Annex 3. Survey findings

Authors: Sven Alsheimer, Elisabeth Dütschke

With contributions from: Ataberk Bagci, Raquel Bertoldo, Ana Delicado, Lila Gonçalves, Lena Kappler, Rania Karametou, Dimitrios Karapanos, Nikolaos Koukouzas, Sergi López-Asensio, Eleonora Manoukian, George Maraslidis, Claire Mays, Christian Oltra, Marc Poumadère, Ana Prades, Sabine Preuß, Jussara Rowland, Luisa Schmidt, Krzysztof Stańczyk, Aleksandra Strugała-Wilczek, Pavlos Tyrologou

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1. Introduction

To enhance the understanding of public perceptions and acceptance towards CO_2-storage, questionnaire surveys with residents in the selected study regions are foreseen. The surveys will be implemented in two waves: the first one in the exploration phase of WP6 at the very beginning of the project. The findings from this survey are shortly summarized in this report and it covered all regions under study. The second survey will be at month 48 to assess the same issues towards the final year of the project. This survey will be implemented in one region per main country (PT, ES, FR).

The aim of the first survey is to have broad findings on the current levels of awareness and acceptance in the regions while taking differences between social groups into account. With this, we aim to identify expectations in terms of benefits and concerns to respond to them in the next steps. The following sections give an overview over the methods (chapter 2) and the results (chapter 3).

2. Methods

For the regional surveys, the original idea was to implement them online with sample sizes of 500 respondents in all six regions. The recruitment of participants was to be implemented through market research institutes as subcontractors. However, following the definition of the affected regions and country specifics with regard to research practices as well as available services from market research companies, the research team decided to implement phone surveys instead of online surveys in Portugal and Spain. According to the type of survey implementation, the survey length also had to be adjusted with shorter questionnaires for the phone surveys. Moreover, for France and the Spanish regions the sample sizes had to be adjusted to around 250 and 300 respectively as higher numbers could not be guaranteed by service providers. Table 1 provides an overview on the final implementation.

Table 1. Overview on study research design and sample sizes.

Country	Final sample size	Type of provision	Length
Portugal – onshore and offshore	N=497	Phone	10 min
Spain onshore	N=300	Phone	7 min
Spain offshore	N=303	Phone	7 min
France	N=243	Online	10 min
Poland	N=495	Online	10 min
Greece	N=489	Online	10 min

A modular questionnaire was developed by the research team that included a common identical core across all surveys to allow for cross-country comparison. In addition, some region specific questions were added as well as some further topics for the longer online questionnaires. The phone survey in Portugal is longer than the phone surveys in Spain, however, content-wise they are highly similar as the greater length in Portugal is mainly due to the fact that the Portuguese survey had to cover the onshore and the offshore option. The topics covered in each regional questionnaire are displayed in Table 2.

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Table 2. Overview on the survey content.

Topics in the questionnaire	Portugal	Spain	France	Poland	Greece
Socio-economic variables	(x)	(x)	x	x	x
Place attachment	x	(x)	x	x	x
Climate change perceptions	x	x	x	x	x
Attitudes towards industry	x	x	x	x	x
Familiarity with CCS	x	x	x	x	x
(Informed) acceptance of CCS	x	x	x	x	x
Expected impacts of CCS	x	x	x	x	x
Conditions for acceptance	x	x	x	x	x
Expectations regarding the process	-	(x)	x	x	x
Trust in societal stakeholders	x	x	x	x	x
Preferred involvement of societal stakeholders	(x)	-	x	x	x
Preferred involvement in the process	x	x	x	x	x

x: included in full; (x): included in abbreviated form; -: not included

For the implementation as phone vs. online survey, we had to slightly adjust the wording of the questions, the instructions as well as the explanatory text in between. The surveys were implemented in national languages and fieldwork started in July 2022 and was completed in each region in September at the latest. Data analyses were conducted in IBM SPSS and mainly focused on descriptive statistics and cross-country comparisons.

Representativity of the sample was aimed for in terms of age (using four categories) and gender. The soft quotas set up for this purpose were not crossed and were based on national statistics due to the low data availability for the tailored regions. Owing to this, a higher tolerance was set for the quota limits. In addition to the criteria mentioned above, the ratio of residents in the respective administrative units as well as the educational level of the participants were monitored on natural fall-out, i.e. no thresholds were set.

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Table 3. Overview on socio-demographic variables and the respective shares in the final sample.

Socio-demographic variables		Portugal (on- & offshore)	Spain onshore	Spain offshore	France	Poland	Greece
Age group (in years)	18-29	25%	11%	16%	24%	19%	22%
	30-49	36%	17%	31%	44%	46%	43%
	50-69	32%	42%	32%	27%	33%	34%
	70+	7%	31%	21%	5%	2%	1%
Gender	Female	59%	57%	49%	40%	57%	51%
	Male	40%	43%	51%	58%	43%	49%
	Non-binary	0%	0%	0%	0%	0%	0%
Place of residence		All of the queried administrative units are represented in sample.					
Educational level	University degree or comparable	35%	16%	42%	57%	43%	69%

The samples drawn aimed at representativity, but they are clearly biased: As outlined above only few socio-economic variables could be used for quota sampling and they were only fulfilled to a certain extent. This is mainly due to the limited number of people living in the respective areas. With regard to the quota set, the regional samples well cover the targeted gender distribution in the population. This partly also applies to the age distribution in the four categories; however, the oldest category is underrepresented in most surveys, with the exception of Spain. In addition, particularly in Portugal, Spain and France where smaller regions were included, it is likely that those who agreed to participate in the survey have different opinions from those who declined or were not interested in joining directories of market research institutes. Thus, the final numbers obtained need to be interpreted with care. In this regard, country comparison is an important part of the interpretation. Therefore, statistics are presented in overall figures.

3. Results of the cross-country comparisons

In the following, the survey results are presented. The summary figures displayed in this section provide the relative frequencies of answering options (excluding the don't know option cf. section 3.9 for a discussion on them). For comparability, only topics that were surveyed in all or most of the regions, i.e. the common identical core of the modular questionnaire, are presented. Due to methodological differences between online and phone surveys, the length of the questionnaire of the phone surveys had to be adjusted and some of the items had to be omitted. Thus, in the following, for some topics no results are available for the regions in Portugal or Spain.

While one onshore storage option is being investigated in France, Poland and Greece, two storage options (on- and offshore) are under consideration in Portugal and Spain. In Portugal, the two storage options are in the same affected area and in Spain the implementation of the onshore and the offshore option is considered in two separate regions. For the remainder of the project a selection will be made in these two countries for one region and the future focus will be on the selected region only.

This chapter is structured as follows: First, we report on the respondents' familiarity with CCS, followed by their (informed) acceptance of this technology option, as well as the expected local

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changes a potential deployment of CCS would bring to the regions, and conditions for acceptance of the deployment. Furthermore, we present results on the expectations for the potential implementation process, the respondents' trust in societal actors and their preferences regarding the involvement of these actors. Finally, we provide an overview of respondents' attitudes and sentiments on issues that might be related to the acceptance of CCS.

3.1. Familiarity with CCS

In the surveyed regions we find that the reported levels of familiarity are rather low (cf. Figure 1), with less than 25% of respondents across all regions reporting to be familiar with the technology. When asked, whether they have ever heard of the technology, the results vary strongly between the regions. While in France (>75%) and Greece (>65%) a comparatively high share of respondents have at least heard of the technology, this share is below 18% in both of the Spanish regions. In Portugal and Poland we find medium levels of familiarity.

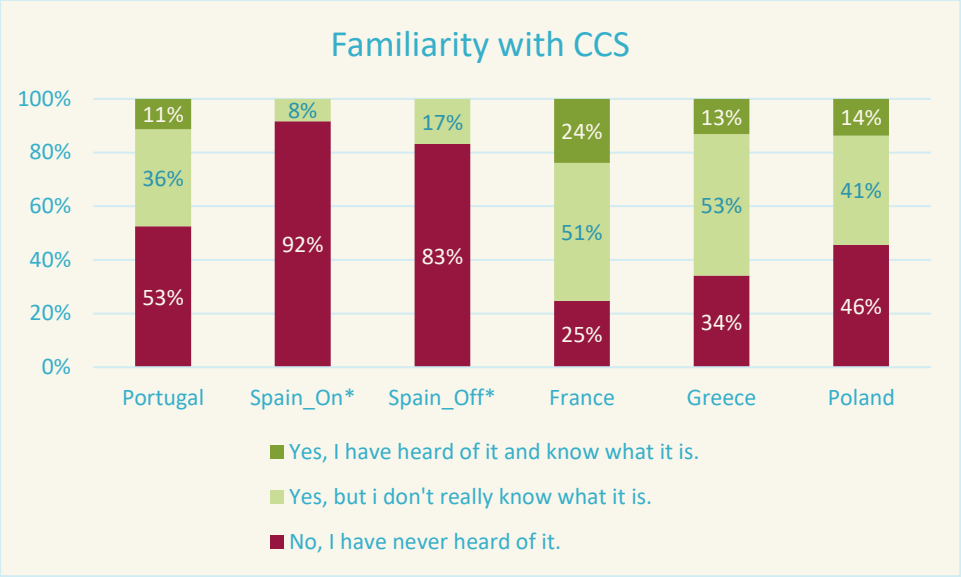

*Figure 1. Familiarity with CCS in all study regions (*in Spain the two Yes-categories were merged into one).*

When asked how the respondents that have heard of CCS have received their information on the technology from, many reported that they have heard of it in the media (e.g. TV, radio, newspapers), in the web, or through personal contacts such as friends or relatives. This question was designed in an open way with no predefined categories.

