Technical assistance with the public consultation on EU summertime arrangements

Final report

Written by Technopolis Group
May – 2019 (revised version)

technopolis | group |

EUROPEAN COMMISSION

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Technical assistance with the public consultation on EU summertime arrangements

Final report

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Luxembourg: Publications Office of the European Union, 2019

ISBN 978-92-76-09254-4
doi: 10.2832/571245

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1 Executive summary

OBJECTIVE AND SCOPE: EU legislation on summertime arrangements was first introduced in 1980 with the objective of harmonising diverging national summertime schedules within the single market. Since 2001, EU summertime arrangements have been governed by Directive 2000/84/EC, which stipulates a switch to summertime for all Member States on the last Sunday of March and a switch back to wintertime for all on the last Sunday of October. In February 2018, the European Parliament adopted a resolution asking the Commission to conduct an assessment of the Directive, and if necessary, provide a proposal for its revision. As part of this assessment, the Commission decided to launch a public consultation to gather the views of European citizens, stakeholders and Member States on the current EU summertime arrangements and on a potential change to these. The results of this consultation are by no means binding but are considered as input to the assessment process. The public consultation ran between 04/07/2018 and 16/08/2018. The consultation reached a wide public: more than 4.7 million responses were submitted online. Under framework contract PO/2016-06/01-Lot1, Technopolis Group was asked by the European Commission, DG MOVE, to help with quality checks and cleaning of the data, and with an independent analysis of the responses.

METHODOLOGY: A preliminary data cleaning was performed by the European Commission in order to remove duplicate responses by the same respondent(s) and to identify 'campaigns'. Further quality checks were conducted by the Technopolis project team in order to exclude inappropriate responses and to re-categorise respondents that chose the wrong stakeholder type (e.g. individual citizens identifying themselves as a business or Member State authority).

RESPONDENT PROFILE: The vast majority of the replies were submitted by citizens, representing over 4.5 million or 99.8% of all respondents. Within the other types, businesses and other stakeholders represented only 0.196% of the responses. The smallest category was the public authorities, accounting for 0.001% of respondents. The category of 'Stakeholders and businesses' included firms as well as research organisations, NGOs or public or private organisations.

QUESTION 1: OVERALL EXPERIENCE: The **majority of the respondents have expressed a negative experience** with the switching arrangements. With regards to the citizens, respondents from all Member States have expressed a negative experience with the current arrangements – with the exception of respondents from Malta, Cyprus, and Greece. Similarly, stakeholders and business respondents have almost all had a negative experience with the switching.

QUESTION 2: TO KEEP OR ABOLISH THE CURRENT ARRANGEMENT: Overall, the **majority of respondents were in favour of abolishing the switching** of standard wintertime to summertime. The majority of citizens respondents from most Member States preferred to abolish the time switching, except those from Greece and Cyprus. Moreover, the majority of stakeholders and businesses respondents were also in favour of abolishing the time switching.

QUESTION 3: WHAT IS THE REASON: The main reason given by respondents in favour of keeping the current arrangements is **leisure activities** in the evening. Conversely, the main reason highlighted by respondents in favour of abolishing the current arrangements is **human health**. Breaking it down per category, citizens respondents pointed to human health as the main reason for their choice, regardless of whether they were in favour of keeping or abolishing current arrangements under question 2. Stakeholders and businesses respondents also mainly highlighted health related issues. According to the free text analysis, the stakeholder category also pointed to other negative experiences stemming from the bi-annual time switches linked to economic activities (e.g. export, trade and transactions with foreign countries), IT expenses and problems, and administrative burden. Moreover, companies highlighted negative effects stemming from higher error rates from employees, increased sick leave, and complications relating to night time shift work. A considerable number of responses from both citizens, stakeholders and businesses also highlighted reasons linked to animal health in their free text replies.

QUESTION 4: WHAT IS THE IMPORTANCE: The majority of respondents from every country indicated that this question was of high importance to them. Given an expected strong self-selection bias, this result most probably reflects that the public consultation is likely to have attracted respondents that have a strong interest in and opinion on the overall matter.

QUESTION 5: PREFERRED OPTION AFTER ABOLISHING THE TIME SWITCH: Respondents were also asked, if the biannual time switch was to be abolished, would they prefer permanent summertime or permanent wintertime. Overall, a majority of respondents would prefer permanent summertime (56%) as opposed to permanent wintertime (36%), while 8% had no opinion on the matter. In most Member States, respondents favoured permanent summertime, except in Finland, Denmark, the Netherlands and the Czech Republic where the majority of respondents expressed a preference for permanent wintertime.

2 Introduction

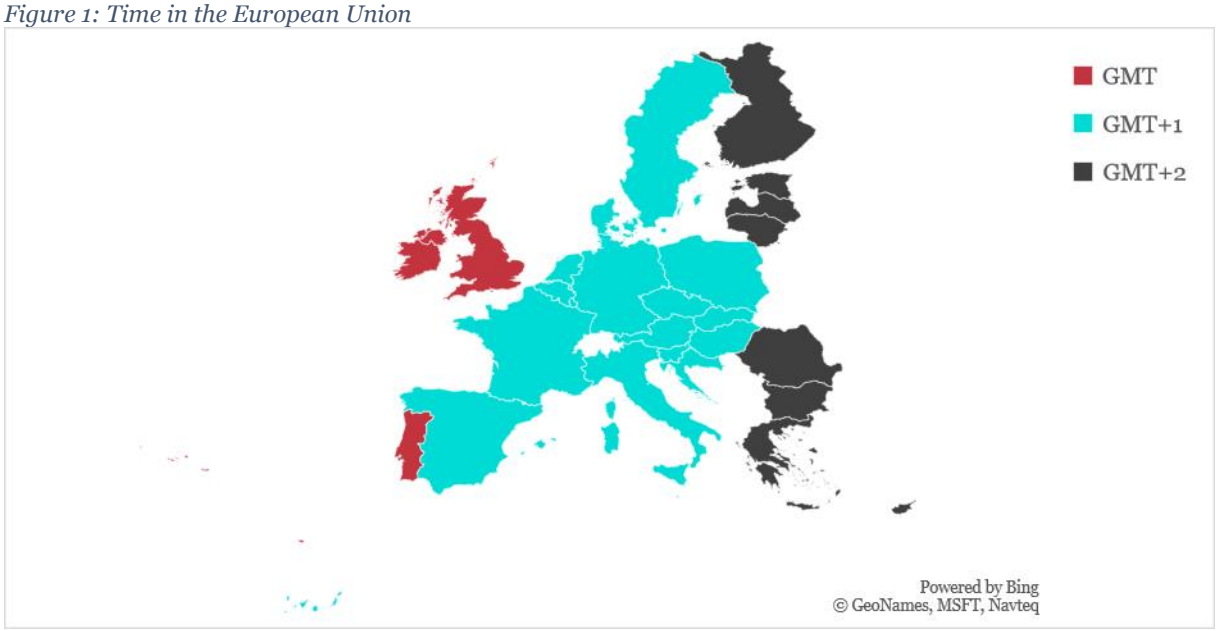
EU summer-time arrangements imply that clocks are changed twice per year in all Member States in order to cater for the changing patterns of daylight across seasons. Clocks are advanced by one hour in the morning of the last Sunday of March and set back by one hour in the morning of the last Sunday of October to return to standard time.

For historic reasons, Member States chose to introduce summertime arrangements. Such arrangements were first adopted during the first and second World Wars to conserve energy. Many European countries later abandoned the measure. Modern summertime arrangements stem from the time of the oil crisis in the 1970s when Member States reintroduced time switches.

EU legislation on summertime arrangements was first introduced in 1980 with the objective to unify existing national summertime practices and schedules that were diverging, thereby ensuring a harmonised approach to the time switch within the single market.

In parallel to, and independent from the EU summertime arrangements, the territories of the Member States on the European continent are grouped into three different time zones or standard times. The decision on the standard time is as such not affected by the EU summertime rules (or any change thereof). *Figure 1* below illustrates the time zone differences across EU Member States.

Figure 1: Time in the European Union



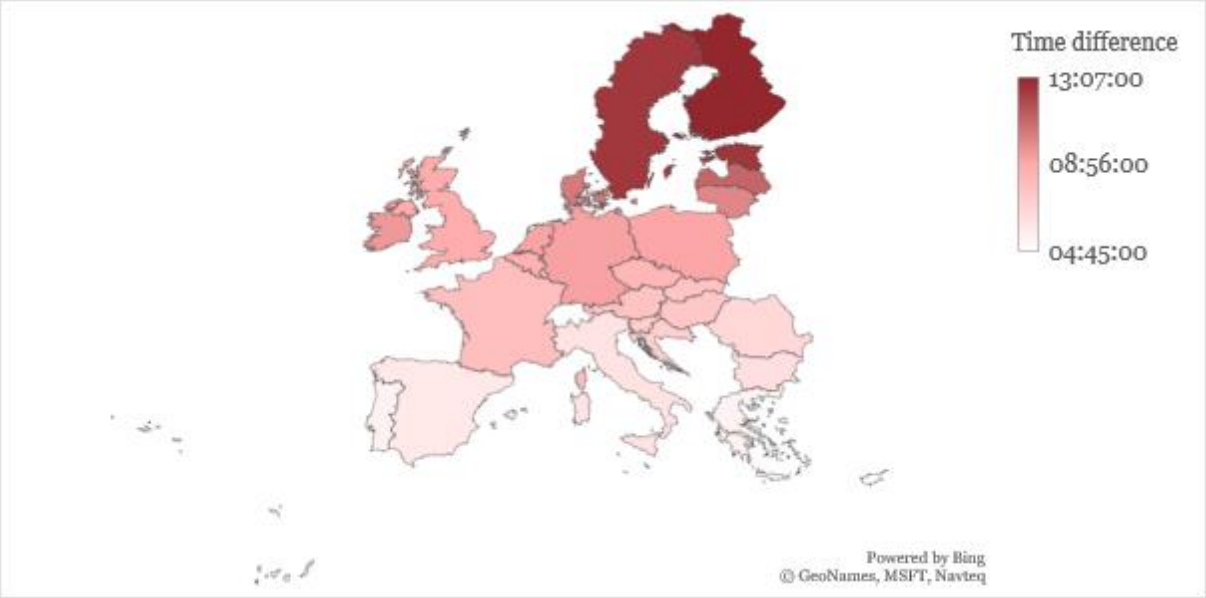
Source: Technopolis Group elaboration

It should also be noted that the daylength varies through seasons across Member States, depending on their latitude. Northern EU Member States experience large seasonal changes in available daylight throughout the year, marked by dark winters and bright summers. Conversely, Southern EU Member States experience relatively small change in daylength across seasons. *Figure 2* illustrates the difference between the daylength on the 20th of June and the 20th of December[1]. In these two periods, the daylength

[1] Solar timetables (sunrise and sunset times) and daylight saving time, DG MOVE, on basis of dataset from NOAA (http://www.srrb.noaa.gov/highlights/sunrise/sunrise.html)

in the Northern countries Sweden, Finland, and Estonia varies by 13 hours whereas in the very Southern ones of Cyprus, Malta and Greece, it is less than 5h.

Figure 2: Difference between daylength on 20th of June and 20th of December



Source: Technopolis Group elaboration

Following a number of requests from citizens, from the European Parliament, and from certain EU Member States, the Commission has undertaken work to investigate the functioning of the current EU summertime arrangements and whether or not they should be changed. In this context, the Commission decided to launch a public consultation to gather the views of European citizens, stakeholders and Member States on the current EU summertime arrangements and on a potential change to these. The results of this consultation are by no means binding but are considered as further input to the assessment process. The public consultation ran between 04/07/2018 and 16/08/2018.

The consultation reached a wide public: more than 4.7 million responses were submitted online. Under framework contract PO/2016-06/01-Lot1, Technopolis Group was asked by the European Commission, DG MOVE, to help with quality checks and cleaning of the data, and with an independent analysis of the responses. This report synthesises the results and provides an overview on the responses, methodology, a summary of the replies and conclusions. In the annex, more detailed tables and explanations can be found.

The report uses the term 'wintertime' instead of referring to 'standard time', since this is the term used in the consultation. Therefore, also 'summertime' is used instead of what is also commonly referred to as 'daylight saving time'.

3 Methodology

3.1 Methodological caveats

The European Commission conducts public consultations to give everyone the possibility to contribute to the EU policy-making process. The general public and interested parties can express their views on the scope, priorities and added value of EU initiatives.

Results from public consultations are not statistically representative. While being open to everyone who wants to participate, web-based public consultations have a self-selection bias of the respondents towards the views of those who choose to respond to the consultation against those who do not. A hint of the self-selection bias can in this case be found among one of the questions (see section 0). People with access to the internet and digital skills are also more likely to participate in a web-based public consultation than people who have no, or only a very slow access to the internet.

A specific limitation of this public consultation was that respondents had to give only very little information about themselves and the interests they represent. For instance, there was no question included on sectors of activity, age group or gender of respondents. This made it difficult to determine, based on the replies, what motivated individual respondents to participate and why they replied in a certain way rather than another.

Therefore, caution needs to be taken for the interpretation of the data in terms of causality and one needs to remember that the results are not representative. This is why only descriptive statistics are presented in the report, which speak for themselves.

The public consultation was announced with a press release and dedicated interviews and received media attention in many Member States. The consultation was also actively promoted by the different Commission representations in the Member States and on social media. Responses came from all Member States, although response rates varied across countries, with the highest response rates coming from three countries. It should be noted that the largest amount of responses came from Germany (70% of all replies), which weighs on the average results when looking at the aggregated absolute numbers and shares (totals).

Even with the caveats in terms of biases and non-representation, the results can be analysed by taking into account an important differentiating factor between the Member States, namely their location and their exposure to more or less light. This was indeed done during the analysis and examples are provided in the annex. However, the graphic display chosen here provides well-known and simple overviews of the responses by country as well as an EU-average.

3.2 Data treatment

The responses were submitted to an EU tool, namely the EU Survey, which is used for public consultations. A preliminary data cleaning was performed by the European Commission (DG CNECT) through the DORIS tool in order to remove duplicate responses by the same respondent(s). For this consultation, duplicates were defined as more than one reply with the same e-mail address. While 4.7 million replies were originally accounted for in the EU Survey, after cleaning of duplicates the total number of valid replies was reduced to 4,559,987, of which 4,551,004 came from citizens. The Commission also searched for campaigns, whereby the exact response is copied and introduced by a large number of respondents from specific interest groups. In the EU Survey, no campaigns were found. However, two limited campaigns were identified amongst the responses sent to the Commission by e-mail. The Commission services translated the responses of the open questions into English, using machine-based translation. In case of documents submitted together with the responses, the Commission also provided a translated version of these documents. Wherever possible, Technopolis project team members analysed the open responses as well as the attachments in the original language.

Given the unprecedented flow of replies, the consultation server was at times unstable. However, users who did not manage to submit their contribution online because of technical difficulties were able to get in touch with the Commission via e-mail (address provided on the consultation page). Replies to the questionnaire sent through other means (e.g. e-mail, post) were also taken into account. They were

treated separately since the format of the data differed from the online submission and a common way to treat them was not available following the end of the public consultation. Analysis of these replies can be found in Annex 0

Before analysing the data, it was checked and further cleaned by the Technopolis project team in view of excluding contributions qualifying as "unsuitable". As indicated in the Commission's public consultation guidelines, the following kinds of content is considered *unsuitable*:

- Abusive, obscene, vulgar, slanderous, hateful, xenophobic, threatening or sexually-oriented comments
- Spam, advertising for a website or product
- Duplicate content
- Off-topic comments, unrelated to the proposed legislation
- Links to illegal or pirated software
- Any other content users report to us [the EC] with a valid explanation as to why[2]

Further quality checks were also conducted by the Technopolis project team in order to re-categorise respondents that chose the wrong stakeholder type (e.g. individual citizens identified themselves as a business or Member State authority). Details on the cleaning and re-classification can be found in Annex A and B.

[2] See https://ec.europa.eu/info/law/better-regulation/rules-feedback-and-suggestions_en

4 Overview of responses

The following provides an overview about the 'raw' number of responses obtained, including entries in the open questions and the changes performed (elimination of duplicates and inappropriate speech, re-classification), and the numbers finally taken into account for the analysis.

Table 1 Responses received, treated, and analysed

	Number of initial responses through system	***Removed: Duplicates***	***Comments (raw)***	***Reclassified automatically (from PAs and S&Bs to Citizens[3]***	***Re-classified (manually?)[4]***	***Removed: Inappropriate speech***	***Data after hate speech removal and reclassification***	***Obtained through mail***	***Final number analysed***
Citizens	**4,688,753**	**-143,561**	800,416	**+7,640**	**+402**	**-2,249**	4,550,985	**+19**	**4,551,004[5]**
Public authorities	**2,107**	**-67**	11	**-1,752**	**- - 242**	**-1**	45	**0**	**45**
Stakeholders and businesses	**15,434**	**-438**	2,414	**-5,888**	**-- 160**	**-10**	8,938	**0**	**8,938**

Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

The large majority of responses came from citizens and to a smaller extent from stakeholders and businesses while public authorities are not only marginal – compared to the others, but also the contributions received were somewhat different. For the sake of clarity, we provide the analysis of the responses by totals and then by citizens and stakeholders/businesses individually. For the limited number of contributions from public authorities, we provide findings and insights where appropriate (see also 4.1.3).

4.1 Responses by respondent type

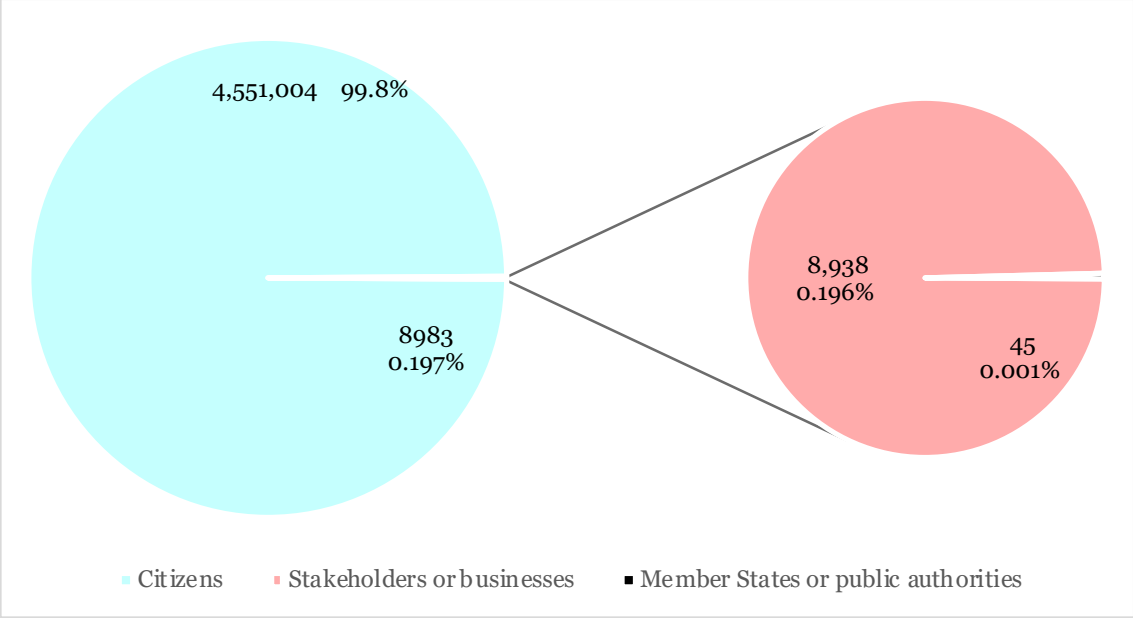
Figure 3 shows the distribution of responses per respondent type, all countries included. The vast majority of the respondents are citizens with more than 4.5 million responses or 99.8%. Within the other types, businesses and other stakeholders represent 0.197% of the responses. The smallest category are the public authorities accounting for 0.001% of respondents.

3 See Appendix A (page 37) on the methodology used for the data treatment and checks performed.

4 During the manual classification, 177 respondents from the public authorities were moved to the stakeholders, 65 respondents from the public authorities were moved to the citizens, and 337 respondents from the stakeholders were moved to citizens

5 This is a revised version of the final report. It contains a correction of the total number of responses from citizens, which has been adjusted from 4,543,366 to 4,551,004. As part of the reclassification of respondents that chose the wrong stakeholder type, 7,640 citizens' responses were mistakenly omitted in the first report published. Of these 7,460 respondents, 2 were removed for hate speech, bringing the total number of citizens removed for hate speech to 2,249. These responses correspond to 0.2% of all responses from citizens and are spread out across Member States, as also reflected in the changes made in the relevant tables in the subsequent sections of this revised report. It should be noted that this correction does not change the conclusions of the report.

Figure 3: Distribution of respondents per stakeholder type



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

4.1.1 Distribution of citizens' responses

Table 2 shows this breakdown per country, ordered by number of respondents and participation rate, i.e. the share of the population responding to the consultation.

In absolute terms, Germany displays the largest number of respondents with over three million or a share of 70%. Comparatively, France which has the second largest number of respondents (393,508) represents 8.6% of the total responses. Malta is the EU Member State with the smallest number of respondents with 1,164, accounting for a share of 0.03%.

For the following *Table 2*, the population size was taken into account in order to calculate a participation rate. Germany displays the highest with 3.81%. Austria and Luxembourg follow closely with 2.96% and 1.79% respectively. Comparatively, the United Kingdom shows the lowest participation rate at 0.02%. EU Member States with the smallest population rates such as Luxembourg, Cyprus and Latvia display relatively high participation rates. Conversely, certain countries with large populations such as Italy, the United Kingdom, or France showed low participation rates.

Table 2: Response and participation rate by Member State

Country	***Number of respondents***	***Share in the total of responses (in %)***	***Participation rate (in %)***
Austria	259,505	5.7	2.96
Belgium	62,613	1.4	0.55
Bulgaria	13,193	0.3	0.19
Croatia	21,823	0.5	0.53
Cyprus	7,551	0.2	0.88
Czech Republic	62,782	1.4	0.59
Denmark	6,267	0.1	0.11
Estonia	12,511	0.3	0.95

Country	*Number of respondents*	*Share in the total of responses (in %)*	*Participation rate (in %)*
Finland	53,130	1.2	0.97
France	393,508	8.6	0.59
Germany	3,142,321	68.9	3.81
Greece	36,375	0.8	0.34
Hungary	20,182	0.4	0.21
Ireland	11,678	0.3	0.24
Italy	23,519	0.5	0.04
Latvia	7,616	0.2	0.39
Lithuania	9,608	0.2	0.34
Luxembourg	10,557	0.2	1.79
Malta	1,164	0.0	0.25
Netherlands	27,873	0.6	0.16
Poland	128,252	2.8	0.34
Portugal	34,382	0.8	0.33
Romania	7,525	0.2	0.04
Slovakia	32,944	0.7	0.61
Slovenia	15,1469	0.3	0.73
Spain	88,252	1.9	0.19
Sweden	48,453	1.1	0.48
United Kingdom	11,737	0.3	0.02

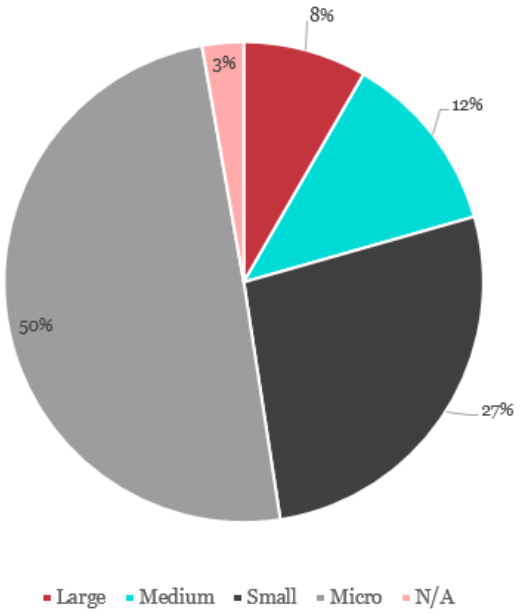
Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

4.1.2 Distribution of responses by other stakeholders and businesses

Figure 4 shows the breakdown of stakeholders and businesses. In the questionnaire, this category of respondents also indicated the size of the organisation. Since the questionnaire did not ask for the type of organisation, e.g. company, sectoral association, NGO, etc. it is not possible to categorise this group other than by size. From a manual checking however, and by taking legal forms mentioned into account, it seems that the majority were businesses, in particular micro firms/self-employed persons that are nevertheless treated as businesses. Other respondents in this category included research organisations and NGOs.

