

MANAGEMENT OF RESIDENTIAL DEVELOPMENT PROJECTS IN POLAND IN THE CONTEXT OF INNOVATION IMPLICATIONS

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Purpose: To identify the level of innovation implementation in the context of management of residential development projects in Poland. The main research problem of the submitted paper is the result of taking into account the changes that the residential real estate market will have to face primarily in the context of the introduced EU regulations.

Design/methodology/approach: Based on an introduction to the research problem at hand, the paper presents the state of the housing market in Poland, highlighting the existence of a large housing gap and the impact of the war in Ukraine. A desk research method was used, i.e. the study of available secondary sources such as publications, reports and statistical data relating to the housing market. The Author's own survey studies among developers of residential projects involving the construction of multi-storey multifamily buildings were conducted using CATI methodology in November 2022 and August 2020 to determine the level of innovation introduced by this category of developers in Poland and to assess them in terms of their preparedness to introduce innovations, the types of innovations they introduce, their management of innovations and the development of their own innovations.

Findings: The conducted study made it possible to determine the level of innovation of Polish development companies implementing multifamily residential construction projects. In addition, the structure of innovating and non-innovating companies was presented by the spatial extent of their activities. Respondents also clearly indicated that the management of innovative housing projects causes additional difficulties even if the company has implemented such projects before, which is why they introduce innovations to their projects gradually and mostly adapt available solutions instead of creating their own innovations. Lack of support from external entities, especially public bodies, was identified as the most significant problem posing a barrier to innovation by developers.

Research limitations/implications: The study concludes by pointing out the most pressing need which is to support and prepare developers to implement innovative projects. Moreover, this should meet the requirements of sustainable development, as a continuation of more detailed research in this area, especially due to EU legislation necessitating innovation within housing.

Originality/value: The paper describes the progress of innovation within the residential real estate market in Poland, identifying the types of innovation most commonly opted for by developers. Furthermore, it points to the lack of skills and knowledge of tools for assessing the risk of introducing innovations in the real estate market. The most important variable determining the dynamics of innovation implementation in the housing market, as indicated by developers, is the possibility of cooperation and support for this process by external public institutions.

Keywords: innovation, housing market, housing developer, renewable energy sources RES
Category of the paper: research paper.

1. Introduction

Back in the 1980s, Central and Eastern European countries had different economic systems: a market economy and a socialist economy. In both systems, the availability of houses as a basic good depended on different factors: in the market economy – on the financial possibilities of the buyer, in the socialist economy – on the administrative decisions of the authorities. In Poland in the post-war period, the satisfaction of housing needs was based on administrative allocation of housing and egalitarianism. Housing was treated only as a social good. It was not until after 1989 that, as a result of economic and political changes, housing also became a market good subject to the laws of the market.

Over the past thirty-two years, market economy mechanisms have replaced Poland's inefficient, centrally controlled economy. It became necessary to move away from nationalist-statist projects (Heydel, 1981) and to limit the state's shareholding in companies and banks, as further nationalisation was a major threat to the efficient market-based mechanism of economic development. Regardless of the market or socialist economy, housing markets, especially in Central and Eastern European countries, faced a substantial housing deficit. The number of dwellings per 1,000 inhabitants best reflects the extent to which housing needs are met in a given country (Smosarek, Cichocki, 2023; Smosarek et al., 2021).

According to the National Housing Programme (Ministry of Development and Technology, 2016) adopted by the Polish Government in 2016, the value of this indicator is expected to reach 415 by 2030. For Poland, the value of this indicator was 363 in 2014, in 2019 it was already 380.7 (EU average 480), while in 2020 this indicator reached 393 (Wielgo, 2021), while for the EU it reached 496 (Nowak, 2023). An analysis of the most recent data (NBP, 2023; Wielgo, 2023) shows that in 2023 Poland reached 420 dwellings per 1,000 inhabitants which fulfils the plans of the 2016 Housing Programme. This was caused, among other things, by numerous housing support programmes and the continued high demand for real estate at relatively high prices.

