

# Poles and air quality

Social norms as a source of change?

Warsaw, June 2020

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ISBN 978-83-66306-80-6

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## Key findings

**A**ir quality is one of the key civilizational challenges ahead of Poland. The effectiveness of actions in this area will determine quality of life for Poles in coming decades. In the light of the latest research regarding possible influence of air pollution on higher death rates from COVID-19, the problem of air quality has acquired a new meaning. The existing system of financial support is not enough to lead to a breakthrough in the struggle against the main source of air pollution – so-called “low-stack emission” that primarily come from households extensively using solutions based on fossil fuels and other low-quality power input to generate thermal energy.

Citizens’ attitudes need to change, too. House owners using outdated heating systems need to be made aware of their direct negative impact on air quality. They need to understand that their actions are punishable and, in vast majority of cases, not accepted by their neighbours. Our research shows that house and apartment owners differ in their assessment of moral and social acceptability of behaviour that contributes to air pollution. It is worth remembering that simple information campaigns are not enough to change such complex behavioural patterns. Our study shows that Poles notice the problem of poor air quality and are aware of its consequences. Nevertheless, Poles are doing relatively little to improve air quality by eliminating the sources of pollution.

Behavioural tools appealing to social and moral norms can support communication: showing that most Poles are not ambivalent when it comes to air quality could prompt people so far discouraged by the air-polluting behaviour of others to take action.

Most Poles seem to have a clear, coherent stance when it comes to a normative assessment of behaviour that affects pollution and air quality. Individual assessments largely overlap with assessments of social expectations. It means that Poles’ normative stance on behaviour that influences air quality does not result exclusively from social expectations, but is confirmed by subjective moral assessments that strengthen these expectations.

Most Poles personally condemn actions that damage air quality, praising social interventions involving e.g. neighbours reporting irregularities, and the relevant services’ involvement in enforcing regulations that aim to protect air quality (e.g. inspections by city guards). Participants of our survey believe that most of society is critical of practices that pollute the air (e.g. burning rubbish, using outdated heating systems) and expects the city guard to actively and diligently enforce anti-smog regulations. Given the complexity of social interactions and mutual influence, designing communication and intervention based on social norms needs to be preceded by detailed analysis of the potential unintended consequences of using specific norms.

## The report in numbers

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2 out of 3

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respondents do not know that home furnaces are the main source of air pollution in Poland.

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Around 40%

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of a representative sample of Polish adults consider the air quality in Poland bad or very bad 50% claim that air quality in Poland has deteriorated over the past two years.

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60%

---

of Poles know that most air pollution is caused by humans, rather than natural phenomena.

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Almost 2/3

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of Poles consider air pollution's impact on their and their loved ones' health.

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Over 1/3  
(35%)

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of respondents said that they have carried out a thermal insulation project or considered one in the past two years. 30% of respondents changed their heating system to a more environmentally-friendly one or considered doing so.

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Over 3/4

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of respondents know there are subsidies for replacing old furnaces and 44% have at least heard of the Clean Air Programme.

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Over 70%

of people who live in blocks of flats (and just 54% of house owners) condemn heating homes using furnaces that do not meet current technical standards and approve of reporting neighbours who use the wrong furnace or fuel to competent authorities and fining people who use furnaces that are not allowed.

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84%

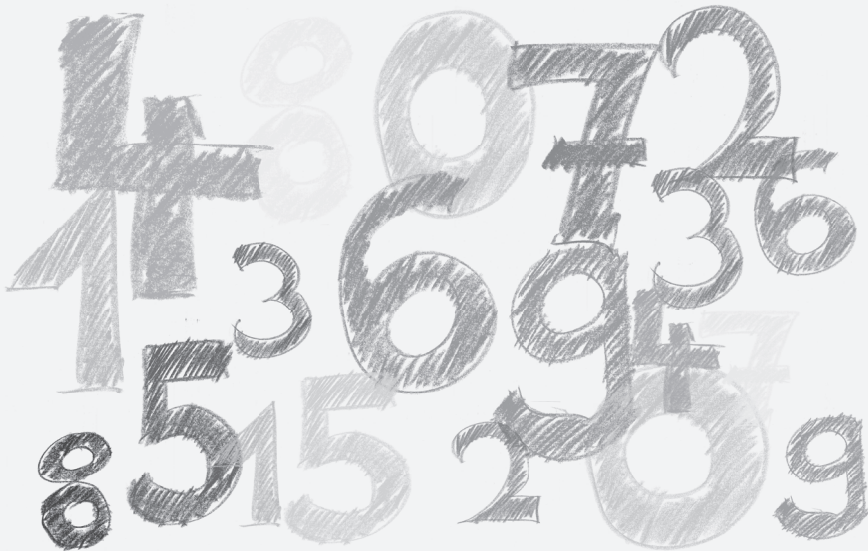
of furnace inspections conducted in 2019 by half of city and municipal guards in Poland did not reveal any irregularities.

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In just 7%

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of cases analysed, the inspection resulted in a fine.



# Introduction

**T**he air in Poland is among the most polluted in the European Union. The main source of this pollution, is non-industrial – so-called “low emissions”, primarily from households burning coal and wood. Needless to say, high level of air pollution is considered to have a serious, negative impact on human health, the environment and the economy as a whole. Successive studies extend the list of confirmed negative consequences of worsening air quality. The latest ones are especially alarming as they point to a link between air pollution and a higher death rate caused by COVID-19 (Setti et al., 2020; Wu, Nethery, 2020), which has paralysed the global economy in recent months. To reduce emissions of harmful substances, Poland has been introducing so-called anti-smog resolutions for the past few years, which ban the use of outdated boilers and furnaces and selected types of fuel. The implementation of these regulations is supported by the city guard, which has been granted the power to inspect furnaces and reprimand or fine people who break the rules. National and local subsidies for modernising houses’ energy infrastructure (Clean Air, Stop Smog, Get Rid of the Dirty Furnace, etc.) have been introduced. These efforts show that improving air quality has become a major objective in the state’s policy, which cannot be achieved without citizens’ cooperation.

An important mechanism to boost this cooperation is the Clean Air, a priority programme launched by the government in 2018. Its task is to issue subsidies and loans enabling people to

replace heating and insulation systems. The programme aims to improve the energy efficiency of 4 million houses by 2029 (an average of 400,000 per year). However, during its first edition over a period of more than a dozen months, just around 131,000 applications were submitted.<sup>1</sup> Does this mean that Poles are not interested in modernising their home energy systems, which is not only good for the air quality, but also for their wallet? This would be too hasty a conclusion, for many reasons.

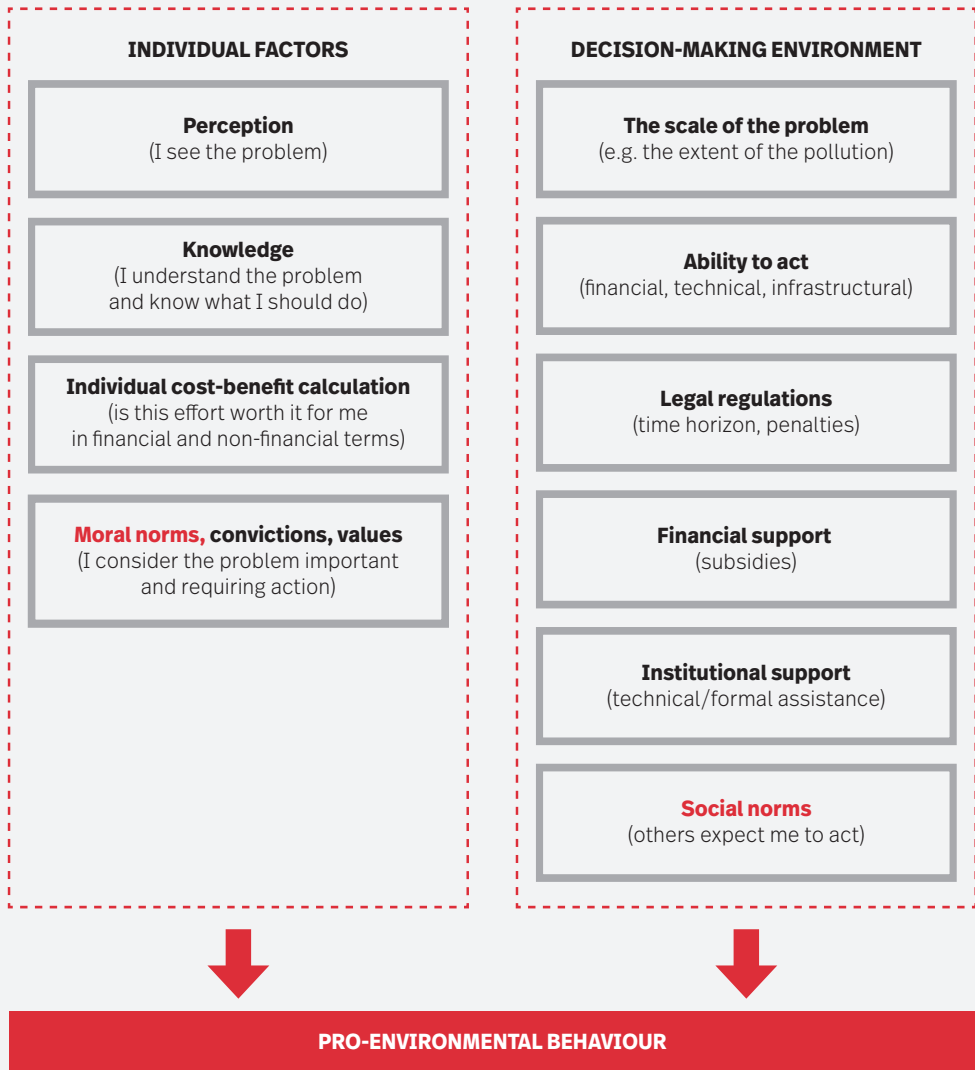
Considering the high cost of replacing old furnaces and the necessary renovations, subsidy programmes are a welcome form of aid for many Poles, especially since, based on the regulations, these actions need to be conducted within the next few years. Relatively low interest in these programmes seems to confirm the results of behavioural research that shows that cost-benefit analysis (mainly from a financial perspective) alone does not offer sufficient motivation to change environment affecting behaviour (Steg et al., 2014; Steg et al., 2015; Whitehead, Cherry, 2007). Deciding to replace a heating system an expensive investment, – is not just the result of a rational calculation; people must also be convinced that it needs to and should be done.

This behavioural observation is the starting point for the research summarised in this report. It also informs our recommendation that the tools designed to improve air quality should include interdisciplinary insights about the factors that shape human behaviour.

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<sup>1</sup> Data from the Ministry of Climate (from 8 May 2020)

↘ **Image 1.** Factors influencing actions that protect the environment



Source: prepared by PEI based on Steg et al. (2015); Geiger et al. (2019)

Pro-environmental behaviour (Image 1) is influenced by many factors – individual (knowledge and awareness, attitudes, norms, values, calculations of profits and losses) and the decision-making environment, which determines

the real scope for action (the presence of necessary infrastructure, housing or financial situation, etc.). These factors do not operate automatically – their presence or absence does not determine concrete actions. Knowledge or awareness of



pollution (or other phenomena harmful for the environment) does not guarantee increased propensity to act. One of the best known problems of human motivation, characterised as the intention-behaviour gap is particularly strong with regard to pro-environmental behaviour (Kollmuss, Agyeman, 2002). The variety of factors shaping people's behaviour and attitudes towards the environment implies that the effectiveness of traditional tools influencing citizens' behaviour (orders, prohibitions, education, incentives and fines) is limited. Traditional public policy approach based on an unrealistic vision of a perfectly rational and fully-informed citizen does not take into account the conditions that largely disrupt this idealistic vision. The new public policy paradigm, which accommodates insights from a number of disciplines (e.g. psychology, anthropology, sociology and neuroscience), instructs policymakers to recognise citizens' cognitive, decision-making and motivational limitations. It also helps to understand that noblest goals and solutions designed by the administration do not always coincide with people's aspirations. It demonstrates that calculations of benefits and losses are not limited to financial categories but extend to many other psychological, social and even moral factors. Constantly-deepening knowledge about our preferences and determinants of our choices provides decision-makers with innovative and increasingly well-calibrated tools that improve the effectiveness of classical methods for influencing citizens' behaviour. The tool map below juxtaposing the traditional approach with the "deepened" behavioural perspective (Image 2) seems particularly relevant to tools for improving air quality. It shows how the existing methods to design programmes for Polish households' energy transformation can be added to. There has already been an attempt to apply one behavioural tool, simplification, to the Clean Air Programme. Numerous analyses criticised the programme's formal flaws and ineffective implementation.

