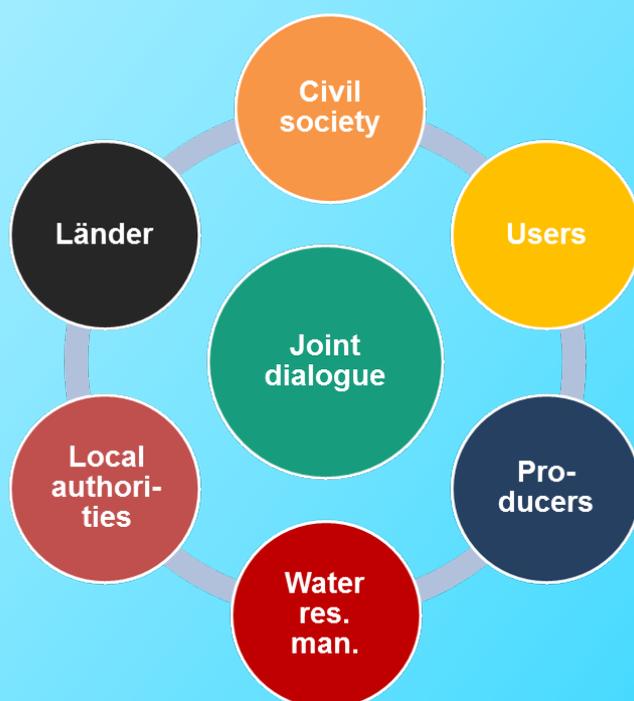


POLICY PAPER

RECOMMENDATIONS FROM THE

MULTI-STAKEHOLDER DIALOGUE ON THE TRACE SUBSTANCE STRATEGY OF THE GERMAN FEDERAL GOVERNMENT

TO POLICY-MAKERS ON OPTIONS TO REDUCE TRACE SUBSTANCE INPUTS TO THE
AQUATIC ENVIRONMENT



JUNE 2017

Outcomes of the multi-stakeholder dialogue on the Trace Substance Strategy of the German Federal Government

Based on the workshops

- on mitigation strategies at source,
- on mitigation strategies on the user side,
- on mitigation strategies based on end-of-pipe measures
- and to amalgamate the Recommendations for Action.

Implementation and organisation of the multi-stakeholder dialogue

Technical consultants:

Dr Thomas Hillenbrand

Dr Felix Tettenborn

Fraunhofer Institute for Systems and Innovation Research ISI
Breslauer Str. 48, D-76139 Karlsruhe

Facilitators:

Marcus Bloser

Frank Fligge

Jürgen Anton

IKU_Die Dialoggestalter,
Olpe 39, D-44135 Dortmund



On behalf of



Bundesministerium
für Umwelt, Naturschutz,
Bau und Reaktorsicherheit

The logo for Umwelt Bundesamt, featuring the text "Umwelt Bundesamt" in white, sans-serif font on a green rectangular background. A small green circular icon with a white leaf-like shape is positioned to the right of the word "Umwelt".

PARTICIPANTS IN THE STAKEHOLDER DIALOGUE

<i>Stakeholders</i>	<i>Representatives</i>
BASF	Dr Gerhard Zimmer
Bayer AG	Dr Reinhard Länge
Bundesverband der Deutschen Industrie – BDI	Dr Günter Müller
Bund für Umwelt und Naturschutz Deutschland – BUND	Laura von Vittorelli; Paul Kröfges
Bundesärztekammer	Prof. Dr Caroline Herr
Bundesverband der Arzneimittelhersteller – BAH	Dr Daniela Allhenn
Bundesverband Deutscher Apothekerverbände - Abda	Prof. Dr Martin Schulz; Dr André Said
Bundesverband der Energie und Wasserwirtschaft – BDEW	Prof. Dr Dietmar Schitthelm
Deutsche Industrie- und Handelskammertag - DIHK	Hauke Dierks
Deutsche Krankenhausgesellschaft – DKG	Dr Iris Juditzki
Deutscher Städtetag	Otto Huter; Andreas Hartmann
Deutscher Verein des Gas- und Wasserfaches - DVGW	Christoph Ontyd
Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e. V. - DWA	Prof. Dr Wolfgang Firk
GKV-Spitzenverband	Michael Weller
Industrieverband Körperpflege- und Waschmittel e. V.; Bereich Kosmetik	Birgit Huber; Dr Klaus Rettinger
Industrieverband Körperpflege- und Waschmittel e. V.; Bereich Waschen	Dr Bernd Glassl
Städte und Gemeindebund – DSTGB	Dr Peter Queitsch; Dr Bernd Düsterdiek
Gesamtverband der deutschen Textil- und Modeindustrie e. V.	Johanna Höger
Verband der Chemischen Industrie e. V. – VCI	Dr Thomas Kullick
Verband der deutschen Lack- und Druckfarbenindustrie	Dr Helge Kramberger
Verband Forschender Arzneimittelhersteller – vfa	Dr Gesine Bejeuhr
Verbraucherzentrale	Philip Heldt
Vereinte Dienstleistungsgewerkschaft ver.di	Clivia Conrad
Verband kommunaler Unternehmen – VKU	Nadine Steinbach; Dr Issa Nafo
Zentralverband Oberflächentechnik	N.N.
Bund-/Länderarbeitsgemeinschaft Wasser (LAWA)	LAWA chair: Peter Fuhrmann; represented by Dr Ursula Maier and Dr Wolfgang Milch Representatives of the Trace Sub- stance Strategy group: Andrea Kaste; Frederik Ahrens

IN-PROCESS SUPPORT

Federal Ministry of Education and Research (BMBWF)	Dr Christian Alecke Dr Verena Höcke (PT-KA)
Federal Ministry of Health (BMG)	Dr Barbara Passek
Federal Office of Consumer Protection and Food Safety (BVL)	Dr Achim Gathmann
Partnership for Sustainable Textiles (<i>Bündnis für nachhaltige Textilien</i> , BnT); c/o Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH	Johannes Förster
Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)	Lutz Keppner Ina Lück Dr Sven Lyko Dr Jörg Wagner Dr Helge Wendenburg
Federal Environment Agency (UBA)	Maren Ahting Dr Frank Brauer Prof. Dr Adolf Eisenträger Dr Joachim Heidemeier Ingo Kirst Cindy Mathan Alexandra Müller Dr Jörg Rechenberg Claudia Thierbach Lars Tietjen

CONTENTS

PREAMBLE	1
MANAGEMENT SUMMARY	3
PROCESS DESIGN OF THE MULTI-STAKEHOLDER DIALOGUE	9
RECOMMENDATIONS FOR ACTION	13
1 Determination of relevant trace substances	13
2 Mitigation strategies at source	15
3 Mitigation strategies on the user side	19
4 Mitigation strategies based on end-of-pipe measures	24
5 Costs and financing of the Trace Substance Strategy	29
GLOSSARY	31

PREAMBLE

As a part of preparations for a federal-government strategy to protect the aquatic environment against anthropogenic trace substances, the multi-stakeholder dialogue on a Trace Substance Strategy of the Federal Government was launched at a kick-off event on 7 November 2016. Selection of stakeholders and issues was based on exploratory talks. The rules for the dialogue process were presented and agreed at the kick-off event. In a first dialogue phase up to June 2017, recommendations to policy-makers were elaborated with the stakeholders; the issues addressed in that phase are to be further concretised in a follow-on phase.

