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Logistics buildings *of tomorrow*

Beyond COVID-19: the impact of demographics, technology, urbanisation and sustainability on future buildings and locations

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Introduction

Warehouses are here to stay, but what they look like and where they are located will change.

Throughout this year the impact of the COVID-19 pandemic has dominated the news around the world and been the principal focus of governments. As at 26 August 2020, the pandemic has led to more than 820,000 deaths globally, according to John Hopkins University; and it is clear from economic statistics and forecasts that this health crisis has generated a global economic crisis, the full impact of which remains to be seen.

In real estate markets, the impact of COVID-19 has been at the top of the agenda for companies occupying property as well for developers and investors that invest in it. At this stage, whilst it seems clear that the pandemic is accelerating certain structural changes already in play, it is also challenging, or further disrupting, others. However, one thing it has certainly done is to highlight the importance of resilient supply chains.

Warehouses (or logistics buildings) are critical nodes in virtually every supply chain and will remain so for as long as materials and goods need to be stored, handled and moved. Although some commentators have suggested that economies are 'de-materialising' (for example, through digitisation and miniaturisation) – and there are many logistics techniques to reduce the need to hold inventory – global freight volumes are expected to triple by 2050.[1] Therefore, in so far as there are any future certainties, the need for warehouses would appear to be one of these.

This report is the first output in a new programme of research and insight designed to provide our views on how, within a predominantly European context, future warehouses may change from a building or location perspective. To help structure our thinking, we have looked at the potential impact of four megatrends that prior to COVID-19 were widely thought to be driving change across every geography and industry and which in our opinion have continuing relevance: **demographic change; technological change; urbanisation; and sustainability**.

Each of these is a massive subject area and this is a short report. Our approach, therefore, has been to dip into some of the research on each and then think through the implications for future warehouses. Our reasoning has been helped by two collaborative discussion workshops with some of our key clients (major warehouse developers, investors and occupiers), separate contact with 25 occupier clients, and an investigation into what leading companies are doing with their warehouses and networks through a case study approach. Subsequent papers will provide a sharper focus on specific areas and issues touched upon in this report.

1. OECD, International Transport Forum. Transport Outlook, 2017. Baseline line shows demand for freight movement rising from 122 trillion tonne-kilometres in 2016 to 329 trillion in 2050.

Demographic *change*

As the labour supply shrinks, there will be more robots but also a human-centric approach.

Changes in demographics have numerous effects such as on economic growth, patterns of consumption and labour markets; here we will focus on the potential impact on labour as this is a top priority for many European warehouse occupiers. For example, JLL occupier clients that we contacted ranked labour as their third biggest supply chain challenge behind reducing overall supply chain costs and servicing shorter customer order lead times.[2]

The latest population data and forecasts from the United Nations highlight key global trends, which include:

Continuing growth in the world's population, but at a decelerating rate, with a forecast increase from 7.7 billion in 2019 to 8.5 billion by 2030.

A strong concentration in population growth in a small number of countries, including within sub-Saharan Africa, plus India, Indonesia and Pakistan.

Population ageing in virtually every country, with the median age of the world's population rising from 30.9 years in 2020 to 33.0 years in 2030.[3]

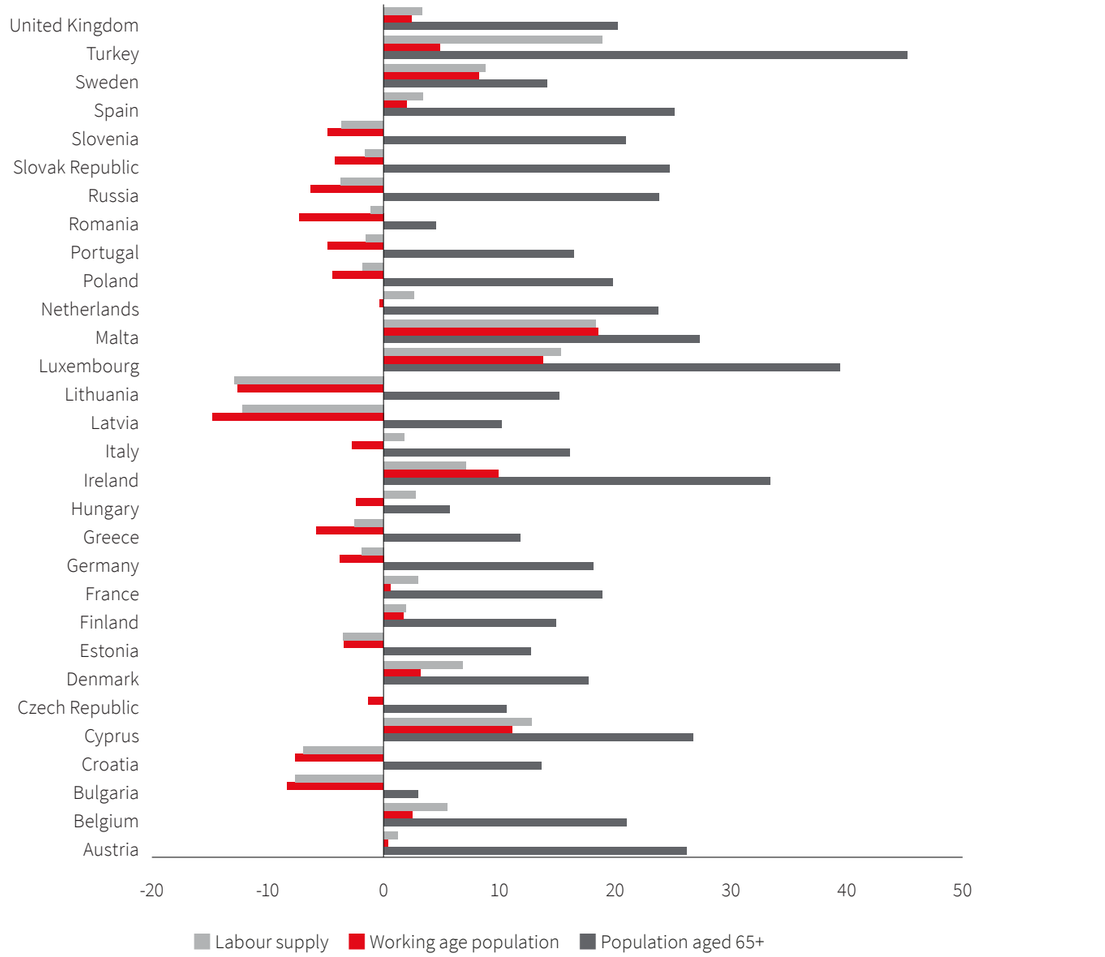
In contrast to global growth, Europe's population is forecast to decline – from 747.6 million in 2020 to 734.7 million by 2030 – and countries such as Russia, Germany, Italy, Spain and Poland are all projected to have smaller populations in 2030 compared with 2020. Over the same period, all European countries will have an ageing population with the median age for Europe overall increasing from 42.5 years to 45.1 years.

