

# MAP REAL ESTATE MARKET INSIGHT

Frankfurt, December 2022

## REAL ESTATE INDUSTRY AND THE CHALLENGE OF CLIMATE CHANGE

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### Introduction

Climate change is being felt all over the planet and represents a growing challenge for the future. The need to reduce greenhouse gas emissions is recognized by almost all countries in the world. More than 110 states have even proclaimed the goal of achieving carbon neutrality by 2050. Climate policy has led to many processes of change in national economies, which will be even more profound in the future. The energy sector, where CO<sub>2</sub> abatement can often be achieved with relatively inexpensive measures with benefits often exceeding the costs, is usually one of the fields tackled first. But after reaping such low hanging fruits, policies which are more elaborate, more expensive and often require behavioral changes move up the agenda. This is the case for transportation, for example, and the buildings sector. In this report, we provide a brief look at the risks that climate change poses to the real estate industry and introduce a tool to assist in proactively managing these risks. The Climate Risk Real Estate Monitor (CRREM) was developed by a transnational initiative with funding of the EU. It allows building owners to compare the carbon footprint of a property asset or portfolio with the emissions reductions needed to meet climate targets.

### Historic Greenhouse gas emissions in the EU and Germany

Efforts since the 1990s to limit emissions of harmful greenhouse gases<sup>1</sup> (GHGs) have resulted in a decrease in total GHG emissions of the EU by 33% between 1990 and 2020<sup>2</sup>. However, not all sectors of the economy contributed to this reduction. The success is mainly due to improvements in energy supply which is, however, the sector with the highest relative share of total emissions. The development of historical emissions in Germany is similar to that of the EU (see Figure 2). Here, too, emissions from the buildings sector have decreased significantly less than in electricity supply.

Figure 1 shows that also industry and the housing sector (“Residential/commercial”) made a significant contribution, even though their emissions are still at a high level. Emissions from the housing sector arise primarily from fossil fuels burned for heat. Further sources of GHGs related to buildings are counted in other sectors such as electricity consumed by homes and offices, which is included in the energy sector. Construction and manufacturing of building materials are incorporated in industrial emissions. All in all, the EU Commission estimates that around 36% of all energy-related GHG emissions come from buildings.<sup>3</sup>

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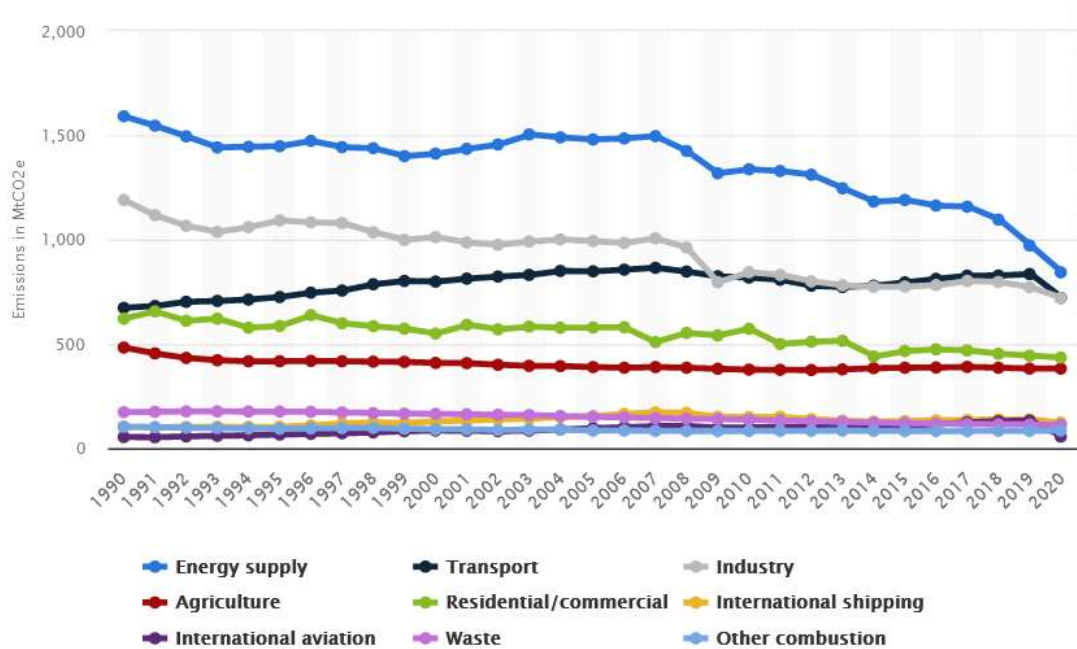
<sup>1</sup> In addition to CO<sub>2</sub>, the values include important other gases such as methane. Their contribution to the greenhouse effect, which is usually significantly higher than that of carbon for the same quantity, is converted into CO<sub>2</sub> equivalents (CO<sub>2</sub>e) to ensure comparability.

