



German Advisory Council
on the Environment

A Political Responsibility: Facilitating Environmentally Friendly Behaviour

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This publication is based on a special report published by the German Advisory Council on the Environment (SRU) in May 2023. The full reasoning, further details and extensive references can be found in the German-language long text version (“Politik in der Pflicht: Umweltfreundliches Verhalten erleichtern”).

Summary

Behavioural change as a building block of successful environmental policy

The manifold environmental crises of our time can only be overcome if people change their lifestyles—which means how they reside, organise their mobility and feed themselves.

For a long time, the focus of environmental policy was primarily on environmentally friendly and efficient production processes and on expanding our use of renewable energies. But as important as these building blocks are, they are not enough to prevent environmental limits from being exceeded. In addition to the production side, successful environmental policy must also focus on environmentally relevant behaviour in the population. Participation of the many in this is often a prerequisite for avoiding environmental damage, for example when it comes to the energy-related refurbishment of buildings, the correct disposal of waste, the spread of electromobility or a reduction in meat consumption.

Many people would like to behave in an environmentally friendly way and to some extent already take ecological aspects into account when making everyday decisions. However, this is not always possible—and is often much more time-consuming or expensive than environmentally harmful behaviour. This means that the framework conditions often turn out to be a barrier to environmentally friendly behaviour. Public policies have always shaped these framework conditions: They

provide infrastructures and services, set incentives through taxes or subsidies and put in place regulatory standards. It will only be possible to make far-reaching changes towards environmentally friendly behaviour if this is facilitated, encouraged and, in some cases, demanded by public policy at various points and using various measures.

When should environmental policy focus on environmentally relevant behaviour?

Changing behaviour is of varying importance in solving a problem depending on the particular environmental issue in question. Political and administrative decision-makers must therefore weigh up in each case whether and to what extent they want to address the behaviour of the population (usually in addition to measures on the production side) in a particular area. This may be warranted for several reasons (Fig. 1).

If there is real urgency: The more serious emerging environmental damage is and the more urgently it needs to be remedied, the more likely it is that the full range of possible solutions will have to be used. This includes behavioural changes if they can make a substantial contribution towards addressing the specific problem(s). For example, this may apply in cases where planetary boundaries have already been exceeded or are in danger of being exceeded. It is undisputed, for instance, that greenhouse gas emissions must be reduced quickly in order to meet climate targets. In some sectors, such as aviation, existing technological

◦ Figure 1

Constellations that speak for policies addressing behaviour



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solutions are not sufficient (e. g., switching to synthetic fuels as well as making efficiency gains) within the short time frame to meet climate targets, especially as the aviation sector is still growing and absolute emissions are increasing. Therefore, policy measures are needed to reduce the demand for air travel.

If behavioural change provides strong leverage: Some environmental problems can be fought particularly effectively through behavioural changes. Changes on the production side are comparatively less effective in these cases. One example is greenhouse gas emissions from agriculture. These are caused to a much greater extent by livestock farming than by the cultivation of plant products. The climate impact of agriculture can therefore be reduced particularly effectively by changing dietary behaviour.

If systemic measures only work in conjunction with certain behavioural changes: Changes on the system side (i. e., on the production side and in infrastructures) can in some cases only work if behaviour changes at the same time. For example, eco-design requirements for producers can ensure that consumer goods such as electrical appliances are designed to be more durable. However, the negative environmental effects will only be reduced if consumers actually use the appliances longer, i. e., if they decide less often to buy new appliances and more often to have these repaired if they are defective. This means that it may be neces-

sary to address the consumption side together with other political measures. It may also be advisable to complement systemic measures with behavioural measures if there is the risk of a rebound effect. If environmental regulations for products and services lead to lower costs for consumers, there is a risk that consumption will be increased or the money saved will be invested in other products or activities, so that the environmental gains are weakened. If, for example, the fuel consumption of vehicles decreases due to European CO₂ emission standards, this may go hand in hand with people driving more due to lower costs per kilometre. Policies should therefore also address the consumption side in order to effectively mitigate environmental damage.

If behavioural changes cost less and offer co-benefits: In some cases, environmental damage can be effectively avoided by both environmentally friendly behaviours and systemic measures. If the behavioural changes bring significant benefits to the population compared to the system-related alternative, this approach is preferable. For example, an urban mobility shift that focuses on public transport as well as walking and cycling also promotes health and quality of life, as people move more, and air pollution and noise are reduced.

If there is a risk of a relocation of production: Regulation that applies only to the production side can, under

certain circumstances, cause industries to relocate abroad (leakage). This would lead to a geographic shift in environmental damage, which might be even more serious than before due to lower environmental standards elsewhere. If it is not possible to improve international standards or to introduce import restrictions for products from particularly environmentally damaging production, an alternative strategy can aim at changing consumption behaviour in order to limit environmental damage effectively. If, for example, the prices for meat from German production were to rise sharply due to production-related taxes or levies without a change in demand, the consequence could be a significant increase in the import of meat products. In such a scenario, the continued high demand for meat would be met by an expansion in livestock farming abroad, merely shifting the environmental impacts to the new location or even exacerbating them. As such, measures to reduce domestic meat consumption and production-side measures should be taken parallel to one another.

