Cover Story

Industry

Towards accelerated change?

TEXT Catherine Moisy **TRANSLATION FROM FRENCH** Martin Davies, Hannah Ekberg

Long associated with the steel foundries that littered the landscape with their blast furnaces and other buildings of almost inhuman proportions, industry is, today, more discreet with sites that may be less spectacular but are just as important for the economy of Luxembourg. The relative weight of this sector in the country's GDP and internal employment dropped considerably following the rampant development of the economy's tertiary sector but, in absolute terms, the figures are far from negligible with more than 750 companies directly employing 34,000 people and achieving a turnover of EUR 14.5 billion. Before the COVID-19 crisis, the sector was already facing several challenges and developing processes that were increasingly based on digital technologies. What will the impact of the crisis be on this evolution: will it slow down, or accelerate?

We are at the end of the 19th century. Throughout Europe, the first industrial revolution replaced crafts workshops and other manufacturing sites with real factories, dedicated to the production of goods on a large scale and enabled by mechanisation. In Luxembourg, the steel industry boomed in the 1860s and began to employ more and more workers. To operate its titanic factories, the sector called on a foreign workforce which soon outnumbered the locals. This influx of people created new housing needs and a booming construction sector led the way in the development of industries specialising in materials complementary to steel. Industry dominated the country's economy for more than a century and in the 1970s it (along with energy production) accounted for 47% of the Gross Domestic Product. After the Second World War, new activities were added to the country's industrial arsenal. The automotive, chemical and energy sectors grew. The American tyre manufacturer, Goodyear, moved to Luxembourg in 1949. It was the first automotive supplier in Luxembourg, but was joined by many others throughout the 1960s, taking the country from an era of heavy industry to one of precision engineering.

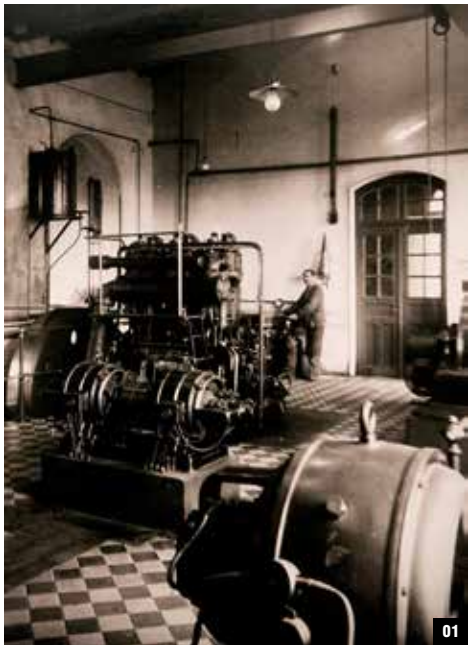
In the late 1990s and early 2000s, new developments transformed industry. The digital revolution made globalised business models possible and led to the fragmentation of production processes as different regions of the world specialised in certain types of production and others abandoned them. We thus moved towards industries of assembly in which the various components could come from all over the world, with complex supply chains managed by sophisticated software.

In Luxembourg, the tertiary sector of the economy continues to grow. However, industrial employment remains stable in absolute terms and foreign investors are developing production units in Luxembourg, the country being always ready to diversify its economy, especially in the advanced materials industry. In relative terms, industry only accounted for 6.7% of the GDP in 2018 but it is a branch that matters, which the authorities have no intention of neglecting. The Strategy of the Third Industrial Revolution, launched at the end of 2015, devoted an entire chapter to industry and its potential, if it can ride the waves of innovation, sustainable development, the circular economy and intelligent manufacturing. It is vital that the country position itself in terms of these technologies because traditional industries have become very competitive – and will have difficulty remaining competitive – due to the high costs of labour and land in Luxembourg, coupled with the legitimate, but expensive, requirements to improve the environment.

Some confidence...

The now recurrent Economic Barometer survey is conducted by the Chamber of Commerce every six months on a sample of companies representing Luxembourg's economic fabric. It allowed us to take the pulse of the industrial sector and compare it to the average responses of companies in all other sectors. This exercise was carried out for the two semesters of 2019. At that time, the results suggested a fragile feeling of confidence, expressed through several criteria.

