

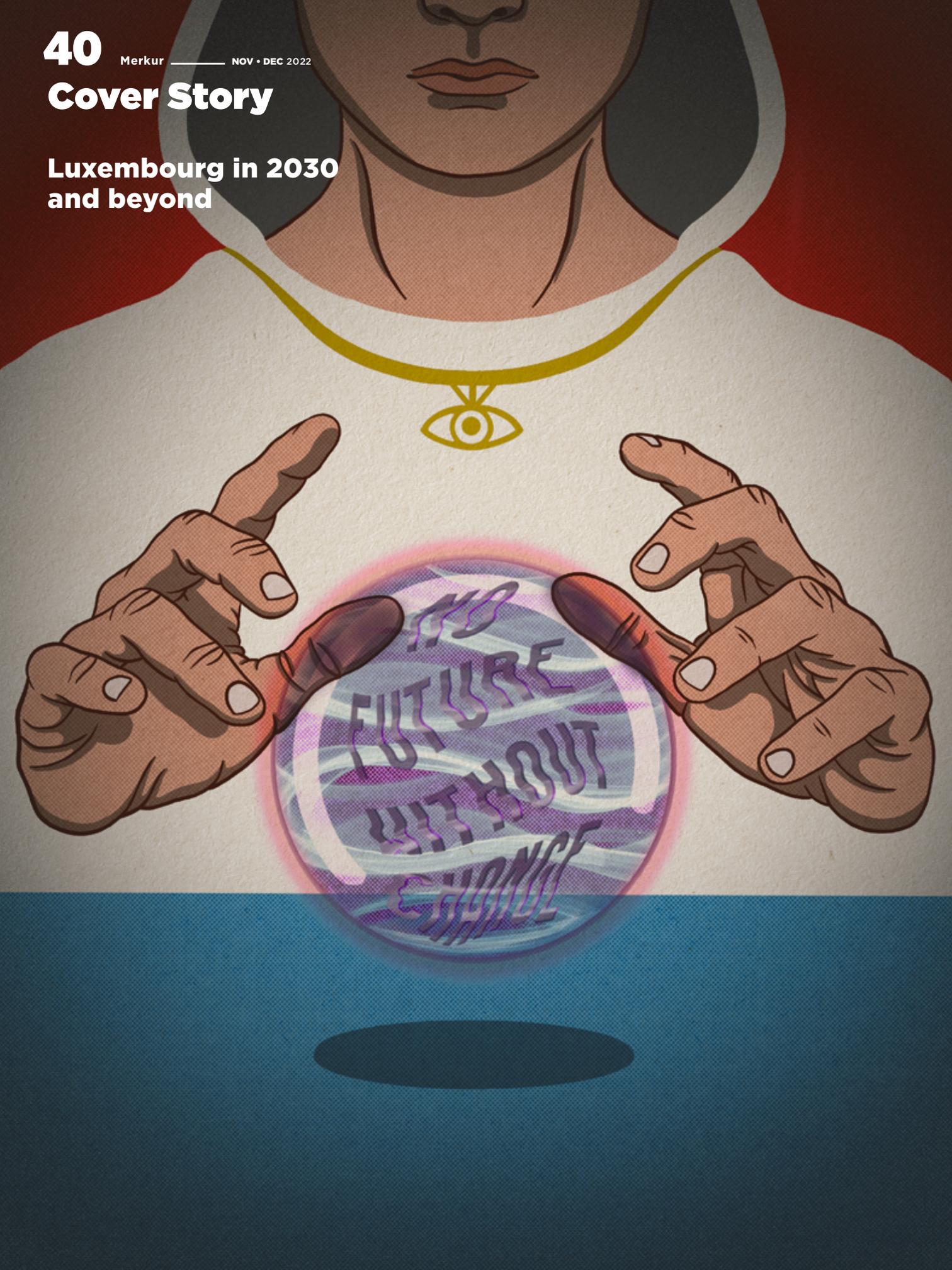
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Cover Story

Luxembourg in 2030 and beyond



The future will not be easy

TEXT Stéphane Etienne / Hypallages and Chambre de Commerce
TRANSLATION FROM FRENCH Martin Davies and Talk finance

What will the state of the world be like in 2030 and beyond? According to the American National Intelligence Council, which, after each presidential election, delivers its predictions for the next 20 years, the future will not be rosy. By 2040, they predict, the cost of mental illnesses will have exploded, climate change and environmental degradation will have both exacerbated the insecurity of basic resources in poor countries and accelerated health challenges. Others take a contrary and more optimistic view relying on the galloping technological progress that awaits us. Where is the truth? Probably somewhere between the two points of view. And what about Luxembourg? Here we try to provide some answers.

2030 or 2050: whatever time period we consider can be seen as long-term and short-term at the same time. Long because time has accelerated since the recent Covid crisis. Innovations follow one another at such a frantic pace, notably under the impetus of artificial intelligence, that Luxembourg, like other industrialised nations, will experience profound changes. Short because Luxembourg faces great challenges. The country is expected to experience a very significant demographic development. The diversity of its population will increase which risks weighing even more heavily on social cohesion. Its economy is dynamic, but still too focused on the financial sector alone. Pressures on the climate and the environment are increasing. Most of the country's groundwater is in poor chemical condition, which threatens the security of the drinking water supply. In addition, nearly 68% of its natural habitats covered by the European "Habitats" directive are in an unfavourable state.

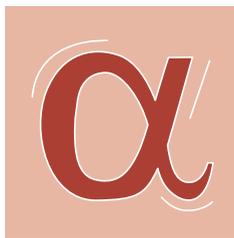
Faced with all these challenges, it is not easy to foresee what the Luxembourg of the future could be like, particularly in crucial areas such as the economy, mobility, housing, the environment and the management of energy.