<sup>2</sup> Data refer to the EU-27 excluding the United Kingdom; European Environment Agency 2022: EEA greenhouse gases – data viewer. <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>

<sup>3</sup> Deloitte 2021: ESG Real Estate Insights 2021. Article #2.

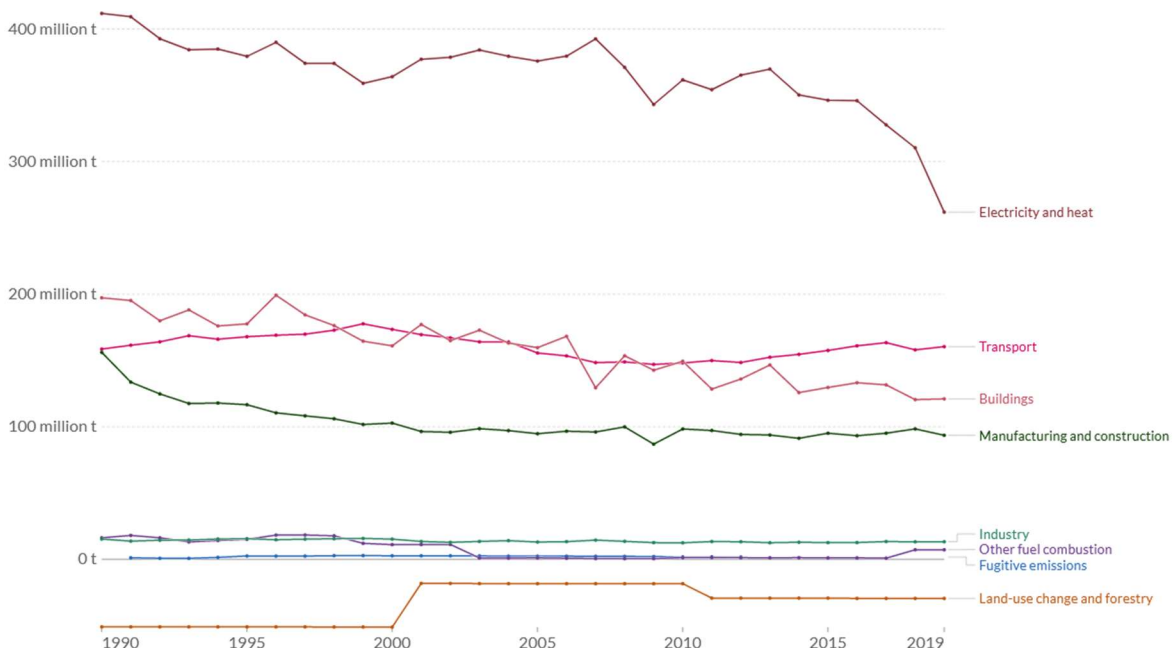
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Figure 1: Greenhouse gas emissions by sector: European Union (EU-27) 1990-2020 in mega tons<sup>4</sup> of CO<sub>2</sub> equivalents



Source: Statista<sup>5</sup>.