The Strategy's purpose is to prevent and reduce inputs of trace substances to the aquatic environment. Guided by the precautionary principle and the polluter pays principle, both of which are enshrined in both EU and German law, and following the risk assessment approaches established in those bodies of law, the stakeholders have developed, in a process of dialogue, practicable and viable solutions. The outcomes of the dialogue process shall contribute to a shared understanding of the technical issues, and the proposal of a package of strategies and measures suited to addressing trace substances at nationwide level.

The outcomes of the discussions, which were intense and sometimes highly controversial, are consolidated in the present Policy Paper on 'Recommendations by the multi-stakeholder dialogue on the Trace Substance Strategy of the German Federal Government'. The dialogue process is organised by Fraunhofer ISI and IKU on behalf of the German Environment Agency (UBA) and Environment Ministry (BMUB).

Following the definitions used in water resources management, the options to reduce and prevent trace substance inputs to waters refer to substances that occur at very low concentrations in our waters. Relevant trace substances are such substances that even at very low concentrations can have adverse effects on aquatic ecosystems and/or can adversely affect the extraction of potable water from raw water. Interactions among various trace substances must also be taken into account. Trace substances originate from diverse products, such as biocides, human and veterinary pharmaceuti-

cals, plant protectants, industrial chemicals, detergents and personal care products. They are used or deliver utility in various fields. In the aquatic environment, they can cause micropollution. Some of these substances are regulated as 'priority substances' or 'river-basin-specific pollutants', while for others no mandatory quality targets have been established for waters.

In the preamble to Directive 2013/39, the EU notes that contamination of water with pharmaceutical residues is an emerging environmental concern; the EU has announced a European strategy to address this problem. The outcomes of the multi-stakeholder dialogue shall feed into the debate on the European strategy, for instance in connection with the European Commission's Roadmap for a 'Strategic approach to pharmaceuticals in the environment', and will be synchronised with the associated policies. The 86th meeting of the Conference of the Environment Ministers of the Länder in the Federal Republic of Germany (*Umweltministerkonferenz*, UMK) has taken note of the report by the Working Group on Water Issues of the German Federal States and the Federal Government (LAWA) on micropollutants in the aquatic environment (*'Mikroschadstoffe in Gewässern'*), and has requested that the findings be taken into account when developing a pollutant strategy coordinated between the federal and Länder governments.

The multi-stakeholder dialogue on a Trace Substance Strategy of the Federal Government focuses on recommendations at all levels of action to reduce inputs to waters from biocides, plant protectants, detergents and cosmetics, household and industrial chemicals, and pharmaceuticals. The outcomes of parallel processes (see Section 2) and multi-stakeholder dialogues that are also relevant to inputs of trace substances to the aquatic environment are taken into account by involving the various federal departments and representatives of the parallel processes in the multi-stakeholder dialogue on a Trace Substance Strategy of the Federal Government. However, the specific topics of those parallel processes were not addressed in further depth; this approach was chosen in order to allow a focus on those topics for which there are and have not until now been dialogue processes at federal level.

MANAGEMENT SUMMARY

As a part of preparations for a federal-government strategy to protect the aquatic environment against anthropogenic trace substances, the multi-stakeholder dialogue on a Trace Substance Strategy of the Federal Government was launched on 7 November 2016. In a first phase up to June 2017, recommendations to policy-makers were elaborated with the stakeholders; the issues addressed in that phase are to be further concretised in a follow-on phase. The multi-stakeholder dialogue focuses on options for action to reduce inputs to waters from biocides, plant protectants, detergents and cosmetics, household and industrial chemicals, and pharmaceuticals.

At four workshops

- on mitigation strategies at source (19 January 2017),
- on mitigation strategies on the user side (16 February 2017),
- on mitigation strategies based on end-of-pipe measures (21 March 2017)
- and to amalgamate the recommendations for action (9 May 2017),

14 recommendations were elaborated.

Trace substances are found in our waters. Some of them have adverse effects on ecosystems and/or on drinking water extraction from raw water. Their sources include the production and use of products such as human and veterinary pharmaceuticals, biocides, plant protectants, industrial and household chemicals, detergents and personal care products. They enter the waters through both point and non-point pathways. To reduce their inputs to waters effectively, a coordinated strategy needs to be adopted at federal level.

The recommendations for action target mitigation strategies at source, on the user side and at the end of pipe. They are explained in more detail in Sections 2 to 6 of this paper. Figure 1 gives an overview of the topics of the recommendations formulated.

<i>source-related</i>	<i>use-related</i>	<i>end-of-pipe</i>
1.: Determination of relevant trace substances		
2.1: Communicating the findings of environmental risk assessments and closing knowledge gaps	3.1: Joint information campaigns on the relevance of trace substances to the aquatic environment	4.1*: Orientative framework for additional effluent treatment in sewage plants
2.2: Producer recommendations on behaviour to mitigate trace substance inputs to waters	3.2: Taking up the issue of the relevance of trace substances to the aquatic environment in initial/advanced training and advisory programmes	4.2*: Research, and development if appropriate, of measures specific to precipitation-water discharge and combined stormwater-sewage discharge
2.3: Recording, and reducing where appropriate, effluent discharges from production and processing	3.3*: Target-group-focused labelling schemes	4.3*: Exchange of information and R&D on the upgrading of municipal sewage infrastructure
2.4*: Reducing trace substance contents in imported products	3.4: Development or refinement of specific measures on the user side	4.4: Proper disposal of residues and wastes
5.*: Costs of implementing the Trace Substance Strategy		

Figure 1: Overview of the topics of the recommendations produced by the dialogue*

Overarching importance attaches to **Recommendation 1**: ‘To define and evaluate specific measures within the Trace Substance Strategy, it is necessary to determine relevant trace substances and the requisite actions.’ The determination of relevant trace substances serves to guide and focus activities, provides a basis for monitoring, and sets the framework for the German Federal Government’s Trace Substance Strategy.

Recommendations 2.1 to 2.4 address **sources** and thus production and imports.

* Recommendations on which dissenting opinions were voiced by individual stakeholders. These opinions are stated in full in their respective contexts in Sections 2 to 6 (Table 1 provides an overview).
 Note by bdew: ‘The 4.1 and 4.3 texts in the Figure should have the same wording as the texts of the Recommendations.’

