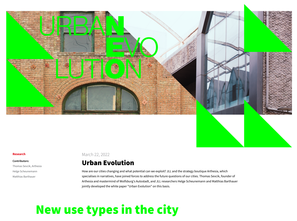

Research

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March 22, 2022

Urban Evolution

Food production in the urban environment can we explain? JLL and the strategy boutique Arthesis, which specializes in narratives, have joined forces to address the future questions of the cities. Thomas Sacré, founder of Arthesis and author of the book "Urban Evolution" and Dr. Stefan Grabitz, Research Hub Director and Matthias Bachmann jointly developed the white paper "Urban Evolution" on the topic.

New use types in the city

Extract — UN Sustainability Development Goals (SDGs)

Even before the coiling Coronavirus (CoV) - officially entitled the coiling Charter on Sustainable Development (SDG) - there had been a return to an urban lifestyle. The pandemic has only accelerated this development. The 17 SDGs are a universally accepted framework for easy into future oriented urban development for the first time. In short, today's models like mixed-use and sustainable city with decentralized, local supply chains, 15 minutes cities and 30 minutes cities are in demand. The 17 SDGs are a universally acceptable set of goals that are the first of the urban dirt of the 21st century. Urban development and urban sustainability are inseparable.

The city of the future will not be defined exclusively by concrete, but rather the city's full potential will be outside the core area in the broadest sense. The "urban" in the future refers to everything which is neither the city center nor a classic green suburb, in many cities such as Cologne, Berlin and Paris, this is traditionally located outside the historic railway ring line. Important infrastructure such as airports and ports and also large office and logistics zones form part of this in between.

There are two specific developments which will increasingly influence our cities and their near-source markets over the coming years: the location of production facilities in the city under second conditions, known as **near-manufacturing** and the new industrial production of food, known as **vertical farming**.

In terms of a multi-functional cityscape, they present interesting utilization options which are relevant for property developers and investors, and also for public sector decision-makers.

These new use types are also extremely important in view of the socio-political discussions on the topic of wellness. These focus on an improved supply function in special situations, certain elements of self-sufficiency and near- and nearbuying, i.e. the return of urban production and the production of healthy food in the immediate vicinity of the 15 minutes city. The 15 minutes city is a model for production and supply on very again growing importance, a reference mentioned by the 2017 Leipzig Charter on Sustainable Cities. The new use types are particularly relevant to logistics and industrial properties, investment and infrastructure, (1) Sustainable cities and communities and (2) responsible production and consumption.

Vertical farming

Definition of term and mode of operation

The term **vertical farming** describes the cultivation of plant based or animal based products in a multi-layer environment with levels positioned one above the other. Vertical farming can take place in an entire building or an individual floor of a property such as a basement or roof ballt with or without natural light. The size of a vertical farm varies from micro cultivation for supplying individual restaurants to large scale mass production.

Vertical Farming Production

Spaces
Warehouse premises or industrial halls can be utilized in some cities and shape which creates outmoed flexibility.

Staff & tech spaces
Production needs specialists (knowledge) and a master to rise efficiency & yield.

Packing & delivery area
Delivery through regular vans. Can be picked up directly by customers, if offering customized packaging.

Production area
Production is scaled up and is easier to rise efficiency & yield.

In the context of this report, vertical farming means the large-scale industrial cultivation of agricultural products such as salad plants, berries and herbs.[1] This has been made possible by significant technological developments in the field of LED lighting and control and sensor technology. The harvesting cycles are independent of weather and season, and are not affected by pests and pathogens. Production is not affected by the lack of sunlight and heights. The reason for growth of floor space is a vertical farm can achieve the same harvest yields as 100 per conventional agricultural land. Food produced by vertical farmers can be supplied to supermarket chains on an industrial scale. One specialized area of vertical farming is the cultivation of medicinal plants and active ingredients, which can be used in the pharmaceutical industry. The cultivation of algae, which can be used as a food supplement, is also of interest. Land use efficiency, which are thrilled with increase the little the last tons of water, energy and fertilizer, and the ability to cultivate all year round are considered to be the most important advantages of vertical farming. The cultivation of fish and crustaceans is called aquaponic farming and can combine into large scale industrial production of frequently designed. Another operation of this type of vertical farming is aquaponic farming on a much larger scale is Lufa Farms Greenhouse Complex with a production area of 16,2000 sqm. In this case, it is important to distinguish it from so-called urban gardening, which primarily serves the purposes of self-sufficiency, which does not form part of our investigation.

