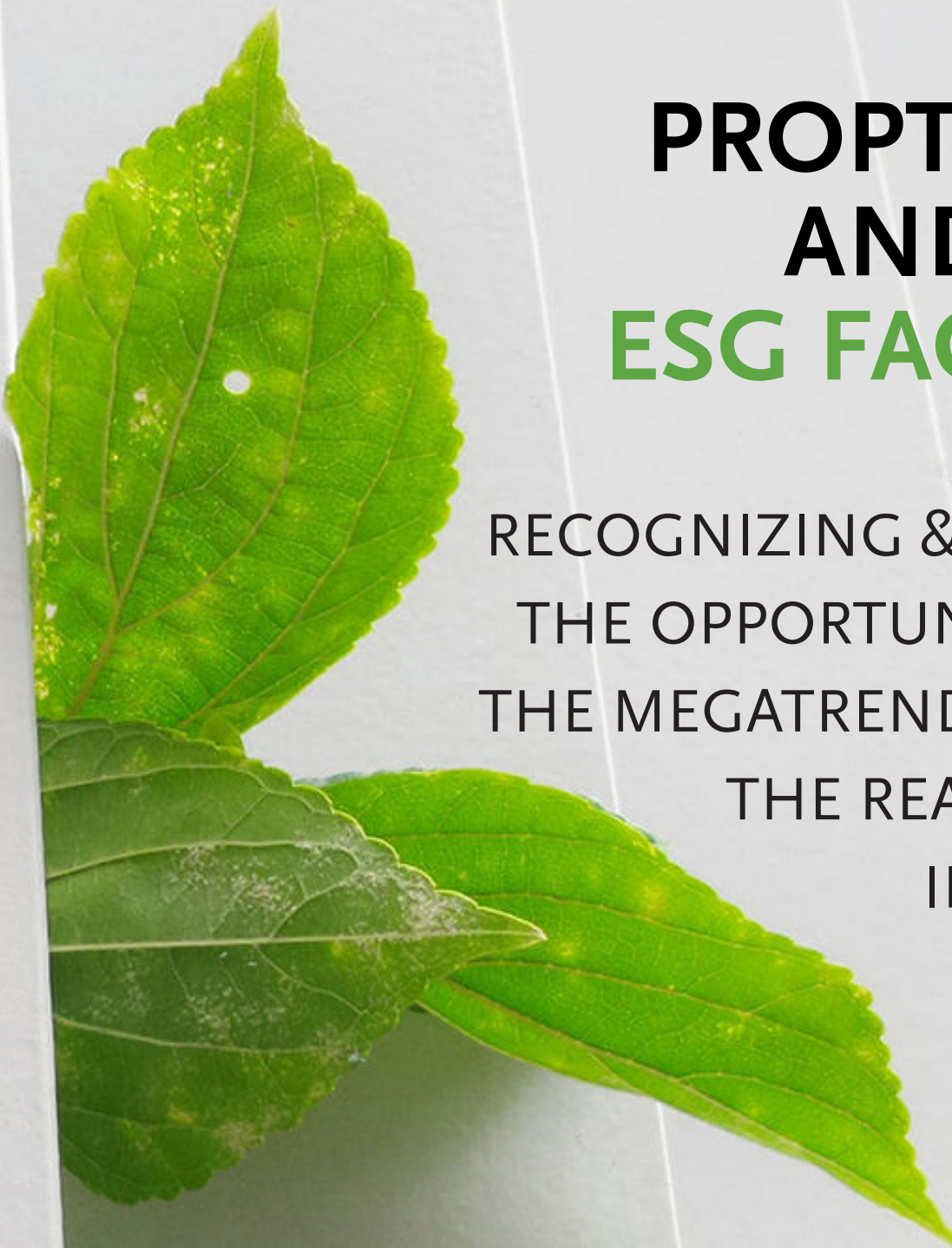






PROPTECHS AND THE ESG FACTOR:


RECOGNIZING & SEIZING
THE OPPORTUNITIES OF
THE MEGATREND WITHIN
THE REAL ESTATE
INDUSTRY





EXECUTIVE SUMMARY


 The construction and operation of real estate is the world's largest contributor to CO₂ emissions. Due to the combination of public pressure, EU regulations, capital market requirements, and customer demands, sustainability will become the megatrend of the next decades ahead.


 The expected excess demand for solutions in the real estate industry triggers a historically large opportunity for providers with scalable solutions. A multi-billion challenge creates a multi-billion opportunity.


 The importance of green buildings for a decarbonized future is rising, but in Europe it is not shiny new flagship projects that offer the most savings potential, but the efficient modernization of existing properties, which account for the majority of CO₂ emissions.

 ESG challenges are not just about carbon emissions, but draw attention to the simmering social, income-based conflict, especially in metropolitan areas, that culminates in the debate about rental prices. Socially responsible action will become a central aspect of an ESG-compliant strategy.

 The failure of the real estate industry to create a sufficient data basis has created considerable liability risks in the area of governance, which can no longer be ignored due to the significantly increased transparency and liability requirements.

 Startups are stepping up to make up for the data backlog through scalable technologies and methods, the creation of implementation plans for the digital transition, and solutions to the labor shortage through method innovation.

 As is often the case, proactive real estate companies are the change winners. Strategic cooperation with startups is not only "nice to have", but usually has no alternative due to the systemic deficits of established companies.

 In addition to operational partnerships, taking on the role of an investor can be seen as the gold standard of these cooperations, enabling participation in the value increase of the startups. Entering into direct investments is tempting but limited in scalability, possible only through a structured corporate venture approach. External venture capital funds therefore offer the optimal innovation strategy.

CURRENT PROPTECH1 PORTFOLIO



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Introduction

Despite the chaos inflicted on the real estate sector by the COVID-19 pandemic, the topic of sustainability, as defined by ESG (Environmental – Social – Governance), is still the most hotly debated and relevant topic within the real estate industry, both in the last year, and in the years to come. If anything, COVID-19 has shown the hugely negative impact an external factor can induce both on the global economy in general and the real estate industry in particular.

Assessing and mitigating risks – whether they stem from external sources like climate change or internal sources like real estate's handling of social aspects – is one of the crucial elements of leading a company or, to put it differently, good governance. The typical reaction of real estate managers to the regulatory tightening coming their way, however, is that of plain annoyance. Increasing ESG regulation by the EU has intensified reporting duties, which has only put the industry's insufficient data basis even more into the spotlight and therefore also its struggle to adequately report on its climate impact.

However, the ESG megatrend, which is driven by regulatory, societal, and investor pressure, is not going away anytime soon. Merely worrying about its effects on one's own

legacy portfolio is hardly the right course of action. On the contrary, a future-oriented business strategy will entail seizing the opportunities that arise from this megatrend while making use of future-oriented technological solutions. While it might not come as a surprise that the traditionally slower – if not to say immobile – real estate industry has, for the most part, failed to capitalize on the emerging ESG developments, some venture capital investors are catching on. Several climate-focused funds, particularly in the US such as Union Square's recently announced climate fund, are currently being raised and will likely find worthwhile investment targets that address ESG issues in a meaningful way.

In this whitepaper, we will firstly explain why ESG will only become increasingly relevant and important for the real estate industry. Subsequently, we will go into further detail on immediately relevant aspects for the built world within the "E", "S", and "G" subcategories. Finally, in the last chapter we will provide concrete examples of technologies and startup solutions that will profit from the megatrend and should be on the radar of every real estate manager.

PROPTECH1 RESEARCH

PropTech1 Ventures, Germany's first venture capital fund focusing on European PropTech startups, employs a team of analysts who research and examine in detail the most important trends, key market developments, and most promising European real estate startups.

We publish the essence of our research at irregular intervals, discussing different sub-segments of the PropTech market. By doing so, we aim to shine a light on new and interesting trends that often question the traditional processes and power distributions within the real estate industry, as well as bring attention to opportunities and risks for incumbents.

In order not to miss any future Deep Dives, please enter your contact details [here](#), and we will send you new editions as soon as they are released via e-mail.

1 ESG Drivers

1.1 ESG Pressure from European Regulations

Europe has set out a goal to become climate-neutral by 2050 and real estate has a critical role to play in achieving this goal, as it contributes to approximately 40% of global carbon emissions. In 2016, the Paris Agreement set the base for a collaborative agenda to combat and adapt to climate change. The global agreement states that the global temperature levels must not rise by more than 2 degrees Celsius, preferably not more than 1.5 degrees Celsius, compared to pre-industrial levels. The EU and its member states are part of the 195 parties that have signed the Paris Agreement. Through various regulations and future agreements, the European Commission has demonstrated that it has not made empty promises with the agreement. We will now make a quick detour into the EU regulations that are bound to have a striking effect on the real estate industry.

