

**HOUSE- REFUGE  
PROJECT**

Attitudes and Behaviours Concerning Fire Prevention and Fighting and Territorial Management, Including its Collaborative Aspect

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**Report**

**No 7**

**RESULTS OF THE QUESTIONNAIRE ON THE  
CURRENT STATE OF THE INSURANCE MARKET  
FIRE RISK INSURANCE IN RURAL DWELLINGS -  
PRESENT PRACTICES AND PERCEPTIONS**

Team



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**Título**

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OF THE INSURANCE MARKET  
FIRE RISK INSURANCE IN RURAL DWELLINGS - PRESENT  
PRACTICES AND PERCEPTIONS**

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## I. INTRODUCTION

The identification and promotion of good risk control practices are positively correlated with the sustainability and deepening of the insurance market. When individuals and businesses interested in obtaining insurance coverage adopt good risk control practices, it enhances the conditions for risk acceptance. Likewise, the existence of reliable fire risk measurement and control models increases the willingness of the insurance industry to accept more risks. This interaction brings potential benefits for fire risk prevention and control. It also expands the possibilities for effective and appropriate occupation of urban-forestry interface areas<sup>1</sup>. As noted by the Chair of the Insurance and Pension Funds Supervisory Authority following the 2017 fires, "[i]f the insurance industry is to play an even more effective role in protecting the day-to-day risks to which individuals and businesses are exposed, it would be essential to find stimuli to strengthen the levels of insurance penetration in society, given the still relatively low levels of coverage, particularly for catastrophic events".

In this context, the House Refuge team recognized the importance of involving the insurance sector in the project. This interest was echoed among the sector's representatives, and the Portuguese Insurers Association (APS) is currently an associated entity in the project.

Initially, the goal was to assess the current market situation regarding the willingness to accept risks in this segment, to identify the most relevant factors for risk assessment and control, and to explore any necessary changes to expand the current coverage.

To achieve this, a questionnaire was developed and distributed among insurers in the Portuguese fire insurance market. The aim was to analyze how the insurance industry approaches fire risk coverage for dwellings located at the urban-forest interface. The questionnaire received responses from 14 insurers, representing 93% of the market share for multi-risk home insurance, as measured by the total volume of premiums. All participants in the study remained anonymous.

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<sup>1</sup> Cf. the Chairman's Note, in Insurance and Pension Funds Supervisory Authority, *Insurance and Pension Funds Sector Report 2017*.

## II. RESULTS ANALYSIS

Apart from the optional identification section, the questionnaire consisted of six questions and a final comments section. It can be divided into two main parts. The first part, comprising questions 2.1 to 2.4, focused on the current practices of accepting or rejecting fire risks at the urban-forest interface. The second part, consisting of questions 2.5 and 2.6, as well as the final comments, involved a prospective analysis of factors that could influence increased risk acceptance and the variables considered most relevant for assessment.

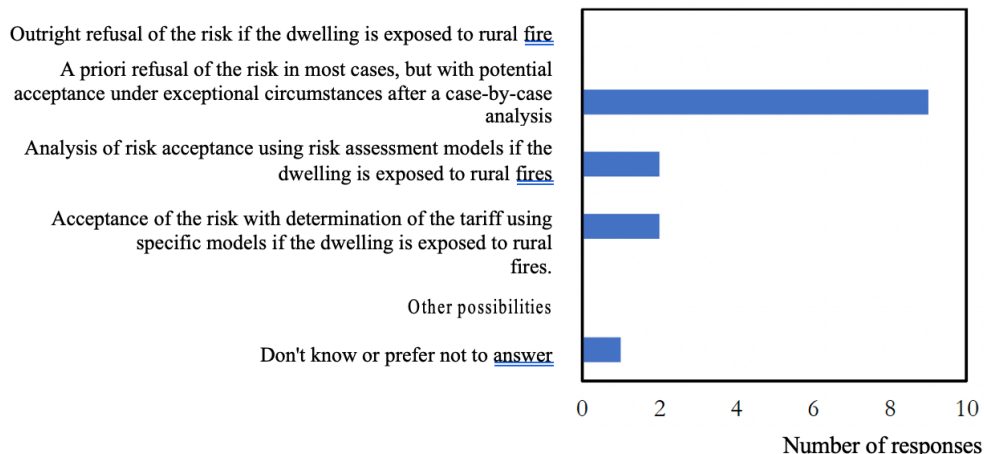
These two parts will be analysed in the following sections 1 and 2.