Despite the increasing number of dwellings in Poland compared to the EU average, there still is a housing gap which will continue in the coming years. This is indicated not only by the cited number of dwellings per 1,000 inhabitants but also by indicators such as (Sobolewski, Zatryb, 2024):

- Type of construction – in Poland, there is a higher percentage of single-family houses than flats: in the EU on average 52% of people live in houses, in Poland 58.2%, while in the case of flats, the EU average is about 47.5% and in Poland 41.7%.

- Overpopulation – the EU average is 16.8%, while Poland has a rate of 35.8%, making us one of the worst EU countries in this category.
- Surface area of dwellings per capita – the EU average is 33m² per capita, while in Poland it is 24.3m².
- Average number of rooms per person – the EU average is 1.6 rooms per person, in Poland the ratio is 1.1. This is another statistic that puts Poland in one of the last places in Europe.
- Number of inhabitants per household – the EU average is 2.3 persons per household, while in Poland it is 2.9 persons.

This indicates that Poland still has a long way to go to catch up with the European average. The housing gap is defined in various ways by authors of publications and specialists; however, one may follow the calculations by K. Sobolewski and G. Zatoryb who, taking into account many aspects, including migration or demographic aspects, estimated the deficit at approximately 1.8 million dwellings. It is also worth noting that the structure of the housing market will also have to change in favour of flats. Due to the trend of major cities developing as economic centres and the decreasing importance of smaller urban centres, the structure of the housing market must also change. At present, there is a shortage of flats in large cities, which are often overcrowded, while smaller cities have a surplus of residential properties, often with houses of large size, occupied by two people.

The real estate market and also the housing market play a decisive role in fulfilling the EU's plans to, among other things, achieve zero carbon emissions by 2050 and the sustainable development goals. According to information from the Council of the European Union (European Council, Council of the European Union, 2019–2024), buildings are responsible for 40% of energy consumption in the EU and for 36% of energy-related direct and indirect greenhouse gas emissions. In addition, it is noteworthy that the above figures present an average for the EU, while in the case of Poland these indicators, as shown in Figure 1, are clearly worse.

Thus, to meet the ambitious EU guidelines, it becomes necessary to innovate in the property market, both in new developments and the existing stock. In the situation of such a large housing deficit, especially in Poland, the further dynamic development of Poland and the European Union becomes possible thanks to the introduction of innovation (Hult et al., 2004; Jin et al., 2004). Within the EU, innovation is seen as a priority for EU development and competitiveness in global markets.

In view of the immense importance of innovation not only in terms of competitiveness but also in terms of sustainable and thus ecological development in the future, the implementation of innovation is becoming a critical element. EU countries have committed to achieving climate neutrality by 2050 and thus fulfil their obligations under the Paris Agreement (2015), which is a legally binding international treaty on climate change (COM, 2021). The EU's green transition comprises a package of initiatives in a number of closely related areas, such as climate, environment, energy, transport, industry, agriculture and sustainable finance.