In the two semesters of 2019, industrial companies were proportionally less likely than others to anticipate a short-term improvement in their business over the next six months. On the other hand, around 40% of them expected a good year in 2020, both on national and export markets. 28% of the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01. 02. 03. The first industrial enterprises appeared in Luxembourg in the second half of the 19th century, thanks to the first industrial revolution. Here, (01) Luxembourg Powder Mills (now Accumalux), (02) Arbed (now ArcelorMittal), and (03) Heintz van Landewyck.

© 01: Accumalux – 02: ArcelorMittal 03: Heintz van Landewyck

industrial companies questioned thought they would augment their workforce in 2020 and almost none thought that they would see it decline. A certain optimism also emerged from the investment plans, with 30% of the companies questioned in the first half of the year and 33% in the second half, announcing short-term projects for 2020. Most of the investments in question related to the modernisation or renewal of installations and equipment. In the second half of 2019, 85% of industrial companies said they were either confident or very confident about the future of their business and this proportion rose to 88% having confidence in the economy of Luxembourg as a whole. Even if these figures were slightly


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lower than the opinion expressed by all of the companies interviewed during these surveys, they nevertheless reflected a good business climate felt by industrial companies in the pre-crisis world, all the more so since the results for confidence in their own future recorded in the second half of 2019 were 9 points better than in the first half.

… And many challenges

This rather serene outlook should not allow us to overlook the structural challenges facing industry.

Even before COVID-19 brought its share of new challenges, Luxembourg industry faced three main challenges. The first was linked to the quest for talent. The Economic Barometer confirmed this was the No. 1 concern, with 75% of the companies questioned placing the lack of qualified labour at the top of their list of concerns and more than 85% saying they had already faced recruitment difficulties. As industrial trades are changing rapidly due to the adoption of new technologies, recruitment needs are inexorably shifting towards more qualified profiles than those that were deemed necessary in the past. Those with technician (DT) and professional aptitude (DAP) diplomas remained the most sought after – 50% of the industrial companies questioned for the Economic Barometer were looking for workers and 35% were looking for technicians – more and more engineers, able to operate within the evolution to a more digitised industry (Industry 4.0) were required (22% of companies were looking for engineers). The latest Qualifications of Tomorrow in Industry survey, conducted by FEDIL in early 2019, reported nearly 1,400 short-term hiring projects in industry and construction. More than half of these job openings were concentrated in the metallurgy, metal processing, chemical and materials industries. Most of these positions (79.5%) were directly related to technical or production functions. '*These careers have passed a little under the radar of young people*', deplored René Winkin, director of FEDIL. '*Families are in fact less and less in touch with the industrial sector as the professions in the tertiary sector and in administration grow. But industry is offering a new chapter of discovery because it is a sector that is constantly changing and evolving.*' A study by the recruitment firm Telluride, conducted in 2018, showed a higher degree of satisfaction among employees in industry than among those in the banking/finance sector.

'Industry only accounted for 6.7% of the GDP in 2018.'

This high degree of satisfaction mainly concerned functions in sales/marketing, engineering/maintenance, and quality control/continuous improvement. Little surprised by these results, René Winkin suggests this may be explained by the fact that these are trades in which we can easily see the results of our work and where we have the satisfaction of witnessing the transformation of production methods. He believes the younger generations need to be able to recognise the significance of their work. He added that remuneration offered in the sector has tended to increase due to the increased skill-levels of the positions offered. In addition to efforts to attract young people into appropriate training for the sector, attention has also focused on other groups of people, thanks to lifelong learning, and tax incentives that make it possible to attract people to Luxembourg from other countries. This work is being done by FEDIL in collaboration with, the *Union des enterprises luxembourgoises*. This theme of attracting talent and skill is intricately linked to the second challenge of the industrial sector which is that of innovation and especially digitisation. This was a major concern for 29% of the sample of industrial companies that responded to the Economic Barometer survey, who saw, in particular, the possibility of improving their organisation and internal knowledge management, whilst at the same time reducing their costs.

Innovation is key

For many years, the industrial sector has innovated and devoted significant staff and budgetary resources to Research Development Innovation (RDI). Attesting to this, FEDIL has awarded a Prize for Innovation since 1982. But in recent years, the trend has been accelerated by the many

Marina Guérin-Jabbour
Head of Luxembourg-Digital Innovation Hub (L-DIH), Luxinnovation

'Supporting the digital transformation journey of industrial companies'

What types of businesses does L-DIH work with?