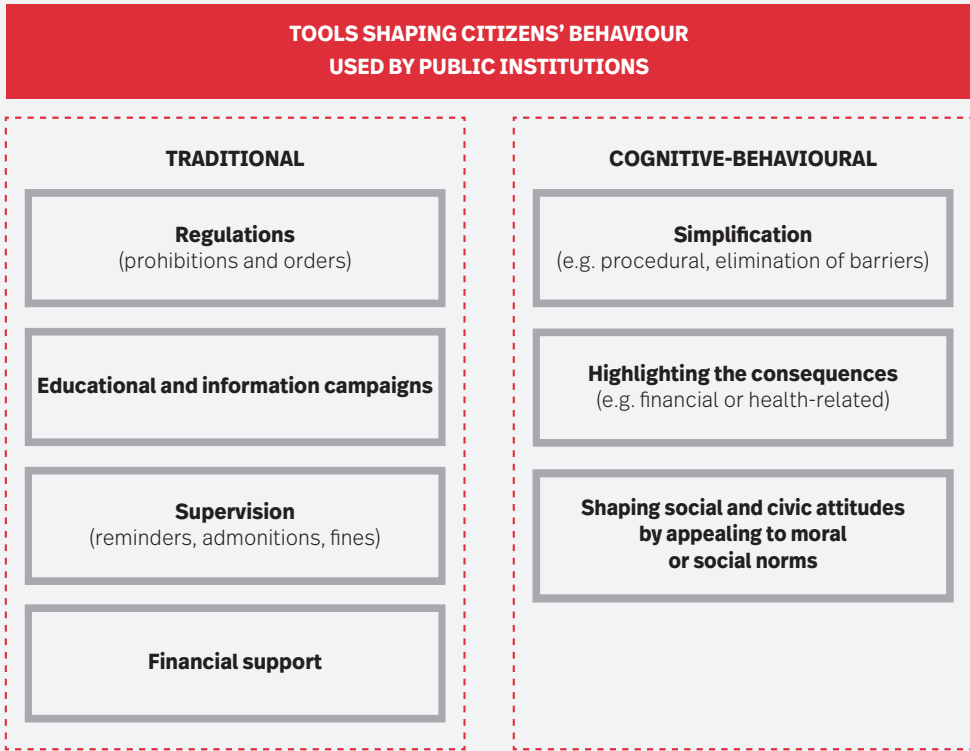
For this reason, the reform of the programme announced at the start of April was prepared (Florek, 2020).

The changes in place since 15 May contain a series of simplifications when it comes to the rules for providing subsidies, putting together an application and the documents required. When submitting the application, people will not have to provide technical information and most of the documents have been replaced by statements. Moreover, the regional fund for environmental protection is supposed to consider applications within 30, rather than 90 days (www1).

It can be expected that these simplifications will mobilise more people to participate in the programme and help achieve its aims. The restrictions introduced by successive voivodships as part of anti-smog resolutions could have a similar effect. A particularly important part of them is how they highlight the legal consequences of failing to comply with requirements within the timeframes specified in the resolution (such as replacing a given class of furnace within the next few years). However, lasting improvements of the state of the natural environment, including air quality, requires more comprehensive actions aiming to change people's awareness, perception and preferences, and, subsequently, their behaviour and habits.

The purpose of this study was to diagnose Poles' awareness, knowledge, behaviour and attitude when it comes to air pollution. Data on these is needed to better understand how seriously Polish society is treating this problem, and how aware it is of the resulting threats, as well as whether and to what extent Poles are inclined to change their habits for this common cause – clean air. This knowledge is extremely important for effectively communicating with citizens, helping those who are convinced carry out difficult and expensive modernisation, and those who are unaware or unconvinced understand the essence of the problem and then take appropriate action.

Image 2. Tools shaping citizens' behaviour used by public institutions



Source: prepared by PEI based on: Ruggeri (2018).

A particularly important part of our diagnosis was an attempt to identify Poles' normative attitudes about behaviour that affects air quality. Referring to the norms that exist in a given society is one of the best-known and widely-used behavioural tools, especially when it comes to protecting the environment. It involves shaping desirable behaviour by showing how the praiseworthy majority (e.g. saving energy) or shameful minority behaves (e.g. not sorting waste). Identifying a norm is the first step towards designing an intervention based on it. Our study shows that a few moral norms influencing Poles' attitudes towards actions serving to improve air

quality or, on the contrary, worsening it, can be observed in Polish society. Poles also show awareness of social expectations concerning behaviour that affects air quality.

The report has six chapters. In Chapters 1-4, we present the results of a survey conducted in December 2019 on a representative sample of 1965 Polish adults. The data shows residents' subjective assessment of air quality in Poland, their knowledge of the sources and consequences of pollution, their actions in response to smog, and their normative assessment of selected behaviour that affects air quality. In Chapter 5, we sum up the data

from a survey conducted among city and municipal guards, whom we asked about their monitoring and preventive actions to improve air quality. Chapter 6 contains conclusions and

recommendations for decision-makers designing regulations and entities managing support programmes and communication with citizens concerning air quality.

*“For the land where it’s a great travesty  
To harm a stork’s nest in a pear tree,  
For storks serve us all...  
I am homesick, Lord!...”*

*- C.K. Norwid*

My Song (II), 1854

# 1. Poles' assessment of air quality

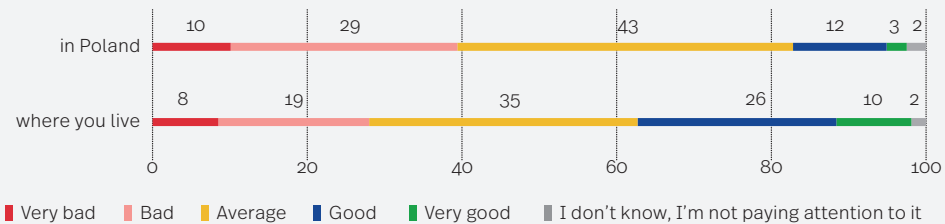
The effectiveness of public policy and its tools largely depends on mutual convergence between its initiator's aims and those of citizens. For this reason, the first stage of our study involved checking how Poles perceive the problem of air pollution by asking

them for their subjective assessment of air quality in Poland and where they live, as well as the perceived change over the past two years.

39% of Polish adults consider the air in Poland bad or very bad. However, just 27% say this is the case where they live (Chart 1).

▼ Chart 1. Subjective assessment of air quality (%)

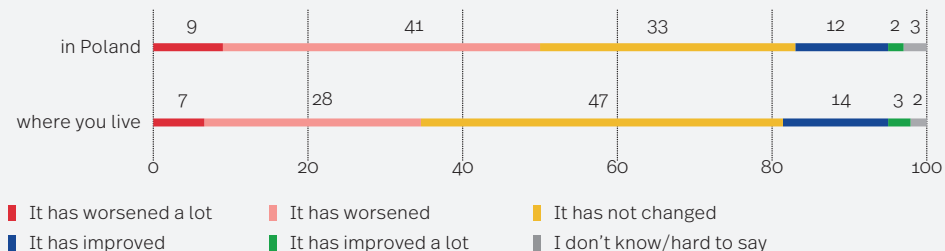
What is your assessment of the air quality...



Source: prepared by PEI based on research results.

▼ Chart 2. Subjective assessment of changes in air quality (%)

Would you say that over the past two years...

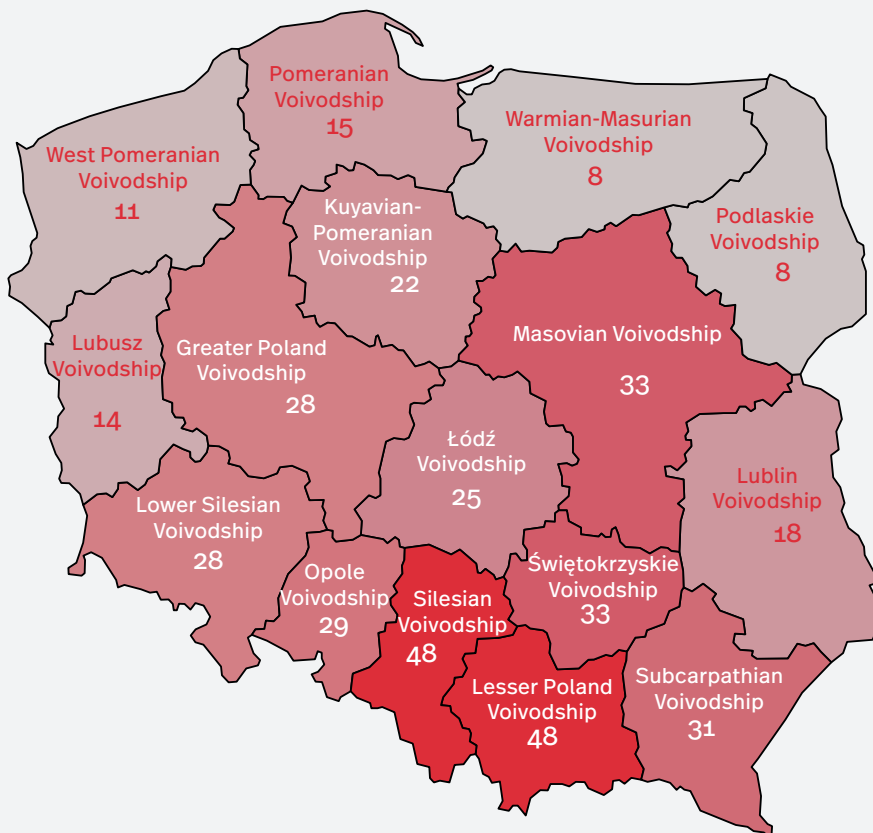


Source: see Chart 1.

Half of society thinks that air quality in Poland has deteriorated over the past two years and 33% has observed this tendency where they live. The negative assessment varies between voivodships.<sup>2</sup> It is worst in southern Poland – almost 50% of residents of the Lesser Poland and Silesian voivodships say that the air quality

there is not good. One-third of residents of the Świętokrzyskie and Masovian voivodships hold this view. It is slightly better in the Lower Silesian, Opole, Subcarpathian and Greater Poland voivodships. Residents of the northern voivodships were the least negative about the air quality in their voivodship (Image 3).

▼ Image 3. Negative assessment of air quality where one lives by voivodship (%)



Source: prepared by PEI based on research results

<sup>2</sup> Lack of representativeness at the voivodship level.

