Title: Can concern for air quality improvement increase the acceptability of climate change mitigation policies?

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Air quality and climate change policies are finding new common grounds today as increasing social complexity requires better integration of separate knowledge domains. This chapter addresses the complex relationship between these two policy domains, their scientific background and the related acceptability issue, which varies substantially among countries and social groups and is influenced by social and cultural factors. The first section of this chapter describes the relationship between air quality and climate change policies. Indeed, global CO_2 reduction objectives require complex adaptations of socio-economic behaviours that might not directly appear to be related to pollution reduction or to improvement the exposure of citizens to harmful pollutants. Recent studies, however, have confirmed that air pollution and its impacts are one of the main environmental concerns for citizens, even if relevant differences in public perception between countries still remain. This section also addresses the ambiguities and conflicts that characterise communication between experts and citizens. The second section briefly describes recent scientific evidence that shows the possibility of coupling air quality and climate change mitigation benefits with policies targeted at specific pollutants called *short lived climate forcers* (SLCF). The third section spells out some preliminary research questions on the acceptability of these policies and their complex relationship with individual interests and cultural contexts. Linking air quality to climate change could be a *win-win* strategy to increase the social acceptability of specific policies and their implementation if knowledge and communication gaps between citizens and policy makers will be reduced.

Keywords: Air quality / climate change / policy acceptability / social perception / Eurobarometer

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Introduction

The European Union has been described as a leading actor in the international climate change policy arena (Wurzel and Connelly 2011). Indeed, the EU Climate and Energy Package, issued in 2008, was a major step in evidence-based policy implementation. However, along with the policy planning, the day-by-day implementation of policies has strong implications for individuals and collective actors (Leiserovitz 2006; Atran *et al*. 2005). Even though, in general terms, climate change is a growing concern for 40% of European citizens (this figure was 22% in 2008) (Eurobarometer 2008; 2011), there are still strong variations among countries (Bucchi and Saracino 2012; Running 2012; Leiserovitz 2006; Buckeley 2000). Moreover, climate change policies face different degrees of social acceptability (Leiserovitz 2012, Withmarsh 2011, Shove 2010). Along with the increase in the share of populations living in urban environments, we have witnessed a global concern for the rising risks and health impacts linked to air pollution (Graham 2015). Recent scientific findings have increasingly linked air quality with climate change, highlighting the possibility of implementing win-win policies to efficiently tackle both problems. These developments opened a complex field of interactions between hard atmospheric sciences, social research and policy studies. They also provide a new scenario for addressing policy-makers activities and citizens' perception about environmental issues. In order to disentangle the complex relationship between scientific evidence, policy domains and the social acceptability of these issues, this chapter is divided into three sections. The first section describes the relationship between air quality and climate change policies and the ambiguities that mark the communication between experts and citizens. The second section briefly describes recent scientific evidence showing the possibility of coupling air quality and climate change mitigation benefits with policies targeted at specific pollutants called *short lived climate forcers* (SLCF). The third section spells out some preliminary research questions on policy acceptability based on the analysis of the Eurobarometer data. The essay will conclude by assuming that even if linking air quality to climate change may be a *win-win* strategy, as shown by scientific evidence, it has to pass the test of social acceptability. The analysis of our indicators will show that a *win-win* approach cannot be taken for granted and is not easily translated by policy makers both at the European and national level.

1. Between experts, common sense and acceptability

Air quality management policies were kicked-off with the *Clean Air Act* of 1956 in the United Kingdom. Air quality (AQ) legislation has been further developed in European countries since the