Source: Arthesis, JLL

"Vertical farming is an investment in the future because it asks the question how long we can continue to produce sufficient food in the field. We assume that there will be an urgent need for food in the future to produce enough food in the future.'

Prof. Dr. Stefan Grabitz, Founder Institut für Nachhaltigkeit und Ingenieurbüro Heinzgrabitz GbR

In addition to the socio-political interests of vertical farming, the risk of crop failures is increasing because of climate change, which will dramatically exacerbate supply and demand bottlenecks from the middle of the century onwards. Crop failures in countries such as Ukraine or Brazil, on which entire species can be calculated and the weather conditions in a growing season are critical for the level and quality of yields from agricultural archives. These factors can be eliminated by the use of new technologies in vertical farming.

Opportunities and threats relating to vertical farming as industrial mass production

So, what suggests that vertical farming and agricultural growth companies in the field of large-scale industrial production?

Sustainability:
Traditional agriculture consumes 11% of global arable land and, by 2050 it is estimated that 50% of the world's population will be affected by a shortage of water. Vertical farming requires 70% to 95% less water and 10 to 20 times less land than traditional agriculture.

Planning certainty:
In the case of farms, crop yields can be planned. Of course, external influences on climate and crop production, but thanks to the kind of technology, it can also regular supply of water, light and nutrients, the predictability of successes and crop yields increases.

Self-sufficiency:
In terms of food supply, disruptions in international supply chains and the aspect of self-sufficiency are particularly relevant. In Germany for example, 20 percent of the fruit and vegetables consumed in the country are imported. Dirk Kaiser-Engelhardt, Germany's largest vertical farmer, has a production area of 1,000 sqm in Bad Aibling, near Munich, and 2,000 sqm in Berlin. He is 100% self-sufficient in terms of electricity and production and supply chain is needed for the German population. Self-sufficiency and self-sufficiency in the case of agriculture is only 17%[2] While regulations such as white or red cabbage do not need to be imported, high proportions of other varieties are imported, for example 90% of all tomatoes.

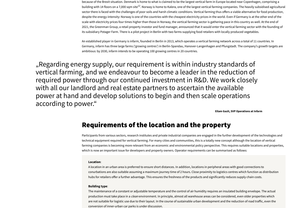
Short transport distances:
Vertical farms can be built in a corresponding high proportion of properties which have relatively long journeys in the case of individual foodstuffs. For example, around 1,200 tonnes of tomatoes are imported into Germany every year. The packaging and transport costs of tomatoes are highly perishable, such as herbs, sprouts, peas and beans[3]. With vertical farming, it is possible to significantly reduce transported distances for valuable products.

Despite the many arguments in favour of the rapid further rollout of vertical farming, there are a number of hurdles which must be overcome:

Acceptance amongst consumers:
In Germany, the traditional image of agriculture is firmly anchored in many people's minds. Germany's soils are particularly fertile and amongst the most productive in the world. The 2 million farms in Germany cultivate 16.7 million hectares of land. The 2 million farms in Germany cultivate 16.7 million hectares of land. Agriculture is a traditional, family-run business, passed on from generation to generation, and is a cultural heritage. Vertical farming can be a high level of confidence, a centrally-controlled, automated, and vertical farming approaches and based solely on technology, vertical farming can help to take the conflict of interests between consumers' increasing quality awareness and their price sensitivity. Technically produced food can be in demand in many cases.

Land use planning:
Land is a finite resource and can appear in building and planning law for industrial and commercial land. Even within the category of land used for agricultural purposes, the term is increasingly used in the context of land use. Vertical farming can be a solution to the conflict of interests between building concession. Vertical farming is still a niche market and is therefore largely not yet considered in land use planning.