In light of the air quality monitoring conducted by Poland's Inspectorate of Environmental Protection, these perceptions are not surprising. Areas in the Silesian and Lesser Poland voivodships were classified as "C", which means that the target or permitted level not just of PM<sub>10</sub> and benzo[a]pyrene, but also of very dangerous PM<sub>2.5</sub> particles, was exceeded. Such serious pollution is becoming more visible and onerous, as confirmed by the observations of residents in the most polluted voivodships. It is worth noting the minimal percentage of "I don't know/hard to say" responses here. In both cases, just 2% of respondents chose it, which may suggest that most Poles are not indifferent to air quality and have personal opinion on the subject. However, a large percentage of respondents say the air quality is average and has not changed over the past two years, which can be interpreted as a lack of clear stance.

When this study was conducted, 11 of Poland's voivodships had adopted anti-smog resolutions. They set out which fuels can be used to heat homes and the class of furnace permitted. The voivodships that had resolutions at the

end of 2019 are in western, central and southern Poland: the West Pomeranian, Lubusz, Greater Poland, Kuyavian-Pomeranian, Masovian, Łódź, Lower Silesian, Opole, Silesian, Lesser Poland and Subcarpathian voivodships. One-third of people living in voivodships with a resolution consider the air in their area bad or very bad. In voivodships without anti-smog resolutions, this percentage is significantly lower (17%). The survey results show that the more negative assessment of air quality among inhabitants of voivodships with anti-smog resolutions, compared to those that do not have one, overlaps with the objectively worse air quality in voivodships with these regulations.

Grass-roots initiatives and social movements play a major role in raising awareness about smog in society and among decision-makers. These organisations inform the public about the level of pollution in individual voivodships and how it can combat smog. At the institutional and non-governmental level, they monitor and assess state initiatives and regulations. They are especially active in the most polluted voivodships, which may increase awareness among their inhabitants.

## 2. What do Poles know about...

**P**olicymakers usually know much more about the challenges addressed by public programmes than citizens. At the same time, reading government documents shows that lack of knowledge is considered the fundamental source of unwanted behaviour by citizens. For this reason, information campaigns that educate society and inform it about the problem are one of the most common responses. Better-informed and more aware citizens are more likely to identify with the state's actions and their behaviour can, in

certain conditions, be more in line with a public policy's aims. Behavioural science reminds us that knowledge alone is not enough to change behaviour, but it can make this change significantly easier. However, for officials to present facts and information effectively, they need to have a good idea of what citizens know – and what is missing. In our survey, we tested Poles' knowledge concerning the sources of air pollution, its health consequences, and the central and local administration's actions to improve air quality.

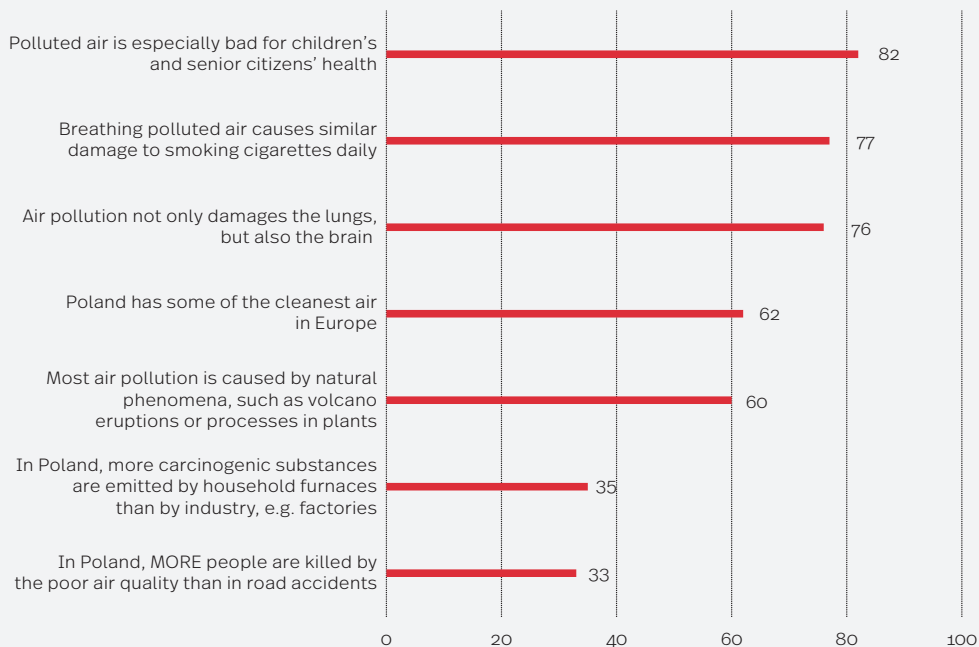
### 2.1. ... the sources and consequences of air pollution?

Poles are relatively aware of the dangers of breathing polluted air. Over three-quarters know that the smog is particularly harmful for children and senior citizens, and that breathing polluted air causes the same damage as smoking cigarettes. An equally large group has more detailed knowledge of smog's impact on health – that it is not only bad for the respiratory system, but also the nervous system. Knowledge of the sources of smog is slightly lower. 60% of Poles know that most air pollution comes from human activity, not natural phenomena. Problematically, though, there is low awareness concerning the main culprit. Almost two-thirds of respondents do not know that low-stack emission is the main

source of smog in Poland (Figure 3). Interestingly, this awareness is higher among residents of blocks of flats than among those who live in houses.

The average score in the test on the sources and consequences of smog was 61%. Results differed significantly between age groups: on average, people aged 45 or over did better than those in the 18-24 and 25-34 age groups (Table 1), although the younger generation is usually considered particularly sensitive to environmental problems (www2). Knowledge is slightly higher in the southern voivodships – Lesser Poland and Silesian – than in Poland's other voivodships (Image 4).

▼ **Chart 3.** Correct answers in response to statements about the sources and consequences of air pollution (%)



Note: the key to the answers is in part II of the Appendix.

Source: see Chart 1.

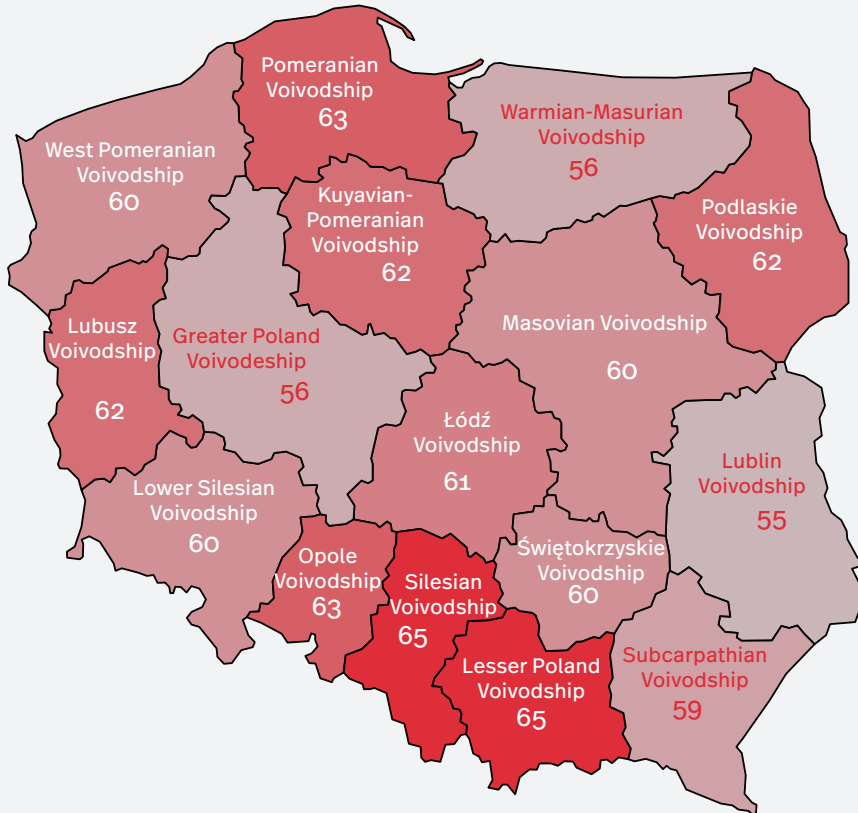
▼ **Table 1.** Correct answer averages in test on the sources and consequences of air pollution

Description	Average share of correct answers (%)	Size of sample/ subgroup	Result of the average comparison test. Average value significantly higher than [group number]
Total sample	61	1965	
Age group			
18-24 years [1]	56	247	-
25-34 years [2]	53	404	-
35-44 years [3]	59	359	2
45-54 years [4]	61	342	1.2
55 and over [5]	67	613	1.2

Source: prepared by PEI based on research results



▼ **Image 4.** Percentage of correct answers in response to statements about the sources and consequences of air pollution among residents of each voivodship



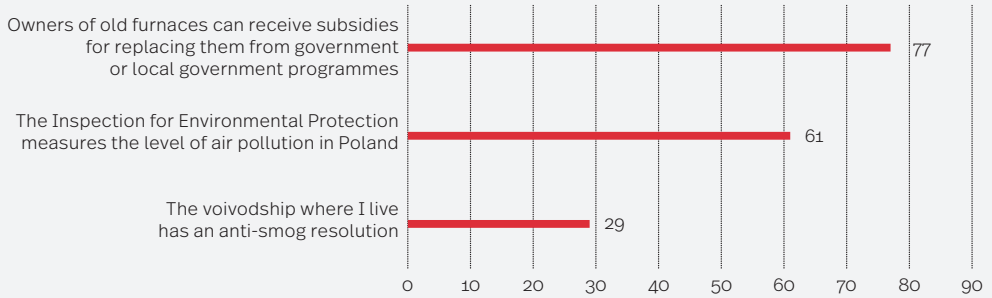
Source: see Image 3.

## 2.2. ... efforts to improve air quality?

Knowledge about actions by public institutions varies and depends on the type of initiative. Knowledge concerning legal regulations was the poorest – just 29% of Poles are aware of the existence (or lack) of an anti-smog resolution in their voivodship (Chart 4). Awareness of the existing resolution varies between

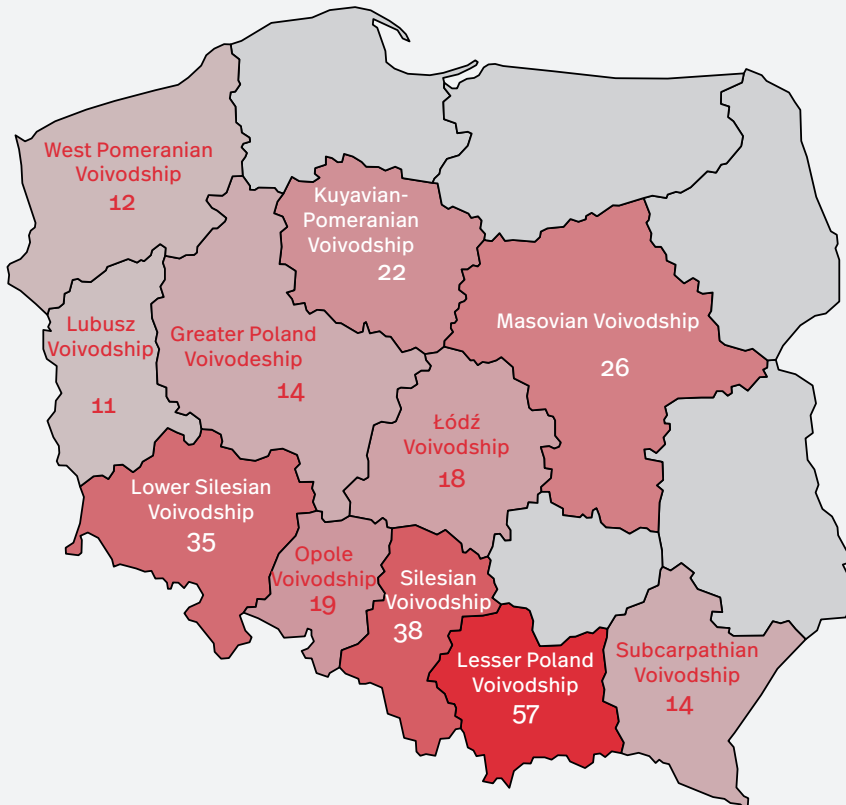
voivodships; in Lesser Poland, 57% of people are aware of the regulations, 38% in the Silesian Voivodship and 35% in the Lower Silesian Voivodship (Image 5). In four voivodships – West Pomeranian, Lubusz, Greater Poland and Subcarpathian – no more than 15% of respondents are aware of it.