1970 EC Directive (70/220/EEC) (Uekoetter 2009). While the EU Directive does address national policy, its translation into national and local plans or interventions has been affected by differences in interpretation and varying levels of coherence (see Giardullo *et al.* 2015). Furthermore, the translation into policy of research findings related to air quality has been gradual but extensive (Williams 2004) and the social awareness of air pollution risks for health seems to increase as well (Eurobarometer 2013). On the other hand, although climate change (CC) has been studied since the '80s, its complexity and debated impacts means that it did not influence specific policy initiatives till 1994 when the United Nations' Framework Convention on Climate Change was signed. At the European level, the Directorate-General (DG) for Climate Action was established in February 2010, adding a new specific department for CC, which was previously part of the DG Environment of the European Commission. More recently, the EU has encouraged attempts to unify the efforts: the Joint Research Center (JRC) set up a specific research unit about the integrated assessment of air quality and climate change policies[1]. Beyond the socio-political complexities and implications of the relationship between AQ and CC research and policy, we need to recognise, as advisers (Irwin *et al.* 1997; Jasanoff 1990) and citizens who can express forms of resistance (Jordan and Lifferink 2004; Jordan 2012), a deeper complex relationship between expert knowledge which contributes to policy-making. The relationship between experts and the public has always been at a crossroads between trust, distrust and misunderstanding, while environment problems have been perceived for a long time as issues to be solved through a top-down transmission of knowledge from experts to citizens[2]. In the last three decades, environmental policy making has been the site of growing conflicts, and policy makers have often come under public scrutiny or been openly criticized or contested (Pellizzoni 2011; Pellizzoni and Ylönen 2012). Today, governance over AQ and CC has become more complex due, for instance, to the coexistence of multiple perspectives and the need to:

i) develop and present multiple arguments taking into account different points of view;
ii) inform public opinion;
iii) establish compromises with multiple social groups and stakeholders in order to achieve main public goals;
iv) avoid serious damage to the interests of any of those groups (Viegas and Macario 2002).

Such challenges are exactly what public communication of science and technology (PCST) debates have already stressed (Peters 2008). In particular when scientists advise policy-makers and

[1] More details on the website of the Joint Research Centre Unit of Air Quality and Climate of the EU http://ccaqu.jrc.ec.europa.eu/acu.php and on the national environmental agencies. The earlier approach was established in the UK; see: http://uk-air.defra.gov.uk/assets/documents/reports/aqeg/fullreport.pdf
[2] One important example is the "Bodmers report" (Royal Society Report, 1985).

scientific knowledge becomes public (Jasanoff 1990) it needs to cope with these extra-scientific challenges. It is not merely a matter of recognising environmental problems and their consequences (problem perception): scientists have to answer the crucial question of whether the efforts required of citizens are appropriately effective and efficient. A general mismatch between the public acceptability of a measure and an expert's appraisal of their effectiveness opens space for multiple micro and macro conflicts (Pellizzoni 2011).