### 1. PRESENT SITUATION: CURRENT PRACTICES OF ACCEPTANCE OR REJECTION OF FIRE RISKS AT THE URBAN-FOREST INTERFACE

The first section of the questionnaire aimed to identify the current practices of accepting or rejecting fire risks at the urban-forest interface and the factors influencing the decision to accept a specific risk.

The survey results indicated that in the Portuguese insurance market, dwelling exposure to rural fires does not lead to an outright rejection of the risk. None of the respondents selected the option stating that "if a dwelling is exposed to the risk of rural fire, the risk is outrightly refused." This can be seen in the graph below:

Consider a dwelling exposed to a rural fire. Please indicate the approach(es) to risk management that best suit your preferences from the following options:



However, it should be noted that the assumption of risk by insurers is not the norm. In fact, out of 14 insurers, 9 stated that they "a priori refuse the risk in most cases, but consider acceptance under exceptional circumstances after a case-by-case analysis." This implies that risk acceptance does not follow a standardized procedure in most cases but is reserved for exceptional situations, subject to individual analysis.

Two insurers (14.3% of the total) mentioned that they analyze risk acceptance using risk assessment models. Similarly, another two insurers (also 14.3% of the total) stated that they accept the risk and determine the rate using specific models. In other words, in this segment representing approximately 30% of the respondents, risk assessment procedures for potential acceptance are standardized. In half of these cases, the risk is accepted in advance, and a standardized assessment is conducted to determine the applicable premium.

One insurer either did not know or preferred not to answer, and none selected "other possibilities" or provided information in the comment field.

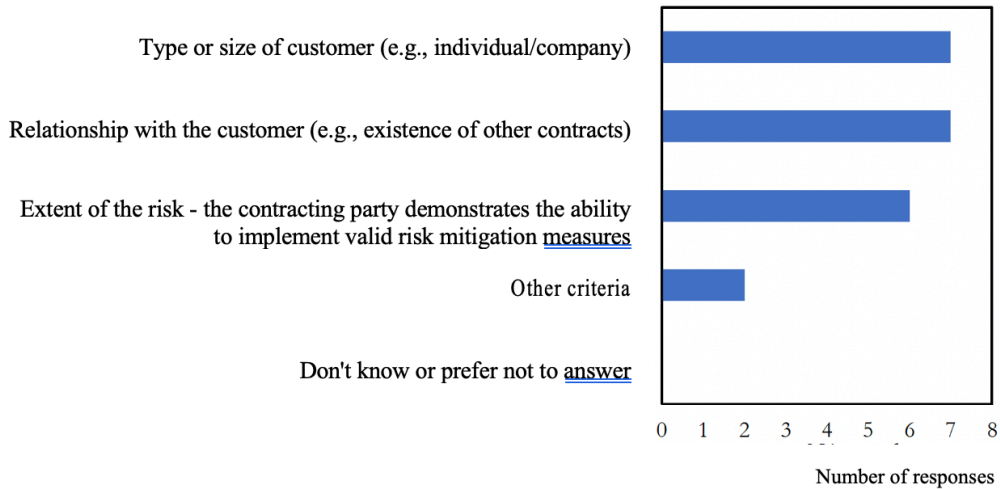
The questionnaire directed the respondents to answer more specific questions based on the type of risk analysis adopted, either case-by-case or standardized (using risk assessment models to decide on risk acceptance or premium determination). In the following subtopics, we will delve into the details provided by these two groups of insurers.

### **1.1. Acceptance of risk based on case-by-case assessments**

Out of the 9 insurers who accept the risk exceptionally on a case-by-case basis, they were asked to choose relevant criteria from a provided set that would allow for risk acceptance. The values indicated below pertain only to these 9 insurers, not the total respondents.