Behavioural measures are no substitute for environmental regulation on the production side

In the discussion surrounding public policies addressing environmentally relevant behaviour, it is sometimes argued that such measures distract from the real structural changes required on the production side. The concern that addressing individuals and their behaviour can lead to a diffusion of responsibility is not unfounded in principle. In fact, specific business actors have tried in the past to steer the discourse in the direction of more consumer responsibility in order to avoid regulations for industry. In the view of the German Advisory Council on the Environment (SRU), public policy should therefore not address people and their behaviour *instead of* addressing the production side. Nor should designing behavioural measures be about assigning (ultimately moral) responsibility to consumers.

More relevant to successful environmental policy are the circumstances under which it is advisable or even necessary to attempt to change behaviour in the population and what approaches would be the best ones to take to achieve this. This report focuses in particular on how the framework conditions for environmentally friendly behaviour can be improved.

Public policies addressing environmentally relevant behaviour are legitimate

It is sometimes argued that using public policies to address environmentally harmful behaviour of citizens represents an illegitimate interference in their freedom or freedoms. While it is true that environmental policy measures may restrict freedom, when assessing such restrictions, it is nevertheless important to bear in mind that human-made environmental changes also pose a threat to freedom, for example, to people's fundamental right to life and good health. Restrictions that are not provided today may have to be imposed on young and future generations. Therefore, it is important to ensure that there is a fair distribution of these restrictions between the generations.

Moreover, consumer behaviour is not a "natural" phenomenon, but subject to various external influences—in particular the diverse advertising strategies of economic actors. And today, all sorts of public policies also shape environmentally relevant behaviour—but too rarely in an environmentally friendly direction. One example is mobility behaviour, which is also a result of decades of cars and their users receiving political prioritisation over other modes of transport.

Understanding environmentally relevant and promoting pro-environmental behaviour

To date, public policies aimed at influencing environmentally relevant behaviour have often been based on an insufficiently complex understanding of human behaviour. However, in order to change environmentally harmful habits and promote environmentally friendly behaviour, it is first essential to understand the multiple factors influencing the respective behaviour.

Basically, all behaviour is influenced by contextual conditions and general characteristics of the individual. In the case of mobility behaviour, for example, what infrastructures are available to a person and how much it costs to use them is highly relevant. General characteristics such as a person's age or the time at their disposal also influence whether they travel by bicycle, on foot, by public transport or by car.

In addition, psychological research shows that some influencing factors generate a basic willingness to engage in environmentally friendly behaviour—independent of a specific decision-making situation. These include personal norms, values and identities as well as awareness of the consequences of one’s own behaviour. In the case of mobility behaviour, for example, this would refer to a person identifying themselves as a cyclist (or as a car driver) as well as the person’s fundamental awareness of the environmental effects of their own mobility.

In a specific decision-making situation, further influencing factors then determine whether a person’s intention to engage in environmentally friendly behaviour is put into practice. These include, in particular, habits, attitudes, social norms, emotions and knowledge, but also the person’s belief that their decision can

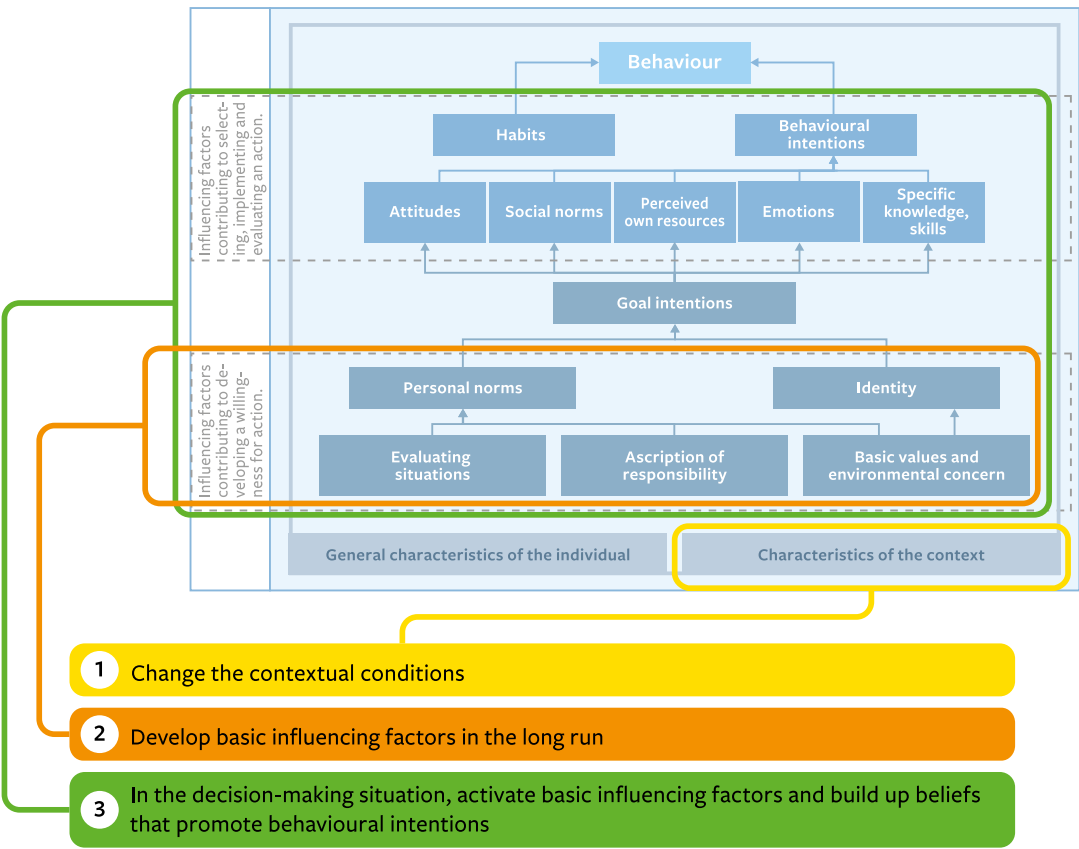
make a difference. How someone gets to work, for example, depends on habits, but also on what they consider to be possible, positive and socially desirable.