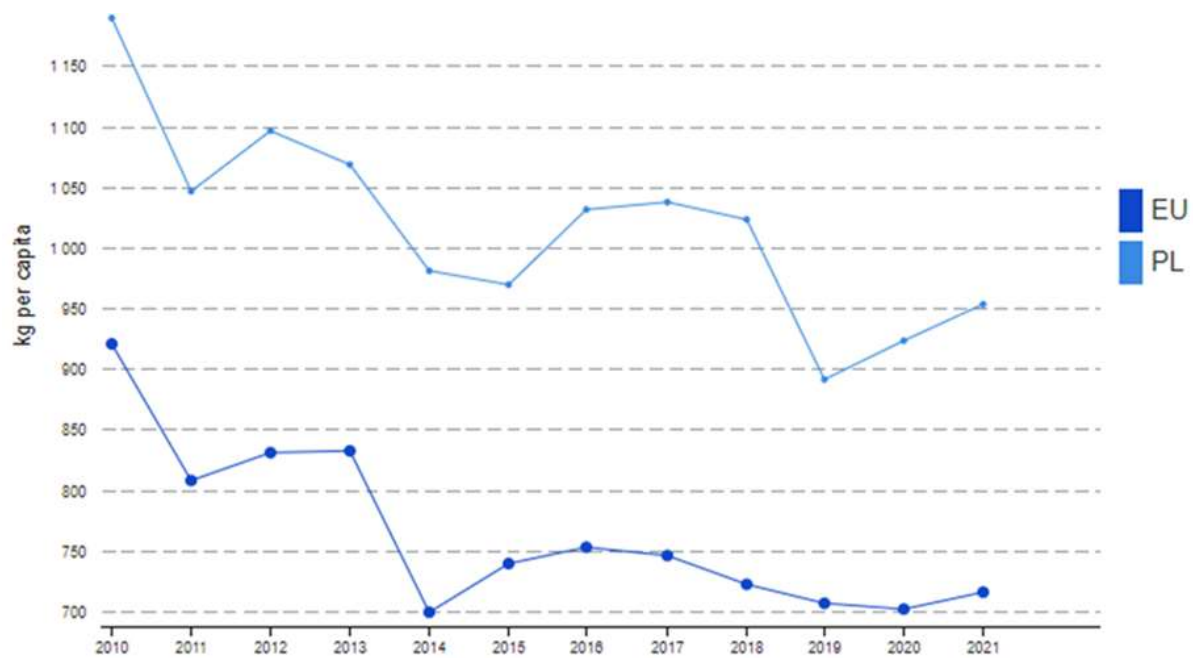


Figure 1. Greenhouse gas emissions by households for heating and cooling (in kg per capita). 2 countries selected.

Source: Eurostat (2020-2021).

These are selected packages of initiatives that are particularly applicable to the real estate sector:

- Green Deal (2022). Supports the transformation of the EU into a just and prosperous society with a modern and competitive economy. Strengthens the Union's position as a leader in the global fight against climate change;
- the Fit for 55 package (2023) as a set of proposals to revise climate, energy and transport legislation and introduce new legislation to bring Union law in line with its climate goals. Thus, by 2030 new zero-emission buildings, solar energy in buildings, existing buildings zero-emission by 2050, average energy consumption decreasing by 16% by 2030, 20–22% in 2035, and phasing out fossil fuels;
- European Climate Pact (2021). The EU and its Member States have committed to reduce net greenhouse gas emissions in the EU by at least 55% by 2030, compared to their 1990 levels (European Commission, 2016; COM 2020);
- European Industrial Strategy, including a circular economy. Actions are to address sectors such as IT, electronics, construction, buildings, among others;
- the Just Transition Mechanism, i.e. sustainable financing (Parliament Regulation..., 2021).

The geopolitical situation, namely the armed conflict in Ukraine, is also a driver for innovation in the real estate market. Russia's invasion of Ukraine, which took the form of a full-scale war that started on 24 February 2022, has caused serious consequences across the global economy, in the economies of EU countries and especially in countries in the immediate vicinity of the conflict, such as Poland. As a direct consequence of Russia's invasion of Ukraine, the price of raw materials, particularly energy commodities such as oil, natural gas and coal,

of which Russia is a strategic exporter, rose dynamically and by leaps and bounds. This was a factor in the increasing importance of innovation, in this case particularly concerning renewable energy sources ensuring climate neutrality and energy security (Karlinski, 2022; Polish Economic Institute, 2023).

The economic consequences of the war in Ukraine for Poland (Kolany, 2022) are a depreciation of the Polish złoty, a significant increase in raw material and grain prices, higher inflation and higher loan instalments, an increase in the cost of assisting the wave of refugees from Ukraine, i.e. also providing them with housing, and a significant increase in military expenditure in Poland as a frontline country.