Recommendation 2.1: *'The available findings of environmental risk assessment studies should be communicated in a transparent manner, and serve to update risk assessments and risk management schemes. Further studies are needed in order to close knowledge gaps.'*

Recommendation 2.2: *'Producers of relevant trace substances and of products containing such substances bear responsibility for preventing or reducing the input of these substances to the aquatic environment. Relevant substances or substance groups must be identified, and recommendations for action to prevent/reduce them in waters must be formulated. Risk assessment underpins these recommendations.'*

Recommendation 2.3: *'The inputs to the environment of trace substances relevant to waters that are caused by effluent discharges from production and processing are to be recorded, assessed and reduced in a manner commensurate with their environmental relevance.'*

Recommendation 2.4*: *'Inputs to the environment of relevant trace substances from products are to be reduced by means of sector-specific agreements and rules on the reduction of contents of relevant trace substances in imported products.'*

It follows that producers must have a substantial say in the design of measures at source. The producer responsibility noted in Recommendation 2.2 is the basis for measures at source. Recommendation 2.1 sets out the conditions for realising producer responsibility, such as transparent communication of potential hazards, the updating of assessments and the closing of knowledge gaps. Recommendations 2.3 and 2.4 address concrete points of leverage: discharges from production and processing, and sector-specific agreements on imported products

Recommendations 3.1 to 3.4 address the **use or application** of substances by technical staff, professional users and consumers. The Recommendations aim at a modified handling of such substances and products that can give rise to trace substance inputs into the aquatic environment.

Recommendation 3.1: *'Stakeholders initiate joint information campaigns and educational provision in order to inform the public comprehensively about the relevance of trace substances to the aquatic environment and create an awareness of the need to handle such products sustainably and dispose of them in an environmentally sound manner.'*

Recommendation 3.2: *'A mandatory basis must be created for sufficient awareness-raising of technical staff and professional users concerning the proper use of products containing relevant trace substances, in order that the issue of the relevance of trace substances to the aquatic environment is taken up in initial and advanced training and in advisory programmes.'*

Recommendation 3.3*: *'Labels inform both technical staff and the users of products containing relevant trace substances about potential impacts on the aquatic environment. The design and communication of labelling systems is readily comprehensible and target-group-focused.'*

Recommendation 3.4: *'Building upon the experience gained in the various product sectors, specific technical and organisational measures to reduce the entry into the environment of relevant trace substances should be developed or refined for the user side.'*

It follows that there is a need to differentiate between different user groups, such as technical staff and consumers, and that the manufacturers and producers must be involved in the design of measures that tackle the user side. Recommendations 3.1 and 3.3 concretise the necessary conditions, such as establishing mandatory fundamentals, but also leeway, with regard to labelling, information campaigns, and initial/advanced training and advisory programmes. It is also recommended that specific technical and organisational measures to reduce the entry into the environment of trace substances should be refined, such as substitution, take-back and collection/containment systems (3.4).

Recommendations 4.1 to 4.4 address **end-of-pipe measures**, involving technical or organisational measures by which to prevent or reduce inputs of relevant trace substances to the aquatic environment.

Recommendation 4.1*: *'To achieve a distinct reduction of the pollution of waters by relevant trace substances, their input to the aquatic environment must already be prevented or reduced at source or on the user side. In justified cases, additional treatment in sewage plants is an important element of efforts to reduce relevant trace substances. Criteria for justified cases include, for instance, the pollution charge of waters, efficiency criteria, standards applying to the use of the water, and the sensitivity of waters. In this context, a uniform nationwide orientative framework needs to be created that provides sufficient leeway for the Länder.'*

Recommendation 4.2*: *'The relevance of precipitation-water discharge and combined stormwater-sewage discharge to the pollution of the aquatic environment by relevant trace substances should be studied in order to be able to devise suitable measures if appropriate. To gauge the effects of existing and new measures, research should be intensified and supported.'*

Recommendation 4.3*: *'To promote the upgrading of municipal sewage infrastructure and reduce trace substances in a targeted manner, a structured exchange of information and experience among all stakeholders should be facilitated. As an ancillary measure, research and demonstration activities should be carried out to address further issues.'*

Recommendation 4.4: *'For products containing relevant trace substances and posing a risk to the aquatic environment, proper disposal of residues and wastes must be ensured. To this end, the provision of user information should be intensified and the existing collection systems should be further developed in line with requirements.'*

These recommendations underscore the need for a uniform nationwide orientative framework for the selection of sewage plants in which, taking account of various criteria (such as pollution charge of specific waters), additional treatment is purposeful (Recommendation 4.1). Recommendations 4.2 to 4.4 concern the need for research on the effects of existing and new measures in relation to precipitation-water discharge and combined stormwater-sewage discharge, action to ensure the proper disposal of residues and wastes, action to facilitate the exchange of information and experience among all stakeholders, which highlights the linkages among the three levels of action, and ancillary research and demonstration activities to address further issues.

Recommendation 5* concerns the financing of the Trace Substance Strategy: *'Implementation of the Trace Substance Strategy incurs costs. Their level depends upon the level/goal of protection that is to be achieved. A proposal for ways to finance these costs must be elaborated by the Federal Government.'* This underscores that financing must be put in place, as without this key elements of a Trace Substance Strategy cannot be realised.

* Dissenting opinions on the individual Recommendations are collated in Table 1.

Table 1: Dissenting opinions on the individual Recommendations

on	by	<i>Dissenting opinion</i>
2.4	Gesamtverband der deutschen Textil- und Modeindustrie e.V.	<i>The existing legal instruments and voluntary commitment mechanisms in the textile chain are effective. We therefore reject additional sector-specific requirements and rules.</i>
3.3	VCI and IKW	<i>Especially the labels of products destined for final consumers should contain the information needed for their safe use in the most concise and clear form. This is already difficult to achieve today because of the many labelling rules. We therefore reject additional labelling rules.</i>
4.1	bdew	<i>Even today there are trace substances that cannot be retained by technical measures and are therefore released to waters in an uncontrolled manner. Insofar it is essential to adopt measures for these substances at source and on the user side.</i>
4.2	Deutscher Städtetag, Deutscher Städte- und Gemeindebund and VKU	<i>The experience of local authorities and municipal corporations shows that there are numerous unresolved issues with regard to precipitation-water management. To resolve these, more research and more practical studies are needed. Such inputs to precipitation water can currently only be reduced to a limited extent; this is because various purification techniques are still at the trial stage. Moreover, the option to convey polluted precipitation water via combined-water systems must remain in the future, in order that purification can take place in the sewage plant.</i>
4.3	bdew	<i>Not the upgrading of municipal sewage infrastructure is the primary goal, but the reduction of trace substances. For a great number of trace substances, there is no link between these two goals.</i>
5	bdew	<i>Financing to cover the costs of the Trace Substance Strategy must be guided by the polluter pays principle, and must not involve a burden for those who pay wastewater charges. This applies particularly in light of the circumstance that an input-reducing effect can only be achieved via the product price.</i>
	DVGW	<i>The costs of the Trace Substance Strategy must be apportioned in a balanced manner among the polluters. It is too early to engage in debate on financing options.</i>

PROCESS DESIGN OF THE MULTI-STAKEHOLDER DIALOGUE

The substantive focus, the design of the dialogue process and the selection of organisations to be involved were established on the basis of exploratory talks held with each stakeholder prior to the process. At the kick-off event, which was attended by stakeholders, federal government departments, public authorities and Länder representatives, the outcomes of the exploratory talks were presented, as were the background, objective and key methodological elements of the multi-stakeholder dialogue process. That event further involved formulation of participants' expectations upon the dialogue, and agreement on the setting and rules of the dialogue process (focus on solutions, striving for agreement, joint release of outcomes).