Towards a greener and more digital economy

What are the possible futures for the Luxembourg economy by 2050? To find out, "*Luxembourg Stratégie*" the strategic foresight department of the Ministry of the Economy, set up several working groups combining both researchers and business leaders. Although their work will continue until March 2023, they indicate that three possible scenarios already seem to be emerging. These were outlined on 17th and 18th October 2022 at *Luxembourg Stratégie's* annual conference. The first scenario bets on continuity: Luxembourg will continue to grow, will attract ever more employees and will have 1.1 million inhabitants in 2050. In the second scenario, focused on societal and environmental aspects, the economy will stop growing, the population will reach a ceiling of 770,000 residents and the levels of wages, pensions and social coverage will stagnate. In the third scenario, called "techno-digital liberalism", growth will continue at a sustained pace with GDP growing at more or less 4.5% per year, the housing and employment markets will be very precarious, and the population will reach 1.2 million people in 2050.

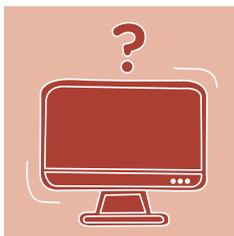
These three scenarios are still only in draft form. By spring 2023, they will have been refined and supplemented by looking at factors that have not yet been addressed and at megatrends such as the aging of the population, digitalisation, the influence of social networks or the scarcity of resources (see also the interview with Pascale Junker, Head of *Luxembourg Stratégie* pages 46 and 47).

Whichever one of these scenarios will eventually materialise, Luxembourg is betting on the green transition and the digital transformation to develop and diversify its economy. In all sectors, the watchwords are decarbonisation, rational use of resources, circularity and digitisation. Thus, a report produced in 2021 by Luxembourg for Finance in collaboration with Deloitte (*The future of the Luxembourg financial industry, Luxembourg for Finance & Deloitte, 2021*) estimates that the financial industry will only be able to maintain its strategic position as a centre of excellence if it focuses its efforts on the following four dimensions: internationalisation:- attracting more international investors; innovation:- betting on technology to make it an essential pillar of the financial centre's strategy; sustainable development:-becoming an international hub for sustainable and social impact investments; and talent: Luxembourg must become more attractive for specialised profiles by focusing on people.



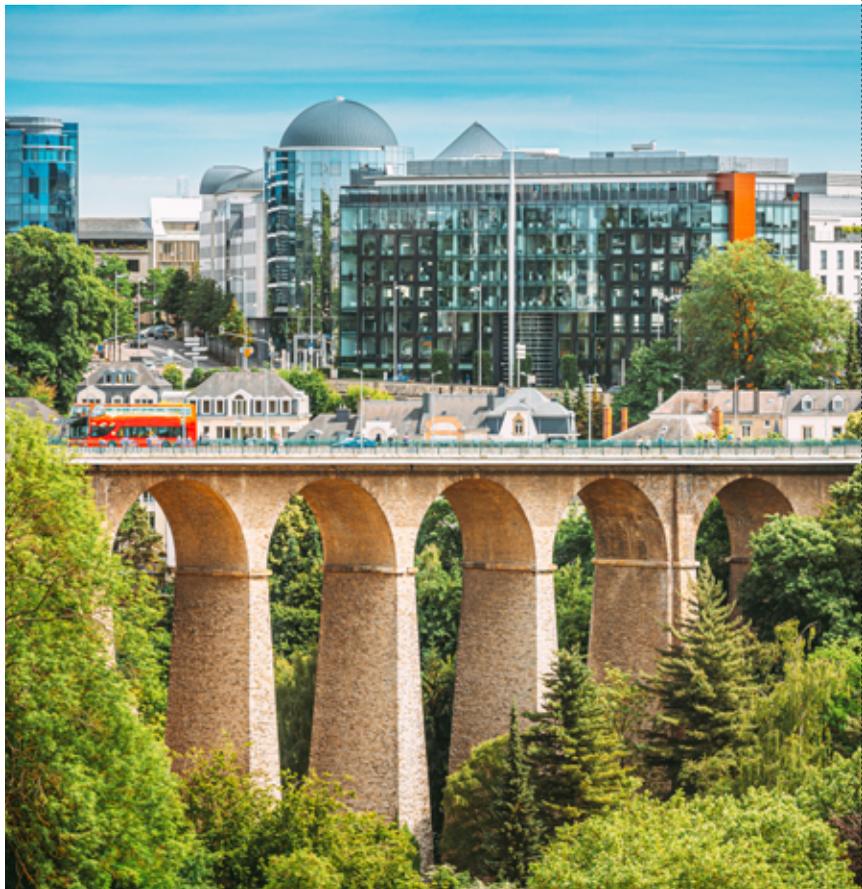
The alpha generation, between myth and reality

After generations X, Y and Z, it is the turn of the alphas to make people talk about them. Named after the first letter of the Greek alphabet, this generation is the first to be born in the 21st century. The oldest among them will be 20 years old in 2030. Completely immersed in technology from an early age, alphas should be much better educated and wealthier than their elders, some experts predict. But beyond this triumphant and consumerist discourse, what is it in reality? The challenges awaiting this generation are immense. They will not only have to repair a world damaged by those who preceded them, but also reinvent the role of humans in the face of an artificial intelligence in constant progression. Will they be able to? Whoever can predict this will need to be very clever.



The four meta-skills of the future

Will certain trades still exist tomorrow? According to the Harvard Business Review, the answer is yes, but work will increasingly be shaped by context, whether professional, socio-economic, environmental or technological. To get a job, acquiring a base of four meta-skills will become essential. They can be summarised as follows: mobilise attentional capacities to assess the quality of relationships with others, build narratives to identify the main risks and organise to prevent them, create meaning and move towards collaborative networks. Those who demonstrate mental flexibility, creativity and attention will have every chance of enriching their professional expertise.



01. In the coming years, the Grand Duchy, like other industrialized nations, will experience profound changes and will have to face major challenges.

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02. To assess the future of the country, several working groups have been set up, which will produce prospective scenarios.

03. 04. In all sectors, the watchwords are decarbonization, resource efficiency, circularity and digitalization.