Micro groups represented the majority of respondents with 50% (4,437 responses). Small groups made just over a quarter of the respondents with 27% (2,409 responses). Together, large (746 respondents) and medium (1,096 respondents) groups added 20%. Additionally, 3% of respondents could not be associated with a size (N/A, 250 respondents).

Figure 4: Distribution of stakeholders and businesses by size



Organisation type	Number of respondents
Large	746
Medium	1,096
Small	2,409
Micro	4,437
N/A	250

Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

4.1.3 Public authorities' responses

The contributions from this group range from national ministries, to regional and local (city-level) authorities, but they also include a handful of contributions from other public organisations such as health or labour organisations, educational boards, or sector-specific stakeholders. In a few cases, more than one response per organisation was received. After checking the responses, organisational duplicates were removed since there was a full overlap in views. Only the different comments were kept for further analysis.

In terms of public authorities, 45 responses (online and in writing) from 21 MS were considered in the analysis. For all of the 21 MS, the responses were sent from one or several ministries (jointly or individually). For Germany, Austria and Lithuania, other regional or local authorities provided their positions.

The contributions obtained indicate a heterogenous picture - some authorities mentioned that the current system should be maintained, others preferred a switch – either to permanent summertime or wintertime. One aspect several respondents from **public authorities** indicated however was a **preference for a harmonised system** in case of an abolishment. It was the exception to find a common position at MS-level to either keep or abolish the current convention. Some mentioned that an impact assessment would be needed to voice a position. A conclusive picture did however not emerge from the contributions. This category is, therefore, not covered in the analysis in Chapter 5.

5 Analysis

This section provides an analysis of the responses by question, first providing the totals and then the break down by citizens, businesses and stakeholders. The structure follows the different questions of the public consultation.

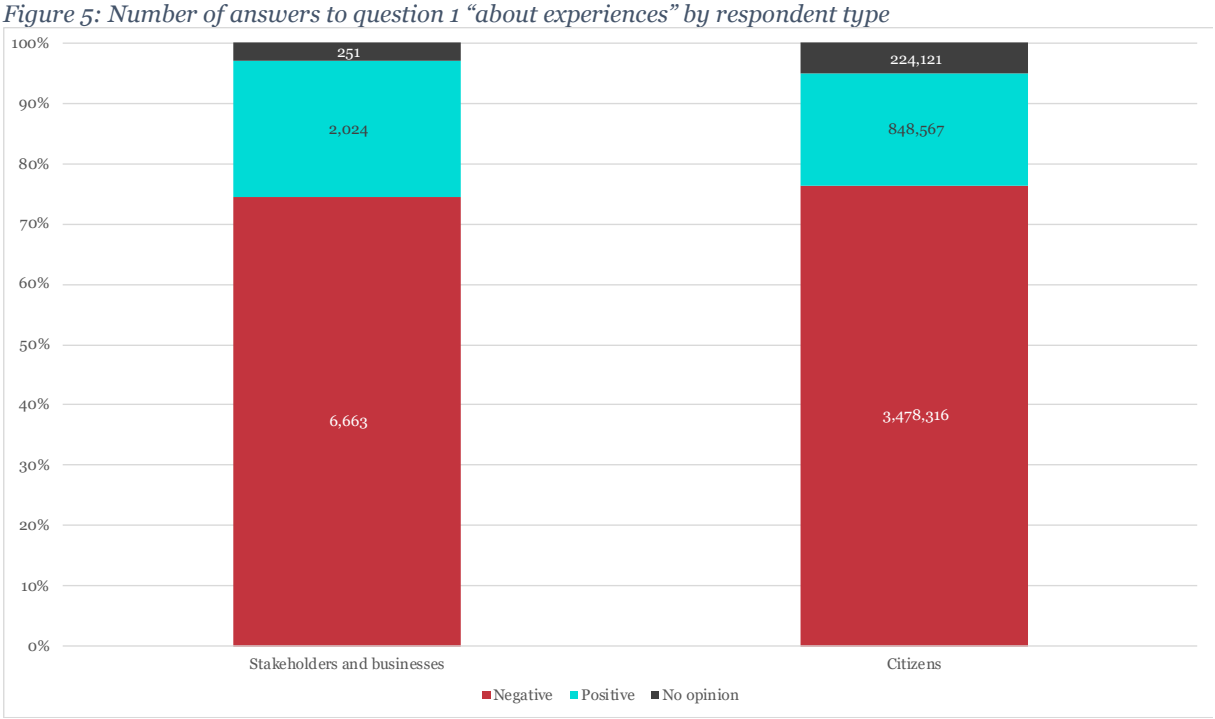
5.1 Overall experience

In order to understand the overall experience with the summertime directive, the first question asked: "*What is your overall experience with the switching from wintertime to summertime on the last Sunday of March and from summertime back to wintertime on the last Sunday of October*?". Available answer categories were: 'Very positive', 'Positive', 'No opinion', 'Negative', and 'Very negative'.

5.1.1 Total responses

Figure 5 indicates the share and absolute numbers of total responses by respondent type. Three quarters of respondents expressed a negative experience (very negative and negative aggregated) with the current switching regime. The difference in shares of negative experiences is very low with 76% among citizens and 75% among stakeholders and businesses.

Figure 5: Number of answers to question 1 "about experiences" by respondent type

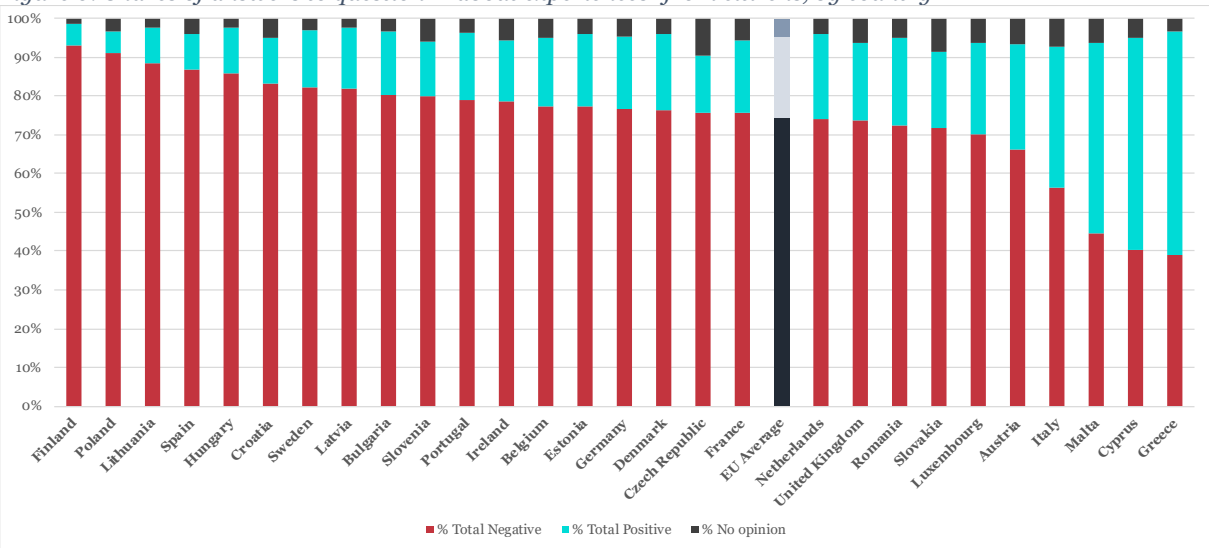


Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.1.2 Citizens

Three quarters of the responding **EU Citizens (76%) mentioned a negative experience** in time switching and 19% indicated positive ones (see *Figure 6*). Overall, Finland has the highest number of negative responses (93%), followed by Poland (91%) and Lithuania (89%). Only in Greece and Cyprus, citizens with positive experiences had higher shares with 58% and 55% respectively. In Italy and Malta, the responses were closer to be balanced, yet in Malta 49% of respondents had a positive experience and in Italy a majority of 56% indicated a negative experience.

Figure 6: Shares of answers to question 1 "about experiences" from citizens, by country

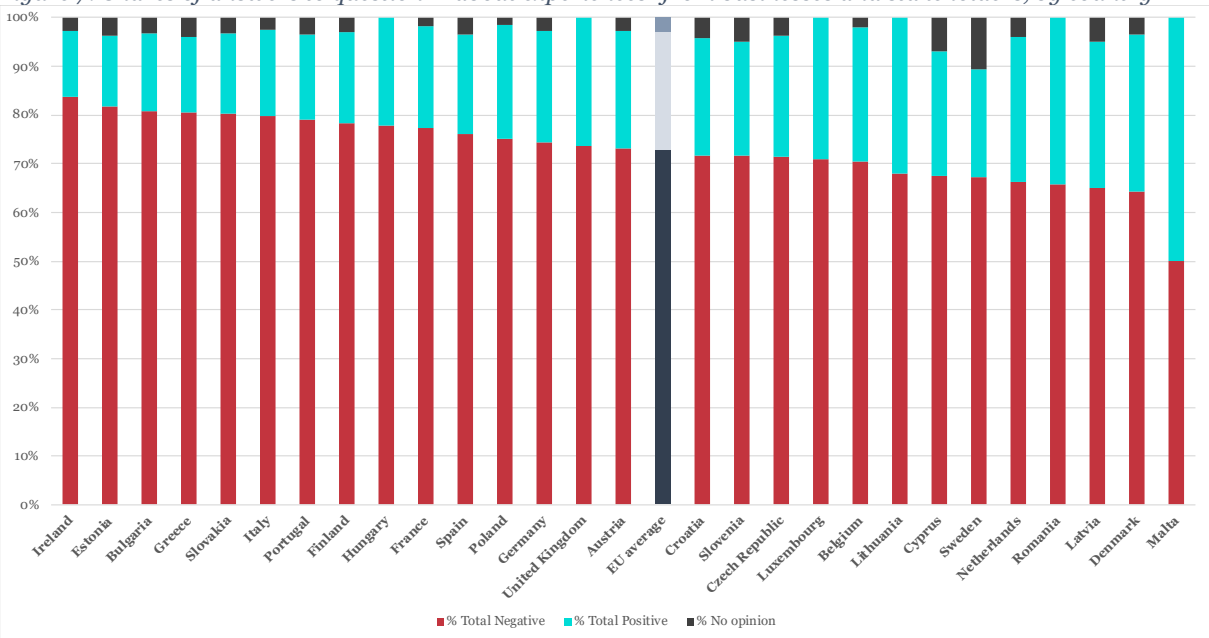


Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.1.3 Stakeholders and businesses

Figure 7 presents the results for stakeholders and businesses. In this group 75% of all respondents mentioned negative experiences and 24% positive ones.

Figure 7: Shares of answers to question 1 "about experiences" from businesses and stakeholders, by country



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group
Note: the number of Maltese businesses is too limited to use the statistics in a comparative analysis.

Thus, also here, three quarters of respondents indicated a negative experience with switching from wintertime to summertime. An exception is Malta, but in this case only two stakeholders responded; they were divided on this question. The share of negative experiences thus ranged from 84% in Ireland, down to 64% in Denmark (excluding Malta).

5.2 To keep or abolish the current arrangement?

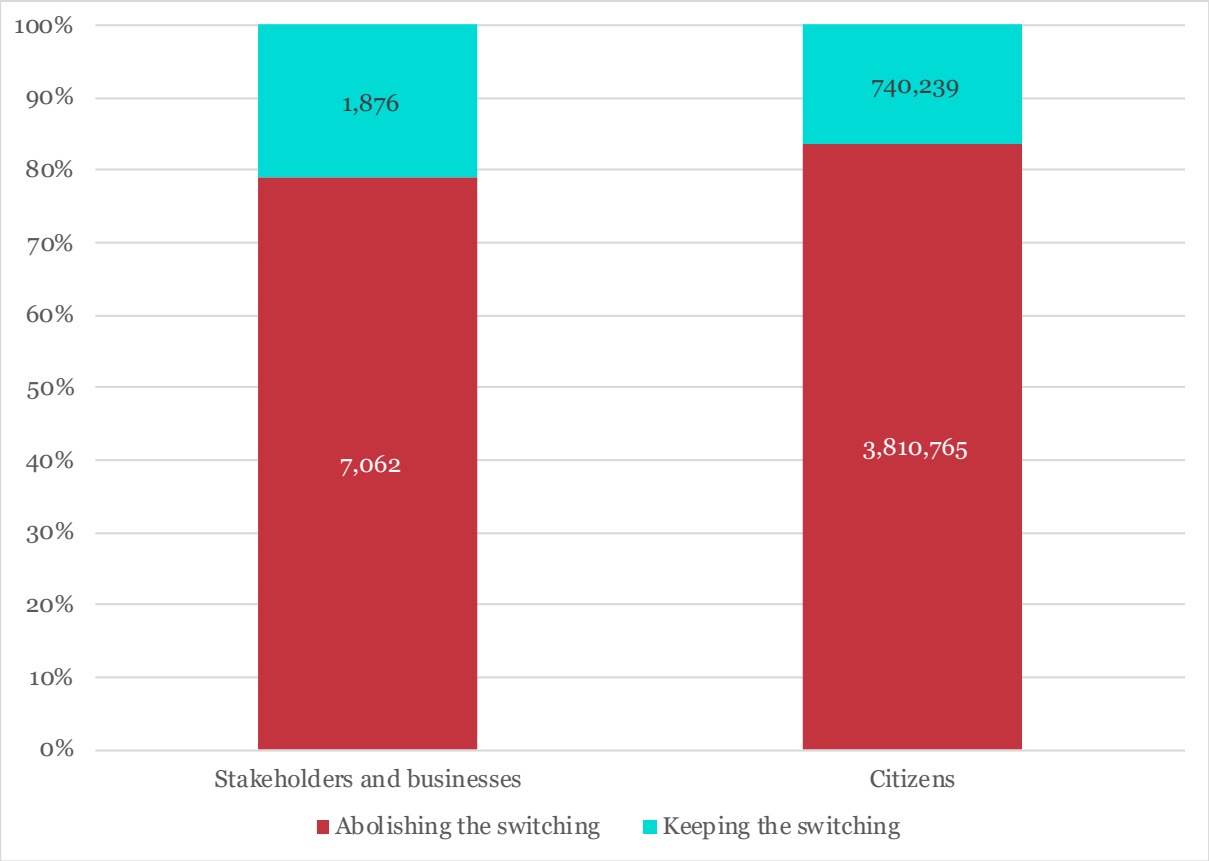
Question 2 asked: "Evidence suggests that common EU rules in this area are very important to ensure the proper functioning of the internal market. In order to ensure such common rules also for the future, which of the following alternatives would you favour:

a. Keeping the current EU arrangements switching between summer and wintertime for all EU Member States
b. Abolishing the switching for all EU Member States?"

5.2.1 Total responses

Figure 8 shows the share of answers to the question by type of respondents. In general, according to both citizens and businesses and stakeholders, **the majority of respondents are in favour of abolishing the switching of wintertime to summertime** of all EU Member States. In particular, 79% of the respondents among businesses and stakeholders, replied that they would prefer to abolish the switching, while 21% would favour keeping the switching. Among citizens, the percentage of respondents who replied in favour of abolishing is even higher with 84%, while only 16% of the respondents prefer to keep the current switching.

Figure 8: Number of answers to question 2 'keep or abolish the current arrangement' by type of respondents)



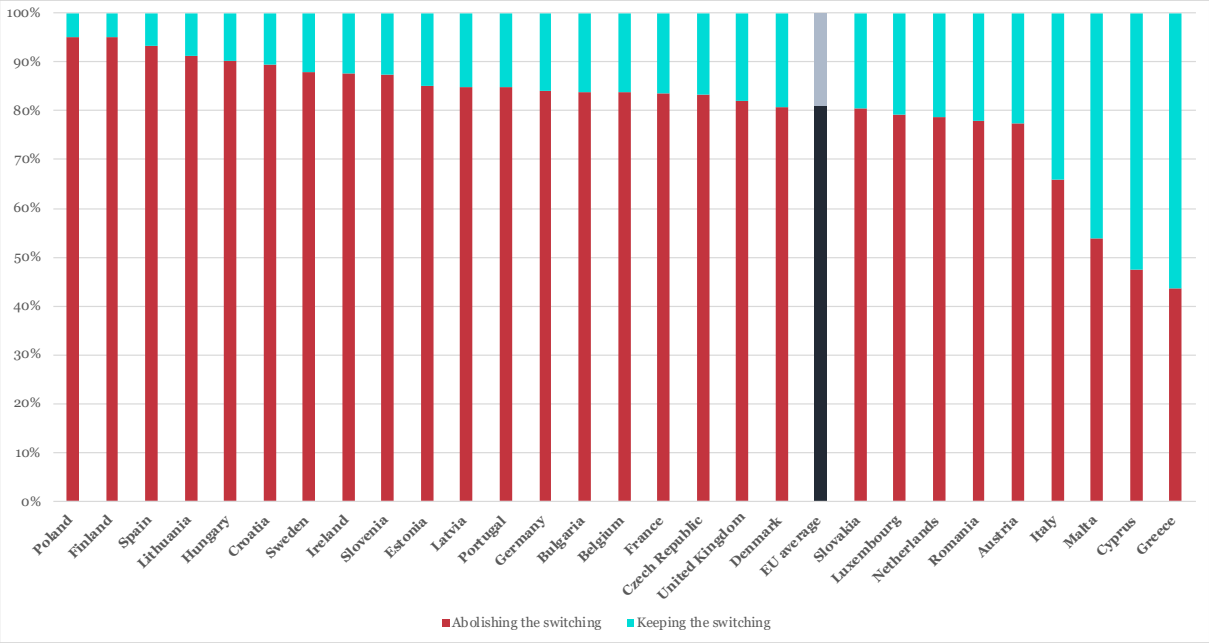
Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.2.2 Citizens

On EU-average**, 84% of the responding citizens favour the abolishing of the current system** while 16% want to keep it (see Figure 9). The highest shares of respondents favouring the abolishment of time switching are in Poland and Finland (both 95%) followed by Spain (93%) and Hungary (90%).

The results also show that, while the net majority of responding citizens prefers to abolish the time switching, the majority of respondents in Greece and Cyprus prefer to keep the current system (with 56% and 53% of respondents respectively), while in Malta the shares in favour of keeping the system is still very high with 46%.

Figure 9: Shares of answers to question 2 'keep or abolish the current arrangement' from citizens, by country

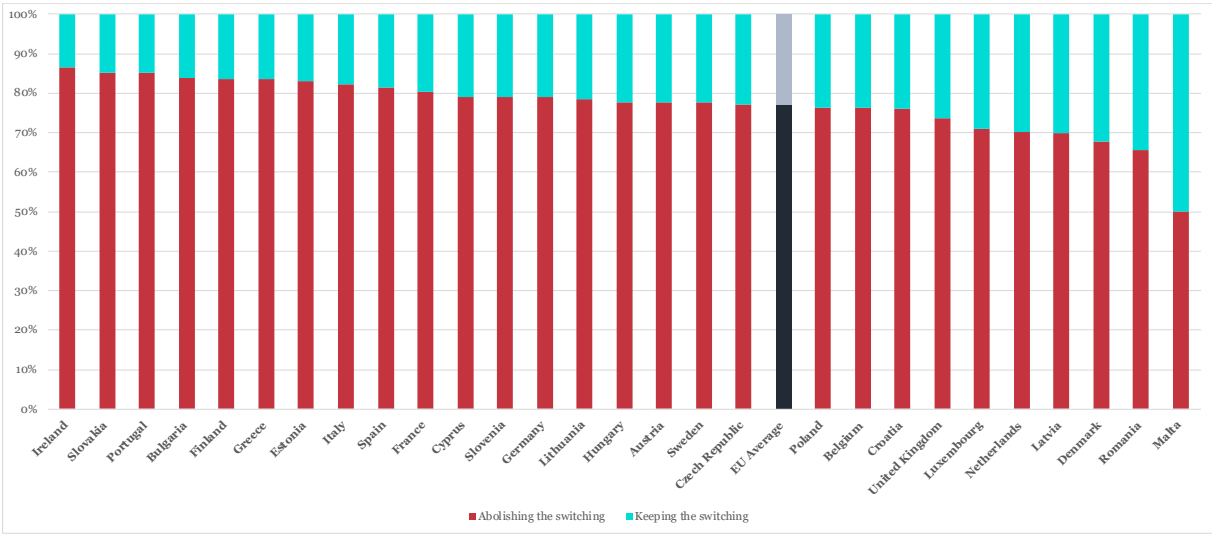


Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.2.3 Stakeholders and businesses

According to businesses and stakeholders responses, the majority of respondents in almost all countries **favour the abolishing of the time switching**, with the exception of respondents from Malta, where the two sole stakeholder respondents were divided between the two answer categories (Figure 10). In general, the responses to question 2 seem to reflect the results of question 1, with Ireland having the highest percentage of respondents who would favour the abolishing of time switching (86%), followed by Slovakia and Portugal (both 85%).

Figure 10: Shares of answers to question 2 'keep or abolish the current arrangement' from businesses and stakeholders, by country



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.3 What are the reasons?

The third question asked respondents to indicate a reason for their position in question 2 and provided a number of answer categories:

- Energy saving / lack of energy saving
- Human health
- Leisure activities in the evening
- Road safety
- Functioning of the internal market (cross border trade, transport organisation, communications, …)
- Other (please specify)

Since this question includes an open question with "other", this field was analysed as well with either quantitative techniques or manual reading and processing.

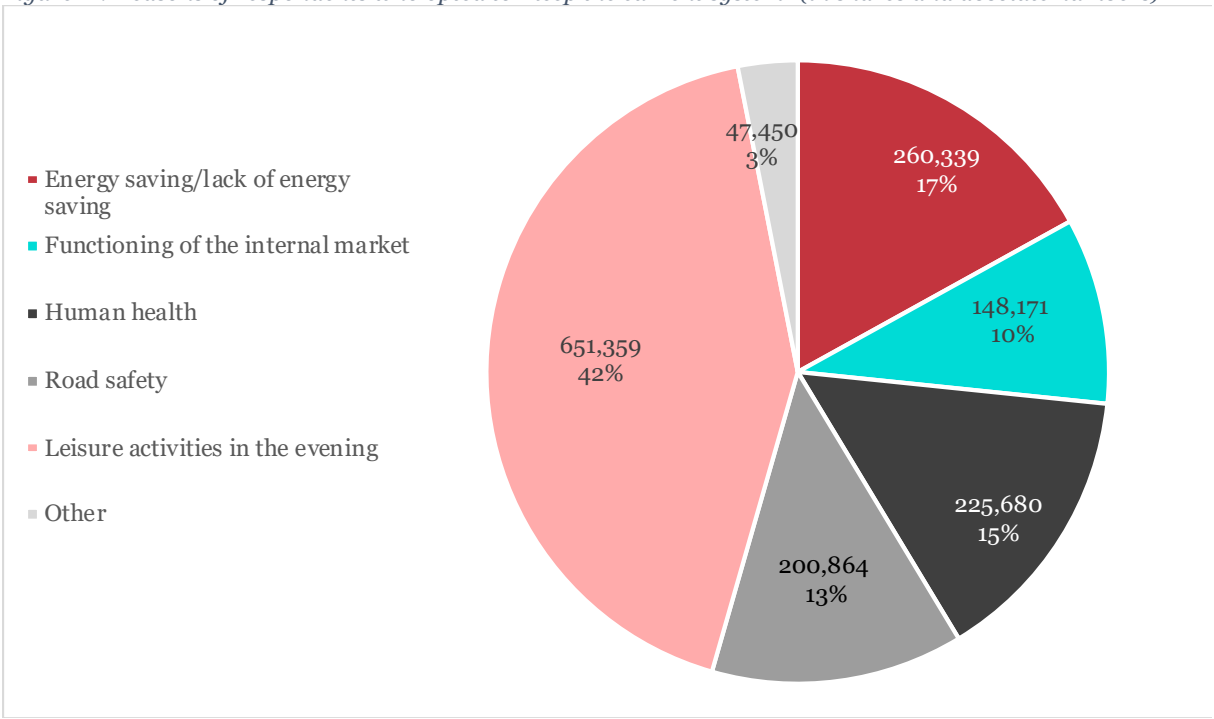
5.3.1 Totals

The overall figures to the closed questions are presented in *Figure 11* and *Figure 12*. We distinguish between respondents who favoured in question 2 either 'to keep' or 'to abolish' the current system.