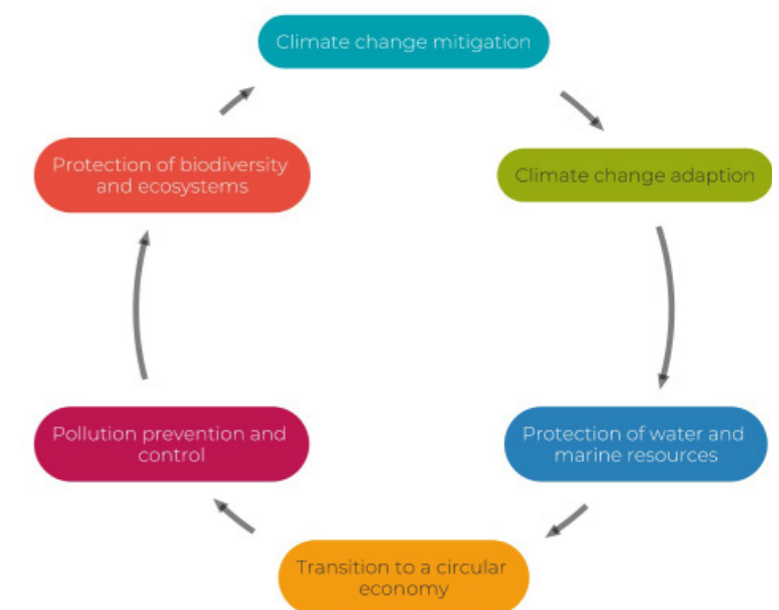
EU Green Deal

In line with the commitments made during the Paris Agreement, the European Green Deal was presented in December 2019. With this the EU published a roadmap that addresses all sectors of the economy and reflects its ambition for Europe to become the world's first climate-neutral continent by 2050. In September 2020, the climate target for 2030 was revised, upping the decarbonization target of a reduction of greenhouse gases from previously 40% to at least 55% below 1990 levels. This sets an even more ambitious path for all sectors of the EU economy to drastically reduce CO₂ emission and should act as an indication for stricter regulations to come. With regards to the building sector, goals to reduce building emissions by 40% until 2030 were published alongside the new target. This is to be achieved through multiple new initiatives including the launch of a renovation wave to improve housing quality and energy effi-

ciency in the EU and a strengthening of the role of eco-design standards of buildings. In the energy sector an even more ambitious target requires a reduction of emissions by 75% by 2030.

EU Taxonomy

In order to facilitate the classification of sustainable investments and activities and incentivise a necessary reallocation of capital, the EU set a goal to establish an EU-wide classification system, the EU Taxonomy. The EU Taxonomy will clearly identify environmentally friendly investments and activities in order to help companies, investors, and issuers recognise sustainable assets and therefore mobilize institutional and private capital towards green investments. For the classification, six environmental objectives have been named:



The regulation will require financial market participants and large public-interest companies with more than 500 employees subject to disclosure requirements under NFRD (Non-Financial Reporting Directive) in order to make sustainability disclosures with reference to the objectives defined in the Taxonomy. The extent of these disclosures is not yet defined and will be published by the end of Q2 2021. However, it is already clear that parties aiming to market financial products and economic activities as sustainable will have to classify their products under the taxonomy criteria. For the real estate industry, the regulation will set a path towards more climate-friendly management and assets and will also require significantly more transparency for real estate funds and investors. For instance, real estate funds will have to disclose which environmental objective individual financial products they pursue, how and to what extent the fund is invested in sustainable economic activities and assets, and, if applicable, what proportion of this is taken up by transitional and enabling activities. Going forward, only the top 15 percent of properties in each local market, in terms of energy efficiency and greenhouse gas emissions, will be classified as sustainable under the taxonomy. The processing, preparation and use of data will require corresponding capacities as well as a strong IT infrastructure. In addition, sufficient expertise must be available in the organization to be able to meet the extended reporting requirements. Thus, to meet the requirements of the EU Taxonomy, a comprehensive transformation of the entire value chain is required.

Further regulations on the EU national and local level

Apart from the Taxonomy regulation, many other regulations targeting the decarbonization of the economy and the reallocation of capital have been established or will follow in the upcoming quarters. For instance, from 2021, the MiFID II regulation will require

asset managers and investment advisors to advise clients on social and environmental aspects and to enquire about the investors' preferences towards sustainable assets in their portfolio. Regulations specifically targeting the real estate sector have also been initiated with the updated EU directive on the energy performance of buildings and the updated EU directive on energy efficiency. These directives, for instance, serve as a basis for the German national "Gebäudeenergiegesetz" (GEG) that, among others, prohibits the installation of new oil boilers in buildings from 2026 and posts additional requirements for energy performance certificates of buildings to include information on CO₂ emissions from the end of 2020 onwards. Moreover, the Netherlands will forbid the renting out of buildings that cannot prove an EPC Rating of A by 2030, whilst in New York, buildings that cannot lower their emissions by 40% until 2030 will be faced with high penalties.

The UK government has also recently set out plans to radically improve the energy performance of buildings. For new homes, the aim is to reduce carbon emissions by 75-80% by 2025. Existing homes will be subject to higher standards and energy efficient replacements of windows and heat pumps, among other interiors, will be required. In France, regulations require all new buildings to produce more energy than they use and existing buildings to reduce energy consumption by 38% by 2021. Across the pond, with the recent change in power in the US, a strong surge towards greener politics can be witnessed: Within his first days in office, President Biden ordered the rejoining of the Paris Agreement and the establishment of a variety of environmental protections, including the establishment of an Office of Domestic Climate Policy and a national climate task force. This sudden change in direction in US politics sends a strong signal to economies all over the world. For Eastern Europe, EU-wide requirements and the push of

1.2

ESG pressure from capital markets and investors

Western economies towards greener policies constitute an even bigger challenge, as it becomes increasingly difficult for them to catch up.

When it comes to local politics, the advance of green policies is also inevitable. In Paris, a city that at present has a fewer-than-average amount of green areas, a climate action renewal plan aims for the city to achieve carbon neutrality by 2050. The city's plan includes planting over 170,000 trees and turning 60 hectares of developed land into green zones until 2025. Furthermore, the plans aim to rehabilitate old buildings with eco-friendly materials such as wood and straw, rather than demolishing them. In Vienna, a city known as the greenest city in the world, where green areas cover 50% of its surface, all new buildings are required to integrate planted facades, and specific zones are declared as green and are protected from new developments. London's Mayor Sadiq Khan also has big plans to transform the city into a net zero city by 2040. To achieve this goal, the use of solar energy will be multiplied by a factor of 20, zero emission zones will be established, and buildings will face stricter energy efficiency regulations. Therefore, major future investments will predominantly target causes that support the carbon neutrality goals of the city.

Ultimately, environmental regulations across multiple locations will continue to target different subsegments within the real estate sector in the following years. Staying competitive in this changing market means anticipating and preparing for these regulations and working towards carbon-neutral business activities.

More than 120 countries have made their net zero ambition clear, yet these countries account for less than a quarter of all global greenhouse gas emissions, and many of the world's largest emitters are not doing enough to address the problem. China, for example, has reportedly resumed construction of the world's largest pipeline for new coal-fired power plants, despite Xi Jinping's announcement during the United Nations General Assembly that China will become carbon-neutral by 2060.

Interestingly, it is investors who fill the gap formed by the inactivity of influential governments. Investors play a central role in motivating companies because they have an inherent interest in freeing their investments from risk. Investors acting both on their own and through activist groups (TCFD, NGFS, ClimateAction100+, PRI, IIGCC) have begun to put pressure on companies. Most recently, a group of leading global investors, through the Institutional Investors Group on Climate Change (IIGCC), called on 36 of Europe's largest companies to adequately reflect the impact of global commitments to limit temperature rise to well below 2 degrees Celsius, and ideally to 1.5 degrees, in their annual financial statements. For example, Natasha Llandell-Mills, co-founder of the IIGCC, was quoted unequivocally in an interview with Handelsblatt: "Either we get serious and start shifting capital flows to activities that are in line with the Paris climate agreement, or we just keep talking about it." The IIGCC represents more than 250 members - mainly European pension funds and asset managers - with more than €33 trillion in assets under management. Climate Action 100+ is another investor initiative designed to ensure that the world's largest companies take necessary action on climate change. The companies include the