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The industrial sector is no different. The High Committee for Industry, steered by the Ministry of the Economy in close collaboration with Fedil, is continuing its work on the development of manufacturing industry in Luxembourg by 2040. How to ensure sustainable transition, put in place circular economic models and above all attract more skills? According to STATEC (*Institut national de la statistique et des études économiques*), nearly 20% of companies in the sector are experiencing recruitment difficulties compared to less than 10% in 2019 before the pandemic.

For its part, Luxinnovation, Luxembourg's innovation agency, published its roadmap for the period 2022-2025 at the beginning of this year. It set out 7 strategic objectives to help meet its mission of making sustainable national economic development possible through research and innovation. The agency aims, among other things, to provide



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“What will the Luxembourg of the future look like in areas as crucial as the economy, mobility, housing, the environment and energy management?”

companies, regardless of their sector, with a range of relevant products and the best experience to better prepare themselves for the future, attract and support start-ups and innovative companies and identify high-added-value opportunities. Currently, the country has more than 500 start-ups, according to the Ministry of Economy.

Another sector with a future but which still needs time to be able to really develop: space. In 2017, Luxembourg was the first European country to adopt a law governing the legal framework for the private exploitation of space resources. In the process, the Luxembourg National Space Agency (LSA) was created in 2018. Currently, some 75 companies and research units are active in the space sector in Luxembourg and the number of employees has increased from 840 in 2018 to around 1,150 today. This figure may seem positive; however, it must be put into perspective. Most of these companies are very young and the chances are that some of them will be unable to sustain their business. As for space resources, the law has not yet been applied for lack of cause. The market is still non-existent and remains a very risky economic sector. The loss of twelve million by the Luxembourg State following its participation in Planetary Resources, an American company dedicated to the mining of asteroids, is the best proof of this.

Overcoming the housing crisis, an impossibility?

Assuming that the country continues to grow economically, it will still need to attract the required talent. However, companies are finding it increasingly difficult to recruit. Bringing a skilled workforce to Luxembourg, even by going further and further afield, is becoming difficult. The real estate market and its very (too) unaffordable prices are one of the main causes. Remuneration in Luxembourg is certainly attractive but is not so interesting if a large part of it has to be reinvested in housing. The issue is also social. Almost half of the population is suffering from real estate prices and more Luxembourgish households are moving to neighbouring countries.

How can we therefore prevent the lack of affordable housing from hampering, in the more or less long term, the economic and social development of the country? Expanding the perimeter of building zones to support supply is not the solution. The environmental impact would be far too heavy and would not solve the problem which is above all structural. Studies by the Observatoire de l’Habitat, a service of the Ministry of Housing, have indeed revealed that the capacity to build housing within the existing building zones is significant, but that there are blockages in terms of bringing land into



Patrick de la Hamette
Director, Digital
Inclusion ASBL

“Digital inclusion is one of the best tools to preserve social cohesion”

What are your association's objectives?

Since 2016, we have been helping all those excluded from the digital world. Concretely, we collect used computers and smartphones sent to us by individuals and companies, refurbish them and distribute them free of charge to refugees and residents in need. We also provide them with a variety of training to facilitate other forms of inclusion such as online language learning, digital literacy and citizenship. We then help them integrate into the world of work.

Do you think that your association's actions contribute to shaping a better future?

We are trying to provide solutions to three major challenges that our societies will face in the years to come. The first concerns digital access for all. Digitisation has accelerated with the pandemic. Today, if you do not have a computer or a laptop and internet access, you do not exist. This exclusion is felt all the more in a country like Luxembourg which is one of the most connected in Europe.

As far as possible, we put the computers received back in the circuit and thus reduce their carbon footprint. You should know that computer products are a major source of pollution and that only 20% of them are recycled. On average, in Europe, each individual produces between 5 and 10 kg of electronic waste per year. This trend will worsen in the coming decades. From year to year, the obsolescence of IT products is accelerating and the number of users, especially in India and China, continues to increase. According to the UN and the OECD, if nothing is done to further promote the circular economy, IT devices will be responsible for 14% of greenhouse gas emissions in 2040 and their waste will represent 120 million tons in 2050.

The distribution of wealth will become increasingly polarized. The shortage of raw materials, energy crises and global warming will accentuate the rate of poverty and increase the number of forced migrants toward richer countries. To preserve this increasingly threatened social cohesion, digital inclusion is one of the best tools. Giving a person a computer and training to use it is, for me, the best way for them to communicate, learn, help themselves and integrate into society.



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05. The industry sector also reflects on its future developments.

06. The country and its actors, such as Luxinnovation, want to set up a range of products to better attract and support startups and innovative companies.

07. 08. Another sector of the future: space. In 2017, Luxembourg was the first European country to adopt a law governing the legal framework for the private exploitation of space resources. In 2018 the Luxembourg National Space Agency (LSA) was established.

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09. Nearly half of the population suffers from real estate prices and lack of affordable housing.

10. Housing capacities within the construction perimeters are significant, but there are blockages in the mobilization of land.

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use. These difficulties stem largely from the very high concentration of land holdings. Half of the potential buildable land is held by only 0.5% of the population and they are not motivated to sell, because retaining the land seems more profitable than selling or building. With land values increasing year on year and an almost non-existent property tax – it dates from 1941! – a building plot is the best possible investment. At the same time, a small number of local actors in real estate production are in a strong position on the market and a large part of the housing produced is bought up by households who already own real estate. Here too, the tax provisions in terms of housing are singled out. A note from the Observatoire de l'Habitat dating from February 2022 and produced at the request of the Ministry of Housing has shown that these mainly benefit the wealthiest owner households. Consequences: affordable housing is becoming scarcer, and inequalities are increasing between landowners, real estate production players, multi-owners on the one hand and households who are having more difficulty finding accommodation in Luxembourg.

At the beginning of October 2022, the Luxembourg government presented a series of



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measures designed to put an end to this imbalance. The first concerns the property tax reform bill. Ultimately, this will replace the current financial tax, which generates too many inequalities between those who only own their homes and rental investors. From now on, a new, more objective, more transparent and fairer land evaluation model will be put in place. This new formula will consider factors such as the building potential, the modes of assignment, the geographical location, the immediate availability or not for construction, the available surface, the number of equipment and services nearby and the general level of real estate prices. There is also a tax allowance, up to a fixed amount, for owners who have their habitual residence on this land.