There is broad consensus that acceptability is crucial for a successful introduction and operation of policies; nonetheless, only a few authors have attempted to formulate a clear and systematic definition of acceptability (Schade and Schlag 2003; Viegas *et al.* 2000; Vlassenroot *et al*. 2010). According to Schade and Schlag, the term 'acceptance' defines "respondents' attitudes including their behavioural reactions after the introduction of a measure" (2000, p. 15), while 'acceptability' "describes the prospective judgment of measures to be introduced in the future" (ibid.). Moving from an individual to a collective perspective on acceptability, since 1991 the 'public (or social) acceptability' (Stankey and Clark 1991) concept has been used, although there is currently an inadequate understanding of its meaning. Usually, acceptability is related to specific measures or regulatory schemes in order to identify which drivers affect the (public) acceptability of a specific policy. Schade and Schlag (2003) stated that the acceptability of a system has primarily been seen as determined by attitudes and influenced by additional system-specific characteristics. In many cases, the social psychological attitude theory of planned behaviour (Ajzen 1991), which describes the relationship between attitudes and behaviour, has been used as a theoretical basis, considered useful for investigating public favour of policy interventions. This might drive policy-makers to be mostly interested in schemes and measures which do not question the wider logic of the whole social system and its ecological implications. This common sense assumption, which equalises high problem awareness with increased willingness to accept (unpopular) solutions in order to cope with environmental problems, has not been confirmed by empirical findings: for instance, the proofs of problem perception's influence on acceptability are still inconsistent or controversial. Although some studies found a relationship between problem perception and the acceptability of various pricing measures (De Groot and Schuitema 2012; Rienstra *et al*. 1999), some other research outcomes show that groups which recognise specific problems can refuse a proposed intervention. This is the case with traffic congestion, which was identified as one of the biggest problems by a group of participants in a study (Harsman *et al*. 2000) who rejected the road pricing solution and did so even more strongly than other groups who perceived the problem differently (Ibidem)[3]. Further, research on environmental awareness has established that knowing the "right action" is a necessary but not sufficient prerequisite for conservation-conscious behaviour (e.g. Bell *et al.* 1990). Thus, while any new measure or policy depends on the level of information available, it is not entirely dependent on it. Among other issues, the background of the problem, the aims of the measure and its concrete implementation have to be clearly explained to and understood by the public (Schlag 1998). Although this causal relation is not straightforward, previous studies have shown that well-known demand management measures meet a higher rate of acceptability than unknown measures. However, findings are, once again, inconsistent. The information level has either not been proved definitively to be a positive driver, as Steg and Vlek (1997) found, or it has been found to produce a negative effect. While a lot of information leads to a higher assessment of effectiveness, it also leads to a significantly lower acceptability of the restrictive measures compared to a less informed control group. Similarly, in the case of biotechnologies controversy, Bucchi and Neresini (2002) demonstrated that people who have the highest level of information about such a topic also have the highest levels of aversion. Hence, a differentiation is made between the so-called objective knowledge and the subjective assessment of both the problem and the proposed solution (Schade and Schlag 2000). For instance, the upfront costs of mitigating CO_2 emissions for people's health or of building dams to reduce the effects of sea level rise loom large due to loss aversion[4], while the uncertain and future benefits of such actions are more heavily discounted than can be predicted by normative models. This is true both at the local/community and national level. Such accounting of present costs against long-term benefits for the consumers may complicate the justification for these expenses (Weber 2013). As the IPCC summary for policy makers states:

> Behaviour, lifestyle and culture have a considerable influence on energy use and associated emissions, with high mitigation potential in some sectors, in particular when complementing technological and structural change (medium evidence, medium agreement). Emissions can be substantially lowered through changes in consumption patterns (e. g. mobility demand and mode, energy use in households, choice of longer-lasting products) and dietary change and reduction in food wastes. A number of options including monetary and non-monetary incentives as well as information measures may facilitate behavioural changes (IPPC 2014: p. 23).

[3] The authors suggest that this pattern might reflect doubts about the efficiency of road pricing. Nevertheless, respondents' attitudes in the survey differ significantly between cities.

[4] "Loss aversion is an important property that distinguishes prospect theory (Tversky and Kahneman, 1992) from expected utility theory (von Neumann and Morgenstern, 1944) by introducing a reference-dependent valuation of outcomes, with a steeper slope for perceived losses than for perceived gains" (IPCC, 2014: p. 162)

A further factor affecting individuals' behaviour is the perceived (social) fairness of the measure. However, this concept is imprecise and overlaps with related definitions of equity, justice and fairness, which also require clarification (Shade and Schlag 2003). First, we need to distinguish between three different perspectives: a normative, an individual and a descriptive perspective. The normative perspective (usually the economic approach) asks which distribution of outcomes should be considered fair from a societal viewpoint. Giuliano (1994) reports that equity as an economic concept primarily refers to the real distribution of costs and benefits within society. From an individual point of view, perceived justice is of major concern as a basic requirement for acceptability. Justice, as people perceive it, may differ from the objective distribution of costs and benefits, but it surely depends on it as one major parameter influencing individuals' perceptions. This differs not only in different situations and among different people in the same situation but even between people with comparable objective costs and benefits. Therefore, besides rational cost-benefit calculations, additional variables must be taken into account. Viegas (2001) tentatively operationalizes equity as a personal outcome expectation. The more people perceive advantages following the introduction of a given measure, the more they will be willing to accept that measure. Apart from intangible individual characteristics (e.g. perceptions, evaluations, etc.), policy acceptability depends on individual socio-economic status and additional characteristics related to the implemented policy. Socio-economic relations of agency and power, as well as spatial and social distribution of risk, have an impact on acceptability and related social behaviour as well (Buzzelli *et al*. 2003; Kenis and Mathijs 2012). In summary, in order to capture how and if environmental policies can reach their objectives, it is important to understand the correlation between the different dimensions of acceptability and policy design.