These findings result in three approaches that can promote environmentally friendly behaviour (see also Fig. 2):

- Approach 1: **Change contextual conditions.** The aim here is to enable or simplify environmentally friendly behaviour. New infrastructures can be created, or existing ones improved, subsidies can be provided, price incentives can be set, or bans can be imposed. Without conducive contextual conditions, there is a risk that people who want to behave in an environmentally friendly way will be demotivated if the behaviour is made more difficult for them or if they fail several times.

Figure 2

Approaches to promote environmentally friendly behaviour



- **Approach 2: Develop basic influencing factors in the long run.** The aim is to promote basic influencing factors that lead to more environmentally friendly behaviour. Education can increase environmental awareness and communicate to people the consequences of their behaviour. Campaigns can promote the spread of environmentally friendly norms.
- **Approach 3: Provide support in the decision-making situation** by activating the basic influencing factors and by building up beliefs that contribute to behavioural intentions. The goal is to increase the chances that someone will behave in an environmentally friendly way in the decision-making situation. If people learn certain skills that are needed for environmentally friendly behaviour or receive concrete support, this can promote environmentally friendly behaviour. It can also be supportive to refer to the behaviour of others in a decision-making situation and to remind people of corresponding norms and values.

Designing effective policy measures

In order to promote environmentally friendly behaviour, government can translate the aforementioned approaches into public policies. It has a broad “toolbox” at its disposal—from incentives and public services to information, education and persuasion, right up to bans. The instruments address different factors that influence behaviour. Since usually more than one factor plays a role, it is advisable to comprehensively address the respective behaviour by using bundles of measures. The instruments can then reinforce each other in their effect. In some cases, a single instrument only works if it is applied in combination with other instruments. When introducing new instruments, it should be taken into account which other measures are already in place so that new and existing measures can be adjusted. In addition, it is crucial for the effective design of instruments to understand the effect they have on behaviour.

Regulatory instruments call for or prohibit a certain type of behaviour. They have an effect both on the contextual conditions and on the decision-making situation. This can make environmentally harmful behaviour significantly more difficult, for example if it is no longer permitted to offer certain products on the mar-

ket. If such a ban directly addresses individuals, they may well decide not to comply with it. However, regulatory instruments are only effective if people (predominantly) comply with them. In order to improve compliance, rule-breaking behaviour can be sanctioned, or rule-compliant behaviour can be facilitated by using further instruments.

Economic instruments change the relationship between costs and benefits in order to influence a decision, and in this way affect the contextual conditions. They can either make environmentally harmful behaviour more expensive or environmentally friendly behaviour more beneficial. Economic instruments are particularly effective when consumers react strongly to price changes. This is more likely if there are good alternatives or if a product is not necessary to satisfy people’s basic needs. Moreover, if price developments are predictable, this contributes to economic instruments being much more effective.

Information-based instruments should enable people to make decisions in concrete situations based on information and thus in line with their own values and beliefs. However, numerous studies show that information and knowledge play only a limited role in determining decision-making, which is why this type of instrument alone is not enough to make people change to environmentally friendly behaviour. Information such as product labels is particularly helpful for people who already display environmental awareness. The information should be presented in a simple way, be appropriate for the target group and have personal relevance. The communication of additional benefits of environmentally friendly behaviour, for example for health, increases the relevance for the addressees.

Persuasive instruments are used to build up basic influencing factors, i. e., change values and norms, and to act as a reminder to people in decision-making situations. They are particularly effective when role models are used for transmission, when there is some kind of personal relevance, and when the campaigns are credible and appropriate for the target group.

Educational instruments have a longer-term effect by imparting knowledge and skills and enabling environmentally friendly behaviour in the first place (e. g., repairing everyday objects). In addition, basic influencing factors such as environmental awareness can develop. Educational instruments should be used in

addition to other instruments and should also be offered to population groups that so far have only had a low level of environmental awareness.

