboot Finland](#) is a project initiated by Nokia, which went through 12 areas where digitalisation is the key and organised a campaign to create eco-systems such as an “IoT factory”. The focus has now shifted to AI.
- Björn Sautter (Head of Research Cooperation, Festo) pointed towards the development of the [Festo motion terminal](#), which consists of a combination of the physical and cyber world, the terminal is completely controlled and operated by a software. Key aspects of industry 4.0 are an improved energy management system and the creation of training centres to continuously coach employees. This last aspect is crucial because skills development means job-saving. Regarding innovation in manufacturing, key areas include: vertical integration in a cyber-physical world, horizontal integration along value chains, the development of circular supply chains, the integration of virtual reality to increase services, and focusing on human centricity to keep an efficient and productive interface between human and machines.
- Cecilia Warrol (Programme Director, Produktion 2030) focused on the role of 5G in industry, with 5G being installed at factory level to improve the monitoring of machines. She gave the particular example of a €20m investment project with SKF which through the integration of 5G in the manufacturing chain, vertical integration, and flexibility in model and volume size have increased greatly. The project is run with the participation of Chalmers University of Technology, where SKF funded a research centre.
- Philippe Montfort (Renault) shared that the company is planning to have 100 collaborative robots from March 2018, and envisages 10,000 connected machines by 2020. One of the major roadblocks to digitalisation is the secrecy of the machine data, an open-source system to share the data of the machines for all the systems is crucial.
- Johan Peeters (Global Strategic Account Manager, Bosch Rexroth) explained how to ensure that all innovations are well disseminated, Bosch created the [IoT cloud](#), which is a catalogue to present all the 4.0 solutions available and provides toolkit to develop IoT innovations. Both he and Mr Montfort noted the difficulties brought about by the need to separate workers and collaborative robots physically for health and safety reasons.

ARTIFICIAL INTELLIGENCE: BALANCING BUSINESS AND OPPORTUNITY WITH ETHICS AND RESPONSIBILITY

Panel 1. Defining and understanding AI

- Andrea Renda (Senior Research Fellow, Centre for European Policy Studies) suggested an Artificial Intelligence definition as “the replication of outputs or outcomes of an intelligent decision process”, ie an imitation of the decision-making process. He highlighted legal uncertainties, suggesting scenarios such as producing liability regimes where we treat robots like animals or like slaves, or in a new category, like robots. Ethical decisions remain to be made by policy-makers on how control is delegated to an external machine-empowered environment, we must retain control. Algorithmic transparency is essential for policy-makers to produce rules.
- Nicolas Demassieux (Senior Vice President Research and Orange Labs) suggested that as developers still need to understand the applications of AI, regulation must come later. He noted Orange’s principles for AI development: first, that for any AI project the end-user must be the focus. Secondly, that the work is done transparently.

Panel 2. The business case for AI

- Lucilla Sioli (Director, Directorate A: Digital Industry, DG CNECT) confirmed that the EC is preparing an AI initiative to be published at the end of April. Competitiveness for industry and ethical issues are

the twin areas of focus for the EC. For Europe to compete with the US and China, fragmentation of investment must be avoided.

- Bénédicte Javelot (Strategy Director, Orange) underlined the importance of intellectual property to avoid developments leaking out of the EU. For policy-makers, a trustworthy framework for consumers must be prioritised, to ensure broad uptake of AI. We also must remain aware of bias when we “educate” machines, and build up the skills necessary to audit them.
- Yann Lechelle (COO Snips) predicted that after a decade of Cloud and Big Data, we will now see a decade of AI, one that is based on developments in the previous two technologies. We must be sure not to centralise data as part of this phenomenon – edge computing is a key aspect of this. The EU needs to support an ecosystem for SMEs in the uptake of European tech solutions on AI and blockchain.
- Ondrej Socuvka (Senior Public Policy Manager, Google EU) said that Europe is not lagging behind in the AI, but did note that opportunities for industry depend on their openness of AI. Questions surrounding liability must be clarified as soon as possible. Accountability and interoperable services are key to Google’s vision – connected to both of these is the development of effective tools to protect privacy.
- David Sadek (Vice President Research, Technology & Innovation, Thales) noted that in their use of private clouds for the storage of data, the validation process is very important. The main domains for Thales are “critical systems”. These systems must be highly trustworthy as the consequences of failure are catastrophic, e.g. a plane that needs AI to keep in flight.