Since the Luxembourg Digital Innovation Hub is a national initiative supported by a number of key partners (FEDIL, the Ministry of the Economy, LIST, the University of Luxembourg, the Chamber of Commerce and the FNR), the target audience is quite large. We focus on any industrial and manufacturing company, regardless of size, that is looking for support during their digital transformation journey.
This support has two main phases. It is first about understanding the business's needs in all its operating areas. Then, it is a question of recommending public or private partners able to support it. DIL also opens the doors to accessing European funding under the current Horizon 2020 framework programme and the future European Digital Programme.

What are the main trends and guidelines that we observe in Industry 4.0?

Industry 4.0 is constantly evolving. This can be seen not only in the integration of the latest technologies, but also in the positioning of industrial companies as major players in society. Three main axes are emerging: greater autonomy from the integration of new technologies such as artificial intelligence, cyber security or high-performance computing; better collaboration along the entire value chain, from marketing to logistics, to design and production; and finally, more sustainability in terms of energy management or circular economy.
The challenge is to ensure that these aspects are covered simultaneously.

What are the prospects for development and evolution?

Based on the three axes described above, we can see that industry 4.0 is developing not only for the relevant use of available data in complete safety, but also to use this data in order to help industrial companies in the production and implementation of sustainable services. This enables the creation of decent work environments conducive to creativity, learning and social bonding.

04. 05. 06. 07. The steel industry has long dominated the Luxembourg industrial landscape. Here, continuous casting in the ArcelorMittal factory in Belval (04), ladle furnace in the ArcelorMittal factory in Differdange (05 and 06), and slag poured in tanks (07).
© ArcelorMittal

possibilities offered by digital technologies. The Economic Barometer also showed that industrial companies were more advanced than the average company in their process toward digitisation. In fact, 70% (against 63%) have already started a digital transformation, of which almost 28% are already very advanced in this process. The last few years have seen the emergence of a true ecosystem of industrial innovation in Luxembourg. The sector is responsible for 63% of the country's investments in RDI. 40% of industrial companies – but only 28% of all companies – have carried out recent innovation projects (Economic Barometer H1-2019). Public research centres, in particular the Luxembourg Institute of Science and Technology (LIST) and the University of Luxembourg are increasing their collaboration with industrial players in an increasing number of applied research projects related to additive manufacturing (3D printing), robotics, virtual design, high value-added materials, the Internet of Things (IoT), etc.


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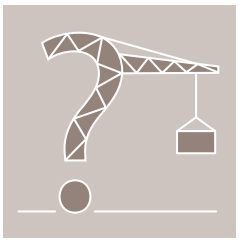
Manufacturers have sometimes reinvented themselves as service providers and complement their range of products with a range of services (sale of spare parts, reactive or predictive maintenance thanks to IoT, annual contracts based on use or productivity…). A good example is Goodyear which has integrated sensors to measure wear in its tyres, allowing its customers to better manage the maintenance of professional vehicle fleets. ArcelorMittal rents sheet piling to the construction market and ensures their recovery and reconditioning before new rental contracts. Such smart manufacturing and maintenance themes as these are also in line with the desire to develop the circular economy.

Industrial innovation now has several interactive platforms where exchanges between researchers, experts and operational teams are developing. This is the case within the various sectoral clusters (materials, automotive, wood, etc.) attached to the national agency for innovation, Luxinnovation, and other innovation platforms, such as the Luxembourg Automotive Campus, already operational in Bissen, as well as the National Composite Center, currently housed within LIST, whose vocation is to further stimulate the development and processing of innovative materials in Luxembourg and which hopes to set up a campus like Bissen.
Innovation is also playing out in the Paul Wurth InCub, where induTech shoots are inventing the industry of tomorrow based on robotics, artificial intelligence and EnergyTech. For its part, the Luxembourg Open Innovation Club (LOIC) connects established companies and innovative startups for fruitful interactions. This is how in 2019, ArcelorMittal and the startup Sagacify set up a pilot project allowing the analysis of industrial data, using artificial intelligence and machine learning technologies to optimise purchases.