Furthermore, **decision-making contexts** can be changed in such a way that environmentally friendly behaviour becomes easier and the new norm. This is particularly suitable in the case of frequent and unconscious behaviour, for example when deciding whether to eat a meat-free meal or one that contains meat. Changed decision contexts thus have an effect via the context conditions, or they support environmentally friendly behaviour at the moment of the decision. Changing default options has proven to be effective, for example when vegetarian meals are made the default when people register to take part in an event. However, it is important that, when public policies change decision-making contexts, this should always be made transparent.

Government can make it easier for people to engage in environmentally friendly behaviour by expanding or modifying its own **services and infrastructures** accordingly and aligning them with environmental goals. By doing this, it can influence behaviour through contextual conditions. This includes public transport services as well as environmentally friendly meals in public canteens. In some cases, public services and infrastructures are even the prerequisite for certain types of behaviour.

Improving the political feasibility of public policies

The aforementioned approaches and instruments can only effectively promote environmentally friendly behaviour if they are also politically decided and implemented. However, the more effective such policies promise to be, the more difficult they are to realise. Although environmental protection has become more important in society, in political parties and also in the economy, actually implementing approaches and instruments like the ones outlined above can be made more difficult by a number of factors. These include a lack of acceptance in society, low compatibility with the programmes of governing parties, resistance against them from organised interest groups as well as institutional and legal framework conditions.

Influencing the behaviour of citizens through public policies is considered unpopular. However, **acceptance** is something that can be influenced to a certain

degree. Especially with the use of suitable bundles of measures, it can be possible to win majority support even for less popular measures. Instruments that make environmentally harmful behaviour more expensive are often rather unpopular, as it is very difficult to make people accept price increases and the environmental steering mechanism they seek to put into effect often remains misunderstood. However, they could become acceptable if the revenues raised were invested for an environmental purpose or redistributed based on social criteria. Furthermore, people are more likely to support such instruments if they understand how they work and have more confidence in their effectiveness. For this reason, accompanying information plays an important role. Combining behavioural with production-side measures can also increase acceptance, as it communicates that everyone has a contribution to make. Furthermore, it can make sense to introduce measures step by step, as acceptance often increases after introduction. Acceptance can also be increased through participatory processes. Since it is proven to be difficult for politicians to assess to what extent behavioural measures are accepted, this should be empirically investigated for important projects.

There are also differences between the **political parties** with regard to how compatible policies aimed at changing the behaviour of citizens are with their own respective party programmes. In order to increase the chances of adopting such measures, it is therefore important to take into account the respective ideas and interests of the governing parties and their voters when choosing approaches and instruments. Framing measures in different ways may enable political actors to opt for measures that at first glance do not appear to fit in with their party-political worldview. Bundles of measures that contain instruments acceptable to each party involved in the government coalition can also improve political feasibility here. Sometimes package solutions are also possible, in which members of a coalition mutually support measures that do not correspond to their own programme concerning different problems.

Political measures that are intended to enable or facilitate environmentally friendly behaviour often affect strong **economic interests** that are generally well-represented in the political arena. Economic interests that benefit from environmentally friendly behaviour, on the other hand, are often less organised and assertive. The chances of adopting such measures can be increased if good arguments and scientific evidence are

available. Beneficiaries of the measures should be identified so that new coalitions of supporters can be forged. In the medium and long term, landscapes of interest can also be changed so that more support can be expected. This can be done by promoting actors in certain niches so that they later have a relevant economic interest in the respective changes.

In addition, **institutional and legal framework conditions** influence the feasibility of measures. Although individual policymakers cannot change these, they sometimes have leeway that is not always made use of. Today, many environmental policy decisions are made at EU level, where member states can push for more ambitious measures. Moreover, they are explicitly allowed to go beyond the measures laid down at European level in environmental policy. Fundamental rights protected in the German constitution also tend to allow greater intervention in environmentally damaging behaviour than is often assumed in political discourse.