▼ **Chart 4.** Correct answers in response to statements about the administration's actions (%)



Source: see Chart 1.

▼ **Image 5.** Awareness of existing anti-smog resolutions among residents of particular voivodships (%)

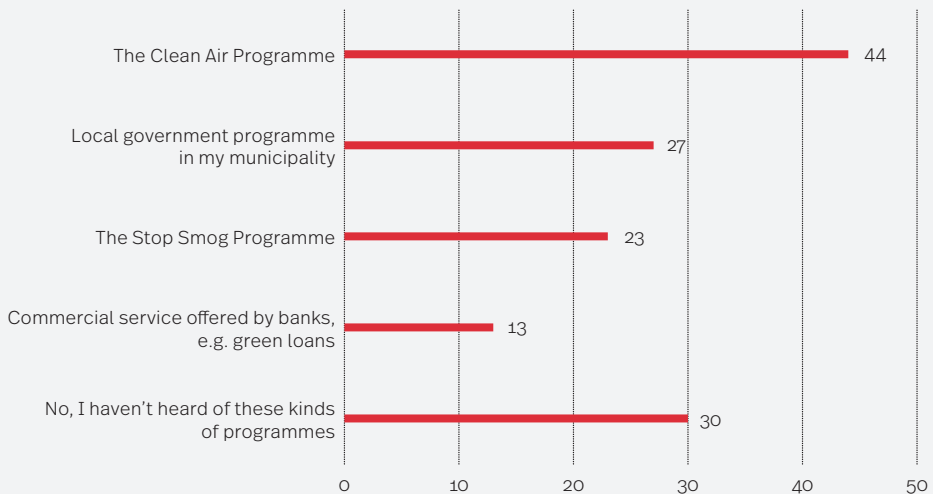


Source: see Image 3.

Over three-quarters of the population is aware of the possibility of obtaining subsidies for replacing old furnaces as part of government programmes (Chart 4). Even though these programmes are for people who live in houses, they are less aware of them than people who live in blocks of flats. Awareness of these programmes increases with people's level of education, but is not related to the size of the town where they live or how their house is heated.

44% of Poles have at least heard of the Clean Air Programme. Even though people who live in housing blocks are more likely to show general knowledge about the existence of government support programmes, knowledge of concrete programmes' names, especially the Clean Air one, is higher among people who live in houses (Table 5 in the Appendix). The exception is the Stop Smog programme, mentioned more often by people who live in flats, who are not its target group.

▼ **Chart 5. Level of knowledge concerning financial support programmes (%)**



Source: see Chart 1.

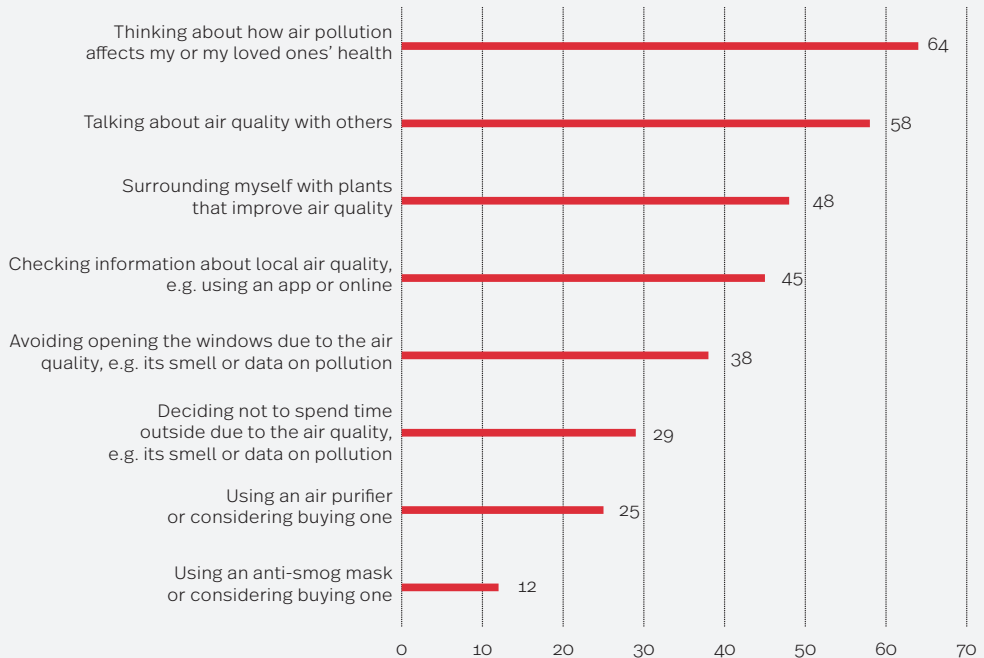
### 3. People's response to air pollution

**D**oes perception of worsening air quality and knowledge of its negative consequences encourage Poles to take action? We checked how seriously Poles treat the problem of low-stack emission by asking them about initiatives and behaviour dictated by awareness of pollution and its consequences. Our study showed that polluted air is a real source of concern. Almost two-thirds of Poles consider its impact on their and their loved ones' health. Almost equally often, these concerns are the subject of conversation, especially in the oldest age group (Chart 6). Actions taken or abandoned in the face of worsening air quality take two forms: levelling the negative effects of breathing in harmful air (shorter timeframe) and reducing the sources of pollution (usually requiring more money or energy, which means that they are considered within a longer timeframe). In the first category, Poles were most likely to mention surrounding themselves with plants that improve air quality (48%) and avoiding opening their windows (38%). Over one-fifth consciously avoids spending time outside due to the poor air quality. Using an air-purifying device or purchasing an anti-smog mask are the least popular responses to breathing in polluted air (Chart 6).

In terms of actions to improve air quality, Poles are most likely to replace an old electric device with a newer one that uses less electricity (44%). Admittedly, this affects CO<sub>2</sub> emissions, rather than smog, but it shows some relevant tendencies. Almost equally often (41%), people use public transport or cycle, rather than driving. Of course, this decision depends on access to infrastructure, so it is more common in cities (51%) or big towns (46%) than in villages or small towns (37%). Social activist is the rarest form of environmental action (24%) (Chart 7).

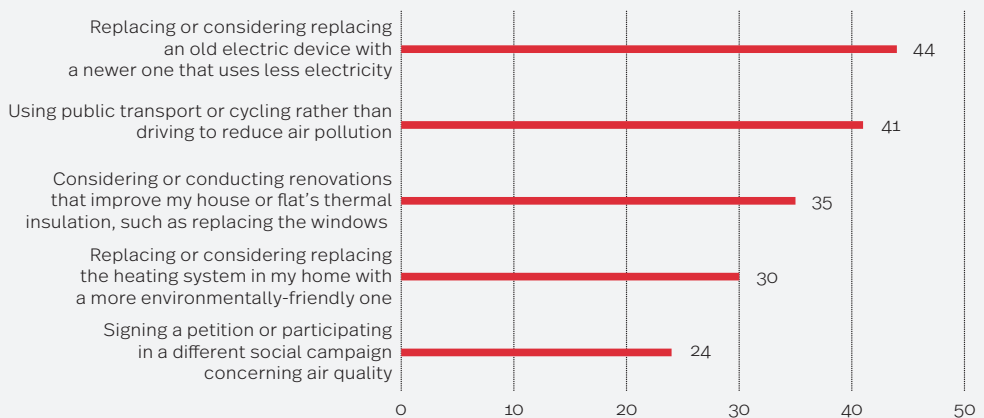
Since low-stack emission – non-industrial and mainly from households – is the main source of smog in Poland, the best step that citizens can take to improve air quality involves modernisation and renovation, such as replacing the heating or improving thermal insulation of their house or flat. Over the past two years, slightly over one-third (35%) of Poles have carried out a thermal insulation project or considered one. 30% of Poles replaced their heating system with a more environmentally-friendly one or considered doing so (Chart 7). Any renovation or modernisation initiative (such as replacing electric devices) is more likely to be done by people in older age groups. For understandable reasons, people in the 18-24 age group are less likely to make such decisions (Chart 7).

▼ **Chart 6. Impact of awareness of air pollution on Poles' everyday behaviour and actions (%)**



Source: see Chart 1.

▼ **Chart 7. Environmentally-friendly actions taken or considered over the past two years (%)**



Source: see Chart 1.

## 4. Social norms and air quality

### 4.1. Social norms as a behavioural tool

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From the perspective of behavioural science, informing and educating citizens has a limited ability to shape their behaviour. Consequently, policymakers should use unconventional tools to influence behaviour by shaping the decision-making environment and changing how people think. The most common behavioural tool discussed in the literature is the nudge. Unlike traditional orders and prohibitions, the nudge and similar forms of intervention (Hertwig, Grune-Yanoff, 2017) by the state aim to get citizens to behave in a way that is beneficial for themselves and, in the long term, for society.

The social nudge constitutes a specific category of behavioural intervention. It involves shaping an individual's behaviour by referring to behavioural habits and views in its entourage. For example, this can be used to encourage people to save water or energy, as well as many other forms of pro-environmental behaviour. The concept of the social nudge was initially put forward by Thaler and Sunstein (2008) in their famous book *Nudge*. They distinguish a category of behavioural intervention using a psychological mechanism based on the principle that people do not like to stand out from others in their actions. If they are informed how their neighbours or another group relevant to

them behaves, many will deem this appropriate behaviour that should be emulated. Even if they are not fully convinced about the rightness or positive consequences of behaviour such as sorting waste or cleaning up after their dog, they copy others' socially-desirable behaviour anyway.<sup>3</sup>

Social interventions can also be based on the norms in a given community. In many cases, these tools are extremely effective (Brent et al. 2017; Cialdini, Reno, Kallgren, 1990). Their success depends on many factors and a thorough understanding of the context in which a given norm functions, as well as the norm's character. The mechanism involves communicating detailed data on compliance with the norm or creating a mutual expectation that the norm will be complied with in a given community. In one of the major publications on analysing norms,

Brennan et al. (2013) define them as a set of attitudes that make us mutually responsible for each other's behaviour. This function is performed by various types of norms: legal, social, moral, and so on. They stem from our conviction that others have the right to set requirements and expectations for us. Norms allow us to achieve personal and social goals and undertakings, and give them social meaning.

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<sup>3</sup> One of the best ways to reduce electricity consumption in the US involves sending people their electricity bill with information about the average power consumption in the neighbourhood and graphics showing whether they use more or less electricity than their neighbours. This saved USD 1 billion over seven years (Benartzi et al., 2017). A campaign in which the amount of water people use to wash themselves was reported had a similar effect. Those who found out that they use more of it started to take shorter showers (Bernedo, Ferraro, Price, 2014).

Bicchieri (2019) defines a norm as a rule of behaviour that dictates or prohibits a specific behaviour in a given group in a certain context. A norm can be considered social when an individual complies with it convinced that a sufficiently large group of others are behaving in a similar way (the empirical element) and that a sufficiently large group of others expects him or her to comply with that norm (the normative element). The norm's functioning is determined by knowledge of it in a given group and a preference for complying with it among the group's members based on the conditions above.