The FEDIL still leads, in collaboration with Luxinnovation and the Ministry of the Economy, the D4I initiative (Digital for Industry), a Luxembourg branch of a European network for the coordination of digitisation initiatives, which aims to inform businesses on the potential benefits and risks of Industry 4.0, identify opportunities for local businesses, and initiate pilot projects. The first concrete evidence of this approach and the most recent corner stone in building industrial innovation in Luxembourg is the L_DIH (Luxembourg Digital Innovation Hub), created at the end of 2019, and responsible for supporting industrial companies in their digital transformation and for the adoption of data-driven models (see the interview with Marina Guerin-Jabbour page xx). It should be noted that the industrial sector does not underestimate the flip side of the digitisation coin and makes sure to alert companies to the threats posed by cyberattacks. The FEDIL has thus developed a self-assessment tool, the Cybersecurity Assessment Online Tool, available free of charge (www.fedil.lu/cybersecurity-assessment/) which allows companies to review their performance against some fifty prudent behaviours, suitable for protecting the corporate data which must now be considered one of companies' most valuable assets.

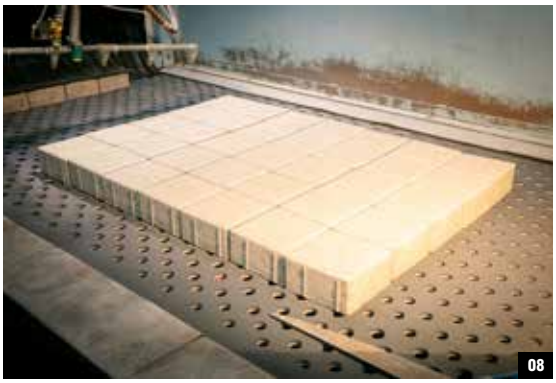
Green challenge

Industry's third major challenge is the energy transition that goes hand in hand with a desire to drastically reduce greenhouse gas (GHG) emissions. These questions are being partly discussed at a supranational



Did you know?

What do the following have in common: the new One World Trade Center in New York, the largest crane in the world, the planned retractable roof for the Roland-Garros stadium in Paris, and the roads of the Greater Region? They all contain ArcelorMittal products. The One World Trade Center contains 12,000 tonnes of Histar steel beams produced in Differdange; the largest crane in the world, installed at the Hinkley Point nuclear power plant in the UK, is mounted on rails manufactured in Rodange - it can lift up to 5,000 tonnes, the equivalent of 1,400 elephants, 63 trains or 20 planes. The ArcelorMittal site in Rodange also produced - in just two months - 44 rails for the construction of a retractable roof for Roland-Garros' central court. The slag (a by-product of making steel in blast furnaces) contained in the historic slag heaps in the south of the country has found a new use which gives it value: it will be recycled during roadbuilding in the Greater Region, until exhausted in 2022.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political level and companies must comply with decisions that do not always take the same direction as they would like to remain competitive in the short and medium terms. However, there too, the FEDIL, which speaks for the industrial sector, works with the government and other federations, to give opinions on current plans, the European Green Deal, the Luxembourg climate law or the Integrated National Plan in Energy and Climate (PNEC). In conjunction with the opinion delivered by the Chamber of Commerce, the FEDIL urges the public authorities to adopt as many incentives as possible to encourage investments that go in the right direction for the planet and the climate, rather than introducing penalising measures which are financially burdensome or administratively complex and restrictive and which could have the counterproductive effect of driving industrial companies from Europe to areas of the world less attentive to production conditions and environmental standards. It would be a shame to discourage new industrial investment because new generation factories can drive good ecological practices. Fortunately, the various institutions defending the interests of businesses can work with the ministers concerned, so that they can influence the decisions taken with their European counterparts.

22 industrial plants in Luxembourg are judged to have a significant environmental impact under the terms of the Kyoto Protocol (the legally binding emission reduction targets for 37 industrialised countries). Cimalux (cement producer), which ranks first among Luxembourg's CO2 emitters, monitors developments concerning carbon storage technologies (carbon capture and storage, CCUS) and ArcelorMittal, second on the list, indicates that its transition to electricity in 1997 has already reduced its energy consumption by 55%, its particle emissions by 97% and its water consumption by 50% compared to the previous production process using blast furnaces. One of the main challenges concerns the treatment of emissions from steelworks (CO2, nitrogen oxides, sulphur oxides, dust). On this point efforts are being made, both in terms of extracting the fumes created inside electric ovens as well as in the buildings housing them.

