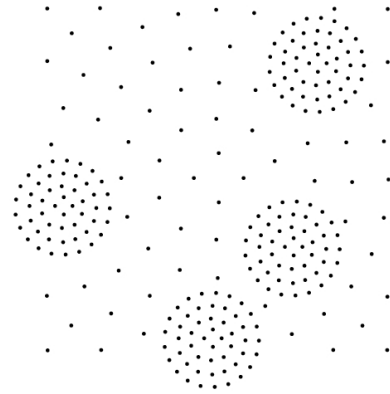


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Environmental Research Network



**Critical Analysis of the Sixth EU Framework Programme for Research
and Development from the Perspective of Transdisciplinary
Sustainability Research**

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For the *oekoforum* - Environmental Research Network

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1 Background

In January 2000, the Commission proposed the creation of a *European Research Area* (ERA) [document COM (2000) 6]. The proposal was adopted by the Member States at the Lisbon European Council of March 2000.¹

Commission Communication COM (2000) 612 of 4 October 2000 *evaluated the outgoing Fifth Framework Programme* and laid down general *guidelines for the Sixth Framework Programme*. Commission Proposal COM (2001) 94 translated these guidelines into concrete terms. Further detail was added in the *Proposals for Council Decisions Concerning the Specific Programmes Implementing the Framework Programme 2002-2006 of the European Community for Research, Technological Development and Demonstration Activities* and the *Proposals for Council Decisions Concerning the Specific Programmes Implementing the Framework Programme 2002-2006 of the European Atomic Energy Community for Research and Training Activities* (both 31 May 2001).

2 Transdisciplinary Sustainability Research

This avenue of research has been developed with great success in recent years. Three elements lie at its core:

Problem focus: The research takes as its point of departure societal problem areas and restates them in scientific terms with the aim of finding the best possible solution. Translating societal problem areas into a form susceptible to scientific inquiry is anything but a trivial undertaking.

Actor focus: This means taking into account the various societal groups, their needs and powers, and the conditions (and constraints) governing their actions. Key aspects include systematically accounting for demographic change, acknowledging and dealing with gender differences, and analysing the various specific cultural connotations of scientific and technological artefacts and processes (the symbolic dimension of nature and technology).

Transdisciplinary approach: Bodies of knowledge from the social, natural, technological and cultural sciences are combined from the outset. In some cases this poses integration problems in itself. Most such problems relate to cognitive integration. To this extent our chosen problem and actor focus presents us with new research challenges.

Our primary focus is on sustainability: This means, firstly, taking an integral view of the ecological, economic, social and political dimensions rather than bringing them into conflict with each other. It necessitates the study of impacts and ways, in both research and policy, of dealing with ignorance. Secondly, it entails the study of 'second order' problems; that is, problems engendered by solutions which are specific to a given discipline or remit (and which may even be successful within their own terms of reference). As a rule, such problems are to be found at the interfaces between nature and human society.

¹ The Council also advocated the implementation of a European Research Area in its resolutions of 15 June and 16 November 2000.

Within the European research community, this approach is gaining ground at independent, academic and major government research centres. A number of EU countries, including Austria and Germany, have now established their own research programmes in this field. For example, 'socio-ecological research' has now been designated a priority funding target in Germany – not least due to the efforts of the **oekoforum** research network (BMBF 2000; ISOE 2000). The decision on a similar allocation of funds is currently pending in Austria. Switzerland's Environment Priority Programme is based on the main features of transdisciplinary sustainability research.

These developments will gain even greater importance with the planned cooperation between the Sixth Framework Programme and national programmes.

3 The Transition from the Fifth to the Sixth Framework Programme

Each framework programme introduced by the European Commission rightly differs from its predecessors. At the same time, each must promote innovative developments put into motion by previous programmes; that is, the programmes must maintain continuity.

We consider two particular, innovative objectives of the Sixth Framework Programme to be of interest in this regard:

- The first is the promotion of 'integrated multidisciplinary'. This overcomes the scientific weakness of research funding so far (as under the Fourth Framework Programme) and serves as the methodological starting point for sustainability research.
- The second is the promotion of 'multisectoral activities'. This overcomes the (socio-) political weakness of research funding so far and serves as a starting point for better results (solutions), for example by following stakeholder approaches or systematically taking user interests and user perspectives into account.

Neither of these innovative approaches is followed by the Sixth Framework Programme as it currently stands. In other words, the arduously accomplished opening of European research funding to sustainability research is in danger of having been in vain. Innovative approaches especially need a probationary period and at first tend to be adopted only gradually, hence they require a correspondingly long timescale to become established.