Norms' conditionality means that they might exist but not be complied with (e.g. corruption). Sensitivity towards norms is an individual matter that depends on many factors, such as personal convictions, the seriousness of the problem involved, social pressure and control, and even how long the norm has been around. Usually, longstanding norms are treated more seriously than those that are only just being formed. Moreover, the prevalence of anti-social behaviour (such as using polluting fuels in heating systems) can be a serious obstacle to individuals changing their behaviour, especially if it requires spending money or other types of unwanted effort.<sup>4</sup> The bad behaviour of the majority is often treated as permission not to comply with norms that benefit society.

It is extremely important to distinguish between separate categories of norms, the

strength of which may vary depending on the problem being considered. A descriptive norm differs from a moral one; common habit is a different category, too. A descriptive norm is purely based on empirical observation of a given behaviour. Social norms contain an empirical component ("others do this") and a normative one ("this should be done"). Social norms play an important role in soothing conflict between individual preferences and the common good.

Social norms are an example of interdependent behaviour: my compliance with a given norm is dictated by the social expectation that it will be applied. This means that shaping behaviour with the help of social norms involves changing expectations. This is not the case with moral norms, which are unconditional and motivated by internal convictions, rather than other people's behaviour or convictions (which is why they are much harder to change). The role of normative and moral factors, both social and individual, is also emphasised in studies on the determinants of pro-environmental behaviour. These factors play an important mobilising function. While simply informing people about others' behaviour can be misinterpreted (often to justify one's own undesirable actions), it is more difficult to question references to obvious moral norms and behaviour expected by one's neighbours that benefits society.

## 4.2. Identifying moral norms and social expectations concerning air quality among Poles

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In our study, we attempted to identify normative attitudes – social expectations and subjective moral assessments – concerning action,

behaviour and inaction that influences air quality. Given the effectiveness of norm-based interventions relating to the environment in other

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<sup>4</sup> This was noticed by the authors of the latest video clip promoting the Clean Air Programme ([www3](http://www3)).

countries, we wanted to research the potential to use similar tools to inform people in Poland about air pollution and how air quality can be improved. In particular, we checked Poles' attitude to their neighbours' behaviour affecting air pollution, their readiness to report undesirable practices to the appropriate authorities, their attitude to the monitoring and punishment of these practices, and the tightening of legal regulations in this area.

To identify social expectations concerning specific behaviour, we asked half of respondents to assess to what extent the behaviour in the following seven scenarios seems socially acceptable to them. To identify the attitudes' moral sources, we asked the second half of respondents to what extent the behaviour is morally acceptable from their own perspective.<sup>5</sup>

Chart 8 juxtaposes both groups' replies. It shows that there is a consensus among most Poles when it comes to a negative assessment of behaviour that has a negative impact on air quality and a positive assessment of actions that enact existing regulations that aim to limit air pollution. Respondents' assessments of most of the behaviour are similar, regardless of whether we asked them about their personal conviction (moral norm) or their assessment from the perspective of society as a whole (social norm). Burning polluting fuels in furnaces is particularly frowned upon. In that case, more Poles personally condemn it (over 80%), compared to how many expect a similar assessment in society as a whole (78%). Using a furnace that does not meet standards was met with a slightly higher level of acceptance, but was still criticised by a clear majority of respondents. 64% condemned it themselves and 59% considered it socially unacceptable.

Some readers might be surprised that respondents supported informing the competent

authorities about alleged irregularities in heating practices observed by random passers-by and neighbours. Over 60% of Poles are personally in favour of it and consider it socially acceptable. There was slightly less support for reporting irregularities in a neighbour's practices, but the level of acceptability was over 60%, too.

There was similar approval for fining the owners of houses that use unpermitted furnaces (positively assessed by 65% of respondents from both perspectives – moral and social). Similarly, Poles condemn city guards' failure to carry out inspections when this is required (65% personally condemn it and 62% consider it socially unacceptable). Opinions are more split when it comes to the ban on burning coal and wood in household furnaces, but even in this case the majority – though a less clear one – considers the ban morally and socially acceptable.

Poles' subjective assessment of the behaviour described in the survey is consistent with their expectations concerning the social acceptability of this behaviour, which indicates that Poles' normative attitudes do not result exclusively from social expectations, but are confirmed in individual moral assessments that strengthen these expectations.

People who live in flats are significantly more likely to condemn behaviour that damages air quality and praise behaviour that improves it than those who live in houses, who often share responsibility for the poor air quality and low emissions. This relationship was observed in both perspectives studied, moral and social. This does not mean that residents of houses do not share the assessment of social expectations in this regard, but acceptance of positive behaviour and rejection of negative behaviour is less intensive in this group, compared to people living in blocks of flats. Moreover, the larger

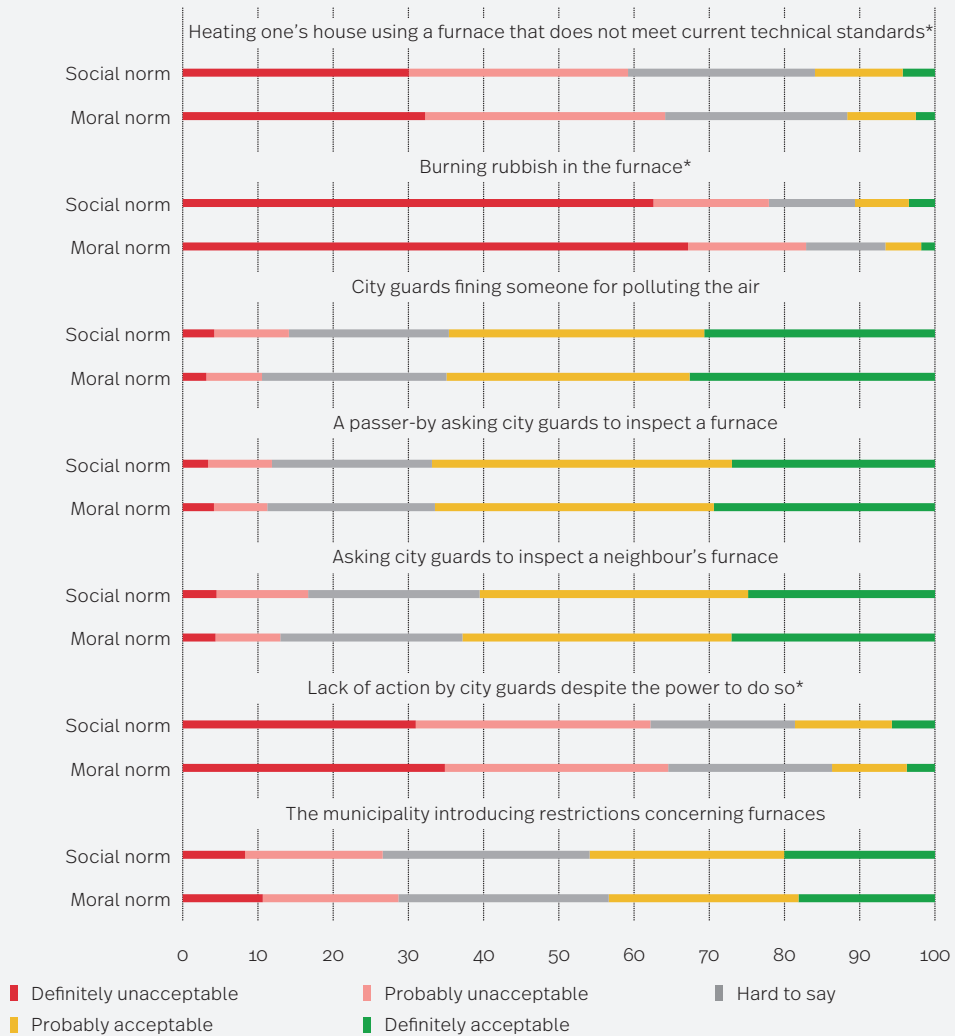
<sup>5</sup> For how the questions were formulated, see the Appendix.



number of “hard to say” answers among people who live in houses indicates that it is more difficult for this group to define its position clearly. Residents of houses are significantly more

reluctant for local governments to introduce restrictions regulating furnaces (Charts 9 and 10), which is understandable, as they would have direct consequences for house owners.

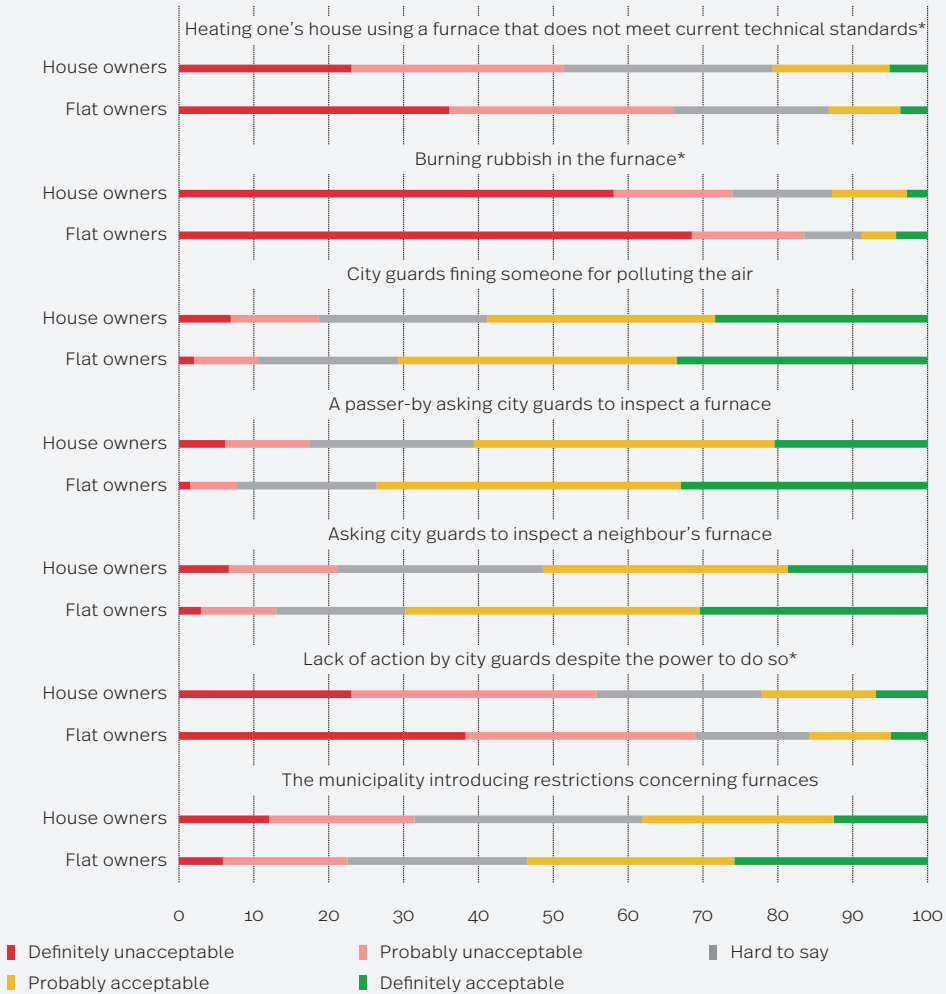
Chart 8. Social and moral acceptability of behaviour that affects air quality (%)



\* Statements with a reverse score.

Source: see Chart 1.

Chart 9. Assessment of social acceptability of behaviour that affects air quality based on what kind of building the respondent lives in (%)



\* Statements with a reverse score.