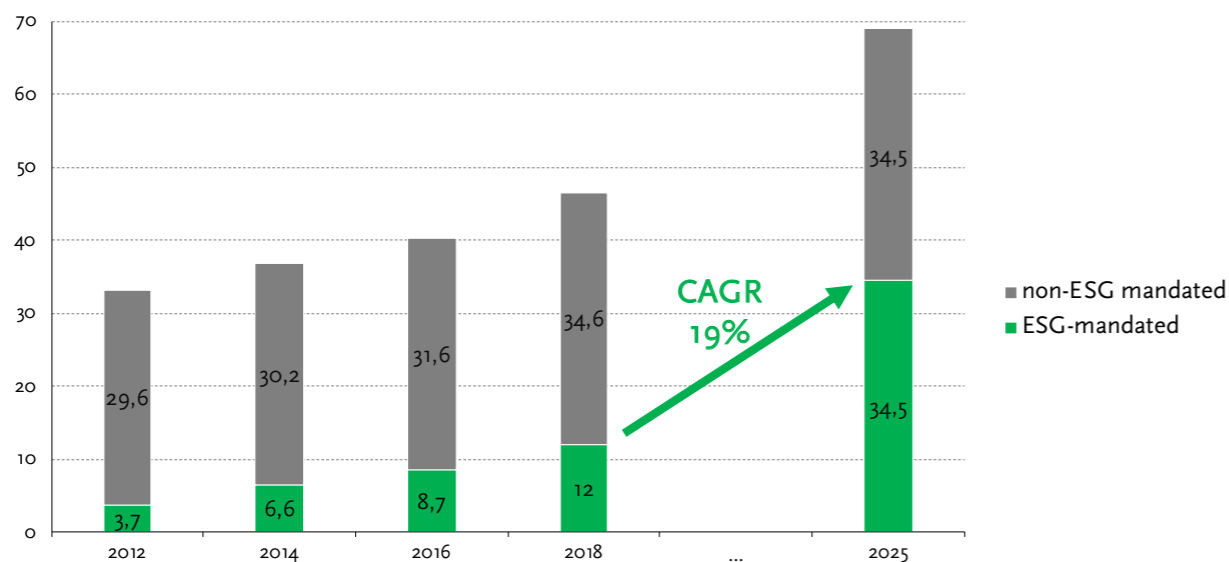
100 companies across the planet with the highest combined direct and indirect greenhouse gas emissions, responsible for two-thirds of annual global industrial emissions, and more than 60 others with opportunities to drive the transition to clean energy. To date, 545 investors with nearly \$52 trillion in assets under management have joined the initiative.

Pressure is also coming from individual institutional investors, such as the world's largest asset manager Blackrock. In his annual "Letter to CEOs", Blackrock CEO Larry Fink points to a significant reallocation of capital coming in the near future and sooner than expected. He warns that waiting too long and not addressing sustainability risks will be met with growing skepticism from markets and eventually lead to a higher cost of capital. Blackrock itself aims to increase its sustainable assets elevenfold from \$90 billion to \$1 trillion by 2030. In addition, the asset manager plans to double the number of sustainability-focused exchange-traded funds it offers and increasingly remove companies that violate ESG criteria from its actively managed portfolio. The Norwegian sovereign wealth fund has also been expecting greater transparency from companies in its portfolio for years, especially regarding their sustainability risks. Since 2015, the

fund has made multiple divestments due to product or behavior-based violations of ESG values. Fund CEO Yngve Slyngstad emphasizes that investors are becoming more sophisticated and will scrutinise the green impact of their investments more closely. Ignoring these ESG-managed assets will mean ignoring half the market in the near future, according to a study by Deloitte. The study shows projections for assets managed by institutional investors exemplified in the U.S.: Here, it is found that the size of non-ESG-mandated assets will stagnate at a magnitude of \$34.5 trillion from today to 2025, but ESG-mandated assets will grow from \$12 trillion to the equally large figure of \$34.5 trillion. The question for every entrepreneur, whether he or she is in real estate or not, is whether they prefer to be active in a growing or in a stagnating market.

The flow of capital is increasingly moving in the direction of sustainability, and this trend will only intensify in the coming years. For companies in all sectors, a change in mindset is therefore mandatory. For players that refuse to make their strategies more sustainable, this will ultimately lead to restricted access to capital and major environmental and reputational risks. Anticipating these risks today is already critical to long-term survival.

PROFESSIONALLY MANAGED ASSETS IN THE UNITED STATES (IN US\$ TRILLION)



Source: Deloitte Center for Financial Services: analysis through 2025

1.3 ESG pressure from societal forces

Alongside new regulations and capital reallocations, the increasing trend towards ESG investing is also driven by significant social pressure, which has created heightened awareness of ESG risks across all sectors. In order to fully understand these dynamics, we need to start at the most basic level: the public.

The moment we will have hopefully gotten the Corona virus under control, the public focus will shift again towards other pressing matters. Protests, strikes, and civil movements under the banner of environmental and social awareness have become more frequent occurrences prior to the pandemic. In September 2019, the largest climate strikes in history took place during the so-called "Global Week for Future". Environmental events such as Fridays for Future will likely return as a frequent occurrence once again. While such demonstrations cannot force change to immediately come into existence, they are a clear sign of the demands present in society.

Increased pressure originating from the general public is clearly represented in political election outcomes on a national and European level. In Germany, we can see increased interest and engagement on topics closely related to the climate crisis. This is indicated by results from polls for the upcoming election in the Fall of 2021, in which 17-21% of voters have stated their support for the green party (up from 9% in the last election). Moreover, the number of members of the green party has almost doubled in the last decade. Across the European continent, green parties appear on the verge of eclipsing social-democratic parties as the main electoral voice of the left. Especially in the most recent 2019 European election, green parties saw unprecedented success. 74 Members of the European Parliament representing the European

Green Party were elected, up from 47 members which were elected in 2014.

The shift towards ESG values can be seen across other parties as well. As evidenced by the recent developments in Germany centered around the quota for women in executive board positions, traditionally more conservative parties or individuals are increasingly open to discuss issues closely related to the social ESG principals. Germany, however, is not the only example. Norway was the first country in Europe to implement woman quotas for board positions. Conservative parties are also keen to respond to the population's desire for more climate protection, while naturally having an inherent interest in mitigating the risk stemming from the climate crisis.

On a local political level, France offers a good example of the increasing influence of the green party in city politics as well: During the local government elections in 2020, the green party won a number of major cities including Lyon, Marseille, Bordeaux, Strasbourg, and Grenoble for the first time and will therefore elect green mayors. The city of Paris with its green mayor, Anne Hidalgo, has recently made headlines with its plans to become a 15-minute city intended for people, not cars. It aims to create neighborhoods where every essential residents' needs are easily within reach in 15 minutes by bike or walking. Besides improving health by eliminating pollution, promoting mobility, and increasing local consumption thanks to pedestrianization, this will also result in an immense reduction of carbon emissions. It is not a question of if, but when, other cities will introduce more of these climate centered policies. Hence, existing real estate within the cities of the future will inevitably face a new wave of green regulations.

2 ESG Sectors in the Spotlight

2.1 “E” in ESG: Green Buildings

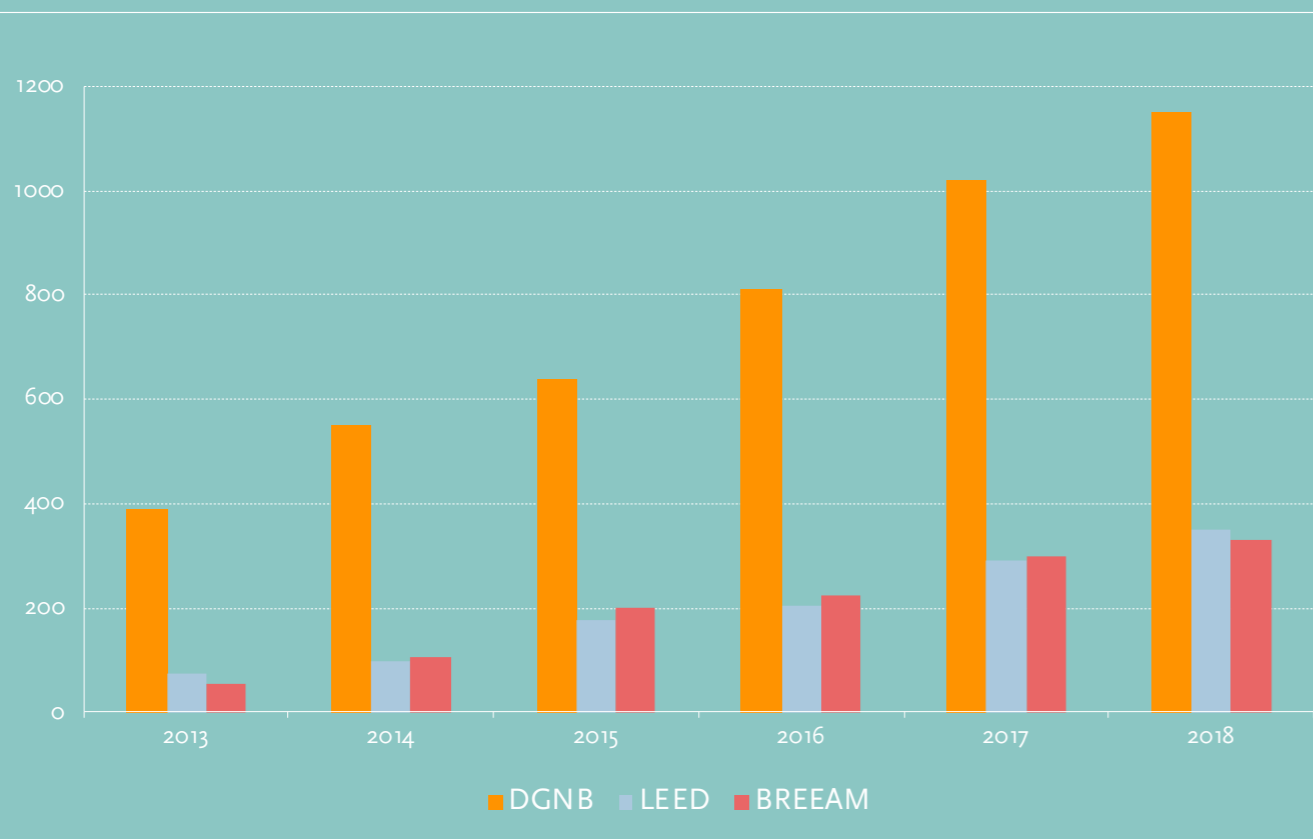
The World Green Building Council defines a green building as “a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment.” More real estate players are actively trying to build green buildings or upgrade current buildings, transforming them into buildings that operate in a sustainable way.