The greatest risks from the perspective of the real estate market caused by the conflict between Russia and Ukraine are high inflation and thus interest rates, which increase the cost of loans, including mortgages, and limit creditworthiness, the increase in the price of raw materials for construction, such as steel or wood, but also energy, which affects the operating costs of buildings, and energy security, which further demonstrates the importance of innovations within the framework of RES (ZBP, 2022),

The above indicates the importance and topicality of the undertaken issues relating to the implementation of innovations in the residential real estate market. The housing gap in Poland determines the further dynamic development of the housing market, the EU strategy and regulations necessitate that this development be sustainable, based on innovation and pro-ecological. The conflict in Ukraine exposes the importance of innovations related to energy efficiency in connection with energy security.

In the paper, the research topic of the study is:

- management of residential development projects in Poland in the context of innovation implications,

while the main research problem is:

- to identify the level of innovation implementation in the context of management of residential development projects in Poland.

2. Material and methods

The study on the management of innovative residential projects was carried out in November 2022 using the CATI methodology. The survey was conducted on a sample of 98 entities – housing market developers implementing investments in multi-storey multi-family construction. The research sample was selected from 230 (+/-5%) entities of the general population operating in the market at the time of the survey.

A similar survey was carried out at the end of August and beginning of September 2020, with a survey sample of 130 entities out of 324 (+/-5%) entities of the general population.

The survey focused on developers implementing residential projects on the real estate market in Poland, with the criterion narrowing down the general population, analogous to the later survey, being the selection of only those developers who implement projects for the construction of multi-storey multi-family residential properties. Therefore, the survey was not narrowed down to one group of developers, e.g. medium-sized companies, but small, medium-sized and large companies were surveyed, as the selection criterion was the capital strength of the companies, i.e. the possibility to implement large residential projects. It was decided to carry out such a survey because even developers classified as small enterprises carry out large investment projects in Poland, involving subcontractors in their projects.

3. Results and Discussion

The survey presented has made it possible to determine, approximately, the proportion of residential developers who innovate in their activities on the real estate market in Poland (Figure 2). As can be seen, the survey revealed an increase in the number of developers declaring that they introduce innovations to their projects over the two years. When analysing the above result, it is necessary to take into account the conditions in which the research was conducted. After all, it cannot be said that this clear increase in the number of developers is only determined by the growth of the number of companies introducing innovations, as the identified general population in 2022 was lower than in 2020.

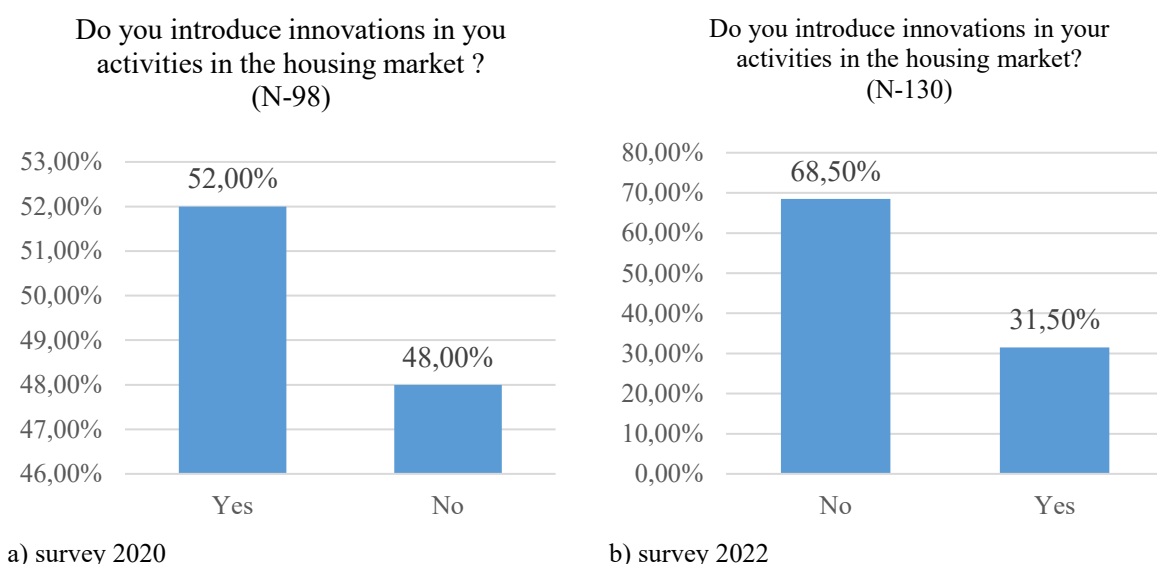


Figure 2. Percentage of developers introducing innovations (2020 and 2022 survey).