Three technical workshops were carried out, focusing on the key fields of action in the life cycle of trace substances:

- Mitigation strategies at source (19 January 2017)
- Mitigation strategies on the user side (16 February 2017)
- Options for end-of-pipe measures (21 March 2017).

An additional workshop was organised on 9 May 2017 to consolidate the outcomes.

Figure 2 shows the three fields in which points of leverage for mitigation measures arise. The first two – source-related and use-related approaches – are particularly closely linked.

The exploratory talks also provided a substantive basis for the workshops in the multi-stakeholder dialogue process; their outcomes were documented and were agreed upon with the stakeholders in the course of the kick-off event. A number of previous research and development projects provided a further basis, notably:

- the report by the Working Group on Water Issues of the German Federal States and the Federal Government (LAWA) on micropollutants in the aquatic environment (*'Mikroschadstoffe in Gewässern'*), which sets out the trace-substance loading of waters in Germany,

- the research project conducted by the German Environment Agency (UBA) on measures to reduce micropollutant inputs to the aquatic environment (*‘Maßnahmen zur Verminderung des Eintrages von Mikroschadstoffen in Gewässern’*) and
- the outcomes of the recently concluded German Research Ministry (BMBF) funding measure ‘Risk Management of Emerging Compounds and Pathogens in the Water Cycle’ (*‘Risikomanagement von neuen Schadstoffen und Krankheitserregern im Wasserkreislauf’*, RiSKWa)

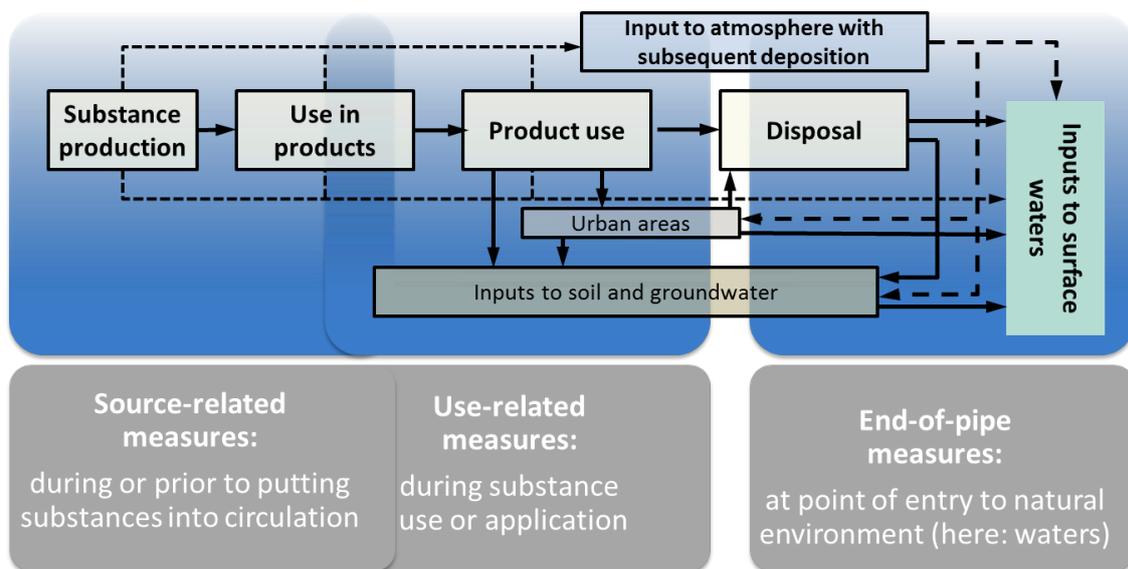


Figure 2: Points of leverage for emissions reduction measures¹

The representatives of federal departments and authorities involved in the process ensured the direct exchange of information among stakeholders, BMUB, Fraunhofer ISI and IKU. The following federal ministries informed the stakeholders about the findings, linkages and current developments of relevance to the Trace Substance Strategy:

- Education and Research (RiSKWa),
- Health (MinimEHR, DART 2020),
- Food and Agriculture (NAP),
- Economic Cooperation and Development (BnT).

¹ Modified after Hillenbrand et al (2016): *Maßnahmen zur Verminderung des Eintrages von Mikroschadstoffen in die Gewässer – Phase 2*. Umweltbundesamt (Berlin): Texte 60/2016 https://www.umweltbundesamt.de/sites/default/files/medien/377/publikationen/mikroschadstoffen_in_die_gewasser-phase_2.pdf

At the technical workshops, strong substantive linkages and potential synergies were noted between the Trace Substance Strategy and the following parallel processes of federal departments:

1. National Action Plan on Sustainable Use of Plant Protection Products (NAP)
 - The goal of the NAP is to further reduce the risks that can emerge through the use of plant protection products. To that end it sets out specific goals, measures and indicators.
 - Linkages between the NAP and the Trace Substance Strategy are to be identified and utilised in Phase 2 of the multi-stakeholder dialogue on the Strategy.
2. Partnership for Sustainable Textiles (*Bündnis für nachhaltige Textilien*, BnT)
 - One goal of the Partnership is transparent communication that permits consumers to recognise sustainable textiles more easily.
 - The Partnership aims to develop uniform and good instruments and standards for risk assessment and labelling.
 - BnT stakeholders are involved in the multi-stakeholder dialogue on trace substances.
3. 'Minimising inputs of human pharmaceuticals to raw water' (*Minimierung des Eintrags von Humanarzneimitteln in Rohwasser*, MinimEHR)
 - The project group was established 2014 on behalf of the Federal Health Ministry (BMG), coordinated by the Federal Environment Agency (UBA) and with contributions from the Federal Institute for Drugs and Medical Devices. A final report was submitted to the Ministry in March 2017; the report is now being evaluated.
 - Involvement of relevant stakeholders is envisioned in the further course of the process.
 - Interlinkage with the outcomes of the multi-stakeholder dialogue is conceivable.
4. Funding measure 'Risk Management of Emerging Compounds and Pathogens in the Water Cycle' (*Risikomanagement von neuen Schadstoffen und Krankheitserregern im Wasserkreislauf*, RiSKWa)
 - The Federal Research Ministry (BMBF) utilises the multi-stakeholder dialogue on the Trace Substance Strategy of the German Federal Government to identify knowledge gaps. This supplements the findings generated by RiSKWa. The knowledge gaps and research requirements identified in the multi-stakeholder dialogue are to be further concretised, under the aegis of BMBF and in dialogue with relevant stakeholders.

The starting points for recommendations for action were formulated as propositions in outcome documents; these served to guide debate in the technical workshops. At the three technical workshops, the propositions were discussed, addressed and adjusted by the stakeholders. After the three workshops, the propositions were amalgamated to recommendations during a final, fourth workshop. Basic agreement among the stakeholders was sought here. Dissenting opinions were documented.

The present Policy Paper includes the dissenting opinions and presents the jointly agreed recommendations, together with brief explanations. This is intended to contribute to the definition of political priorities with relation to trace substances during the next term of parliament. In a follow-on process, the strategy for reducing trace substance inputs to the aquatic environment shall be further concretised.