42% of the respondents who are in favour to keep the current time switching system, inserted as main reason "leisure activities in the evening", 17% "energy saving", 15% "human health", 13% "road safety" and 10% "functioning of the market".

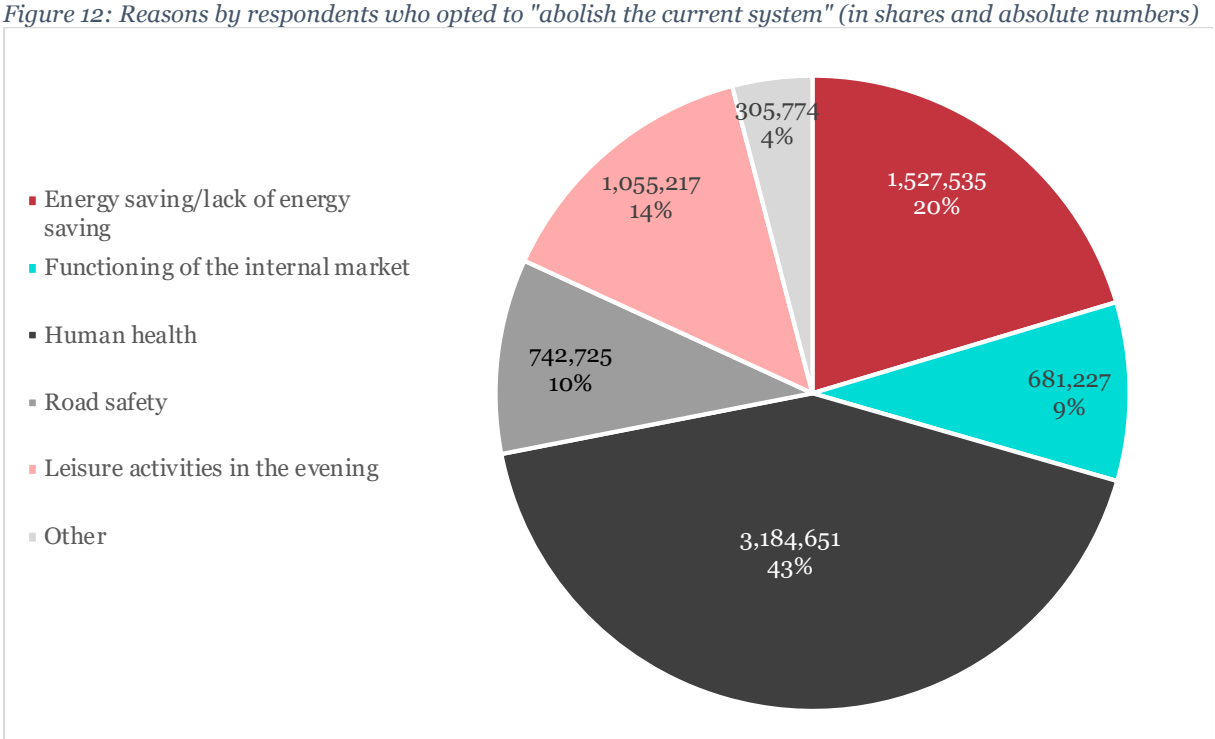
Very different are the figures when looking at the answers from respondents who prefer to abolish the current system. In this last case, 43% of respondents indicated as main reason "human health", 20% "energy saving", 14% "leisure activities in the evening", 10% "road safety", and 9% "functioning of the internal market".

Figure 11: Reasons of respondents who opted to "keep the current system" (in shares and absolute numbers)



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

Figure 12: Reasons by respondents who opted to "abolish the current system" (in shares and absolute numbers)



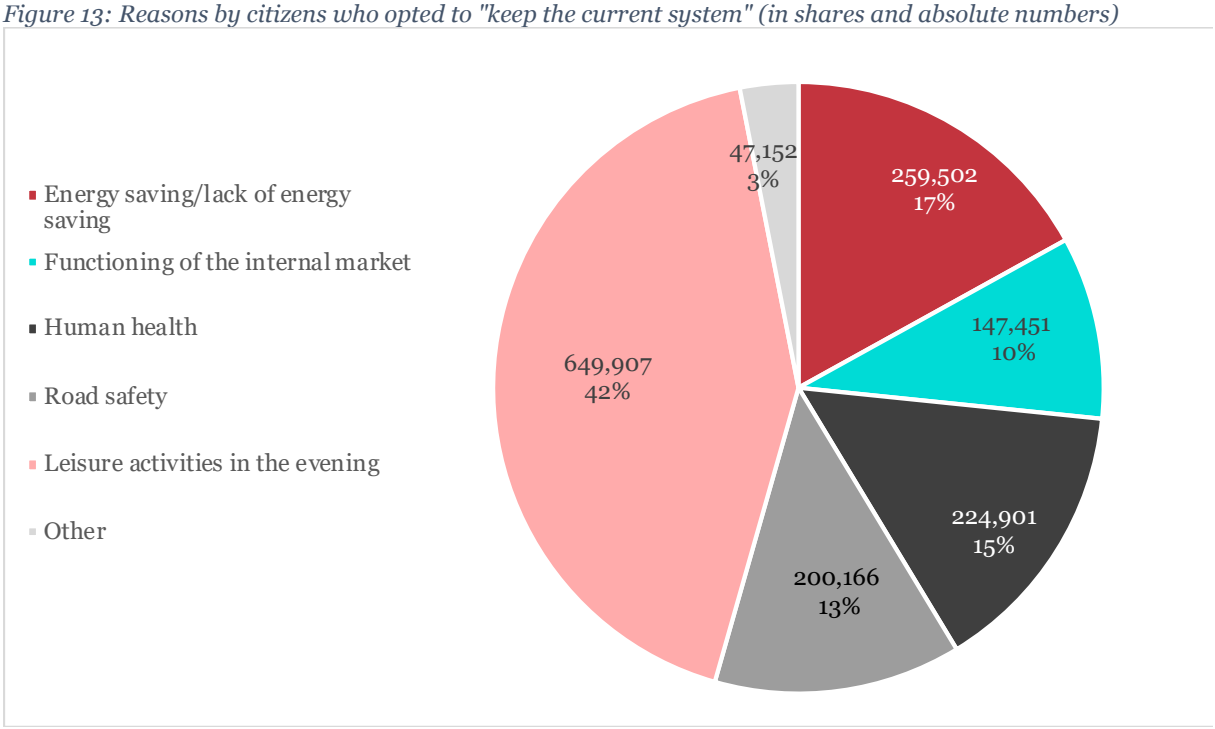
Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.3.2 Citizens

Analysing the same breakdown for the citizens' replies, we find similar results to the ones presented for the total population. In particular, the pie chart presented in *Figure 13* shows how 42% of the replies from citizens who opted to "keep the current system" indicated leisure activities in the evening as one of their primary motivations. The second motivation in order of importance is energy saving, with 17% of the replies. Health considerations have less importance (15%), as well as the road safety reason (13%) and the functioning of the internal market (10%).

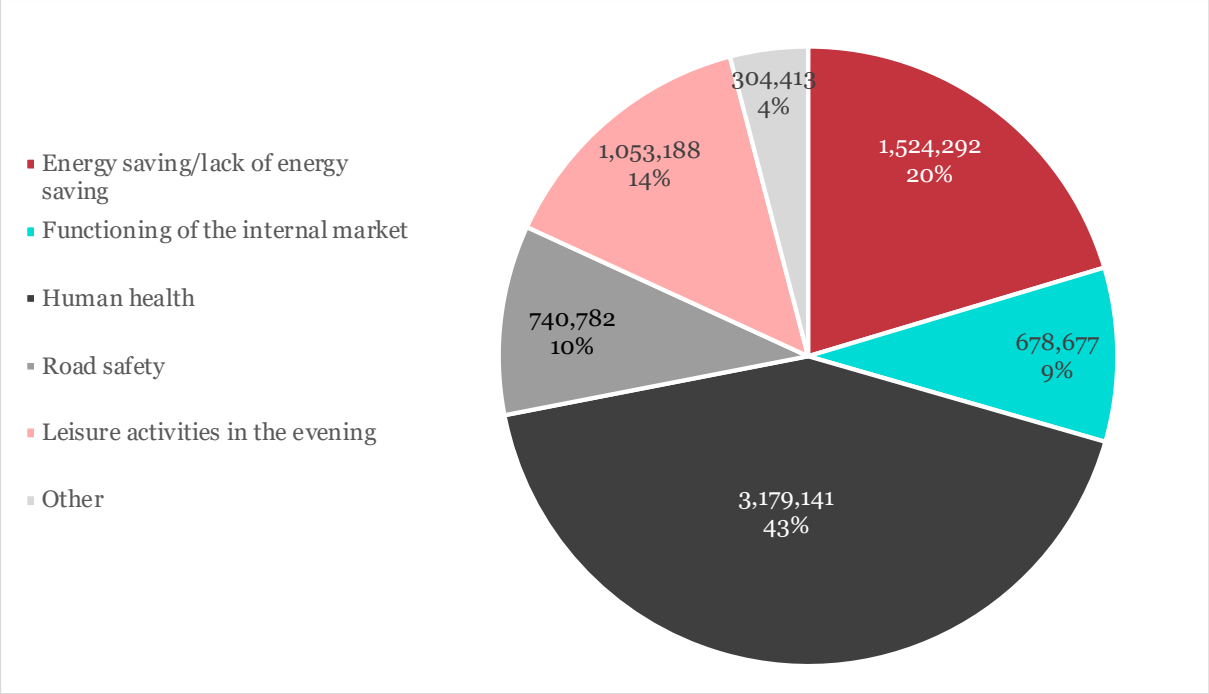
When instead we analyse the replies of citizens who opted to "abolish the current system", we see how the health reasons acquire importance, with 43% of respondents indicating it as their major motivation. Second reason is again energy savings (with 20% of replies) followed by leisure activities in the evening (14%), road safety (10%) and functioning of the internal market (9%).

Figure 13: Reasons by citizens who opted to "keep the current system" (in shares and absolute numbers)



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

Figure 14: Reasons by citizens who opted to "abolish the current system" (in shares and absolute numbers)

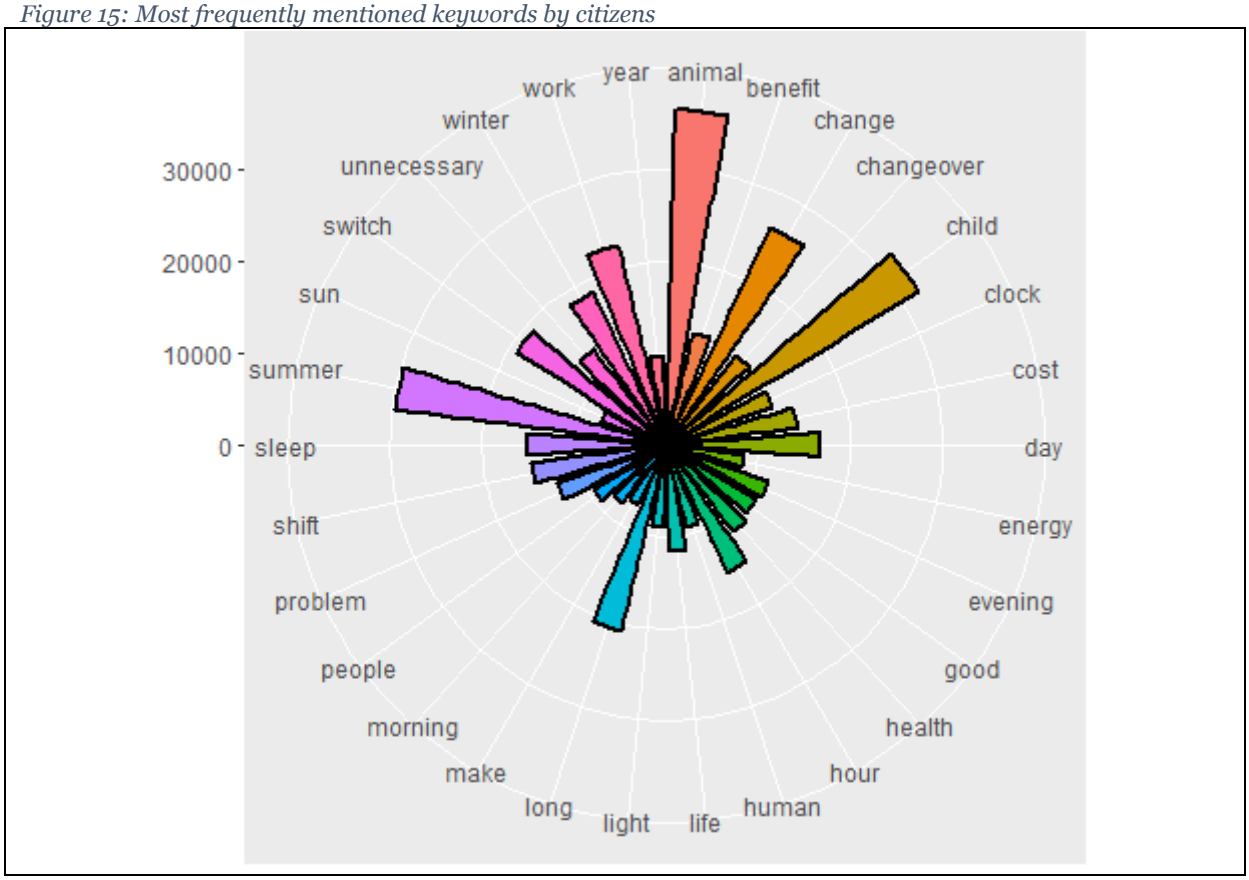


Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

Respondents were able to provide other reasons for negative or positive experiences and used this opportunity to voice concerns or suggestions (under the option "other", which represents 4% of the total replies from citizens). The citizens have stated different reasons. Given the very large number of comments obtained, a text mining process was used to identify the most often mentioned terms. *Figure 15* shows what citizens mentioned most frequently (in alphabetical order).

The word frequency analysis revealed that the word 'animal' was the most often used, followed by the terms 'child', 'summer', and 'change'. Several unspecific terms like 'long' and 'switch' have equally high frequencies. Two aspects which are frequently mentioned by citizens are equally addressed in the stakeholder and business group, namely 'animals' and 'work' (see *Figure 18*). Graphs for the individual Member States are included in Annex, Figure 34). However, this frequency analysis can only show the main topics raised but not if this is in a positive or negative context.

Figure 15: Most frequently mentioned keywords by citizens



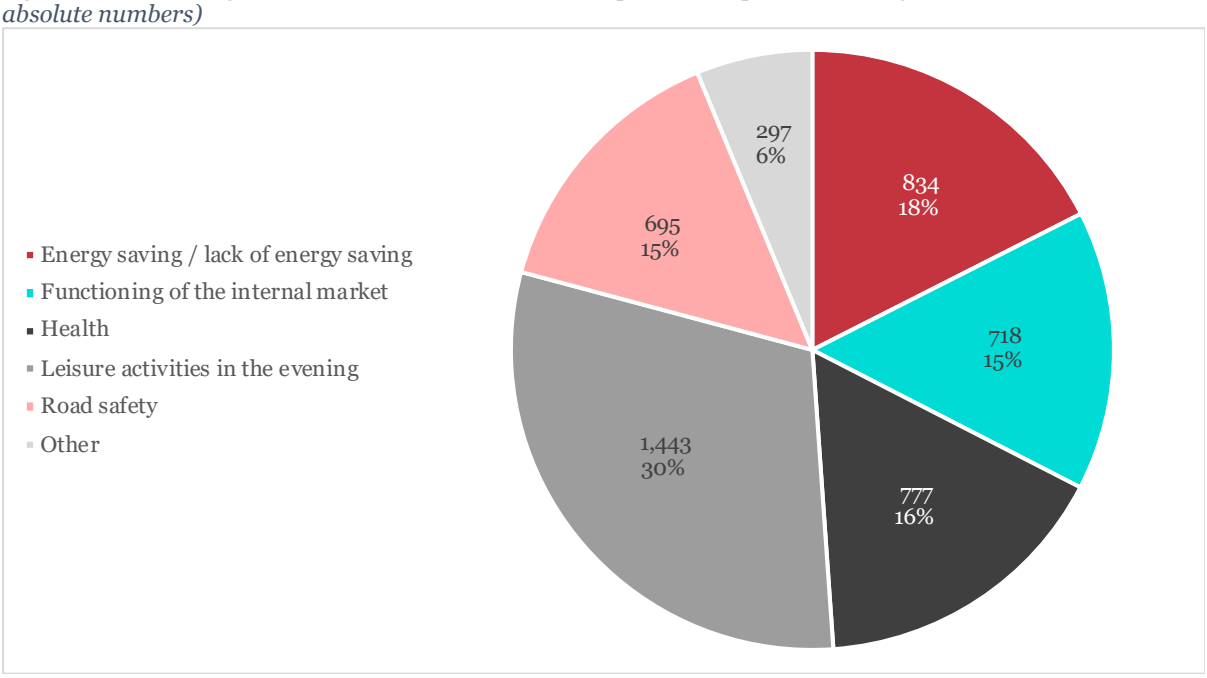
Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.3.3 Stakeholders and businesses

The breakdown of reasons as indicated in *Figure 16* shows that for stakeholders and businesses almost one-third of replies from respondents who opted to "keep the current system" indicate 'leisure activities in the evening' (30%). However, this share is lower than the one for citizens, where 42% of the replies indicated 'leisure activities in the evening' as main reason. Other reasons chosen by stakeholders and businesses are 'energy saving' (18%), 'health' (16%), 'functioning of the internal market' (15%) and 'road safety' (15%).

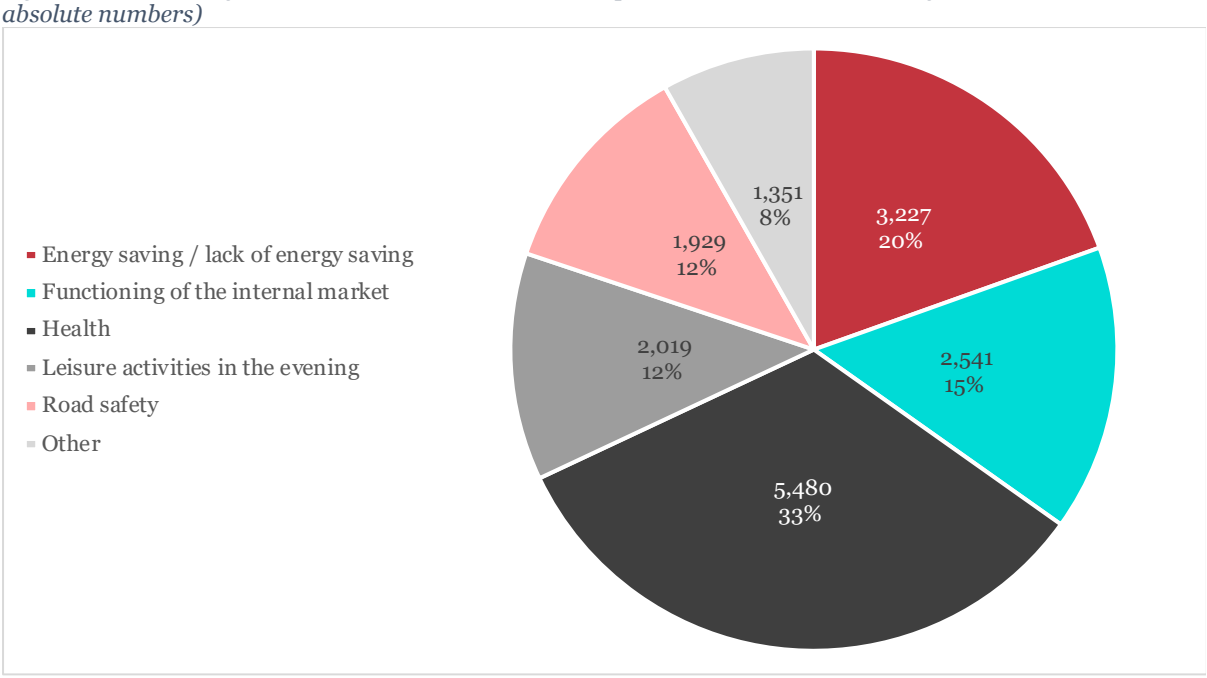
Results change when looking at the reasons indicated by stakeholders and businesses who opted to "abolish the current system", presented in *Figure 17*. In fact, in this case, 33% of the replies indicated 'health' as their main reason, followed by 'energy saving' (20%) and 'functioning of the internal market' (20%). 'Leisure activities in the evening' counted only for 12% of the respondents as well as 'road safety'.

Figure 16: Reasons by stakeholders and businesses who opted to "keep the current system" (in shares and absolute numbers)



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

Figure 17: Reasons by stakeholders and businesses who opted to "abolish the current system" (in shares and absolute numbers)



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

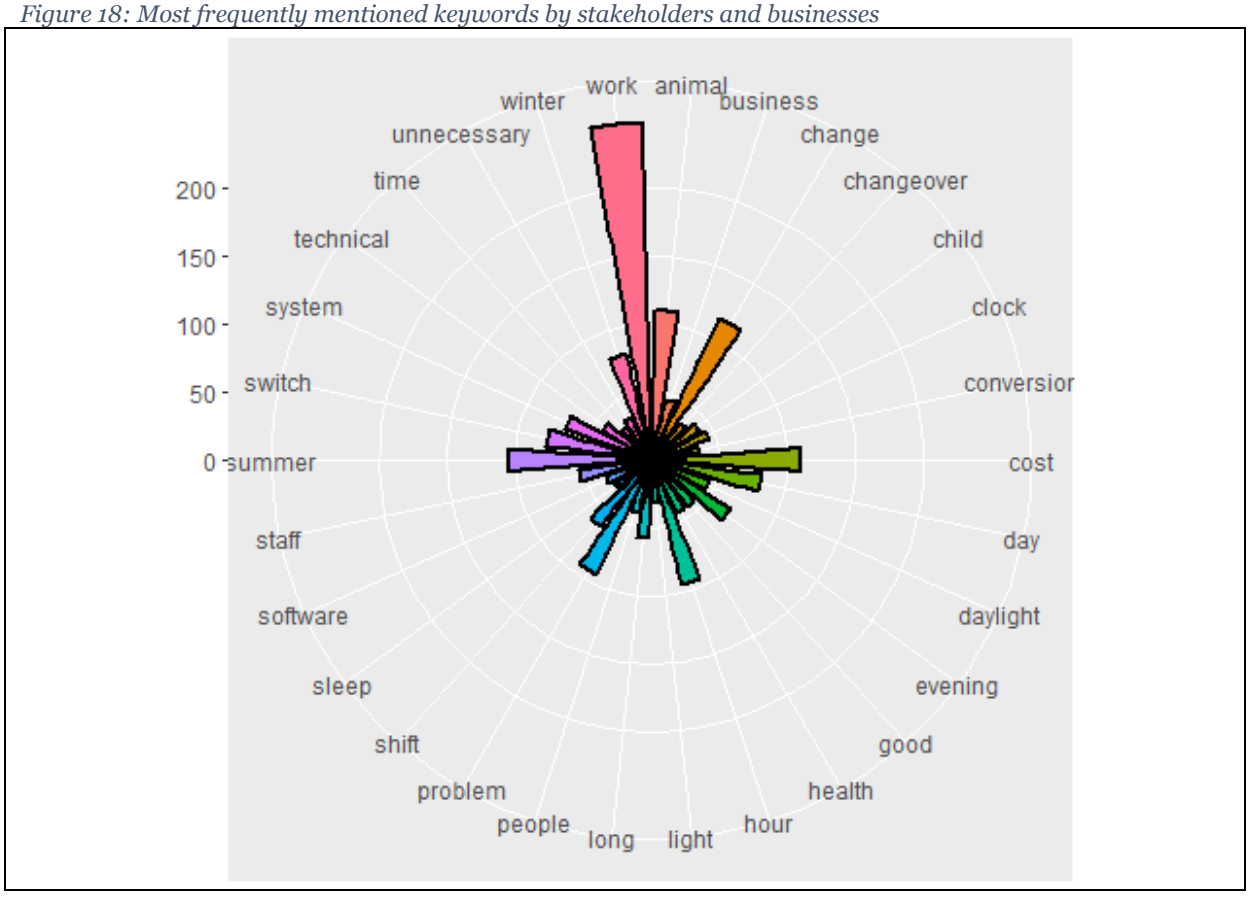
Respondents were able to provide other reasons for negative or positive experiences. 1.584 (18%) of the business and stakeholders used this opportunity to voice concerns or suggestions. For the stakeholders – the vast majority being businesses judging from the legal status mentioned as well as the explanations

provided – a clear additional reason emerged with the most frequently mentioned term 'work' (see *Figure 18*).