Source: the Author's own elaboration.

The implication is that a number of companies disappeared from the market during the period under review, which, due to conditions prevailing at the time such as the Covid-19 pandemic, high interest rates severely limiting lending and thus the demand for housing, rising prices for raw materials and construction materials, among others, due to the war in Ukraine, was difficult for business. Therefore, the hypothesis that most of the companies that disappeared from the market did not innovate seems plausible, in line with the fact that innovative companies are more competitive and therefore more resistant to bankruptcy, but confirmation of this hypothesis would require appropriate research.

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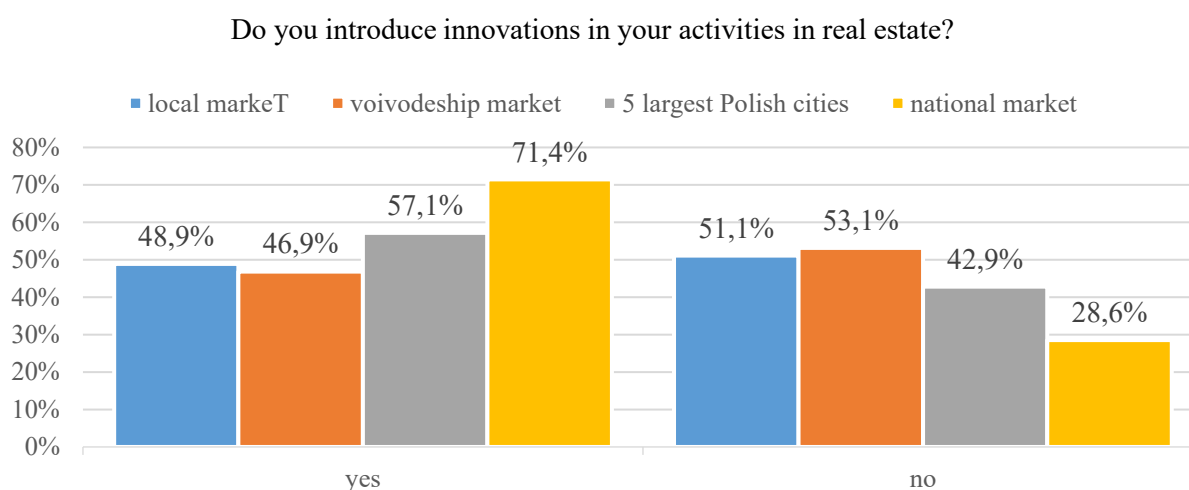


Figure 3. Developers' propensity to innovate according to the territorial scope of operations.

Source: the Author's own elaboration.

Analysing the structure of developers declaring innovations according to the territorial scope of their activity, it can be noticed that developers operating on the largest scale are the most willing to introduce innovations, then those operating on the market of the five largest cities, while developers operating on the local and voivodeship markets show the lowest propensity to introduce innovations (Figure 3). The results seem to confirm that developers operating on

a larger scale and thus in a more competitive environment are more willing to innovate. This is in line with the trend described in the global literature, where research in England by G. Killip and A. Owen (2020) indicates that companies operating locally are less likely to innovate than those operating on a broader scale.