To combat the housing shortage, a tax on the mobilisation of land will be introduced at the national level. The tax will come into play where it is possible to build, regardless of property relations and cadastral limits. Clearly, if the fund has a size or configuration that does not lend itself to the construction of housing while respecting the regulatory limits or dimensions, it will not be taxed. This will also be the case if a parcel of land already includes constructions and cannot

accommodate additional ones. On the other hand, if there is a residual area sufficient to erect a new building, even if there is already an existing construction, it will be taxed if the available space is not used.

A national tax on non-occupancy of housing will also come into force. A dwelling is considered unoccupied when there is no entry in the national register of natural persons for a period of six months. Once the municipality has noted the non-occupation of a dwelling, the tax will amount to 3,000 euros per dwelling for the first year, then increased by 900 euros per year up to a maximum amount of 7,500 euros. If the accommodation is still uninhabited, this amount will be due annually.

Will these measures be enough to overcome the housing crisis? No, writes Max Leners, secretary general of the Robert Krieps

“Companies are finding it increasingly hard to recruit. Bringing skilled workers to Luxembourg, even by going further and further afield, is becoming difficult”.

Foundation, in a collective work (The housing crisis in Luxembourg and the means to get out of it, Robert Krieps Foundation, 2022). They must be accompanied by others such as, for example, the densification of living spaces with taller buildings and smaller housing and a simplification of administrative procedures.

Smoother traffic in 2035?

Another problem and not the least: mobility. How to make it more fluid than it is now and prevent the situation from getting worse as needs continue to grow in the years to come? To respond to this, the Ministry of Mobility and Transport presented its National Mobility Plan 2035 in April 2022, a thick 200-page document. This roadmap, intended to be reassessed, and possibly adapted every 5 years, aims to implement the approaches recommended by the Modu



Pascale Junker

Head of *Luxembourg Stratégie*,
Luxembourg Ministry of the Economy

“Strategic foresight doesn’t predict the future, nor does it aim to solve problems or create strategies by itself. It proposes common visions of the future.”

Can you remind us how *Luxembourg Stratégie* came into existence?

The idea of *Luxembourg Stratégie* first arose at the end of 2020 in the context of a meeting between the Luxembourg Minister of the Economy, Mr Franz Fayot, and his team, and France Stratégie. Initially, it was a question of deepening and extending the foresight method implemented as part of the Third Industrial Revolution (TIR) strategy study commissioned in 2016 from futurist Jeremy Rifkin. After 20 years working at international level on environment and climate issues, and at national level on the nitrogen budget and on the master plan for regional planning in Luxembourg, I joined *Luxembourg Stratégie* in May 2021 as head of the foresight unit. Today, *Luxembourg Stratégie* has a team of five and is integrated into the Minister’s office. It provides decision-making assistance and a working method, and its primary mission is to carry out strategic economic foresight studies.

Why is foresight essential today for the economy of tomorrow?

We should now accept that we have exceeded the limits of use of the planet’s resources. However, we still behave as if the time to act and resources available to us were unlimited and permanently affordable. Covid-19, the invasion of Ukraine, the rising cost of living and socio-economic inequalities, as well as the acceleration of global warming and the degradation of biodiversity, all highlight the vulnerabilities of our current socio-economic system and require the development of alternative visions based on concrete data, scientific results and a systemic approach. Moreover, some certainties have to be put into perspective, including the conviction that intermittent, low-density renewable energies can replace dense and controllable fossil energies one by one and within a short time; that a full and swift decoupling of economic growth and growth in the consumption of raw materials and energy on the one hand, and greenhouse gas emissions on the other, is possible; that cars with electric- or hydrogen-powered engines will

replace and outnumber individual combustion-powered vehicles by 2050; that the development of the circular economy is already well underway and profitable; or that we can make construction go green without first changing our consumption habits. The question arises as to the feasibility and consequences of the choices we make. It should be made clear that strategic foresight neither predicts the future, nor aims to solve problems. Foresight attempts to add objectivity to the debate by proposing visions of the future that seek to align social needs with biophysical constraints, while taking into account the growing complexity and uncertainty of the situations we face. It produces a range of plausible scenarios that take into account a multitude of viewpoints and variables. Foresight also helps us to prepare for a number of possible futures, and whether or not to adjust positions that may be radically opposed. Thus, foresight can challenge preconceived ideas and expectations, and even shake up established ways of working. Strategic foresight has been around for some time in many other countries. It is institutionalised in the Nordic countries and Japan, for example. Among other reasons, this is why *Luxembourg Stratégie* keeps track of world-renowned expertise. For example, we have joined international strategic working groups alongside for example *France Stratégie*, the OECD, and – in partnership with the Luxembourg Ministry of Foreign Affairs – the European Commission, which itself now has a Vice-President for Strategic Foresight. The latter’s role includes using this approach to develop future-proof EU policies and to strengthen the culture of foresight in EU Member States.

How are the various economic scenarios developed and what are the next steps?

To create scenarios for potential futures, we first took stock of the megatrends that also affect Luxembourg. A megatrend is a fundamental trend, a global driving force with a lasting impact on the whole of humanity over horizons of up to 20 years. Digitalisation, pandemics, biodiversity loss, social isolation and an ageing population, climate change, the depletion of resources (Luxembourg has already lived through the depletion of a resource vital for its economy – iron ore): all have significant impacts that we must better understand if we are to be able to anticipate and adapt the future of the economy based on a vision that looks beyond the short term. The horizon for our scenarios is 2050. To know where to start and to make the most of the work already completed, we then took stock of the government’s 45 sectoral strategies, as well as the long-term scenarios for Luxembourg previously developed in various fora.