A building’s sustainability is becoming increasingly recognized as both an important and differentiating factor for office tenants, signaling the importance of environmental responsibility within the company’s culture. The transaction volume is impressive: In 2018 a total of 10.1 billion Euros worth of green real estate changed ownership in single deals across Europe.

While a working certificate system is important and creates a welcome incentive, it does not mean that non-certified buildings must therefore be unsustainable. In particular, smaller and medium-sized companies often decide against having their building certified due to the high costs of certification involved.

While substantial progress has been made on changing the attitude within the real estate industry, most buildings are still unsustainable and waiting to be transformed. Buildings still account for 40% of total energy usage within the EU. Out of this, 80% of a buildings energy use is due to heating, with the remaining 20% mostly due to the construction and material manufacturing of the building.

MARKET SHARES OF THE CERTIFICATION SYSTEMS



Source: BNP Paribas Real Estate (18 June 2019)

Renovation

While it is important to consider the green aspect of new development projects, the operational efficiency of the existing building stock has a far greater urgency if we want to reach the climate goals set out by the European Union. Therefore, the EU has set out to renovate 35 million house by 2030, and is, thus, aiming to reduce building’s greenhouse gas emissions by 60%. In Germany, the governing coalition led has resolved to increase existing residential buildings that are certified green buildings to 10.7 million in 2025 in order to meet the climate goals. To achieve this goal, the current rate of yearly building renovation will have to be at least doubled, if not tripled. Not only will this satisfy environmental standards within the ESG framework, but providing heated accommodation for everyone also addresses social factors, as 34 million Europeans currently struggle with energy poverty.

Suitable renovations include both structural measures and technological advances. The structural improvements largely revolve around better insulation and creating the local infrastructure needed for decentralized, renewable energy generation. This generally includes the construction of a photovoltaic system, greatly reducing CO2 emittance by providing renewable, local energy, and electricity, thus contributing to the difficult, but important challenge of exiting from all non-renewable sources of energy.

However, the hardware needs to be leveraged by the right software. This revolves around building and energy management systems, built on an Internet of Things infrastructure. This enables inhabitants to manage energy usage efficiently, initially reducing, and in a second step, eliminating excess energy usage. Building automation technologies (BAT) and building energy management systems (BEMS) play an important role in reducing carbon emissions in real estate. This makes them a key component of green buildings, promising up to 22% in savings of all building energy consumption by 2028.

Construction

As buildings become more energy efficient and energy systems decarbonize due to renewable energy sources, a greater proportion of a building’s emissions come from the construction methods and materials.

Historically, concrete and steel have been the dominant materials used for the construction of real estate. The structural properties of both have enabled us to build bigger and higher, being a main driver of economic development. However, both materials are notoriously unsustainable. For example cement, concrete’s main ingredient, accounts for 8% of global CO2 emissions. According to McKinsey, steel also contributed around 8% to global CO2 emissions.

To sustainably reduce the environmental impact of the built environment, new and alternative approaches need to be considered. Opportunities arise through the usage of new building materials, as well as the more efficient use and greater circularity of existing materials – the circular economy. As shown below, the greatest potential is in the reduced use of steel and concrete. However, all areas offer substantial room for reduction in greenhouse gas emissions.

2.2 "S" in ESG: Rent price development & the public opinion

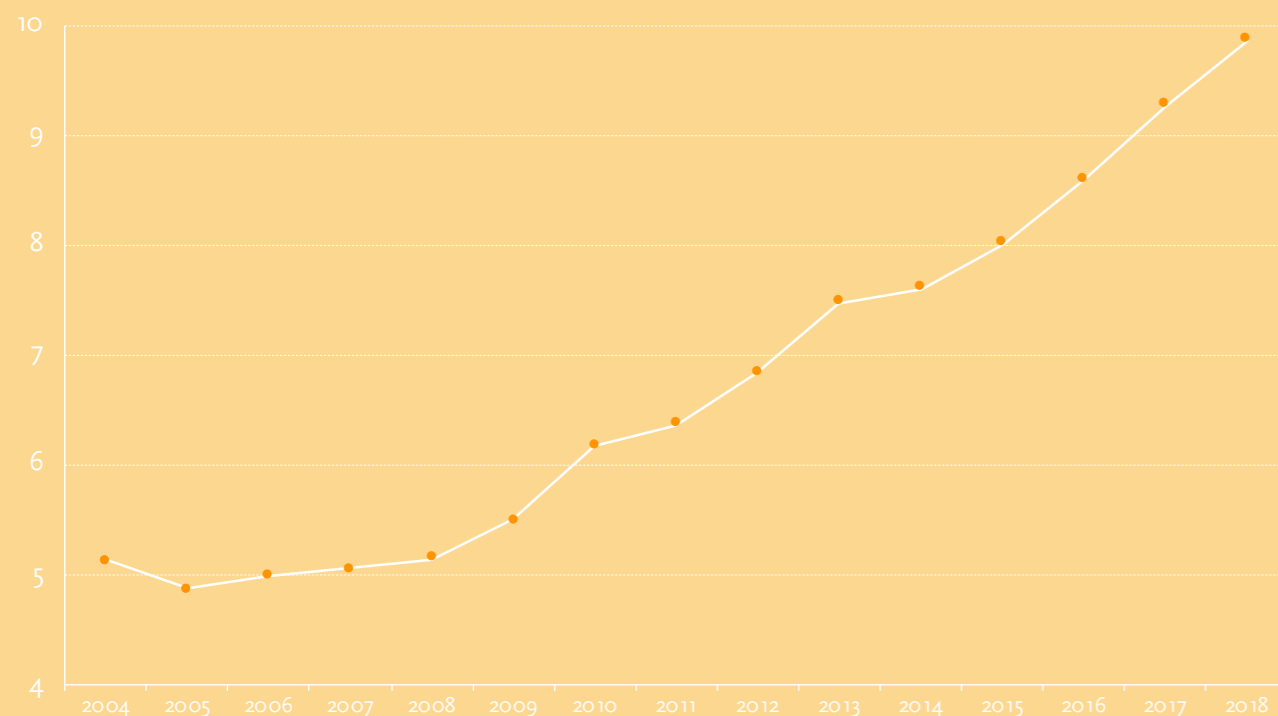
In addition to the urgent climate-related problems, the "S" in ESG - the social factor in the equation - should not be overlooked, as it represents the most criticized aspect of the industry, at least in the public perception. One central aspect has emerged as highly controversial in the social discourse: The evergreen issue of rising rents, especially in urban areas. In this aspect, the real estate industry plays another prominent role in a global megatrend: the increasingly widening wealth gap.

Berlin, as Germany's capital and a bellwether in terms of rent development, certainly offers the most prominent case study of how certain currents in society react when housing prices are no longer affordable or at least account for a noticeably rising proportion of the cost of living, especially for the middle class, leading to the much-cited gentrification of various neighborhoods. Si-

milar developments can also be observed in other European metropolises such as Paris, Amsterdam, Barcelona, or Helsinki. It goes without saying that large parts of the real estate industry benefit from (constantly) rising rents and that these are naturally inevitable for achieving returns.