In many countries this will mean that the labour force (which is broadly a function of the size of population of working age, including net migration, and the economic activity rate) will grow at a slower rate than the population overall, while in certain countries, like Germany and Poland (both major logistics markets), it is projected to decline. This is highlighted in separate country forecasts by Oxford Economics in Figure 1.

2. See also survey evidence presented in Prologis, Top Solutions to Source, Train and Retain Labour in Logistics Facilities, March 2019.

3. United Nations, World Population Prospects 2019

Figure 1: Projected change in population 65+, working age population and labour supply, 2020-2030 (in %)



Source: Oxford Economics, June 2020

The current challenge of sourcing labour for logistics (to work in warehouses and transport) in countries with high employment and low unemployment rates will therefore likely continue. However, this situation could change in the short-term if unemployment rises sharply, especially when Government schemes in many countries to support jobs and incomes during the COVID-19 pandemic come to an end.

The labour issue will also accelerate the move to further automation and more robots, which will additionally be driven by the productivity benefits these provide. This trend could also be encouraged if companies move more quickly into automation to reduce their reliance on people in their warehouse operations to minimise any future potential disruptions to workers, like those caused directly by COVID-19 and the social distancing counter measures.

Any acceleration in the uptake of automation and robots could reduce demand for some types of warehouse labour but increase demand for people with higher skills. Moreover, the labour issue and the need to attract and retain a workforce, is likely to compel developers, investors and companies to provide warehouses with enhanced building features and amenities for workers. We consider this 'human-centric warehouse' approach later in the report (see 'Sustainability').

Technological *change*

Automation and robot use will rapidly advance and challenge existing building designs and locations, but 'smart' warehouses and 3D printing will take slower steps.

Technological developments have long been drivers of change for warehouses. For instance, the introduction of Automated Storage and Retrieval Systems (AS/RS) led to high bay warehouses and, more recently, the growth in e-commerce has generated demand for a range of different types of warehouses.

A multitude and fusion of technologies, some established and others emerging or pioneering, are now propelling the Fourth Industrial Revolution. From the perspective of future warehouses, we think the most significant are:

Artificial intelligence (AI), which will support the proliferation of **automation**, autonomous machines, **robots** and 'smart warehouses'

The Internet of Things (IoT), which will provide a foundation for 'smart' warehouses and logistics;

3D printing or additive manufacturing, although this is likely to be much more significant in certain industries than others.

The rise of **automation and robots** across industries and geographies is highlighted in numerous studies, and the logistics industry (storage and distribution) is typically identified as one that is particularly vulnerable to automation and robots due to the routine and predictable nature of many of its activities and jobs.[4] Supporting this, independent research has pointed to the significant global growth in the size of the automated materials handling (AMH) market. For example, Mordor Intelligence predicts a 11.3% compound annual growth rate (CAGR) globally over the next five years 2020-2025.[5]

4. See for example Carl B. Frey & Michael A. Osborne The Future of Employment: how Susceptible are Jobs to Computerisation?, 2013; M. Arntz, T. Gregory and U. Zierahn, The Risk of Automation for Jobs in OECDC Countries: A Comparative Analysis, 2016; PWC, Will robots really steal our jobs?, 2018 and Martin Ford's award-winning book The Rise of the Robots, 2015.

5. Mordor Intelligence, Automated Material Handling (AMH) Market Growth, Trends and forecasts (2020-2025).

In our opinion, automation and robots will continue to grow significantly in warehousing and drive changes in building specification and locations, the latter because access to power will become more important. However, the automation of freight transport by the widespread use of autonomous lorries or drones is a more distant prospect, largely due to legal and regulatory barriers.