As CCS is an unfamiliar topic, it is also relevant to look into the shares of respondents answering "I don't know". It is worthwhile to note that up to 17% of respondents chose the don't know option in the CCS related questions that are depicted in section 3.2 and section 3.3. These are not counted in the shares outlined in all of the following sections, thus, decreasing them relatively. More details on the distribution of don't know answers in the sample are reported in section 3.9.

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3.2. (Informed) acceptance of CCS

In the survey we asked the respondents to evaluate CCS, which was introduced as a technology option to mitigate CO_2 emissions, and to report their level of acceptance for the potential implementation of this technology in their area. To enable the respondents to make an informed assessment we provided them with basic information on CCS and the project activities in the national languages. In the following, the information as provided in the online questionnaires is presented. In these surveys only onshore storage was described and - in contrast to the phone surveys - an explanatory figure as well as a map of the area was included. For Spain, where additionally an offshore option, and Portugal, where both options were explored, the information provided in the questionnaire had to be adjusted accordingly.

> *To tackle **climate change**, governments and companies are exploring various **mitigation options**. These options include **Carbon Capture and Storage (CCS)**, which **reduces CO_2 emissions**, mainly from existing industrial plants. CO_2 is the main cause of human-induced global warming and the associated climate crisis.*

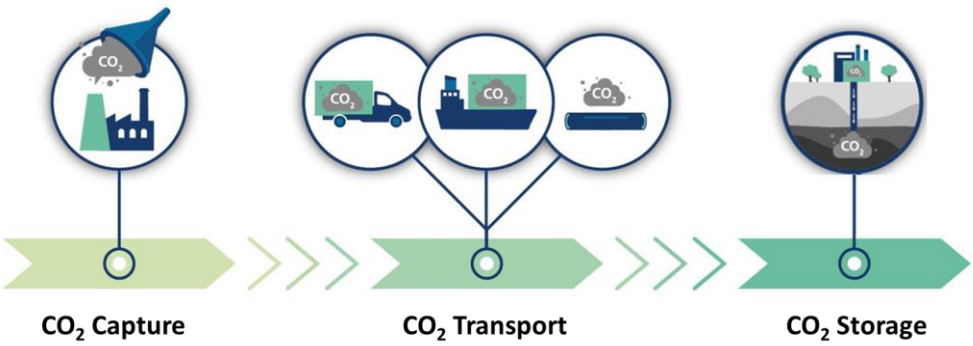

Figure 2. Explanatory figure on CCS provided in the questionnaire.

> *The basic mechanism is to capture CO_2 from the source (industrial plants that emit large amounts of CO_2 during production). The captured CO_2 can then be permanently stored deep underground.*

By providing a complementary map we further described that the current research project is assessing the suitability of the respective area for the underground storage of CO_2 from a scientific viewpoint. This includes geological research, an economic and environmental evaluation as well as involving the local population. We further explained that the decision of whether or not underground storage of CO_2 could happen in the respective area in the future goes beyond the scope of this project and will depend on other factors such as political decision making processes. Finally, we provided information on where the CO_2 could potentially be captured, how it could be transported and stored.

In the following we present the results on the topics previously described. For this, we first report overall results in this regard, for which we take the full sample in each region into account, then we turn towards the results subdivided across different social groups.

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3.2.1. Overall results on the (informed) acceptance of CCS

According to the survey results in the regions, the overall evaluation of CCS as a technology option to mitigate CO_2 emissions is mixed (cf. Figure 3). Portuguese and French respondents evaluate this option rather positive, with respectively more than 70% of valid answers categorizing it as a good or very good option. Among the Spanish and Greek respondents the share of positive or rather positive ratings was the lowest (38%), with the evaluation by the Polish participants being somewhat in the middle (>58%). In both Spanish regions and in Greece, many respondents are undecided (>31%) and about a fourth is skeptical. Between the Spanish onshore and the offshore region, no statistically significant difference can be observed in the answering patterns.

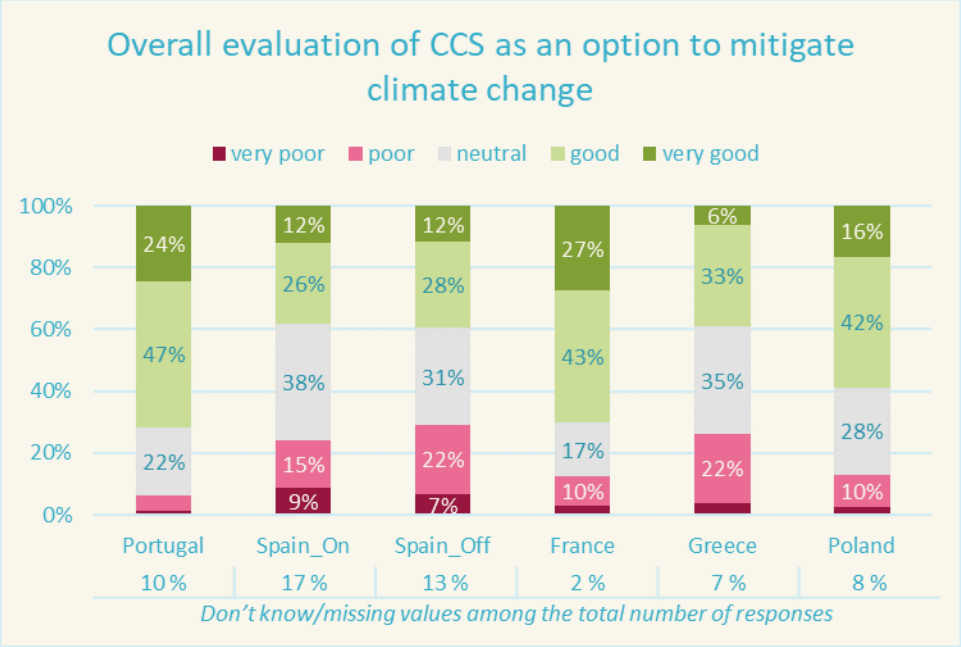

Figure 3. Overall evaluation of CCS as a technological option.

With regard to a local implementation in the region (cf. Figure 3), respondents from Portugal reacted very positively with more than 70% supporting it by answering with totally acceptable or acceptable. However, this share decreases if the potential storage location is specified as in the underground on land. Here, the rates of support are lower (>60%), with especially now more respondents choosing the neutral-option. If the storage site is specified as being under the sea, the shares of respondents now choosing totally unacceptable or unacceptable more than double (support rates now >50%). Besides Portugal, high levels of acceptance were also reported in France and Poland. In France, over 70% perceive a potential implementation of CCS in their area to be rather acceptable or acceptable. The share of respondents categorizing it as an acceptable option for their region was highest in Poland with nearly 50% stating full support, however, a very small share ticked rather acceptable; thus, overall acceptance is not higher than in the countries previously mentioned.

The lowest acceptance rate can be observed in the Spanish offshore region. While, in the onshore region a medium level of acceptance is reported, with nearly half of the respondents (>47%) considering it as (totally) acceptable, in the offshore region this applied to only about a third of survey participants. Instead, nearly half of the offshore respondents see it as (totally) unacceptable. This share is only about a third in the onshore region.

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In Greece, more than half of the respondents perceived a potential implementation of CCS in their region positively and thus on the local level, their perception is clearly more positive than their overall evaluation of the technology.