Energy costs:
The high density of water is recirculated and, according to industry data, requires only 5% to 10% of the consumption of traditional agriculture, electricity consumption is a key factor in the operating costs of vertical farming and southern California's power crisis has shed light upon the environmental balance if the electricity does not come from renewable energy sources. One alternative alternative to locate vertical farms close to data centres, which produce high levels of heat and thus energy, which can be fed into the vertical farms in the form of closed loops.



Status quo and case studies

Whilst vertical farming is still in its infancy in Germany, countries in East Asia such as Singapore, Japan and the United Arab Emirates are the global pioneers. In Singapore, which has a land area of 719 square km and a population of 5.7 million, the large island and territory-state has to make the goal of significantly increasing the rate of self-sufficiency.[4] This objective is also reflected in other countries where traditional agriculture is faced with difficult conditions, such as the United Arab Emirates, which has to develop innovative alternatives. Right now, around 100,000 sqm of floor area is occupied by vertical agriculture in building conditions.

Fischer Farms, Berneck (UK)
Fischer Farms was founded in 2016, Fischer Farms operates a 1,000 sqm vertical farm in Berneck, which produces over a total area of 1,000 square meters of 1,000 square meters, 1,000 square meters of 1,000 square meters of 1,000 square meters of

- Real Estate has the opportunity to realise its satisfying difference between good quality of life and high efficiency potential.
- Clear certain farming offers an opportunity to meet the climate policy challenges of the next two years and years.

Neo-manufacturing

- The return of production and its integration into urban structures is at the right of the agenda for towns and cities and their representatives.
- Production is an important part of a mixed use city and its individual neighbourhoods.
- Industry 4.0 and new technologies open up attractive opportunities for the use of vacant offices and retail spaces.
- Optimising towards technology instead of strict planning law regulation helps close the gap in the development of new production areas.
- A "made in" and supports public sector marketing campaigns, which benefit from the desire of many consumers for greater level of loyalty.
- The "Neo-Manufacturing" space potential for neo-manufacturing in vacant ground floors in office buildings in the 1st-tertiary city of around 100,000 sqm.

Definition of term and mode of operation

Urban production refers to manufacturing and processing of semi-finished goods or closely associated uses, often using local resources and locally embedded value creation chains[1]. The new development is the frequent use of innovative technologies and materials which offers new possibilities for production in urban settings and the resulting use of city labels an attractive proposition(Mark H.Zurich, Mark H.Hamburg). This is also associated product image. Urban production combined with these new developments is what we understand under the term **neo-manufacturing**.

Neo-manufacturing means that production industry - be it in a workroom, factory or workshop - is back right next to the residential areas of a city. This does not question the production which can be found in Germany's traditional, centre and industrial zones, which are fully functioning.

The proximity to housing and other uses requires less emission and emission efficient production and transport methods so as to avoid conflicts of use. Technological progress and the digitalisation of production processes offer opportunities for this, which are discussed in the following section. This implies changing requirements in terms of locations in the urban area, economic locations and properties, as well as new forms of work and the necessity for workers, citizens, companies, neo-manufacturing aspects to all companies in sectors which can be described as city-oriented. These include the following economic sectors:

- **information and communication technology (ICT),**
- **cutting-edge and high-value technology (hi-tech), healthcare and creative industries;**
- **parts of the service industry and trade and craftsmen.**

It is with such urban functions that a mixed use city is constituted and which will be more dedicated in sequence chapter (see above).