Figure 2: Greenhouse gas emissions by sector: Germany 1990-2019 in million tons of CO<sub>2</sub> equivalents



Source: Climate Watch (CAIT), 2022: Country Greenhouse Gas Emissions Data. <https://www.wri.org/data/climate-watch-cait-country-greenhouse-gas-emissions-data>

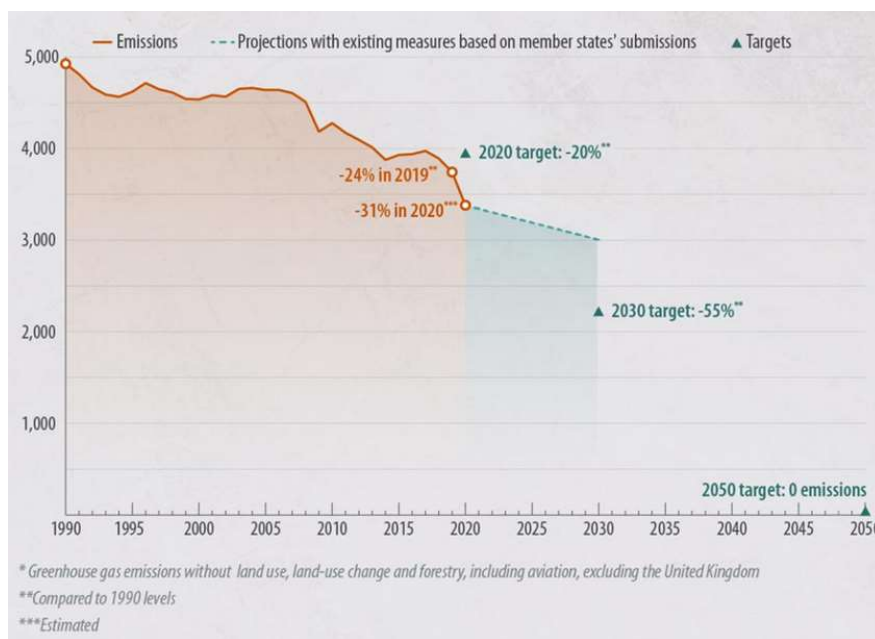
<sup>4</sup> Mt = mega ton = 1 million tons.

<sup>5</sup> <https://www.statista.com/statistics/1171183/ghg-emissions-sector-european-union-eu/>

## Climate targets of the EU and Germany

Although reductions in greenhouse gas emissions have been achieved in the past, there can be no doubt that the current development path is not compatible with global mitigation targets to which countries have committed themselves in the Paris Agreement of the UN Framework Convention on Climate Change (1.5° C - target<sup>6</sup>). In line with this treaty, the EU has set itself various objectives, of which the two central goals are a 55%-reduction in GHG emissions in 2030 compared to 1990 levels and a carbon neutrality goal for 2050. Figure 3 shows that the target for 2030 will be missed very significantly if efforts are not increased. The strong decrease in total GHG emissions in 2020 was due to the special impact of the Covid-19 crisis and will not continue in this manner. A projection based on existing policies and measures predicts a much slower decline through 2030. The net-zero-goal for 2050 will also not be achieved with business as usual and requires a further tightening of EU-climate policy.

Figure 3: Greenhouse gas emission trends: emissions, projections and targets for the European Union – in million tons of CO<sub>2</sub> equivalents



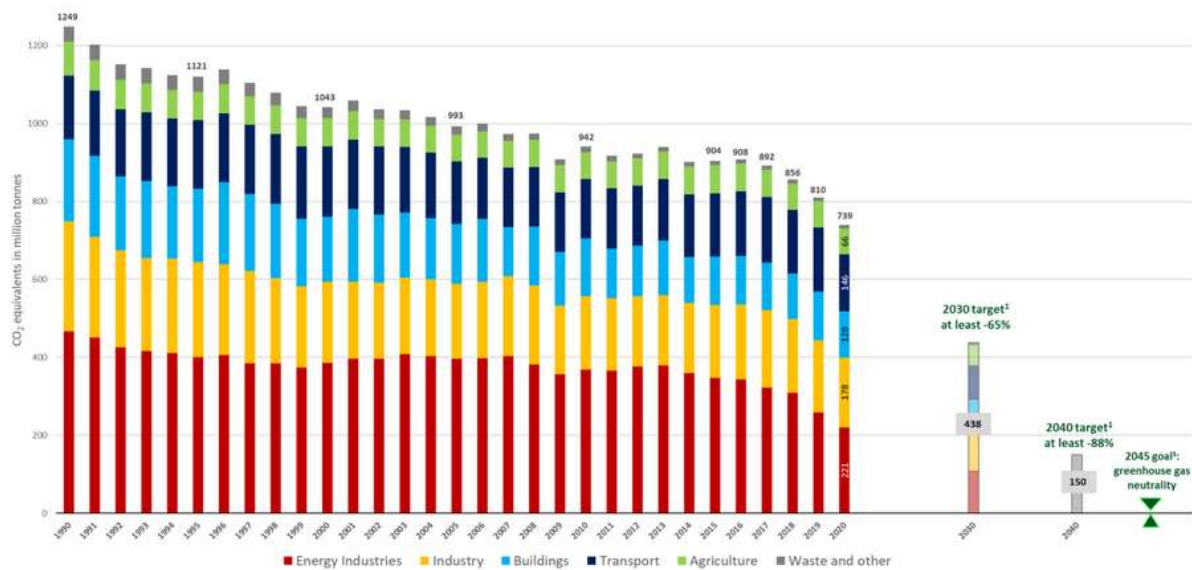
Source: European Parliament<sup>7</sup>.