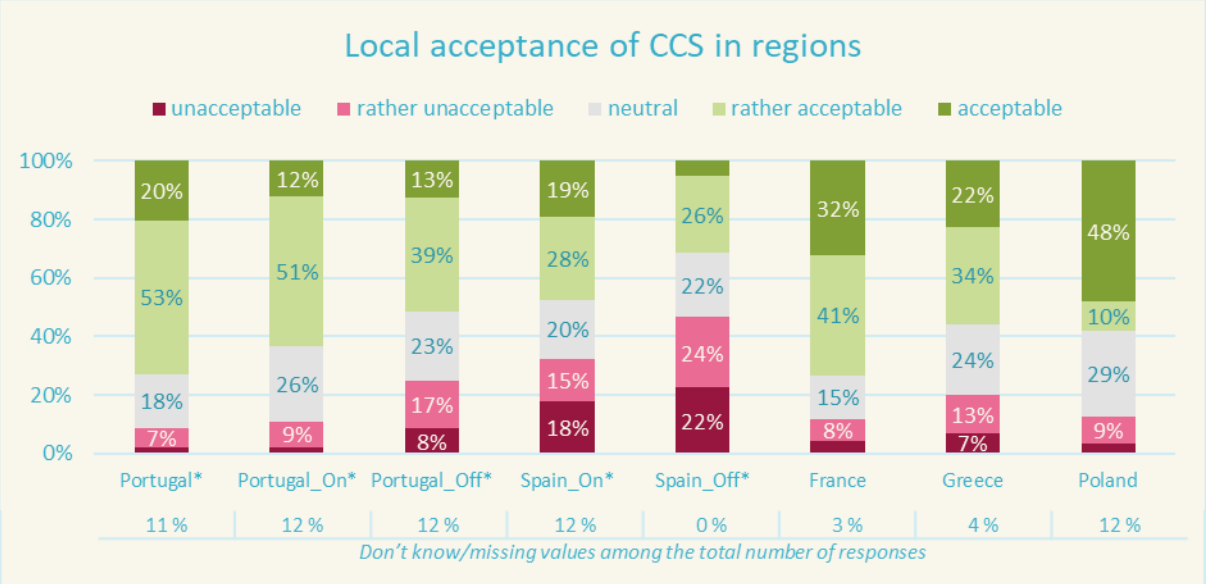

*Figure 4. Local acceptance of CCS in the respective study regions (*in the phone surveys, i.e. Portugal and Spain, the wording of the scale was slightly different ranging from "totally unacceptable" to "totally acceptable").*

In the regional surveys, some people did not decide to give an opinion on CCS acceptance and preferred the don't know option instead (up to 17% in the question on the general evaluation in the Spanish onshore sample). This resonates with low levels of familiarity in this region. For the Spanish offshore region it has to be noted that some irregularities might have occurred when surveying this question as none of the participants in this region chose the don't know option. As this finding is unexpected we can only assume that the interviewers treated the neutral option as equal to the don't know option for this question, thus increasing the share for this option.

3.2.2. Results on the (informed) acceptance of CCS across different social groups

In order to take differences between various social groups into account, we examined how those groups evaluated CCS and in how far their acceptance levels differed. For this, we specifically looked at differences across genders, age groups and types of residency.

For comparing genders, we had to exclude the group of respondents identifying as non-binary as the share of respondents in this group was very low, i.e. below 1% in each sample (cf. Table 3). For female and male respondents, no clear differences regarding the overall evaluation of CCS as an option to mitigate climate change emerge. In terms of local acceptance, however, we find statistically significant differences in Portugal and France with male respondents evaluating the potential implementation of CCS in their area as more acceptable. In Figure 5, the respective results for those countries where statistically significant differences were found are reported. Interestingly, in Portugal these differences are only significant when asked about a potential implementation without specifying storage as onshore or offshore.

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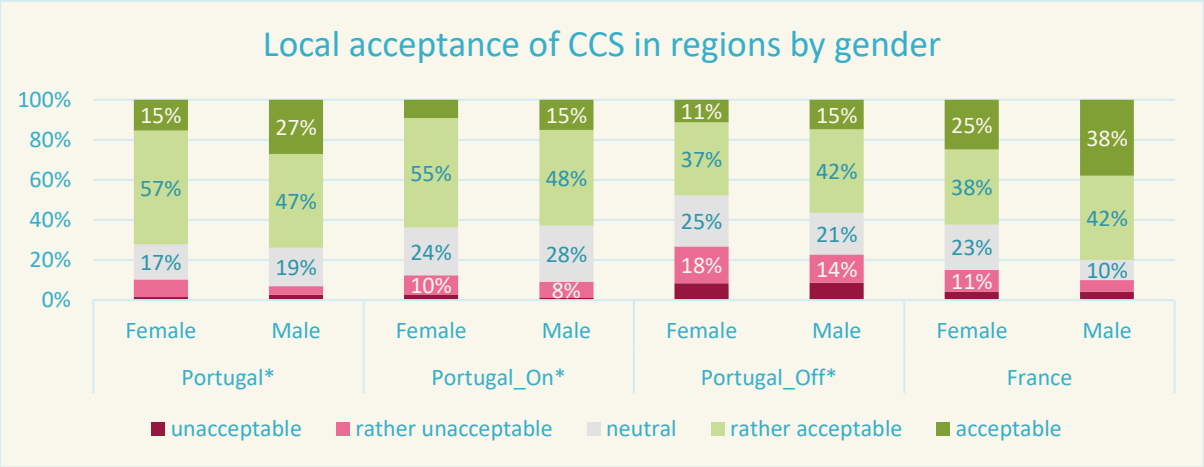

*Figure 5. Local acceptance of CCS in the respective study regions by gender (*in the phone surveys, i.e. Portugal and Spain, the wording of the scale was slightly different ranging from "totally unacceptable" to "totally acceptable").*

Next, we present results on the differences between the four age groups assessed in the survey. Here, it has to be noted, that - especially in the online surveys - the share of respondents aged 70 years or older is comparatively small (cf. Table 3). Thus, the results for this group have to be interpreted with care. Regarding the overall evaluation of CCS as a technological option to mitigate climate change, we only find statistically significant differences between the groups in Portugal. Here, the group of 30-49 year old respondents significantly differs from the next older group, i.e. the 50-69 year olds. While for both of the younger age groups in Portugal, the share of respondents choosing one of the two highest answering options is higher than 75%, more respondents in the age group of 30-49 year olds (>32%) evaluated CCS as very good compared to the youngest age group (>19%). The share of respondents 50 years or older choosing one of the two highest options is below 63%. As for the overall evaluation of CCS, in those cases, where we find statistically significant differences between the groups, the level of local acceptance also tends to be higher for younger age groups than for older ones. This is the case in Portugal and Greece, although in Portugal, the level of local acceptance only differed when assessing the potential implementation of CCS in general and when the implementation is specified as onshore, but not for an offshore implementation of CCS. In the other regions surveyed, the answering patterns do not differ significantly.

Finally, we also looked at different types of residency, i.e. whether the respondents had their primary or secondary place of residency within the respective region. This showed to be most relevant in the French and the Spanish onshore region, where a comparatively high share of respondents (>12%) stated that their place of residence within the specified region is their secondary one. However, when comparing these two groups of respondents in terms of their evaluation and local acceptance of CCS, no clear pattern emerges.

Thus, overall we find only few differences along these social groups.

3.3. Expected changes resulting from an implementation of CCS

After the respondents evaluated CCS and reported their level of acceptance for a potential implementation of this technology in their region, they were asked about their expectations on the

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changes this implementation would bring to their region. Here, we distinguished between expected overall changes (cf. Figure 6) and more specifically the expected environmental, economic and societal changes (cf. Table 4).

In line with the findings on the overall evaluation of CCS as an option to tackle climate change and the local acceptance of CCS in the regions, in Portugal (>71%) and France (>65%) the share of respondents expecting positive or very positive overall changes resulting from a hypothetical implementation of CCS is highest. The same applies to the Spanish regions, where local acceptance of CCS was lowest and the expectations regarding the overall changes are the least positive compared to the other regions. Especially in the offshore region a rather high share of respondents assess the overall changes resulting from a potential implementation of CCS negatively, with more than 38% having (rather) negative expectations. The onshore region is mainly characterized by a high share of undecided respondents, with about 38% choosing the neutral option. As for Portugal and Spain, also in the other regions the answering patterns for the assessment of the overall changes roughly resembles the one for the local acceptance of CCS.

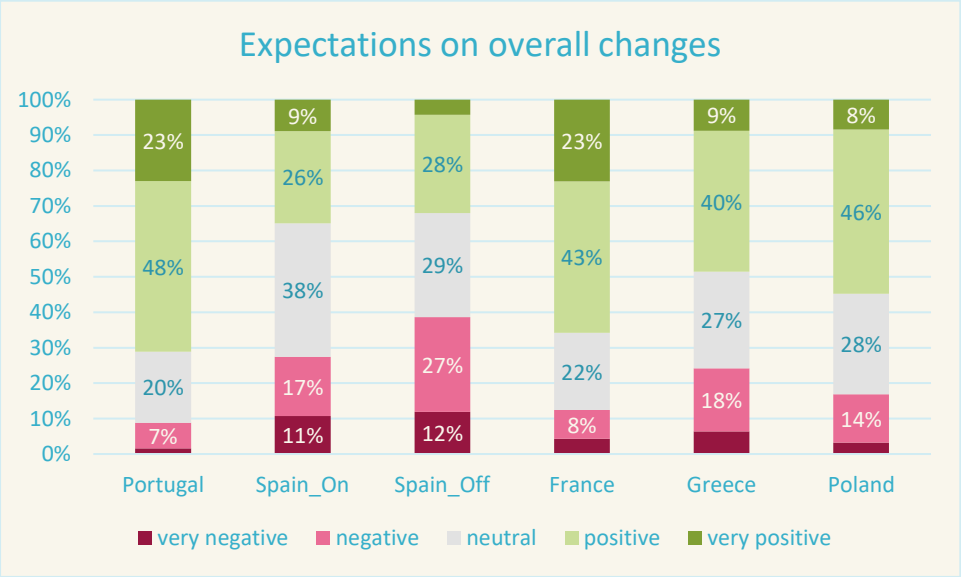

Figure 6. Expectations on overall changes the implementation of CCS could bring to the respective study regions.