The Internet of Things (IoT), involving the connection of physical objects to the Internet, will provide the foundation for 'smart' warehouses and 'smart' logistics. Combined with 'big data' analytics, it has the potential to improve warehouse operations and productivity; for example, through the better utilisation of equipment and space and real-time information, and in minimising risks to workers. Even so, while some companies like DHL are pioneering 'smart' warehouses, IoT adoption remains modest to date, hence we think smart warehouses will be slow to proliferate. For the same reason, we believe that more radical visions of smart logistics systems, such as the 'Physical Internet', are at present a far-off possibility – although elements of these systems could be incorporated into some types of warehouse or freight transport operations in the much nearer term.[6]

Globally, the **3D printing industry** is currently worth around $10 billion, including printers and related services.[7] To date, 3D printing has mainly been used in niche applications in sectors such as aerospace, automotive and medical instruments, and in the manufacture of prototypes and specialist components. However, its application could be extended to a wider range of products and sectors. One potential implication for warehouses could be a reduced need for inventory, with some (particularly 'slow-moving') items being printed as and when required rather than held in stock.

As well as these three significant technologies, the growth of technology platforms which connect businesses that need warehouse space with owners or occupiers that have surplus space could stimulate **on-demand warehousing and new models of occupation**.

In addition to platform providers such as Timocom, which describes itself as 'Europe's largest warehousing exchange' offering access to over 7,000 warehouse spaces in 44 countries, a number of third-party logistics service providers are also offering a similar service through their own portfolios.[8] The type of service on offer in on-demand warehouses varies from basic storage to more valued added services, including the use of automated solutions.

The use of this type of warehouse is relatively modest so far, but it could expand due to growing demand from businesses for flexible space to match volatile customer demand, and as part of a wider growth in the 'sharing economy'. This on-demand space is typically acquired on a pay per use basis, but other models could be applicable – such as where a company pays a subscription fee to a single landlord to access facilities (subject to space availability) where ever and whenever it needs them. These models challenge the traditional leasing model with potential implications for risk and value for property owners.

6. The Physical Internet has been defined by Benoit Montreuil its originator as 'a hyperconnected global logistics system enabling seamless open asset sharing and flow consolidation through standardised encapsulation, modularisation protocols and interfaces.' In Europe, the physical internet has been adopted by the Alliance for Logistics Innovation through Collaboration in Europe (ALICE), which is recognised by the European Commission as a European Technology Platform. One current focus of ALICE is the application of physical internet principles to city logistics.

7. Estimate for 2018 based on Wohlers Report 2019. https://all3dp.com/4/interview-terry-wohlers-state-3d-printing-industry-2019

8. For example, Wincanton the largest UK-based third party logistic service provider has a OneVastWarehouse platform.

Urbanisation

The growing challenges associated with logistics in cities mean that multi-level and multi-storey ramped buildings will become a necessary feature in certain major cities.

Urbanisation involves a growth in the number and proportion of people living in cities and urban areas and is, in many respects, a subset of demographic change. Although there has been some speculation that one impact of COVID-19 could be a slowdown in, or reversal of, urbanisation, we think this megatrend will continue long-term. Urbanisation is one of the main drivers behind the relatively recent rise of city or urban logistics, which is generating increasing demand from occupiers and growing interest from developers and investors.

Between 2000 and 2018 the proportion of Europe's population inhabiting urban areas rose from 71% to 75%, and by 2030 it is forecast to reach 77.5%.[9] Related to this trend, major European cities have typically grown more rapidly in economic and employment terms than their respective countries or the European Union (EU), and this is forecast to continue.

According to Oxford Economics, over the five years 2020-2024, 30 major cities in Europe are projected to see:

aggregate **GDP growth** of

1.3%

per annum

compared with **1.0%** for the EU and UK.

aggregate **employment growth** of

0.6%

per annum

compared with **0.3%** for the EU and UK.[10]

The growth of urban populations and economies has also been a factor behind the upward demand to deliver **online retail purchases** to home or collection points in urban areas. COVID-19, and the associated national lockdowns, resulted in a surge in online spending in many countries, including in grocery spending. As a result, many forecasts now suggest an acceleration in online growth, compared with rates of growth expected pre-COVID.

Across Europe, the **share of total retail sales** accounted for by online is estimated to have risen from **4.8%** in 2012 to

8.8%

in 2018[11]

Online retail growth from 2019 to 2024 is forecast to grow

11.5%

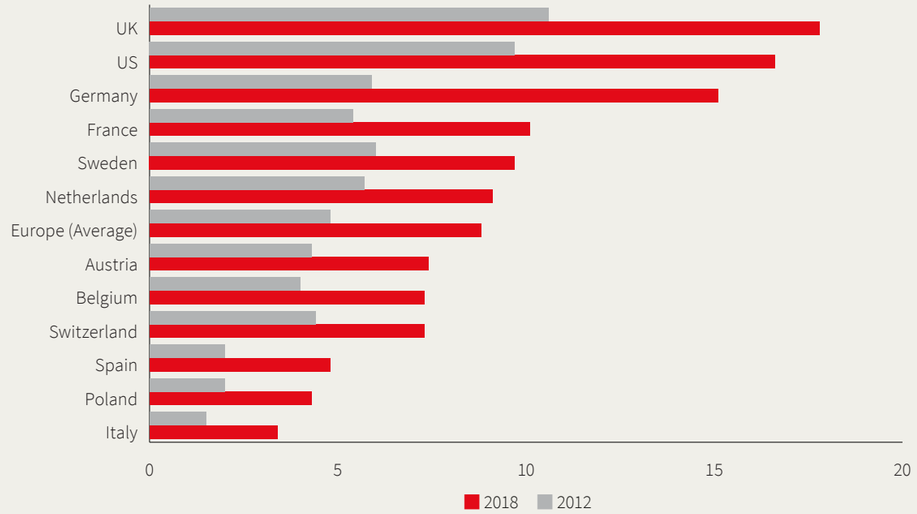
per year

across Western Europe.[12]

9. United Nations, 2018 Revision of World Urbanization Prospects.
10. Oxford Economics, European Cities and Regions Outlook, June 2020.
11. Centre for Retail Research Online: UK, Europe & N. America
12. Forrester, Online Retail Forecast, 2019 to 2024 (Western Europe), Q4 2019 Update, February 2020

Given the concentration of population, income and spending in major cities and urban areas it is unsurprising that these are the main destination for online deliveries.