RECOMMENDATIONS FOR ACTION

1 Determination of relevant trace substances

To provide a basis for defining and evaluating specific measures, Recommendation 1 addresses the determination of relevant trace substances, which is also important for use-related and end-of-pipe measures.

RECOMMENDATION 1: To define and evaluate specific measures within the Trace Substance Strategy, it is necessary to determine relevant trace substances and the requisite actions.

The Trace Substance Strategy addresses all anthropogenic trace substances relevant to water resources protection². In order to achieve a joint, nationwide orientation and focus within the Strategy, to agree on the need and options for action to mitigate impacts in the various generator fields, and to promote an efficient deployment of resources in monitoring, it is necessary to identify those trace substances that are highly relevant with regard to their occurrence in the environment and their human- or ecotoxicological properties³.

It needs to be ensured here that all the major generator and activity fields are covered, and that this set of substances allows monitoring, as required, as a basis for evaluating the Strategy. The stakeholders formulate proposals for the determination of relevant

² On the definition of the concept of 'relevant trace substance' as used here, see the Glossary (pp. 28 ff).

³ Cf. the approach pursuant to the EU Technical Guidance Document (TGD 2003).

trace substances for their specific spheres of responsibility. The determination of relevant trace substances is a task for the second phase of the multi-stakeholder dialogue on the Trace Substance Strategy of the German Federal Government, and shall be used for the further concretisation and implementation of the recommendations that emerge from the dialogue. The determination process is the responsibility of BMUB in close consultation with the Länder authorities.

Determination can employ numerous previous works and existing lists of substances⁴. Exclusive use of one of the existing lists would not be purposeful, for various reasons (other purpose of the list, other regional frame of reference, lack of currency).

Knowledge of the effects and occurrences of relevant trace substances in waters is always incomplete because of the great diversity of substances. Such knowledge depends both upon technical advances in analytics and findings and studies about substances' impacts. This is why the precautionary principle is pivotal. Determinations must be adjusted when new relevant findings concerning trace substances in waters become available. To this end, a process needs to be defined that is in line with the German Surface Waters Ordinance (*Oberflächengewässerverordnung*, OGeWV) and the EU Water Framework Directive.

Clustering substances in chemically related groups appears purposeful for determination. Timely development of such an approach could allow the Federal Government to provide input to related discussions at European level.

⁴ For instance: river-basin-specific pollutants pursuant to the German Surface Waters Ordinance (*Oberflächengewässerverordnung*, OGeWV); substance groups and representative substances defined in the LAWA report '*Mikroschadstoffe in Gewässern; Prioritäre und prioritär gefährliche Stoffe nach den EU-Richtlinien 2013/39/EU, 2008/105/EG und 2000/60/EG*'; EU Watch List pursuant to Directive 2008/105/EC; ICPR List of Rhine Substances 2014; Polar organic trace substances as indicators in anthropogenically influenced hydrological cycles (*Polare organische Spurenstoffe als Indikatoren im anthropogen beeinflussten Wasserkreislauf*, a RiSKWa paper).

2 Mitigation strategies at source

Source-related approaches to reduce inputs of trace substances include closing information gaps in environmental risk assessment of individual substances and substance mixtures (Recommendation 2.1) and, building on that work, developing and implementing a risk management scheme (Recommendation 2.2). Within the risk management scheme, environmental pollution by relevant trace substances caused by discharges from production and processing (Recommendation 2.3) and imports (Recommendation 2.4) needs to be considered and mitigated.

RECOMMENDATION 2.1: *The available findings of environmental risk assessment studies should be communicated in a transparent manner, and serve to update risk assessments and risk management schemes. Further studies are needed in order to close knowledge gaps.*

Studies of the impacts and environmental risks associated with relevant trace substances in waters should be further advanced. There is (still) insufficient knowledge about many substance and metabolites. There is also a need for research in order to improve analytical processes and assess the combined action of relevant trace substances in a targeted manner. Further gaps in knowledge prevail, for instance with regard to pathways (e.g. rainwater, non-point sources) and special regional effects.

The effort required for such studies should be minimised by taking an approach focussed on relevant trace substances. Existing sources of information should be used (e.g. on substance properties and uses in REACH registration dossiers, biocide active agent approvals, EMA datasets for authorised pharmaceuticals).

The procedures and findings of studies are to be communicated in a transparent manner. Tools suited to the various target groups (public authorities, technical staff, final consumers, wider public) are to be used in this. Existing information platforms are to be used wherever possible. Producers should increase data transparency, publishing environmental risks, for instance via their company websites, and make knowledge accessible to water resources management institutions. Consumer and users should be informed by the relevant stakeholders.

The knowledge generated by the additional studies should be transmitted to fields of activity such as the regulatory assessment of substances in product approval procedures, in order to adjust the existing risk assessments and risk management schemes to the latest scientific findings.

RECOMMENDATION 2.2: Producers of relevant trace substances and of products containing such substances bear responsibility for preventing or reducing the input of these substances to the aquatic environment. Relevant substances or substance groups must be identified, and recommendations for action to prevent/reduce them in waters must be formulated. Risk assessment underpins these recommendations.

Producer responsibility for products containing relevant trace substances comprises an appraisal of the environmental relevance of substances, the provision of information to and awareness-raising of users and consumers of substances/products, and, where there is an environmental hazard, the identification and implementation of remedial measures within the framework of a risk management scheme.

The information and recommendations for action need to be communicated in a transparent manner. Existing information platforms can be utilised and expanded for this purpose, or new information tools employed. What is decisive is that the form is tailored to the various target groups (public authorities, technical staff, final consumers, wider public); this form must make all relevant aspects accessible in a package.

Recommendations for action can be formulated by producers, by producer-stakeholder groups, and/or by a neutral institution. Competencies for this are to be clarified and laid down in the further course of the multi-stakeholder dialogue process, or by federal government.

RECOMMENDATION 2.3: *The inputs to the environment of trace substances relevant to waters that are caused by effluent discharges from production and processing are to be recorded, assessed and reduced in a manner commensurate with their environmental relevance.*

In accordance with the procedures adopted for other environmentally relevant substances, analyses at both direct and indirect dischargers are required for anthropogenic trace substances relevant to waters. The available data, for instance from plant and substance registries, are to be taken into account, data gaps identified and closed, and the data thus generated are to be processed in a transparent manner. Measurement programmes and reporting duties – if required – are to be designed in a targeted manner and limited to a suitable scope. Concrete recommendations for the approach to be taken can be derived from sector-specific best practice.

The information assembled ensures the availability of findings upon which the necessary risk management activities can build – including an evaluation of the need for action and the requisite implementation of emission abatement measures. Selection of substances to be studied should be guided by the determination made according to Recommendation 1. Emission-abatement measures can involve both in-company modifications and improvements to purification technology in industrial effluent treatment plants.

RECOMMENDATION 2.4: *Inputs to the environment of relevant trace substances from products are to be reduced by means of sector-specific agreements and rules on the reduction of contents of relevant trace substances in imported products.*

To limit inputs to the aquatic environment of relevant trace substances from imported products, monitoring of the obligations/restrictions upon substances contained in imported products should be stepped up (approval, labelling and communication obligations, restrictions). This can build upon existing federal government initiatives and voluntary commitments in individual sectors.