The reported expectations regarding the environmental, economic and societal changes resulting from the potential implementation of CCS in the regions are mostly in line with those for the overall changes. The biggest difference can be observed for the Spanish onshore region, where considerably more respondents perceive the economic (>65%) and societal changes (>69%) to be (very) positive compared to the about 35% who do so for the overall changes. This leads to respondents in the Spanish onshore region evaluating the economic and societal changes the most positive together with those in France and Portugal. In contrast, this doesn't apply to survey participants in the Spanish offshore region where compared to some of the other regions, the more specific changes resulting from the potential implementation of CCS queried are still expected to be rather negative.

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Table 4. Expectations on various types of changes the implementation of CCS could bring to the respective study regions. Combined relative frequencies for the categories "positive" and "very positive" are displayed.

Expectations on ...	Portugal	Spain_On	Spain_Off	France	Poland	Greece
... environmental changes	55%	26%	23%	57%	33%	39%
... economic changes	60%	66%	34%	62%	44%	39%
... societal changes	53%	70%	30%	59%	34%	33%

In addition to the previously described closed items, survey respondents in all regions except the two Spanish regions were asked to indicate their positive or negative expectations regarding the potential deployment of CCS in their respective regions by answering an open question. For the analysis of the respective data, we categorized the responses in positive, neutral and negative expectations.

The categorization of the data revealed that throughout the regions, the most common positive expectations revolve around the contribution of CCS to reduce CO_2 emissions and the general positive impact on the environment the implementation of this technology could have. In addition, further local benefits are expected such as economic prospects and improvements on air quality or health. Finally, some respondents also expressed to have trust in the involved actors regarding future decisions. Among those responses that were categorized as neutral, some contained a wish for further or more extensive research on the overall impacts and the feasibility of an implementation of CCS and others requested transparent information to be provided. Furthermore, some alluded to the importance of the involvement of independent actors as well as finding a suitable location for the implementation of this technology. In terms of negative expectations on the potential implementation of CCS in the region, many respondents mentioned safety and environmental concerns. Some further expressed distrust in the involved actors or feared negative local economic or societal impacts.

Overall, a large number of respondents did not fill out the open question on their expectations on the hypothetical implementation of CCS in their respective regions, although the share of missing values varies between the regions. In France, about 56% of respondents answered this question, while in Greece and Poland the share of valid answers was lowest with below 29%. When comparing the comments across the different regions, we find that a rather high share of comments in Portugal is linked to the environmental benefits of CCS (56 out of 198 valid responses). This is considerably higher than the share of negative aspects mentioned, such as safety concerns (29 out of 198 valid responses) or environmental concerns (27 out of 136 valid responses). In the other countries, this is more balanced and in the case of France, it is the other way round with most comments being linked to safety (19 out of 198 valid responses) and environmental risks (16 out of 136 valid responses) and less referring to the potential contribution to emission reduction (5 out of 136 valid responses).

3.4. Conditions for acceptance

In order to generate insights on the preferences for measures that the implementation of CCS should be accompanied by in order to be acceptable, a mix of open and closed questions was included in the questionnaires. In the case of the Portuguese region the open question was omitted due to time constraints. For the online surveys, the open questions were presented before providing the three items with the predefined measures. In the phone surveys in Spain on the other hand, out

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of methodological considerations, we had to adjust the order of the questionnaire so that the open question was asked directly after the closed ones in the form of an "other"-category.

The results of the open questions show that for an implementation of CCS in the region being perceived as acceptable, safety measures are considered highly important. Here, general safety concerns but also more specific concerns for the environment or health were voiced frequently. Other important themes that became apparent are the request for the provision of transparent information throughout the process, compensatory measures such as the creation of jobs locally or a just distribution of financial compensations. Finally, and again, further or more extensive research on the overall impacts and the feasibility of an implementation of CCS, as well as accompanying the deployment of CCS with CO_2-reduction measures was requested.

Besides the open question, the respondents in all regions were given the possibility to evaluate specific measures to accompany the implementation of CCS in their respective region. One was the economic compensation of the municipalities (cf. Figure 7). For this measure especially respondents in the Spanish onshore region expressed a high preference, with more than 87% perceiving the economic compensation as (very) important.

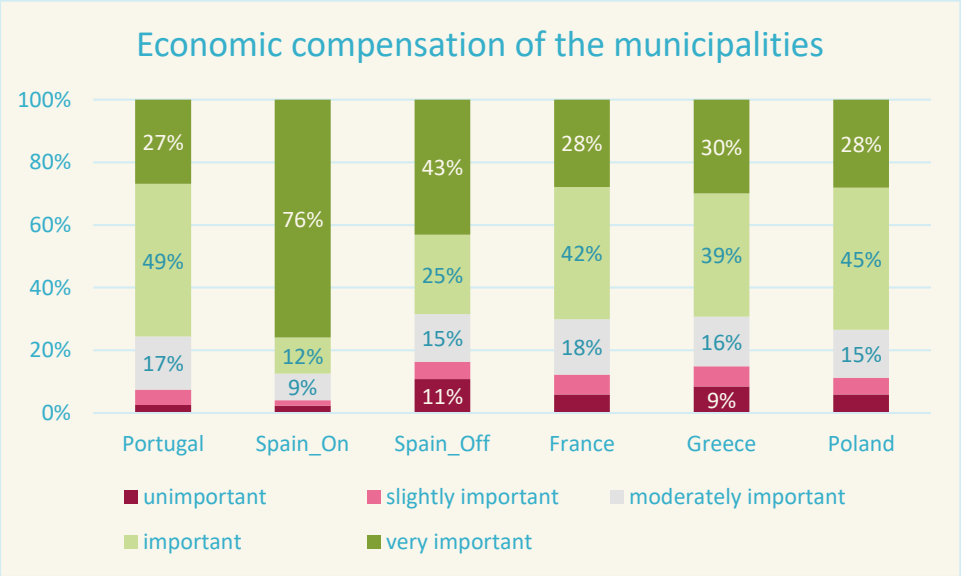

Figure 7. Importance of the economic compensation of the municipalities as a condition for acceptance.

The other two accompanying measures were the municipal advisory boards to keep the public informed and the active citizen engagement in decision making (cf. Figure 8 and Figure 9). For both, the share of respondents who perceived these measures to be very important was highest in Spain, with more than 67% respectively. When comparing the two highest categories combined, however, no big differences between the regions can be observed.

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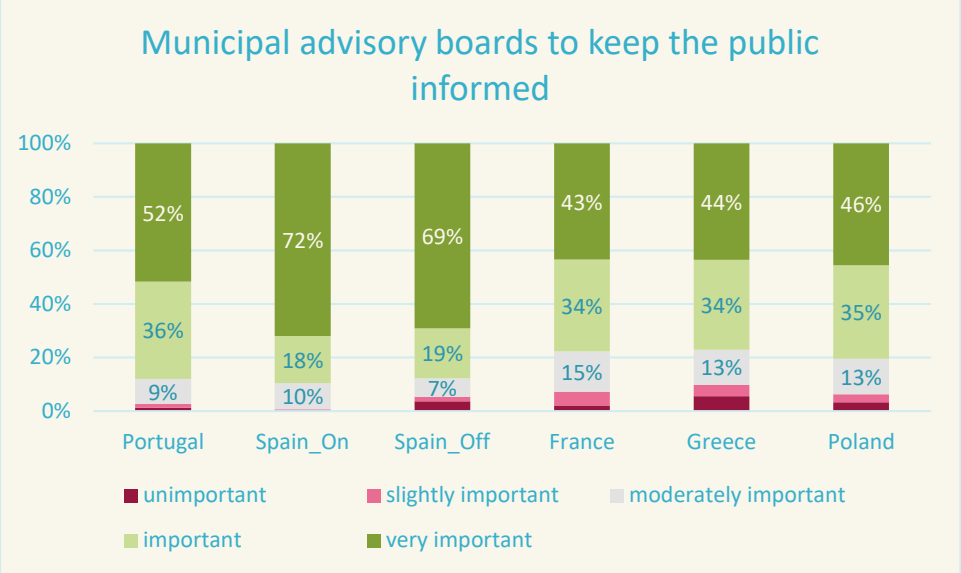

Figure 8. Importance of municipal advisory boards to keep the public informed as a condition for acceptance.

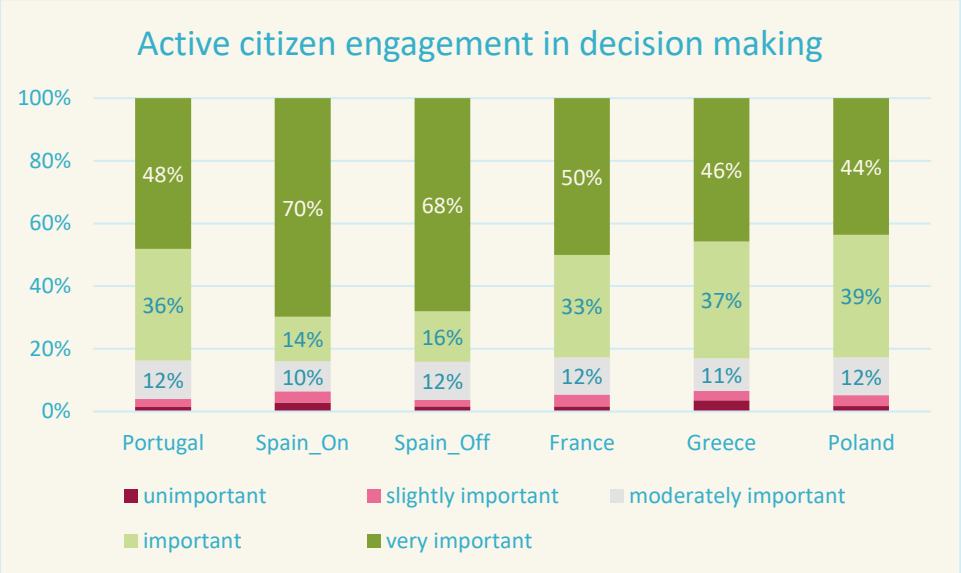

Figure 9. Importance of active citizen engagement in decision making as a condition for acceptance.