Figure 2: Changes in online shares of retail trade 2012-2018



Source: Centre for Retail Research (CRR)

These factors have led to increasing demand for logistics services and buildings in cities. However, the land available for logistics in cities has generally diminished due to competition from higher-value land use, including growing housing need due to urbanisation.[13] In many cities former industrial and logistics uses have been displaced beyond the city, a trend sometimes referred to as 'logistics sprawl'.[14]

The imbalance between logistics demand and supply that has emerged in urban areas presents major challenges for logistics operators (occupiers) but huge opportunities for real estate developers and investors.

For **operators**, the challenges include sourcing appropriate and affordable facilities in and around cities to enable them to service their customers (whether B2B or B2C) efficiently and, increasingly, at greater speed. In addition, operators in cities must typically work around regulations designed to minimise the adverse impacts of freight transport such as congestion, air pollution, carbon emissions and noise. These include restrictions on lorry routes, the timing of deliveries, road pricing systems (such as congestion charging) and environmental zones, such as the low emission zones. Across Europe, these regulations are likely to become tougher due to rising concerns about air quality and sustainability.

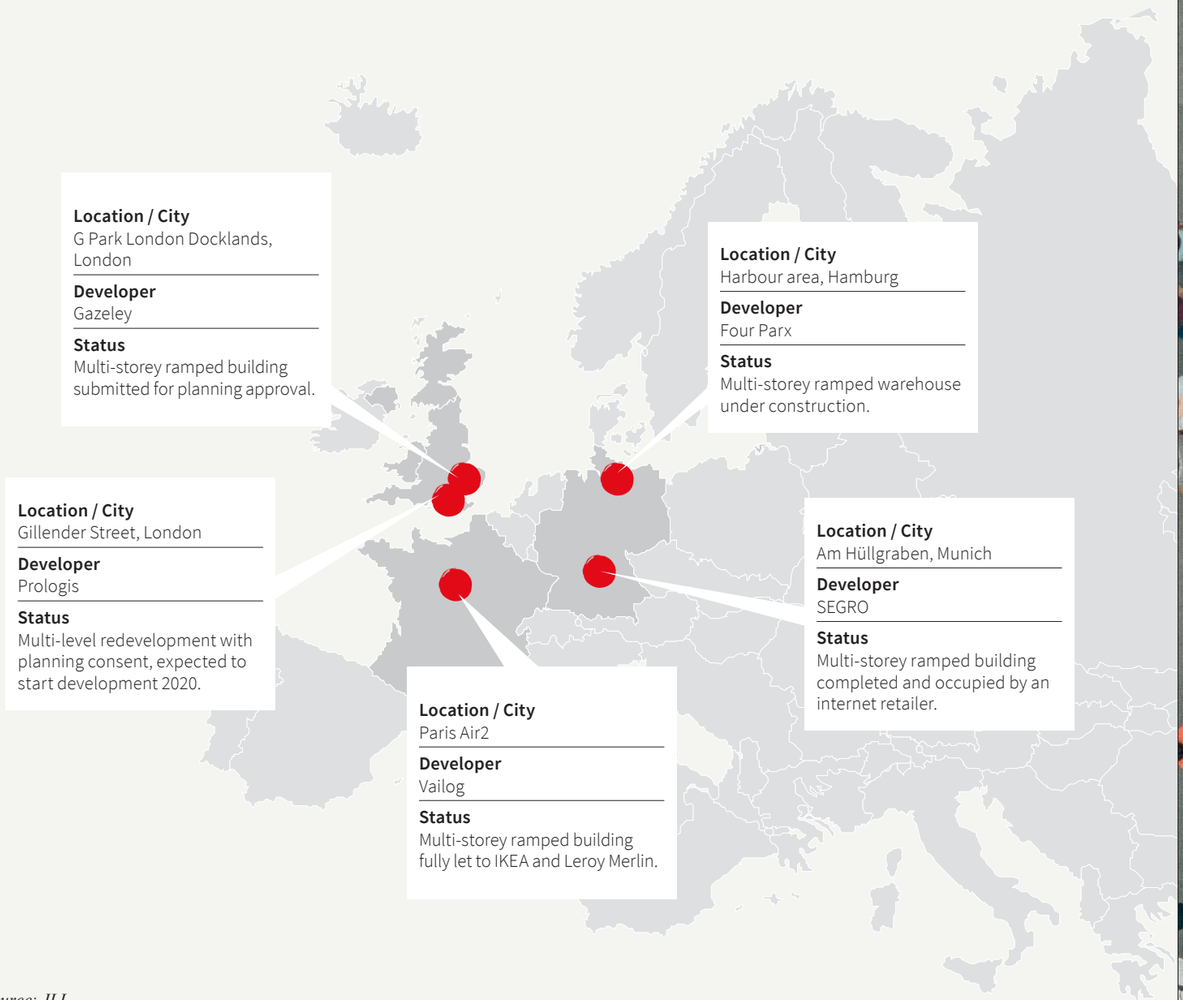
For **developers and investors**, the demand and supply dynamics in many cities are highly favourable as they are likely to underpin stronger rental growth than has typically been achieved by traditional (out of city) big-box logistics properties. In 2019, for example, SEGRO which owns both types of assets, reported rental value growth of 2.7% across its European big-box properties but 3.4% for its 'urban warehouses'.[15]