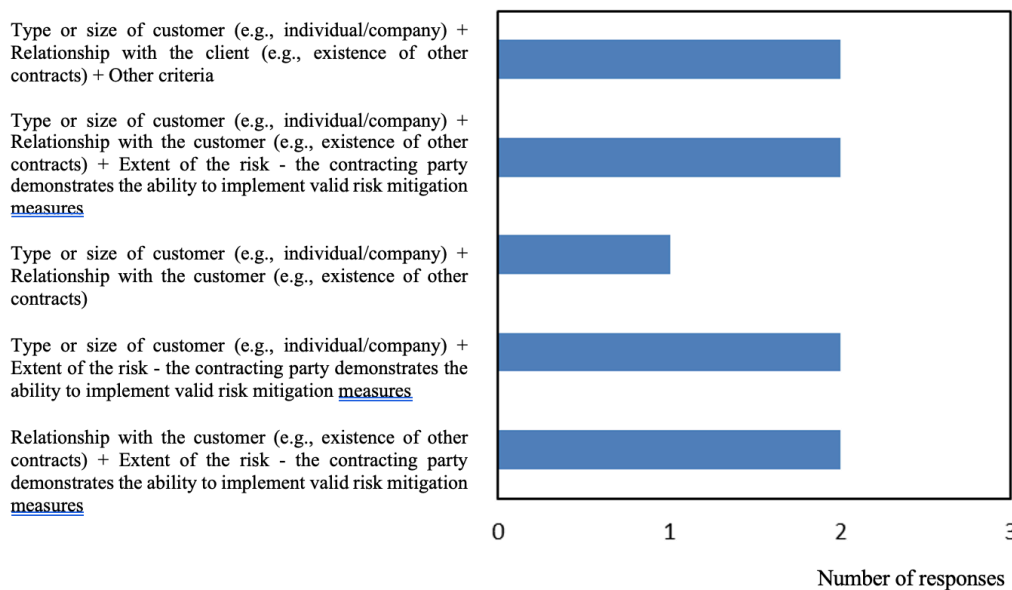
The table below shows the number of responses for each criterion considered relevant:

2.3 Which criteria would you consider in order to accept the risk, on a case-by-case basis?



The next table illustrates the combinations of criteria chosen, indicating how many responses displayed the same combination:

2.3 Which criteria would you consider in order to accept the risk, on a case-by-case basis?



- 2 out of 9 insurers indicated that the criteria for risk acceptance include "relationship with the customer (e.g., existence of other contracts)" and "extent of the risk - the contracting party demonstrates that it can implement valid risk mitigation measures."

- 2 out of 9 insurers indicated that the criteria for risk acceptance include "type or size of customer (e.g., individual/company)" and "extent of the risk - the contracting party demonstrates that it can implement valid risk mitigation measures.;"

- 1 out of 9 insurers indicated that the criteria for risk acceptance include "type or size of the customer (e.g., individual/company)" and "relationship with the customer (e.g., existence of other contracts)."

- 2 out of 9 insurers indicated that the criteria for risk acceptance include "type or size of customer (e.g., individual/company)," "relationship with the customer (e.g., existence of other contracts)," and "extent of the risk - the contracting party demonstrates that it can implement valid risk mitigation measures."

- 2 out of 9 insurers indicated that the criteria for risk acceptance include "type or size of the client (e.g., individual/company)," "relationship with the client (e.g., existence of other contracts)," and "other criteria." In one of the cases, the additional criteria mentioned in the comments could still fall under the category of "extent of the risk - the contracting party demonstrates that it can implement valid risk mitigation measures." The insurer stated that "exceptional risk acceptance is also considered whenever the customer has implemented measures that demonstrably mitigate the impact/consequences of a fire risk." The same partially applies to the other case, as the answer identifies factors that can be modified by the insured and factors that cannot. In this case, the insurer referred to the "more detailed analysis of the location and surroundings, including the nearest forest area, clearance of the land, and the slope of the terrain."