However, too rapid a price increase - bypassing the income reality of existing tenants - is a short-sighted strategy that can have serious consequences in the long term. It is telling that the popular metaphor of the rent shark is probably the most common association with property owners and landlords in the public perception. However, the fact that real estate developers are also responsible for the creation of social housing or that many cities in Germany have very fair rent levels are justified pro-arguments for the industry, but are too rarely heard in the public debate. This points to a vehement

BERLIN RENTAL PRICE IN EUROS PER SQUAREMETER



Source: Development of rental prices for apartments in Berlin, statista

PR problem that the entire industry has ignored for many years and at most tried to counter with lobbying on the part of its associations. The latter can be sometimes also counterproductive for the public reputation and take on almost caricaturesque features concerning the lack of self reflection, which a Berlin landlord association demonstrated. It added a countdown to its public website with the purpose alert landlords how little time they had for a rent increase before the Berlin rent cap came into force in 2019.

The rent cap adopted in Berlin is the best example of how the "public opinion", which seems to be very diffuse, can have a very real impact on the business model of many players in the real estate industry. Tenants' dissatisfaction spills over to political representatives, whose task and greatest interest is to address the wishes and complaints of voters. The extent to which politicians can prioritise the current sensitivities of their constituents over far-sighted housing policy planning is demonstrated by several recent examples:

- When around 800,000 Berliners voted against the development of Tempelhofer Feld in a referendum (4,700 apartments were to be built), the Berlin Senate decided at short notice to also put the construction of 5,000 further apartments in the north of Berlin on hold.
- After the prominent real estate company Signa presented new construction plans for the Karstadt shopping center at Hermannplatz in Berlin-Kreuzberg (which could be regarded as quite a positive development in a neutral market situation), the residents of the adjacent neighborhood expressed displeasure about possible gentrification due to the upgrading of the residential area. Many Berlin politicians opposed the project - the outcome of the debate is uncertain.

- The creation of new housing is hindered by the ever-increasing uncertain political landscape for real estate investors and developers. Responsible for this is not only the rent cap that has come into effect, but also the increasing willingness to engage in serious discourse and consider the popular initiative "Deutsche Wohnen und Co. enteignen", which aims to expropriate Berlin's largest real estate company.

Whether hindering the creation of new housing, serious tenant protection measures such as the rent cap, or expropriation plans, they all demonstrate a disregard on the part of politicians for the underlying causes of rising rent levels in metropolitan areas, namely the strengthening of supply when rising demand cannot be regulated.

All the more reason why it must be the task of the real estate industry, on the one hand, to educate the public in a transparent manner about these market dynamics. On the other hand, it is also in their own interest to examine the long-term social compatibility of rent increases or luxurious modernization measures and to consider consciously foregoing some of the short-term returns.

Turning the electorate of entire districts and cities against one's own industry and business practices, results in calls for expropriation or protests against the upgrading of a residential area, which can only be seen as damaging to business in the long term. Certainly, the example of Berlin is a special one in Germany, partly because of its rather left-leaning government, but the political trend throughout Germany leans toward limiting rent increases, as the widespread use of rent control measures in a large number of cities and municipalities shows. Increased resistance can also be registered across Europe, as demonstrated, for example, by

student protests against excessive rents throughout the Netherlands, a rent brake passed in Catalonia, or complaints about the transformation of Paris into a "ville musée" - a museum city that has become unaffordable for the working class.

A no less important social aspect, which should be mentioned at this point, is that of demographic change in Europe. Increasing life expectancy combined with low fertility rates is leading to a dramatic age increase of

the average European population. The proportion of people aged 80 or over in the EU population is expected to more than double by 2050, reaching 11.4%. Not only will affordable housing therefore have to be made available to a broader swath of the population, who in case of doubt will be living solely on a state-provided pension, but a growing proportion of real estate portfolios will also have to be age-appropriate. The complex issue of energy-efficient renovation is thus heightened by the need for the need to make

2.3

"G" in ESG: Risk management as a central aspect to good governance

While the environmental and social aspect seem to be the focus of attention in most discussions concerning the buzzword ESG, the importance of the third aspect, governance, should not be neglected. This is because at its core lies one issue that is highly relevant to all directors and board members of a company: The assessment and management of risk.

As the topic of risk management in real estate is broad, we will focus on the topics we have come across the most in our day-to-day work. The number one issue we encountered when speaking to representatives of the real estate industry is the old age and condition of the majority of the existing building stock. With about 60% of the German real estate having been built before 1970, detailed information and data about the current state of owned property can be hard to come by. Large real estate investors, therefore, often do not have a clear overview of the condition of their building stock. This lack of knowledge entails risks and ESG pitfalls as real estate owners and investors are liable for the safety and intact condition of their property.

Within the building infrastructure and maintenance there is an abundance of different norms that a property has to adhere to. Staircases have to follow specific measures, trees have to be regularly checked in order to not be of risk to pedestrians, sewer pipes must not leak into the ground water, pipes have to be kept free of salmonella, and escape routes have to be kept obstacle free for fire safety reasons – just to mention a few. Regular maintenance and compliance checks are therefore vital for real estate owners. Another topic that can lead to particularly great liability risks is the toxic material asbestos

that was used in many of the buildings built between 1960 and 1993. Surprisingly, it is too often the case that the presence of the carcinogenic material is not known to the real estate owner to this day.

Elevator management is another issue that can lead to significant risks for the property owner or manager. Older installations are often no longer state of the art and hence harbour dangers to its users. Property owners are thus obliged to regularly subject their elevators to risk assessment and modernization, if necessary. Neglect of this part of the building stock can have grave consequences, as personal injuries obtained due to negligence can lead to severe penalties. By transferring operator duties to the property manager, property owners think they can free themselves of any liabilities; however, this is not always the case. When regular maintenance is disregarded or warnings by the property manager are ignored, the liability can quickly fall back to the property owner. This of course applies to the above-mentioned topic of general liability as well. To avoid cases of liability altogether, proper maintenance records and property data management will become much more crucial.

To mitigate these risk, new buildings are often equipped with IoT sensors to obtain real-time data; however, it is impossible to retrofit each and every old building with the necessary equipment to achieve the required standard. Ultimately, the management of older buildings requires new solutions that make proper risk management more efficient and feasible. For instance, the analysis of the year of completion of a building, the occupancy, usage patterns, and the number of renovations completed during its lifetime can result in data patterns that can

predict the probability of all the issues that a particular building might be faced with. For instance, a home that was once occupied by an entire family, but now only houses a single person has a higher chance of undrained waterpipes and therefore salmonella. Predictive maintenance solutions and the analysis of existing data can help property owners to find out which buildings to prioritize with check-ups or renovations and can therefore significantly reduce risks and enable best-in-class ESG documentation of those processes. As for the elevator management, startups like the PropTech1 portfolio company Simplifa, which provides solutions to track elevator data, predict maintenance needs, and conduct maintenance tasks,

create certainty in this area, thereby significantly reducing liability risks for the property owner.