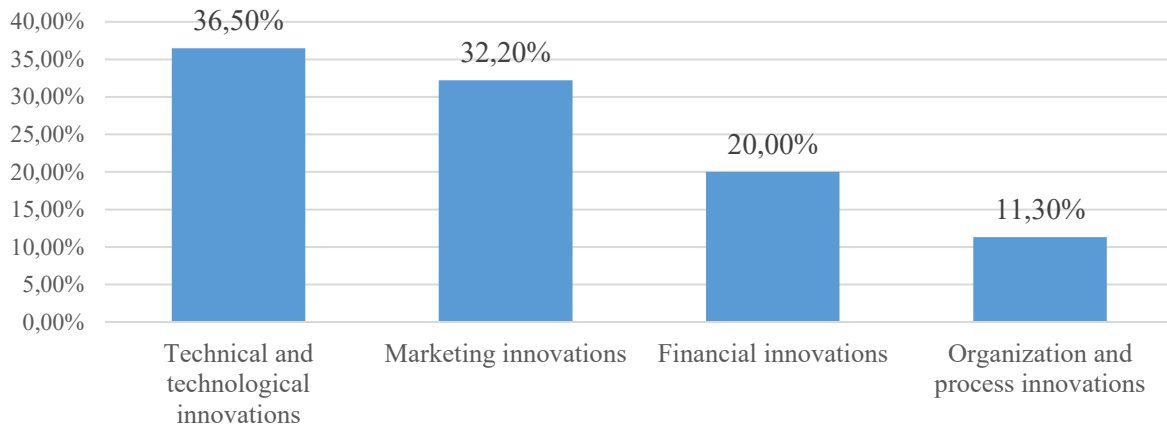


Figure 4. What type of innovation does developers use?

Source: the Author's own elaboration.

The most common innovations used by developers include technical and technological innovations (Figure 4), such as RES or specific building materials, which have an impact on building operating costs, but are associated with high implementation costs, which makes errors in managing such projects very costly. Technical and technological innovations are classified according to the Oslo Manual (OECD, 2018) as product innovations. The division of innovations proposed in the study differs from the division presented by the Oslo Manual, however, it has been adopted as more pertinent in the case of the real estate market as other authors also point out (Bac, 2014). Innovations from the marketing innovations group are also often used because their implementation costs are not high and the process of introducing them is therefore not risky.

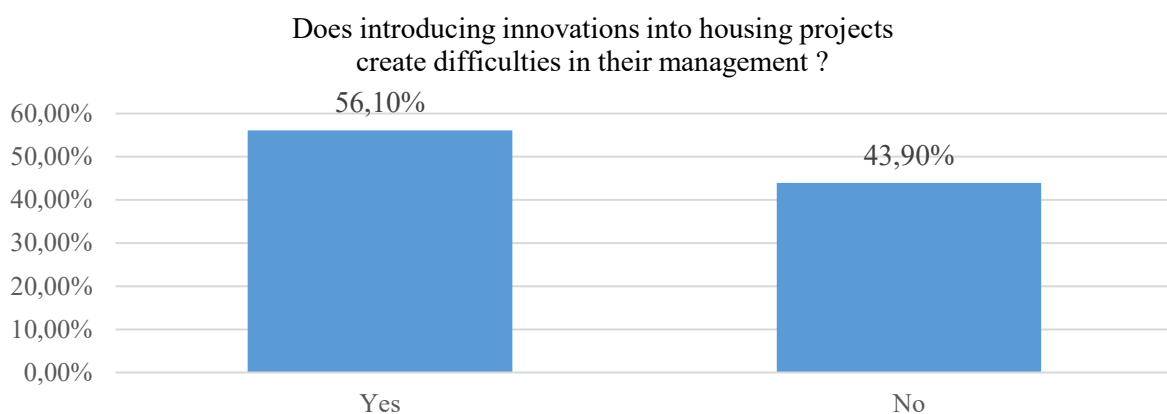


Figure 5. Are projects involving innovations difficult to manage?

Source: the Author's own elaboration.