This work – available on our website – fed into the first scenario-building workshops, which in turn produced eight draft scenarios for the future of the economy. To this end, we carried out a series of analyses

and comparisons between megatrends, bifurcations – uncertain developments, areas where we can intervene –, certain sub-trends, and weak signals. These draft scenarios were then condensed and contrasted, enriched with missing themes, and purged of duplications and inconsistencies, until what finally remained were four plausible, distinct and consistent preliminary scenarios. These four preliminary scenarios were then submitted to “expert” corporate leaders who were able to exchange their points of view on each and add certain missing aspects. At the same time, *Luxembourg Stratégie* also sought the opinion of its group of experts tasked with ensuring the consistency and challenging the robustness of the four scenarios. Ultimately, three scenarios emerged, in addition to a “black swan”, i.e. an unpredictable event unlikely to occur, but which would have far-reaching and exceptional consequences. In the upcoming workshops, which will continue until March 2023, these scenarios – which detail what may happen, but beyond our control – will be used to develop a strategic economic vision about how to deal with these potential futures, while mitigating the associated risks and enhancing opportunities.

Which stakeholders/actors have a say in the process?

To respect the means at its disposal while seeking a wide range of opinions, *Luxembourg Stratégie* has set itself priorities. Thus, various groups are involved in the process. First, an inter-ministerial political steering committee was established. At a technical level, a working group is in charge of developing the scenarios and the strategic vision. It comprises professional chambers, associations, ministries, practitioners from the public and private spheres, and various observatories, of which there are 17 in Luxembourg monitoring megatrends. We also work with thematic or foresight experts, SOLEP, IMS, the IDEA Foundation, My Energy, OAI, Caritas, Spatial Foresight, and the Luxembourg Trade and Investment Offices (LTIO) of the Ministry of the Economy, which observe global megatrends worldwide, as well as the Luxembourg High Committee for Industry, the econometric modelling team within STATEC and research bodies (University, LISER, LIST, LIH, IBLA, etc.). By the end of this year, the general public, citizens and municipalities will take part in the final stage of the consultation process via meetings and a digital consultation platform that will collect opinions from which further directions will emerge.

How can we be sure a “fair” economic strategy will be adopted?

Foresight cannot predict the future and does not create strategies by itself. Nor does it guarantee their success. Instead, it is an exercise that provokes and challenges the consensus. The results are sometimes

surprising or critical, and break from the restrictions of traditional approaches. Our scenarios provide a kind of Lego box for decision-makers to build or adapt their own constructions. They will be updated over time or broken down into specific technologies or sub-sectors such as manufacturing. We have developed a range of potential scenarios that cover all possibilities, rather than scenarios that are desired or desirable. Scenarios are not strategies. The former are imposed on the economy, while the latter depend on our will and bring about the future we desire when successful. A strategy is sound when it is effective regardless of what the future holds. *Luxembourg Stratégie* does not attempt to tinker with existing or future sectoral strategies. Instead, it tries to contribute methodologically to ensure their overall consistency, with a view to resource efficiency and strategic relevance. The scenarios themselves account for only a third of the work, with the remaining two thirds needed to put them to use. In line with the concept of a “safe and just operating space for humanity” quantified by science, we believe that a resilient economic system is a trade-off between biophysical limits, human well-being and social needs. Will the strategy be fair? I leave that value judgement to others. All I can say is that it’s rather like running a business: without foresight, we risk getting left behind.

What if other countries fail to adopt these processes and more or less similar strategies?

I feel bound to say that this would be no reason not to do anything! However, there is currently a buzz around foresight, which is increasingly being used as a tool by a range of national, Greater Region, European and international entities. There is a kind of awareness in many countries that sustainable development is no longer enough, that institutionalising foresight in decision-making allows us to move towards other possible futures and a certain type of resilience. When we look at what other countries are doing in terms of trends and scenario-building, we see that we are quite close to each other.

■ Further information: luxstrategie.gouvernement.lu



Dark stores, an obscure force that is gaining ground

We do not see them. We do not know them. Yet they are popping up everywhere. Alternately called “shadow supermarkets”, “ghost kitchens” or “stores without customers”, these new kinds of businesses work in concert with e-shops. Housed in classic commercial premises, they prepare and ship the items ordered online. Their objective: to reduce delivery times as much as possible by being as close as possible to customers. If this phenomenon seems inevitable in view of new consumer habits, more and more voices are beginning to be raised. In addition to the nuisances caused by the incessant coming and going of delivery vehicles, dark stores risk eventually sounding the death knell for traditional businesses and transforming cities into neighbourhoods without facades.



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Which languages will dominate the world in 2050?

While English, Mandarin, Spanish and Hindi are currently the most widely spoken languages in the world, this order may reverse in the future. An unexpected challenger could well climb onto the third step of the podium: French! In just under 30 years, the number of French-speakers should in fact triple and amount to 715 million, or 8% of the world's population. French is spoken in areas of the world where population growth is very dynamic, such as sub-Saharan Africa. In these countries where many languages coexist, French is a unifying element for all the inhabitants. It is also the only language, along with English, to be used on all five continents. Will Molière soon catch up with Shakespeare? An open question.

2.0 strategy for sustainable mobility. The date of 2035 was not chosen at random. If the country continues to develop as expected with GDP growth of between 1.5% and 4.5%, the country should absorb 2.8 million trips per day in 13 years, i.e., 800,000 more than in 2017. If nothing is done by then, Luxembourg will probably be faced with saturation of its transport infrastructure.

Even though the date of 2035 serves primarily as a benchmark and could change according to developments within the country, managing the additional demand in barely ten years while respecting the quality of life, the environment and the budgetary means remains an ambitious objective. Ambitious but achievable, says the Ministry of Mobility for whom this objective poses three major challenges. The first consists in organising traffic flows into and within Luxembourg City. In 2035, it can expect to have 172,000 additional entries and exits per day and 123,000 additional internal trips compared to 2017. Priority to urban transport modes in the three urban areas (Luxembourg and its peripheral belt, Esch-Belval and the Nordstad) is the second

challenge. The third aims at the differentiated development of the rural environment where two different flows coexist: one weak and diffuse generated by a population preferring to live and exercise a professional activity far from urban centres and the other denser generated by people without the financial means to afford to live in the town where they work.