The situation is very similar in Germany, which has set its own national climate targets to complement the EU goals. The Climate Action Law, which came into force in December 2019, provides for the first time for the country a central framework of national climate policy. At the same time, it gives the emission targets set out in it a legally binding character, which is also a first for Germany. The most important of these goals is a reduction target for GHG emissions of -65% in 2030 compared to 1990 levels and climate neutrality in 2045.

<sup>6</sup> In the exact wording, the 196 participating parties commit to limiting global warming to well below 2° C, preferably to 1.5° C, compared to pre-industrial levels.

<sup>7</sup> <https://www.europarl.europa.eu/news/en/headlines/society/20180706STO07407/eu-progress-towards-2020-climate-change-goals-infographic>

Figure 4: Greenhouse gas emission trends: emissions, projections and targets for Germany – in million tons of CO<sub>2</sub> equivalents



1) 2030, 2040 and 2045 targets as stated in the Climate Action Law.  
 Note: Without emissions from land use, land-use change and forestry (LULUCF). With the 2021 climate law reform, Germany introduced GHG emissions sink targets for this sector (-25mln t CO<sub>2</sub> eq by 2030, -35mln t by 2040 and -40mln t by 2045).

Source: Clean Energy Wire<sup>8</sup>.

The historical emissions trend shown in Figure 4 demonstrates that both goals can only be achieved with additional policy measures. Again, 2020 and 2021 are to be considered exceptional years due to the Covid-19 crisis. In addition, emissions in 2022 will be higher due to the partial conversion of the country's energy supply to coal-fired generation as a result of the Russian attack on Ukraine.

The gap between what will be achieved with existing policies and the trajectory that is in line with the reduction targets will have to be closed with significantly increased efforts. It is foreseeable that the real estate sector will become more involved in this respect than in the past. On the road to climate neutrality, there will be no part of the economy that will not have to move its emissions (very close) to zero.

Any emissions still occurring at this point in time must either be offset by negative emissions (e.g. through afforestation) or removed from the atmosphere using technical solutions, e.g. the carbon capture and storage (CCS) method. However, the limits of feasibility are likely to be rather narrow in this respect. There will be no way around the obligation to radically reduce emissions for all sectors. A possible politically motivated delay of this task might also prove difficult, because the German climate goals are legally binding for the Government since they were laid down in the Climate Action Law. Similar to the statutory thresholds in air pollution control, which in 2018 were enforced by legal action through driving bans, the courts could decide in the future that climate protection measures should be tightened.

In April 2021, the German Constitutional Court already issued a landmark ruling on German climate policy.<sup>9</sup> The ruling described the Climate Action Law as inadequate, because it lacked details on emissions reductions beyond 2030. The court considered this a violation of the

<sup>8</sup> <https://www.cleanenergywire.org/factsheets/germanys-planned-carbon-pricing-system-transport-and-buildings>