Neo-manufacturing is an attractive option in the medium-term. It begins with high-tech suitable for service and knowledge-based actors back to the cities (called reshoring, specifics, Ron schon Vernaul) whereby which is decoded from both a economic and also political perspective. For companies, this makes production in an urban setting and the resulting use of city labels an attractive proposition(Mark H.Zurich, Mark H.Hamburg). This is an important factor, especially for lifestyle products such as fashion, food, furniture and interior design, but also for more technical products. Many electric scooters or even specialised electric vehicles are now produced in Germany. In the field of production of fashion marketing, Given the cities benefit from a high level of attractiveness, companies can also benefit from the "made in" and support public sector marketing campaigns, which benefit from the desire of many consumers for a high level of loyalty and brand recognition for some time now. Bucks Gear says the city of Bremen is one of at most, and Bielefeld Gear and Jean Jan Bockelmann are also of the Elbe or Freiland region in their commitment. This trend is also spilling over into the industrial sector. Our thinks of the pride of the citizens of Bielefeld, Bremen, Hamburg, Munich and Berlin, which is also reflected in the 'made in' mentality. Companies can also benefit from the image of quality in Berlin-Tempelhof using the slogan 'Made in Berlin' to gaining significantly in relevance.

Opportunities and threats of neo-manufacturing as a critical economic factor

What future conditions are manufacturing gaining importance in German cities, and what are the risks facing its positive development?

Security of supply:
Companies in sectors where the trend towards global production has led to delivery bottlenecks due to leading to relocate production closer to their customers. This is the case, for example, in the medical technology sector. According to a survey by the Association of German Chambers of Industry and Commerce in Autumn 2021, 4% of companies said they were relocating production to new locations in response to raw materials shortages and supply bottlenecks. A current example is the announcement by Dyk that it intends to relocate production from Asia to Europe. The Corona crisis underscored the importance of production capacity and supply chain security of supply. The slogan 'support your hands' is gaining significantly in relevance.

Climate protection:
The promoting of production in the manufacturing sector ensures short delivery journeys and the avoidance of transport emissions. The current intense debate on climate protection offers significant opportunities for growth amongst companies from the neo-manufacturing sector.

Neighbourhood development:
The development of districts for living, working, shopping and culture is being encouraged by residents and promoted by the cities themselves. Federal and state funding programmes such as urban development funding also see themselves the objective of maintaining or establishing diversity and units of functions within cities. Companies with a low emission production of goods seem a small area set to be a good neighbour.

Economic:
As a result of Germany's federal structure, there is a high degree of competition between the various regions and cities. The location of companies from production sector and city-oriented services in Germany's business employment figures are fairly high by the limits. Furthermore, it is of interest to cities to reduce commuter numbers and delivery traffic via neo-manufacturing in order to improve their own city's carbon footprint.

'Berlin is the future-orientated capital of the innovative republic of Germany. With great ingenuity, creative solutions and new technologies, this shows the importance of a strong connection between production and service - especially in the field of urban production'

Dr. Stefan Franzke, Berlin Partner für Wirtschaft und Technologie GmbH

Currently, however, there are still some challenges that hinder the successful establishment of businesses.

Urban land use planning:
Land use plans since the areas in a city earmarked for development. In addition to residential and commercial development sites, there are increasingly also areas for production companies. Although there are 'mixed use' and 'commercial' and 'industrial' areas in Berlin-Wedding and Berlin-Pankow/Blankenburg/Karow, in 2017, in these areas, governmental development bodies, commercial developers together with social, cultural and other amenities which do not significantly disturb a residential area. The degree of disturbance must be assessed by the planning authorities and can be a hindrance to development.

Local acceptance:
Even if the segments in the neo-manufacturing sector generally emit low emissions, there is still delivery traffic to the production sites themselves and the vehicular arrival and departure of employees. Even if this is largely carry out by public transport, it is not entirely noise. The number of delivery vehicles and employees can be increased in some cases.

Customer price sensitivity:
The production and distribution of labour are reflected in lower prices for consumers. Consumer acceptance is essential for a local producer to be successful within the global value chain.

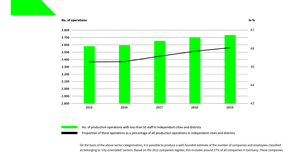
'The integration of urban production into city structures offers us the chance to counteract the increasing alienation of consumers, products and their manufacture. This can give people the opportunity to participate in the entire process of production again which increases their appreciation, which in turn brings about reflective consumption.'