To meet these three challenges, the Ministry of Mobility has identified five opportunities: the expectation of residents and cross-border commuters for quality transport offers, the popularity of cycling, the capacity of public transport which can still be increased, the carpooling on cross-border highways and better parking management. In concrete terms, managing the large flows expected in 2035 can only be achieved through intramodality. In other words, to encourage users to abandon the car for their journeys, they must be offered the possibility of linking several modes of transport which is more attractive, more comfortable and faster than individual motorised transport.



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To this end, the National Mobility Plan 2035 has provided for a large number of projects which, to avoid the mistakes of the past, will not be planned independently. Priority corridors will be created for bicycles and buses in urban areas and for carpooling and buses on the road and motorway network. Walking will be made more attractive for short-distance journeys thanks to the development of a continuous and safe pedestrian network. The rail offer will be expanded. In particular, a better connection between Differdange, the third most populous city in the country, and the capital is envisaged, i.e., a gain of 15 to 20 minutes in travel time. The current Hollerich station will be moved to the route d'Esch, where a future tram stop is also planned. The city of Luxembourg will also have a fourth station located in Howald. The tram will undergo a major expansion with three additional lines. A fast section, where the tram can go

up to 100 km/h, will connect the capital to the future urban tram of Esch-sur-Alzette. It will thus be possible to get from Belvaux to Findel airport in less than an hour or from Esch-sur-Alzette to Cloche d'Or in less than a quarter of an hour, all with better reliability than the car. New large car parks (P+R) will be added at the entrances to towns. Finally, a national parking strategy is underway which will favour the most useful uses (visiting or supplying a store, drop-off, etc.) to the detriment of parasitic uses which block available spaces for a long time.

If the project is very attractive on paper, there are still some grey areas. Can these large-scale works be conducted on time, and will they respect the budget allocated to them? Difficult to predict. Will workers, and mainly cross-border workers, be ready to abandon their cars to go to their place of work? Again, the answer is not obvious.

11. Another important issue is mobility. The question is how to prevent the situation from worsening, as the need will continue to increase in the years to come.

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12. 13. 14. Will intermodality, in other words, encouraging users to leave the car behind for their trips, by offering the possibility of linking several modes of transport, be a solution to the problems associated with mobility?

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 13: Jean-Baptiste Moisy



Louis Chauvel
Professor of Sociology,
University of Luxembourg

“Luxembourg will be more fragmented but will maintain its balance.”

As a sociologist and futurologist, how do you envision Luxembourg thirty years from now?

If we approach it from an economic angle, two scenarios are possible: the optimistic and the pessimistic. Several arguments plead in favour of the first. The country has a stable political situation. Thanks to its pragmatism and culture of compromise, it is able to make big decisions quickly. We can therefore imagine that Luxembourg will continue to grow and remain an important source of jobs. Like Switzerland, it will constitute an island of security in an increasingly problematic world.

That said, even in this optimistic scenario, ongoing challenges will remain such as labour-related immigration, transport, environment, housing and urban planning. How to create new housing for a growing population? How to multiply road infrastructures without threatening the environment? Fragmentation, particularly linguistic and cultural due to the diversity of its population, is also likely to appear and undermine the unity of the country as it existed in the 1950s. Luxembourg will be more fragmented but will retain its balance.

What will happen if economic growth is no longer there?

In this case, tensions are likely to arise and undermine the country's social cohesion. Luxembourg society will be more segmented and polarised. Social inequalities will increase, whether in terms of employment or access to housing. A significant part of the population will undoubtedly fall into precariousness. The pension system, one of the most generous in Europe, will also be put under pressure. However, we must be reasonable. Even if this pessimistic scenario were to come true, Luxembourg will always be better off than its neighbours.

In your opinion, does Luxembourg have a clear vision of its future?

The country is a Tower of Babel where nearly 200 different nationalities coexist. This is its strength, but also its weakness. The success of a country depends above all on its ability to put in place a collective vision. The city-state of Singapore, for example, knows exactly where it wants to go. In Luxembourg, several plans to prepare the future of the country have been drawn up, whether by the government, financial institutions or other organisations, but none of them are shared by the majority of the population.



15. Electromobility figures show strong growth.

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Admittedly, the players in the Greater Region have agreed to improve transport infrastructure in the future and encourage users to adopt a more responsible attitude, but there is no guarantee that everything will be done on time and within the limits allocated budgets. More fundamentally, we can also question the behaviour of users. Will they agree to radically change the way they move around and juggle different forms of alternative mobility rather than remaining comfortably seated in their vehicle? Many of them have an emotional connection to their automobile, which is much more than a simple means of transport – and consider it an essential part of their daily lives.

Climate neutrality: a behavioural issue above all?



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"The most effective solution to reduce our carbon footprint would therefore be for us to change our lifestyle".

Then there is the question of sustainable development. In this regard, 2030 is a pivotal date in many ways. Like 195 other States around the world, Luxembourg is committed to implementing the 17 Sustainable Development Goals (SDGs) set out in the United Nations 2030 Agenda. These 17 goals aim to achieve a better and sustainable world for all by 2030 by fighting poverty, reducing inequalities and preserving the planet in the face of climate change and the loss of biodiversity. In 2019, as part of the third national plan for sustainable development (PNDD), the government and the associations that supported it identified ten priority areas of action to meet the country's major challenges. In addition to the key measures already mentioned above, the National Integrated Energy and Climate Plan (PNEC) also features prominently. Adopted in 2019, the PNEC aims to meet the objectives set by the

European Union within the framework of the Green Deal for Europe. By 2030, Luxembourg will have to reduce its greenhouse gas emissions by at least 55% – i.e., in absolute figures, a reduction from 8.18 million tonnes of CO₂ to 4.55 million tonnes –, increase the share of renewable energies to 25% and improve its energy efficiency from 40 to 44%.

This plan was supplemented two years later by the National Long-Term Climate Action Strategy aimed at achieving climate neutrality by 2050 in Luxembourg, like the other Member States of the Union. This facilitating framework has enabled the implementation of numerous levers and instruments such as the Climate Pact – which is currently in its second version and extends until 2030 – or the urban-architectural and landscape consultation Luxembourg in Transition.