Source: see Chart 1

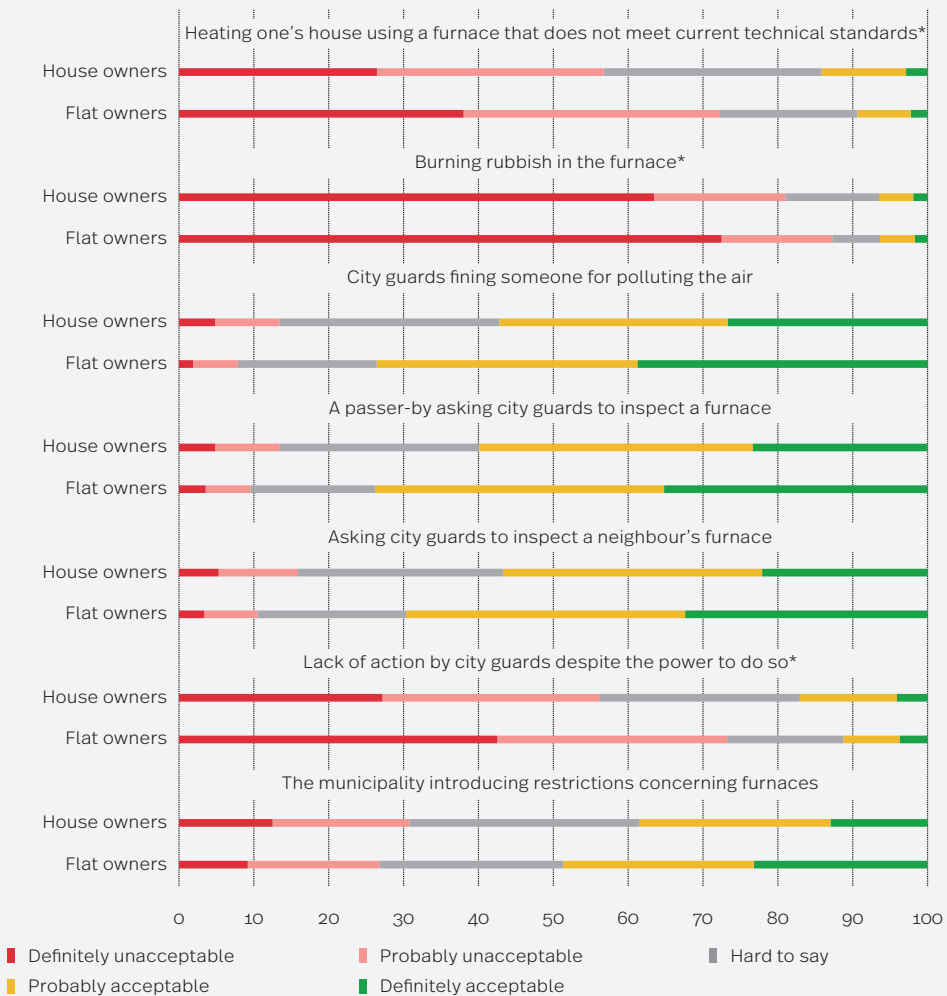
We checked how the level of acceptability of specific behaviour, both socially and individually, changes with people's perception of air quality, declared environmentally-friendly actions and level of knowledge concerning the sources of smog, its consequences and

institutional actions to improve air quality in Poland. The acceptability of behaviour that is good or bad for the environment is correlated with the level of knowledge about the causes and effects of smog and the administration's actions to improve air quality. As the level of

knowledge increases, the acceptability of positive behaviour and the unacceptability of negative behaviour increases (Table 7 in the Appendix). This is similar when it comes to conscious actions to protect the environment, both

short-term ones and more demanding ones that are done less often. Those who did more of them also had a more restrictive attitude towards the behaviour described in the survey (Table 7 in the Appendix).

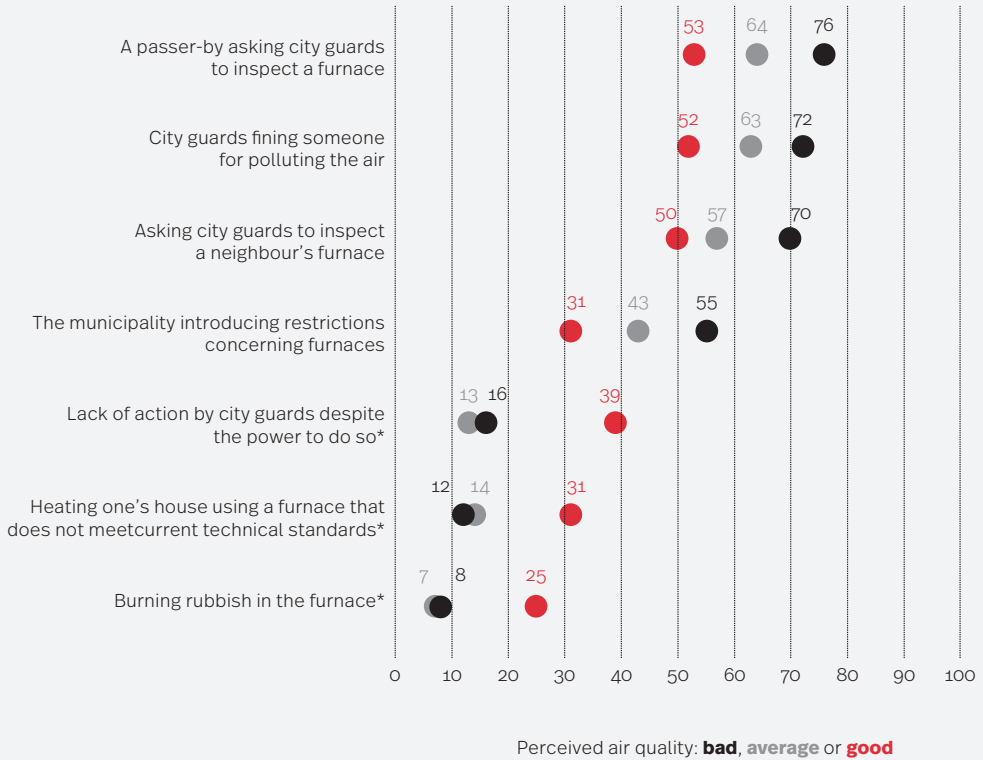
Chart 10. Individual acceptability of behaviour (moral norms) improving air quality based on what kind of building the respondent lives in (%)



\* Statements with a reverse score.

Source: see Chart 1.

▼ **Chart 11.** Assessment of the social acceptability of behaviour depending on perceived air quality in Poland (%).



\* Statements with a reverse score.

Source: see Chart 1.

We have already mentioned that awareness of the problem of air pollution is the foundation shaping behaviour in this area. We therefore assume that perceived air quality – especially a negative assessment – is a starting point for taking action to improve it in line with existing norms or social expectations. This is confirmed in the results of our study. People who think that the air quality is bad are much more likely to expect social approval for behaviour that improves air quality and lack of it for

polluting behaviour. When air quality is considered bad, there is a much higher expectation that society will support intervention by the city guard, while expecting marginal social approval for heating one's house using unpermitted fuel (Chart 11). There is a similar tendency in people's subjective assessment of specific behaviour: less approval for harmful behaviour and greater support for behaviour that improves air quality among people who perceive the air quality in Poland as negative (Chart 12).

▼ **Chart 12. Subjective approval for behaviour depending on perceived air quality in Poland (%)**



\* Statements with a reverse score.

Source: see Chart 1.

Our study has shown that most Poles have a clear and consistent position on the normative assessment of behaviour that affects air quality. Individual assessments largely overlap with people's assessment of social expectations concerning this behaviour. This finding is crucial when it comes to designing communication for

public programmes that aim to improve air quality in Poland and execute existing legal regulations in this area. Referring to the dominant normative attitudes in society can be an important way to motivate citizens to take necessary actions to mitigate air pollution. We set out a few ways in which this tool could be used below.

## 5. Traditional enforcement and norms as illustrated by city and municipal guards' activity

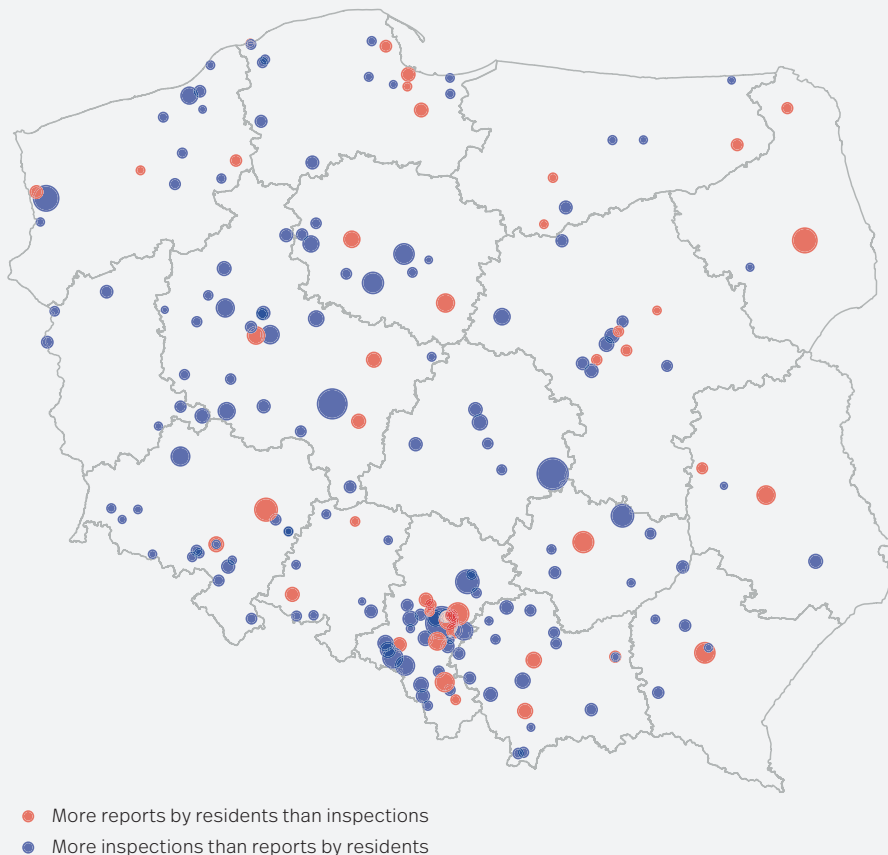
**S**ociety's involvement in spreading the right attitudes is an important part of using norms to shape behaviour that improves air quality. Behavioural research shows that traditional ways of enforcing existing environmental regulations can be supported by local leaders who are not necessarily linked to environmental organisations. This support manifests itself in civic attitudes that serve the local community, such as informing the competent authorities about improper practices. The effectiveness of the civic actions requires deep authority engagement and tools enabling them to perform their duties.

We juxtaposed the assessments of hypothetical situations presented in the survey with data showing what some of these scenarios look like or may look like in reality. We were especially interested in examining to what extent referring to moral norms and social expectations can increase the effectiveness of traditional enforcement actions by the relevant services. We collected data from city and municipal guards in Poland concerning furnace inspections in 2019. We asked about the number of these inspections in 2019, the number of irregularities reported by residents of a given municipality and the type of enforcement actions

taken, as well as other actions (training, informational) and the infrastructure available.