In general, national and EU-wide bans and restrictions should be transferred to the extent possible to internationally imported products. EU single market rules and world trade law need to be taken into account. Voluntary agreements by producers can help to advance such developments.

The rules governing restrictions upon relevant substances applicable at European level should be developed in such a way that these can also be complied with by imported products. This applies particularly to products imported from non-EU states in which substances banned or restricted in the EU can still be used.

At the same time, restrictions upon relevant trace substances should be expanded at international level, e.g. in the context of the Stockholm Convention to end or restrict the production, use and release of persistent organic pollutants.

Online trading and the increasing volume of goods traded via online services needs special consideration; in this field, there is still partly a lack of sufficient information and data.

To safeguard monitoring and checking of imported products with regard to their impacts, sufficient inspection and analytical capacities need to be ensured or created.

Dissenting opinion on Recommendation 2.4.⁵

⁵ Dissenting opinion of the Confederation of the German Textile and Fashion Industry (Gesamtverband der deutschen Textil- und Modeindustrie e.V.): *'The existing legal instruments and voluntary commitment mechanisms in the textile chain are effective. We therefore reject additional sector-specific requirements and rules.'*

3 Mitigation strategies on the user side

Strategies and measures on the user side to prevent and reduce the entry of trace substances into the environment address the options for producers, professional users and final consumers to act when handling finished products (e.g. clothing, pharmaceuticals, paints and varnishes, personal care products, household chemicals). The recommendations for action aim at an altered handling of substances or products from which inputs of relevant trace substances to the aquatic environment can result, and address technical and organisational options at the sites of use. They include segregated collection followed by safe disposal, but also distributed conditioning of highly polluted effluent streams. These measures should be accompanied by awareness-raising, informational and educational measures. Product labelling can help consumers to behave in a more environmentally sound manner.

The recommendations for action on mitigation strategies on the user side comprise several issue areas: campaigns to raise public awareness (3.1), inclusion of 'trace substances in waters' as a topic in educational and advisory programmes (3.2), indications of relevant trace substances in product labelling (3.3) and the development and broad-based implementation of technical and organisational measures to reduce or prevent emissions of relevant trace substances on the user side (3.4). Links to the recommendations on mitigation strategies at source are noted where such links arise.

RECOMMENDATION 3.1: Stakeholders initiate joint information campaigns and educational provision in order to inform the public comprehensively about the relevance of trace substances to the aquatic environment and create an awareness of the need to handle such products sustainably and dispose of them in an environmentally sound manner.

Informing and raising the awareness of the public about the issues surrounding trace substances is a key element of the Trace Substance Strategy. This promotes acceptance of the Strategy overall, and involves members of the public in emissions-reducing measures by modifying their behaviour. The precondition is that those involved become aware of the issues. Important points of leverage include:

- producing material for the media, schools, adult education centres, etc., in a process involving the relevant stakeholders for the various product categories,
- sector- and issue-specific information campaigns,
- structured expansion of freely available, target-group-specific information platforms on products, their active ingredients and their environmentally sound disposal by trustworthy institutions, and
- development of models and services to perpetuate the campaigns

Development of a target-group-specific, professional communication strategy is essential in order to raise public awareness of the issue surrounding trace substances and inform the public about the options it has to modify its own behaviour. Target groups should be involved in information campaign design in order to appropriately address their requirements and specific levels of knowledge. Goal conflicts should be stated in the course of information campaigns.

RECOMMENDATION 3.2: A mandatory basis must be created for sufficient awareness-raising of technical staff and professional users concerning the proper use of products containing relevant trace substances, in order that the issue of the relevance of trace substances to the aquatic environment is taken up in initial and advanced training and in advisory programmes.

Targeted information and advice for technical staff and professional users on how to handle products containing relevant trace substances is essential in order to allow a more aware handling of products. Findings on the environmental relevance of trace substances and on options to prevent and reduce environmental impacts should be integrated in the initial and advanced training of technical staff and professional users. Points of leverage suited to the various fields of application are identified, promoted and implemented by the stakeholders. Due to the different structures, distinctions can be made between, for instance:

- Pharmaceuticals: doctors, dispensing chemists, nursing staff (initial and advanced training)
- Biocides: specialist advice for professional users, retailers (initial and on-the-job training of sales staff), trainee courses and courses for acquisition of specialist competence

- Washing and cleansing agents: retailers, professional users and consumer protection institutions.

The goal is to make professional users of relevant products aware of the risks that can emanate from the trace substances contained in products, and of the options to prevent and reduce such risks. They should become acquainted with good practice, which comprises proper use of products as well as preventive and alternative measures. It is expedient to link these activities closely to recent findings, for instance from environmental risk assessments (2.1) and (more technically oriented) demonstration projects (3.4).

Responsibilities for determining proper use or proper handling are to be clarified and defined in the further course of the multi-stakeholder dialogue. To make the corresponding thematic additions to syllabuses, curricula etc., the federal and Länder education ministries need to be involved.

RECOMMENDATION 3.3: Labels inform both technical staff and the users of products containing relevant trace substances about potential impacts on the aquatic environment. The design and communication of labelling systems is readily comprehensible and target-group-focused.

That producers provide a readily comprehensible and target-group-focused labelling of products containing relevant trace substances is a precondition to users (technical staff and product users) behaving in an environmentally sound manner when handling these products and thus preventing or reducing environmental impacts. For the relevant trace substances and the various product fields, the scope for action towards product-specific labelling of impacts on the environment in general or the aquatic environment in particular should be reviewed and (further) developed. These activities should build upon existing labelling systems. If those are considered insufficient to promote the goal of maintaining water quality, additional product-specific labelling elements should be introduced. Consideration must be given to compatibility between new labelling systems and existing legislation and case law.

With the involvement of producers, it needs to be examined to what extent information on relevant trace substances is available in sufficient volume and clarity. For those fields for which no ecolabelling of products is yet in place (such as prescription-only and over-the-counter medicines, cosmetics), a labelling system should be devised and

implemented wherever necessary; if appropriate, this system should provide for differentiated depths of information for technical staff and final users (e.g. patients). Care should be taken to employ uniform symbols and information systems, in order not to overburden users and consumers by a great array of systems.

Mandatory labelling needs to be regulated at European level and must apply to all products placed on the market in the EU. National labelling activities can proceed within the context of voluntary labelling schemes.

Dissenting opinion on Recommendation 3.3.⁶

RECOMMENDATION 3.4: Building upon the experience gained in the various product sectors, specific technical and organisational measures to reduce the entry into the environment of relevant trace substances should be developed or refined for the user side.

Building upon past experience in various product sectors, specific technical and organisational measures should be deployed broadly. Furthermore, research and pilot projects should be launched and brought to market maturity. Product-specific solutions to be developed could include:

- Substitution
- Take-back systems
- Collection/containment systems (at consumers or in institutions),
- Technical devices for optimal dosing
- Special processing methods such as encapsulation or application systems.