A comparison of the measures presented above indicates, that in all regions the respondents attached great importance to accompanying the implementation with all of the measures listed. This especially applies to the Spanish onshore region. Across the other regions, measures that enable the provision of information to the general public and the active participation of citizens are preferred over the economic compensation of the municipalities. This tendency is most pronounced in the offshore region in Spain.

3.5. Expectations regarding the process

In terms of their expectations regarding a potential process of implementing CCS in their regions, the respondents were asked to assess how they expect the legitimacy of the corresponding decisions to

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be, and how likely they estimate an actual implementation to be in their region. In Portugal, these questions were not part in the questionnaire. For Spain, only the item on the expected process legitimacy was included.

In order to measure the perceived process legitimacy of a hypothetical CCS implementation in the regions, the respondents were asked how fair they would expect the decision about the implementation to be (cf. Figure 10). In France, the survey participants expressed the most positive expectations on the fairness of this decision compared among the different regions with about 62% expecting it to be fair or very fair and over a fourth choosing the highest option. Another country with mostly positive expectations regarding the legitimacy of the process is Greece, even though the number of respondents expecting the decision on the implementation to be very fair is considerably smaller (>5%) and over a fifth of respondents expecting the process to be unfair. In the other regions, the respondents seem to be undecided with the majority respectively choosing the neutral option. This especially applies to the Spanish onshore region. The respondents in the offshore region in Spain on the other hand do also feature a high share of rather negative expectations with over 41% of survey participants expecting the process to be only slightly fair or even unfair.

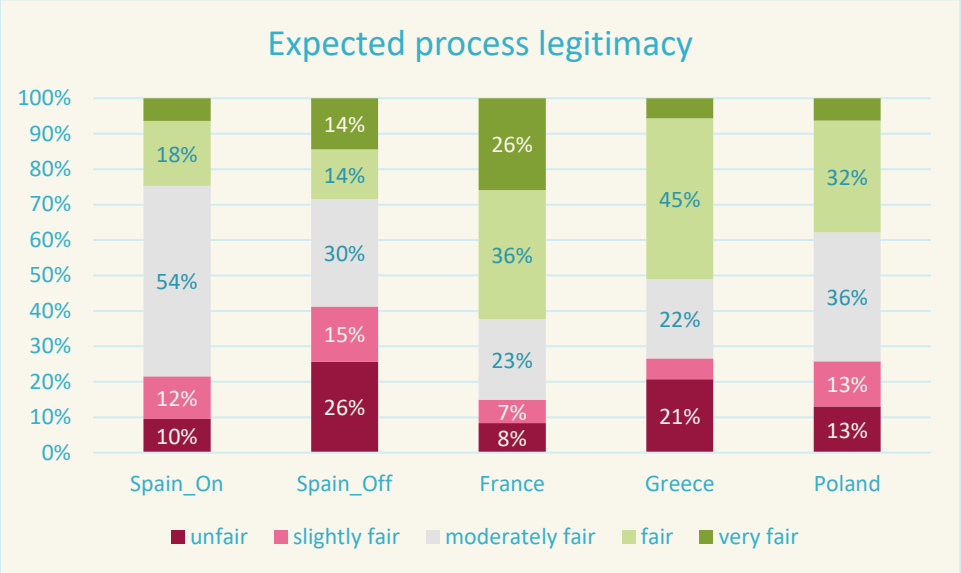

Figure 10. Expected legitimacy of the decision on the implementation of CCS in the regions.

In the online surveys, we further queried the expected likelihood of an actual implementation of CCS in the regions (cf. Figure 11). In a statistical sense, the answering patterns in all three regions differ significantly from each other with the French respondents being most optimistic regarding the likelihood of the implementation, followed by the ones from Greece and then Poland. This is in line with the findings on familiarity, where we can observe similar patterns. Overall, the respondents appear to be to a large extent undecided on the likelihood of an actual implementation of CCS in their regions, although in France about a third of the participants in the survey do deem it rather likely and about 14% further perceive it to be very likely. This also reflects the fact that plans for a factual deployment of CCS in the French region are actually furthest advanced.

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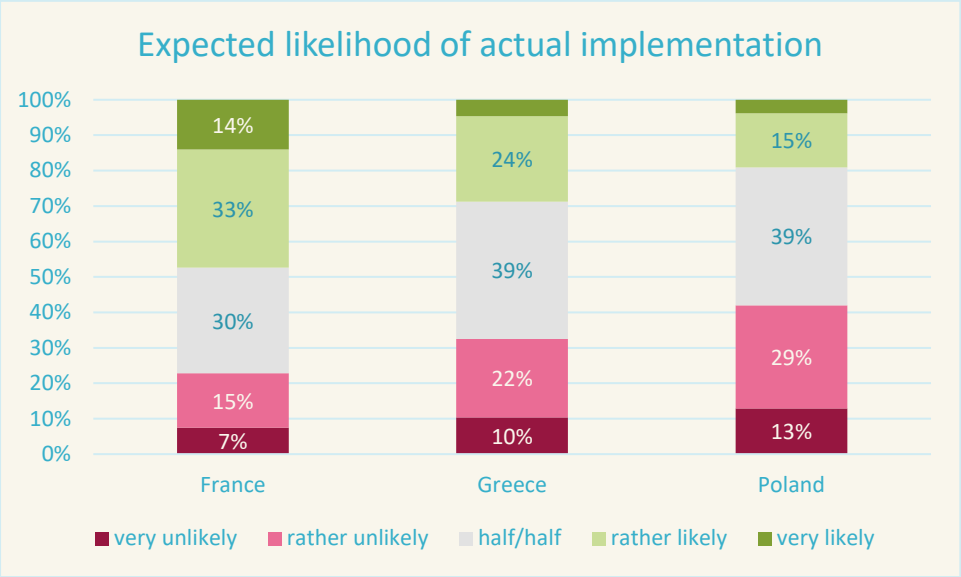

Figure 11. Expected likelihood of an actual implementation of CCS in the regions.

3.6. Trust in societal stakeholders

Participants in the survey were asked to provide feedback on their level of trust in various societal stakeholders that could potentially be relevant for a hypothetical deployment of CCS in the regions. It has to be noted that all the figures in this and the following section, i.e. Figures 12-14, only include those groups of stakeholders that are queried across all of the six regions.

Turning towards the survey results for the items on trust in societal stakeholders we find that in each region scientists are the most trusted group. Further, the results show that across all actor groups the level of trust that survey participants attribute to them varies rather strongly (cf. Figure 12). Overall, it can be observed that on average the respondents in Portugal, the Spanish onshore region and France trust the queried actor groups the most with mean values of more than 3.5 respectively. The other regions, on the other hand, do feature mean values of below 2.9. Thus, also between the two Spanish regions different levels of trust can be observed with respondents in the onshore region displaying a higher level of trust for all actor groups except for scientists, where no statistically significant difference exists.

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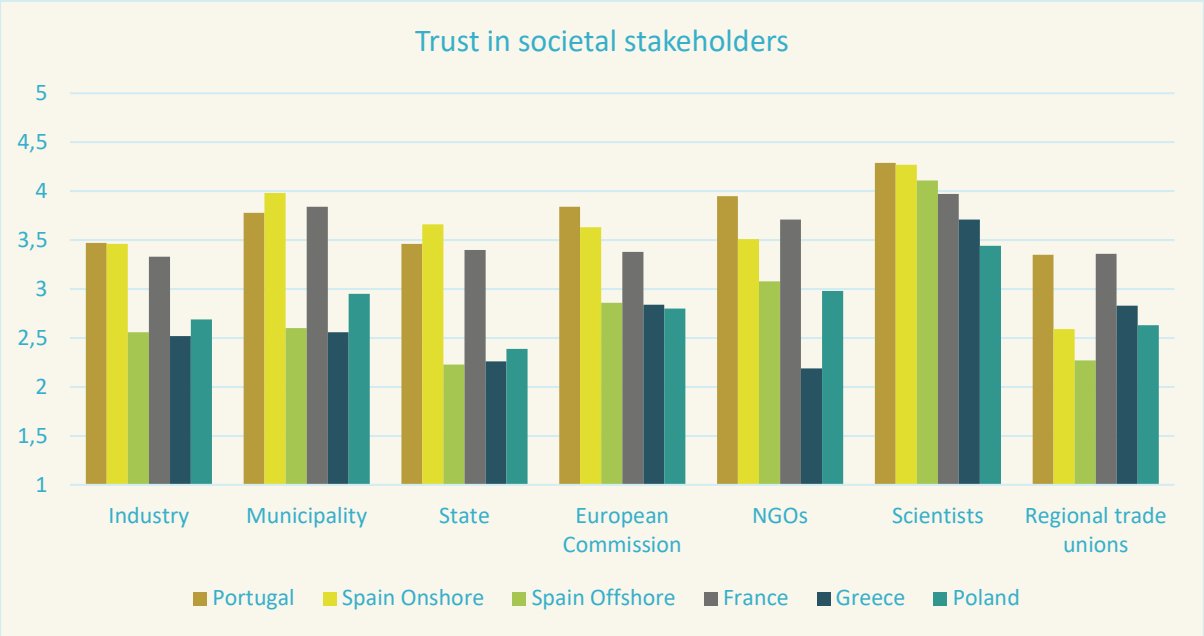

Figure 122. Mean value of trust in societal stakeholders for each actor group per region, with scores ranging from 1 ("no trust") to 5 ("complete trust").