Integrating air quality and climate change policies: the path towards a *win-win* option?

Until the first decade of the new century, air quality and climate change policies, both in Europe and at the international level, were dealt with according to different policy frameworks. Such distinctions produced different action plans and policy agendas, given the separation of goals and competences: typically, energy ministries dealt with climate change (e.g. the United Kingdom), while environment ministries and agencies dealt with air quality. As a consequence, the relationships between these two policy areas have often been ignored or underestimated, despite part of the scientific community arguing that climate change and air quality are actually two faces of the same problem (Pleijel 2009; Fuzzi and Maione 2009). Nowadays, an integration of both policy areas is being supported by increasingly stronger scientific arguments (Barker *et al*. 2007;

Bollen *et al.* 2013; Rao *et al*. 2013; Maione and Fuzzi 2013; Stocker 2014). Furthermore, since major *greenhouse gases* (GHGs) originate from the same sources as air pollutants, a coordinated abatement strategy is emerging as the more effective and rational choice (Williams 2012). This has also been shown by a recent study undertaken by the *International Institute for Applied System Analysis* (IIASA) at the request of the European Parliament's Committee on *Environment, Public Health and Food Safety* (Amman *et al*. 2014). This study provided a complementary impact assessment, exploring the interactions between the European Union's air quality policy and the proposed EU climate and energy policy. It showed that reduced consumption of polluting fuels resulting from the climate and energy targets that have been put forward by the European Commission in early 2014 (i.e. a 40% reduction in GHGs, a share of 27% renewables, and a 30% improvement of energy efficiency compared to the 2007 baseline) would reduce premature mortality from fine particulate matter in the European Union and make further air quality improvements less costly. In short, its authors say: "Climate and energy efficiency policies will reduce the consumption of polluting fuels, which in turn will lower air pollutant emissions and costs for further air quality improvements" (Amman *et al*. 2014: p. 8).

Further steps towards such integration have been made at the transnational level where, until recent times, emissions of GHGs and air pollutants have been regulated separately. The Kyoto Protocol sets internationally binding emission reduction targets for a set of well-mixed GHGs including methane. On the air quality side, the Gothenburg Protocol sets emission ceilings for reactive pollutants; its revision, agreed in 2012, included an emission ceiling for primary $PM_{2.5}$, requiring the reduction of sources with high proportions of black carbon (BC). This, together with the inclusion of emission reduction obligations for methane, created the first legislative link between air quality issues and so-called *short-lived climate pollutants* (SLCPs) like BC, tropospheric ozone and methane. BC is an air pollutant that causes major health impacts and is also a major contributor to global warming. Tropospheric ozone reduces crop yields and damages human health and is also the third most important greenhouse gas. Methane, besides being a potent GHG with a relatively short lifetime, affects air quality and climate as a precursor of tropospheric ozone. It has been estimated that reducing global methane and BC emissions by 2030 could prevent about 2.4 million air pollution related deaths and save 50 million tonnes of crops, substantially reducing, at the same time, the risks of crossing the 2 degrees C threshold during the 21st century (UNEP 2011; Shindell *et al*. 2012). Indeed, policies aimed at fighting climate change represent a long-term commitment. Meanwhile, as already shown by the decrease in atmospheric levels of the reactive pollutants in the developed countries (where timely actions have been taken), air quality policies can have an immediate effect (Shindell *et al*. 2012; Raes and Seinfeld 2009).[5]

3. Relationships between air quality and climate change perceptions in Europe

The growing scientific consensus on the need for integration of AQ and CC policies as a win-win option, together with the limits of public acceptability studies, opens new challenges for social research on environmental policy. We argue that exploring public perceptions and attitudes to these environmental challenges represent a basic starting point in order to plan strategies for fine-tuned policy intervention and communicative efforts.