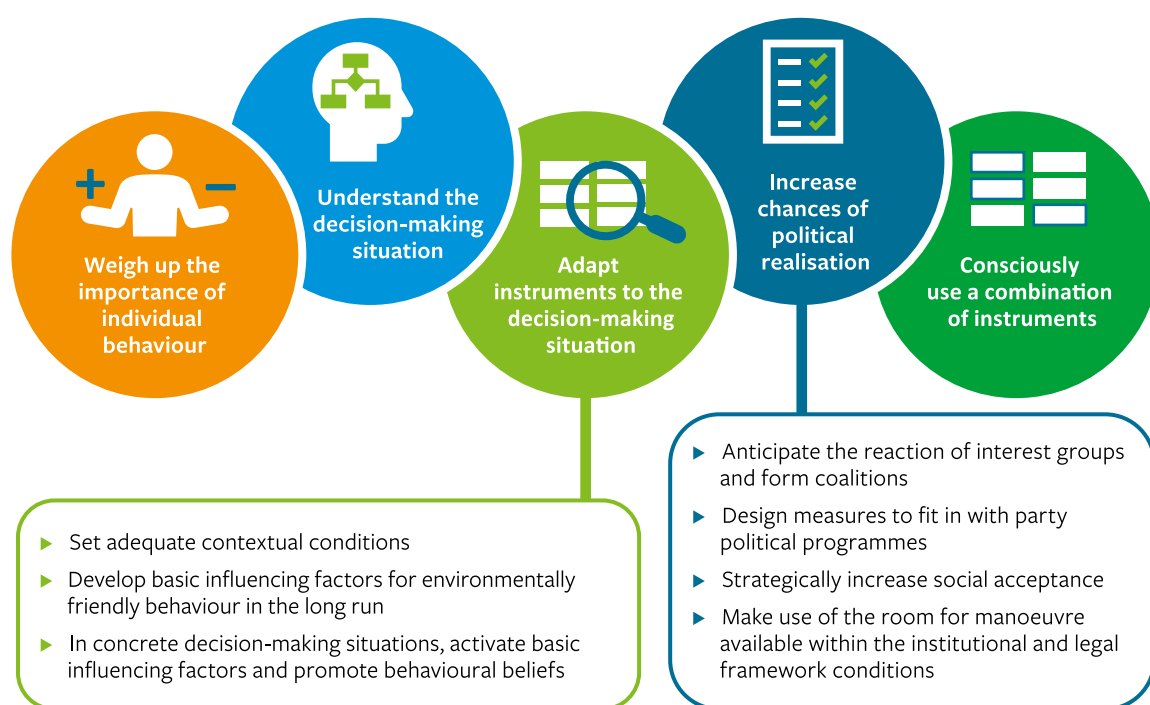
Recommendations for promoting environmentally friendly behaviour

Achieving Germany's environmental and climate goals not only requires changes to production processes in companies, but also changes to behavioural patterns in the population at large. Governments have the means to facilitate, encourage and, in part, demand environmentally friendly behaviour—and are responsible for actively leading the way in this respect. The SRU would like to support this environmental policy change with some overarching recommendations (Fig. 3).

Whether political steps should be taken to change behaviour in order to achieve an environmental goal should be weighed up separately in each individual case. As a rule, this makes sense in combination with further measures on the production side. Behavioural measures should be taken, in particular if:

◦ Figure 3

Recommendations for promoting environmentally friendly behaviour



- o urgent action is needed to prevent the environmental damage in question,
- o behaviour changes in a problem area can have particularly strong leverage,
- o they are necessary as an accompanying measure to ensure that systemic measures are effective,
- o behavioural changes promise co-benefits or
- o there is a risk of production being relocated elsewhere.

If decision-makers conclude that one or more of the aforementioned arguments make it necessary to address environmentally relevant behaviour, then the reasons for the existing environmentally harmful behaviour should first be understood. Depending on which behaviour is in focus, policy instruments should be applied at different points: The contextual conditions of the behaviour (Approach 1), the basic influencing factors (Approach 2) or the decision-making situations (Approach 3). The entire range of available policy instruments should be used for this purpose.

In addition, it should be anticipated how high the acceptance of certain instruments is in society, how these can be made compatible with the programmes of the governing parties, whether resistance from interest groups is to be expected and which institutional framework conditions could stand in the way.

In order to address this systematically on the basis of scientific findings and to increase the chances of implementation in the political process, the SRU has developed a list of guiding questions for the development and introduction of behavioural instruments in this report, which can be found at the end of this summary (Table 1). This compilation of questions and approaches is intended to help administrative and political decision-makers to systematically incorporate the considerations and recommendations of this report into the development of respective public policies.

Case studies—how environmentally friendly behaviour can be promoted in three fields of action

Meat consumption, smartphone use and energy-efficient home renovation—three case studies can show

which approaches can be used to change environmentally relevant behaviour in practice. All three have particular relevance for the environment and require behavioural changes. At the same time, the case studies differ significantly, for example in terms of previous public policies or the frequency with which decisions are or have to be made—some of which are taken very often and affect everyday behaviour, and others that are taken only rarely. The case studies illustrate the line of argumentation of this report in three important fields of action.

Meat consumption—setting the framework for a nutritional turnaround

Food production is associated with a variety of negative environmental impacts. It contributes to climate change, biodiversity loss and environmental pollution. However, these effects can be significantly reduced. For animal products, they are particularly high per kilogram of food consumed compared to plant foods. In order to reduce the negative effects of food consumption in Germany on the environment and on the climate, a change in dietary behaviour is necessary alongside changes in agricultural production methods. This includes, among other things, a reduction in meat consumption, which is taken as an example in this report.

Dietary behaviour is a very important aspect of people's identity and is embedded in the societies and cultures people live in. Since dietary decisions are also strongly influenced by people's habits, a combination of different policy measures should be used to initiate change. To this end, the contextual conditions of nutrition, which currently favour meat consumption in many cases, should be changed (Approach 1). In addition, basic influencing factors that promote a plant-based diet should be strengthened (Approach 2). It also makes sense to make meat-free food more attractive at the moment when people are choosing what to eat (Approach 3).