3.7. Preferred involvement of societal stakeholders

In addition to the assessment of their trust in societal stakeholders, respondents were further asked to report their preferences on the potential involvement of societal stakeholders in case an implementation of CCS should occur in the regions. In the questionnaire, we distinguished between the involvement of these stakeholders as initiators (cf. Figure 13) and as decision makers (cf. Figure 14). It has to be noted for the interpretation of these results that the respective questions were not asked in the Spanish questionnaires and only the first one was queried in the Portuguese survey.

Both for initiating the implementation of CCS as well as for the decision making in this process it can be observed that in every single region where the respective questions were asked scientists are the group most preferred to be involved in the implementation of CCS. This is similar to the results on trust in the various stakeholder groups. For the other actors the results are mixed with the regional stakeholders and NGOs featuring rather low mean values. With regard to NGOs this means that in general across those regions in which all items were included, they are rather trusted by many of the respondents, but when asked on the preferred involvement in the implementation, they are favored less. One country, where NGOs feature low values in all regards is Greece.

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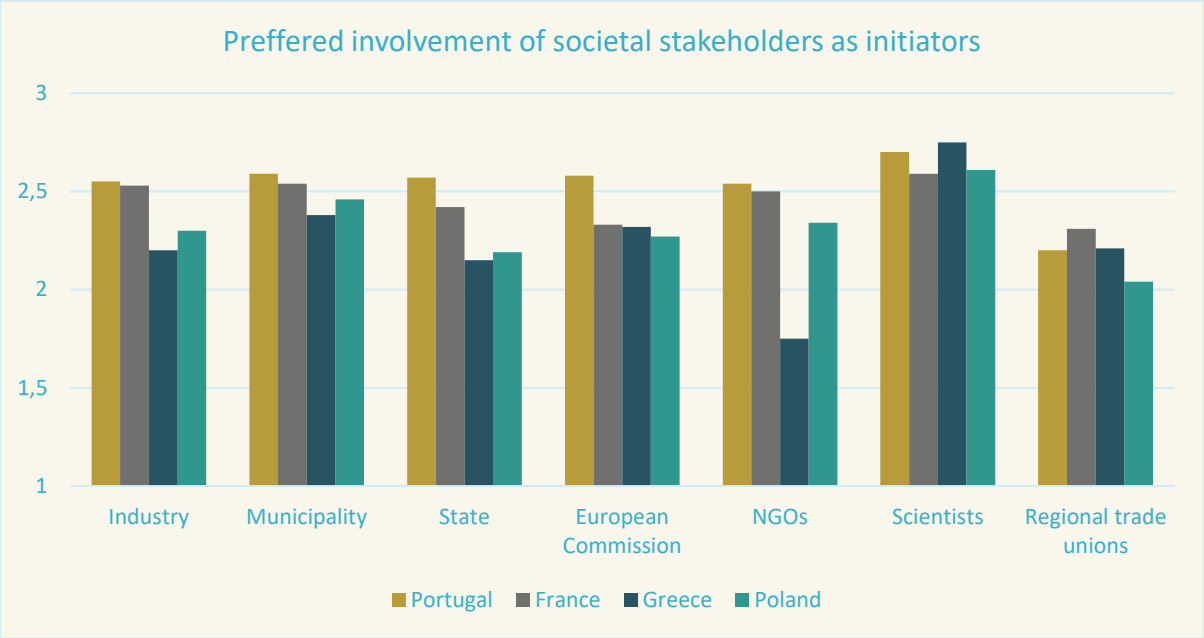

Figure 133. Mean value of preferred involvement of societal stakeholders as initiators for each actor group per region, with scores ranging from 1 ("not involved") to 3 ("very involved").

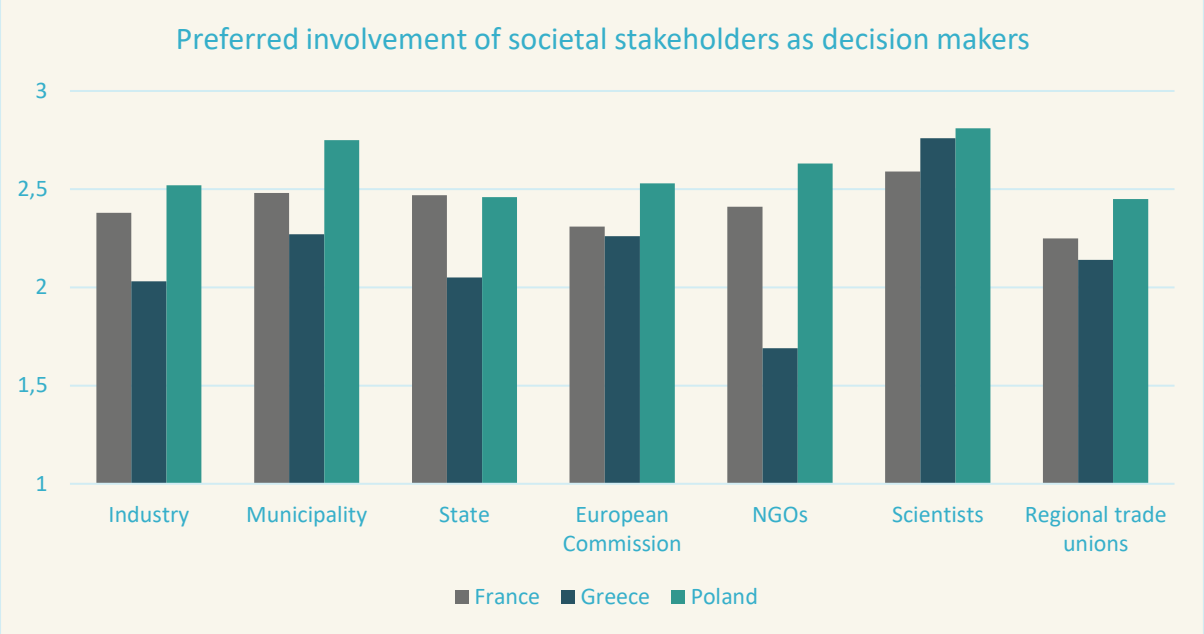

Figure 144. Mean value of preferred involvement of societal stakeholders as decision makers for each actor group per region, with scores ranging from 1 ("not involved") to 3 ("very involved").

3.8. Further attitudes and sentiments of the respondents

To better understand the attitudes of the respondents towards the potential implementation of CCS in their region, we included questions on the survey participants' perception of climate change, their attachment to their area and their attitude towards energy-intensive industries. These insights are

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expected to help provide a more comprehensive reflection of the attitudes and sentiments of people in the regions, which might be relevant when exploring CCS further there.

3.8.1. Perception of climate change

The majority of respondents in all surveyed regions describes climate change as a severe or very severe problem (cf. Figure 15). The lowest share of respondents choosing one of those two options is found in the Polish and then in the Portuguese region, although those two options still add up to more than 68% respectively. However, due to the comparatively low number of responses in the highest category (>29%), the importance of the issue of climate change is evaluated significantly lower by the Polish respondents than by those in the other countries, also in a statistical sense. In Spain, especially in the offshore region, the share of respondents perceiving climate change to be a (very) severe problem is the highest with up to about 91% choosing one of the two corresponding options.