Out of the 1.584 respondents that provided reasons, 82% had mentioned negative experiences and 18% positive ones. Negative experiences were often **work related** and thus differing from the provided answer categories. The group of businesses and stakeholders added **economic reasons** such as:

- **Export, trade and transactions with foreign countries**, in particular the US, Asia, and non-changing African countries. "*Conversion cooperation with partners in countries which do not have a summer/winter time change*" (in terms of appointments, deadlines etc.) summarises the various responses.
- Unnecessary **IT expenses and problems**: the coordination of time zones for programmers; a high amount of time needed for the transfer of all company clocks on measuring instruments and IT infrastructure; and minimising unnecessary technical risks (associated with the current switching) where frequently mentioned ("*as a programmer I have regular errors calculating correct timespans etc. with summertime*"). Data collection and international exchange of data and time series was equally mentioned as being a reason, however much less often than IT problems.
- To many respondents, the work required to adjust IT systems, clocks and machines is seen as **unnecessary administrative burden** and a **cost** factor.

Figure 18: Most frequently mentioned keywords by stakeholders and businesses



1. Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

Abolishing the current system would lead to better organisation of business activities in a number of sectors (e.g., 24h production plants) and reduce costs associated with IT costs for the switching (for example in the transport sector (railways).

Very often (more than 200 times), as indicated in *Figure 18*, the term '**work**' was mentioned. The term is mentioned often in connection to employees being late, not being concentrated and distracted at work and it would take some to several days to come back to normality. To companies this has economic effects:

- A higher error rate from employees;
- Increased sick leave;
- Night-time workers have to work an additional hour (manufacturing, hospitals…).

The longer days due to the summertime arrangement were also referred to as having minor negative effects on some leisure activities: events that require darkness need to start later (outdoor movies, planetariums) and risk that less people will attend. Too long day hours also prevent people from going to the movie theatres.

On the other hand, several business and stakeholder respondents provide economic benefits due to the longer day light. The service sectors, such as Horeca seems to profit tremendously from 'longer summer days' but also retailers suggest a positive impact. They argue that for an increase in shopping, more light is positive in consumer behaviour ("*Nobody likes shopping in darkness and coldness*"). Sport activities as well as personal leisure time is mentioned by a number of businesses as a positive effect of longer daylight.

The longer daylight is the main argument of a very large number of respondents who either favour permanent summertime but also to those who want to keep the current system. In fact, some explanations were made if summertime was abolished: for those working outdoors, e.g., vineyards, which are highly depending on the extra summer hour in the evening, or construction workers, who appreciate the early sunlight, a return to permanent wintertime would have negative impacts. Those stakeholders and business respondents with positive experience and preferring the continuation of the current system, are in the majority for keeping permanent summertime - if there would be a switch.

Several **health** related issues were mentioned - explanations can also be found in particular from stakeholders providing additional information why they favour the abolishment of the time switch: Beside the biorhythm of humans in general and their necessary adaptation, persons with mental disorders "*face enormous difficulties*", those with autism "*do not understand their routine modification*" and for "*elderly people with dementia we observe that it increases their troubles*". Summertime allows to be (longer) active outdoors and thus has a positive health effect as well.

School teachers and paediatricians mention the "*negative impact on **children**, schools and kindergartens*" and the change in biorhythms of small children.

A number of responses pointed to **animal health** ("*dairy cattle stress*"). Farming was referred to as being hampered since milk cows and poultry have their own biorhythm and time switching requires changes in operational procedures for example for feeding and milking times or switching on lights for indoor poultry.

While health was a main argument against the time switch, it is also given as the main argument for permanent wintertime. Several respondents point out that wintertime is 'normal time' and as such, better adapted to sleep and awake periods. This argument has also been pointed out by specific health related stakeholders and underpinned with scientific studies. Another concern speaking for permanent wintertime and against permanent summertime affects those who need to leave to school or work early. Since the sunrise would be later, there would be a higher potential for road accidents in the morning. This argument is rebutted by those pointing out to less accidents in the longer, lighter afternoons.

5.4 What is the importance?

Question four asked: "If you would prefer to keep/abolish the switching, how important is it for you to see that happening? Please rate from 0 – 10 (0 = not an important issue; 10 = very important issue)".

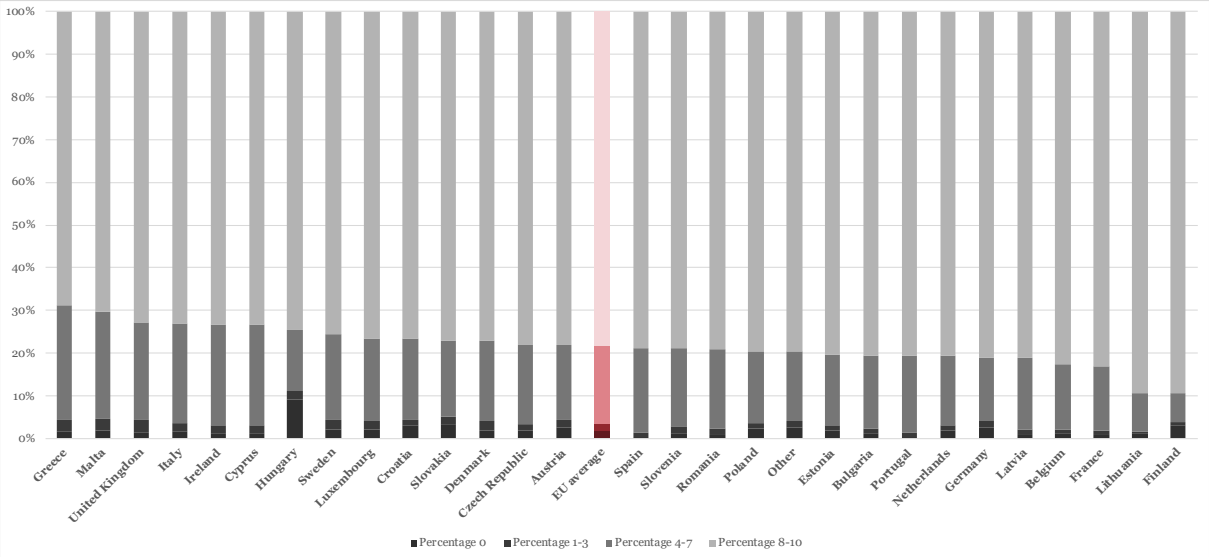
In general, respondents of every country, regardless of the option chosen in question 2, suggest that it is of "high importance", to either keep or abolish the system (between 71% and 83% for the two options, as can be observed from the EU averages in *Figure 19* and *Figure 20*) suggesting a rather strong self-selection bias.

As stated earlier, the public consultation is likely to 'attract' respondents that have a strong interest in and opinion to the overall question. If that is the case, one can expect that responses to this question are significantly oriented to the answer categories "very important issue" – thus in the higher scores from 8-10.

The responses to this question were aggregated for all respondents and grouped for the purpose of clarity (from 1 to 3, 4 to 7, and 8 to 10). If it is 'not an important issue' (scores 1-3), why would many people opt for answering the questionnaire? These considerations are very much mirrored by the responses.

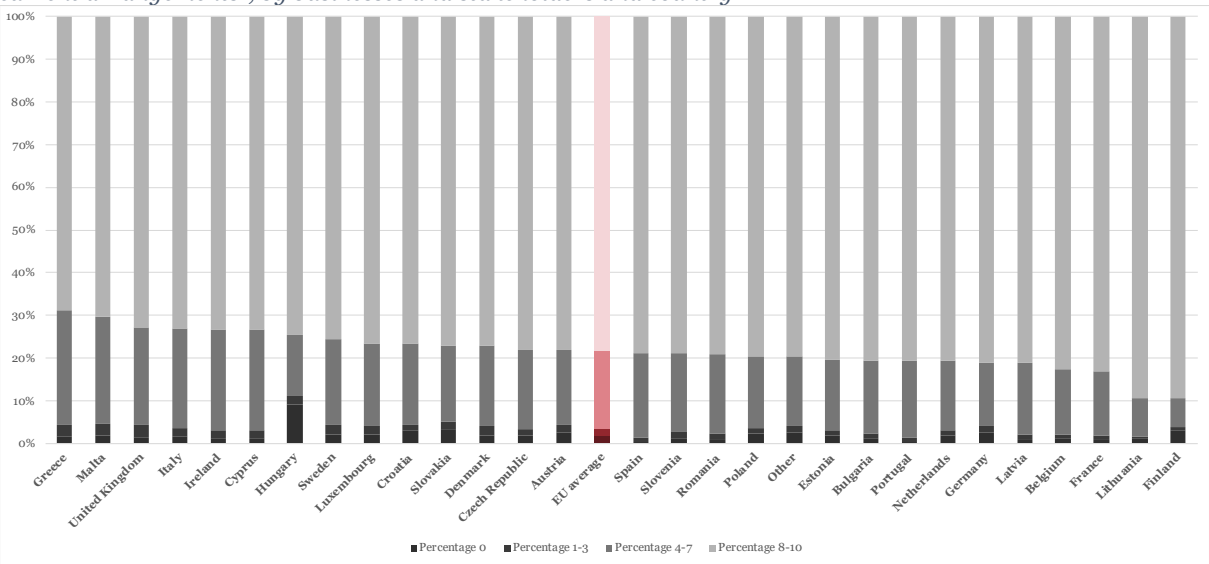
Figure 19 shows the share of answers of all respondents to question 4 having chosen the option to "keep the current arrangements" in question 2. The interesting question is to see if countries strongly in favour of keeping the current system such as Greece and Cyprus, confirm this wish with a high share of responses in the categories of "an important issue". One could expect a similar high response rate in the upper category. In fact, it is strong in Greece and Cyprus (and also Italy and Malta) with 65% to 70% of answers in the "very important" categories but it is even higher in those countries which were less in favour of keeping the current system respectively. Interestingly, respondents in other countries seem to be much more determined. Among the small share of Finnish citizens in favour of keeping the system, more than 90% find this a 'very important issue'.

Figure 19: Share of answers to question 4, "what is the importance" in function of the preference to "keep the current arrangement', by citizens and country



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group
Note: The answer categories 0-10 were grouped here. The absolute values per category are included in Annex B, *Table 11*

Figure 20: Share of answers to question 4, "what is the importance' in function of the preference to "abolish the current arrangements", by businesses and stakeholders and country"



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group
Note: The answer categories 0-10 were grouped here. The absolute values per category are included in Annex B, *Table 12*

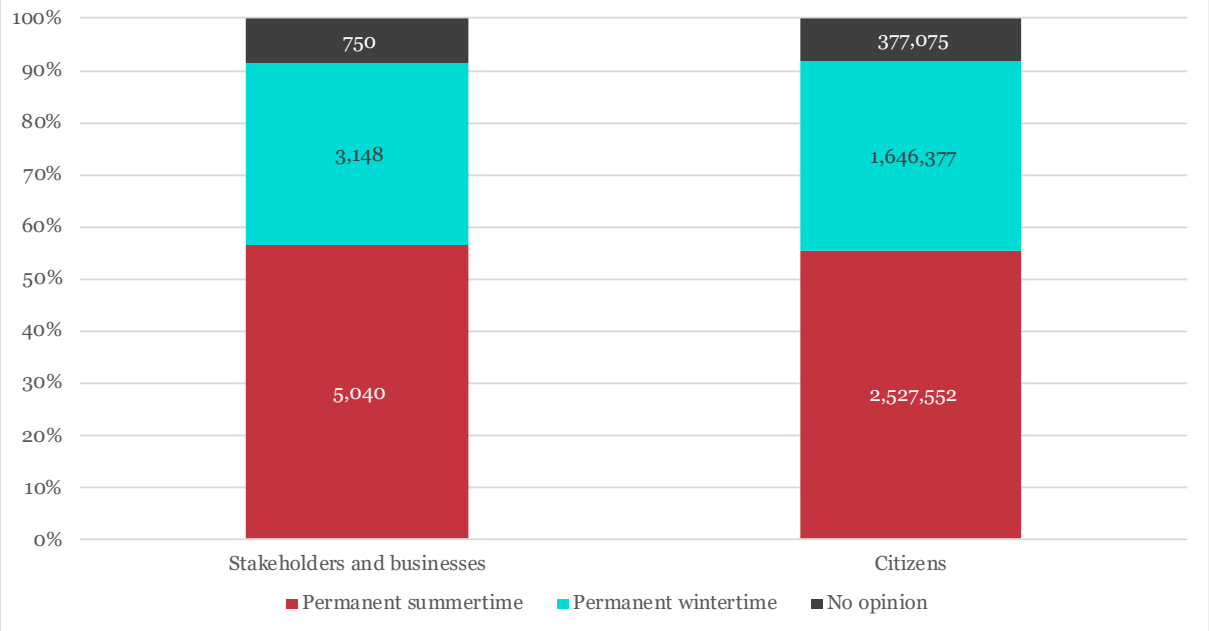
5.5 Preferred option after abolishing the time switch

Question five finally asked: "If the switching were to be abolished, what option would you prefer? To abolish the switching and stick with "permanent summertime" or "permanent wintertime". There were three answer categories including "permanent summertime", "permanent wintertime", and "no opinion".

5.5.1 Totals

Figure 21 presents the distribution of answers to question 5 according to the type of respondents. Overall, similar distributions can be observed between citizens and businesses and stakeholders, with an average of 56% of respondents from both groups replying that they would prefer permanent summertime, while 35% of business and stakeholders and 36% of citizens were in favour of permanent wintertime. The remaining part of respondents (9% and 8% respectively) does not have an opinion on this matter.

Figure 21: Number of answers to question 5 'preferred option after abolishing' by type of respondents



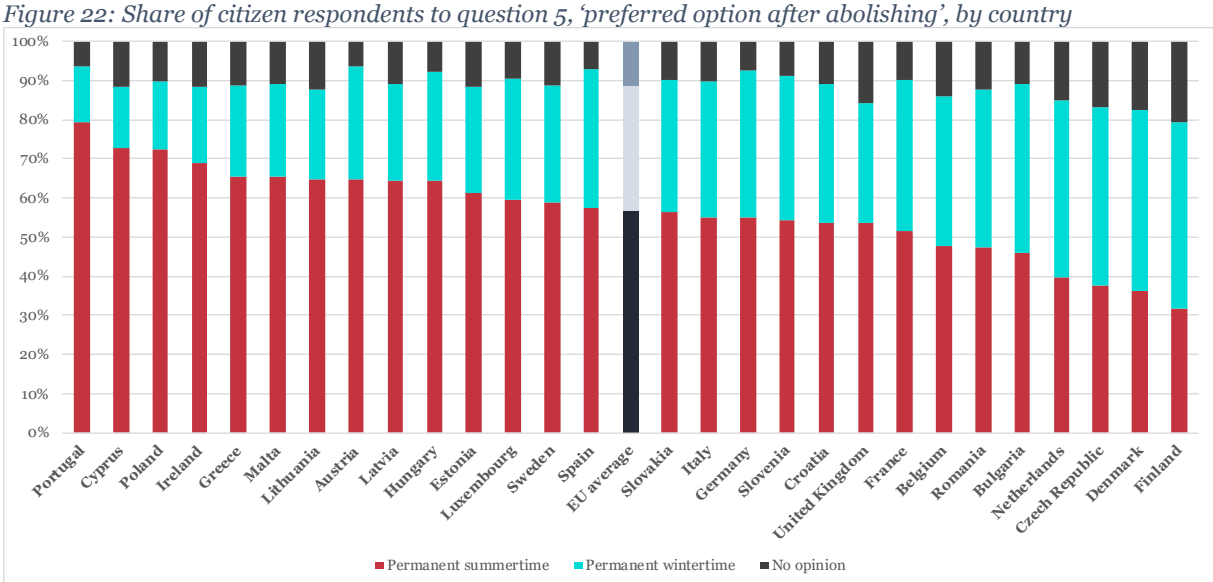
Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.5.2 Citizens

In total, 4,168,876 citizen replies were taken into account for this question on preferred options after abolishing.

Contrary to the businesses, **56% of citizens** who answered this question **favour the option of "permanent summertime"**, while only 32% prefer "permanent wintertime". The highest share of respondents in favour of "permanent summertime" is in Portugal (79%), Cyprus (73%), and Poland (72%). The highest share of respondents in favour of "permanent wintertime" can be found in Finland (48%), Denmark (46%), the Czech Republic and the Netherlands (both 45%). An EU-average of 11% of citizen respondents have expressed no opinion.

Figure 22: Share of citizen respondents to question 5, 'preferred option after abolishing', by country



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

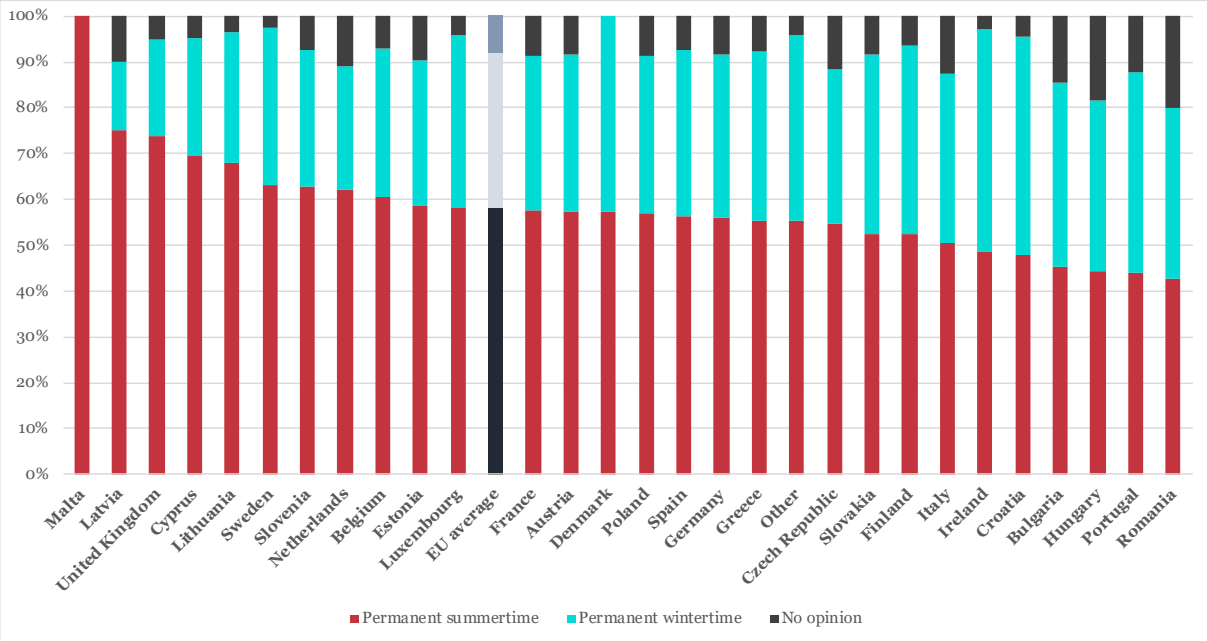
Obviously, interesting results can be pointed out: with Finland and Denmark, there are a majority of respondents from two Nordic countries favouring permanent wintertime while all other Baltic countries and Sweden a majority of respondents preferred permanent summertime. Thus, while the geographic location is similar, national preferences seem to differ.

5.5.3 Stakeholders and businesses

In total, 8,948 responses were taken into account for analysing the preferences by stakeholders and businesses. However, it should again be noted that for Malta only two responses were provided.

In general, responses from **businesses and stakeholder groups show a clear preference of 58% for permanent summertime**, while 34% are in favour of a permanent wintertime option.

Figure 23: Share of stakeholders/businesses respondents to question 5, 'preferred option after abolishing', by country



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

5.6 Comments by citizens, stakeholders and businesses

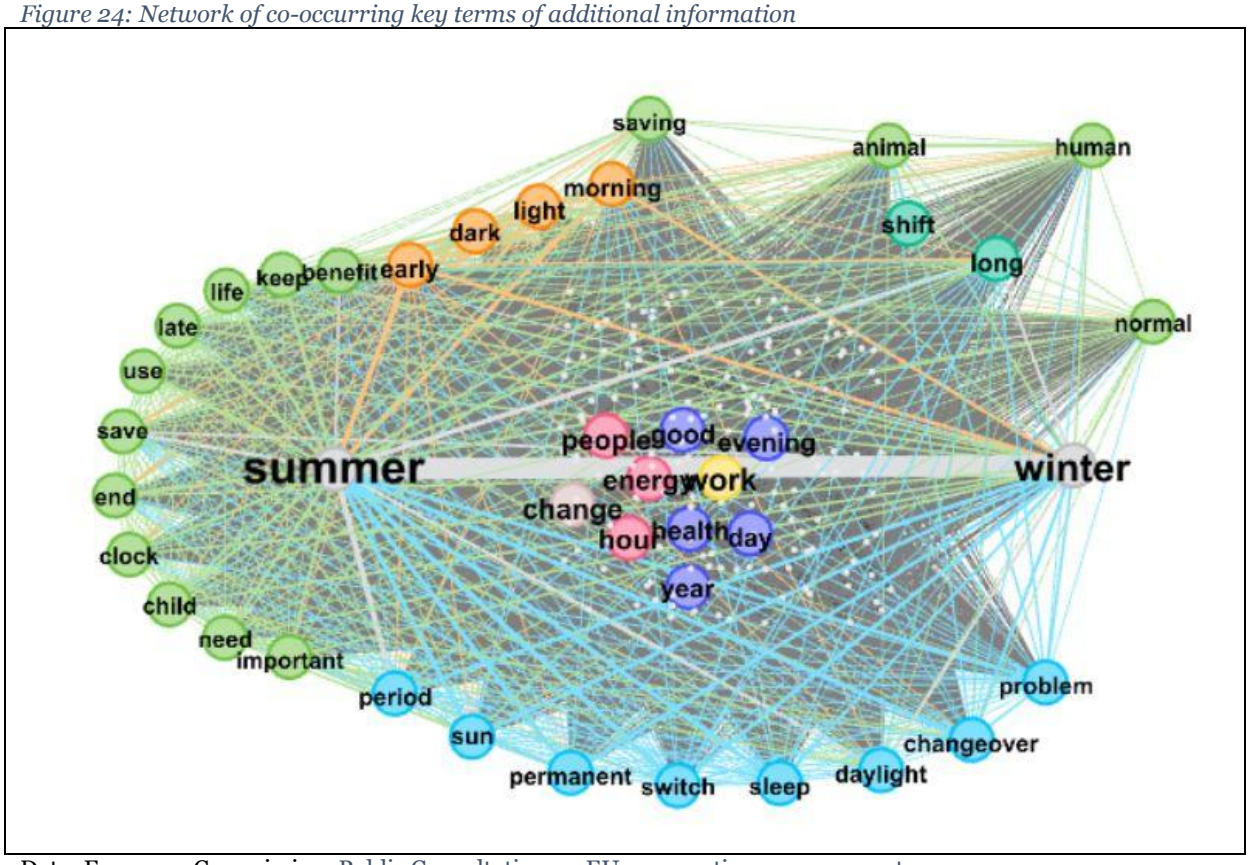
At the end of the questionnaire, respondents had the possibility to leave a comment and/or to upload relevant documents. Given the amount of information provided, the team opted for a quantitative analysis – similar to the one used for the 'other reasons' but this time, the Technopolis team did a so-called co-word analysis. The team analysed the most common combinations of the 200 most frequently used terms. The 30 most often co-occurring words are presented in form of a network in *Figure 24* below and in the Annex *Figure 35* with a simplified version and absolute values in *Table 14*.

In the network visualisation, the different colours represent the number of connections that the word has to other words within the network, i.e., how often it co-occurred among the most often used key terms. The main terms are mentioned, the small 'dots' are other terms, however less frequently mentioned. 'Summer' and 'winter' are the terms that co-occurred the most (almost 238.000 times). 'Summer' co-occurred with 35 other terms among the top 200 terms while 'winter' was highly connected with 25 terms. The centre indicates the terms respondents mentioned most often and which co-occurred

the most after 'summer' and 'winter'. These are: 'work' (which co-occurred with 12 other key-terms such as 'day' or 'health'), 'change' (9 co-occurrences), 'hour', 'energy', and 'people" (with 8 co-occurrences each), and finally 'day', 'health', 'year', 'good' and 'evening' which co-occurred 5 times among the most frequently occurring terms.