Panel 3: Ethical considerations of AI

- Eva Kaili (MEP – S&D, Greece) noted that AI raises many questions for consumers, particularly on responsibility and liability. On privacy, we will also have to closely monitor the application of the General Data Protection Regulation (GDPR).
- Nozha Boujemaa (Director of Research, DATAIA Institute Director, INRIA) explained how data analytics is changing from descriptive to prescriptive, from descriptions of decisions to prescribing solutions. Transparency will depend on remedying the information asymmetry between the producer of the digital service and its consumers. Regarding the legal side, we do not need more laws, but better use and understanding of existing regulation. We also need a new generation of algorithms that are transparent by design and responsible by design – an interdisciplinary approach is key.
- Liam Benham (Vice President, Government and Regulatory Affairs, IBM Europe) spoke about transparency, noting that for AI to be credible, organisations must be transparent about who builds the systems. Data ownership and human privacy must be ensured. Skills development must also be a focus.
- Laurent Zibell (Policy Advisor, IndustriAll Europe) stated that in previous industrial revolutions, technological change was overcome by increasing production levels and productivity levels. There is uncertainty whether this is happening on AI. A key issue is that AI depends on using past data to project future actions, creating difficult questions for workers around consent. We must also decide how our relationship with AI should be framed – similarly to our relationship with animals?

ARTIFICIAL INTELLIGENCE FOR INDUSTRIAL TRANSFORMATION

- Rina Joosten-Rabou (Co-Founder, Seedlink) noted that AI is pushing ahead outside of Europe, particularly in China. We must not be too risk-averse in the way we explore and find solutions, especially considering that in China, the question of liability is not as prominent.
- Philippe Brunet (Director, Directorate I: Space Policy, Copernicus and Defence, DG GROW) noted that AI is essential for industrial transformation because it allows us to process in data in new and complex environments, like space. Copernicus generates a lot of data that must be processed through different vertical services – originally expected one petabyte every year and a half, but now we are

facing 6 petabytes. Data mining is at the core of Copernicus' strategy. With 20 Petabytes of data a year, we need to find ways of making the data available.

- Andrea Renda (Head of Regulatory Policy, CEPS) referred to AI as a KET but noted the need to address the ethical issues of consent, control and liability. Two trends are appearing in AI: optimisation and prediction:
 - o Optimisation will lead to job losses. It is in Industry 4.0, energy supply chain, where more powerful computers can optimise the process to reduce inefficiencies, requiring the substitution of labour by capital.
 - o Prediction is developing in strange way, incorporating our own biases. For example, the predictive policing systems used in California.

Algorithmic neutrality does not exist, we will never be able to take out the biases.

- Andreas Tegge (Head of Global Government Relations, SAP AG) also worried that the EU is falling behind the USA and China on AI, and flagged "AI for enterprise" as an emerging issue, one Europe can capitalise on. Start-ups in Paris and Berlin are dealing with this. Early adopters of AI are large digital savvy companies, the motive is not cost-cutting but optimisation and customer growth. It allows to improve productivity. Companies need to leverage data, but also require guidance on the impact of the GDPR. These concerns should go into the design of algorithms, if trust is to be created.
- Robert Spicer (CEO, vyzVoice) said that policy considerations should conflate all technologies that help us reach a clear goal e.g. health/wellbeing. The question on Big Data is how we farm this correctly.
- Juha Lehtola (European Investment Fund) noted that the deep-tech sector has been a big growth sector for start-ups and SMEs in Europe, and the latter will drive investment and innovative solutions. The EU has a competitive advantage, thanks to its science base and talent pool, but is behind the US and China on public investment into AI. We need to develop funding solutions that are more long-term - commercialisation takes years, even decades and the availability of private capital remains scarce.