Despite the heterogeneity of the criteria combinations observed among the responses, it is noteworthy that some criteria were selected by almost all respondents. Therefore, 8 out of 9 respondents identified criteria related to the extent of the risk and the contracting party's ability to adopt valid risk mitigation measures, either by choice or through their comments. On the other hand, 7 out of 9 respondents emphasized commercial criteria related to other relationships with the client. Additionally, 7 out of 9 respondents highlighted criteria related to the type or size of the client, which could be linked to both commercial considerations and the potential for greater investment in risk control by the counterparty.

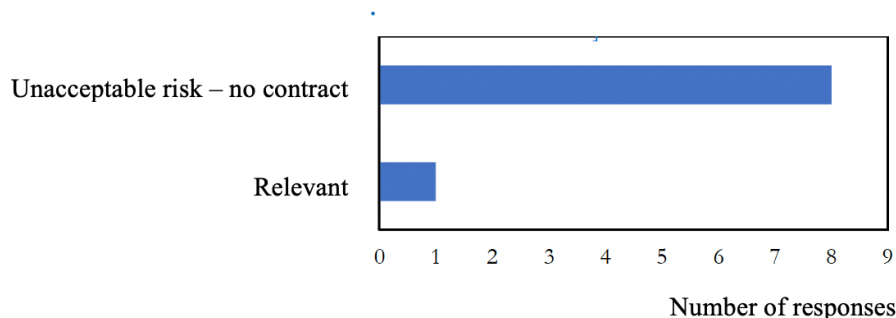
Furthermore, the insurers who claimed to perform a case-by-case analysis for exceptional risk acceptance were asked to indicate the relevance of specific parameters predetermined by the questionnaire that would lead to the non-acceptance of the risk. The assessment scenarios presented were as follows: (i) a dwelling located in an area



with a high propensity for rural fires; (ii) a dwelling surrounded by an area with a potential for extreme risk (e.g., a dwelling surrounded by eucalyptus trees without adequate management of combustible materials); (iii) a dwelling built with highly flammable materials and/or construction practices that increase its vulnerability to rural fires; and (iv) a dwelling with no capacity for self-protection.

Regarding these criteria, the majority considered a dwelling built with highly flammable materials and/or with construction practices that increase its vulnerability to rural fires (iii) as an unacceptable risk, leading them to decline entering into a contract. This response was provided by 8 out of the 9<sup>2</sup> insurers who answered the question, while one insurer considered the factor as "relevant"<sup>3</sup>

**Risk refused after analysis [Housing built with highly flammable materials and/or with construction practices that increase its vulnerability to rural fires].**



Furthermore, 7 out of 9 insurers considered the case where the "dwelling's surroundings create an extreme risk (e.g., dwelling surrounded by nearby eucalyptus trees without adequate fuel management)" (ii) as an unacceptable risk, leading them to decline entering into a contract. It should be noted that 7 insurers represent half of the total universe of 14 insurers who replied to the questionnaire. The same factor was considered relevant by 2 out of 9 insurers.

*Housing without any capacity for self-protection*" (iv) was deemed unacceptable by 4 out of 9 insurers and considered a relevant factor by 3 out of 9 respondents. It was regarded as of minor relevance by 1 out of 9 insurers and as irrelevant by 1 out of 9 insurers.

On the other hand, "housing located in an area with a high propensity for rural fires" (i) was deemed a relevant risk factor by the majority, specifically 6 out of 9 insurers. However, only 3 out of 9 insurers indicated that it would render the risk unacceptable and lead them not to enter into the insurance contract.

<sup>2</sup> Corresponding to 57.1% of the total number of insurers that answered the questionnaire.

<sup>3</sup> In relation to the total respondents of the questionnaire, this number would correspond to 7.1%.

Finally, one of the insurers added a comment on this issue, pointing out that "Currently, most homes located in areas vulnerable to fire risk have no self-protection capacity. For customers with high commercial relevance, the construction characteristics and their surroundings are relevant in the decision-making and eventual acceptance of the risk".

## **1.2. Acceptance of risk based on pre-defined models for risk assessment**

As mentioned earlier, around 30% of respondents (4 out of 14 insurers) base their decision on pre-defined risk assessment models. For 2 out of 14 respondents, "if the dwelling is exposed to rural fires, risk acceptance is analyzed using risk assessment models." Another 2 out of 14 insurers responded that such risk tends to be accepted, and they make use of models to set the tariff.