With the aim of verifying the win-win option, we investigated the links between air quality and climate change in terms of perception, using Eurobarometer's data. As argued by Nissen (2014), Eurobarometer is one of the most up-to-date sources of data representative of the European population and can be considered a valid tool for investigating the relationship between the two issues. We opted to use the most recent 2011 Eurobarometer wave 75.2, which investigated both air quality and climate change within the same questionnaire[6]. Our goal is to answer the following questions:

- Are people concerned by both climate change and air quality?
- Are these differences in concern the same in different countries?
- Do people share the same attitudes about drivers for social acceptability of environmental policies?

In order to answer the first research question, respondents' attitudes about the two matters of concern have been crossed. The hypothesis was: "if respondents are concerned about the same issue, they might be likely to share preferences for policies that are able to tackle both".

[5] However, measures reducing SLCPs have to be seen as complementary rather than a substitute for early and stringent CO_2 mitigation (Rogelj *et al.* 2014).
[6] In September 2014, a new wave about Europeans' environmental attitudes has been published by Eurobarometer (Special Eurobarometer 416 / Wave EB81.3), but, as they report, "the list and number of concerns presented to the respondents has been modified from the previous survey" (p. 12). Two alternatives have been deleted, namely: climate change and man-made disasters.

Tab. 1. Cross analysis of respondents' concerns about air quality and climate change (% values).

		Air quality	
		Non concerned	Concerned
Climate change	Non concerned	43.53	16.68
	Concerned	31.09	8.69

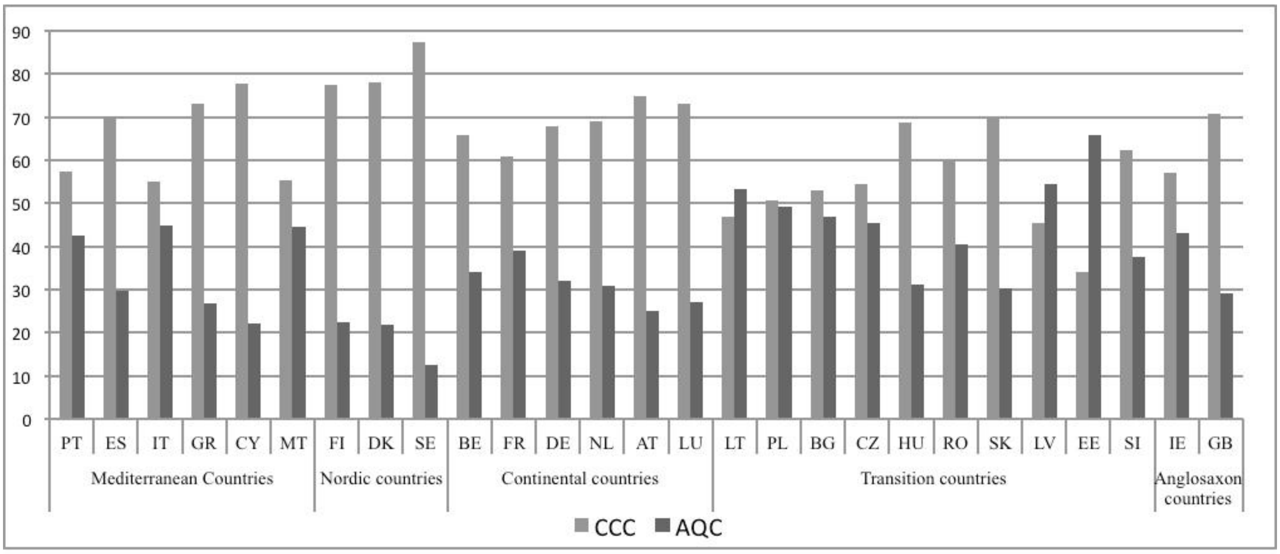
Source: Own calculations on Eurobarometer (2011). n = 26825; Phi = -0.066; p = 0.000.