Setting ecological price incentives: The currently applicable reduced VAT rate on meat and meat products is an environmentally harmful subsidy and sets the wrong incentives. The SRU recommends raising this to the regular VAT rate (Approach 1). In return, the VAT on fruit, vegetables and pulses should be abol-

ished altogether, which has become possible under EU law since April 2022. Further social compensation measures for people with low incomes should be introduced. If the change in VAT rates in combination with other instruments does not turn out to be sufficiently effective, measures should be considered to help ensure that meat prices more closely reflect the environmental costs of production.

Making vegetarian options in canteens and catering facilities more attractive: In order to change the contextual conditions in out-of-home consumption as well, it is recommended that vegetarian options in canteens be improved and that they be made more attractive through appropriate pricing (Approach 1). Government should make greater use of its own scope for influencing public canteens, for example in educational institutions and public authorities, but should also work towards better vegetarian options in private canteens and in the catering sector.

Conveying knowledge about environmental effects and convincing people to eat an environmentally friendly diet: Educational measures have the potential to reduce existing knowledge gaps about the environmental effects of meat consumption. They can help to develop basic influencing factors that favour a plant-based or meat-reduced diet (Approach 2), such as environmental awareness and social norms. Educational measures have a long-term effect and should be combined with other measures.

Providing useful information on the environmental effects of food: Product labels, such as an indication of the CO₂ footprint on food, make it easier for people who want to eat in an environmentally friendly way to choose an ecological option when shopping or eating out (Approach 3). The SRU recommends improving existing information tools and developing some new ones. A simple and intuitive presentation of information, for example by using traffic light colours, can make a significant contribution towards consumers ultimately paying more attention to such information.

Providing inspiration for the preparation of vegetarian meals: In order to support environmentally friendly nutrition in the decision-making situation (Approach 3), the range of nutrition education, for example in schools, should be expanded in cooperation with civil society organisations, among others, and more strongly oriented towards the preparation of

environmentally friendly vegetarian dishes. This can help to arouse interest in meat-free dishes and change previous shopping and cooking habits.

A combination of measures also makes sense in terms of acceptance and party-political compatibility. Initially, measures with a lower level of intervention should be chosen. These enjoy greater acceptance and can contribute to changing norms in the long term. This applies, for example, to the expansion of vegetarian options in canteens. If higher VAT rates on meat are accompanied by financial relief for low-income households, these measures are also more likely to meet with approval. Here, however, the timing is crucial. High inflation and increased food prices make this difficult at the present time. However, the fact that some of the relevant ministries are currently the responsibility of one party certainly offers a window of opportunity for inter-ministerial coordination.

Smartphones—easing the way from replacement product to long-term companion

Many electrical appliances are replaced even though they are still intact or could be repaired. The production of new devices causes environmental damage along the entire value chain due to raw material and energy requirements. Nevertheless, smartphones, for example, are only used for about 2.5 years on average in Germany. Obstacles to longer use are poor reparability, high repair costs, the lack of software updates or new devices free of charge as part of phone contracts. However, studies show that some consumers would be willing to use their devices for longer. Changes in the contextual conditions (Approach 1) and in the decision-making situation (Approach 3) can provide a remedy, but it is also necessary that basic influencing factors be developed further (Approach 2).

Product characteristics for the entire European market: Contextual conditions will foreseeably change on the production side. The eco-design requirements for smartphones and tablets, which are expected to apply to all new devices sold in the EU from 2025, demand that devices be designed in a way that enables a longer service life. The German government should actively promote the European discussion on a general right to repair, which could support the eco-design rules.

Strengthening consumer rights and skills: Basic influencing factors strongly depend on the provision of information and education. This includes, for example, repair as a subject in primary and secondary schools (e. g., in technical studies lessons), training in appliance care, but also knowledge about the social and environmental impacts of raw material consumption. Longer guarantee and warranty periods and the right to repair can lead to greater appreciation in the medium term.

Improving product information: Information on environmental impacts, durability and reparability enable conscious purchasing decisions. The planned European reparability index, combined with Germany's Blue Angel eco-label and the Eco-Rating Initiative, could serve as the basis for a uniform, easily accessible and comprehensible ranking system.

Changing purchase and usage options: Contract changes or extensions as well as signs of wear and tear are frequent reasons that prompt people to purchase a new device. There are various ways to achieve the goal of making longer use of functional devices more attractive, including separating contracts from devices or at least making sure the total price for the device is clearly displayed. Devices can be rented instead of purchased or innovative bonuses can be offered for contract extensions (e. g., battery or display exchange).

Making repairs more financially attractive: The offer of an individual cost reduction, such as the Thuringian repair bonus, simplify the repair decision for consumers. In addition, easier organisational factors such as uncomplicated access to spare parts, instructions and repair businesses—for example via information platforms—have a supporting effect, as does promoting regional repair initiatives.

The chances of slowing down the trend towards frequent replacement of functional electrical appliances are generally good: the European initiative for sustainable products will foreseeably lead to more eco-design in appliance planning. Complementary measures are likely to meet with acceptance among the population, as longer use of appliances helps to save costs. It should also be possible to communicate such measures in terms of party politics, as consumers gain greater freedom of choice in the use of appliances through information, repair options, their own repair skills or financial support. It would also be helpful to form coalitions of supporters, for example for a nationwide

repair bonus. A possible ally could be the repair business, for example, which in turn can itself become active by offering training and further education activities and in cooperation with repair initiatives. The municipalities also benefit when jobs and added value are created locally, so they should be won over as partners.