These two groups of insurers were asked to provide comments specifying the risk assessment models they use. The responses were as follows:

*- "This and all other risks are underwritten in accordance with the Underwriting Standards in use at the Insurance company. Provided the property meets all the acceptance criteria, the proposal is not refused on account of the rural fire risk."*

*- "The Multirisk home insurance simulator uses mark-ups in the pricing of risks according to the location of the risk, with regard of a fire-risk zoning."*

*- "We take into account risk factors such as building typology, surroundings, land clearance, land topography, safety distance between risk units, among other criteria."*

*- "In the development of risk models, we take into account several criteria, such as those identified in section 2.6 as being fundamental or very relevant".* In section 2.6, the insurer considered the following factors to be fundamental: fire history in the area where the dwelling is located (municipality, region...); house surroundings - topography (e.g., location in a canyon); house surroundings - combustible materials (e.g., location in a forest area); construction materials (e.g., wooden house). The following were considered very relevant: the existence of self-protection systems (e.g., outdoor sprinkler system) and type of occupation (e.g., permanent/occasional, owned/rented house).

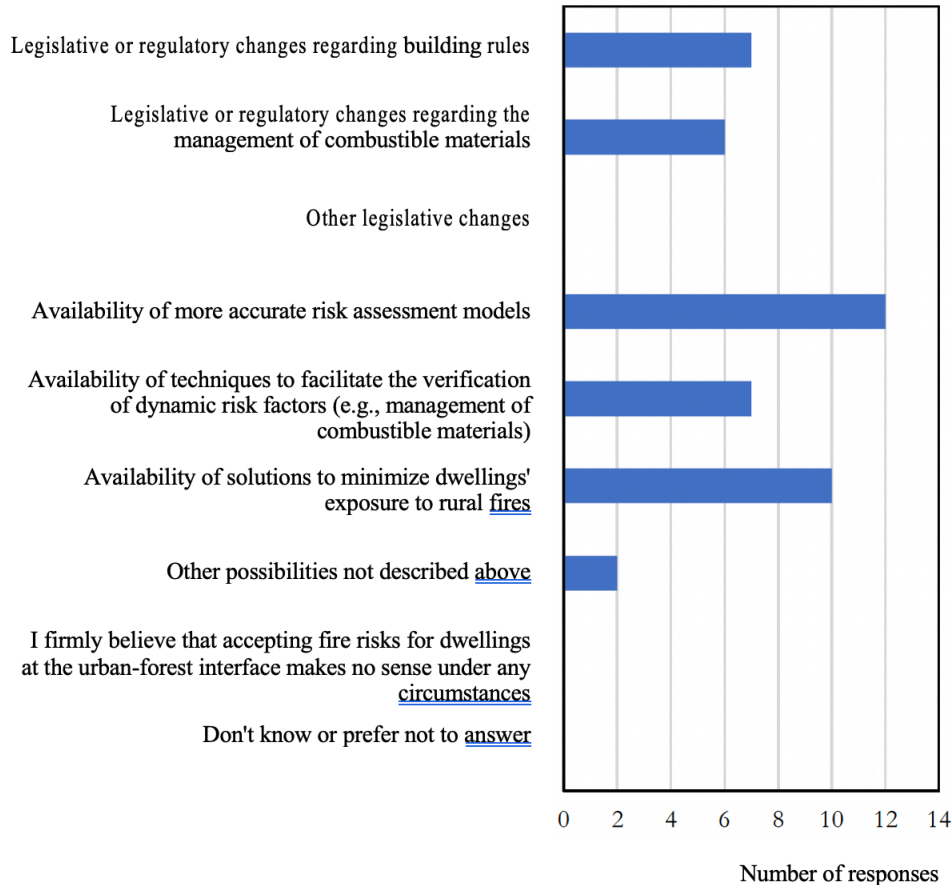
## **2. PROSPECTIVE ANALYSIS**

### **2.1. Factors that could lead to the acceptance of more fire risk coverage at the urban-forest interface**

In addition to understanding current practices of accepting or refusing fire risks at the urban-forest interface, the questionnaire also aimed to explore potential circumstances or changes that could contribute to a broader acceptance of this type of risk coverage. A multiple-choice question was used to investigate this, and the alternatives and responses obtained are as follows:

- (i) Legislative or regulatory changes regarding housing regulations;
- (ii) Legislative or regulatory changes regarding rules on the management of combustible materials;
- (iii) Other legislative amendments;
- (iv) Availability of more accurate risk assessment models;
- (v) Availability of techniques to facilitate the assessment of dynamic risk factors (e.g., management of combustible materials);
- (vi) Availability of solutions to minimize dwellings' exposure to rural fires;
- (vii) Other possibilities not mentioned above;
- (viii) I firmly believe that accepting fire risks for dwellings at the urban-forest interface makes no sense under any circumstances;
- (ix) Don't know or prefer not to answer.

The distribution of responses was as follows:



As insurers were allowed to choose multiple answers, the combinations of responses varied<sup>4</sup>. However, instead of presenting the full answers, it is worth highlighting and grouping the elements pointed out by each insurer.

Firstly, it is important to note that 12 out of 14 respondents selected items (iv) "existence of models that allow for a more rigorous risk assessment" and (vi) "existence of solutions that allow for the minimization of housing exposure to rural fires" as circumstances that could contribute to the desired changes.

Furthermore, 9 out of 14 respondents emphasized the relevance of item (v) "existence of techniques that facilitate the verification of risk factors that are often dynamic (e.g., management of combustible materials)", and 2 out of 14 respondents stated that a greater openness to accepting the risk of fire in rural dwellings also involves other solutions not mentioned in the questionnaire.

<sup>4</sup> The combinations of responses were as follows: (i), (ii) and (iv) - 7.1% (one insurer); (i), (ii), (iv), (v), (vi) - 7.1% (one insurer); (i), (ii), (iv), (v), (vi), (vii) - 7.1% (one insurer); (i), (iv), (vi) - 14.3% (two insurers); (i), (iv) - 7.1% (one insurer); (i), (iv), (v), (vi) - 14.3% (two insurers); (v) - 7.1% (one insurer); (iv) - 14.3% (two insurers).

The insurers provided comments on the relevant solutions they identified. One insurer suggested that rules regarding fire risk management should be renewed and better integrated and articulated with land use regulations<sup>5</sup>. Another insurer highlighted the importance of making necessary resources for managing combustible materials accessible to all and suggested modifying applicable statutes and regulations to enable effective supervision and control of risk control measures, as well as clarify who should be responsible for managing combustible materials<sup>6</sup>.

Regarding legislative changes, 7 out of 14 respondents chose item (i), which pertains to building regulations, while 6 out of 14 insurers preferred item (ii), which focuses on changes in the rules for managing combustible materials.

Insurers also emphasized the importance of inspections to ensure practical results from the required measures<sup>7</sup>, as well as the need for holistic evaluation models that consider "legislative aspects, construction characteristics, impact of self-protection measures, and proven solutions to minimize exposure and reduce damage"<sup>8</sup>.

## **2.2. The variables considered in abstract most relevant for assessing fire risk for dwellings in urban-forest context**

Lastly, the questionnaire aimed to identify the variables considered most relevant for assessing fire risk for dwellings in an urban-forest context, even if they are not currently taken into account. The insurers were presented with a set of pre-defined variables and asked to indicate the relevance they attributed to each variable on a scale ranging from irrelevant, not very relevant, relevant, very relevant, to fundamental for risk analysis.

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<sup>5</sup> The complete comment is as follows: "2017 confirmed that rural fires have a tendency to worsen, in frequency and severity. Once the 3x30 occurs, as on 15/10/2017, the most common risk mitigation measures become ineffective, such as the type and quality of construction, distance to forested areas, clearing of woods, sprinklers, etc. Renewed and integrated rules on fire risk management, including land use planning, are also necessary. However, [it is doubtful that] practical effects will be achieved in the near future".