CLEAN ENERGY INDUSTRIAL FORUM - CONSTRUCTION

- Gwenole Cozigou (Director, Directorate C: Industrial transformation and advanced value chains, DG GROW) noted the dominant role played by buildings in climate change goals - to achieve the 2030 climate targets, it is estimated that the EU will need €50/60 bn a year in construction and renovation. The Commission and the EIB are working together to develop this financing, but an important role will be played by local authorities and the private sector.
- Paul Vermeulen (President and CEO CityConsult sprl.) pointed towards a change in the cultural aspect of consumption in the past century. Nowadays we want to renovate building instead of building new ones (circular economy). Therefore, materials that are needed to enhance energy efficiency of buildings should be easy to recycle.
- Niels Kare Bruun (CEO, Better Home) presented the goal of his company as to save energy, improve comfort and increasing property value through renovation.
- Antoine Aslanides (Co-Chair of the ECTP Energy Efficient Building Partnership) argued that there is a transformation of the sector meaning that the industry has to move from a passive view of the building to an active one, where buildings will need to be energy producers. It is also essential to move from a single building perspective to a block of building perspective. Also, the approach should be customer-centric rather than building-centric.
- Luca Bertalot (Secretary General, European Mortgage Federation - European Covered Bond Council) noted the need to create a critical mass of banks ready to change the perception of mortgages – otherwise, the necessary investment will not be unlocked.

CLEAN ENERGY INDUSTRIAL FORUM – CROSS-CUTTING

- Charlina Vitcheva (Deputy Director-General, Joint Research Centre, European Commission) noted that the JRC has identified groups of challenges: the materials value chain (here, the EU's dependency on resources means that disruption is the biggest risk), education and skills, social innovation,

digitalisation, social innovation, and global change. The EU must also make sure not to fragmentise the strategy for investment.

- Asa Karlsson Bjorkmarker (Vice-Mayor of Vaxjo, Member of the Board of the European Covenant of Mayors advised the local level to increase their efforts to become sustainable cities, as “visionary cities attract visionary companies”.
- Jean-Michel Glachant (Director of the Florence School of Regulation and Director of Loyola de Palacio Energy Policy Programme, European University Institute) described 3 waves of innovation: decarbonisation, digitalisation, and artificial intelligence. Consequently, a pure technology push doesn't work anymore, and industry must embrace a consumer-driven reality.

CLEAN ENERGY INDUSTRIAL FORUM: BATTERIES

- Maroš Šefčovič (Vice-President of the European Commission in charge of the Energy Union) noted the need for a €20bn investment by 2025 to create production capacity – the EFSI shows that we are capable of finding financing. The market for batteries will eventually amount to €250bn. There must be a combined effort – the European Commission, the European Investment Bank, and member states must pull together. Already, the Battery Alliance has managed to generate concrete actions, and lots of positive buzz – “the first Commission startup”. Building upon this dynamic sector, the Commission wants to present Clean Mobility Package in May – he hopes this can be a part of it.
- Andrew McDowell (Vice President, European Investment Bank) described the level of cooperation between the EC and the EIB on energy policy is maybe the strongest of any policy area. The EIB is very enthusiastic about the battery initiative, recognising that they are critical in unlocking clean energy in a range of sectors (transport, heating, appliances....). However, investment must happen across the entire value chain, and will depend on much public financing and derisking of private financing through institutions such as the EIB.
- Diego Pavia (CEO, InnoEnergy) noted that the Battery Alliance, led by InnoEnergy, is presiding over an extremely fast-moving project, which has attracted the attention of the world's leading lithium exporters. By mid-March, the Alliance will publish in full its 20-point-plan, which will focus on impact, timeline, and feasibility. One key task is to fast-track permitting, to make sure technology gets to the market as soon as possible.
- Holger Gritzka (CEO, TerraE) told how in Spring 2017, a number of German industries (e.g. Siemens, Thyssen-Krupp) set up a consortium to help plan for products, processes, building, factory construction. This is subsidised by the German government, and began operations in January 2018. He noted that the novelty of the emergence of batteries means public finance is essential, and that it is very time sensitive – speeding up not just on the R&D&I side, but also on questions such as due diligence and regulation. Also, subsidies should focus not on final products but on the whole development chain.
- Peter Carlsson (CEO, Northvolt) said it was important for Europe to build energy independence – from raw materials to transformation of industries. Northvolt is building an entire batteries ecosystem in Northern Sweden, based on significant EIB investment. They hope to be in a position to address a shortage on batteries which is already apparent, especially driven by SME demand. As large companies (e.g. automotive) look to change all components over the coming years, there is a need to be prepared in order to meet demand.
- Ghislain Lescuyer (CEO, SAFT) highlighted the importance of fair competition in global trade, reciprocity in public procurement, high environmental standards and labour standards, access to finance, and a skilled workforce, as elements of a successful battery ecosystem for the EU. Also, batteries should not be seen as pure commodities.