Building renovation—accelerating the heat transition in owner-occupied homes

A particularly great challenge in climate protection in Germany is the heat transition. Owner-occupied single-family and two-family houses account for almost half of the final energy consumption in Germany's building stock. To achieve climate targets, most houses must be energy-efficiently renovated and heating systems that use renewable energies must be installed by 2045. This requires extensive action on the part of homeowners. However, not many people deal with this issue in their daily lives. Usually, a renovation is only considered when there is a specific reason for homeowners to do so, such as a transfer of ownership or pending repairs. In addition, renovation is difficult to finance for some homeowners. This means that policy instruments can target contextual conditions in particular (Approach 1). Furthermore, the complex decisions around energy renovations are challenging for many owners, so further support can be provided in this respect (Approach 3).

Making better use of occasions to renovate and creating new ones: On the one hand, public policies can aim to make better use of existing occasions for renovation. For example, owners can be obliged to install a heating system that is powered by renewable energies when replacing their old heating system. Legislation can also prescribe an insulation standard that is compatible with the climate goals for renovations that are due to be carried out anyway. This is also important because it avoids bad investments and protects owners from the need for repeated renovations and the associated additional costs of that. On the other hand, additional reasons for renovation can be created through legal requirements, for example through minimum energy performance standards for existing buildings. These instruments change the contextual conditions surrounding homeowner's decisions about renovating (Approach 1).

Improving economic viability and enabling financing for less affluent homeowners: The economic viability of renovating is an important issue for owners, but it is often not calculated in detail. Nevertheless, it is important to improve the objective economic viability of renewable energy and energy efficiency measures through policies such as CO₂ pricing and thus to change the contextual conditions (Approach 1). Some owners also lack the financial means for renovation. In order to make renovation possible for all, financial support can become means-tested, that is, dependent on people's income and wealth so that less affluent homeowners are given higher rates of financial support.

Providing better support for homeowners: Homeowners have to make many complex decisions in the course of a renovation. This can be a great challenge for many. Public policies can therefore aim to support the decision-making process (Approach 3), i. e., to better structure and accompany the process, to bundle offers and services or to make environmentally friendly solutions clearly recognisable. This includes in particular the nationwide introduction of one-stop shops, i. e., contact points that bundle many offers and services or can refer to others.

Improving knowledge about the energy status of houses and targeting specific groups: Many owners are not sufficiently aware of the energy status of their home, so that they do not consider renovation to be necessary and therefore do not seek advice. This

knowledge can be made available to specific target groups in the decision-making situation through information-based instruments (Approach 3). It is also important to address owners directly, for example by actively approaching them in their neighbourhoods.

Even for rarer and costly decisions such as building renovation, economic incentives alone are not enough. Rather, a package of measures is needed that also includes regulatory instruments such as a usage requirement for renewable energies or minimum energy performance standards for existing buildings. Regulatory instruments meet with greater approval when they are combined with improved advisory and support services as well as financial support. The introduction of further regulatory instruments therefore seems quite realistic—also because, for example, a usage requirement for renewable energies is already stipulated in the coalition agreement. Legally, there are no fundamental hurdles, as long as proportionality is maintained. Since heat is a basic need, care must be taken with all measures—also for reasons of acceptance—that less affluent households are not additionally burdened. This requires, on the one hand, a redistribution of the revenues from the CO₂ pricing, and on the other hand, significantly higher subsidy rates for renovations. However, these high subsidy rates should only apply to owners of homes with lower incomes and assets, as otherwise massive costs would arise for the state budget.

◦ **Table 1**

Guiding questions for the development and introduction of instruments that address the environmentally relevant behaviour

1. Weigh up the importance of individual behaviour	
Central questions	<p>Is a change in the behaviour of citizens necessary to solve the problem, because:</p> <ul style="list-style-type: none"> ◦ the problem is urgent or particularly serious, ◦ behaviour change offers particularly strong leverage, ◦ a change in behaviour is required for measures on the production side to be successful or to reduce the rebound effect, ◦ a change in behaviour brings additional co-benefits and/or ◦ production-side regulation may lead to a shift of environmental effects abroad?
Approaches	<p>If at least one of these conditions is given, addressing environmentally relevant behaviour should be considered (usually in addition to production-side regulation).</p>
2. Understand the decision-making situation	
Central questions	<ul style="list-style-type: none"> ◦ In what context and with what frequency are specific behavioural decisions made? ◦ What are the relevant factors influencing this behaviour, which of these could facilitate environmentally friendly behaviour? ◦ What role do conscious considerations and knowledge as well as unconscious behaviours and habits play in this? ◦ What role do existing contextual conditions and infrastructures play?
Approaches	<ul style="list-style-type: none"> ◦ Different instruments or bundles of instruments should be in focus, depending on which influencing factors play a particular role. Examples: ◦ If contextual conditions and infrastructures have a strong influence, they should be adapted to promote pro-environmental behaviour (Approach 1). ◦ If social embeddedness is strong, instruments should be chosen that change social norms and values in the long term (Approach 2) and instruments that remind people of norms in the short term (Approach 3). ◦ If the intention for a certain behaviour is widespread, but many people lack the necessary competences or skills for it, concrete assistance for environmentally friendly behaviour should be given (Approach 3).
3. Adapt instruments to the decision-making situation	
Set adequate contextual conditions (Approach 1)	
Central questions	<ul style="list-style-type: none"> ◦ Which existing infrastructures, services or price signals make environmentally friendly behaviour more difficult? ◦ How would infrastructures, services or price signals have to be designed to make the ecological behaviour easier, more intuitive and/or cheaper? ◦ Where can the government exert direct influence by designing public services and infrastructures?