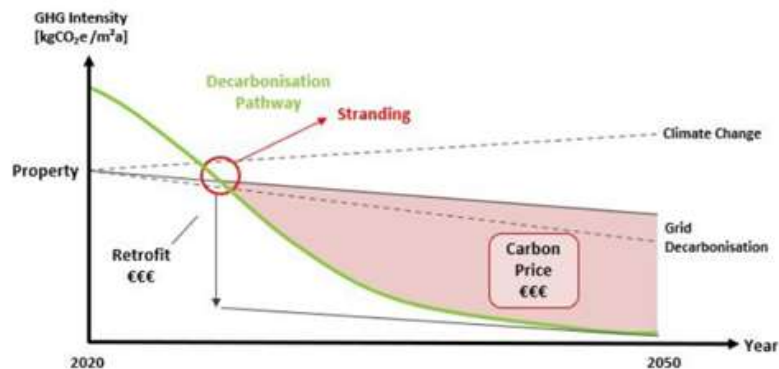
<sup>9</sup> Bundesverfassungsgericht, 2021: Verfassungsbeschwerden gegen das Klimaschutzgesetz teilweise erfolgreich Pressemitteilung Nr. 31/2021 vom 29. April 2021.

freedom of the plaintiffs, many of whom were young climate activists. In response to the ruling, the Government passed an amendment to the law that included a tightening of the 2030 reduction target from -55% to -65% and an advancement of the deadline for net carbon neutrality to 2045 instead of 2050.

### CCREM Project: A tool to assess climate risk in real estate assets or portfolios

Due to the long life cycles of real estate assets, proactive action is required to counter rising regulatory expectations and growing concerns about climate change from real estate market participants. In the absence of an appropriate response, there is a risk of a sharp decline in the value of assets or portfolios in the future. Figure 5 shows how the energy demand of an asset over time leads to higher and higher costs due to the policy of decarbonization up to climate neutrality. The premium on energy prices in the form of effective carbon pricing will rise successively. In parallel, the risk of an asset or portfolio becoming 'stranded' will increase. In addition to rising operating costs, there are other financial risks, such as market effects, technological disruptions, legal liabilities and reputational risks. A stranding asset is confronted with potential write-downs and devaluations.

Figure 5: Risk of becoming a 'stranded asset'



Source: Bienert (2022)<sup>10</sup>

The Climate Risk Real Estate Monitor Initiative (CRREM)<sup>11</sup> which is supported by EU funds developed an operational tool for asset and portfolio managers to set science-based targets, benchmark specific real assets, and analyze portfolio performance against the backdrop of the aforementioned risks. The CRREM tool delivers specific calculations for most global real estate markets and use-types. The goals of the Paris Agreement are translated into regionally and property type-specific pathways<sup>12</sup> which are used to quantify the risk of an asset or portfolio becoming stranded. In addition, the tool supports the preparation of a retrofit and refurbishment strategy in order to adapt to future decarbonization requirements.

The application of the CRREM tool requires the collection of data on properties (most important: energy consumption) that can be used in the calculations. The quality of the results depends of course strongly on the correctness of the input. Obtaining data proves difficult in practice when this information cannot be fully disposed of by the owner but is in the hands of tenants. This requires the asset manager to make estimates, which is one of

<sup>10</sup> Bienert, S. 2022: Carbon Risk Real Estate Monitor. CRREM Webinar „Basics“ & Q+A Session.

<sup>11</sup> For further information and download opportunities see [www.crrem.org](http://www.crrem.org) and [www.crrem.eu](http://www.crrem.eu).

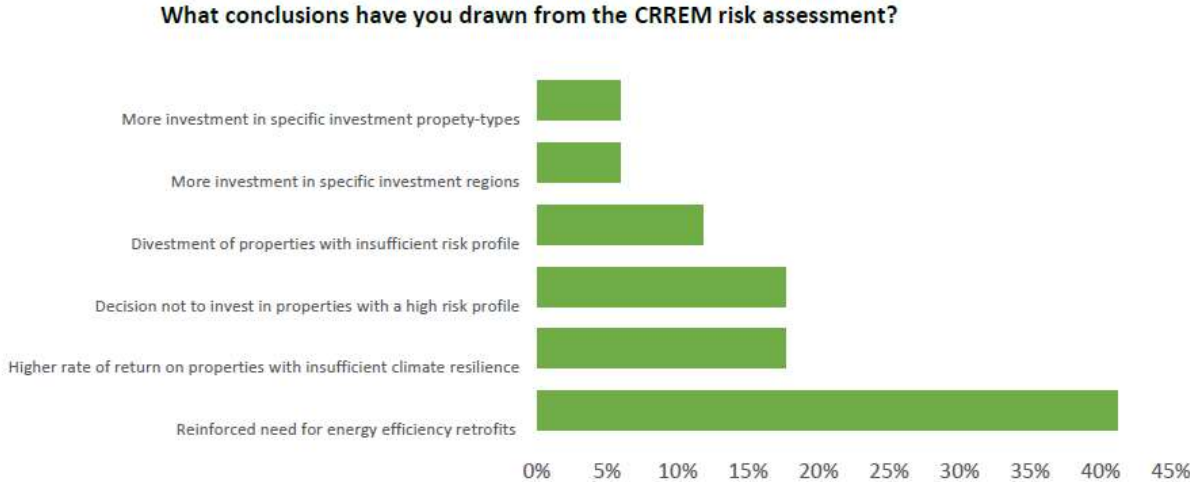
<sup>12</sup> The pathways are aligned with the 1.5° C and 2° C global warming targets.