EU LEADERSHIP IN CLEAN ENERGY AND CLEAN MOBILITY TECHNOLOGIES - THE STRATEGIC ROLE OF ADVANCED MATERIALS

- Martin Porter (Executive Director, i2-4c association (Industrial Innovation for Competitiveness)) recommended that stronger governance structures must be developed to support R&I projects on advanced materials.
- Kurt Vandeputte (Senior Vice President - Rechargeable Battery Materials, Umicore) is innovating battery production through increased nickel-use, which improves the efficiency and advanced lithium iron. Future battery sales will depend on the electrification of our cities and mobility. Electrification, energy storage systems and increasingly portable products will all help the growing battery market. The transportation sector in particular will see the focus shift from Asia to Europe. Key messages are:
 - o Support the creation of a local market for de-fossilised mobility (vehicles that don't use fossil fuels);
 - o Increase and focus R&I support for the next generation of rechargeable products;
 - o Promote sustainable sourcing of raw materials;
 - o Include principles of circular economy into the life-cycle of production.
- Ludovic Odoni (R&I Director Belgium, Solvay) mentioned that though the majority of the company's business is now in Asia, it's R&I focuses on Europe. It is engaged in providing services on light-weighting, electrification, and power train for vehicles, but has also diversified its offer to a range of light-weight plastics and developing products. He advised policymakers to increase investment and do more work to develop hubs.
- Jeroen Bello (Global Automotive Marketing Manager, Dow Chemical) noted that Europe is Dow's second largest region (14bn sales, 50 manufacturing sites, Germany most important manufacturing base outside the US). Current major challenges are resource scarcity and growing energy consumption – one way they try to address this is with chemical solutions preserving the freshness of foods. Dow contributes to the EU clean mobility sector by developing foams, battery cells, adhesive, silicon solutions, rubber for cables and airbags that are important for the contents of the car. Highly resistant silicon rubber is being used for the turbo charger in the car's power train. The growth of the Original Equipment Manufacturer (OEM) brands in Europe is a positive sign.
- Niels Schreuder (Manager Public Affairs, AGC Glass Europe) stated that advanced glass manufacturing could help reduce energy emissions by 30%. New generation double glazing and integrating photovoltaics into building windows are among the latest innovations. FP9 should fund the latest smart glass solutions.
- Philippe Thibaux (Technology Manager Metal Structures Centre at Arcelor Mittal Global R&D, Arcelor Mittal) noted the interdependency between clean energy and steel: support structures for wind turbines, future power plants operating at high temperatures require steel. We not only need new material steels, we need new systems. Today's cars use advanced high strength steels that are cost effective & reliable. The EU can help to introduce new materials through collaborative projects (such as in H2020) through the engineering & supply chains. We must also be sure to focus on manufacturing skills, where the EU is under threat from competition abroad.

TECHNOLOGIES OF THE FUTURE

- Jürgen Rüttgers (Chair of High Level Strategy Group on Industrial Technology) which is now releasing its report on how to strengthen the EU's industrial capacity for Key Enabling Technologies (KETs). He outlined two central facts: first, as far as innovation is concerned, there is a deficit of implementation not awareness - national policies are not implementing. Secondly, the fears of Members States must be better understood within the Commission. Technology liberates us but also creates risks fears of job loss, relocation of industries, alienation from home land and traditions are fears to be considered. Job losses in manufacturing must be mitigated. Key Enabling Technologies (KETs), are the topic of a sizeable programme worth €6.6bn.
- Daan Schuurbijs (De Proeffabriek) underlined the need to move from a volume-based industry to a resource-based industry.
- Giulia Gregori (Novamont) explained the bio-based industry's ambitions for jobs and growth by creating new value chains, new production levels and optimising the use of feed stock. They are also aware that societal impact and the cost of externalities must be understood as part of this aim.