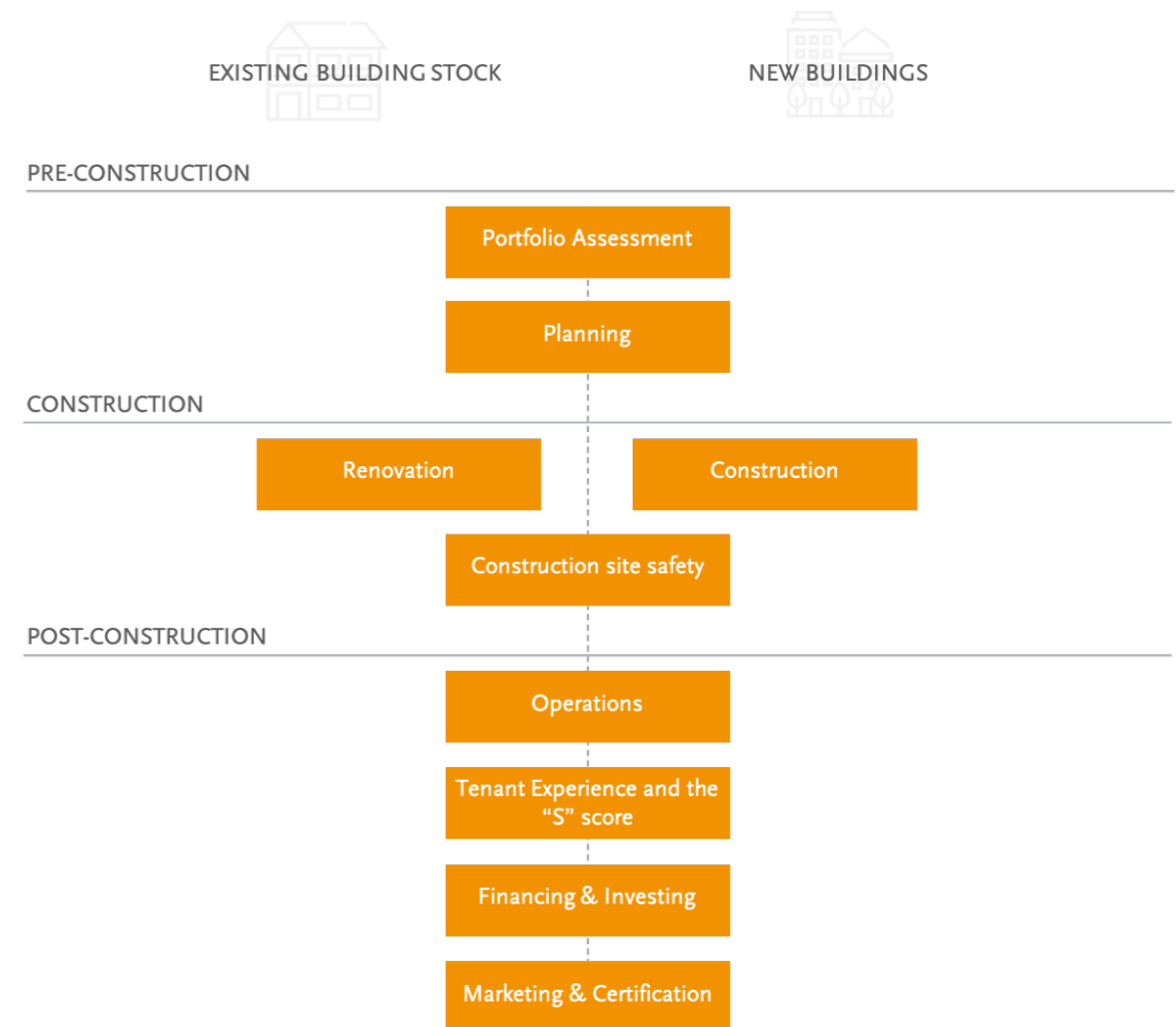
Overall, the abundance of norms and regulations mixed with the old age of the majority of today's building stock and the lack of real-time property data leads to high uncertainty in risk management and proper maintenance of owned property. Real estate owners and investors require solutions to help them clarify the situation within their building stock. This way necessary maintenance works can be prioritized, risk management is more feasible and efficient, and the overall risk of incidents can be reduced.

3 Startups and digitalization as a driving factor in solving ESG issues

ESG is a highly relevant topic and there are a lot of indications that now is the time to take action. It is not only investors that are demanding a stronger focus on these matters, but also regulators and consumers requesting a change in behavior. Moreover, in order to be able to successfully complete an ESG audit report, massive amounts of data will need to be collected, which is still not digitalized or being tracked at present. The real estate industry is facing various challenges centered around the transformation of the whole industry and the adaptation with regards to ESG measures, whether they concern the construction of new buildings with

a low-carbon footprint or the retrofit of existing ones.

As a venture capital investor, we analyze startups every day that use technology to transform the status quo, boost innovation, and help the real estate industry to adapt to new ESG measures. To point out the relevance of the emergence of new and innovative business models within the PropTech space, we will give a brief insight into relevant companies in the startup ecosystem and explain in detail why and in which way they will have a positive contribution and play a significant role in the ESG megatrend.



3.1 Pre-Construction



The pre-construction process currently includes a number of steps and checks, most of which revolve around financial viability and regulatory approval. However, assessing the environmental viability of a real estate project is currently not a fixed part in the pre-construction process. This is due to two reasons: Firstly, there has not been a sufficient amount of pressure to do this, although this is rapidly changing. Secondly, the tools that assess and plan a real estate project, whether it is a new build or the renovation of existing ones, have not been available. These two factors are changing as data is becoming increasingly available and companies are building tools that enable an accurate assessment of the environmental viability of a real estate project.

Assessment of the real estate portfolio

Understanding which part of the building stock is in need of renovation is key for asset managers. Currently, this is a tedious and manual process due to the lack of readily available data. Furthermore, this process excludes the assessment of sustainability factors. With data digitalization happening at an ever-increasing speed, more tools have emerged that allow for a quick and accurate assessment of one's portfolio. This will lead to landlords and asset managers to focus

their renovation efforts on the buildings that need it most, eliminating the greatest emitters within the existing building stock first.

PropTech Solutions

One solution is *Caala*, a venture based in Munich that has set out to enable lifecycle analysis of real estate in real time, enabling insights into the potential of environmental pollution a building has during construction, operations, and its eventual demolition. The information generated allows asset managers to evaluate their portfolio and provide insights to investors and regulators on the portfolio's performance against sustainability benchmarks. It is generally agreed that both the regulator and investor will want to see asset managers critically analyze their existing assets and adapt their strategy to ensure their portfolio meets the agreed upon sustainability targets. The software provided by Caala and others enables asset managers to allocate their assets accordingly, ensuring focus on the buildings that require the most immediate attention.

At a larger portfolio level, software solutions such as *Deepki* and *ZiggyTech* are able to collect and centralize ESG-related data on existing real estate assets which property and asset managers collect. From there, the

software identifies actions that make assets more sustainable and can be used for reporting purposes, so that stakeholders can monitor and certify the evolution of ESG KPIs. Both software solutions are already in use by large real estate investment firms including Hines, BNP Paribas, and Invesco.

Planning

The need for data-driven planning and assessment tools aren't only needed for renovations of existing portfolios. The plans for new buildings will face ever tougher sustainability regulations, so accurate planning and forecasting is critical for success. The use of tech-enabled design tools, such as generative design, allows humans to see all possible opportunities and choose accordingly, ensuring a new building is financially viable while reaching all sustainability targets. With more investors and tenants becoming cautious of the asset's sustainability performance, it is ever more important to plan accurately and efficiently in advance. Whilst humans will continue to be the creative force behind the design of buildings, the real-time analysis of all possible options is an immense opportunity for all stakeholders.

PropTech Solutions

There has been notable business success within the space. *Spacemaker AI's* exit to Autodesk for north of \$200 million is the prime example of the value innovative and automated planning can add today. *Spacemaker AI* has made it its mission to improve decision making through data, increasing design options through generative design and enhance collaboration. The software empowers real estate developers, enabling them to build sustainable cities that offer a higher quality of life.

Similarly, building planning software such as *Kreo* can be used to generate building design and material options at the architectural design stage. Companies can test more environmentally friendly solutions both in terms of cost and aesthetics from day one of planning.

Archilyse, a PropTech1 portfolio company, is the only provider that makes the quality of architecture and real estate digitally and objectively measurable, comparable, and understandable for everyone. Through its software solution, *Archilyse* empowers decision makers to evaluate their micro-planning, optimize floorplans to build the optimal workspace for all stakeholders, create an environment that is more sustainable, and to better utilize space.

3.2 During Construction



Renovation

The assessment of a portfolio's climate resilience will enable asset managers to focus on the renovation of the worst-performing assets within a portfolio first. While renovation will be the key driver to reach a climate neutral building stock, there is still a shortage of solutions that enable cost and time-efficient renovation while increasing the sustainability and livability of buildings. Therefore, many landlords avoid renovations; however, with both ventures emerging that offer an efficient solution, and growing pressures from regulators, more landlords should be incentivized to renovate their buildings in the future. There is a large market available, with the EU's target being over 3 million renovations per annum until (at least) 2030.

Retrofitting solutions work by installing a variety of products including renewable energy solutions (mostly solar panels), roof and wall insulation panels, and underfloor insulation within existing houses. Money invested on retrofitting these solutions into existing houses can be offset by a reduction on future energy bills and maintenance works. Furthermore, planning permission is much

more likely to be approved (where required) as these works are far less disruptive to the local neighborhood.

PropTech Solutions

One of these solutions is *ecoworks*, a PropTech1 portfolio company. *ecoworks* has built its vision around exactly this goal. The company is decarbonizing the German building stock, using the country's first net-zero modernization of multi-family homes. This is achieved through the industrialization of the process, using prefabricated solutions, which reduces waste and increases speed. Furthermore, *ecoworks* modernizes the operations of the building, creating decentralized and renewable energy generation through solar panels and energy efficient heating through the installation of a heat-pump and storage tank.

A Dutch company, *Physee*, replaces a building's glass facades with its patented „SmartSkin“ solar glass panels, which generate electrical energy for the building without compromising on the glasses' transparency. The result is a product which can balance indoor climate, lower energy consumption, and increase user comfort.