The data[7] in Tab. 1 show that we have to reconsider this hypothesis. The two concerns do not coincide: it seems unlikely that people are worried by both climate change and air quality. People worried about both concerns represent only 8.69% of the sample, while 43.53% of the respondents were not concerned by climate change or air quality[8]. Such an outcome suggests the need to investigate the topic further. We opted to work on the remaining 47.77% of the sample by splitting it between the two matters of concern we are interested in. The differences between people concerned about air quality (from now on, AQC) and climate change (CCC) were investigated by clustering the 27 EU countries by the classical social policy regimes description (Esping-Andersen 1990) according to the model suggested by Jahn (1998), introducing further questions.

[7] The questionnaire allowed multiple answers to the same question (*From the following list, please pick the five main environmental issues that you are worried about*). For this analysis, we opted to use respondents as a unity of analysis, rather than the answers, as Eurobarometer normally does.

[8] The most quoted concern in 2011 was man-made-disaster followed by water pollution. See Eurobarometer EB75.2, available at http://ec.europa.eu/environment/pdf/EB_summary_EB752.pdf

Fig. 1 Comparing concerns in EU+28 countries (% values).



Source: Own calculations on Eurobarometer (2011).

In Fig. 1, we divided the countries into five clusters to identify regularities between countries with similar cultural and welfare heritages. Apparently, there are too many exceptions to consider a clear correlation: for instance, if we consider transition countries, 3 of them have higher levels of AQC compared to CCC, three others have almost the same levels and four others have a reverse situation. The lack of regularity confirms how complex the scenario that European authorities have to work with is and how difficult it must be to intervene through a win-win policy strategy. Other intervening factors have to be considered, such as, for instance, the performance of the countries in terms of atmospheric concentration of pollutants. Indeed, data on air quality (2014)[9] by the European Environment Agency (EEA) show that countries performing badly in terms of PM_{10} levels, such as Italy, Poland and Bulgaria, tend to be more concerned about air quality.

[9] www.eea.europa.eu/themes/air/interactive/pm10-interpolated-maps. Data available from 2006 to 2010.

Conversely, countries such as Spain and Portugal, which sensibly improved their performances in terms of the measured PM_{10} levels, are less concerned by air quality. According to the EEA, Lithuania is the worst Baltic country in terms of PM_{10} levels, which might explain its strong air quality concerns. This is not true in Estonia, where air quality data are better than in Lithuania but the concern is higher. Such differences are a first element that should be considered in order to actually deal with win-win strategies across the European Union.

Continuing in our investigation of the relationship between the two issues, we compared two mutually exclusive groups: a) the CCCs and b) the AQCs. The two groups were compared in terms of the six dimensions of social acceptability for environmental policies identified by the SEFIRA[10] project (Valeri *et al.* 2014). These were specifically converted into six indicators, according to Eurobarometer's variables (Tab. 2).

Tab. 2 Acceptability drivers converted into indicators.

Acceptability driver	**Indicators**
1. Environmental sensibility and interest	Environmental sensibility
2. Behaviour	Environmental commitment
3. Estimated efficacy	Judgement on efficacy for environmental resource management by political institutions
4. Equity and fairness	Attributed environmental responsibility
5. Socio-economic status in society	Self-placement on the societal scale
6. Level of knowledge	Self-perceived level of information about the environment

Source: adapted from SEFIRA project (Valeri *et al.* 2014).