Accordingly, we propose that the two objectives of integrated multidisciplinary and multisectoral cooperation be adopted as research (and funding application) precepts.

4 General Points of Criticism Regarding the Sixth Framework Programme

The main points of criticism in our view are:

- Very strong technology focus: 'Sustainability' is cited as an objective in the introduction but is not incorporated as such into the body of the Sixth Framework Programme. This is true not only of the seven priority areas as a whole. The aim of promoting integrated, problem and actor-focused research

approaches is not even apparent for the sixth priority area, despite its title of 'Sustainable Development and Global Change'.

- The preventive approach has largely been abandoned as a guiding principle of European research funding; technology impact assessment is marginalised, as is research into the impacts of innovations in technology and the natural sciences in general.
- As it stands, the general perspective of the Sixth Framework Programme is global. Aspects of everyday life do not feature in it; nor, specifically, do the varied circumstances of everyday life as the main arena in which problems arise and are resolved. Equally scant attention is paid to local and regional problems, let alone the mutual dependencies between them or their interrelationships with problems at global level.
- The thematic focus on Science and Society, at first sight a welcome advance, stands revealed on closer inspection as a sort of 'playground', with less than three per cent of the total budget. Here, social scientists are more or less free to practise their skills in ex-post conflict resolution as a means of restoring legitimacy – retroactively picking up the pieces of public confidence in science after it has been shattered elsewhere in the Framework Programme. This applies equally to gender studies, which are given their own corner of the playground under the designation 'Women and Science'. As all this shows, the Commission has yet to take on board the fact that gender mainstreaming in science and research is about more than balanced representation on committees and giving consideration to the specific circumstances of woman researchers: at a more fundamental level, it is also about making allowance for gender differences within the very processes of research, and incorporating the bodies of knowledge, methods and theories of gender research in problem analysis and problem solving.
- The instruments as they have been proposed, and in particular the networks of excellence and the integrated projects, so far show no visible evidence of support for science-based SMEs in the non-profit sector (this is apparent for example in the 50% funding rule, which presupposes a high proportion of own funding and/or an interest in commercialisation, neither of which apply for non-profit institutions). Such institutions with their small and flexible research structures consequently risk structural exclusion from the European Research Area.

5 Instruments of the Sixth Framework Programme

5.1 Network of Excellence in Transdisciplinary Sustainability Research

Research networks can develop great innovative potential. However, the context within which they operate must be attuned to the research landscape. Under the current Commission proposals, all such networks will be technology-focused. We believe a transdisciplinary network of excellence is required specifically to promote European sustainability research.

However, the Commission's plans leads us to assume an average annual work volume of some 240 person-months – equivalent to an annual budget of between 2 million and 2.5 million euros – for each participating establishment. There are barely any large institutions in the field of transdisciplinary sustainability research. The stated order of magnitude exceeds the annual budget of many innovative research centres in this sector.

This has serious implications for quality: such a network would imperil the innovative capabilities and the diversity of individual institutions, for whom participating at this sort of scale (and the attendant imbalance in internal cooperative activities) would be highly risky. These institutions would be in danger of over-reliance on other partners in the network (in being dependent on the success of the network as a whole).

A further structural barrier is that because the other priority areas do not yet incorporate sustainable development as an integrative cross-sectional perspective, there is a lack of advocacy and support in those areas for a research environment capable of promoting sustainability in support of such a network.

In the opinion of **oekoforum**, the present Commission proposal thus lets slip a chance to give urgently needed stimulus to European sustainability research. The exclusion of this longstanding work on transdisciplinary sustainability research is one of the biggest deficits in the present Framework Programme plan. Accordingly, future plans for the Framework Programme ought to incorporate calls for tenders for a transdisciplinary sustainability research network.

5.2 Anticipating Scientific and Technological Needs

We see great opportunities in the priority area of Anticipating Scientific and Technological Needs, given that it is directed towards 'policy-oriented research'. So that the budgeted funds can be allocated in targeted fashion, however, the present wording would need to be made more explicit. In our opinion, research projects in this area should be directed towards implementation-oriented and policy-oriented concept development and on compiling knowledge to aid in political decision-making. Such research should always be problem and actor-focused and interdisciplinary.