- Astrid Simonsen Joos (CEO Philips Lighting, Nordics (Norway, Denmark, Sweden, Finland and Iceland)) noted that the lighting sector is behind on the transformation, but accelerating investments into the technology, services. Government must create the right framework to ensure an investment friendly environment for companies.
- Markus Borchert (Senior Vice-President Market Europe, Nokia and President of DigitalEurope) welcomed the adoption of cybersecurity and AI as KETs. However, investment still lags, and integration of technology needs to be worked on – 5G may offer a chance here for the EU to bounce back. Also, infrastructures for this change will have to be developed by the private sector, rather than government alone. One way to increase investment would be to relax regulation, and extending licenses to more companies.
- Karen Amram (CEO, CEA-Liten) noted that government's role in developing the technologies of the future will remain crucial. Giving the example of the semi-conductor market, nations capable of developing strong industry (US, China, Taiwan, Korea) all benefited from substantial state support. In the United States, the role of government support in ensuring leadership in semi-conductors was recognised by a [report](#) of President Obama's Council of Advisors on Science and Technology (PCAST), from Jan 2017. Targets in quantum technologies and spintronics rely on long-term and multi-path research programmes - KETs are a good example of how the EC can show leadership in this domain.
- Andrea Elisabeth Reinhardt (Platform Co-Chair, NANO futures) noted obstacles faced at local level, (e.g. Rhineland Palatinate's plan to implement registers for new nanotechnologies). Government is needed to support long-term R&D investments. For nanotechnologies we are lacking the skills, we have the initial manufacturers of the technologies but upskilling is needed further up the value chain, government can help do this.

INVESTING IN STRATEGIC VALUE CHAINS FOR EUROPE

- Sabine Herlitschka (CEO, Infineon Technologies Austria) drew attention to the importance of "Made in Europe" supply chains; strategic value chains define themselves on building on KETs, and respond to the need of customers. New production facilities require high volume products, pilot lines, services & solutions for generating economic growth. Micro- and nano-electronics combine the analogue and the digital – If we lose control of these KETs, we risk bringing significant disadvantage to the region's competitiveness. Collaboration is key. It is crucial to protect strategic competences – there is a need to find a balance between free trade and the protection of know-how. On AI, though it is of course a KET, we must not forget it is also about data ownership.
- Niklas Johansson (State Secretary, Swedish Ministry of Enterprise and Innovation) stressed the importance of investing in digital skills. Furthermore, the EU needs to boost its self-sustainability and independence (i.e. EU extracts a small percentage of the minerals available in the region).
- Frédéric Saint-Geours (Chairman of the Supervisory Board, SNCF) believed the EU needs breakthrough innovation and a holistic approach for Europe to promote and defend the value chains; For this, FP9 must be bigger than Horizon 2020, and has to address both incremental and disruptive innovation.
- Frank Treppe (President, EARTO (European Association of Research and Technology Organisations)) reiterated the need to invest in KETs, which have to be a key part of FP9 with an appropriate budget. EARTO calls for the establishment of a dedicated programme to support technology infrastructures, which are essential to the development of KETs. Boosting cooperation between RTOs and industry is a key EU resource that needs to be fueled with FP9 funding.
- Stefano Firpo (Director-General for Industrial Policy, Italian Ministry of Economic Development) underlined the need for cross-border and cross-sectoral collaboration, innovation and entrepreneurship across different regions and value chains. "Speed, risk, and size" are the key elements.