As can be seen from the responses of developers, the management of innovative projects in the residential market in Poland clearly causes difficulties for them (Figure 5). This seems understandable from the point of view of the essence of innovation as something new and unique, however, developers, even those who have previously introduced innovations in their projects, declare that each time an innovative project shows a higher level of difficulty in managing it. The above answers by respondents regarding the difficulty of managing innovation projects are determined by the above mentioned, most frequently used type of innovation, i.e. costly technical and technological innovations, or the lack of knowledge and appropriate tools for assessing the risk of innovation, which is also indicated by the survey results. Forty-nine percent of respondents admitted that they do not measure risk as part of their innovation activities, 39.2% declared that they measure risk intuitively based on market experience and only 11.8% used specialised tools to do so. There are various risk measurement methods presented in the literature on the subject. These include, among others, scenario analysis, the SWIFT method or, FMEA analysis - Failure Mode & Effect Analysis - analysis of the causes of failures and criticality of failures (Heuresis, 2020). In the case of measuring the risk of introducing innovations in the housing market, the Dematel method can be considered, which has already been pointed out in previous works (Sitek 2022). In addition, developers indicated a clear need for external, especially public, support for the management of innovative projects (Figure 6).

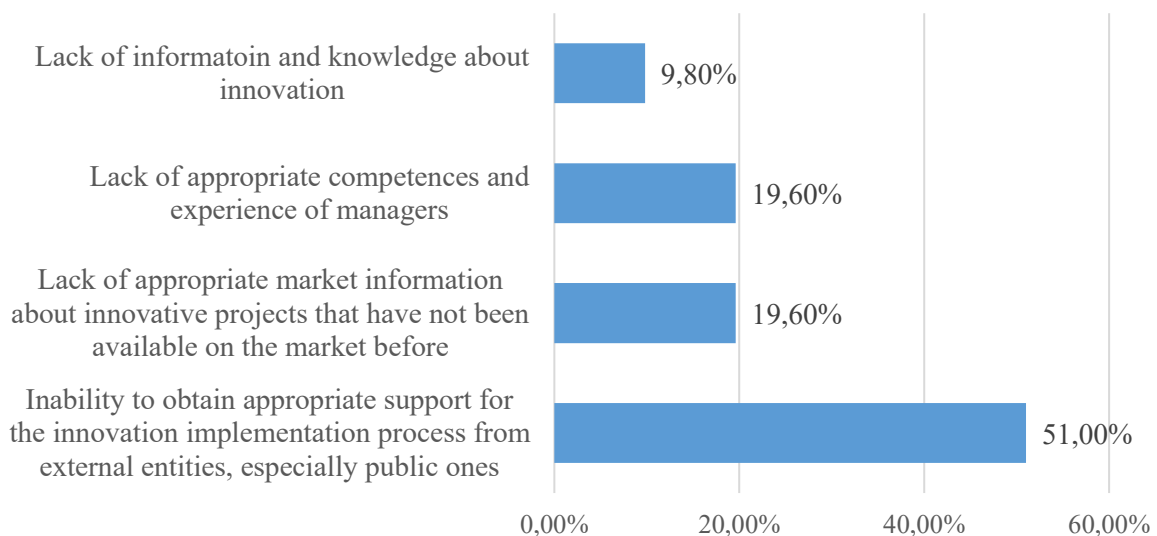


Figure 6. If introducing innovation into housing projects creates difficulties in managing them, it happens primarily through.

Source: the Author's own elaboration.

Since in response to the question 'If introducing innovation into housing projects creates difficulties in managing them, it happens primarily through...' 51% of the respondents cited the inability to obtain adequate support from external actors, especially public ones, for the implementation of innovations. This could mean that they need comprehensive support for the management process and knowledge about innovation. Lack of information on innovations that are

possible to introduce, but not yet implemented on the market in Poland was mentioned as the second reason – 19% of responses, as well as lack of assistance in creating own innovations. In the last-mentioned case, this was confirmed by answers to another question concerning the source of innovations introduced. Namely, 76.5% of respondents admitted that they adapt innovations already introduced earlier, 21.5% declare that they conduct research on their own and obtain licences and patents for their own innovations, and only 2% confirm work on innovations in cooperation with external entities.