- The substance of this priority area must be defined in such a way as to place it in the context of EU policy initiatives. Necessary points of focus include the Sixth Environmental Action Programme, the White Paper on Security of Energy Supply, climate protection measures (the Kyoto Protocol), Integrated Product Policy (IPP) and gender mainstreaming.
- The impacts of intra-European economic deregulation should be investigated by way of policy impact assessment. Areas of importance here include energy (market-readiness of energy-saving technologies, regenerative energy sources and ultra-efficient power stations) and water (effect on quality standards, etc.).
- The activities covered by the White Paper 'European Governance: Enhancing Democracy in the European Union' likewise need scientific underpinning which can be provided from within this priority area.
- A further area of activity should be that of providing scientific support for restructuring the policy process between researchers, political actors and the public (Science and Society, Democratising Expertise and Establishing European Scientific References).

5.3 Equal Treatment of Independent Non-Profit Institutions

To improve administrative efficiency, the EU Commission plans a substantial increase in the size of projects to be awarded. This is understandable in administrative terms, but is not necessarily in keeping with the objectives regarding the quality of research. As the debate in Germany and Austria has shown, small and independent research institutions (science-focused SMEs) have proved particularly innovative. The

dimensioning of projects should not be such as to exclude these institutions. In particular, qualitative selection criteria should be given priority here over quantitative criteria.

State and independent research institutions must also be given equal opportunities to participate. Independent non-profit institutions now furnish a significant fraction of European research capacity. Such institutions are effectively excluded from the research programme by the European Union's 50% funding rule, since they operate without a full capital base and so lack own funds to make up the other 50%. Nor do they commercialise their research findings. The Sixth Framework Programme should thus accord equal access to such institutions by providing appropriate funding arrangements.

6 Appraisal of the Priority Areas

6.1 General Remarks

The concentration of research funds on priority areas makes sense in terms of allowing research forces to be combined. However, the exclusive focus on technology issues does not do justice to the field of inquiry dealing with the complexities of integrating new technologies (IT, biotechnology and new materials) into society. Modern technology studies ought in our opinion to take an integral or at least parallel approach to technological, ecological and social aspects. These include impacts on health, the environment and community life.

From experience, an exclusive focus on technology issues carries risks of misdirection in R&D. For example, there is a danger of losing sight of the fact that the (socially and culturally differing) circumstances and impacts of everyday activities are highly relevant to policy and policymaking. This can be avoided in particular by greater consumer focus. All actors (producers, vendors and consumers) should be involved from the development phase onwards.

Sustainable development aspects must be made part of analysis and problem-solving in all research areas. This follows directly from the objective of promoting sustainable development proposed for the Framework Programme by the Commission itself.

New technologies in particular offer a chance to perform technology impact assessment in parallel with product development. The Framework Programme should thus provide funds for this purpose in all research areas, bearing in mind that technology impact assessments also make economic sense in that they can reduce business risks.

The current proposal for the Sixth Framework Programme does not generally link-in other European Union initiatives. This should be done, for example, for the Sixth Environmental Action Program, the energy supply security activities (Green Book on Energy), integrated product policy (IPP), and the EU's gender mainstreaming projects. In this regard, the programme's task is to close knowledge gaps in the service of informed scientific and political decision-making.

In the following, we derive specific suggestions for the individual priority areas from the above points.

6.2 Genomics and Biotechnology

The research focuses outlined for this priority area lack an interdisciplinary approach and have a strong technology orientation. For example, the proposals do not touch upon the importance of the results of the human genome project in philosophy-of-science terms, or upon new research approaches that are consequently necessary particularly in genomics. Social science and cultural aspects are not linked with natural science and medical research objectives.

In particular, this area raises the need to incorporate the coming developments in pure and applied molecular medicine into an evaluation of the social consequences (prominent examples include PID, embryonal and adult stem cell research, and cloning). It is impossible to overlook the fact that (prenatal) genetic diagnostics will have lasting social, ethical and economic impacts on the European health care system. It thus appears urgently necessary to add a thematic focus covering social and natural science-based assessment of the impacts of methods in molecular medicine. A comparative evaluation of the various methodologies and their problem-solving capacity is similarly desirable.

6.3 Information Society Technologies

This area should be supplemented with work on technology impact assessment and the social impacts of information and communication technologies. Specifically, this includes research on:

- Health risks of information society technologies and the avoidance of such risks (electromagnetic fields, wireless communications devices, etc.).
- Direct and indirect environmental impacts of information and communication technologies and the avoidance of such impacts (low-emission, energy-efficient devices).
- Integrated development of new technologies involving users, and technology impact assessment.
- Social implications of information and communication technologies (for example with reference to gender, senior citizens and education) and cultural implications of such technologies (for example the commercial use of knowledge, culture and cultural heritage).