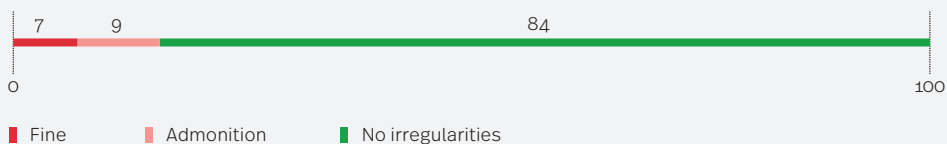
The data concerns the actions of 226 city or municipal guard divisions, almost half of those in Poland (474). Although this is not a representative sample for the whole country, our analysis shows clear regional tendencies and varying activity depending on the factors being studied, such as the existing legal regulations (anti-smog resolutions) and perceived air quality. In particular, they show the low activity of city and municipal guards (defined by the number of furnace inspections) in voivodships that do not have an anti-smog resolution (especially Podlaskie, Lubusz and Warmińsko-Mazurskie), which suggests that, in the absence of formal restrictions, the guards do not treat furnace inspections as a priority. At the same time, in eastern voivodships, residents reported potential abuses more actively (in these voivodships, there were more reports than inspections). In contrast, in voivodships with a resolution, inspections initiated by the guards dominate (Image 6). Detailed statistics on the results on the inspections come from 131 guards' divisions. Most of the inspections, 84%, did not reveal any irregularities. 7% resulted in a fine and 9% in an admonition.

Image 6. Relationship between number of inspections and number of reports by residents



Source: prepared by the authors based on data from city and municipal guards.

Chart 13. Results of furnace inspections in 2019 (%)



Source: prepared by the authors based on data from city and municipal guards.

The very high percentage of inspections that did not reveal irregularities seems surprising. It might be that the inspections were conducted in places that did not require intervention or that, for unknown reasons, the guards decided that fines and admonitions are unjustified. Analysing this data in detail would require separate analysis and additional information. The data obtained in our survey shows, in most cases in which residents did not comply with requirements, guards used traditional measures: inspections, fines and admonitions, as well as educational activity.

Behavioural science shows that unconventional methods can increase the effectiveness of these traditional enforcement actions. However, these measures require a minimum of social and/or technical infrastructure. The results of the diagnosis of normative attitudes described above shows that reporting irregularities to the competent authorities is acceptable to a clear majority of Poles. Moreover, there is a consensus among them that these kinds of attitudes are expected by society. Interestingly, Poles are inclined to accept this kind of reporting by a random passer-by, but also when it is done by

a neighbour. This kind of local activism in support of clean air could make it easier to create a separate number for reports concerning furnace inspections. Our survey shows that just 32 out of the 232 cities and municipalities that took part in our study have a number of this kind. The study's results suggest that creating a number in other municipalities – combined with informing residents about the possibility of reporting these incidents and the social acceptability of doing so – could mobilise local communities and thereby influence harmful behaviour by house owners, while increasing the number of inspections where they are needed.

Actions activating the right attitudes are also supported by informing residents about the current level and type of air pollution in a given town or region. For this, the appropriate measuring devices are needed. Some municipalities use drones or special smog vans for this purpose. However, our survey indicates that just a small share of municipalities do this (drones – 10%, smog vans – less than 4%). Again, traditional communication methods dominate: 70% of guard divisions surveyed organised informational and educational campaigns for residents.





# Conclusions and recommendations

**I**ssues relating to protecting the environment, especially air quality, appeared on the political agenda in Poland relatively recently and broader public debate on the subject is primarily focused in the voivodships most affected by smog. Our study shows that most Poles are aware of air pollution and treat it seriously, and have relatively detailed knowledge of the health consequences. Their awareness is confirmed by the simple actions taken quite often to reduce and counter the effects of pollution. However, there are not enough serious actions to reduce low emissions, the main source of pollution and smog. Too few Poles are replacing polluting furnaces or carrying out other forms of energy modernisation. This partly results from lack of knowledge that old furnaces that do not meet the requirements are the main source of air pollution in Poland – which just one-third of Poles are aware of. This fact needs to be communicated more effectively, especially among the people directly concerned. It turns out that this very group is the least aware that it is their own heating systems that are causing a serious damage to the environment. By implication, people who are not aware of the damage they are doing will not consider themselves the targets of programmes financing energy modernisation. Yet, knowledge and awareness do not suffice.

Our report is part of the wider discussion among experts that supports the state developing innovative ways of shaping pro-environmental behaviour among citizens, methods based on the finding of behavioural and social research. The results of this research show that if we want to change behaviour on the scale of whole communities – the aim of most environmental policies, including those to improve air quality – we must better understand the factors that

motivate the behaviour of individuals, including those who are relatively aware and well-informed. The availability of state support in the form of a subsidy for replacing a furnace and renovation work only influences on (admittedly important) part of the decision. Our analysis of norms concerning citizens' behaviour, as well as actions by legislators and the authorities enforcing regulations, has revealed regularities that may reflect a consensus among Poles when it comes to their normative assessment of behaviour affecting air quality. Identifying this consensus can lead us to suppose that, when informing the public about programmes financing houses' energy modernisation, it is worth appealing to Poles' moral norms and social expectations concerning practices that improve air quality. Showing that most of society is not ambivalent when it comes to air quality could prompt those who are discouraged by air-polluting behaviour of others to take action. This message would highlight that they themselves, rather than the state administration, are the beneficiaries of Poles' modernisation projects, as those are the expectations in society.

It should be noted that our study did not cover other behavioural aspects that potentially prevent people from participating in subsidy programmes to replace their furnaces. Some of them, such as those linked to cognitive burdens and obstacles resulting from funding application procedures, were analysed in research by the World Bank conducted in cooperation with the Polish administration. The details of communication based on social and moral norms require deeper analysis and testing concrete messages in the field where programmes for replacing furnaces and adding thermal insulation are already in place. The initial conclusions offered by our

study suggest that communication between the state and citizens can harness the potential of local communities and leaders – one who are not necessarily associated in environmental organisation, but who are conscious representatives of their voivodship and care about the air quality there. The average citizen rarely identifies with activists operating within organised environmental structures; they are more mobilised by their friends' and neighbours' expectations. Telling citizens that they need to replace their furnace by appealing to these expectations and/or via local community representatives could be more effective than official campaigns on television, posters and fliers.

We recommend two courses of action. The first is geared towards house owners who are still using outdated furnaces. In addition to existing actions simplifying procedures and making it easier to apply for financial support, it is worth using messages that emphasise social expectations, which could mobilise the people whom these modernisation programmes address. Shaping behaviour by appealing to moral norms and social expectations is a very specific type of behavioural intervention. Compared to simpler tools, such as facilitation or framing, it requires a careful and nuanced approach. Like in most behavioural interventions, there is no guarantee of an automatic success. In addition, given the complexity of social interaction and mutual influence, norm-based nudges can easily result in failure or even be counterproductive. For this reason, when designing a norm-based intervention or communication, policymakers need to consider a few relevant factors, such as the target group, the issued and source of the message, and local conditions that need to be diagnosed more accurately. The diagnosis

above is just the first step in the process of designing norm-based intervention.

The second course of action relates to influencing the system for monitoring Poles' compliance with the regulations concerning furnaces in their homes, especially by city and municipal guards. It is worth supporting the social capital identified in our study (especially asset to report irregularities to the guards) with appropriate incentives and infrastructure. An important – but inexpensive and not too demanding – form of support would be to clearly inform residents that there is a number that they can call to report abuse to the guards in their area. Depending on the availability of staff and local needs, a special telephone number could be created for this purpose. Significantly, the communication materials should inform citizens that reporting these irregularities is a socially-acceptable form of care for the common good – in this case, clean air. This relatively simple message would allow citizens who want to get more involved in efforts to counter pollution.

This form of cooperation with residents would also make inspections more effective, as they would target locations where abuse is legitimately suspected and confirmed. Another important measure, requiring greater spending, would be to equip guards with tools for measuring local air pollution. Passing on this data to the local community – the residents of a given municipality – could raise awareness of the scale of the problem (especially where the pollution is especially bad) more effectively than a national or regional information campaign. As the data cited earlier in this report shows, the deterioration of air quality is perceived to a lesser extent at the local level.

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# Appendix

## I. Methodological details

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The data used in the report comes from two sources:

- 1) a survey conducted by the Polish Economic Institute between 6.12.2019 and 18.12.2019. The data was collected using the CAWI method by the Ariadna poll agency.

The survey was conducted on a random-quota sample of 1965 respondents over the age of 18. The data was weighted by gender, age and the size of the place of residence.

The questionnaire had two parts. The first part contained a list of questions about the acceptability of behaviour that influences air quality presented in short descriptions (Table 1). Given the multifaceted concept of norms as a factor shaping behaviour and the resulting complexity of behavioural tools appealing to norms, the sample was randomly divided so that one half of respondents would

assess the acceptability of various types of behaviour in terms of social expectations (a given actor's behaviour is socially acceptable or unacceptable) and the other half would assess it in terms of their personal convictions (in your opinion, the behaviour is acceptable or unacceptable).

The second part of the questionnaire contained questions concerning perceived air quality and how it has changed in recent years, behaviour dictated by awareness of air pollution, actions aiming to improve air quality and knowledge of the sources, consequences and institutional solutions relating to air quality in Poland.

- 2) a survey conducted among city or municipal guards in 232 localities. The data was collected using a form on the Survey-monkey platform between 17.02.2020 and 23.03.2020.

▼ **Table 1.** Examples of behaviour affecting air quality described in the survey

Description of behaviour being assessed normatively		
Lp.	Shortened version (for the purposes of the report)	Version in questionnaire
1	Heating one's house using a furnace that does not meet current technical standards*	House owners heat the house and water using a furnace that does not meet current technical standards and releases particles that pollute the air
2	Burning rubbish in the furnace*	House owners burn rubbish, e.g. plastic packaging, in the furnace that releases particles that pollute the air
3	City guards fining someone for polluting the air	City guards inspected a house, that had suspicious smoke coming out of its chimney, probably polluting the air in the area. They issued a fine of PLN 500 for using an unpermitted furnace
4	A passer-by asking city guards to inspect a furnace	A passer-by noticed suspicious smoke coming out of a house's chimney. He called the city guard and asked it to check whether the house's owners use a permitted furnace and the right heating materials
5	Asking city guards to inspect a neighbour's furnace	Mr Kowalski noticed suspicious smoke coming out of his neighbour's house's chimney. He called the city guard and asked it to check whether his neighbour uses a permitted furnace and the right heating materials
6	Lack of action by city guards despite the power to do so*	City guards noticed a house with suspicious smoke coming out of its chimney, probably polluting the air in the area. Despite the power to inspect it, they did not check whether the house's owners are heating it lawfully
7	The municipality introducing restrictions concerning furnaces	Municipal councillors banned burning coal and wood in household furnaces to reduce emissions of harmful substances into the air

\* Statements with a reverse score.

Source: prepared by PEI.

## II. Processing of research results

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▸ **Table 2.** Answers to knowledge test

<b>SOURCES</b>	
In Poland, more carcinogenic substances are emitted by household furnaces than by industry, e.g. factories	True
Most air pollution is caused by natural phenomena, such as volcano eruptions or processes in plants	False
<b>CONSEQUENCES</b>	
In Poland, more people are killed by the poor air quality than in road accidents	True
Air pollution not only damages the lungs, but also the brain	True
Poland has some of the cleanest air in Europe	False
Polluted air is especially bad for children's and senior citizens' health	True
Breathing polluted air causes similar damage to smoking cigarettes daily	True
<b>ACTIONS</b>	
The voivodship where I live has an anti-smog resolution	True or False depending on place of residence
The Inspection for Environmental Protection measures the level of air pollution in Poland	True
Owners of old furnaces can receive subsidies for replacing them from government or local government programmes	True

Source: (www4); (www5); (www6); (www7); (www8).