Fifty industrial companies have also joined together in a voluntary energy efficiency agreement concluded in February 2017 between the government and FEDIL. The companies party to this agreement have undertaken to contribute to the national objective of improving energy efficiency and reducing GHG emissions. In return for their efforts, these companies can take advantage of special tax rates on the consumption of electricity and gas. By the end of 2018, the companies concerned had already exceeded the energy savings targeted for the end of 2019, according to a balance sheet drawn up by MyEnergy Luxembourg which

'The planned investments in the industrial sector overwhelmingly concerned modernisation or renewal of facilities and equipment.'

esteemed these results 'encouraging'.

When crisis causes a rupture

In the first half of 2020, the COVID-19 crisis reshuffled many cards and made many analyses and perspectives of the 'old world' obsolete. The IDEA foundation, based on figures provided by Statec, the ECB, the Institut national de la statistique et des études économiques (INSEE) and the Observatoire français des conjonctures économiques (OFCE), estimates that the industrial sector lost 50% of its business (as a percentage of added value) during lockdown. This figure is corroborated by the results of the Economic Barometer for the first half of 2020 in which 80% of industrial companies recorded an average decline of 52% in their turnover (making industry second only to catering as the sector most affected). The difficulties encountered by these companies are mainly linked to staff absences (illness and family reasons) and to a fall in customer

08. 09. 10. Companies producing materials for construction developed rapidly from the 1920s onwards to accompany a boom in the building sector to meet the housing needs of a growing population. Here, the Contern company.

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11. 12. Companies manufacturing materials and equipment for logistics operations multiplied in the 1960s. Here, Entreprise CTI, manufacturer of integrated solutions for heavy goods vehicles (11), and Codipro, manufacturer of eye bolts (12).

© 11: Pierre Guersing
12: Codipro

Materials with high added value

Because of COVID-19, the Dupont plant at Contern saw orders explode for its Tyvec medical protective suits, which multiplied by 100 in the first three weeks of the pandemic. But while there has been a lot of talk about these products in recent weeks, they are not the company's only high-tech products. The Contern plant also produces other technical plastics with many applications: Hytrel plastic, as flexible but more wear-resistant than rubber, is used for the manufacture of seals resistant to large temperature variations. It now also exists as filaments that can be used in 3D printers. Typar is a permeable non-woven material, used for the fight against erosion and road building because it does not decompose.

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'Manufacturers are reinventing themselves as solution providers.'


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demand. In its brand-new monthly dashboard, IDEA reported in April that the sector was very worried, with 78% of companies expecting turnover to fall further and 59% anticipating a decline in employment. In May, morale seemed even lower with the balance of opinion (difference between the number of respondents hoping for an increase in turnover and those fearing more decline) on the evolution of production continuing to fall to a level of -71%. The level of pessimism was similar to that seen in 2009, at the height of the last financial crisis. However, a slight sign of hope in May compared to the April survey, showed that the anticipated prospects for turnover during the next three months were not as bad as previously thought. The Economic Barometer, carried out in early June, shows us th at industrial companies are still seeing a 37% drop in their turnover in the first half of the month and that they anticipate ending 2020 with lost turnover of 26%. 30% of companies believe that these declines will have a negative impact on their workforce. In terms of international business, it is rather positive to note that 41% of industrial companies have not experienced a fall in their exports, and some have even seen them increase, but, for those whose exports have fallen, this decline averaged 51%.

According to René Winkin, the industrial sectors are very differently affected. '*All suppliers in the automotive sector, and there are many in Luxembourg, have probably lost more than 50% of their turnover. Certain companies in globalised markets have been able to fare well. For many others, however, there is great uncertainty as to future exports because the stimulus measures taken by various governments are not all as intense as in Europe. The economic players in these countries will continue to be reluctant to consume or invest*', he explained. The US market, in fact, despite unprecedented aid announcements, is a typical example of a market where household consumption is likely to suffer enormously with an exponential rise in unemployment. Another uncertainty is China. This country has resumed production but, because of the fall in consumption mentioned, will most likely find itself with overcapacity in many manufacturing sectors and there is a risk it will try to sell off goods cheaply, creating a dumping situation unfavourable to its international competitors. The crisis has also created uncertainty concerning longer-term structural impacts. The behavior of economic players can be durably or permanently changed by the unprecedented period being experienced and this may have consequences that are still difficult to foresee but which may concern entire sectors. For example, we might cite aviation, which seems unlikely to return to its pre-crisis level of activity. However, this sector supports many others who will have