There are a number of terms, which are either only connected to 'summer' or to 'winter' but also many, connected to both such as the terms in the lower side 'sun', 'switch', 'permanent' etc. (see Annex Figure 35). The ones connected to 'summer' can be seen on the left outer side of *Figure 24*, and include for example: 'benefit', 'keep', 'life', 'save', 'clock', 'child', 'need', or 'important'. For 'winter', one can see at the right side of the figure the term 'normal'. 'Normal' is exclusively linked to 'winter' with about 25.600 times). Indeed, the remark that the use of the term 'wintertime' (as included in the public consultation) is incorrect and that it is called 'normal time' can be found numerous times. There are a few examples of main co-occurrences outside the 'summer' or 'winter' terms. For example, the term 'energy' occurred together with 'winter', 'summer', 'saving', 'people' and 'health' etc. However, taking into consideration only the main co-occurrences, only the term 'saving' co-occurred with 'energy' while the numbers for the other co-occurrences were much lower (see Annex *Figure 35*). In the upper right one can see the terms 'animal' and 'human' which similar to 'energy' and 'saving' form the strongest co-occurrence. They appeared in almost 31.000 responses together. As indicated in *Figure 15*, 'animal' was the most often used term by citizens in their reasoning for other reasons. 'Human' was a term among the key terms but was less frequently used. In the open comment section they did however co-occur often for example as: "human and animal health", "human and animal biorhythm", "human and animal life", "human and animal disorders", etc. (see also Annex *Figure 35*).

Figure 24: Network of co-occurring key terms of additional information



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group
Note: Green: 1-degree nodes, Light blue: 2, Orange: 3, Sea green: 4, Purple: 5, Pink: 8, Mauve: 9, Yellow: 12, Grey: >24

This visualisation of the comments (*Figure 24*) suggests that 'summer' is connected with benefits and respondents want to keep it. The contributions linked to 'summer' provide numerous arguments in form of different connected terms while for 'winter', the main argument seems to be that wintertime is 'normal' time.

'Work' is discussed in numerous ways – this analysis confirms the key-word analysis done for the 'other reasons' under question three (see sections 5.3.2 and 5.3.3).

Finally, it is worth taking into account the comments of the citizens, stakeholders and businesses. In the first group, the comments tend to be a bit more emotional.

In their comments, citizens frequently say something like "*Please change quickly*" or provide personal reasons. To many, the time change is a relict and has not fulfilled the initial energy saving goals but instead, provokes sleeping problems "*This rotation of time has no effect on energy savings, and in most cases impacts on people's sleep*." "*The time rotation is entirely meaningless and destroys health*!". The benefits of the longer days in summer are associated with quality of life: "*An abolition of the time change in favour of permanent summer time would mean a plus in quality of life for many people, since then also those, who have to work longer in the evening, would still come into the benefit of daylight*." It is hard to find any comment suggesting that summertime as such is linked to negative impacts. While the change impacts sleep and the biorhythm, the longer light hours are generally highly appreciated "*A shorter day means depression. It is always waiting for the end of March*."

Possibly one of the reasons why several citizens opted to keep the current system can be seen here: "*In general, I am in favour of permanent summer time, but before permanent winter time is introduced, I am in favour of maintaining the time changeover*." Permanent wintertime seems to be a threat to all those who prefer summertime and those fearing to lose the summertime; a return to permanent wintertime seems to possibly deprive a large share of citizens of the benefits encountered with the summertime.

Those commenting on and in favour of permanent wintertime mention that "*The time change is unhealthy for the animal world and for humans*" and point out that wintertime is normal time "*The winter time is the only true time - we should get back to living in harmony with nature*". The long, dark mornings -when there would be permanent summertime – are mentioned several times "*If we would switch to summertime, sunrise will be at 9am in winter! How terrible. Wintertime is the normal time, so let's switch to it*" but gains in the afternoon are also acknowledged.

How difficult a decision at a personal level is, summarises the following comment: "*There seem to be pros and cons for keeping either just wintertime or just summertime. Psychologically, daylight seems to be important as pacemaker for our inner clock (so wintertime would be better) however summertime would mean we would enjoy more light during winter AND summer which is better for our health for various reasons. I can't make my mind up about it as I am not an expert. But abolishing one of them seems to be the right choice as the benefits this concept promised didn't occur*."

5.7 Analysis of the attachments

A total of 282 attachments have been uploaded by the respondents to the EU Survey system, as part of their feedback to the public consultation.

Attachments uploaded include text documents, pictures, charts/graphic representations (e.g. EU time zones) and other types of files. An in-depth analysis has been carried out only in relation to text documents. Other types of documents have been excluded from the analysis when they were not relevant (e.g. ID documents, photos) or they did not allow to extract a clear message.

Out of the 113 text documents identified, 61 documents have been considered relevant, the remaining being off-topic or irrelevant documents (e.g. screenshots, electricity bills, bank statements, empty questionnaires). Relevant attachments included text documents drafted for the purpose of the consultation, reports, news or journal articles on the topic of time change. It should be noted that some attachments were included multiple times. Specifically, two documents have been attached by 21

different respondents, one by 10 different respondents[6] and another document by 11 different respondents[7].

Out of the 61 relevant attachments, most of them (37) concerned the **adverse impacts** of the time switch in spring, from wintertime to summertime, on **health**. According to these documents (mainly scientific journal articles, press-releases by scientists, or reports and position papers reviewing scientific studies), this transition is likely to increase the health risk, including depression and other mental disorders, metabolic disorders, cardiovascular diseases, sleep disruption or errors in the delivery of medications.

Four attachments underline the limited economic benefits of the current arrangements or call for abolishing them because of the **lack of benefits in terms of energy consumption**.

In other cases, the attachments report on:

- **Survey-based statistics** (3 attachments) showing the position of citizens with regard to time switch. Two of the attachments focus on graphs showing that citizens do not consider the time switch necessary.
- **News** items referring to the fact that Russia abolished the time switch (2 attachments).
- **Position** papers, personal opinions or other argumentations against time switch (4).

Only three attachments aimed to support the view that **summertime arrangements should be kept**. These documents point to the following aspects: data on economic benefits (i.e. savings in terms of energy consumption); the lack of strong scientific evidence about the impact of 'time lag on the biological cycles' and possible counterproductive effects in terms of energy efficiency; the fact that the decision of Turkey (in 2016) to have permanent summertime resulted in an increase in energy consumption and in negative impacts on business relations with Western countries.

Five attachments simply present **pro and cons of a time switch**, or scientific evidence that does not lead to final conclusions. Among them, there are two reports that discuss the issue without taking a position. One report[8] discusses the issue by pointing out that the relevance of the current arrangements might have changed over time, due to 'changes in economic activity, working time and employment, mobility and leisure behaviour, efficiency of lighting equipment and other electrical appliances'. Moreover, according to the report, there is enough evidence (although limited and partly contradictory) of both negative and positive effects. More research is needed and any revision of the current legislation should be based on scientific evidence. The other one is a report published by the Scientific Service of the German Bundestag, in 2014, and represents a review of scientific studies concerning various medical impacts of the annual switch[9].

Finally, three attachments do not report a clear position or represent a very specific position that cannot be classified in line with the above categories (e.g. a paper referring to the Spanish case and not aimed to abolish nor keep the current arrangements, but to modify them).

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[6] Hubertus Hilgers and Peter Spork, Press release: Transition to summer time as referred to as summer time on 25 March 2018.

[7] Till Roenneberg, Summertime from the point of view of chronic medicine.

[8] Report publicly available: Claudio Casviezel und Christoph Revermann, unter Mitarbeit von Simon Rabaa (Büro für Technikfolgen-Abschätzung beim Deutschen Bundestag -TAB), Bilanz der Sommerzeit, Februar 2016, Arbeitsbericht Nr. 165. Available online: https://www.tab-beim-bundestag.de/de/pdf/publikationen/berichte/TAB-Arbeitsbericht-ab165.pdf.

[9] Deutscher Bundestag, 2014, Studien zu gesundheitlichen Folgen der jährlichen Zeitumstellung auf die Sommerzeit.

6 Conclusions

While the public consultation is not a representative survey, the very high response rate – in particular from citizens– provides interesting findings.

Given the very small share of responses from public authorities and their heterogeneous nature, it is not possible to draw any firm conclusions from the public consultation for this specific category.

Based on citizens, businesses and the other stakeholder responses, the main findings are the following:

- The **majority of the responses** by citizens and businesses/stakeholders **mention negative experience with the switching**. With Greece and Cyprus there are two Member States where positive experiences prevail.
- There is a **large majority among respondents (84%) in favour of ending the current regime of switching time**. This finding is consistent among the Member States, citizens and businesses/stakeholders. Only in Greece and Cyprus, a majority would like to keep the current system.
- Most frequently, respondents who are in favour of abolishing the time switch mention health as a reason (43%). Respondents who are in favour of keeping the current arrangement most frequently refer to their leisure activities (42 %).
- When asked about a preference for permanent summertime or permanent wintertime, **a consensus among citizens as well as businesses/stakeholders can be found for permanent summertime**. Exceptions are Finland, Denmark, the Netherlands, and the Czech Republic where respondents rather favour permanent wintertime.
- Based on the various comments received, it is obvious, that perspectives and arguments differ according to how people are affected – positively or negatively – by the time switch. Positive and negative impacts differ in function of sector of activity, business practices, and geographic location.

Appendix A Methodology

A.1 Re-categorisation of respondents

In the questionnaire, participants were asked to indicate whether they were responding as a citizen, business or a Member State. We could observe that some participants chose a wrong respondent category. For instance, some participants identified themselves as a business, but when asked for the name of their organisation, they indicated that they answered as an individual person. In order to re-categorise participants into the correct respondent category, we checked the answers of businesses and Member States to the following questions and marked those with the subsequent characteristics.

Table 3: Conditions for the re-categorisation of respondents

Question	***Answer marked if respondent ...***	***Marking***
Name of the organisation/authority on which behalf you are replying	... indicated that s/he is not an organisation (in different languages). E.g. "privat", "me stesso", "family", etc. ... answered with an opinion. E.g. "Ich brauche keine Umstellung" ... provided an unrelated answer. E.g. "Guten Tag" ... wrote random/repeated characters. E.g. "asdf", "xxxx" ... indicated a geographical area as an organisation. E.g. "Bayern", "Polska" ... introduced text without alphabetical characters. E.g. "?", "25689" ... wrote less than 3 characters. ... did not provide any information on the organisation. I.e. NA	O
Size of your organisation (number of employees)	... the size of the company is smaller than 1 employee (self employed) ... did not provide any number. ... did not provide any information on size. I.e. NA	S
Email address	... provided a commercial email address instead of an institutional one. E.g. Gmail, Yahoo, etc.	E

Source: Author's elaboration

After a discussion with the Client, it was agreed that participants be re-categorised according to the following conditions.

Table 4: Final conditions for re-categorisation of respondents

Re-categorisation	***Condition for re-categorisation***
Business or stakeholders is re-categorised as citizen	When marked with "O"
	When marked with both "E" and "S"
Member States respondent is re-categorised as a citizen	When marked with "E"
	When marked with "O"
	When marked with both "E" and "S"

Source: Author's elaboration

This check and re-categorisation were performed with automatic processes developed in the programme R[10]. Subsequently, the project team also performed a manual check for each response in the datasets of business/stakeholder and Member States, in order to ensure a thorough re-categorisation and validate the quality of the datasets.

[10] See: https://www.r-project.org/

A.2 Identification of inappropriate contributions

The answers of all respondents were checked to identify those containing hate speech in the text answers. This involved the creation of an English dictionary of bad and hate words, based on the dictionary of Hatebase[11], a WordPress blacklist of words[12], and a list of offensive/profane[13] words published by an academic at Carnegie Mellon University. Answers containing words included in this dictionary were marked and manually checked by the project team. If the answer contains hate speech, it is excluded from the dataset.

Cleaning process of open questions

The following steps have been applied in order to clean and analyse the responses from the open questions provided by the citizens:

- We removed:
  - Non-alphabetical terms;
  - Double spaces;
  - Quotation symbols;
  - Symbols;
  - Stop-words.
- We converted:
  - Accented characters to plain characters;
  - Uppercase to lowercase;
  - Plural to singular.

A.3 Analysis by latitude

Initially, the hypothesis was that country patterns would be different by their geographical location. Therefore, first the data was analysed by latitudinal grouping. The grouping followed according to a range of coordinates. The coordinates of the capital city of a country were used as reference for assigning a country to a latitude grouping. Therefore, the first geographical category includes all Member States above the 53rd Parallel North, the second all Member States between the 53rd and 46th Parallel North, and the third all Member States below the 46th Parallel North. *Table 5* summarizes these geographical groupings. *Figure 25* displays a graphical representation of the geographical categories

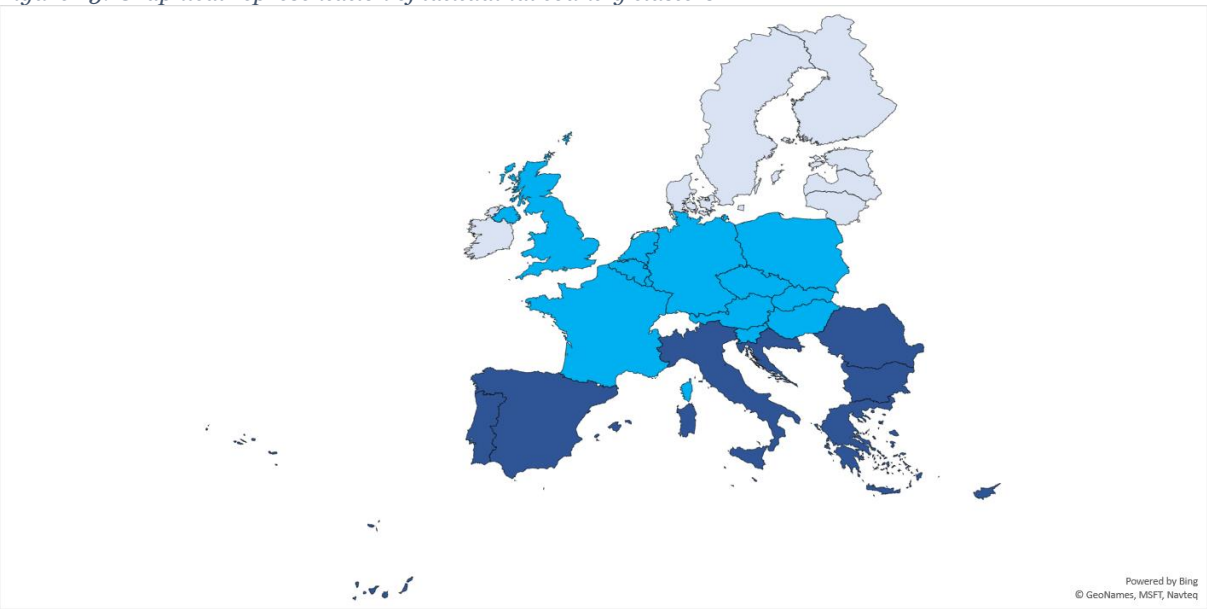
Table 5: Geographical categories of Member States by latitude

Latitude category	***Nomenclature***	***Member States***	***Total number of respondents***
Above the 53rd Parallel North	>53° N	Finland, Estonia, Sweden, Latvia, Denmark, Lithuania, Ireland	149,290
Between 53rd and 46th	From 53°N to 46°N	United Kingdom, Luxembourg, Belgium, Netherlands, Germany, France, Poland, Austria, Czech Republic Slovakia, Hungary, Slovenia	4,166,407
Below 46th	<46°N	Portugal, Spain, Italy, Romania, Bulgaria, Croatia, Greece, Malta, Cyprus	233,795

Source: Author's elaboration

[11] See: https://www.hatebase.org/
[12] See: https://www.freewebheaders.com/wordpress-comment-blacklist-words_comment-moderation_spam-comments/
[13] See: https://www.cs.cmu.edu/~biglou/resources/

Figure 25: Graphical representation of latitudinal country clusters



Source: Author's elaboration

This analysis by latitudinal grouping does present caveats. For example, EU Member States within the same grouping are affected by different time zones. This difference suggests possible divergences in answers to certain questions across countries within the same group.

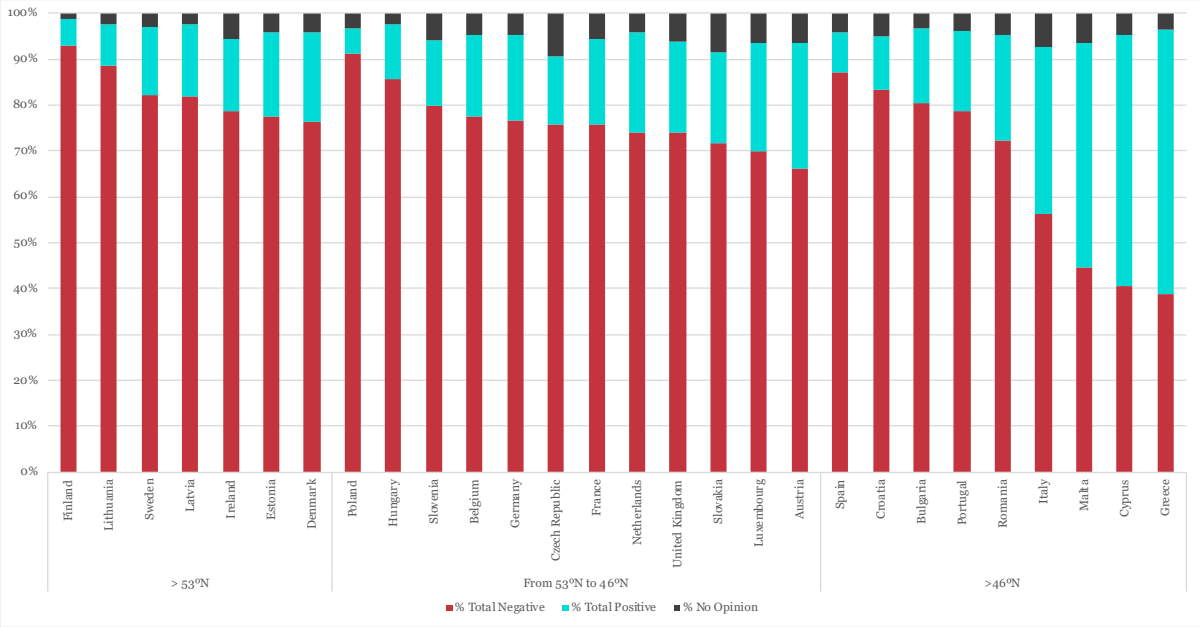
Additionally, selecting the capital city as a reference point for a grouping suggests that the larger part of the population is located above or under this point. In countries which have a considerable difference between its most northern point and most southern point, results might be biased towards specific regions of those countries where population density is higher (e.g. Sweden, the United Kingdom, France, Italy, Spain, Germany).

The figures below present the results grouped by latitude.

A.4 Responses by latitude

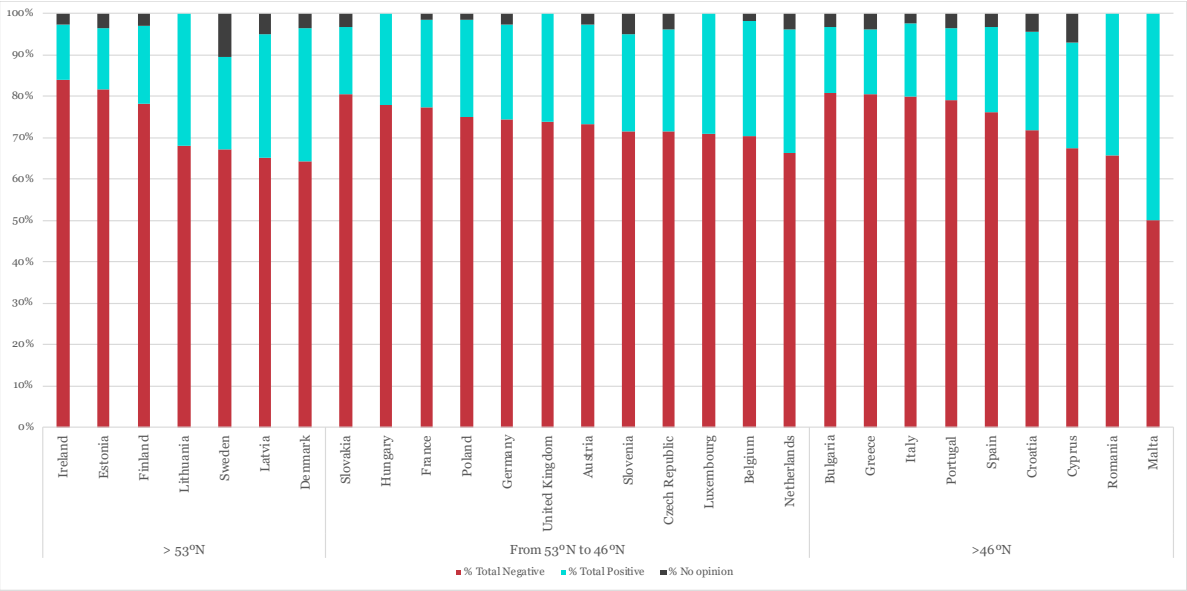
A.4.1 Question 1 - Overall experience

Figure 26: Shares of respondents to question 1'about experiences' among citizens, by country and latitude



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group

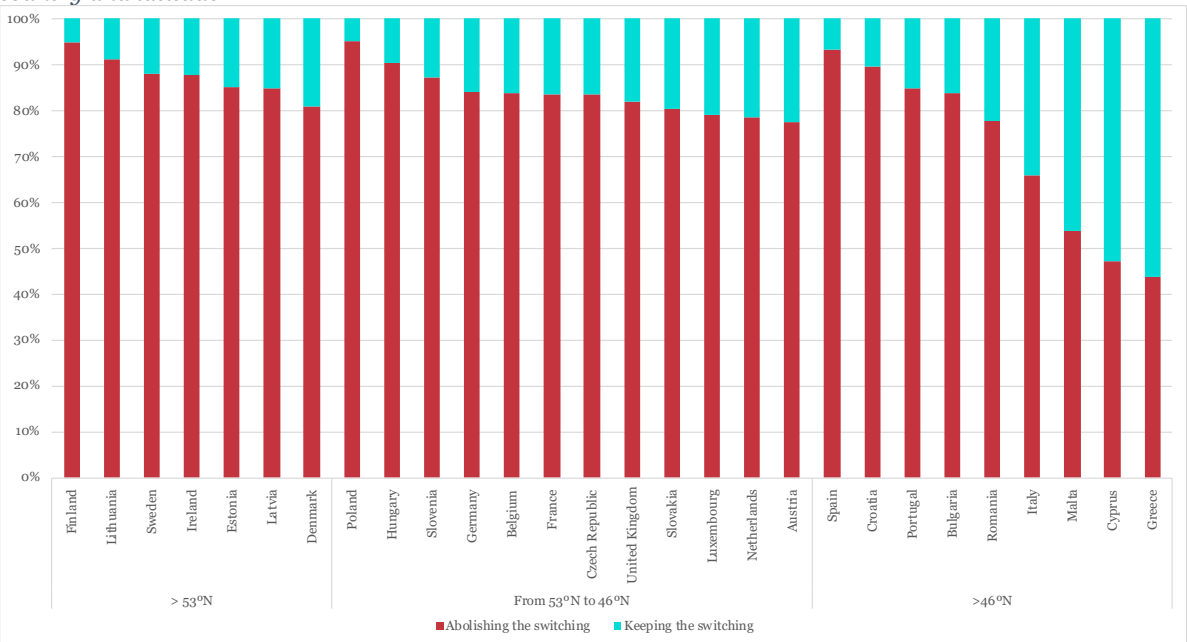
Figure 27: Shares of respondents to question 1 'about experiences' among stakeholders and businesses, by country and latitude



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group

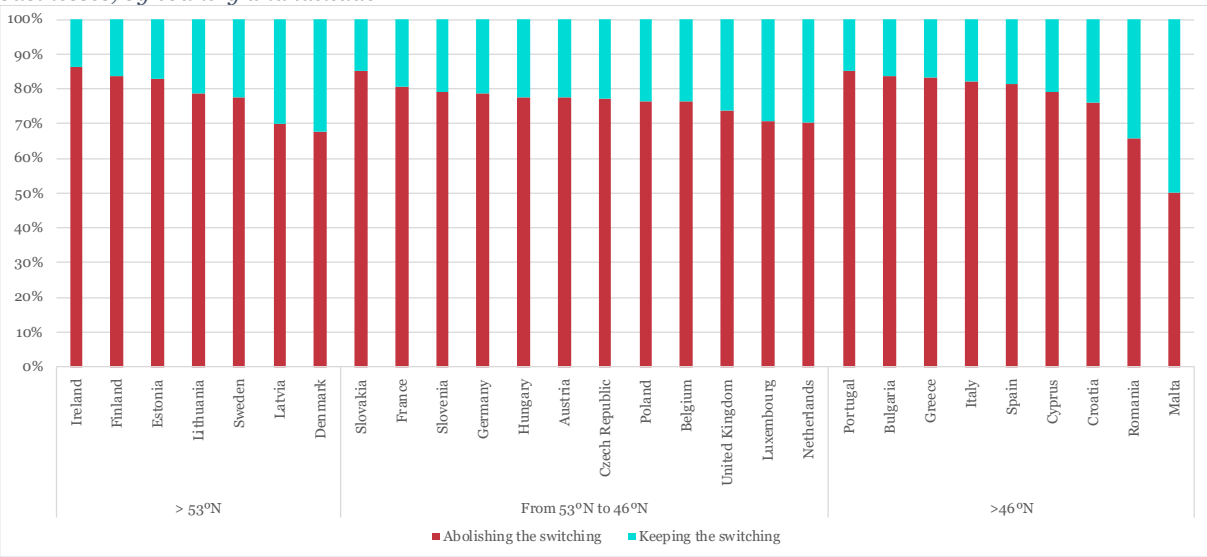
A.4.2 Question 2 - To keep or abolish the current arrangement?