The first indicator, environmental sensibility, combines different variables[11] limiting social desirability. The second indicator, behaviour, has been transposed in a measure of commitment (e.g. the number of environmentally friendly actions or membership of an association). The third indicator is a proxy of the judgement of environmental efforts in policy-making by different institutions (European Union and national government), while the fourth indicator is about the responsibility for environmental degradation. The last two indicators are respectively defined by

[10] Sefira (Socio-economic implications for individual responses to Air Pollution Policies in EU +27) is an FP7 Cooperation Project (2013-2016) under the scientific coordination of Prof. Yuri Kazepov and Michela Maione, co-authors of this paper (www.sefira-project.eu).
[11] Namely: EU parliament priorities; to be in favour of innovative policies for contrasting climate change; importance of environmental protection.

respondents' declarations about their estimated position in the societal scale and about the level of knowledge on environmental issues. The outcome of this comparison is presented in Tab. 3.

Tab. 3 Comparison between AQC and CCC on social acceptability of environmental policies.

Indicator	Sig.	Modalities	AQC (n=4327)	CCC (n=8167)
1. Environmental sensibility	χ^2:175,141 p: 0,000	Low	**54.44%**	**42.83%**
		Medium	33.71%	38.88%
		High	**11.83%**	**18.28%**
2. Environmental commitment	χ^2:48,230 p: 0,000	Low	**73.33%**	**63.30%**
		Medium	**21.54%**	**26.38%**
		High	5.13%	6.32%
3. Judgement on efficacy for environmental resource management by political institutions	χ^2:14,695 p: 0,005	Not doing anything	59.63%	63.07%
		Not doing enough	18.41%	19.91%
		Doing sufficient	16.47%	15.56%
		Doing enough	2.65%	2.02%
		Doing a lot of efforts	1.23%	0.98%
4. Attributed environmental responsibility	χ^2:50,994 p: 0,000	Big polluters	**14.97%**	**10.98%**
		Both individuals and big polluters	80.07%	82.53%
		Individuals	4.96%	6.49%
5. Self-placement on the societal scale	χ^2:69,213 p: 0,000	Low	14.51%	10.34%
		Medium low	43.34%	41.21%
		Medium high	**39.85%**	**46.07%**
		High	2.31%	2.38%
6. Self-perceived level of information about the environment	χ^2:52,215 p: 0,000	Very badly informed	**8.22%**	**5.59%**
		Fairly badly informed	33.26%	30.59%
		Fairly well informed	**51.18%**	**55.04%**
		Very well informed	7.34%	8.78%

Source: Own calculations on Eurobarometer (2013); Valeri *et al.* (2014).

The two groups share the same trends, even though some differences emerge. In Tab. 3 we highlighted them in bold. CCCs have a higher general environmental sensitivity and environmental commitment; we should, however, acknowledge that the level tends to be low in both groups. This implies that they carry out few environmentally friendly actions (e.g. reducing car use or implementing energy or water consumption controls) and are rarely active members of an environmental association. The two groups also share the same negative judgement on the efficacy of environmental resource management. The low value of χ^2, however, limits the importance of this indicator. The AQCs tend to attribute more responsibility to big polluters, such as large companies and industrial activities in general, rather than to individuals. This might be a kind of delegation of responsibility to the political and regulatory authorities in charge of controlling activities, and it is normally associated with the absence of a sense of guilt about the importance of their everyday life actions (Kollmuss and Agyeman 2002). However, a general correlation is present between environmental sensibility, recorded through the Individual Environmental Sensibility (IES) index[12], and responsibility attribution (ρ: 0.73 p: 0.000): indeed, the higher the sensibility, the higher the tendency to consider individuals as responsible for environmental problems.

Tab. 4 Respondents' average age and the average age at which they ended full time education.

	EU	**AQCs**	**CCCs**	**Correlation**
Age	μ 48.4 y.o. Std. Dev. 18.2	μ 50 y.o. Std. Dev. 18.5	μ 46.63 y.o. Std. Dev. 17.8	- 0.444 p: 0.000
Ending age of full time education	μ 25.8 y.o. Std. Dev. 22.2	μ 25 y.o. Std. Dev. 22.4	μ 27,2 y.o. Std. Dev. 24.2	

Source: Own calculations on Eurobarometer (2013).