to find new outlets for their products and technologies. We can fear the same phenomenon for the automobile. This seems to plead for the rapid adoption of digitisation programmes allowing industrial companies to introduce more flexibility into their processes and more flexibility to adapt their production in volume – or in kind – to external events. Adopting, for example, additive manufacturing (3D printing) so that production can easily be switched from one item to another. But this strategy is potentially a double-edged sword because it makes the competitive landscape unpredictable. For example, in the glass industry: the pandemic and the near shutdown of the auto industry has led some windshield manufacturers to plan to start producing thicker, flat glass for construction. However, as this specific market is already occupied by historic players, the new entrants risk disrupting the market and pricing. The sector as a whole does not necessarily come out a winner. Flexibility is in any case not suitable for all industrial branches. It will be easier to orchestrate in chemistry and para-chemistry where production can be more easily redirected without having to thoroughly update machinery.

13. 14. 15. The automotive sector appeared in Luxembourg when Goodyear set up in Colmar-Berg in 1949. The sector then grew considerably and today benefits from the Luxembourg Automobility Cluster, and a campus bringing together several players in Bissen. Here, Goodyear (13), GuardianGlass (14), and Accumalux (15) products.

© 13: Guardian Glass.
14 et 15: Pierre Guersing

Opportunities in the post-covid world

According to FEDIL, the priorities of Luxembourg industry will probably not change fundamentally after the crisis, even if it is still a little early to be able to affirm this. The professional federation promises to organise feedback with its members, on new ways of organising work, in a more digital

René Winkin
Director, Fedil

'We want to increase the opportunities for dialogue between young people and industry.'

What is industry's No. 1 challenge today?

For industry there is not one challenge but three. These have not changed with the Covid crisis, even if we now look at them with fresh eyes! The first challenge is that of attracting talent when our sector is increasingly in need of qualified people. For this we have several activities in progress to attract young people to our professions. The second challenge is technological evolution and innovation with, of course, the many opportunities offered by digitisation but also increased awareness of the need to pay attention to cyber security. Finally, our third priority challenge is energy transition.

Your federation organises an environmental prize and an innovation prize. What is the purpose of these awards?

The first objective is to promote these two subjects and the investments made by companies in these two fields. This is an opportunity to put a spotlight on achievements and new processes, notably through making video clips for the winners. It is also a good opportunity to communicate, notably with young people. During the last innovation prize, we brought in the winner of the *Jonk Fuerscher* National Competition organised by the Young Scientists Foundation. Next time, we aim to have even more young people in the room. For this, we are working in collaboration with teachers. We want to increase the opportunities for dialogue between young people and industry.

FEDIL has indeed had the goal for several years now to promote industrial trades. What is the outcome of the HelloFuture initiative aimed at young people?

It is a bit early to measure the impact of the HelloFuture initiative because our roadshows that have existed since the 2017-2018 school year were aimed at young high school students who had not yet chosen their studies. There is already a slight increase in requests for internships in industry. HelloFuture is part of a panoply of initiatives intended to give visibility to trades in industry and we are not the only ones to act. We are assisted by an entire ecosystem that brings together the Luxembourg Association of Engineers, the National Research Fund, the Ministry of Labour, ADEM, the Science Centre, the Chamber of Commerce… All our combined efforts will bear fruit.

InduTech Meetups with Paul Wurth InCub

During these meetings, organised with the help of FEDIL, industrial companies were invited to combine their expertise with that of the startups present to discuss the specific innovational challenges they face. An opportunity for some out-of-the-box thinking. The subjects of InduTech meetings are drawn up by FEDIL members and a search for potential solutions is carried out among local and international start-ups, or research centres. During the meetings, a selection of startups and companies present the way in which they have solved challenges based on real cases. The final objective of these InduTech meetings is to facilitate technological monitoring and to launch POCs (proof of concept) of innovative and commercially viable technologies within industrial organisations.

'New-generation factories are drivers of good environmental practices.'


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mode. On the subject of skilled employment, René Winkin anticipates that the shift towards more qualified professions will continue, or even accelerate, 'I think that the crisis is undoubtedly the right time to offer people who have lost their jobs, the possibility to retrain and reorient themselves towards industry, and in particular the promising sectors such as renewable energies. This could provide access to a new pool of labour when the recovery is firmer.'