Developers point to the inability to obtain adequate support for the process of innovation implementation from external entities, especially public ones, as the main factor influencing the evident difficulties in managing innovative projects. Additionally, respondents indicated that the main barriers contributing to the abandonment of innovation implementation are the difficulty of carrying out the process and overly complicated regulations. It should be emphasised here that future tasks aimed at specifying the needs of developers in terms of the desired support from external entities to increase the growth dynamics of innovation implementation in the housing market in Poland seem justified. Also, future research could be extended to include not only the group of developers but also other companies in the construction sector, which in the near future will face the necessity of applying advanced solutions to reduce energy intensity and emissions of the existing stock in connection with the need to meet the conditions of zero emission by 2050, to reduce energy consumption, also by buildings, as early as by 2030 or to increase the acquisition of energy from renewable sources including photovoltaic installations on buildings, where possible, according to EU regulations (European Council, Council of the European Union, 2019–2024).

4. Conclusion

In conclusion, it is important to realise that the share of innovations implemented in the real estate market in Poland, including the housing market, is low. This article touches only marginally on the possible reasons for this situation, as it was not aimed to identify its reasons but to assess the level of innovation in the housing market in Poland and how this level is affected by the difficulties in managing such projects. Of course, as indicated earlier, further research aimed at describing in more detail and better understanding these causes and understanding the needs of developers in terms of introducing innovations is highly justified, especially in the situation of achieving zero-emission or energy-efficient buildings and building an innovative economy, which is a priority of the EU required by the introduced regulations. According to the European Commission's State of the Energy Union Report 2024 (European Commission, 2024), in 2022, energy consumption by residential buildings fell by 6.7 per cent year-on-year, but this was due to savings made and a mild winter rather than improvements in the energy

efficiency of buildings. The report emphasises that to meet the targets, efforts need to be stepped up regarding the energy efficiency of new buildings and the renovation of the existing stock. Therefore, the relevance of this topic seems high.

The following conclusions can be drawn from studies concerning the introduction of innovations in housing projects by developers in Poland:

- the research showed a reduction (by 44 entities) in the number of innovating developers in 2022 compared to 2020. The reasons could be attributed to the difficult market situation after the Covid-19 pandemic, high inflation and interest rates and the outbreak of war in Ukraine and its further consequences;
- despite the decrease in the number of entities in the general population, an increase in the number of developers declaring innovation was observed, illustrating a positive trend which may, however, have been reinforced by the disappearance of non-innovating developers from the market;
- a higher number of innovating developers was observed in the group operating on a geographically broader market than in those operating locally. This may reflect the greater importance of innovation in a situation when there is a need to compete in the market;
- the high proportion of non-innovating developers is a result of a lack of demand/need for innovation. In the context of the changes described in relation to the “Fit for 55” package and the directives introduced, it can be concluded that the main determining factor described as a lack of the need to innovate, has changed 180 degrees;
- invariably, the most important and most frequently used innovations are those in the technical and technological category. This group includes renewable energy sources, specific materials and construction techniques;
- respondents declare that innovation creates problems in the management of development projects. Therefore, the development of knowledge and support and the transfer of know-how of the management process in innovation projects seems to be very important;
- respondents clearly indicate the need for adequate support in the innovation implementation process from external and especially public entities. Although the EU is seeking to create tools to support innovation, it is apparent that a systemic change is needed at the level of the state, namely Poland;
- it was indicated that despite the awareness of the existence of innovation risk and the difficulties implementing innovative development projects, developers do not use identification and measurement of this risk, and even if such identification is carried out, it is intuitive. There are many methods of measuring risk, however, the Dematel method can be proposed to measure innovation risk in the residential real estate market (Sitek, 2022). It should be emphasized that this is only a proposal, and confirmation

of the possibility of its implementation in innovative housing projects requires additional research;

- respondents indicate that a lack of innovation increases the risk of bankruptcy, which is why they include elements of innovation in their strategies. Gaining a competitive advantage, and thus a leading position in the market, was identified as the main factor for incorporating innovation into strategies;
- it should be emphasised that the most important action to be taken in this situation is to identify the needs of developers in the process of implementing innovation in the context of providing them with adequate support and preparation for the implementation of innovation projects that can meet current and future sustainability requirements, which can be adopted as a follow-up to further, more detailed research.

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