In Estonia, *Roofit.solar* installs solar modules that integrate with existing rooftops in order for buildings to start producing energy. Environmental impact analysis undertaken by *Roofit.solar* has shown a single 10kW roof will avoid emitting 300 tons of CO₂, and approximately 80 million houses in Europe are suitable for installation. Excess energy produced by these buildings can be sold back into the energy grid to offset energy usage consumed during the Winter seasons.

Renovating the existing building stock does not just have environmental benefits, the social implications can be just as large. The increasingly ageing demographic profile of Europe means that more seniors will be forced to leave their home and move to retirement homes unless proper renovations are made. *Seniovo*, a PT1 portfolio company, has created a simple and cost-efficient solution to make apartments suitable for seniors. Through bathroom remodeling, simplified by digital processes, it enables independent living at home for as long as possible. This empowers the elderly and reduces pressure on our social system.

Construction

While the renovation of the existing building stock is key, ensuring that newly constructed buildings are carbon neutral is also a vital piece to meeting the climate goals. We have previously examined issues the construction industry is facing and that it is still a long way from being sustainable. However, it can be argued that our economic development and societal advancement was at least in part enabled by the emergence of building materials such as steel and cement.

These materials are not immediately substitutable; therefore, it will be vital to create a construction process which is as efficient and climate friendly as possible while simultaneously looking for sustainable alternatives to the traditional building materials.

Recycling and reusing these valuable but unsustainable materials where possible as part of a circular economy is another viable approach. The optimization of processes, which we have seen in many other industries, has not been possible in construction due to the limited collection of data. As a consequence, the construction industry has little insights into workflows, processes, etc. With that in mind, many ventures have set out to increase efficiency and sustainability, but all of them are planning to collect valuable data while doing so.

PropTech Solutions

On site, seemingly small digitalization efforts can make a difference for both sustainability and efficiency. An example is *QFlow*. The PropTech provides a digital solution to tracking all materials and waste on a construction site, ensuring all deliveries are up to the environmental standard the contractor and the client set themselves, while simultaneously decreasing waste by highlighting potentially faulty materials. The data collected will enable *QFlow*'s AI to analyze the supply chain and give insights on its sustainability.

Looking past the digitalization of current deliveries, we believe the shift to digital procurement will represent a huge chance for the industry. This explains our investment in *Inpera*, providing an e-procurement solution for construction materials. Initially, the *inpera* platform will enable all players, on the demand and supply side, to transact construction materials in a more efficient way, removing the need for paper and fax (something one would think happened 10 years ago). With all stakeholders on a centralized platform, data analytics will enable efficient supply chain management, decreasing the pressure on the environment created by the transportation of building materials.

However, optimizing processes is just one approach to changing the industry. *o11h*, a company that has recently raised a very impressive 10 million euros seed financing round is trying to revolutionize the way we construct residential real estate. The startup focuses on the use of timber frames to construct prefabricated, high-quality, and affordable residential housing. Timber, when sustainably sourced, is a great material to construct carbon negative buildings and is being adopted by startups and incumbents alike. Ventures like *o11h* put pressure on the traditional players within the construction industry, as they can offer exciting possibilities to developers to build high-quality, low-carbon real estate. The more this will become available, the greater the demand will become, increasing the pressure on incumbents to provide similar services and in turn become more sustainable.

While prefabrication is one way of decreasing costs and increasing sustainability, increasing circularity within the field of construction is another opportunity. Currently, the construction industry is the largest waste stream in the EU. Even though an increasing amount of construction material is being reused, it is still an insignificant percentage, and there are still massive challenges with regards to the execution of these circular processes. With the rise of a circular economy, an economic system focusing on the replacement of the current end-of-life with a system focused on reducing, reusing, recycling, and recovering materials is emerging. A number of ventures are trying to make the construction industry more circular by developing smart re-use concepts and reducing the use of new materials. *Concular*, is an example of this. The startup has created a digital platform for all stakeholders, collecting data for all types of materials and creating a digital inventory. With this, the company is able to match demand for reusable ma-

terials with the materials that are available, thereby creating a databank that will cover a number of building materials needed, providing high-grade recovery of typical waste materials, which increases both sustainability and affordability.

Construction site safety

With over 106k accidents on German construction sites (a number that is surprisingly rising every year) as well as 87 deaths in the first 9 months of 2020, there is also a social aspect to construction technology. Creating a safe working environment for everyone is of huge social importance, and construction has often been left behind. The level of structured, ready-to-use data from construction sites is limited; however, the increased use of sensors, cameras, and other technological support will enable technology to identify safety hazards. The insights generated will lead to changes in the status quo on a construction site. These changes will create a huge opportunity for ventures and in turn create a safe working environment.

PropTech Solutions

An example is *SafeAI*, which is retrofits heavy vehicles in mines and large-scale construction sites, making them autonomous, leading to a large amount of data that is being collected and a decreased risk for workers. *Pillar Technologies* has created a sensor which monitors a number of environmental metrics, ensuring quality control and risk management at all times. Finally, *Eave.io* has constructed a headset which protects the ears when high volume sounds emerge while allowing normal communication when noise levels permit.

3.3 Post-Construction



Operations

Over the past decades, buildings were not operated through a data-driven approach, but rather as a black box. This has led to a status quo of inefficient operations that leaves large potential for optimization. By changing the way buildings are operated and energy is managed, it is not only possible to save costs, but also to operate them in a resource efficient way – greater access to data and increased transparency is the prerequisite. Energy usage-related CO₂ emission have risen over the past years, reaching an all-time high in 2019. An enormous number of emissions can be reduced when energy efficiency in buildings is increased and less fossil fuel is being used. This can be seen in various areas: (1) production of energy, (2) efficiency of usage in individual buildings, and (3) optimization of energy distribution amongst communities and cities. Even though there has been gradual improvement over the past years, the energy generated through renewable sources has been on a rise, and Germany has made significant steps with regards to the transition towards a low carbon energy system, this is only one side of the story. There are still various questions governments and regulators are trying to find answers to that will shape the entire industry.

Startup solutions can generate a high number of data points during the operation of a building, which in turn will be of significant importance when determining its value. The lack of data not only related to the construction process, but also to operations will additionally increase the demand for such solutions, as these data points will be needed in order to fulfill certain ESG criteria.

PropTech Solutions

There is a need for companies that integrate software solutions to further boost the generation and distribution of renewable energy. Amongst others operating in this field is *Ampeers Energy*, a company developing a software solution that enables landlords to generate decentralized energy, leading to more sustainable buildings. By integrating newly designed software into the current energy system, there will be a major impact on the way energy is being generated, distributed, and used.

Whereas modern buildings are equipped with building management systems that enable building owners and users to monitor and control a limited number of features within the building, the industry has recently been focused on a new generation

of building control. Through a deep integration with the existing Building Management System (BMS) by rolling out IoT sensors and machine learning, these solutions enable owners and users to get deeper insights into control operations. *R8*, an AI-supported software company that makes BMS operations more effective and reduces energy consumption significantly, serves as an example. These kinds of solutions not only provide a high level of transparency, but also enables much higher energy efficiency. In doing so, energy usage is reduced, costs are decreased, and the building's carbon footprint is lowered. Similarly, *Demand Logic*, a UK PropTech company has serviced many of the largest UK property managers with their BMS that provides insights into how energy performance can be optimized without installing any additional infrastructure beyond basic energy metering.

Thing-it, another PropTech portfolio company, is an IoT integration platform and process management tool for smart offices, smart neighborhoods, and smart facility management. Thing-it serves as the operating system of a digitized building. The platform basically provides a solution for pooling the technical infrastructure in buildings and a variety of IoT devices in one application. In addition, Thing-it serves as the main communication and service tool for all stakeholders in a building. Use cases such as access management, HVAC and lighting control, room bookings and indoor navigation, for example, are included in Thing-it's digital solution. Implementing the platform in buildings not only creates a multitude of data points, but also enables intelligent and digital control of the entire building. Transparency is increased and buildings can be operated more efficiently.

Energy management software such as UK-based *Fabrig* and *SmartSpaces* enable property managers to manage energy and building performance data across their properties using their operating systems. These platforms connect to IoT devices that monitor and control various heating, ventilation, air conditioning, and lighting consumptions to reduce unnecessary energy use. Performance improvements can be shared to engage all building stakeholders from landlords to tenants. Along with connecting to a variety of building components, both solutions offer an operating system for property managers to view and benchmark multiple energy datapoints.

However, it is not only important for asset managers to track and reduce energy usage, but also for individual tenants. *Greenely* makes energy usage more transparent by providing an application for the end user – like a fitness tracker, but for personal energy usage.