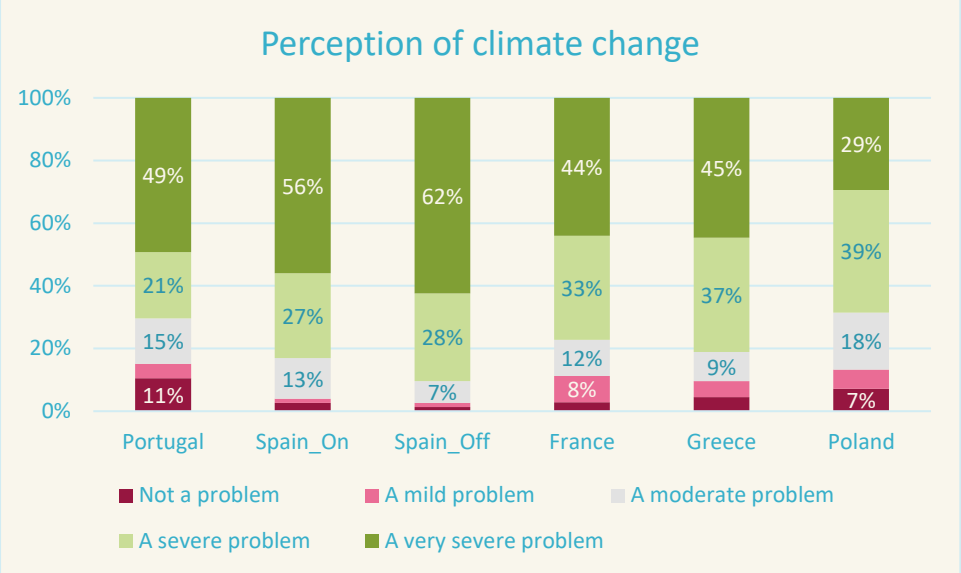

Figure 155. Perception of climate change in the regions.

3.8.2. Place attachment

To assess the attachment of the people participating in the survey with the area they live in and gain a better understanding on how the examined regions differ from each other in this regard, we have included several items related to this topic in the questionnaire.

First, we asked the respondents to state how long they have lived in the area of their place of residence. Here, major differences between the regions become apparent (cf. Figure 16). While in the Spanish onshore region, the vast majority of respondents have been living within the area for over 20 years, only about a fifth of the respondents in the French region did live in the area for that long. Instead, more than half have lived there for under 10 years.

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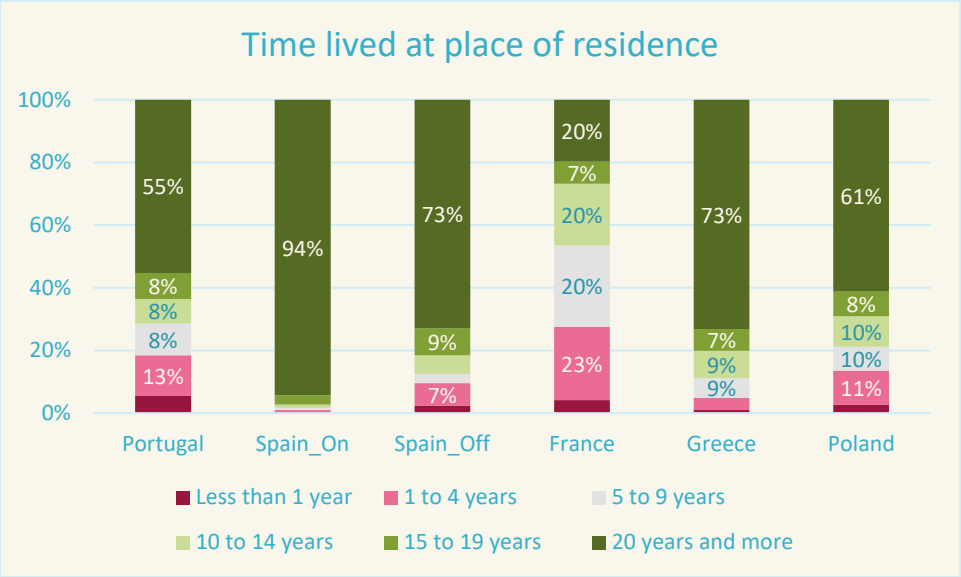

Figure 166. Time lived at the place of residence in the regions.

When comparing the previously described results to the level of attachment the survey participants attribute to the region, it can be seen that the results on the duration lived in the area is at least partly reflected by the overall attachment to it. This is especially evident in the case of the Spanish onshore region, where about 99% strongly agree or agree to the question on whether they feel attached to their area (cf. Figure 17). In the Spanish onshore region as well as in Greece and Poland, over three in four respondents do live in the area for ten or more years, but compared to the Spanish onshore region they all feature lower values of place attachment, albeit still being highly attached to their area. For the French region, it is the other way round with the respondents having lived in the area for a comparatively shorter time, but featuring similar levels of place attachment as the respondents in the other regions.

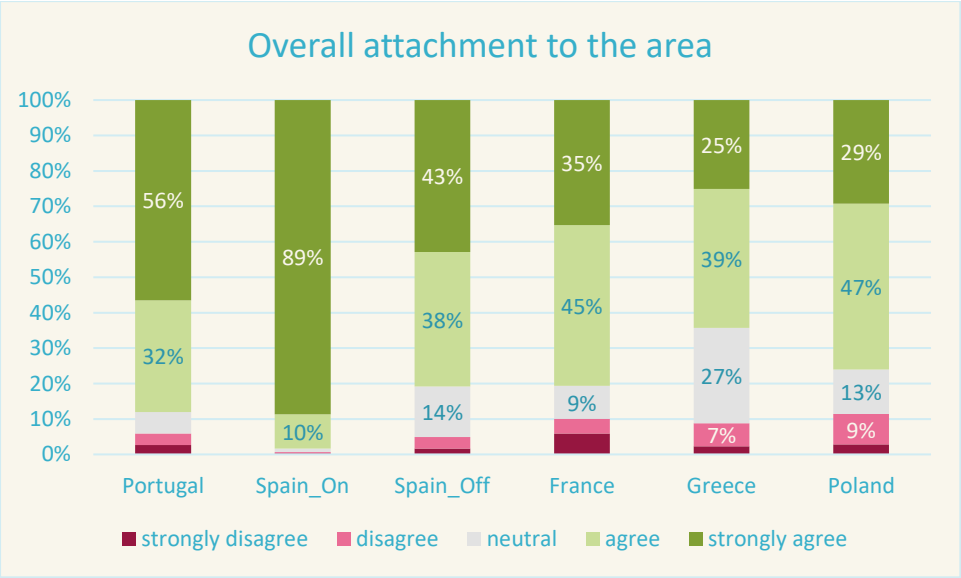

Figure 177. Overall attachment to the area the respondents live in.

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After assessing the overall attachment the survey participants attribute to the area they live in within the examined regions, we then asked the respondents to evaluate to which extent they feel attached to the natural heritage in their area (cf. Figure 18). Except for the Spanish regions, the participants in all regions finally should further do the same with regards to the cultural heritage of the area (cf. Figure 19). For both specifications of place attachment, the patterns are similar to the one for overall attachment to the area. However, the shares of respondents (strongly) agreeing to be attached slightly decrease from the overall evaluation to the more specific ones presented in the figures below.

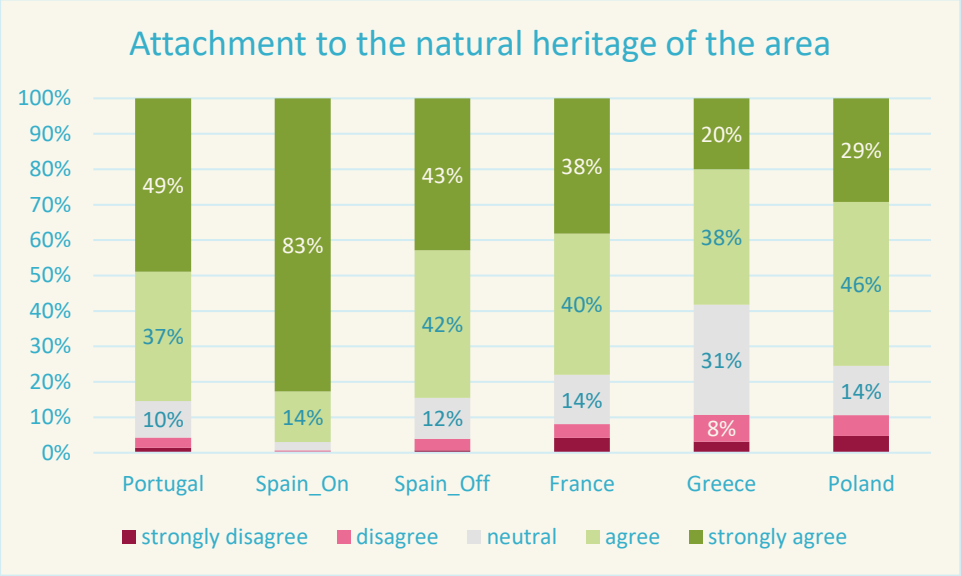

Figure 18. Attachment to the natural heritage of the area the respondents live in.