In certain European cities, where the availability of industrial land is particularly constrained and land values are high, we are beginning to see some 'industrial intensification' by the development of multi-level buildings, where the upper levels are serviced by cargo lifts, and multi-storey ramped buildings, which provide direct vehicle access to the upper floors.

13. London lost 1,300 hectares of industrial land between 2001 and 2015, according to the Greater London Authority (GLA).
14. The phrase 'logistics sprawl' is associated with Laetitia Dablanca and her research into the location of warehouse depots in Paris. See, for example, Laetitia Dablanc and Dina Rakotonarivo, The impacts of logistics sprawl: How does the location of parcel transport terminals affect the energy efficiency of goods' movements in Paris and what can we do about it?
15. SEGRO, 2019 Full Year Results, 14 February 2020

Urbanisation (continued)

Map 1: European examples of multi-level or multi-storey ramped warehouses



Source: JLL

These types of buildings are the norm in many cities in Asia Pacific, but have barely been seen in Europe in the recent period of modern logistics buildings.[16] To date, their development has been very limited and confined to a select few cities, but four out of five occupiers we contacted said they would consider occupying space within a multi-storey multi-user warehouse development. We expect to see more of these buildings coming forward in certain European cities combined, more generally, with a growth in 'urban infill' logistics development as major developers and investors such as Prologis, Gazeley, Goodman and Blackstone seek to realign their strategies with these urban dynamics.[17] In some cases urban infill for logistics may take the form of re-purposing retail, or other uses.

16. Multi-level warehouse buildings were more common in certain major European cities in the past, the best example being the Speicherstadt ('Warehouse District') in Hamburg, which is now a UNESCO World Heritage Site.

17. Blackstone launched it last-mile fund called Mileway in September 2019.

"To date, their development has been very limited and confined to a select few cities, but four out of five of occupiers we contacted said they would consider occupying space within a multi-storey multi-user warehouse development."

Sustainability

Sustainability raises huge challenges in terms of decarbonising logistics and will drive big changes in the design and specification of warehouses.

Sustainability is rapidly moving up political and business agendas, although meaningful actions have lagged behind.

The evidence on global warming presented in numerous studies by the Intergovernmental Panel on Climate Change (IPCC) is unequivocal. While the COP21 conference in Paris (2015) saw a commitment to keep the increase in average global temperature 'well below 2 degrees C between 1850 and 2100' it now seems clear that governments will not meet their commitments when these are reviewed at the COP26 conference in Glasgow which has been deferred until November 2021. It is unsurprising, therefore, that the World Economic Forum recently said that severe climate threats accounted for all its top long-term risks.[18]

In logistics, transport is a much larger contributor to greenhouse gas (GHG) emissions from supply chains than warehouse buildings – 87% compared with 13%. As a result, companies that wish to decarbonise will need to address their whole supply chains, including potentially more local sourcing, but the contribution from warehouses should clearly not be ignored.[19]

Sustainable 'green' warehouses have been promoted by developers for at least the past 15 years or so; for example, Gazeley launched its eco-template in 2003. However, we are not aware of any comprehensive statistics on the total stock of green warehouses in Europe.

Statistics we have sourced from BREEAM, the first building certification organisation and the market leader in Europe, show that across the EU-27 + UK countries around 2,200 industrial buildings secured some level of BREEAM certification between 2008 and 2018, 88% of which involved new constructions and 12% of which involved refurbishment or retrofits of existing (in-use) facilities. This is a relatively small number, although a more complete picture would also take account of certifications from other bodies, such as DGNB (the main certificating organisation in Germany), plus the fact that not all buildings that incorporate green features are certified.

Good examples of green warehouses can be found across Europe, as highlighted in Table 1. These buildings typically incorporate a range of design features, as illustrated in Table 2.

18. World Economic Forum, Global Risks Report 2020.

19. World Economic Forum/Accenture, Supply Chain Decarbonisation: role of transport and logistics in reducing supply chain carbon emissions, 2009 estimate that 87% of carbon emission in logistics were generated by transport and 13% by buildings.