Dr. Martina Hoppe-Ivo - PROJECT - URBANE PRODUKTION IN DER CONSTRUCTION

Status quo and case studies

Neo-manufacturing will be a new sub-asset class in the real estate sector, with specific demands on locations, buildings and local conditions. It is impossible to continuously define the city-wide mix as it is still in formation, but it is developing into a strong and defining element of modern cities. The first signs of this may be the increased numbers of showroom rentals by electric car manufacturers over the last two years. There is no local production, but the rental space leased by manufacturing companies is used to display and sell products. Companies from the production sector in these locations, such whereas are eager to connect with customers in the other sector, for which local production would be important. The Corona crisis underscored the importance of local supply chains. Companies from the production sector, for which local production would be made on the basis of regional statistics published by the Federal Statistical Office. There are almost 20,000 manufacturing companies with fewer than 50 employees in Germany. Around 500,000 employees work for these companies. More than 1,700 of the companies are located in an independent city or increasingly in urban districts. With these cities, the Federal Statistical Office has accounted for a remarkable share of 80% of all manufacturing companies.

The importance of small-scale industrial operations is in evidence in the cities



No. of production operations with less than 50 staff in independent cities and districts

Proportion of these operations as a percentage of all production operations in independent cities and districts

On the basis of the above sector categorisation, it is possible to produce a well-founded estimate of the number of companies and employees classified as belonging to "neo-manufacturing" sectors. Based on the ISTAT sources, there are in Germany's cities around 17% of all companies in Germany. These companies employed a little over 17%[2] of the total workforce. Assuming that the relative proportions are still applicable today, the result is 600,000 companies with a total of 6.7 million employees[3].

Wimda, Berlin (Cité)
Wimda was founded in Detmold in 2012 and was the brand name of a well-known furniture shop public. Today, Wimda produces watches, bicycles and leather accessories. From the beginning, the idea was to produce in the inner-urban area in order to be part of the story of Wimda's customers and to profit from Detmold's traditional craftsmanship. Wimda's products are made from local materials and are produced within the city.

In addition to pure production activity, showing how things are produced is becoming a more attractive proposition. In addition to the pure sale of manufactured goods, some manufacturers are also creating showrooms by offering factory tours and workshops. Making the production process transparent is a key factor in the 'made in' mentality. Many companies are also using their production sites as showrooms. Many production companies make use this marketing of integrating element within their and are attracting increasing interest from both planning authorities and real estate players.

FRITWIG, Zürich
FRITWIG was founded in Zurich since 2007, and for same time now, is a specially constructed urban production warehouse (MIFRI). Production known products are the Revenge bags made from old tarpaulins. The company also produces handbags, accessories and other design and fashion products which are distributed worldwide. Fritwig is one of the co-initiators of the Made in Zurich initiative for urban production.

Stromwerkstatt 1.0 (Berlin)
In addition to housing, this new campus will also bring together production companies, the research center and also and. Stromwerkstatt is an example of a new kind of neighbourhood development with the objective of bringing manufacturing companies back into residential districts. Thus providing a new mix of living and working areas have ever existed in Berlin.

Operational requirements of the location and the property

For company, and the processes and activities that take place within it, the location within a city/urban city that combines living and working is fundamental.

	Location	Specification	Limitations
Production workshop	City district	Workshop	None
Office property	City centre/ high street	Ground floor, 1st and 2nd floor, upstairs, cellars	Ceiling height, floor loading capacity, fire protection, noise protection
Retail unit	City centre/shopping centre	Showroom, smaller units	Rental price
Light industrial, building construct workshop	City district	>5,000 sqm, exhibitry	None
Neighbourhood centre	City district	Low emission, former repair and craft workshops	Compatibility with residential use, planning law

In our view, there are three possible urban locations suitable for neo-manufacturing:

City centre / high streets:
High rental costs in city centres and only allow a minority of production companies to find their way into the core areas. These can be manufacturers which require small areas and want to combine production and business plans for their customers. Production companies may also be suitable for showroom or pop-up stores in which the products are neither manufactured nor sold. Retailing exhibitions of goods and services are also conceivable in these locations. Although, in the 1st-tier cities, there are 1st-floor premises available, these are not suitable for such uses as noise. A prerequisite is large income concepts, which in addition to pure sales, also offer inquiry from the city, which can be combined with food & beverage concepts and high-quality direct marketing sales. These areas were previously planned either as traditional shopping streets or as 'high street' locations. In the 1st-tier cities, there are 1st-floor premises available, but these are not suitable for such uses as noise. A important role in the development of the city centre is to become quiet, in main zones, three factors and also are significantly cheaper to buy and rent than in the city centre. Since neo-manufacturing mostly involves individualised, higher priced goods, locations with affluent and rather trendy clientele are preferred. Traditional commercial areas are therefore unsuitable.

Neighbourhood centres / shopping centres:
Neighbourhood centres are ca. 1 km is reflected in the many independent shopping which have the word "quarter" (neighbourhood) in their name. Despite the vague term, for a neighbourhood centre to be in the centre of a residential area, it must be easily accessible by public transport and have a high level of attractiveness. In the 1st-tier cities, the neighbourhood centres should comprise of the elements relating to living and working. The neighbourhood centre must also be planned and developed under one roof to ensure that the mixed uses are co-ordinated with each other. The neighbourhood centre should be a place where residents can meet and communicate with each other. Production companies and businesses and also rooms or set-ups which belonging to conceptual workspaces in depth market services. The first mixes a shopping centre could also be considered as such a location. Thanks to the open and transparent spaces, these can be used to within customer proximity and the customer experience.

Neo-manufacturing: locations

The greatest potential for urban commercial real estate is in city district locations and in particular, the older areas which are more difficult to market due to accepted demand for high specification space. To assess this potential, we have analysed the current vacant office space in the big 7 German cities (Berlin, Düsseldorf, Frankfurt, Hamburg, Munich, Cologne and Stuttgart). We focused on space

- **which is unsuitable or B or C grade space and which is characterised by disadvantages in terms of rail access**
- **in district locations outside the respective city centres, but still within the city boundary; and**
- **currently available on the ground floor of a property, assuming that production only rarely takes place on the upper floors of an office property.**

The starting point is which these properties are located in ideal inner-city locations, not in whether the space is suitable for commercial to industrial use by companies specific conditions. In the context, there are potentially around 200 production units scattered throughout the 7 cities of 100,000 available. The average size of these area is 600 sqm. In relation to the total vacancy of 1.4[4] million sqm (B and C grade space in these locations, this results in a share of just under 13%. As national alone, not all space will be suitable, however, the reserve of these area should consider to what extent letting this space to manufacturing companies could be both a sensible idea and economically feasible. Reducing the vacancy level should also be in the interest of the cities themselves.

Space potential for neo-manufacturing companies

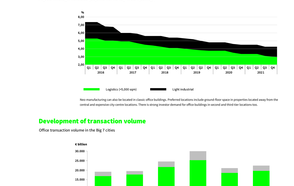
'The rental price which must be paid by manufacturing companies is a decisive location factor. In inner-urban neighbourhood centres, in which the mix of residential and commercial space is both permissible and desired, production companies often lose out when it comes to market competition with residential and office uses.'

Kerstin Meyer, Schoenhaus+Partner

Investment case

Investor demand for properties that can potentially accommodate neo-manufacturing is very high. There was a new record transaction volume in the 1st-tier cities in the last year of around EUR 2.5 billion, which was 20% higher than the 10-year average. In the 1st-tier cities, there were 120 billion of capital invested with over 510 billion of capital invested in commercial warehouses, distribution properties and light industrial units. The latter can accounted for a volume of almost € 1 billion over the last year.

Transaction volume logistics/industrial sectors — Germany



Light industrial properties are units of less than 5,000 sqm in size which are used for the assembly, disassembly, finishing, enhancement, packaging, repair or processing of materials. The office component of light industrial properties is usually less than 25%. The high demand from investors is reflected in the yield development. Similar to the fall in yields for investments in classic logistic properties, yields for light industrial properties have fallen significantly over recent years.