Approaches	<ul style="list-style-type: none"> Change contextual conditions accordingly (economic instruments, regulatory instruments, public services and infrastructures, decision-making contexts).
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Develop basic influencing factors for environmentally friendly behaviour in the long run (Approach 2)

Central questions	<ul style="list-style-type: none"> Is the population aware of the environmental consequences of the respective behaviour and is the effect of their own behaviour perceived? Do widespread norms and values support environmentally friendly behaviour, or do they stand in the way? Are there actors in society who work for a change in values and spread other norms?
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Approaches	<ul style="list-style-type: none"> Provide knowledge about environmental problems and skills for environmentally friendly behaviour (educational instruments). Develop and disseminate norms and values that encourage environmentally friendly behaviour in the long run with the help of campaigns and role models (education and persuasion instruments).
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In concrete decision-making situations activate environmentally friendly basic influencing factors and promote behavioural beliefs (Approach 3)

Central questions	<ul style="list-style-type: none"> Do many citizens have the knowledge and intention to behave in an environmentally friendly way, but do they still make environmentally harmful decisions in the short term in certain situations? Do the values and norms that support environmentally friendly behaviour take a back seat in the decision-making situation? Do certain emotions make environmentally friendly behaviour more difficult in the relevant situations? Do the people in the specific situations lack the necessary knowledge or skills to behave in an environmentally friendly way?
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Approaches	<ul style="list-style-type: none"> Use tools that remind people of intentions and supportive values and norms in decision-making situations (information, nudging). Use information and persuasion to help or remind people of the desired behaviour.
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4. Increase the chances of political realisation

Increase social acceptance through careful design of measures

Central questions	<ul style="list-style-type: none"> How high is acceptance of the measures among the population and specific groups of voters? How can measures be designed in a way that increases support for them?
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Approaches	<ul style="list-style-type: none"> Do not rule out regulatory instruments from the outset; these enjoy more support than is often assumed. Examine the acceptance of instruments and their distribution effects in advance. Use citizen participation to design instruments. Inform addressees about the effectiveness of measures. Combine instruments in a sensible way, among other things to avoid heavier burdens on low-income households. Combine regulatory and economic instruments with information. Introduce instruments step by step, evaluate and adapt if necessary.
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Making measures politically compatible

Central questions	<ul style="list-style-type: none"> How do the governing parties stand in terms of the regulatory intention and various instruments? What party lines can be made use of, and what instruments fit in best with the party programmes and constituencies of the governing coalition? What might a balance of interests between the coalition partners look like?
Approaches	<ul style="list-style-type: none"> Design and communicate instruments in detail so that they are compatible with the programmes of the governing parties and with their constituencies. Enable compromises between coalition partners by presenting bundles of measures and package deals.

Anticipate the reaction of interest groups and use it constructively

Central questions	<ul style="list-style-type: none"> What interest groups can be expected to resist a political project? Which stakeholders can be won over as partners? How can landscapes of interest be changed in the medium to long term?
Approaches	<ul style="list-style-type: none"> Prepare the scientific evidence that can justify the measure well. Change landscapes of interest in the medium to long term, e. g., through research funding or other policies. Form new coalitions of supporters.

Use room for manoeuvre in the institutional and legal framework conditions

Central questions	<ul style="list-style-type: none"> What limitations are there on the scope of action due to higher-ranking law, and which ones are rather political restraint and can therefore be overcome? Environmental policy takes place at different levels in the multi-level system: Where can which level make a meaningful contribution?
Approaches	<ul style="list-style-type: none"> Use legal and political room for manoeuvre at national level. Trigger ambitious action at EU level. Use the available scope for action provided by the federal system: federal level support for the Länder and municipalities. Where possible and appropriate, introduce specific instruments at federal state and municipal level.

5. Consciously use a combination of instruments

Central questions	<ul style="list-style-type: none"> What different influencing factors play a role, and which different instruments are needed to address each of them? Are any undesirable side effects expected that should be offset by other instruments? Does a staggered introduction make sense?
Approaches	<ul style="list-style-type: none"> Introduce instrument bundles such that undesirable consequences of one instrument are mitigated by another instrument. In the case of a gradual introduction, already think about what the next steps will be right from the start and create political/legal structures in the initial phase.

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