### III. Tables of results

▸ **Table 3.** Assessment of social acceptability of behaviour (social norms) by age group

Social norms		Age				
		18-24 years	25-34 years	35-44 years	45-54 years	55 and over
Heating one's house using a furnace that does not meet current technical standards*	Definitely unacceptable	28%	24%	29%	25%	38%
	Probably unacceptable	30%	30%	23%	31%	30%
	Hard to say	26%	25%	28%	28%	20%
	Probably acceptable	13%	16%	13%	11%	9%
	Definitely acceptable	2%	6%	7%	5%	3%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
Burning rubbish in the furnace*	Definitely unacceptable	57%	51%	54%	60%	79%
	Probably unacceptable	19%	19%	14%	15%	13%
	Hard to say	14%	16%	16%	13%	4%
	Probably acceptable	8%	9%	10%	7%	3%
	Definitely acceptable	2%	5%	5%	5%	1%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
City guards fining someone for polluting the air	Definitely unacceptable	6%	4%	4%	3%	4%
	Probably unacceptable	8%	10%	11%	13%	9%
	Hard to say	22%	21%	30%	22%	16%
	Probably acceptable	33%	37%	28%	31%	38%
	Definitely acceptable	32%	29%	27%	31%	33%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
A passer-by asking city guards to inspect a furnace	Definitely unacceptable	3%	4%	3%	5%	2%
	Probably unacceptable	14%	7%	10%	8%	6%
	Hard to say	21%	25%	25%	22%	16%
	Probably acceptable	36%	42%	36%	39%	43%
	Definitely acceptable	26%	21%	26%	27%	32%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>



Social norms		Age				
		18-24 years	25-34 years	35-44 years	45-54 years	55 and over
Asking city guards to inspect a neighbour's furnace	Definitely unacceptable	5%	3%	6%	6%	4%
	Probably unacceptable	15%	13%	11%	14%	10%
	Hard to say	22%	26%	28%	23%	18%
	Probably acceptable	33%	39%	31%	33%	39%
	Definitely acceptable	26%	19%	24%	24%	29%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
Lack of action by city guards despite the power to do so*	Definitely unacceptable	27%	18%	28%	34%	41%
	Probably unacceptable	32%	35%	28%	32%	30%
	Hard to say	22%	24%	23%	18%	13%
	Probably acceptable	13%	16%	16%	10%	11%
	Definitely acceptable	7%	7%	5%	6%	5%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
The municipality introducing restrictions concerning furnaces	Definitely unacceptable	9%	10%	9%	8%	7%
	Probably unacceptable	15%	18%	17%	19%	21%
	Hard to say	35%	28%	30%	28%	22%
	Probably acceptable	17%	25%	24%	26%	31%
	Definitely acceptable	24%	18%	21%	19%	20%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>

\* Describes negative behaviour.

Source: prepared by PEI based on research results.

▼ Table 4. Individual acceptability of behaviour (moral norms)

Ethical-moral norms		Age				
		18-24 years	25-34 years	35-44 years	45-54 years	55 and over
Heating one's house using a furnace that does not meet current technical standards*	Definitely unacceptable	28%	24%	29%	25%	38%
	Probably unacceptable	30%	30%	23%	31%	30%
	Hard to say	26%	25%	28%	28%	20%
	Probably acceptable	13%	16%	13%	11%	9%
	Definitely acceptable	2%	6%	7%	5%	3%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
Burning rubbish in the furnace*	Definitely unacceptable	57%	51%	54%	60%	79%
	Probably unacceptable	19%	19%	14%	15%	13%
	Hard to say	14%	16%	16%	13%	4%
	Probably acceptable	8%	9%	10%	7%	3%
	Definitely acceptable	2%	5%	5%	5%	1%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
City guards fining someone for polluting the air	Definitely unacceptable	6%	4%	4%	3%	4%
	Probably unacceptable	8%	10%	11%	13%	9%
	Hard to say	22%	21%	30%	22%	16%
	Probably acceptable	33%	37%	28%	31%	38%
	Definitely acceptable	32%	29%	27%	31%	33%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
A passer-by asking city guards to inspect a furnace	Definitely unacceptable	3%	4%	3%	5%	2%
	Probably unacceptable	14%	7%	10%	8%	6%
	Hard to say	21%	25%	25%	22%	16%
	Probably acceptable	36%	42%	36%	39%	43%
	Definitely acceptable	26%	21%	26%	27%	32%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>

Ethical-moral norms		Age				
		18-24 years	25-34 years	35-44 years	45-54 years	55 and over
Asking city guards to inspect a neighbour's furnace	Definitely unacceptable	5%	3%	6%	6%	4%
	Probably unacceptable	15%	13%	11%	14%	10%
	Hard to say	22%	26%	28%	23%	18%
	Probably acceptable	33%	39%	31%	33%	39%
	Definitely acceptable	26%	19%	24%	24%	29%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
Lack of action by city guards despite the power to do so*	Definitely unacceptable	27%	18%	28%	34%	41%
	Probably unacceptable	32%	35%	28%	32%	30%
	Hard to say	22%	24%	23%	18%	13%
	Probably acceptable	13%	16%	16%	10%	11%
	Definitely acceptable	7%	7%	5%	6%	5%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>
The municipality introducing restrictions concerning furnaces	Definitely unacceptable	9%	10%	9%	8%	7%
	Probably unacceptable	15%	18%	17%	19%	21%
	Hard to say	35%	28%	30%	28%	22%
	Probably acceptable	17%	25%	24%	26%	31%
	Definitely acceptable	24%	18%	21%	19%	20%
	<b>Size of group</b>	<b>123</b>	<b>193</b>	<b>184</b>	<b>176</b>	<b>302</b>

\* Describes negative behaviour.

Source: see Table 3.

▼ **Table 5.** Knowledge of financial support programmes by type of home

	Type of home	
	Flat	House
Clean Air Programme	42%	50%
Stop Smog Programme	26%	18%
Local government programme in my municipality	26%	29%
Commerical service offered by e.g. banks, such as green loans	13%	13%
Other	1%	1%
No, I have not heard about these kinds of programmes	31%	25%
<b>Size of group</b>	<b>1080</b>	<b>807</b>

Source: see Table 3.

▼ **Table 6.** Knowledge of financial support programmes by how home is heated

Name of programme	Heating system at home			
	Boiler or solid fuel stove	Gas stove	Fireplace	Electricity, RE solutions (heat pump etc.)
Clean Air Programme	53%	49%	54%	47%
Stop Smog Programme	12%	19%	32%	26%
Local government programme in my municipality	31%	31%	24%	30%
Commerical service offered by e.g. banks, such as green loans	11%	14%	19%	17%
Other, what kind?	1%	1%	0%	0%
No, I have not heard about these kinds of programmes	22%	27%	21%	23%
<b>Size of group</b>	<b>354</b>	<b>192</b>	<b>106</b>	<b>88</b>

Source: see Table 3.

▼ **Table 7.** Spearman's Rho correlation coefficient between the variable describing the level of acceptability / unacceptability of behaviour and the variables describing the level of knowledge about smog, the level of engagement in performing actions with a shorter and longer time horizon, and the assessment of air quality in Poland and in one's place of residence<sup>a</sup>

Behaviour	Level of knowledge		Level of engagement in performing actions with a shorter time horizon		Level of engagement in performing actions with a longer time horizon		Assessment of air quality in Poland		Assessment of air quality in place of residence	
	Social norms	Ethical and moral norms	Social norms	Ethical and moral norms	Social norms	Ethical and moral norms	Social norms	Ethical and moral norms	Social norms	Ethical and moral norms
	Heating one's house using a furnace that does not meet current technical standards*	-0.301**	-0.347**	-0.232**	-0.295**	-0.158**	-0.225**	0.238**	0.325**	0.2**
Burning rubbish in the furnace*	-0.301**	-0.326**	-0.17**	-0.23**	-0.116**	-0.219**	0.23**	0.266**	0.188**	0.145**
City guards fining someone for polluting the air	0.331**	0.355**	0.322**	0.35**	0.234**	0.223**	-0.208**	-0.289**	-0.185**	-0.219**
A passer-by asking city guards to inspect a furnace	0.349**	0.371**	0.357**	0.357**	0.24**	0.217**	-0.22**	-0.301**	-0.204**	-0.238**
Asking city guards to inspect a neighbour's furnace	0.287**	0.356**	0.294**	0.338**	0.195**	0.225**	-0.192**	-0.259**	-0.173**	-0.222**
Lack of action by city guards despite the power to do so*	-0.291**	-0.348**	-0.185**	-0.235**	-0.129**	-0.148**	0.263**	0.307**	0.232**	0.208**
The municipality introducing restrictions concerning furnaces	0.328**	0.309**	0.34**	0.286**	0.183**	0.161**	-0.226**	-0.303**	-0.219**	-0.27**

\* Describes negative behaviour.

\*\* Statistically significant factor of 0.01.

<sup>a</sup> The level of knowledge is determined by the sum of points obtained in the knowledge test consisting of ten questions (on the sources and consequences of smog, as well as actions taken by the administration). The level of engagement in performing actions is defined as the sum of actions taken.

Source: see Table 3

▼ **Table 8. Behaviour and actions over the past month by age group**

Action	18-24 years	25-34 years	35-44 years	45-54 years	55 and over
Thinking about how air pollution affects my or my loved ones' health	60%	59%	63%	58%	73%
Checking information about local air quality, e.g. using an app or online	50%	46%	44%	37%	48%
Talking about air quality with others	51%	57%	56%	54%	66%
Avoiding opening the windows due to the air quality, e.g. its smell or data on pollution	37%	39%	41%	29%	40%
Using an anti-smog mask or considering buying one	19%	18%	13%	6%	7%
Deciding not to spend time outside due to the air quality, e.g. its smell or data on pollution	29%	34%	31%	21%	29%
Using an air purifier or considering buying one	27%	33%	28%	19%	20%
Surrounding myself with plants that improve air quality	40%	44%	42%	42%	60%
<b>Size of group</b>	<b>247</b>	<b>404</b>	<b>359</b>	<b>342</b>	<b>613</b>

Source: see Table 3.

▼ **Table 9. Actions over the past two years by age group**

Action	18-24 years	25-34 years	35-44 years	45-54 years	55 and over
Using public transport or cycling rather than driving to reduce air pollution	43%	42%	39%	37%	44%
Signing a petition or participating in a different social campaign concerning air quality	28%	25%	25%	20%	25%
Replacing or considering replacing an old electric device with a newer one that uses less electricity	36%	39%	48%	45%	49%
Considering or conducting renovations that improve my house or flat's thermal insulation, such as replacing the windows	25%	34%	39%	35%	38%
Replacing or considering replacing the heating system at home with a more environmentally-friendly one	28%	33%	32%	32%	28%
<b>Size of group</b>	<b>247</b>	<b>404</b>	<b>359</b>	<b>342</b>	<b>613</b>

Source: see Table 3.

▼ **Table 10.** Thermal insulated work considered or conducted in particular voivodships

Voivodship	Considering or conducting renovations that improve my house or flat's thermal insulation, such as replacing the windows (%)	Replacing or considering replacing the heating system at home with a more environmentally-friendly one (%)	Size of group
Lower Silesian Voivodship	38	43	129
Kuyavian-Pomeranian Voivodship	42	26	117
Łódź Voivodship	32	27	119
Lublin Voivodship	35	31	138
Lubusz Voivodship	30	26	53
Lesser Poland Voivodship	32	36	145
Masovian Voivodship	32	25	295
Opole Voivodship	37	37	68
Subcarpathian Voivodship	44	30	104
Podlaskie Voivodship	35	23	66
Pomeranian Voivodship	31	31	110
Silesian Voivodship	36	36	229
Świętokrzyskie Voivodship	37	26	62
Warmian-Masurian Voivodship	33	24	88
Greater Poland Voivodeship	36	31	164
West Pomeranian Voivodship	31	27	78

Source: see Table 3.

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