Development of prime yields

Logistics and light industrial properties in the Big 5 cities (average)

Neo-manufacturing can also be located in classic office buildings. Preferred locations include ground floor space in properties located away from the central and prominent commercial locations. There is strong investor demand for office buildings in second and third-tier locations too.

Development of transaction volume

Office transaction volumes in the Big 7 cities

The chart shows the development of office transaction volumes in the big 7 cities (Berlin, Düsseldorf, Frankfurt, Hamburg, Cologne, Munich and Stuttgart). Over the period 2016 - 2021, around 200 billion euro invested in office properties in these cities. Of this sum, invested in office properties in secondary locations, many of which were about fairly office locations used by companies in specific office buildings. In secondary locations, there were also rental contracts from companies from the production sector in complementary use types. Other properties in third-tier locations appear to be even more suitable for neo-manufacturing. These accounted for only 12% of total volume, but the absolute volume of almost 12 billion means that they are a high demand from investors.

As neighbourhood centre developing focusing on residential use, we see neo-manufacturing as a complementary element. Smaller companies with production units could be integrated into a neighbourhood centre. Although the production units would be in direct competition with residential units in a neighbourhood centre, the greater the opportunities to integrate other uses. The question then arise of whether the classic commercial sector/office type property could also be defined as a neighbourhood centre, even without any residential component. Offer very well connected to the public infrastructure and in attractive locations, such high-footfall locations could be ideal for innovative and production companies.

'In Germany, there are few examples of completed real estate projects which specifically implement the concept of urban production. However, there are certainly developers who are rethinking the concept of commercial real estate through the development of commercial real estate with production use or to enable flexible use structures, not least because of the shortage of commercial space.'

Jens Mensing, Team Immobilien & Fördere ab Ministerium Wirtschaft/Bremen Wirtschaftsförderung Bremen development office in Cologne

Conclusion

Industrial companies are by no means 'new tenants' in the real estate sector. However, as cities become more diverse, new options are opening up in combination with innovative technologies in terms of the having and development strategies of both cities and communities, real estate investors and developers.

We see...

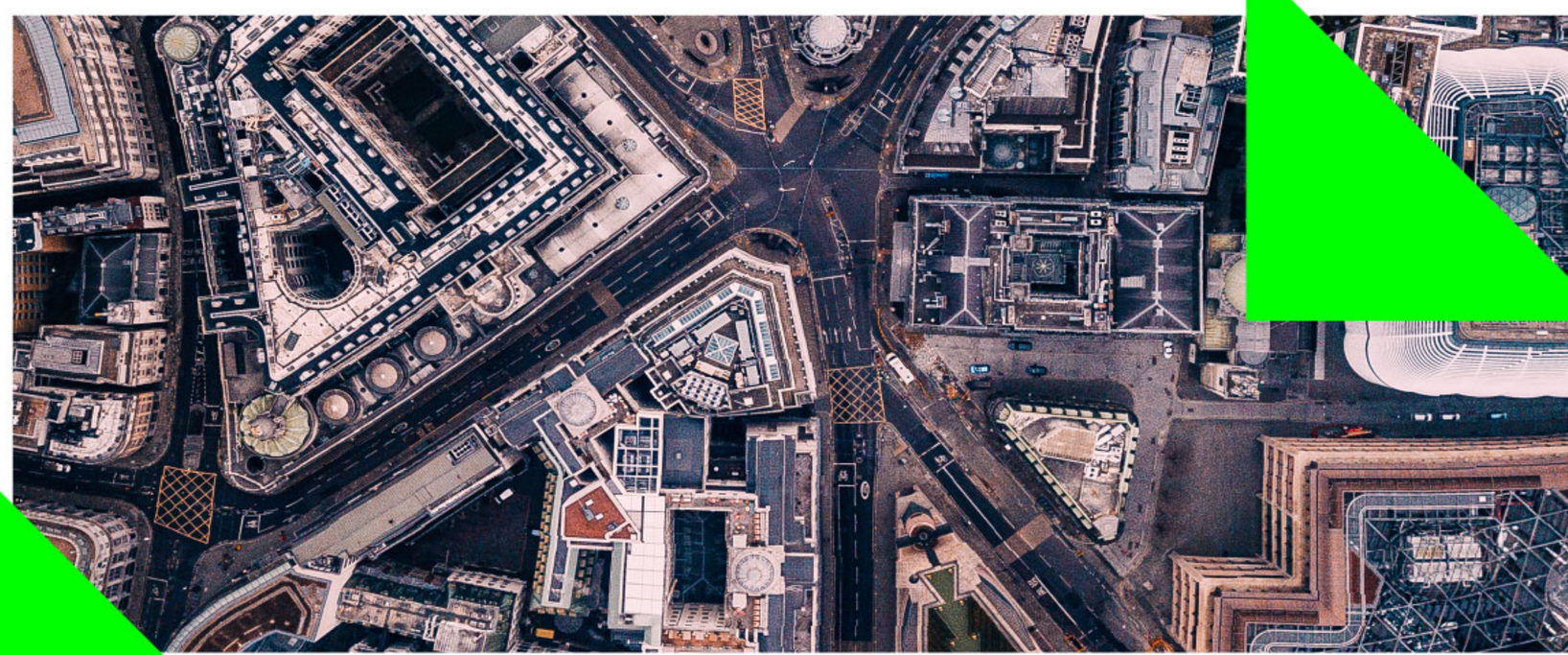
- more opportunities for increasing the attractiveness of towns and cities, and enhancement support from local authority economic development offices.
- increased demand for urban and suburban locations, which are driven by increasing job profiles.
- challenges in terms of current planning law and regulatory hurdles.
- that neighbourhood centre developers are not perhaps only interested production companies as the agents.
- a certain level of prevailing stereotypes in the minds of many people, which could be overcome by appropriate marketing and office and residential use.
- a growing number of production companies in towns and cities as a finding factor for companies in the service sector.