Each Luxembourg municipality that adheres to the Climate Pact and undertakes to implement the catalogue of measures established by the European Energy Award will receive, in return and depending on the degree of certification obtained, a subsidy for the costs of climate advisers and efforts to reduce greenhouse gas emissions. The international consultation Luxembourg in Transition, for its part, aimed to bring together strategic proposals for land use planning and to produce scenarios of ecological transition by 2050 for the Grand Duchy of Luxembourg and its border territories. This call for bold ideas resulted in the selection of four multidisciplinary teams in May 2022. The process is now entering a new phase, that of implementation and concrete projects.

At the same time, a Citizen's Climate Council (Klima-Bürgerrot) was launched in January 2022. Starting from the Integrated National Energy and Climate Plan (PNEC), this body, made up of 100 people from civil society – 60 members and 40 alternates –, had the task of determining whether Luxembourg's efforts in terms of climate policy were sufficient and to determine in which areas the bar should be raised. The Bureau's proposals, which range from agriculture and forestry to renewable energy, sustainable construction, waste management and mobility, were presented to the government in mid-September 2022. They will be debated in Parliament then integrated into the latest version of the National Energy and Climate Plan scheduled for 2023.

All these initiatives are certainly commendable, but they have not yet really found



Beryl Koltz
Ministry of Foreign and
European Affairs
Strategic Head of Branding
Promotion, Ministry of Foreign
and European Affairs

*“Our priorities are
creativity, diversity and
sustainability”*

Can you remind us of the principle objectives of Nation Branding Let's Make It Happen?

Today, many different actors are involved in promoting Luxembourg abroad. Our mission is to identify their needs and produce communication concepts and tools to deploy messages that are consistent and in line with Luxembourg's positioning. We then seek to federate and connect the greatest number of actors with each other in order, for the sake of maximum consistency, to develop a community around these concepts and tools. We also carry out direct promotional actions linked to events and strategic partnerships. Finally, we are monitoring the external perception of Luxembourg.

Luxembourg is too often perceived in a negative light abroad. Do you think that initiatives like yours can change this perception?

When one knows the history of Luxembourg, its progressive commitment at the international level, the solidarity it shows in terms of development and migration aid, its sustainable and societal initiatives, it is obvious that Luxembourg is today an open, dynamic country determined to be a facilitator of innovative ideas that can contribute to a better world. It is often said that there is "savoir-faire" (know-how) and "faire savoir" (make known or let people know). Our initiative aims to "let people know". This is a long-term effort, but by methodically deploying our promotional actions, by succeeding in uniting the actors involved and by raising awareness to also think about the communication of initiatives in terms of international perception, we can have a real impact on the perception of Luxembourg.

What are Luxembourg's values, what has always characterised it and what does it want to be in the years to come?

Through a broad participatory process in 2015, a reflection on the assets of Luxembourg allowed us to clarify the values of our country – defined in three words: dynamic, open and reliable. On the basis of these values – what we are – three priorities for Luxembourg were then defined in 2021 – what we want. These are creativity, diversity and sustainability. These priorities make it possible to demonstrate to the eyes of the world the path that Luxembourg wishes to take and the resources in which, in a cross-sectoral manner, it has undertaken to invest in the years to come.



concrete applications on a large scale. But time is running out. Many observers already believe that the targets for reducing greenhouse gas emissions set by the government for 2030 will never be met. Admittedly, the figures for electromobility are experiencing a sharp increase, but they must be put into perspective when we know that the number of cars per person in Luxembourg is much higher than in any other country. Construction remains an important carbon emitter, the second in the country with nearly 20%, because the number of existing buildings needing to be renovated is still very high. In addition, the country is too small to create value chains around recycling, which must be considered more at the level of the Greater Region. The country could possibly respect its commitments with compensation measures generated by green financing. Luxembourg is indeed the leader in sustainable investment funds with the Luxembourg Green Exchange (LGX) of the Stock Exchange.

But these are only assumptions which, in any case, may not be sufficient to achieve the objectives of reducing greenhouse gas emissions by 55% by 2030. Each year, the team of Claudia Hitaj and Thomas Gibon



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from LIST (Luxembourg Institute of Science and Technology) estimate the carbon footprint of Luxembourg residents. This is currently 15.5 tonnes of CO₂ per year and needs drop to 1.6, i.e., a reduction of 90%, if Luxembourg wants to meet its decarbonisation objectives! In comparison, France is at 10 tons and Germany at 13. This elevated level in Luxembourg is due to many factors, but they all have a common denominator: purchasing power. Even if deep inequalities persist within Luxembourg society, the standard of living of its inhabitants is higher than the European average and has as a consequence a greater capacity for pollution. The most effective solution to reduce our carbon footprint would therefore be for us to change our way of life. Adopting climate-compatible actions is possible and within everyone's reach, such as leaving

your car in the garage to take the bus or train, learning to repair instead of throwing it away, eating less meat, buying second-hand or – why not? – try gardening. But these behavioural changes are difficult to implement. However, it will have to be resolved eventually. Relying on technology to help us maintain our quality of life and solve the climate crisis is a utopia, even if it can contribute in part.

Digitise to anticipate better

This is particularly the case with digital twins. Digital twinning consists of reproducing the constituents and operation of a system or asset using a set of digital models and simulating its behaviour and evolution in interaction with its environment throughout its lifecycle. It can concern devices as

16. 17. Based on the *Plan national intégré en matière d'énergie et de climat (PNEC)*, a Citizens Bureau makes proposals ranging from renewable energy to sustainable construction, waste management and mobility.

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Serge Allegrezza
Director, STATEC

"In Luxembourg, the key to success has always been diversification."

Will Luxembourg's demography develop as quickly as predicted? Isn't there a risk of increasing the pressure on social cohesion in the long term?