<sup>6</sup> The complete comment is as follows: "Within the legislative and regulatory changes, there should be inspection and effective control regarding the rules of construction and management of combustible materials, as well as clarification of whether public or private entities should be responsible for their management. Other possibilities include the existence of resources for managing combustible materials that are accessible to all owners under general rules rather than on a case-by-case basis. Monitoring dynamic risk conditions is administratively and operationally cumbersome and may be fallible.

<sup>7</sup> "The safety culture in Portugal still has a long way to go to reach a level of maturity that allows us to feel safer. I believe it is very important not only to make the law stricter but also to ensure that it is supervised and strictly complied with. Many rules are not being complied with, as we have seen in the recent fires of 2017 and 2018.

<sup>8</sup> "In order to consider accepting fire risk within this type of framework, it is important, in our view, to have evaluation models that take into consideration legislative aspects, construction characteristics, the impact of self-protection measures, and proven solutions to minimize exposure and reduce damage".

Almost all respondents, 13 out of 14, considered “house surroundings - combustible forest materials (e.g., location in a forest area)” as a fundamental aspect. The remaining respondent classified it as “very relevant”.

Other factors that were highlighted as relevant by a significant majority of the responding insurers include:

(i) Construction materials (e.g., wooden house): Rated as fundamental by 11/14 respondents and as very relevant by 3/14 insurers.

(ii) House surroundings - topography (e.g., location in a canyon): Rated as fundamental by 9/14 insurers, as very relevant by 1/14 insurers, and as relevant by 4/14 insurers.

(iii) Fire history in the area where the dwelling is located (municipality, region, etc.): Rated as fundamental by 6/14 respondents, as very relevant by 7/14 insurers, and as relevant by 1/14 insurers.

The factor "self-protection systems (e.g., outdoor sprinkler system)" was rated as fundamental by 6/14 insurers, as very relevant by 2/14 insurers, as relevant by 4/14 insurers, not very relevant by 1/14 insurers, and as irrelevant by 1/14 insurers.

The factor "type of occupation (e.g., permanent/occasional, owned/rented house)" was considered as fundamental by 1/14 insurers, as very relevant by 4/14 insurers, and as relevant by 9/14 insurers.

The factor "construction practices (e.g., architectural design)" was considered as very relevant by 3/14 insurers, relevant by 3/14 insurers, not very relevant by 4/14 insurers, and irrelevant by 2/14 insurers. Two insurers stated that they did not know or preferred not to answer.

Respondents also identified "other parameters" as fundamental, including "*safety distance to other dwellings, availability of water via gravity or motor pumps, alternative evacuation routes, appropriate second intervention routes (self-protection measures), and the existence of houses of refuge*".

The periodicity of clearing the surrounding areas was considered very relevant by one insurer.

The location of the dwelling, not being an isolated building and having other dwellings

in its proximity, as well as the proximity of the fire brigade and accessibility of the site, were also highlighted as relevant factors.

The respondents emphasized the importance of proving the effectiveness of self-protection systems<sup>9</sup>. However, due to the inability to perform case-by-case analysis, they could not be considered reliable<sup>10</sup>.

At the end of the questionnaire, the importance of municipalities implementing adequate self-protection measures was also highlighted<sup>11</sup>.

### III. GENERAL ASSESSMENT OF RESULTS

The market exhibits a cautious attitude towards accepting any risk in this segment, with the majority of respondents (9/14) stating that the acceptance of risk is prima facie refused if the dwelling is exposed to rural fires. Acceptance of risk is considered exceptional and subject to case-by-case analysis.

As mentioned in the comments made in the questionnaire, as well as in previous meetings with APS, the present situation should be understood in the context of significant insurance losses caused by fires in the urban-forestry interface in recent years. Notably, the fires in Madeira in 2016 resulted in numerous claims (totalling 267 reported claims) and substantial compensation paid and provisions set aside (totalling €19,709,641)<sup>12</sup>. The fires in Pedrógão Grande and neighboring municipalities in Portugal in June and October 2017 had a dramatic impact on the insurance market, with a large number of claims (412 claims in June and 4,266 in October) and substantial compensation paid and provisions set aside (€17,452,206 for the June fires and €222,926,392 regarding the October fires)<sup>13</sup>.