Figure 28: Shares of respondents to question 2 'keep or abolish the current arrangement' among citizens, by country and latitude



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group

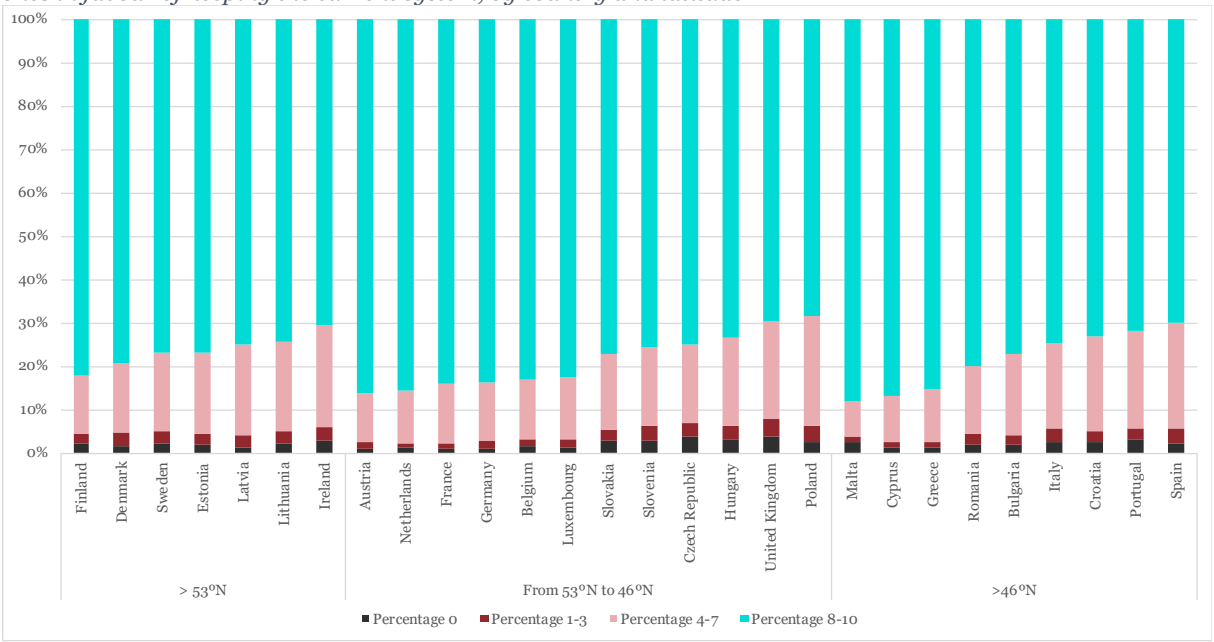
Figure 29: Shares of respondents to question 2 'keep or abolish the current arrangement' among stakeholders and businesses, by country and latitude



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group

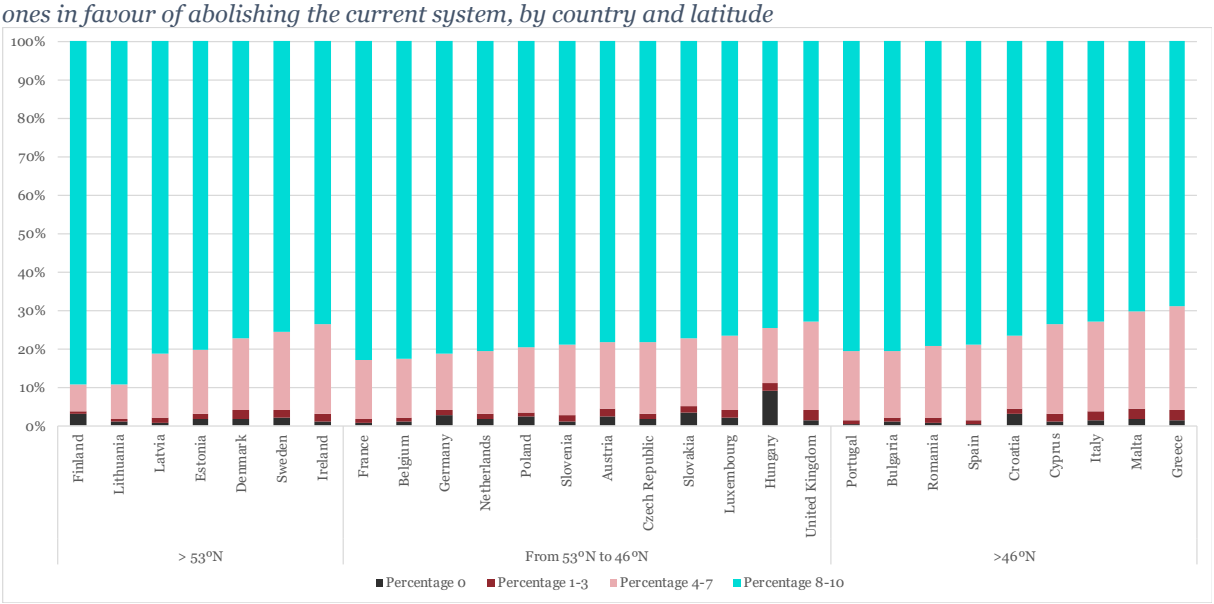
A.4.3 Question 4 - What is the importance?

Figure 30: Shares of respondents to question 4 'what is the importance' in function of the preference among the ones in favour of keeping the current system, by country and latitude



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group

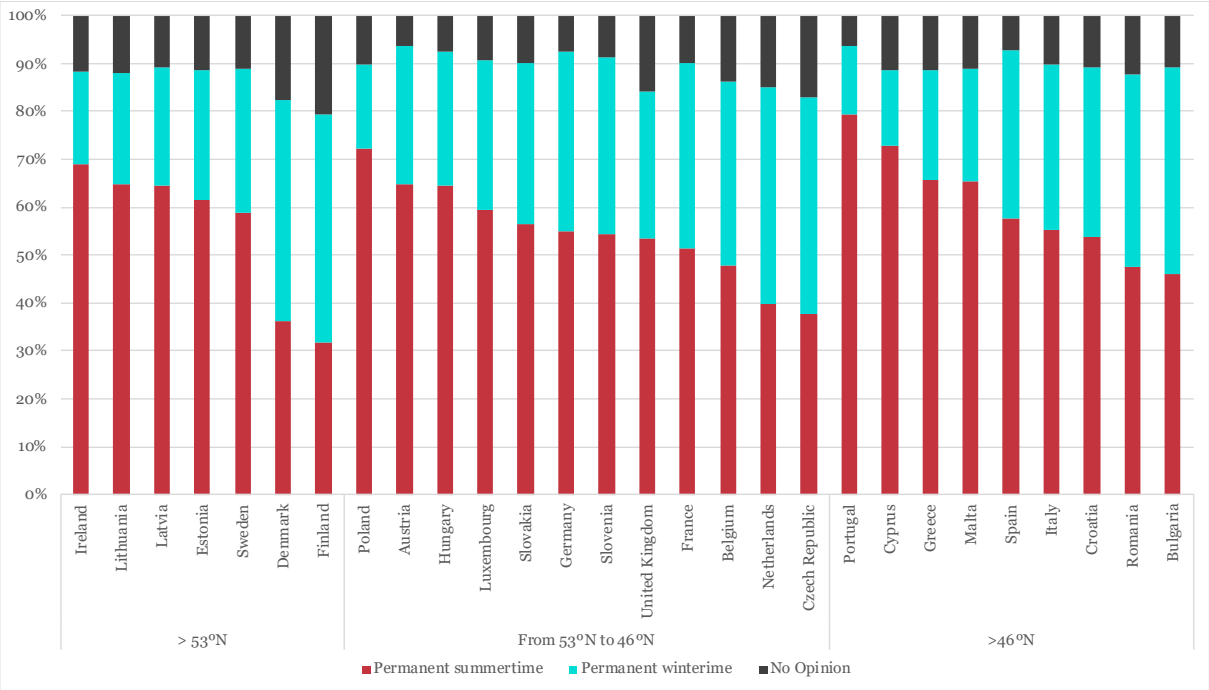
Figure 31: Shares of respondents to question 4 'what is the importance' in function of the preference among the ones in favour of abolishing the current system, by country and latitude



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group

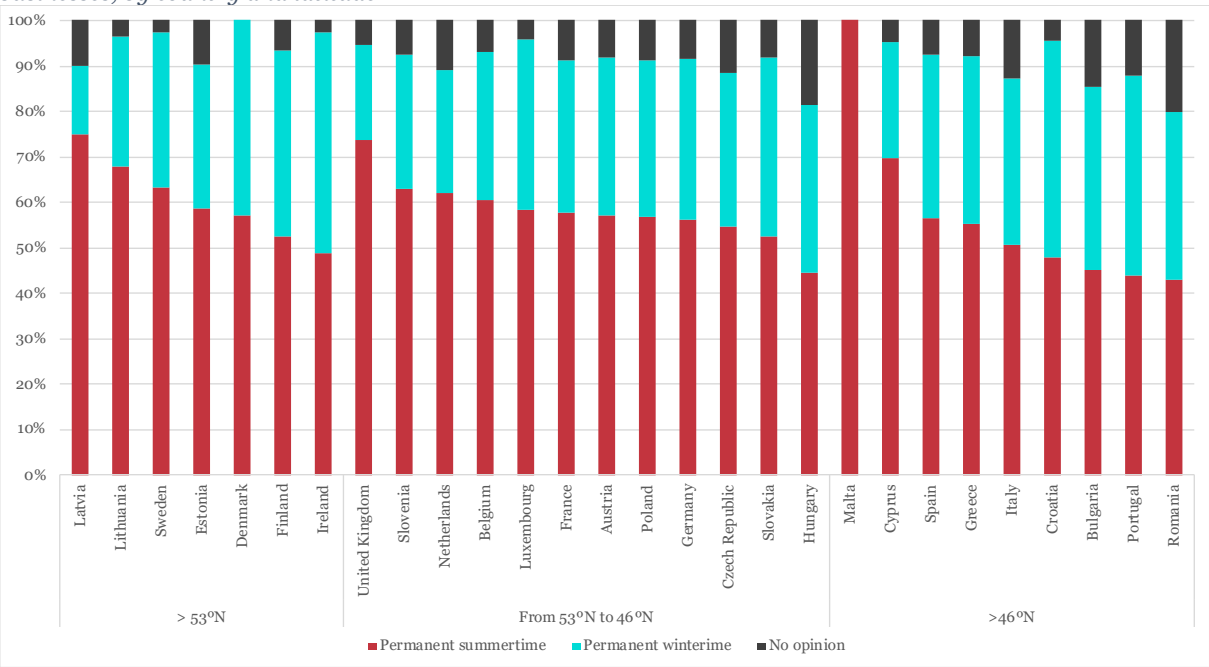
A.4.4 Question 5 - Preferred option after abolishing the time switch

Figure 32: Shares of respondents to question 5, 'preferred option after abolishing', among citizens, by country and latitude



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group

Figure 33: Shares of respondents to question 5, 'preferred option after abolishing', among stakeholders and businesses, by country and latitude



Data: European Commission, Public Consultation on EU summertime arrangements
Calculation and visualisation: Technopolis Group

A.5 Analysis of input received through other means than the EU Survey

Apart from responses received as part of the public consultation, the Commission also received a total number of 1,286 individual e-mails[14] or letters stating opinions on the issue of summertime arrangements. Input which did not respond to the consultation questionnaire does not form part of the analysis in the main report, but were still examined.

The overwhelming majority came from citizens, of which **1088 indicated their preference for abolishing the current arrangements: 170 indicated a preference for permanent summertime, 234 for permanent standard time and 684 did not express any preference for either summer or standard time.**

In addition, two campaigns were identified. The first campaign was launched via email and reached the Commission in the functional mailbox for the summertime consultation. This campaign was organised by www.cyberacteurs.org and expressed the preference for a permanent standard time. A total of 1503 emails were received.

A second campaign was organised by ACHED (Association Contre l'Heure d'Été Double) and was sent by means of a filled in template by post. A total of 17 contributions were received expressing the opinion to stop the seasonal time change and for a permanent standard time.

Two papers were also sent in by stakeholders:

The aviation sector submitted a position paper which stressed the importance of keeping a harmonised time switching system across the EU. They also pointed out that any change to the current system would have an impact on airlines schedules and slot planning and that sufficient lead-time would therefore be needed in order to allow making the necessary adjustments.

The Road Safety Authority of Ireland also shared an existing report on the road safety impact that was made in the context of a legal proposal that was considered in the Republic of Ireland in 2012. The proposal was to launch an experiment and change the applicable time-zone of the Republic of Ireland to CET or GMT+1. The report concludes that it is not possible to come to final conclusions as with the change of daylight over the year and different time arrangements, one choice would lead to brighter mornings and the other to brighter evenings, consequently to less traffic accidents in either morning or evening conditions. But overall, one might end up with a similar number of accidents.

[14] Excluding campaigns.

Appendix B Data tables

B.1 Absolute values of respondents at the closure of the public consultation (total analysed)

B.1.1 Question 1 - Overall experience

Table 6: Absolute number of answers to Question 1 'overall experience' by citizens

Country	*Very negative*	*Negative*	*Positive*	*Very positive*	*No opinion*	*Total*
Austria	66,966	103,975	24,090	46,832	16,827	258,690
Belgium	23,166	25,165	4,128	6,927	3,024	62,410
Bulgaria	5,632	4,916	802	1,356	425	13,131
Croatia	8,312	9,846	1,122	1,380	1,117	21,777
Cyprus	1,301	1,742	923	3,178	364	7,508
Czech Republic	22,600	24,851	4,255	5,011	5,907	62,624
Denmark	2,604	2,168	347	865	254	6,238
Estonia	5,670	3,947	954	1,347	511	12,429
Finland	34,621	14,605	1,093	1,909	732	52,960
France	134,150	163,291	29,647	43,295	22,238	392,621
Germany	1,034,708	1,369,679	234,204	347,340	150,352	3,136,264
Greece	5,694	8,409	4,858	16,045	1,266	36,272
Hungary	10,096	7,195	1,119	1,243	502	20,155
Ireland	4,020	5,119	765	1,076	661	11,641
Italy	5,017	8,198	3,209	5,310	1,706	23,440
Latvia	3,562	2,660	519	670	183	7,594
Lithuania	5,024	3,454	356	521	222	9,577
Luxembourg	2,740	4,633	1,007	1,484	669	10,533
Malta	220	299	125	444	74	1,162
Netherlands	10,481	10,093	2,104	4,008	1,113	27,799
Other	3,464	4,492	747	1,157	590	10,450
Poland	57,442	59,134	3,727	3,430	4,241	127,974
Portugal	11,637	15,365	2,591	3,388	1,287	34,268
Romania	2,295	3,123	679	1,031	362	7,490
Slovakia	9,118	14,436	3,213	3,289	2,826	32,882
Slovenia	5,069	6,998	990	1,132	899	15,088
Spain	34,462	42,018	3,417	4,404	3,631	87,932
Sweden	25,717	14,074	2,179	4,995	1,412	48,377
United Kingdom	4,126	4,517	951	1,379	726	11,699

Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

Table 7: Absolute number of answers to Question 1 'overall experience' by businesses and stakeholders

Country	***Very negative***	***Negative***	***Positive***	***Very positive***	***No opinion***	***TOTAL***
Austria	342	251	52	143	23	811
Belgium	80	63	15	41	4	203
Bulgaria	33	17	4	6	2	62
Croatia	25	8	2	9	2	46
Cyprus	18	11	1	10	3	43
Czech Republic	70	42	10	29	6	157
Denmark	10	8	4	5	1	28
Estonia	43	24	1	11	3	82
Finland	75	58	8	24	5	170
France	396	288	45	142	15	886
Germany	2,188	1,537	271	871	142	5,009
Greece	46	37	0	16	4	103
Hungary	9	12	1	5	0	27
Ireland	20	11	2	3	1	37
Italy	31	32	4	10	2	79
Latvia	6	7	1	5	1	20
Lithuania	12	7	2	7	0	28
Luxembourg	9	8	0	7	0	24
Malta	1	0	1	0	0	2
Netherlands	26	23	3	19	3	74
Other	19	11	2	14	1	47
Poland	114	93	14	51	4	276
Portugal	50	40	8	12	4	114
Romania	11	12	2	10	0	35
Slovakia	29	20	3	7	2	61
Slovenia	25	33	1	18	4	81
Spain	150	93	16	49	11	319
Sweden	35	16	4	13	8	76
United Kingdom	12	16	2	8	0	38

Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

B.1.2 Question 2 - To keep or abolish the current arrangement?

Table 8: Absolute number of answers to Question 2 'to keep or abolish the current arrangement?' by citizens and businesses and stakeholders

Country	***Abolishing the switching for all EU-MS*** ***Citizens***	***Keeping the current EU arrangements*** ***Citizens***	***Abolishing the switching for all EU-MS*** ***Businesses and stakeholders***	***Keeping the current EU arrangements*** ***Businesses and stakeholders***
Austria	200,160	58,530	630	181
Belgium	52,267	10,143	155	48
Bulgaria	11,008	2,123	52	10
Croatia	19,493	2,284	35	11
Cyprus	3,557	3,951	34	9
Czech Republic	52,233	10,391	121	36
Denmark	5,042	1,196	19	9
Estonia	10,561	1,868	68	14
Finland	50,288	2,672	142	28
France	328,124	64,497	713	173
Germany	2,633,311	502,972	3,953	1,056
Greece	15,829	20,443	86	17
Hungary	18,203	1,952	21	6
Ireland	10,205	1,436	32	5
Italy	15,464	7,976	65	14
Latvia	6,448	1,146	14	6
Lithuania	8,744	833	22	6
Luxembourg	8,337	2,196	17	7
Malta	625	537	1	1
Netherlands	21,851	5,948	52	22
Other	8,758	1,692	36	11
Poland	121,668	6,306	211	65
Portugal	29,045	5,223	97	17
Romania	5,827	1,663	23	12
Slovakia	26,435	6,447	52	9
Slovenia	13,177	1,911	64	17
Spain	81,961	5,971	260	59
Sweden	42,562	5,815	59	17
United Kingdom	9,582	2,117	28	10

Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

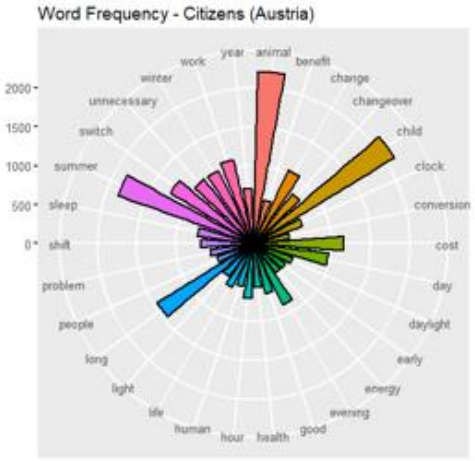
B.1.3 Question 3 - What are the reasons?

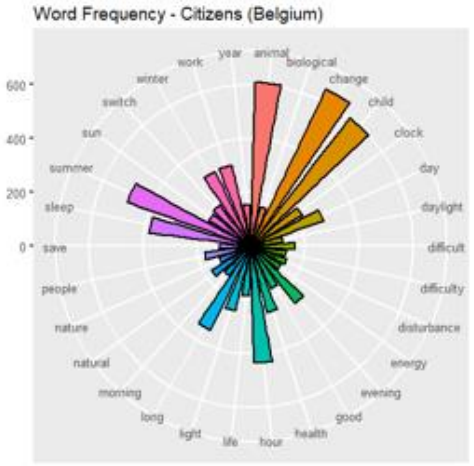
Table 9: Absolute number of answers to Question 3 'what are the reasons', by citizens

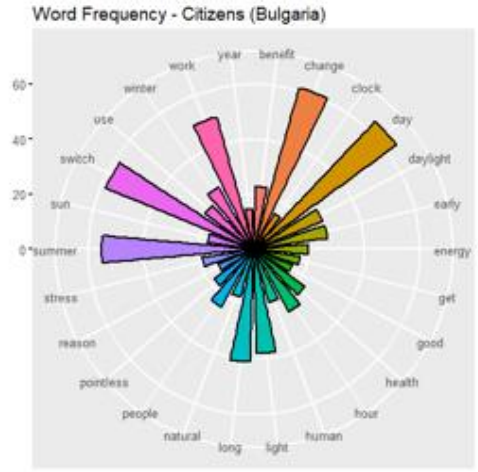
Country	*Energy saving lack of energy saving*	*Human health*	*Road safety*	*Internal market*	*Leisure activities in the evening*	*Other please specify*
Austria	90,491	168,899	48,445	46,609	130,573	20,738
Belgium	25,941	46,934	17,880	9,022	20,786	5,606
Bulgaria	4,060	10,838	3,449	2,174	4,222	577
Croatia	8,710	17,439	5,510	4,649	7,800	1,131
Cyprus	4,326	4,481	2,780	1,715	4,207	433
Czech Republic	14,327	49,313	10,726	10,919	21,083	4,674
Denmark	2,331	4,421	1,749	1,437	1,920	985
Estonia	3,395	9,835	2,750	2,050	5,305	921
Finland	16,668	45,248	9,255	10,319	12,696	7,011
France	190,089	286,731	98,126	54,603	124,818	27,053
Germany	1,220,412	2,356,101	624,423	565,715	1,186,467	246,542
Greece	19,994	22,818	9,852	8,828	17,066	1,579
Hungary	8,006	16,326	5,327	3,074	8,818	1,079
Ireland	4,287	8,239	4,184	2,167	6,177	918
Italy	11,138	14,268	4,469	4,040	10,121	1,503
Latvia	2,405	6,191	1,787	1,167	2,926	526
Lithuania	1,825	8,365	2,137	1,168	3,759	542
Luxembourg	3,896	7,519	2,305	1,659	4,488	720
Malta	561	709	249	219	688	105
Netherlands	10,917	18,566	6,348	4,479	9,283	4,077
Other	4,040	7,597	2,060	2,310	3,661	1,360
Poland	51,629	106,578	37,032	46,606	39,390	7,179
Portugal	15,477	25,757	7,190	7,944	17,931	1,643
Romania	2,692	5,523	1,650	1,721	3,019	395
Slovakia	8,818	24,476	7,583	5,125	13,983	1,763
Slovenia	3,955	11,176	3,171	2,544	6,313	1,134
Spain	36,253	72,623	10,118	11,768	16,312	5,344
Sweden	12,238	38,759	7,361	9,148	14,347	4,788
United Kingdom	4,913	8,312	3,032	2,949	4,936	1,239

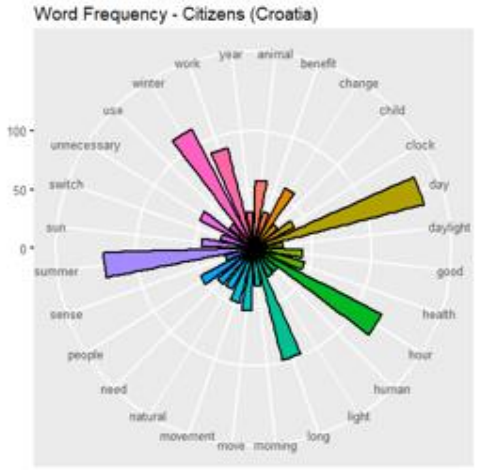
Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

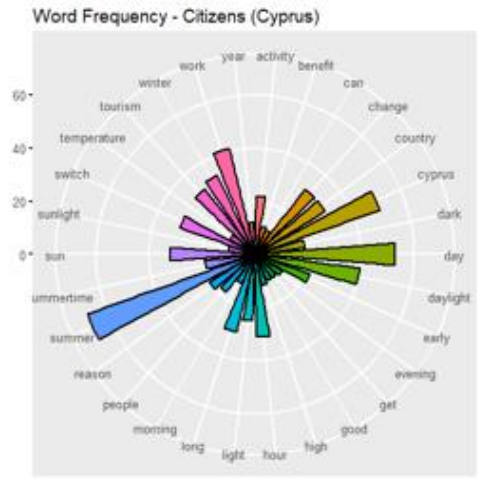
Figure 34: Member States frequencies of main terms addressed under 'other reasons' (contin.)