... that the current neo-manufacturing sector niche will gain in importance in the course of urban evolution.

Outlook

Vertical farming and neo-manufacturing are innovative functions which will help to shape cities and urban landscapes as they continue to develop.

Sustainability and the political and social drive relating to urban development will, in our opinion, result in the emergence of a separate asset class. Over the coming years, vertical farming will gain a lot of momentum thanks to the social discussions relating to climate change in combination with agriculture. Neo-manufacturing offers the opportunity for increased integration of production industry into cities and the expansion of the functional mix. Cities now aim to become productive, inclusive and diverse places. In the course of urbanisation, city brands will become more important than country brands (Made in Hamburg instead of Made in Germany). Companies will become brand ambassadors for the cities, which will boost their attractiveness for well-educated talent. There is still a lack of exemplary and outstanding lighthouse projects. Developers must therefore be courageous and increasingly consider including these use classes. This requires close and early co-ordination with the planning authorities, in order to include these uses in corresponding local development plans. At present, production in the form of vertical farming and neo-manufacturing is not sufficiently explained, or in extreme cases even totally excluded. What is needed here is a readjustment of the terminology and content of the urban area according to §6a of the German Land Use Ordinance. One possibility is the use of a 'twin concept' which could be termed '*new urban production'*, which would be similar to the urban area and would permit greater possibilities. This will ensure that vertical farming and neo-manufacturing will soon become a part of everyday life in our developing cities.



Footnotes

[1] The production of cannabis or other medicinal products does not take place in a vertical farm.

[2] https://www.prosieben.de/tv/galileo/videos/2021166-pflanzen-und-tiere-auf-dem-dach-der-nachhaltigste-supermarkt-clip

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[18] The basis for the extrapolation is the business register of Destatis. https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Handwerk/aktuell-struktur-handwerk.html; https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Unternehmen/Unternehmensregister/ Tabellen/stat-unternehmen-beschaeftigten-groessenklassen-wz08.html

[19] One example among many is the 'Built in Barmbek' business park (https://www.built-in-barmbek.de/) in Hamburg. It offers space for more than 50 businesses and is intended to bring production back to the city. It was developed by the Stadtentwicklungsgesellschaft (Steg), and 90% of the space has already been let (Hamburger Abendblatt, 21st January 2022).

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