Tenant Experience and the “S” score

Many commercial real estate firms are now looking to a digital layer for their buildings in the form of a tenant experience app to improve the overall user experience for their tenants. These apps bring together elements of community engagement, local amenity and services hiring, and smart building/ IoT device control inside a seamless and mobile-first experience for tenant users. Under the Global ESG Benchmark for Real Assets (GRESB) standard, property managers are encouraged to collect and submit information of tenant's sense of engagement with their property and local community, as well as sense of health & well-being that can be improved by their physical surroundings. Tenancy engagement apps can be an engaging, useful, and convenient channel for property managers to collect this feedback from their tenants and link it automatically to their ESG audit software.

PropTech Solutions

Companies such as *District Tech* and *Spaceflow* in the UK are partnering with real estate firms to launch white labelled tenancy experience apps and further digitize the interaction between landlord and tenant. Different solutions can suit different types of tenants – for instance residential apps such as *District* and *Spaceflow* focus more on delivering information on local services to tenants whereas office-focused *Workwell* in France offers an open platform to integrate a wide network of office, health, and employee services on each staff member's mobile device.

Financing & Investing

Real estate affects everyone in society; however, a remarkably small portion of our society has the opportunity to create value through real estate. This is an important social issue, as owning property is still the easiest way to create widespread wealth. Real estate prices have risen sharply while real wages are stagnating, creating a situation in which our traditional process using bank mortgages have often failed to work. Creative solutions to give people the opportunity to invest in the largest asset class on Earth will be the key.

PropTech Solutions

In the UK, the government have introduced the Help-To-Buy and Lifetime ISA schemes in order to help first time homebuyers to access the property ladder. However, these public solutions place restrictions on the application eligibility based on the type of property and type of applicant. Private startups such as *Tembo*, *Propportunity*, and *Generation Home* offer alternative solutions using real estate data and alternative financing solutions to allow budding home buyers to access cheaper mortgages. For instance, *Tembo* offers applicants who have wealthier parents access to retirement interest loans

(RIOs) in order to help their children place a large down deposit for their mortgage and therefore get access to a cheaper loan. *Propportunity* gives people looking to buy a home the chance to successfully apply for a mortgage with less savings. Comparing this to traditional mortgage providers would allow people to apply approximately 5 years earlier. When considering the yearly increase in real estate prices over the past 30 years, those 5 years can be highly profitable for the home buyers. *Generation Home* provides a mortgaging and conveyancing platform to simplify the added complexity of adding more family members to a property deal, in order to help the lenders receive greater deposits and/or incomes to access a cheaper mortgage.

A second aspect is the ability to invest in real estate, something that is traditionally even more exclusive than homeownership, with only a tiny percentage of the population being able to invest in quality real estate. *Estating*, a venture from Berlin, democratizes real estate investing by offering much smaller tickets, making it available to a demographic group that is not able to directly invest into real estate assets today.

Investing in real estate does not just have social implications. As previously highlighted, many financial asset managers are increasingly looking for “green” investments. The real estate bank *Berlin Hyp*, one of PropTech1's LPs, has for example has issued green bonds in the amount of 5.2 billion as of to date. The implications of the rising demand for green bonds will be felt in real estate, as access to the capital available through them will be linked to certain sustainability targets. This will put further pressure on real estate funds and developers to provide sustainable and green real estate.

Marketing & Certification

Last but not least, there is significant potential in the marketing of improved building standards with regards to ESG measures. Not only is it important to meet certain ESG reporting standards in order to secure funding from investors and lower costs in the long run, ESG criteria can also be used to improve the image of the building and its attractiveness.

Heightened consumer awareness for environmentally friendly products has unlocked the full potential of the marketing of ESG-compliant buildings. Several studies show that the overall interest towards a more sustainable lifestyle and also towards more sustainable investment decisions has significantly grown over the past years. High standards of disclosure and transparency are moreover mitigating risk of investing into real estate and important for attracting capital. Investors might benefit from an increased retention rate over the long run and therefore increase their ROI.

PropTech Solutions

Various solutions developed by startups that help stakeholders in the real estate industry to use this as a positive force can already be found on the market. *Greenpass* provides a software that enables real estate developers and owners to make a performance assessment of real estate assets. During this process, Greenpass does not only analyze the status quo, but also provides information and guidelines for potential improvements with regards to certain ESG criteria. At the end of the process, the company awards various certificates of building standards, depending on the overall CO₂ footprint of a building. This in turn can naturally be used for advertising and marketing. What differentiates Greenpass from conventional solutions is its unique do-it-yourself approach that enables the developer to act completely independent by using only one software for the analysis and the whole assessment process.

4 How real estate companies can benefit by investing in PropTechs

As the pressure from EU regulations, investors, and society on the real estate industry is beginning to mount, those players within the sector that comprehend ESG as a once-in-a-lifetime chance will greatly benefit from the megatrend. Building a sustainable, future-ready real estate portfolio that meets all social and governance criteria is no small feat, however, and will require data, processes, and technologies that most companies will not be able to develop in-house.

For most incumbents, the solution will be to engage in external innovation. The plethora of PropTech and ConTech startups emerging from Europe and elsewhere provide precisely the innovative solutions that are needed in all specific use cases. Traditional real estate players are even at an advantage compared to other industries that saw themselves faced with profound changes. While startups in other sectors looked to bring about disruptive changes and make incumbents obsolete, real estate remains an analog asset. Therefore, young companies essentially are forced to cooperate with traditional players.

While cooperating operationally with the fast-growing startups, which no large market participant can get around, the gold standard is to look for an even greater benefit. By investing in them, which means becoming a minority shareholder, incumbents can not only from their future-ready solutions and methods, but also directly benefit from their increase in value. Traditionally, after insights of decades of innovation management gained in other industries, there are three ways in which to participate in external innovation:

1. Direct Investments

The first, simplest approach is the direct investment from the corporate balance sheet in individual startups. While this strategy is in itself not wrong and seems very tempting to companies taking their first steps in innovation management, it quickly becomes apparent that quantitative limits will soon be reached. Since it is not the core business of a real estate company to make startup investments, it will neither have the suitable human resources nor the know-how needed. Initially investing may be easy, but systematically growing a portfolio and supporting startups requires skill that is traditionally not found in classic corporate resources.

2. Corporate Venture Capital Fund

Naturally, the aforementioned personnel can be hired, and large corporates also have the resources to set up a corporate venture fund, which consists of a multi-member investment team and systematically evaluates a multitude of investment opportunities with the goal to build up a portfolio of companies with relevant solutions in line with the corporate's own strategic objectives. While this approach is definitely more professional and structurally evolved, it comes with its own deficits. The most successful startups fear the strategic influence that is exerted by the company behind the corporate venture fund, never being entirely certain of the ultimate goal the corporate player. In addition, post investment, other market participants have much less interest in working with a startup whose shareholder profits from their business as a competitor, not to mention the internal company data that is thereby disclosed.

3. Independent Venture Capital Fund

The third approach has been largely proven to be the most successful: an investment in an independent venture capital fund. As is the case with an in-house VC fund, a corporate player can in this way gain access to a structured, differentiated portfolio of solutions available on the market, which additionally creates opportunities for direct co-investments or takeovers at a later stage. Yet, it provides the advantage of avoiding the adverse selection that, by definition, emanates from a corporate venture fund. The investor in an external VC fund can thus expect a financial return as well as structured access to a variety of innovative concepts, business models, and technologies that simply cannot be developed in the same breadth and speed by in-house efforts.

All things considered, every way of involvement in external innovation is highly advisable and promises competitive advantages necessary for a sustainable long-term strategy. It requires to recognize the significant changes that the real estate industry will be faced with in the years to come and to be convinced that these they present an opportunity for one's own business model, or the expansion of it, instead of becoming paralyzed by the change. Incumbents from other industries that saw themselves confronted with similar decisions have demonstrated all too well that a proactive innovation approach should be highly favored.

ABOUT PROPTECH1

The first dedicated venture capital fund focusing on the untapped innovation potential of the real estate industry in Europe

1 Utilize the digitalization potential of the real estate industry

PropTech1 Ventures has brought together Europe's largest group of real estate companies, serial entrepreneurs from the digital sector, and venture capital experts within a VC fund. The fund's focus is on the untapped innovation potential of the real estate industry in Europe.

3 Added value for investors beyond a pure financial return

PropTech1 offers access to highly focused deal flow, detailed market research, and proven venture capital methodology expertise to its growing number of fund investors. PropTech1 also enables economic participation both through the fund and through direct co-investment opportunities.

2 Balanced portfolio of European PropTech startups

As an independent venture capital investor, we aggregate a qualitative and proprietary deal flow of PropTech startups in Europe. We create a portfolio with a balanced risk profile of minority stakes in what we consider to be the best companies after thorough analysis.

4 Heightened smart money value for startups

In addition to independent capital, PropTech1 offers startups an extensive network in the traditional real estate industry, access to existing client bases and real estate portfolios as well as support in structuring future financing rounds, M&A activities, and exits.

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PANDION

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