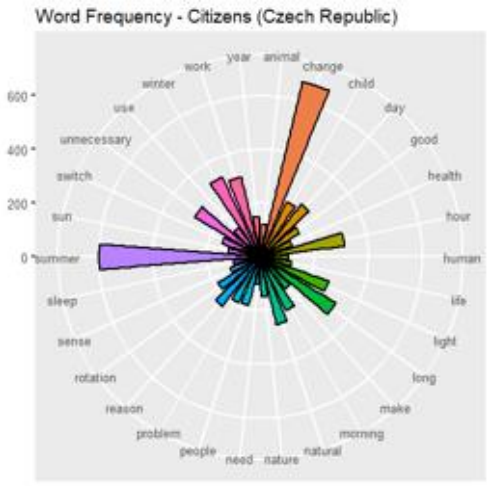




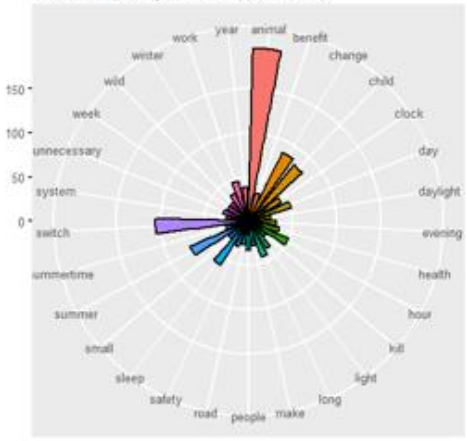




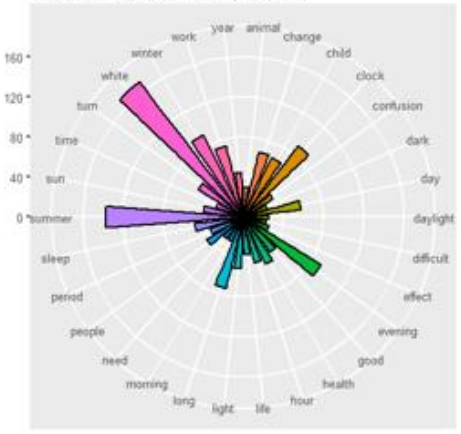




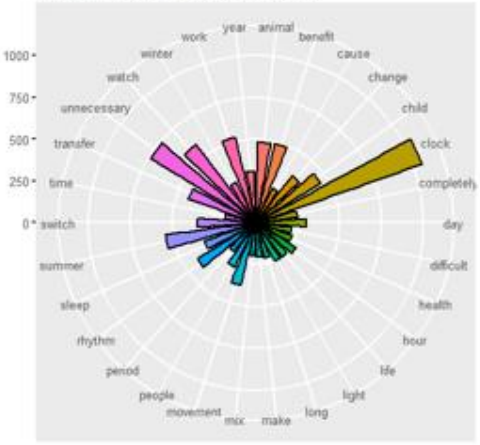
Word Frequency - Citizens (Denmark)



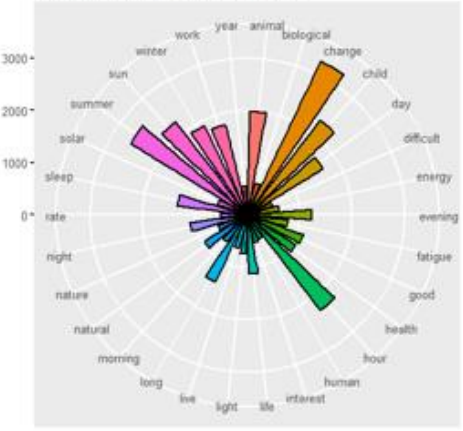
Word Frequency - Citizens (Estonia)



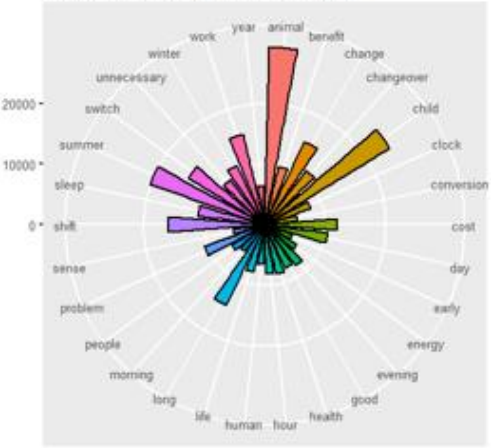
Word Frequency - Citizens (Finland)



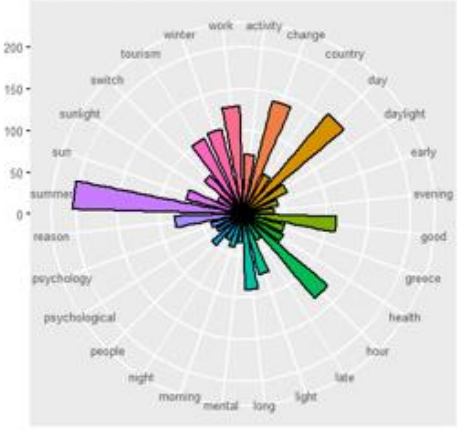
Word Frequency - Citizens (France)



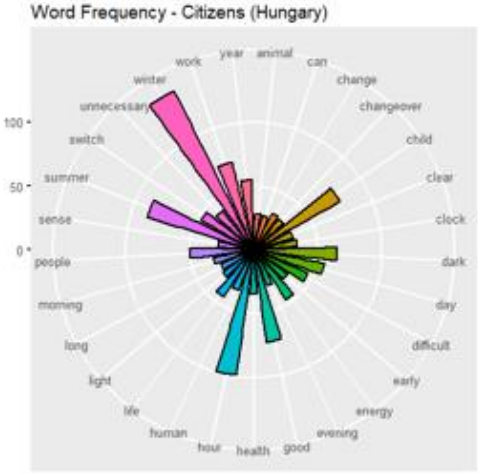
Word Frequency - Citizens (Germany)



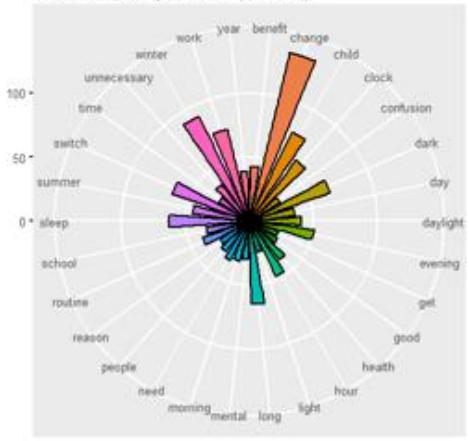
Word Frequency - Citizens (Greece)



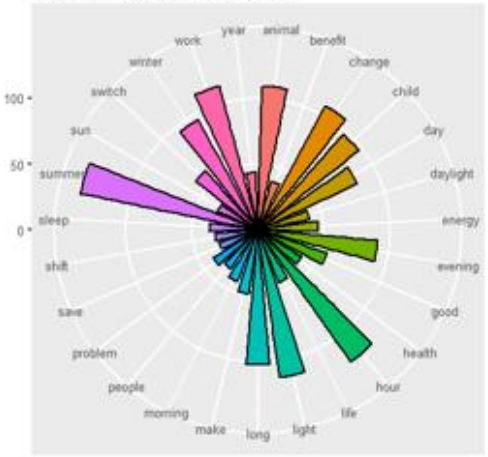
Word Frequency - Citizens (Hungary)



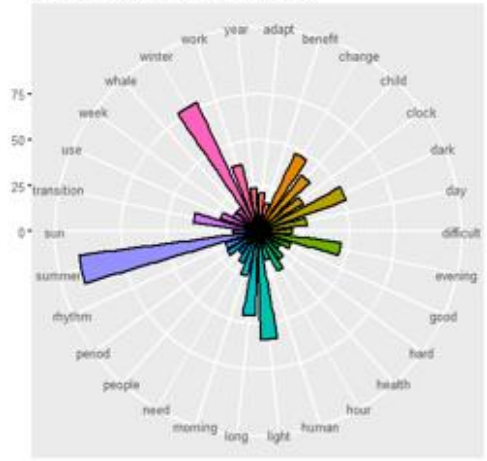
Word Frequency - Citizens (Ireland)



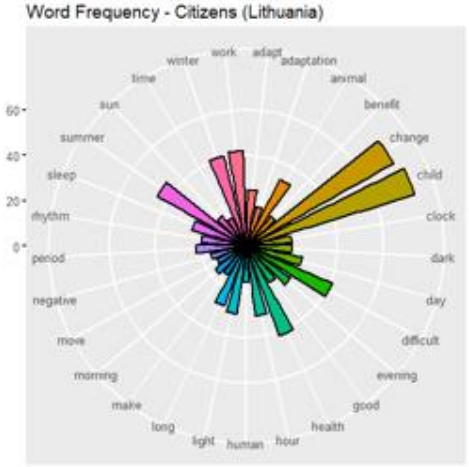
Word Frequency - Citizens (Italy)



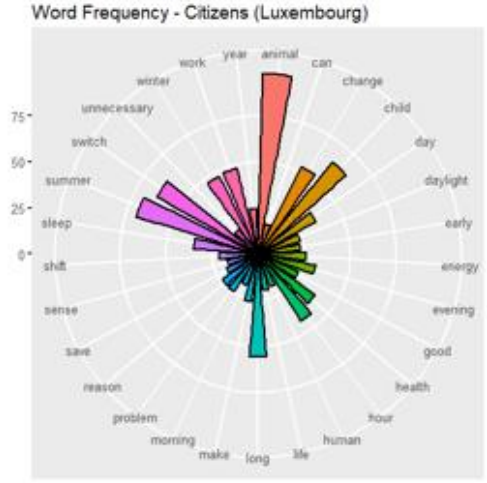
Word Frequency - Citizens (Latvia)



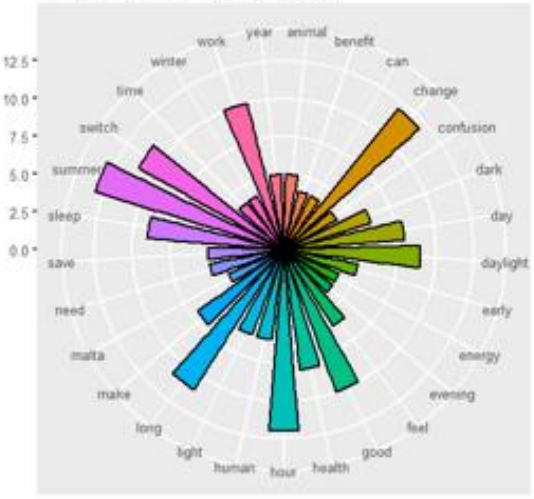
Word Frequency - Citizens (Lithuania)



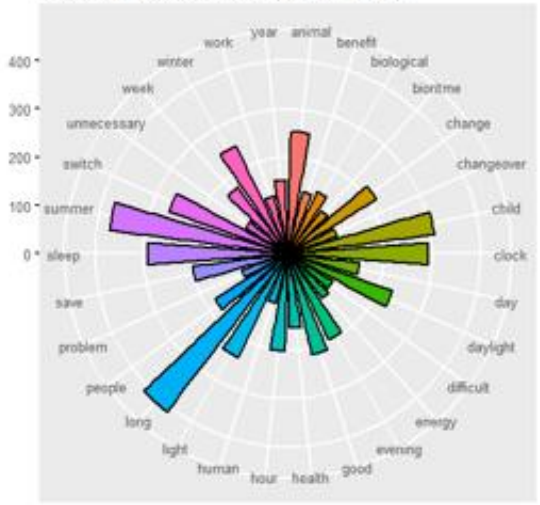
Word Frequency - Citizens (Luxembourg)



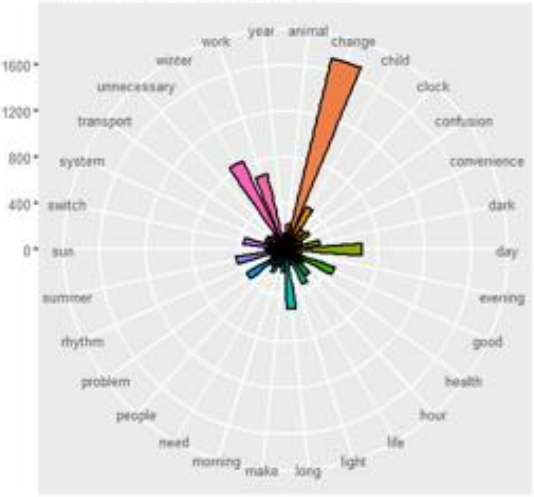
Word Frequency - Citizens (Malta)



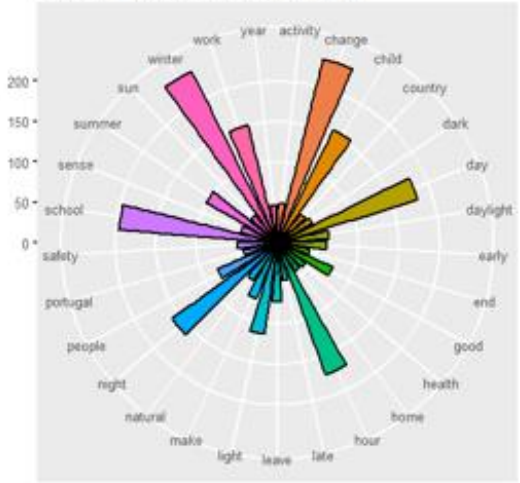
Word Frequency - Citizens (Netherlands)



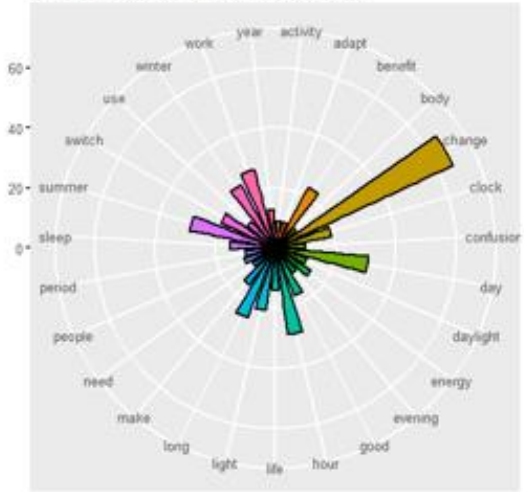
Word Frequency - Citizens (Poland)



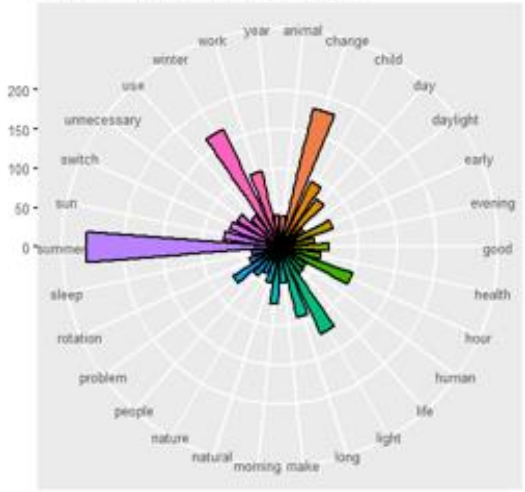
Word Frequency - Citizens (Portugal)

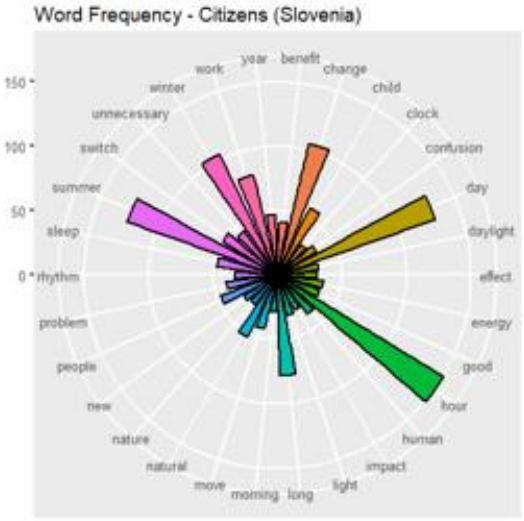


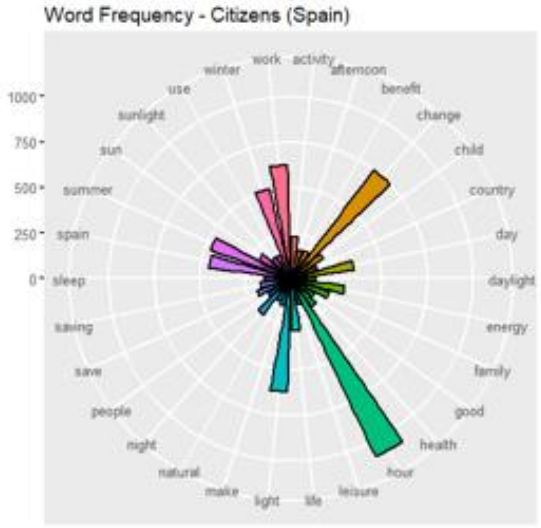
Word Frequency - Citizens (Romania)

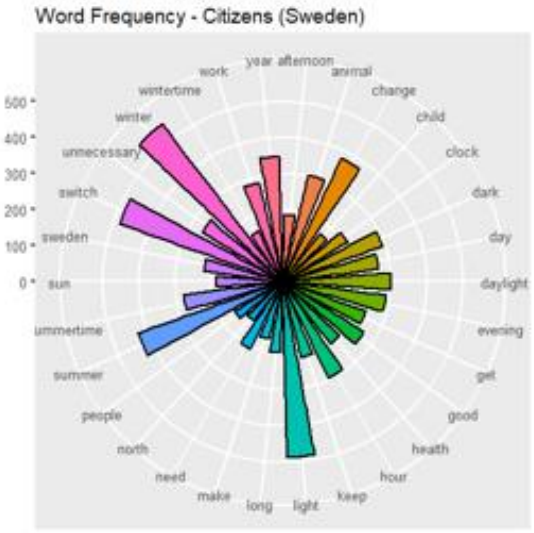


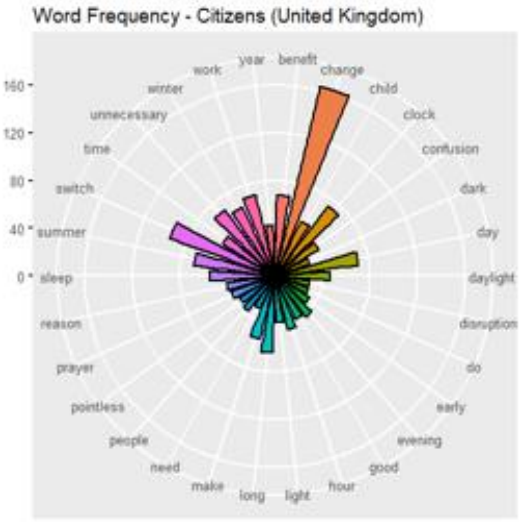
Word Frequency - Citizens (Slovakia)











Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

Table 10: Absolute number of answers to Question 3 'what are the reasons', by businesses and stakeholders

Country	Energy saving	Human health	Road safety	Internal market	Leisure activities	Other please specify	Total
Austria	370	550	228	310	324	147	1,929
Belgium	87	130	64	78	86	43	488
Bulgaria	31	35	20	31	16	6	139
Croatia	26	30	19	20	20	8	123
Cyprus	24	27	14	17	19	7	108
Czech Republic	80	111	51	58	75	33	408
Denmark	12	19	2	7	11	5	56
Estonia	33	63	34	26	39	17	212
Finland	70	126	51	62	64	32	405
France	410	622	278	310	350	159	2,129
Germany	2,260	3,521	1,434	1,825	1,898	915	11,853
Greece	39	74	25	38	33	15	224
Hungary	14	20	10	10	9	4	67
Ireland	14	28	13	6	16	6	83
Italy	35	56	14	27	22	11	165
Latvia	8	13	6	8	13	1	49
Lithuania	9	22	10	11	11	4	67
Luxembourg	12	14	6	12	9	2	55
Malta	1	1	1	2	1	1	7
Netherlands	38	47	30	33	38	16	202
Other	24	35	10	13	20	8	110
Poland	124	196	89	89	112	56	666
Portugal	57	78	25	45	33	19	257
Romania	19	27	13	13	15	10	97
Slovakia	27	43	18	15	23	17	143
Slovenia	37	53	23	28	32	25	198
Spain	141	235	100	119	125	65	785
Sweden	40	55	23	32	33	12	195
United Kingdom	19	26	13	14	15	4	91

Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

B.1.4 Question 4 - What is the importance?