Indeed, the government seems to be betting on digitisation and the energy transition to revive the industrial and economic machine, as confirmed by a representative of the Industry department of the Ministry of the Economy: 'In the long term, our desire remains diversification towards high added value (industry 4.0) and sustainable production'. This is the meaning of the stimulus package, called Neistart Lëtzebuerg, presented by the government on May 20, 2020. The financial component aims to encourage investment in procedural or organisational innovations and those in favour of better energy efficiency. These projects may be subsidised up to 50% with public money, up to a limit of EUR 800,000. This non-repayable aid, the amount of which is much higher than that of existing aid, reflects the concern, shared with Europe, to stimulate a rapid recovery, part of the funds being drawn from European budgets. This aid not only concerns the industrial sector but represents an opportunity for it to initiate necessary modernisation.

The industrial sector regularly announces major projects across the country. For example, to name just a few: Feymonville, who manufacture trailers for exceptional transport, are building a new factory and a 10,000 m^2 logistics centre in Lentzweiler; Avery Denison (special labelling papers) are extending their Rodange site to 12,000 m^2 to accommodate a new production line and to increase storage and shipping capacity; Ocsial, a manufacturer of carbon nanotubes, are creating a research centre in Differdange; Dupont, which is expanding its Tyvec production capacity, with a second line at its historic site in Contern; Eurocomposite in Echternach which invests in state-of-the-art equipment or, in the food industry, the construction of a new Luxembourg Brewery in Diekirch. According to the Industry Department of the Ministry of the Economy, this investment dynamic does not seem to be questioned now. It seems only a question of projects being delayed for 3 to 6 months.

Caution is required, however, as 42% of industrial companies surveyed in June for the Economic Barometer predict falling investments in the short term (next 6 months) against only 9% who said this in the previous semester. This still leaves 58% of companies wishing to maintain or increase their investment projects, with the constant objective of renewing or modernising their


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equipment.

These investments and projects are often made by multinational groups, but the industrial fabric of Luxembourg is also made up of many SMEs. The Fit4resilience diagnostic and support system presented by Sasha Baillie, CEO of Luxinnovation, to a press conference organised on 28 May 2020 is intended for them in particular. It offers subsidised days of consultancy to help identify the strengths and weaknesses of companies and their ability to cope with a shock like that of COVID-19. The objective is to rethink organisational procedures, supply chains, digitisation plans and the adoption of more sustainable processes, depending on each company's situation. Peinture Robin, the only lacquer manufacturer in the Greater Region, was able to test this support and draw-out some very interesting ideas, particularly with regard to its supplies and outlets, with a more local and sustainable presence, which it hopes will

16. 17. 18. 19. 20. Only around thirty industrial companies in Luxembourg have more than 200 employees. Many industrial companies in Luxembourg are SMEs. Here, the agro-food company Moutarderie de Luxembourg (16, 17 and 18) and the company Piwel, producer of steel wool (19 and 20).

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Christophe Keller
Digital solutions manager, Husky Injection molding Systems

'For improvement purposes, we systematically collect the data created during the stages of order fulfilment.'

How long have Husky had a digital solutions manager?

After successfully piloting the 'Factory of the Future' project at the end of 2017, Husky increased the resources assigned to the digital transformation of our procedures. I joined the team during the summer of 2018.

What is your role?

It is above all about reducing our lead times and refining our predictive models, in order to retain our customers. My objectives are multiple, both in terms of identifying needs, as well as defining, developing and implementing lasting and scalable solutions. I am committed to the creation of a process that validates the performance of our products, while capturing all the related data. It is from this data that we can create or refine our models.
With regard to manufacturing, the 'digital twin', a virtual replica of our molding shop, aims to maximise our Total Effective Equipment Performance (TEEP) and Overall Equipment Effectiveness (OEE) performance while reducing manufacturing times. In view of the many criteria that we can develop, as well as different forecasts in terms of load, this optimisation led us to integrate artificial intelligence to obtain rapid results. With a connection to our means of production, a cyber-physical coupling could be developed to adjust our manufacturing strategies.
Technical solutions must be supported by our staff in accordance with our ethics and be in line with the company's spirit of sustainable development. My role is therefore also to ensure that I identify the training needs of our employees.

What is the objective of the company's digitisation process?