According to the report prepared by the Insurance and Pension Funds Supervisory

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<sup>9</sup> *"It should be stressed that, in relation to self-protection systems, it is important that their effectiveness is proven in mitigating the impacts of this risk".*

<sup>10</sup> *"Self-protection systems are very rare in these typologies and a case-by-case analysis of the systems will not be feasible, so they will be assumed to be of limited or very limited adequacy and reliability."*

<sup>11</sup> *"The subject of the survey is extremely important. I would like to point out that no less important will be the existence of adequate self-protection measures by the Municipalities for these areas."*

<sup>12</sup> Document entitled "Fire in Madeira from 8 to 10 August 2016", provided by APS, with data as at 1 September 2016.

<sup>13</sup> Cf. respectively the document entitled "Fires in Pedrógão Grande, Castanheira de Pera and Figueiró dos Vinhos between 17 and 24 June 2017" and the document entitled "Fires in mainland Portugal between 14 and 16 October 2017", provided by APS, both with data as of 2 July 2018.

Authority for 2017, "[i]n 2017, the number of companies with positive technical results decreased from ten to seven, and this group of companies achieved an average technical result of €5.5 million. On the other hand, the 12 companies with negative results concluded 2017 with an average negative technical result of €4.2 million, resulting in a cumulative loss of €50.7 million"<sup>14</sup>.

The responses regarding the factors that could lead to the acceptance of more risks indicate a willingness to consider risk mitigation measures. Among the respondents who base their practices on a case-by-case analysis, 8 out of 9 value criteria related to the size of the risk and the contracting party's ability to adopt valid risk mitigation measures. Two insurers who use models for risk acceptance or determination also emphasize similar factors. However, when it comes to respondents who conduct case-by-case analyses, these factors are only considered in conjunction with other factors that support compliance with risk mitigation measures, such as the type and size of the customer and commercial relations.

In terms of prospective factors, the respondents consider the existence of models for more rigorous risk assessment and solutions that minimize dwelling exposure to rural fires as the most relevant factors for increasing risk acceptance (highlighted by 12 out of 14 insurers). These technical improvements are therefore deemed the most important.

On the other hand, modifications to administrative rules are considered necessary by around half of the respondents. Seven respondents consider changes in house building rules necessary, while 6 out of 14 insurers believe changes in rules regarding the management of combustible materials are necessary. Moreover, some respondents believe that the possibility of highly dangerous events requires an integrated and well-thought-out response from a land-use planning perspective.

The market, therefore, appears receptive to taking on more risks once it has more reliable and detailed models for evaluating rural fire risks and solutions to minimize dwelling exposure to these risks. The factors that the market perceives as most relevant for risk and should be considered in a model for this purpose include (in order of relevance) "house surroundings - forest combustible materials," "construction materials," and "house surroundings - topography." (question 2.6).

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<sup>14</sup> Insurance and Pension Funds Supervisory Authority, *Insurance and Pension Funds Sector Report 2017*, p. 90.



Additionally, the importance of the costs associated with verifying information or implementing control measures is emphasized in this context. This becomes evident in the answers provided to question 2.5, where nine out of 14 respondents chose the hypothesis referring to the existence of techniques that facilitate the verification of dynamic risk factors, such as the management of combustible materials. Comments provided by respondents also underscore the significance of compliance verification costs, particularly when dynamic factors are involved.

The responses emphasize the importance of technical factors in promoting the acceptance of more risks. Therefore, research and application of its results in this area, with a focus on improving risk assessment models and reducing costs related to initial risk parameter verification and compliance monitoring, are crucial.

Regarding the influence of applicable legal standards, the combination of chosen answers and provided comments suggests that the respondents' concern lies not so much in the absence of relevant rules but rather in their lack of effectiveness. They highlight the need for proper monitoring of compliance and clarification regarding who is responsible for implementing risk control standards, whether it is public authorities or private parties.

In summary, the prevention and enforcement actions of public authorities should contribute to expanding the coverage of residential fire risks in rural areas. Clearer identification of mitigation measures to be adopted through administrative norms is also essential.

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