DIGITAL MEETS ENERGY UNION MEETS CIRCULAR ECONOMY

- Andreea Strachinescu (Head of Unit C2, DG ENER) described digitalisation is an opportunity to further decarbonise the energy system, and emphasised the intrinsic correlation between the energy and ICT sectors. This is reflected in various parts of the Clean Energy Package. The Commission is taking this reality forward through the orientation of Horizon 2020 towards this integration, as well as through the Strategic Energy Technology Plan. Dynamic pricing is also on the agenda, in order to create smarter consumers.
- Monique Goyens (Director General, BEUC) noted that consumers must be included in the development of new energy solutions. She also drew attention to the need for trust in data-sharing, but also in the safety of smart appliances – there can be no weak links. Companies must also be aware when pricing adapted appliances that consumers will be facing the need to replace everything with new generation versions, but will not do this at the same time. Lastly, interoperability must be at the core of the transformation of consumer goods.
- Luc Triangle (General Secretary, industriAll) said that it must be admitted that digitisation will cost jobs, even if it also creates them – we need to already invest in skills. With that said, digitisation is key to a truly functioning circular economy, and also empowers consumers – for example, it should allow extremely accurate traceability, which should also lead to gains in CSR.
- Jean-Jacques Marchais (Chairman, Orgalime Energy Working Group) focused on buildings, explaining the paradigm shift where buildings are no longer considered mere shells, but rather need to be energy-proactive, as well as adjusted to the needs of their inhabitants. Considering EU skills in construction and energy utilities, we should ensure cooperation between the two to make Europe the world leader in smart buildings.
- Naemi Denz (Member of the Executive Board, VDMA (the Mechanical Engineering Industry Association)) reminded that digitalisation is not just about technology, but also about services. We need to focus not just on products, but also on processes – this is the foundation of Industry 4.0. As a first step, the focus should be on infrastructural development, however. Application comes later.
- Viktor Sundberg (Vice President, Electrolux) said there is great potential to reduce CO2 emissions through appliances, especially those that deal with heating and cooling. However, we should not expect too much, as a lot has already been achieved – only so much improvement can come. Customers need to see the benefits of improved appliances nonetheless, as the cost savings in energy efficiency have reached a peak. He also argues that smart appliances are safer than traditional versions.

DIGITAL INNOVATION HUBS (DIH)– FROM CONCEPT TO DEPLOYMENT

- Nathalie Lefevre (Head of sector 'economic development', Ile-de-France region) detailed how the region has invested €300 M for five years, with the support of EU fundings to improve the competitiveness of industrial organisations, and helping them cope with the new challenges and find solutions for the digital era.
- Gregorio Ameyugo (Deputy Director, CEA LIST) presented CEA List, the technological research division of CEA, a public research institution whose aim is to improve industrial competitiveness through technological innovation. CEA has developed a tool for AI that is second only to Google in terms of usage. He underlined the urgency to move forward fast, bringing together large groups, SMEs and the public sector to make AI available on the market.
- Anne-Marie Sassen (Deputy Head of Unit A2 “Technologies and Systems for Digitising Industry”, DG CNECT) noted that only 1/5 European companies are highly digitised and the level of digitisation depends on where companies are located and on the size of the company. Therefore, she stressed the need to encourage more investments, both public and private, for the development of DIH, and mentioned the existing EU’s funding opportunities under H2020. FP9 will promote more investment in digital transformation, including through DIHs, where connections with financial institutions will be strengthened.
- Manuel París Lestón (European Programmes Manager, Axencia Galega de Innovación (GAIN)) told how the Spanish government is considering the idea to implement a funding strategy for DIHs. It is not

clear in which kind of funding mechanism will be created, nor how it will work but it is envisaged. This should be part of a broader strategy to create an EU-wide networks of DIHs.

- Thomas Hahn (German National platform on DIH LNI4.0, Siemens) stressed the importance of cross-sector standardisation, and the need to engage in a continuous dialogue with SMEs (with networks of test centers, practical testing and validating the input for standardisation);
- Fabio Pianesi (Manufacturing Industry Digital Innovation Hub project coordinator, EIT Digital) detailed EIT Digital's role in launching, with 20 partners, the Manufacturing Industry Digital Innovation Hub (MIDIH) initiative (funded by H2020 and Factories of Future cPPP and I4MS programmes). MIDIH aims to boost innovation partnerships between solution providers and industries, and to bring Europe to the forefront of the Industry 4.0 market by 2023. MIDIH wants to have a European dimension. It incubates a pan-European network acting as a one-stop-shop of services in order to make the cross-European DIHs ecosystem become reality.
- Mauro Colombo (Hybrid IT Sales and Presales Manager, Hewlett Packard Enterprise Italy) outlined HPE's decision to invest in Italy, along with local partners, launching the "Innovation Lab" initiative. In the past year, HPE opened around 20 Innovation Labs across the entire country. The Innovation Labs offer hands-on environments and real-world examples, providing a venue to collaborate with HPE IoT technology solutions, learn about HPE's direction and key strategies, and build business relationships. In the next future, HPE will aim to expand capabilities (working on local start-ups to get them on board) and involve other global players in the initiative (i.e. Siemens, GE). It is also planned to increase links with local academic institutions.

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