Based upon risk assessment findings and risk management schemes (see 2.1), measures are to be developed jointly by producers and users. Direct coupling with activities following from Recommendation 2.2 is possible. In addition, for the individual

⁶ Dissenting opinion of VCI and IKW: *‘Especially the labels of products destined for final consumers should contain the information needed for their safe use in the most concise and clear form. This is already difficult to achieve today because of the many labelling rules. We therefore reject additional labelling rules.’*

fields, approaches should be developed for implementing the experience gained as broadly as possible (e.g. information measures (3.1) in tandem with Recommendation 3.2 or 3.3, financial incentives, etc.).

4 Mitigation strategies based on end-of-pipe measures

The entry of trace substances to the aquatic environment can be reduced by means of end-of-pipe measures. Supporting information measures are to be seen in connection with the recommendations for action on mitigation strategies on the user side. As concerns options for end-of-pipe measures to reduce the entry of relevant trace substances to waters from agriculture, such as establishing permanent buffer strips along the banks of water bodies, reference is made, in accordance with the stakeholder agreement, to the parallel process concerned with the National Action Plan on Sustainable Use of Plant Protection Products (*Nationaler Aktionsplan zur nachhaltigen Anwendung von Pflanzenschutzmitteln*, NAP) and to implementation of the EU Water Framework Directive.

The recommendations for action on mitigation strategies based on end-of-pipe measures address: additional treatment of wastewater in municipal sewage treatment plants (4.1.), examination of the relevance of precipitation-water discharge and combined stormwater-sewage discharge (4.2) and proper disposal (4.4). The need for underpinning through measures to promote the sharing of experience and through further research and demonstration projects is addressed by Recommendation 4.3.

RECOMMENDATION 4.1: *To achieve a distinct reduction of the pollution of waters by relevant trace substances, their input to the aquatic environment must already be prevented or reduced at source or on the user side. In justified cases, additional treatment in sewage plants is an important element of efforts to reduce relevant trace substances. Criteria for justified cases include, for instance, the pollution charge of waters, efficiency criteria, standards applying to the use of the water, and the sensitivity of waters. In this context, a uniform nationwide orientative framework needs to be created that provides sufficient leeway for the Länder.*

In addition to measures at source or on the user side, or when such measures are not possible (e.g. due to a lack of substitution options), the expansion of municipal sewage plants can serve to reduce relevant trace substances; in some situations, this can substantially reduce releases to the aquatic environment. Various processes are available for this purpose. Plants of this kind are currently found especially in the German Länder

of North Rhine-Westphalia and Baden-Württemberg, and in Switzerland. Based on the experience gained with these plants and with various research projects, there is a fundamental understanding of their effectiveness and costs.

A differentiated approach must be taken that considers following criteria among others:

- Pollution charge of receiving waters (possibly determined on the basis of the proportion of wastewater in channel flow) (this includes assuming upstream responsibility); monitoring results, substance-flow models and emission registers can be used here;
- Efficiency and cost-effectiveness criteria (such as the size and state of wastewater management facilities);
- Standards applying to the use of the water (conservation of (potable) water resources) including leisure uses (bathing waters);
- Ecological sensitivity of waters.

The above criteria should be defined in a uniform nationwide orientative framework that provides leeway for the Länder. Only in a second step should the federal government, acting in close consultation with the Länder, consider an expansion of the German Wastewater Ordinance (*Abwasserordnung*; amendment to Annex 1).

Dissenting opinion on Recommendation 4.1.⁷

RECOMMENDATION 4.2: The relevance of precipitation-water discharge and combined stormwater-sewage discharge to the pollution of the aquatic environment by relevant trace substances should be studied in order to be able to devise suitable measures if appropriate. To gauge the effects of existing and new measures, research should be intensified and supported.

For products containing relevant trace substances that have outdoor applications, but also for substances entering waters via the air pathway or via street outlets, precipita-

⁷ Dissenting opinion of bdew: *'Even today there are trace substances that can not be retained by technical measures and are therefore released to waters in an uncontrolled manner. Insofar it is essential to adopt measures for these substances at source and on the user side.'*

tion water can represent a relevant path by which these trace substances enter the aquatic environment. In sewerage systems designed as combined systems that receive both stormwater and sewage, untreated combined-water releases can cause a direct discharge of effluent and thus the input of trace substances to the aquatic environment. Overall, a need for research remains with regard to the precise analysis and recording of relevant trace substance loads in precipitation-water discharge and combined stormwater-sewage discharge. Such analyses must consider, beside technical aspects, the character of the catchment area (conurbation, commercial zone, types and intensities of use, etc.). Where sufficient information on relevant inputs of trace substances via precipitation-water discharge and combined stormwater-sewage discharge is available, appropriate solutions should be identified and implemented.

In addition to measures addressing sources and the user side, substance inputs can be reduced through decentral (locally at the level of individual buildings or city quarters) and central precipitation-water management. Such approaches have already been trialled in various pilot projects. They are considered applicable mainly at points with high inputs or for waters of particular conservation value. In contrast to localised precipitation-water management, combined-water sewerage systems with purification in sewage treatment plants can be an alternative, with due regard to potential trace substance inputs. The goal is to minimise untreated combined-water releases.

Building upon the experience gathered, and in conjunction with Recommendation 4.3, trace-substance-focused pilot projects should further refine the approaches and technical strategies and adjust them to diverse settings. A comprehensive exchange of experience should be initiated in order to make the findings gained universally available.

Dissenting opinion on Recommendation 4.2.⁸

⁸ Dissenting opinion of Deutscher Städtetag, Deutscher Städte- und Gemeindebund and VKU: *'The experience of local authorities and municipal corporations shows that there are numerous unresolved issues with regard to precipitation-water management. To resolve these, more research and more practical studies are needed. Such inputs to precipitation water can currently only be reduced to a limited extent; this is because various purification techniques are still at the trial stage. Moreover, the option to convey polluted precipitation water via combined-water systems must remain in the future, in order that purification can take place in the sewage plant.'*

RECOMMENDATION 4.3: *To promote the upgrading of municipal sewage infrastructure and reduce trace substances in a targeted manner, a structured exchange of information and experience among all stakeholders should be facilitated. As an ancillary measure, research and demonstration activities should be carried out to address further issues.*

In recent years, research and pilot projects have been carried out on ways to upgrade municipal sewage treatment plants so as to reduce trace substances. In addition to projects and studies at international level, new scientific findings and practical experience have been gathered through the RiSKWa project, which was concluded in 2015 with support from the German Research Ministry (BMBF), and through pilot projects carried out by individual Länder. Some Länder have set up centres of competence to provide scientific and technical backup for the implementation of measures. This work has concentrated on upgrading sewage treatment plants in order to reduce trace substances. Little consideration has been given up to now to the role of sewerage systems, including precipitation-water management, and possible measures by which to reduce trace substance emissions from such systems.

A need is therefore seen to expand the exchange of information for all Länder and other stakeholders, in consultation with the technical-scientific associations, so that all available experience can be reviewed and utilised when setting standards and taking action in future (technical design and dimensioning of facilities, integration and utilisation of existing built structures, cost data, experience with supervision and monitoring). Further research questions should be identified and tackled. This should take account of important recent developments, such as those concerning the future role of sewage treatment plants as energy and resource centres. To implement and introduce such developments, practical demonstration activities are needed as lighthouse projects.