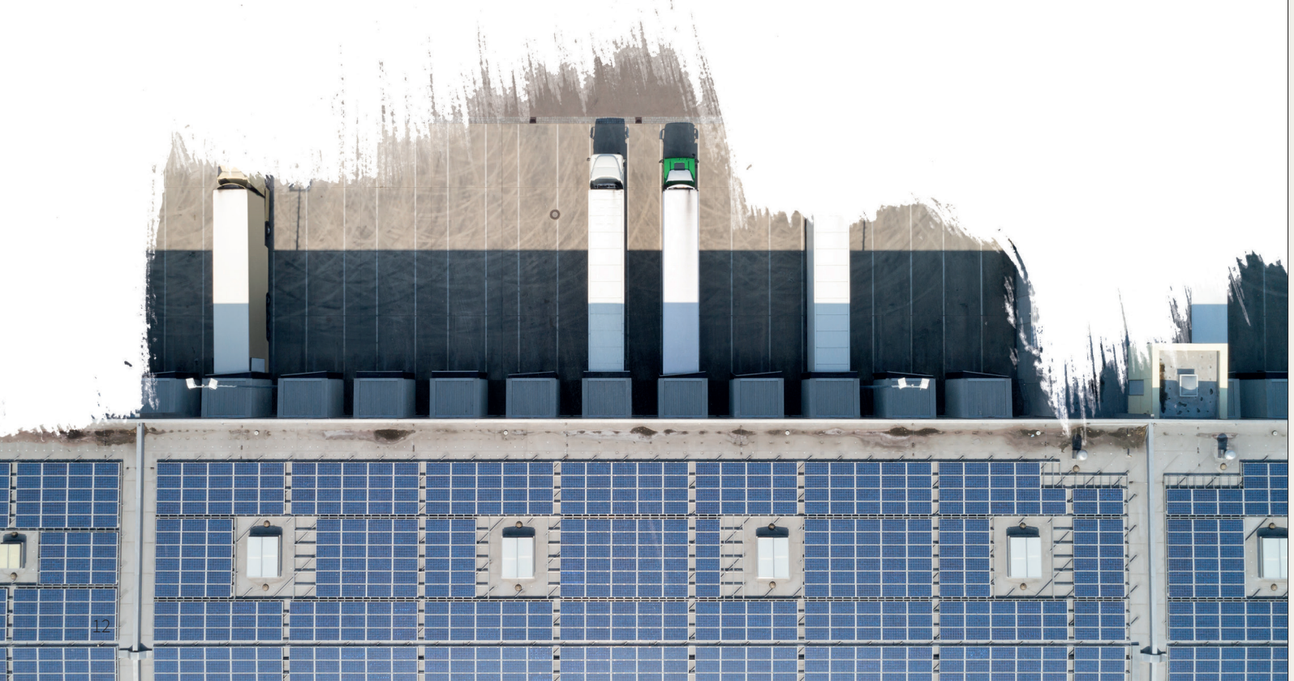


Table 1: Examples of green warehouses in Europe

Location / City	Developer	Comment
G-Park, Blue Planet, Staffordshire, UK	Gazeley	Speculative development awarded BREEAM Outstanding (at design). Occupied by JCB
L'Oreal warehouse, Muggensturm, Germany	Prologis	Awaiting DGNB Gold certification
Biocoop warehouse, Ollainville, France	Barjane	Awarded HQE Excellent and Biodiversity Excellent
The Tube, Tilburg, Netherlands	Dokvast	Owned and occupied by Rhenus Logistics Awarded BREEAM Outstanding
Nike Campus, Ham, Belgium		Awarded LEED Gold
South Gate Industrial Park, Moscow, Russia	Radius Group	Awarded BREEAM Very Good and LEED Silver
Amazon, Panattoni Park Prague Airport, Dobroviz, Czech Republic	Panattoni	Awarded BREEAM Excellent
Prologis Park Budapest, DC12, Hungary	Prologis	Awarded BREEAM Very Good
Building C, SEGRO Logistics Park Warsaw, Nadarzyn, Poland	SEGRO	Awarded BREEAM Very Good
Vailog, Verona, Italy	Vailog	Awarded DGNB Platinum
Lidl, Plataforma Logística, Cheste, Spain	Bertolin Group	Awarded BREEAM Excellent and awaiting AENOR Zero Waste certification

Source: JLL Research

Table 2: Selective green warehouse design features

Feature	Comment
Significant proportion of building materials sourced locally/ regionally	Reduce transport emissions during construction phase
High-efficiency roofing and walls	Optimise interior temperatures, minimise energy wastage
Rooflights (and/or above dock areas)	Reduce need for lighting in day
Internal/external LED lighting	Reduce energy usage and light pollution
Rainwater harvesting	Minimise water consumption
Rooftop solar panels	Generation of green energy
Wind turbines and other green energy generation	Generation of green energy
Electric car charging stations	Reduce emissions from commuters
Battery storage	Allow occupiers to vary their battery requirements
Designed for deconstruction / disassembly	Reduce emissions at end of life demolition

Source: JLL Research

Independent research on green buildings in general highlights significant benefits to occupiers and investors, including reduced operating costs and higher asset values, as highlighted in Table 3.

Table 3: Business benefits expected from Green Buildings (Median values reported in 2012, 2015 and 2018 surveys)

	New Green Building		
	2012	2015	2018
Decreased 12-Month Operating Costs	8%	9%	8%
Decreased 5-Year Operating Costs	15%	14%	14%
Increased Asset value (according to owners)	5%	7%	7%
Payback Time for Green Investments	8 years	8 years	7 years

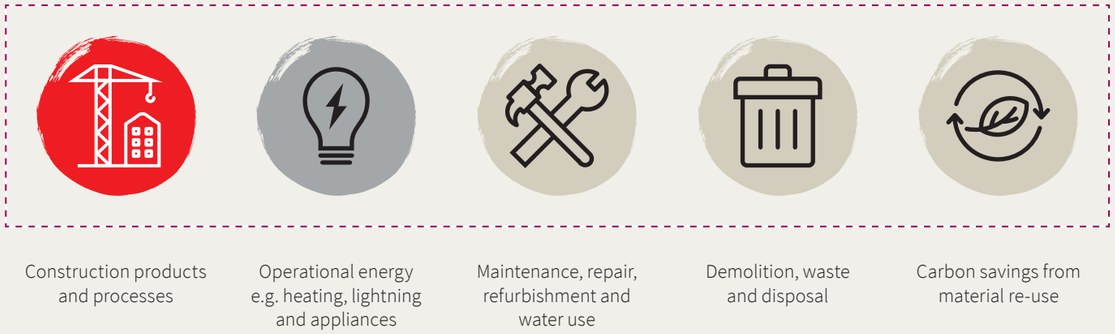
Source: Dodge Data & Analytics, World Green Building Trends 2018. Based on all types of green buildings.