Table 11: Absolute values and shares of respondents to question 4 "What is the importance of keeping the current arrangements"

Country	0		1		2		3		4		5		6		7		8		9		10	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Austria	486	5.7	265	8.3	258	6.1	436	7	339	6.5	2,224	7	1,200	6.1	2,890	6.1	7,722	6.6	5,739	6.8	37,154	9
Belgium	152	1.8	43	1.4	55	1.3	74	1.2	51	1	357	1.1	294	1.3	687	1.5	1,643	1.4	1,449	1.7	5,386	1.3
Bulgaria	41	0.5	14	0.4	11	0.2	20	0.3	15	0.3	129	0.4	79	0.2	180	0.4	343	0.3	232	0.3	1,069	0.3
Croatia	59	0.7	12	0.4	20	0.5	23	0.4	23	0.4	183	0.6	96	0.5	201	0.4	381	0.3	253	0.3	1,044	0.3
Cyprus	52	0.6	14	0.4	8	0.2	20	0.3	18	0.3	119	0.4	87	0.2	204	0.4	459	0.4	452	0.5	2,527	0.6
Czech Republic	377	4.4	77	2.4	89	2.1	160	2.6	99	1.9	663	2.1	338	2.1	791	1.7	1,610	1.4	1,212	1.4	5,011	1.2
Denmark	19	0.2	13	0.4	9	0.2	16	0.3	11	0.2	68	0.2	35	0.2	79	0.2	204	0.2	135	0.2	617	0.1
Estonia	38	0.4	8	0.2	16	0.4	19	0.3	19	0.4	135	0.4	51	0.4	149	0.3	266	0.2	224	0.3	957	0.2
Finland	56	0.7	20	0.6	14	0.3	27	0.4	28	0.5	127	0.4	66	0.3	147	0.3	452	0.4	442	0.5	1,321	0.3
France	582	6.8	192	6	275	6.6	358	5.8	323	6.2	2,359	7.5	1,802	6.6	4,486	9.6	10,947	9.3	8,126	9.6	35,220	8.5
Germany	4,990	58.5	2,032	63.6	2,859	68.2	4,220	68.3	3,512	67	21,044	66.5	12,923	68.2	30,918	65.8	79,986	68.1	55,982	66.1	285,566	68.9
Greece	272	3.2	66	2.1	83	2	79	1.3	110	2.1	678	2.1	494	2	1,241	2.6	3,095	2.6	3,022	3.6	11,320	2.7
Hungary	64	0.7	13	0.4	15	0.4	32	0.5	19	0.4	113	0.4	78	0.4	190	0.4	370	0.3	200	0.2	864	0.2
Ireland	41	0.5	13	0.4	15	0.4	18	0.3	23	0.4	109	0.3	70	0.4	133	0.3	267	0.2	136	0.2	616	0.1
Italy	195	2.3	63	2	80	1.9	104	1.7	106	2	378	1.2	378	1.9	727	1.5	1,491	1.3	1,032	1.2	3,436	0.8
Latvia	16	0.2	2	0.1	9	0.2	19	0.3	12	0.2	83	0.3	40	0.2	109	0.2	214	0.2	160	0.2	489	0.1
Lithuania	19	0.2	11	0.3	3	0.1	9	0.1	7	0.1	79	0.3	20	0.1	67	0.1	110	0.1	106	0.1	408	0.1
Luxembourg	27	0.3	15	0.5	14	0.3	14	0.2	12	0.2	95	0.3	62	0.3	150	0.3	367	0.3	266	0.3	1,181	0.3
Malta	14	0.2	2	0.1	2	0	2	0	1	0	14	0	13	0	16	0	60	0.1	64	0.1	350	0.1

Country	0		1		2		3		4		5		6		7		8		9		10	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Netherlands	67	0.8	22	0.7	15	0.4	36	0.6	39	0.7	132	0.4	147	0.4	402	0.9	1,096	0.9	1,083	1.3	2,931	0.7
Other	36	0.4	7	0.2	12	0.3	20	0.3	18	0.3	99	0.3	41	0.3	111	0.2	285	0.2	186	0.2	888	0.2
Poland	160	1.9	59	1.9	66	1.6	107	1.7	106	2	539	1.7	332	1.6	647	1.4	1,158	1	703	0.8	2,495	0.6
Portugal	157	1.8	41	1.3	42	1	57	0.9	54	1	361	1.1	241	1	527	1.1	1,002	0.9	636	0.8	2,122	0.5
Romania	33	0.4	15	0.5	9	0.2	16	0.3	19	0.4	84	0.3	42	0.2	119	0.3	255	0.2	228	0.3	855	0.2
Slovakia	183	2.2	56	1.7	45	1.1	67	1.1	70	1.3	436	1.4	179	1.1	428	0.9	911	0.8	765	0.9	3,316	0.8
Slovenia	55	0.6	10	0.3	19	0.5	34	0.6	26	0.5	135	0.4	67	0.5	123	0.3	329	0.3	248	0.3	882	0.2
Spain	141	1.7	39	1.2	78	1.9	77	1.2	86	1.6	433	1.4	314	1.9	646	1.4	1,137	1	766	0.9	2,313	0.6
Sweden	123	1.4	46	1.4	52	1.2	75	1.2	70	1.3	338	1.1	229	1.2	413	0.9	895	0.8	560	0.7	3,031	0.7
United Kingdom	84	1	20	0.6	22	0.5	39	0.6	26	0.5	148	0.5	95	0.5	210	0.4	352	0.3	225	0.3	906	0.2

Data: European Commission, Public Consultation on EU summertime arrangements; Calculation: Technopolis Group
Note: from 0 (not important) to 10 (very important)

Table 12: Absolute values and shares of respondents to question 4 "What is the importance of abolishing the current arrangements"

Country	0		1		2		3		4		5		6		7		8		9		10	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Austria	5,116	5.6	888	7.2	1,056	7.1	1,855	7.1	1,625	6.3	9,582	6.3	6,929	5.7	16,777	5.5	34,324	5	17,440	4.5	105,200	5.2
Belgium	539	0.6	131	1.1	188	1.3	298	1.1	290	1.1	1359	1.1	1,710	1.4	4,644	1.5	10,032	1.5	6,890	1.8	26,341	1.3
Bulgaria	118	0.1	36	0.3	26	0.2	70	0.3	83	0.3	483	0.3	401	0.3	939	0.3	1,857	0.3	1,228	0.3	5,819	0.3
Croatia	613	0.7	77	0.6	62	0.4	121	0.5	126	0.5	955	0.5	768	0.6	1,824	0.6	3,472	0.5	2,020	0.5	9,490	0.5
Cyprus	43	0	19	0.2	21	0.1	26	0.1	32	0.1	236	0.1	174	0.1	405	0.1	747	0.1	370	0.1	1,518	0.1
Czech Republic	899	1	126	1	258	1.7	429	1.6	428	1.7	2439	1.7	1,933	1.6	4,920	1.6	9,035	1.3	5,162	1.3	26,726	1.3

Country	*0*		*1*		*2*		*3*		*4*		*5*		*6*		*7*		*8*		*9*		*10*	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Denmark	90	0.1	22	0.2	30	0.2	71	0.3	48	0.2	217	0.2	210	0.2	472	0.2	981	0.1	519	0.1	2,401	0.1
Estonia	206	0.2	37	0.3	34	0.2	66	0.3	77	0.3	521	0.3	352	0.3	807	0.3	1,750	0.3	1,262	0.3	5,517	0.3
Finland	1,522	1.7	113	0.9	95	0.6	148	0.6	152	0.6	682	0.6	688	0.6	1,974	0.6	6,296	0.9	7,725	2	31,035	1.5
France	2,510	2.7	705	5.7	987	6.6	1,542	5.9	1,651	6.4	9,754	6.4	10,711	8.8	28,031	9.2	64,358	9.4	38,923	10.1	169,666	8.4
Germany	71,776	77.9	8,735	70.8	10,193	68.5	18,339	69.8	18,113	70	91,804	70	80,005	65.8	200,614	65.8	466,131	68	251,883	65.5	1,419,695	70.5
Greece	249	0.3	90	0.7	134	0.9	202	0.8	205	0.8	1175	0.8	982	0.8	1,935	0.6	3,198	0.5	1,816	0.5	5,929	0.3
Hungary	1,655	1.8	118	1	126	0.8	125	0.5	133	0.5	588	0.5	518	0.4	1,382	0.5	2,730	0.4	1,506	0.4	9,343	0.5
Ireland	103	0.1	29	0.2	71	0.5	114	0.4	102	0.4	470	0.4	586	0.5	1,247	0.4	2,019	0.3	925	0.2	4,571	0.2
Italy	234	0.3	66	0.5	103	0.7	173	0.7	208	0.8	775	0.8	900	0.7	1,733	0.6	3,360	0.5	1,703	0.4	6,274	0.3
Latvia	54	0.1	14	0.1	25	0.2	35	0.1	42	0.2	259	0.2	198	0.2	591	0.2	1,172	0.2	891	0.2	3,182	0.2
Lithuania	91	0.1	11	0.1	10	0.1	31	0.1	25	0.1	200	0.1	142	0.1	423	0.1	1,072	0.2	1,036	0.3	5,728	0.3
Luxembourg	179	0.2	38	0.3	46	0.3	70	0.3	58	0.2	400	0.2	384	0.3	788	0.3	1,684	0.2	895	0.2	3,812	0.2
Malta	11	0	2	0	4	0	11	0	8	0	31	0	45	0	74	0	109	0	49	0	282	0
Netherlands	383	0.4	89	0.7	81	0.5	135	0.5	162	0.6	458	0.6	819	0.7	2,100	0.7	4,904	0.7	3,237	0.8	9,535	0.5
Other	223	0.2	28	0.2	50	0.3	70	0.3	73	0.3	333	0.3	304	0.3	720	0.2	1,654	0.2	831	0.2	4,508	0.2
Poland	2,925	3.2	365	3	393	2.6	736	2.8	732	2.8	4695	2.8	4,417	3.6	10,733	3.5	22,257	3.2	13,603	3.5	61,024	3
Portugal	117	0.1	44	0.4	80	0.5	160	0.6	172	0.7	1065	0.7	1,137	0.9	2,865	0.9	6,118	0.9	3,742	1	13,642	0.7
Romania	44	0	19	0.2	22	0.1	48	0.2	45	0.2	227	0.2	205	0.2	608	0.2	1,064	0.2	775	0.2	2,793	0.1
Slovakia	909	1	121	1	125	0.8	223	0.8	179	0.7	1478	0.7	903	0.7	2,132	0.7	4,134	0.6	2,509	0.7	13,775	0.7
Slovenia	155	0.2	42	0.3	71	0.5	123	0.5	108	0.4	628	0.4	480	0.4	1,191	0.4	2,579	0.4	1,531	0.4	6,333	0.3
Spain	333	0.4	137	1.1	262	1.8	399	1.5	433	1.7	2790	1.7	3,424	2.8	9,676	3.2	18,838	2.7	11,419	3	34,511	1.7
Sweden	905	1	189	1.5	243	1.6	497	1.9	447	1.7	1948	1.7	1,748	1.4	4,395	1.4	8,164	1.2	3,603	0.9	20,482	1
United Kingdom	137	0.1	34	0.3	85	0.6	153	0.6	123	0.5	455	0.5	488	0.4	1,131	0.4	1,849	0.3	896	0.2	4,259	0.2

Data: European Commission, Public Consultation on EU summertime arrangements; Calculation: Technopolis Group
Note: from 0 (not important) to 10 (very important)

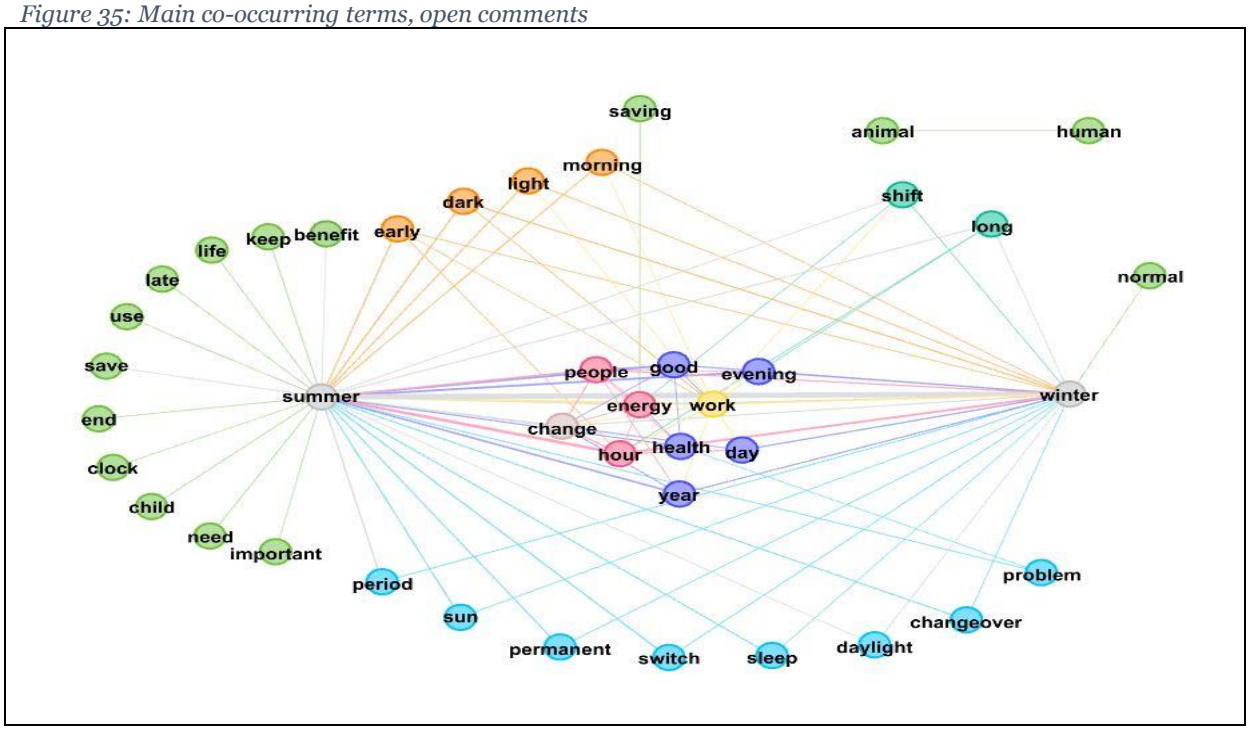
B.1.5 Question 5 - Preferred option after abolishing the time switch

Table 13: Absolute figures of citizens, businesses and stakeholders to Question 5 'preferred option after abolishing'

Country	Permanent summertime Citizens	Permanent wintertime Citizens	No opinion-/ I don't know Citizens	Permanent summertime Businesses and stakeholders	Permanent wintertime Businesses and stakeholders	No opinion / I don't know Businesses and stakeholders
Austria	167,429	75,016	16,245	464	280	67
Belgium	29,812	23,954	8,644	123	66	14
Bulgaria	6,044	5,667	1,420	28	25	9
Croatia	11,688	7,710	2,379	22	22	2
Cyprus	5,469	1,182	857	30	11	2
Czech Republic	23,667	28,354	10,603	86	53	18
Denmark	2,253	2,889	1,096	16	12	0
Estonia	7,635	3,371	1,423	48	26	8
Finland	16,780	25,240	10,940	89	70	11
France	201,841	152,009	38,771	511	298	77
Germany	1,727,458	1,176,142	232,683	2813	1776	420
Greece	23,775	8,417	4,080	57	38	8
Hungary	12,986	5,638	1,531	12	10	5
Ireland	8,035	2,259	1,347	18	18	1
Italy	12,931	8,137	2,372	40	29	10
Latvia	4,902	1,878	814	15	3	2
Lithuania	6,204	2,213	1,160	19	8	1
Luxembourg	6,274	3,267	992	14	9	1
Malta	760	273	129	2	0	0
Netherlands	11,060	12,578	4,161	46	20	8
Other	5,112	4,285	1,053	26	19	2
Poland	92,545	22,298	13,131	157	95	24
Portugal	27,235	4,838	2,195	50	50	14
Romania	3,559	3,018	913	15	13	7
Slovakia	18,565	11,057	3,260	32	24	5
Slovenia	8,203	5,571	1,314	51	24	6
Spain	50,597	31,024	6,311	180	115	24
Sweden	28,470	14,511	5,396	48	26	2
United Kingdom	6,263	3,581	1,855	28	8	2

Data: European Commission, Public Consultation on EU summertime arrangements
Calculation: Technopolis Group

Figure 35: Main co-occurring terms, open comments



Data: European Commission, Public Consultation on EU summertime arrangements;
Calculation: Technopolis Group

Table 14: Top co-occurring terms, absolute values (extract)

	winter	summer	change	period	day	energy	long	hour	shift	evening	save	work	daylight	animal	people	health	year	light	morning	benefit	like	twice	sun	changeov	sleep	life	school	wintertim	switch	time
winter	0																													
summer	237796	0																												
change	44005	58133	0																											
period	39784	57411	9692	0																										
day	54791	51848	29186	9622	0																									
energy	32481	51007	27660	9774	18734	0																								
long	25896	46520	18308	8704	23566	16726	0																							
hour	90093	122505	49049	20397	44600	25875	30425	0																						
shift	30115	39021	16567	10816	13159	25590	11570	4869	0																					
evening	52465	85537	16523	12981	19084	15729	28573	21696	2106	0																				
save	24483	36109	4147	7230	13430	16146	6244	18748	16518	11800	0																			
work	68500	88584	34700	16326	34846	21068	16164	44270	28747	38538	15243	0																		
daylight	27664	32023	11218	5792	13464	6456	9554	23991	4805	15875	16026	21506	0																	
animal	15109	23316	9058	5953	3746	18967	6625	7070	3208	5537	12414	9606	1908	0																
people	50875	73443	34291	13593	20987	25478	13447	21297	5044	26338	18203	16215	14939	22635	0															
health	32860	48932	23613	10181	10881	27408	12233	13172	3849	2176	17825	24292	8229	16837	29173	0														
year	48652	72241	35630	14372	15753	21914	11975	16744	18189	3524	15892	28215	10201	12203	28868	16202	0													
light	38604	46379	11543	7496	16430	14403	13585	15398	1184	3997	10765	26574	7565	3694	18005	10512	9999	0												
morning	33854	45724	10057	7829	12542	11170	7657	14548	1254	2977	8125	25535	8305	3606	16332	6987	10644	16269	0											
benefit	7879	25269	9098	4762	8415	3973	6538	11331	11809	7581	2713	10046	2471	6097	11722	10272	9776	5102	3925	0										
like	16075	22984	8110	3480	7262	4475	4688	10822	4341	7438	994	9118	3340	2561	8935	4679	8301	4436	3733	988	0									
twice	5002	7559	8161	1719	2373	4639	1599	2187	3390	491	3263	4220	1414	3017	5495	3873	21474	1450	1247	2168	1284	0								
sun	35261	43001	11529	6124	12417	7153	5510	18600	4849	2278	4929	19051	5136	3635	15027	8157	9053	8815	9615	3350	4222	1241	0							
changeover	28499	45040	11179	10974	15895	16494	10411	16078	2372	9723	11771	15476	3504	13102	17123	15580	17577	4973	6074	7885	4203	3025	3313	0						
sleep	26475	45377	21408	9248	13693	13602	10863	16196	13187	3711	9656	18199	5751	7021	3222	2446	13868	1343	11943	4731	4211	2419	6972	1806	0					
life	18259	32444	12869	5712	8614	7141	8342	8325	1407	1934	4875	17314	5062	4289	12778	8827	10568	6628	4625	3919	2605	1725	5224	5521	967	0				
school	13492	16253	5837	3631	6840	3079	6875	10711	675	5904	2300	10926	3155	1933	6636	3728	5306	3756	6150	1612	1316	610	3035	3058	813	2011	0			
wintertime	4645	9065	3758	385	2194	2593	1812	1836	382	1169	1923	6002	3613	992	5851	3097	4832	2853	2580	1096	2604	848	3030	20	1852	1180	1049	0		
switch	37256	51726	13076	7223	13094	22030	11662	13742	10242	6450	16010	12267	8038	13741	10922	18415	10715	8532	8202	9134	7541	2981	6062	1483	11333	2518	3783	3952	0	
time	14826	20402	14529	3873	5784	8099	3223	6602	6290	937	5567	11324	2853	6404	10552	6951	15605	3995	3671	2938	2481	1821	4084	5028	5442	3445	1786	1247	4756	0
permanent	34608	44326	8176	7505	5338	4919	4502	6300	1206	1883	4094	12000	6118	3337	10194	7140	5665	5658	5423	3420	3549	1260	4907	5962	735	4015	2384	5899	11519	2420
take	14978	14672	17688	3420	7663	11048	12035	8979	4758	3786	7641	10853	4347	3583	6328	4757	7476	2668	2682	2962	4048	1067	2525	5550	3916	2158	468	455	3787	2647
make	8689	11482	12554	1759	7140	8676	6942	8629	4193	2731	2685	14362	5762	3748	14627	6387	4030	5456	2360	3528	2862	804	2280	1505	3328	4157	2657	1249	7829	1495
summertime	24463	25140	11565	12395	10979	8604	6695	17311	4010	14430	6249	17428	9120	3803	16533	9810	16012	8120	7332	4161	6305	2086	6638	4103	5432	5477	2993	16390	12949	3276
important	18598	26730	7986	4536	6301	5952	6427	6221	958	1658	4169	12873	5435	3308	10690	10388	6587	6768	5139	2415	2625	1191	4710	4411	644	4502	1951	1744	6350	2647
country	8400	12120	5774	2048	3876	3517	2294	8029	3153	2582	2533	5065	2202	1122	5342	3385	4396	2578	1573	1870	1966	782	2831	1782	1819	1663	703	1073	4121	1775
leisure	11003	20259	3200	3774	4151	3405	6077	5618	565	10441	2447	11297	4086	1098	5907	4291	4001	4123	3394	2258	1156	401	2131	2496	327	3046	1272	576	1017	1255
impact	10010	13868	9042	2968	3610	7588	3429	3821	932	673	4066	6988	2047	3470	7085	11112	5317	2829	2287	2039	1109	956	2132	3596	604	3081	1330	468	1520	1838
good	54324	77087	30723	11690	23963	18160	4464	5148	2717	25163	13179	32894	12167	12063	30897	25412	24780	16284	13190	7277	7559	3612	14100	8017	2263	12993	4880	5473	2238	7673
spring	5856	10609	3157	2253	2599	2179	1986	6320	2728	3454	1659	4116	1480	1329	3366	2316	3612	2205	2590	1005	943	458	1469	3047	3109	1188	1029	442	2473	1051
dark	54282	53276	10096	9281	16756	7225	23275	24401	1138	22998	5992	32675	9833	2777	16616	6971	11694	14959	16046	3596	4964	1179	7077	6674	1205	5348	6308	3980	8747	3232
think	13061	17268	8058	2405	4248	6133	3002	4108	3571	1080	4425	7819	2702	2791	10564	5448	5397	3728	3319	2238	2703	1290	3693	3375	2745	2257	1285	1973	6589	2245
addition	7471	10439	2517	2346	4402	5467	2932	6695	4659	3360	3444	5515	1212	2642	4655	4160	3878	2504	2293	904	987	819	1814	3278	3202	1560	876	120	2636	1474
end	17958	33711	6869	8133	10262	5835	5611	6437	1011	7854	4386	10414	3595	3053	7980	5442	8896	5266	5318	2740	2426	1052	4294	6263	4644	3259	2004	755	4954	2336
believe	7578	10385	2557	1848	3863	4671	2673	6226	3451	2939	2983	4489	1504	1777	5739	4162	3939	2369	1731	1048	1072	722	1906	2652	2019	1741	720	446	2741	1272
keep	25125	35222	10991	7092	6128	5595	4604	7561	744	3967	4257	7328	5089	2559	6665	6055	12385	5558	4387	2644	4680	1369	5332	1010	629	2432	1080	4634	4637	2887
need	21137	31897	19162	6759	14427	13263	7044	17144	1992	10004	9256	2948	4644	7892	2588	9727	12767	10288	9103	4044	3427	2455	5994	8763	1615	4641	3639	2015	3938	5052
clock	19112	26724	20076	5629	3591	11429	7052	8951	1870	7575	8544	14339	5229	7560	15100	10296	16582	5745	6107	5240	3672	4582	7287	2492	1703	4443	2461	2186	4949	5358
possible	14323	21504	6940	4259	5535	5565	4230	5617	747	7018	4053	9486	3434	2478	6739	5047	6338	4518	3564	2329	1968	829	4632	3719	523	2707	1401	828	1491	1904
difficult	9510	14075	9558	2931	6225	4195	5640	8533	1057	4106	2713	7742	1326	3829	6434	3690	5652	2184	3702	1549	1191	1044	2355	4612	906	2138	2132	488	1308	2522
child	22239	31837	23369	6805	15330	12461	15741	20319	2496	11322	8070	16918	3561	13409	17841	11630	13572	6008	9094	4420	2931	2766	5600	11313	2783	5105	17039	1247	11029	5677
reason	5822	9353	10171	1460	2518	10206	5359	3866	3933	1793	984	3396	2318	1529	3453	6247	4483	1227	1150	1493	2048	1146	1384	1999	2327	1133	598	887	4955	1303
really	6673	9111	6706	1098	3431	3525	1849	5367	2232	3029	2601	4476	1714	1200	4920	2389	4288	2116	2032	639	1909	873	1944	1583	2208	1241	675	1401	4612	1241
young	2726	4448	3496	1016	2185	1926	2082	2944	1980	1395	1214	2405	486	1986	5503	1879	2235	687	1021	691	460	411	758	1655	2014	891	1354	141	1542	863
autumn	6158	8793	1295	1965	3310	1610	2066	5197	2312	2921	1208	3296	1276	936	2766	1753	2895	2101	1918	449	767	340	1017	2536	1928	936	741	289	1706	846
positive	8377	13766	4988	2432	2728	4238	2027	2613	595	4419	2749	4958	2522	1874	5404	5544	4335	2758	1620	1554	1034	756	1509	3303	299	2471	678	749	1839	1239
human	15223	20633	13878	4355	6230	15400	4940	7285	1943	1893	9555	6030	2878	30912	6873	20956	5109	3101	3151	5131	2031	1506	5575	6116	808	3241	1398	1246	8044	2649

Data: European Commission, Public Consultation on EU summertime arrangements; Calculation: Technopolis Group

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[MI-01-19-653-EN-N

Publications Office

ISBN: 978-92-76-09254-4

doi: 10.2832/571245