Luxembourg has always been a country of immigrants. There was certainly a drop in international migration following caused by the Covid-19 pandemic, but the figures have since started to rise again. If the country continues on its trajectory, I think we will see a population explosion in the years to come. One million inhabitants will be easily exceeded within 45 years. The only brake on this demographic expansion could be housing.

As to whether these demographic trends will have an impact on social cohesion in the country, I am unable to answer you. The subject has not been studied in depth and the view we have of it is not comprehensive enough to form an opinion.

Will inequality, not only in terms of income, but also wealth, widen in the years to come?

They will certainly not decrease, and inequality relating to real estate will be much greater than disparities linked to income. Access to property has become increasingly difficult because there are not enough offers and prices have soared. With the return on capital outpacing economic growth, primordial inequality will only grow in the years to come.

How do you envision the socio-economic future of the country?

In Luxembourg, the key to success has always been diversification. The problem is that all the business activities that ensured its wealth are declining and reaching the end of their life cycle. The government is currently trying to find the golden nugget, the sector that can regenerate the economic bases of the country. That said, I remain confident in the country's ability to bounce back: as long as we preserve the spirit of openness and welcoming that has allowed us to evolve until today.

Do you have reason to believe that this could change?

What is happening in Ukraine right now calls into question the period of peace and prosperity that we have known since the end of the Second World War. I think that the tremendous achievement that the construction of the European Union represented for a small country like ours is threatened. If the world becomes polarised, if a new cold war arises, the range of possibilities that will open up to us will be much more limited than in the past.

"Relying on technology to help us maintain our quality of life and solve the climate crisis is a pipe dream."

well as production machines, buildings, urban and energy infrastructures, human organs, social organisations and even our planet. To bridge the gap between the real world and the virtual world, this mirroring relies on the continuous collection of a combination of data, notably via sensors and connected objects. Thanks to their ability to simulate different scenarios, digital twins offer many application possibilities, mainly in energy management and sustainable development. They thus represent an essential tool for the establishment of smart cities (see the file "The city of the future will be smart", Merkur of May-June 2019).

As is being done in Singapore with the Virtual Singapore project, a collaborative tool for dynamic three-dimensional modelling of the city-state, Luxembourg is also aiming to create a digital twin on the scale of the country, which would be a first in Europe. This digital copy, formed from the nationwide collection of all the available data that makes sense, will make it possible to understand a certain number of issues related to energy, mobility and urban planning, to evaluate solutions and then apply them in reality.

A first step towards the creation of this digital twin should take place by 2026 with the establishment of a national energy data platform. The purpose of this platform, the installation of which has been entrusted to



The Luxembourg Chamber of Commerce: a key player in foresight

The public sphere is not alone in preparing and shaping Luxembourg's future. Convinced that we need to adopt a proactive approach to preparing for the future, the Chamber of Commerce – the voice of the business world – is a long-standing player in the field of foresight. For several decades, it has been initiating, shaping, supporting and feeding the public debate, while proposing constructive and inclusive solutions to the major socio-economic challenges of our time. Its commitment can be summarised in a few recent key dates:

2009: The Chamber of Commerce was one of the founding members of SOLEP, a non-profit organisation whose aim is to promote the evaluation of public policies and foresight in order to contribute to the quality of public decision-making.

2011: Publication of a first ambitious contribution on sustainable development, *Actualité et Tendances n°10 – Le développement durable au Luxembourg* available at www.cc.lu/Publications.

2013: Launch of the participatory platform *2030.lu*, a broad citizens' debate promoting direct and unprecedented interaction between economic and social leaders, representatives of civil society and citizens. The end result was the publication of a large collection of 355 citizens' ideas about addressing the major challenges facing Luxembourg in the future.

2014: Creation of IDEA, an ideas laboratory with the goal of conceiving a sustainable future for Luxembourg within the framework of a global approach based on three pillars of action: identifying major challenges, producing knowledge and new ideas, and actively participating in the public debate. With its multidisciplinary operational team overseen by a board of directors and a scientific council, IDEA remains Luxembourg's only professionalised think tank.

2015: In September, the Chamber of Commerce and the Ministry of the Economy announced that a major strategic study, The Third Industrial Revolution (TIR) Strategy, would be carried out in collaboration with IMS Luxembourg. The aim was to identify and facilitate the long-term roll-out in Luxembourg of a new business model based on the convergence of information and

communication technologies (ICT), energy, and transportation within a smart network. A study to be carried out with Jeremy Rifkin, the world-renowned economist specialising in foresight.

2016: On 14 November, the TIR strategic study, the result of a participatory process involving nine working groups and more than 300 socio-economic players, was presented to the general public at the Luxembourg Sustainability Forum.

2020/2021: The new Minister of the Economy took over the Rifkin/TIR process and announced his intention to broaden the initial scope to include climate change and the reduction of greenhouse gas emissions with the aim of making the economy and society at large more resilient. In collaboration with the Ministry of the Economy, the Chamber of Commerce and IMS Luxembourg carried out a review to assess progress on the 49 strategic measures identified in the TIR report.

2021/2022: The new *Luxembourg Stratégie* management team integrated into the Ministry of the Economy opted for a new approach inspired by France Stratégie. The Ministry of the Economy decided not to continue with the TIR study and to instead launch a new study based on the development of potential scenarios. This new study no longer draws directly on the lessons, trends and concrete measures resulting from the Rifkin/TIR process, to the regret of the Chamber of Commerce (see opening editorial in *Merkur*).

the electricity and gas network operator Creos as TSO (Transmission System Operator), is to collect all of the country's consumption and production data for gas and electricity. To do this, it will rely on a common central system relating to smart meters and those metering systems specific to industrial and large groups.

Nevertheless, unknown remains, and it is essentially of a legal nature. To make its predictions, this digital twin made in Luxembourg will rely on masses of data, including personal data. How to ensure that it will comply with the General Data Protection Regulation? How can individuals assert their rights without jeopardising the predictive potential of this management tool? What guarantee(s) will citizens who have agreed to make their personal data available to the public have that data will not fall into the wrong hands?

Whichever way you look at it, the future will not be simple. ■