Sustainability (continued)

Over the next 5 to 10 years and beyond, we anticipate growing demand for green warehouses, including **net zero carbon buildings** as major companies make commitments on carbon emissions. Three-quarters of the major occupiers we contacted either 'strongly agreed' or 'agreed' that reducing carbon emissions associated with their warehouse operations was very important. More broadly, 937 companies are taking science-based climate action as part of the 'Science Based Targets' initiative, which is part of the wider "We Mean Business" coalition. We would expect these companies, and others with similar commitments, to be among those most likely to drive demand where they have relevant facilities.[20]

Net zero carbon buildings are based on a 'whole-life' approach and have been defined as 'when the amount of carbon emissions associated with a building's embodied and operational impacts over the life of the building, including its disposal, are zero or negative.'[21] As Figure 3 highlights this 'whole-life' approach encompasses building construction, operation, end-of-life and beyond end-of-life scopes.

Figure 3: Breakdown of net zero carbon – whole-life



Source: Adapted from UK Green Building Council. Net Zero Carbon Buildings: A Framework Definition

20. The Science Based Targets initiative is a collaboration between CDP, the United Nations Global Compact (UNGC), World Resources Institute (WRI), and the World Wide Fund for Nature (WWF) and one of the We Mean Business Coalition commitments. See. www.sciencebasedtargets.org

21. UK Green Building Council, Net Zero Carbon Buildings: A Framework Definition, April 2019

Over time the sustainability agenda has broadened to embrace not just environmental issues but other social and governance factors (ESG factors). In this context, there is an emerging interest among some developers and investors in developing warehouses or logistics parks that provide enhanced building characteristics and amenities which address **worker wellbeing**, and which also offer opportunities for occupiers to engage with the local community.

This interest largely reflects the increasing challenges that companies are facing in attracting and retaining labour for warehouses, as outlined in our discussion on 'Demographic change' earlier. In this respect, warehouses and parks that provide better building features and amenities and which offer their occupiers an opportunity to engage with the local community (which is often a primary source of labour) may provide a competitive advantage for companies in terms of labour recruitment and retention, especially if the wider proliferation of automation and robots leads to increasing requirements for labour with higher skills. As such, these buildings and parks may also be expected to give developers and investor owners their own competitive advantage.

One manifestation of this approach is the nascent interest among some warehouse developers, investors and occupiers in securing the WELL Building Standard. The foundation WELL version 1 is based around seven broad concepts while Version 2 is based on 10.

Table 4: The WELL Building concepts

WELL V1	WELL V2
Air	Air
Water	Water
Nourishment	Nourishment
Light	Light
Fitness	Movement
Comfort	Thermal Comfort
Mind	Sound
	Materials
	Mind
	Community

Source: International Well Building Institute

Developers and investors at the forefront of incorporating wellbeing and a human-centric approach to designing their buildings and parks include:

- **Prologis**
  In the UK, Prologis's PARKlife concept embraces the provision of a range of park-wide services and amenities including green spaces, paths, running trails, cycleways and green travel plans to provide an environment that is good for its customers, their employees and the wider community.[22] In addition, according to Prologis, its DC5 warehouse at Tilburg in the Netherlands is the first European facility to comply with the WELL Building Standard.[23]
- **Gazeley**
  Gazeley's enhanced base build specification includes a host of wellbeing elements that are designed to achieve the WELL Building Standard. Its speculative Altitude development at Magna Park, Milton Keynes in the UK was developed as 'WELL ready', subject to an occupier's own operational requirements.[24]
- **Delta Development Group**
  Delta's developments are based on a 'Cradle to Cradle' circular design philosophy and a human centred design approach.[25]

  Although WELL certification is very new in warehousing, with only one scheme certified in Europe and a further two globally, we envisage growing interest in wellbeing considerations in warehouse design among both occupiers and developers and investors, with or without WELL Building certification.[26] This will have implications for the design of logistics buildings and their external areas together with their positioning within the wider local community.

22. www.prologis.co.uk/park-life

23. Prologis, Top Solutions to Source, Train and Retain Labour in Logistics Facilities, March 2019

24. https://altitudemk.com/the-building

25. www.deltadevelopment.eu/en

26. Figures supplied to JLL by the Well Building Institute.
Figures are up to the end of 2019.

Conclusions
Beyond COVID-19: Logistics buildings of tomorrow

In this paper we have highlighted the challenges posed by four megatrends, which we believe will be the major drivers of change over the medium and long-term even though the impact of COVID-19 dominates current and short-term planning.

Demographics

Ageing populations will mean that the labour supply in most European countries will grow more slowly than the total population and in some countries it will contract. While unemployment rates are likely to rise in the short-term due to COVID-19 induced recessions, longer term, this will increase the challenge of attracting labour to work in warehouses and transport.