the challenges for the application of the tool.<sup>13</sup> However, CRREM is able to close some data gaps by extrapolation.

CRREM delivers useful support for asset managers and can be considered a success. According to the initiators, CRREM is widely applied by major global investors, industry bodies and academics. It can be described as “standard for the real estate market’s net-zero ambitions.”<sup>14</sup>

A survey among global market participants from the banking sector and international investors conducted by the CRREM team in 2021 illustrates the importance that climate change risks have for the industry.<sup>15</sup> Nearly 90% of respondents indicated that they will substantially expand their activities related to risk assessment in the next two years. Figure 6 shows the conclusions drawn from the application of the tool. About 40% have identified an increased need for retrofitting measures to improve energy efficiency. More rarely, the strategy is to avoid investing in assets with a high-risk profile altogether. Just as often, the plan is to compensate for the high climate risk with a corresponding return.

Figure 6: CRREM survey on transition risk in real estate



Source: Institute for Real Estate Economics<sup>16</sup>.

**Conclusion**

Despite all the efforts made so far, the gap between ambitious climate targets and the expected development path of GHG emissions is still noticeably large. In the future, climate policy will have to reach out more strongly to economic sectors that today account for high shares of total emissions. The real estate industry is one of them. There is still a long way to go before we achieve climate neutrality. Demands will increase from both regulators and investors. A consistent focus on ESG criteria could soon become the standard for the latter. According to a recent study by JLL, poor energy performance in buildings is already resulting

<sup>13</sup> Institute for Real Estate Economics (IÖ, Austria) and United Nations Environment Programme Finance Initiative (UNEP FI) 2021: Managing Transition Risk in Real Estate: Aligning to the Paris Climate Accord. <https://www.crrem.eu/managing-transition-risk-in-real-estate/>

<sup>14</sup> Ibid.

<sup>15</sup> The authors of the survey do not provide details as to the survey procedure. The number of respondents is therefore unknown, as is a possible sampling method, if one was used; cf. Institute for Real Estate Economics 2022: CRREM Survey on Transition Risk in Real Estate. <https://www.crrem.eu/crrem-transition-risk-survey/>

<sup>16</sup> Institute for Real Estate Economics 2022: CRREM Survey on Transition Risk in Real Estate. <https://www.crrem.eu/crrem-transition-risk-survey/>



in significant price discounts. In the first half of 2022, discounts averaged between 12% and 33%.<sup>17</sup>

The financial cost of decarbonizing real estate is very high. Given numerous demands from other sectors (e.g. transportation) on the electric power supply, the switch to electricity heating while simultaneously fully decarbonizing the power generation is only conceivable with accompanying measures to improve energy efficiency. The large stock of existing buildings will not remain unaffected by this either. Extensive government support programs could help, but at present – in Germany – these are not in sight. Unfortunately, the current trend is more in the opposite direction, as existing support programs are expiring and being replaced only very hesitantly. The multiple crises of recent years have led to gigantic public spending programs, which make expensive financial packages for real estate seem unlikely for the time being.

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<sup>17</sup> <http://www.deal-magazin.com/news/119808/Wohnhaeuser-mit-schlechter-Energiebilanz-leiden-unter-Preisabschlaegen>

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