Age and level of education either play a role: CCCs are on average younger (46.63 years old) compared to the EU average value (48.36 y.o.) and even more compared to AQCs (50 y.o.). Age is also linked to education level: the younger generations are more educated compared to older generations, as shown by the negative correlation between age and the age at which full time

[12] This index has been calculated using three indicators: 1) level of information; 2) environmental sensibility; 3) environmental commitment.

education was finished (-0.444 p: 0.000). Again, CCCs left full time education two years later than AQCs on average. This seems to be reflected in the number of information sources respondents declared they consulted regularly in order to collect environmental information: AQCs' percentage of respondents who consulted three different sources of information tends to decrease linearly with rising age, from 51.26% for the group aged 15-24 years' old to 48.74% for the group aged 65 and older. At the opposite end, CCCs' percentage tends to increase: from 52.72% for the groups aged 15-24 years' old to 55.27% for the group aged 65 and older.

Such differences suggest that people with different environmental concerns are characterized by different profiles, not only in terms of environmental sensibility or commitment but also in terms of other social markers such as age and level of education.

Conclusions

Our contribution showed how complex the integration between scientific and policy fields can be. However, in order to face the challenges of our times, especially for human health protection, it has become a necessary direction to take. The urgency of effective strategies to avoid health problems from climate change for future generations requires new efforts at the political level.

Recent scientific evidence suggests the importance of coupling what has been separated for decades: air quality and climate change. As climate change mitigation has become the top issue on the global environmental agenda, related fields such as air quality might be downgraded, leading to the risk of financial cuts or political bargains. One recent example is the Clean Air Package proposed by the former European Commission in December 2013, which was supposed to comply fully with air quality regulation by 2020 but has been re-oriented. Indeed, air quality and climate change policies have been re-framed by the vice-commissioner Timmermans within a much longer time frame: 2030, a date that was set by the 2030 Green Paper on Climate and Energy policies (European Commission 2013). The delaying of important deadlines for mortality reduction linked to air pollution have been justified by the economic concerns of European business lobbies, while the economic and social damage of pollution-related diseases have once again been considered as a dependent function of economic growth. According to scientific evidence, continuing to decouple air quality and climate change strategies is a big mistake. Until now, the division between the two issues has split resources. However, fostering a *win-win* strategy for air quality and climate change would avoid health costs and would be more effective. As we have argued, when scientific knowledge is translated into policy practice, the outcomes cannot be easily foreseen. Through the lens of the social sciences, we explored the links between the two problems as matters of concern for European citizens, with the aim of further stimulating reflections on a more concrete translation of scientific evidence into practice. Our analysis of Eurobarometer data shows that air quality and climate change concern people with different characteristics including environmental sensibility and cultural capital; a further element is the relationship between environmental concern and material conditions in the countries where the respondents live. Regarding the latter, our preliminary findings suggest that a single European solution is unlikely to work in the same way in 28 member states: in some countries, sensibility of climate change is higher, while in other countries it is perceived as less important (or even ignored) compared to other environmental threats to health such as, for instance, air quality. Regarding the former, if we imagine national governments communicating the necessity to sustain new economic burdens (i.e. excise taxes for fuels), they may concentrate their efforts on specific target groups which may be particularly hostile. Indeed, people are concerned by different environmental problems according to specific social characteristics. We found that age and education play at least as much of a role as pro-environmental behaviour.

As an answer to the question in our contribution's title: yes, it is possible to use air quality concerns as a driver for climate change policies, but the issue should be considered carefully. While a win-win strategy may be correct—as the scientific evidence has shown—the path of this strategy is paved with social variables (perception, age, education, practices), which policy-makers should seriously take into account.

Acknowledgements: This paper has been made possible thanks to the FP7 SEFIRA Cooperation Project (2013-2016), which was financially supported by the European Union under the 7th Framework Program; Theme: ENV 2013.6.5-2[ENV.2013.6.5-2] Mobilising environmental knowledge for policy and society Grant agreement: 603941 (Project Title: SEFIRA). The views expressed here are solely those of the authors.

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