Technological change

The rise of automation and robots will challenge the design and specification of logistics buildings and their locations will need to have access to sufficient power. By facilitating a growth in on-demand buildings, technology platforms will challenge existing models of occupation and use.

Urbanisation

Population (and economic) growth in cities will increase the demand for logistics services but intensify demand for land from other competing uses. Occupiers, developers and investors will be challenged to intensify their use of land for logistics in major cities and to make city logistics more efficient, more sustainable and with fewer adverse impacts.

Sustainability

The urgent need to decarbonise logistics will challenge existing logistics buildings and operations, and lead to a wider re-configuration of supply chains.

In the future, as is the case now, the design and location of warehouses will reflect the function they perform in the supply chain, such as inventory holding, cross docking and final delivery to customers. As a result, the logistics buildings of tomorrow will be characterised by different sizes, shapes and specifications and different locations.

However, based on our analysis, we envisage that

10 key attributes

will characterise an increasing number of tomorrow's logistics buildings.

People will remain key for the foreseeable future

1. Tomorrow's logistics buildings will still require significant labour

Labour will remain a critical operational factor for occupiers, and buildings in locations that do not provide access to sufficient labour will have a greater void risk. Occupiers, developers and investors will all need to pay closer attention to labour availability and quality of available labour. Even if unemployment rises in the short-term, occupiers (and developers and investors) could benefit by looking at ways of attracting workers from a deeper pool of labour, including through initiatives to attract people who may be economically inactive but who want a job. This could include linking up with charities working with ex-offenders, homeless people, people with learning difficulties or people with mental health issues; and supporting local training initiatives.

2. Tomorrow's logistics buildings will require more skilled labour

In the long-term, the wider adoption of automation and robots will reduce warehouse labour overall yet lead to increased demand for higher skilled personnel such as warehouse systems managers, data analysts and engineers to ensure the automated systems function optimally. To attract higher-quality workers, companies will need to have greater regard to the quality of the working environment and staff amenities provided.

More automation, robots and smart logistics buildings that are part of a fully connected network

3. Tomorrow's logistics buildings will tend to be taller but smaller than their manual counterparts

Automation and robots will result in warehouse buildings with smaller footprints as occupiers will be able to use the cubic capacity of their buildings more efficiently. This will lead to increasing demand for taller buildings to permit Automated Storage and Retrieval Systems (which typically require heights of 22-24 metres and over) or multiple mezzanine floors, which may enable the widespread deployment of robots.

4. Tomorrow's logistics buildings that are more automated will require access to more power than their manual counterparts

Power requirements will increase not only due to automation but to accommodate growing demand for electric charging points for material handling equipment, delivery vehicles and cars. Power will become a critical location consideration.

5. Tomorrow's logistics buildings will increasingly be 'smart' warehouses and part of a connected physical distribution and information network

Although, at present we are aware of very few 'smart' warehouses that are utilising Internet of Things technology and big data analytics, as these technologies proliferate this will lead to a growth in 'smart' warehouses. As a result, warehouses will become critical nodes for the flow of information in supply chain networks in addition to their traditional role in the movement of physical materials and goods. Tomorrow's logistics buildings will therefore be part of a fully connected physical distribution and information network. These networks could be 'private' and confined to the supply chain parties, or 'open', as with the Physical Internet concept. The latter incorporates elements of standardisation (e.g. in freight capsules and material handling equipment) in order to facilitate shared use.

6. Tomorrow's logistics buildings will include facilities that can be used 'on-demand'

These facilities will provide occupiers with more flexibility to meet volatile customer demand and provide a different model for occupation than the standard lease commitment.

Multi-level and multi-storey buildings will become a feature of logistics in certain major cities

7. Tomorrow's logistics buildings in major cities will include multi-level and multi-storey ramped developments

Urbanisation will increase demand for city logistics and the need for innovative types of multi-level/ multi-storey buildings in selective cities. This represents a shift in location from the 'big boxes' that have previously dominated the modern logistics era, as these have been mainly located at major gateway locations (notably around large container seaports and freight airports), alongside key motorway corridors for strategic retail distribution, or close to large manufacturing centres.

The predicted acceleration in e-commerce will also drive demand in cities and major urban areas to support last mile fulfilment. In turn, this demand will encourage wider urban infill by developers and investors, which in some locations will include the re-purposing of retail, and other, uses.

8. Tomorrow's logistics buildings in cities will be designed for rapid throughput with requirements for more doors, more yard space and more energy supply points

Given constraints on land and pressures to improve the sustainability of logistics in cities, we think more of these buildings will be based on a collaborative, shared user, approach.

Green warehouses that incorporate a human centric approach to design

9. Tomorrow's logistics buildings will increasingly be green warehouses including net zero carbon buildings

Rising corporate concerns about the climate emergency and ways to reduce carbon emissions will mean growing demand for green buildings. Existing buildings will need to be renovated and retrofitted with carbon-reducing systems and the construction of new buildings will need to minimise whole-life emissions in order to avoid obsolescence. Companies will also seek to reduce the emissions associated with their transport operations, which may lead to some modal shift to rail or water and greater demand for intermodal or multi-modal logistics locations.

10. The logistics buildings of tomorrow will more widely embrace human-centric design considerations

Occupiers, developers and investors will take more account of human-centric design considerations for their warehouses to help them attract and retain workers.

We look forward to hearing from you about what you think the key attributes of tomorrow's logistics buildings will be.

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