Dissenting opinion on Recommendation 4.3.⁹

⁹ Dissenting opinion of bdew: *'Not the upgrading of municipal sewage infrastructure is the primary goal, but the reduction of trace substances. For a great number of trace substances, there is no link between these two goals.'*

RECOMMENDATION 4.4: For products containing relevant trace substances and posing a risk to the aquatic environment, proper disposal of residues and wastes must be ensured. To this end, the provision of user information should be intensified and the existing collection systems should be further developed in line with requirements.

Recommendations that are uniform nationwide are needed for the disposal of products of trace-substance relevance. To this end, the existing regulations must be taken into account and – where necessary – adjusted. Existing collection/take-back systems should be further developed in accordance with requirements, taking account of regional and local aspects (for instance, in urban settings requirements differ from those in rural areas).

Uniform and consistent information measures supported jointly by stakeholders, including targeted awareness-raising campaigns (coordinated with 3.1 and 3.2) and labelling schemes (coordinated with 3.3), should be deployed and tailored to the various target groups (private final consumers, commercial users and suppliers). Traders and local authorities should make suitable information available as appropriate. The details should be clarified in the further course of the multi-stakeholder dialogue. EU rules on the leaflets enclosed with medicines are desirable, whereby these should take account of the special features of national systems for disposing of pharmaceuticals.

5 Costs and financing of the Trace Substance Strategy

The issue of the costs and financing of the Trace Substance Strategy was discussed during the multi-stakeholder dialogue, without agreement being reached on a more concrete recommendation on this issue. Some stakeholders noted that they have no mandate for this. The Federal Government should make proposals for cost determination and for ways to finance implementation of the Trace Substance Strategy, and should suggest a setting in which to discuss these aspects.

RECOMMENDATION 5: Implementation of the Trace Substance Strategy incurs costs. Their level depends upon the level/goal of protection that is to be achieved. A proposal for ways to finance these costs must be elaborated by the Federal Government.

Implementing measures under the Trace Substance Strategy (such as information measures and campaigns, technical measures on the user side, upgraded sewage treatment, analysis and monitoring) generates costs. The question of who is to bear these costs is not yet resolved. The general environmental policy objective of the polluter pays principle and the objective of balanced burden-sharing among producers, distributors, water resource management institutions and citizens (as consumers, and as those who pay taxes and charges) demands an analysis and assessment of the available instruments (these can include tax, levy and charge approaches, such as utilising the existing wastewater levy instrument, and special funds) and their targeted integration within the overall strategy. The manner in which costs are apportioned can generate allocative effects and, especially in combination with information measures, behavioural incentives that may lead directly and indirectly to further reductions in inputs of substances to the environment. Therefore both the financing contribution and the incentive effects of each instrument need to be assessed. Incentives can generate both short-term effects (such as substitution of trace substances or of relevant products through already available alternatives) and medium- to long-term effects (research and development of new, more environmentally sound approaches or substitutes). A further assessment criterion is the practicability of instruments, which means they can be implemented readily and payments can be collected with minimum effort.

It can be expedient in this context to differentiate between the various sources and applications of relevant trace substances.

Dissenting opinions on Recommendation 5.¹⁰

¹⁰ Dissenting opinion of bdew: *'Financing to cover the costs of the Trace Substance Strategy must be guided by the polluter pays principle, and must not involve a burden for those who pay wastewater charges. This applies particularly in light of the circumstance that an input-reducing effect can only be achieved via the product price.'*
Dissenting opinion of DVGW: *'The costs of the Trace Substance Strategy must be apportioned in a balanced manner among the polluters. It is too early to engage in debate on financing options.'*

GLOSSARY

Direct dischargers: Commercial and industrial enterprises that discharge their liquid effluent directly to a body of water in accordance with a permit under the German Federal Water Act (*Wasserhaushaltsgesetz*).

End-of-pipe measures: The measures that address the point of input of trace substances to the natural environment. These are differentiated from source-related measures (coming into effect during or prior to the placing on the market of substances) and use-related measures (addressing the use or application of substances or products containing trace substances).

Indirect dischargers: Enterprises that discharge their liquid effluent untreated or pre-treated to the municipal sewerage and thus generally discharge it 'indirectly' to the aquatic environment via a municipally-operated sewage treatment plant.

Labelling / product indications of relevant trace substances: In the context of the multi-stakeholder dialogue on the German Federal Government's trace substance strategy, indications on products of their trace substance content are understood above all as product labelling to inform final consumers and retailers, the purpose being to inform them about potential impacts upon waters and urge them to handle products properly and dispose of them safely.

Micropollution: Pollution of the aquatic environment caused by relevant trace substances at very low concentrations.

Polluter pays principle: A principle of environmental protection in environmental law. The principle demands that the costs of measures stipulated under environmental law be borne by the polluter.

Precautionary principle: The principle has two dimensions: risk prevention and resource preservation. Risk prevention means taking precautionary action in situations characterised by incomplete or uncertain knowledge about the type, extent, probability and causality of environmental damage and hazards, in order to prevent such damage or hazards from the outset. Resource preservation means

handling natural resources such as water, soil and air sparingly in order to safeguard them over the long term and preserve them in the interests of future generations.

Priority substances: Substances pursuant to Article 16 of the European Union's Water Framework Directive that present a significant risk to the aquatic environment and for which environmental quality standards have been established.

Producer responsibility: The responsibility that the producers or traders of a product have with regard to their product, including the product's environmental impacts.

Producers: The producers of substances and other industrially producing stakeholders in supply chains.

Relevant trace substances: Trace substances that even at very low concentrations have adverse effects on aquatic ecosystems and/or adversely affect the extraction of potable water from raw water. In the aquatic environment, relevant trace substances cause micropollution. Some of these substances are regulated as 'priority substances' or 'river-basin-specific pollutants'.

Risk assessment: Risk assessment of chemicals involves estimating the probability of occurrence of adverse effects. In this process, the hazardous properties of a chemical are placed in relation to the anticipated exposure of people and the environment to this chemical. Precise rules guide this process at European level (notably the 2003 Technical Guidance Document (TGD) on Risk Assessment).

River-basin-specific pollutants: Specific synthetic and specific non-synthetic pollutants that are listed in Annex 6 to the German Surface Waters Ordinance (*Oberflächengewässerverordnung*, OGWV) and for which environmental quality standards have been established.

Source-related measures: The measures that come into effect during or prior to the placing on the market of substances. These are differentiated from use-related measures (addressing the use or application of substances or products containing trace substances) and end-of-pipe measures (addressing the point of input to the natural environment).

Trace substances: Substances that occur at very low concentrations in waters. Trace substances originate from diverse sectors and products, such as biocides, human and veterinary pharmaceuticals, plant protectants, industrial chemicals, detergents and personal care products.

Use-related measures: The measures that address the use or application of substances or products containing trace substances. These are differentiated from source-related measures (coming into effect during or prior to the placing on the market of substances) and end-of-pipe measures (at the point of input to the natural environment).

Users: The private and professional users of products containing trace substances.

Wastewater facilities: The infrastructure required to convey and treat wastewater.