We must provide the best solutions to our customers and customise solutions according to customers' needs. After the phase of defining our solution, our objective is to deliver and put it into service with our customers as soon as possible, with a level of quality exceeding their expectations. Here too, we strive to systematically collect the data created during all stages of order fulfilment, for the purposes of improvement, and in particular to develop new services, and to consider smarter solutions that allow optimised productivity.

The material crash test

Within the Luxembourg Institute of Science and Technology (LIST) there is a laboratory where materials are distressed to verify their mechanical properties and assess their durability by accelerating their natural aging process. The laboratory thus helps manufacturers comply with the standards in force in their respective markets. The laboratory's capacities and skills have already been put to use in the construction, packaging, automotive and aeronautical sectors, and at various stages in a product's lifecycle, such as development, validation or quality control. We can verify, for example, that an electronic device will continue to operate in a severe climatic environment, going from very cold to very hot and humid, while retaining its aesthetics (absence of rust, discoloration, etc.). As for fastenings of all kinds: glue, welding, mechanical fasteners, their resistance can be tested in configurations close to end use.


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open up new perspectives for the company.

In addition to this more or less long-term aid, the Ministry of the Economy is engaged in strategic discussions at European level on the advisability of relocating strategic industrial enterprises such as those producing certain health equipment to Europe. This is consistent with Luxembourg's desire to develop its HealthTech sector. In general, Luxembourg calls for Europe to have the most complete industrial landscape possible and to secure its jobs and industrial know-how.

Luxembourg must, however, continue its efforts (attracting talent, investing in research and infrastructure, maintaining stable and advantageous legal and fiscal environments, etc.) to develop or attract industrial activities to the country, so as to maintain the share of industry in its economic fabric. This is a real challenge for the country which is at the bottom of the European ranking for the share of industry, both in GDP and in employment, unlike its big German neighbour, whose powerful industrial history has never wavered. ▬

'The government is betting on digitisation and energy transition to revive the industrial and economic machine.'

21. 22. 23. 24. Over time, Luxembourg has welcomed new industries with high added value in sectors such as chemicals or materials. Here, the cosmetics company Cosmolux (21, 22 and 23) and the manufacturer of advanced composite materials Euro-Composites (24 and 25).

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25. 26. The future of industry is in robotics and artificial intelligence. Here, Fanuc's robots are adapted to tasks in the food industry.

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27. 28. Talent attraction, especially of young people, is one of the challenges that the industry must face to secure its future.

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Paul Ribus
Managing Director,
FANUC Benelux

'Industrial robots enable manufacturers to quickly adapt their production.'

How is the market for industrial robots evolving?

Automation, and especially robotisation, is a big thing in the industry and is continuously growing. We see the importance of automation now more than ever with the COVID-19 pandemic with the manufacturing industry looking for more automation solutions. As industrial robots can be used very flexibly, they enable manufacturers to quickly adapt their production to meet new demands and opportunities deriving from the market.
With technology constantly evolving, new industrial robot models in combination with new features, artificial intelligence, smart software and accessories will find their way in new industries or new applications to automate. This includes so-called Cobots which can work 'hand in hand' with humans, for example lifting heavy work pieces for them.
Optimising production efficiency is another important topic that is increasingly developing. To be able to optimise the production process, it is necessary to monitor and analyse it. FANUC is constantly working to develop Artificial Intelligence and IoT solutions to support this trend.

Do you have customers in Luxembourg?

As FANUC Benelux is responsible for the Benelux market we are in daily contact with our customers and potential customers in Belgium, the Netherlands and of course Luxembourg. In fact, the European headquarters of FANUC is located in Echternach and our huge European warehouse and repair centre are also located in Luxembourg so that we can quickly respond to any of our customers' needs. Especially in Luxembourg, our customers are very divers. Our robots are operating in many manufacturing companies in the wood industry, and in the metal, aerospace and automotive industries. Also, Luxembourgish machine builders are implementing our robots in automation solutions which they offer to their customers, and Luxembourgish schools are using our robots to educate young people for their future jobs.

How do you work with them?

We work with our customers in different ways: sales, service or training oriented, depending on their needs and questions. In our FANUC Academy, we train operators as well as line builders, offering dedicated courses depending on their skill levels. Our sales colleagues help our customers to choose the right robots for their specific automation needs. If customers have technical questions, our technical department is right there.
And of course, we also offer maintenance services for all our customers to ensure that their production is running efficiently and fully satisfying their needs. We are proud of our many long-term partnerships with customers in Luxembourg.