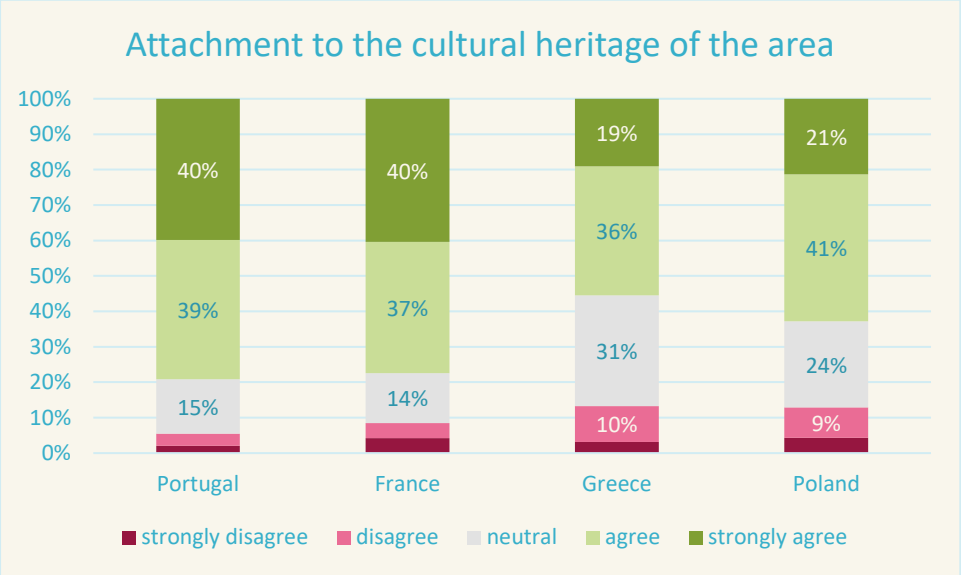

Figure 19. Attachment to the cultural heritage of the area the respondents live in.

3.8.3. Attitudes towards energy-intensive industries

In order to create an understanding on the prevalent attitudes towards energy-intensive industries in the regions, the respondents in our regional surveys were asked to assess how important they

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consider those industries to be. In order to clarify, which industries are considered energy-intensive and thus relevant for the capturing and storing of CO_2, we listed the relevant sectors or where feasible the specific companies in the regions.

When asked about their attitudes towards energy-intensive industries in the region (cf. Figure 20), the respondents in the Spanish onshore region associated a relatively low importance with energy-intensive industries (about 40% considering them as unimportant or slightly important) while the offshore region showed an answering pattern similar to the other countries or even slightly higher levels of perceived importance. Here, about 82% of respondents with valid answers reported energy-intensive industries to be either important or very important with nearly half of the Spanish respondents in the offshore region considering them as very important.

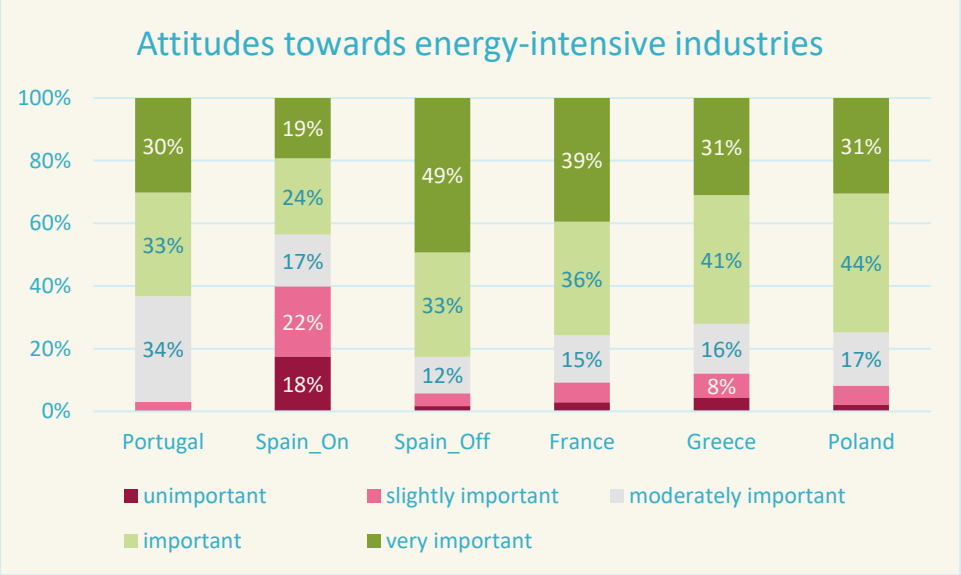

Figure 20. Attitudes towards energy-intensive industries in the regions.

With regard to employment (cf. Figure 21), the significance of the energy-intensive industries appears to be the highest in the French regions, where about 14% of respondents are themselves employed in one of the companies listed in the questionnaire and about further 20% reported that someone of their family is working there. The share of respondents reporting that they themselves or someone of their family is working in the listed energy-intensive companies is lowest in Greece and Poland.

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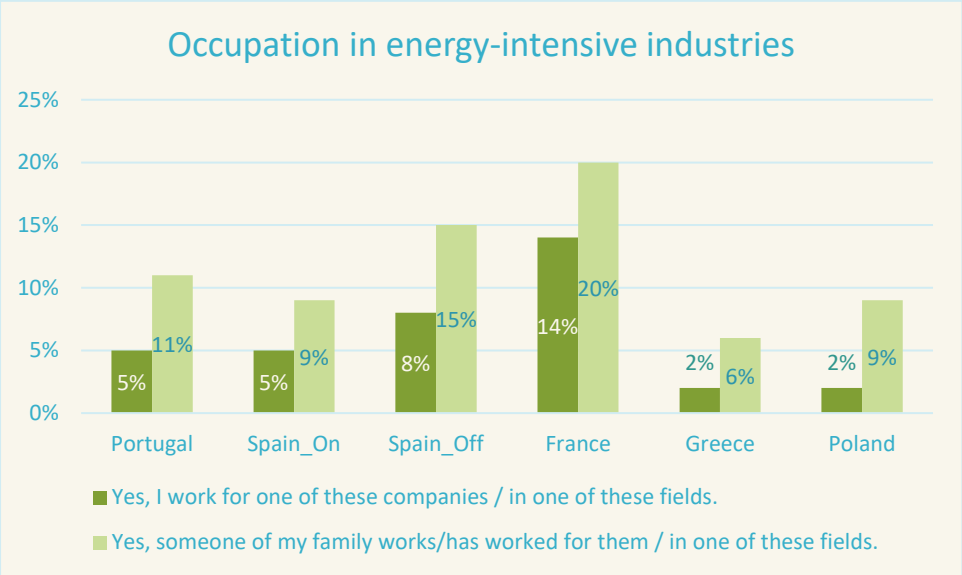

Figure 21. Occupation in the energy-intensive industries in the regions.

3.9. Insecurities in the response behaviour

The figures presented in this report and the shares of respondents reported in the text and the figures each refer to valid answers only, i.e. excluding missings and don't know responses. If taken into account, these missing values would decrease the shares outlined in this section.

When looking into the CCS related questions it has to be noted that up to 17% of respondents chose the don't know option. In comparison to other questions in the regional surveys, the share of missing values is rather high for these items reflecting the low familiarity the respondents have with the technology. Another question where the share of respondents was comparatively high in all of the surveyed regions was the one on the expected fairness of the potential implementation process of CCS. Across all items, Polish respondents had the highest probability of choosing the don't know option with an average of over 10% doing so.

4. Concluding discussion

Portuguese and French respondents evaluate CCS as an option to mitigate climate change rather positively, with respectively more than 70% of valid answers categorizing it as a good or very good option. Among the Spanish and Greek respondents the share of positive or rather positive ratings was the lowest (38%), with the evaluation by the Polish participants being somewhat in the middle (>58%). In both Spanish regions and in Greece, many respondents are undecided (>31%) and about a fourth is skeptical. Between the Spanish onshore and the offshore region, no statistically significant difference can be observed in the answering patterns.

In all countries, more people make positive rather than opposing statements when evaluating CCS as an option to mitigate climate change. However, again, we find some heterogeneity and also large groups (17-38%) being neutral in this regard. With regard to a local implementation, respondents from Portugal reacted very positively to a potential implementation in the region. However, this share decreases if more specification about the potential storage location is provided (for both onshore and offshore). A majority in favour (>50%) were also found in France, Greece and Poland,

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but not in Spain. As conditions for acceptance, in all countries, survey respondents emphasized the need for economic compensation and transparent engagement processes. In open questions safety aspects were also often mentioned.

Trust in societal stakeholders varies between the regions. In Portugal, the Spain onshore region and France trust in different types of stakeholders is higher than in the other countries. All samples agree that they put the highest level of trust on scientists. The patterns whether the different stakeholders should be involved in the process of developing CCS are similar to the patterns found for trust but with less pronounced differences. Embedding the discussion around CCS more broadly, we find that participants are highly aware of climate change as a challenge to societies.

It is important to note that especially for the CCS-related questions and in some regions, we recorded relevant shares of respondents choosing the don't know-option instead of providing an evaluation. On the one hand, this makes sense in the light of the low levels of familiarity. On the other hand, this puts another layer of insecurity regarding the generalization and replicability of findings as it leads to the expectation that findings will be unstable to some extent.

When breaking down the survey results by different social groups we found gender-related differences regarding the local acceptance of CCS in Portugal and France, although when specifying storage as onshore or offshore in the Portuguese region, the differences are no longer statistically significant. The overall evaluation of CCS as a technological option to mitigate climate change does not show gender-specific differences. Regarding different age groups, there appears to be a tendency for younger respondents to evaluate CCS more positively and show higher levels of local acceptance, although this was only observed in Portugal and Greece.

Further insights can be gained from a multivariate analyses of the results as well as from integrating them with further findings using other methods (cf. D6.2).

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