6.4 Nanotechnologies, Intelligent Materials and New Production Processes

The programme of work should be supplemented with technology impact assessments for materials, products and production processes in this area.

6.5 Food Safety and Health Risks

The programme of work as it stands is mostly backward-looking, 'sticking plaster' research. There is a complete lack of forward-looking research themes needed to develop new concepts in this important area. For example, there is no mention of the world-wide debate about the impacts of the controversial 'new' food production methods. In the view of **oekoforum**, the changes in European nutritional culture, so easily labelled with catchwords such as 'genetics' or 'functional food', and their so-far little heeded social and ecological impacts must be given due attention as central objects of inquiry. For these reasons, we are of the

opinion that a different orientation should be visible from the title of the priority area itself. We propose a new title as follows: **'Healthy Foods, Sustainable Agriculture and Consumer Protection'**.

Forward-looking research should in particular incorporate system studies of the entire production, processing and consumption complex to make better sense of hitherto unknown rationales and developments. We consider system studies of this kind to be a prerequisite for (monetarily) efficient EU agricultural and food policies. Specifically, work such as the following should be carried out in the form of prospective research:

- Risk comparisons of agricultural systems (environmental, health and economic risks).
- Development of funding policy instruments serving sustainable development.
- Research into organic farming.
- Research into possibilities for achieving closed biochemical cycles at regional level.

Consumer-oriented research is an important task in this area. Owing to the socio-economic structures, there is also a close link with gender studies.

6.6 Aeronautics and Space

This area's focus on the two major European industrial complexes of aeronautical engineering and the space industry is all too clear. Starting out from the societal problems, in our opinion the area should extend to all issues of mobility and accordingly be given a new title: **'Sustainable Mobility and Space Travel'**.

In principal, we welcome research into cutting noise and pollution from aero-engines. The proposed sub-area should be supplemented, however, with research into next-generation aircraft concepts (regenerative fuels, aerodynamics, noise, etc.).

Noise research should be supplemented with a special research program: **'Health Effects of Transport Noise, Noise Reduction Standards and Ground Noise Reduction Measures'**. With the spread of high-speed trains, railway noise reduction must also be stepped up. The research would thus relate to both rail and air transport.

A further important field of inquiry in the area of sustainable mobility is the investigation of available scope for and ways of implementing greater use of intermodal options, particularly in inner-European transport; social and cultural attitudes to and sustainable styles of mobility; and new transport utilisation concepts in which the emphasis is on access to rather than ownership of means of transport.

Air traffic is currently growing at between 6% and 7% a year. Concerted effort is needed to contain such growth within Europe. This requires system analysis and the development and testing of measures to encourage traffic avoidance and modal shifting.

6.7 Sustainable Development and Global Change

The existing plans for this area testify to a misguided understanding of sustainable development. For example, all sorts of energy and transport measures are listed under this heading that aim to reduce greenhouse gases. As important as climate protection is in Europe (to achieve the reduction pledges of the Kyoto protocol), sustainable development involves more than technical aspects of climate protection.

The sustainable development of Europe and its regions in a global context depends on lasting success in dealing with fundamental problems at the interfaces between nature and society. The knowledge base required to do this is still lacking. Accordingly, two avenues must be pursued here:

Firstly, as mentioned earlier, sustainability issues must be addressed as cross-sectional problems in all priority areas. Here, an integral view must be developed of the economic, ecological and social impacts of individual problems and solutions while taking into account any interdependencies among them.

Secondly, the necessary widening and deepening of the knowledge base for sustainable development in Europe requires investigation of especially urgent problems in a separate priority area, 'Sustainable Development, Integrated Resource Management and Global Environmental Change'.

This area should incorporate, for example, the development of new instruments for the implementation of climate protection technologies. These should not be restricted to regulatory measures: market-based instruments (such as creating the operating environment for an energy services industry) can also be highly effective.

The important topic of demand-side energy efficiency has so far been entirely ignored. Yet as all progressive energy scenarios show, major cuts in emissions can only be achieved by mass use of energy-efficiency technologies and measures. Both technological and implementational research is required in this area.

There is still a lack of feasible, problem-centric strategies for decentralised, regionally sustainable water use, particularly in view of the impending liberalisation and deregulation of the European water market and the modernisation of the supply and disposal systems.

There is a need for systematic development of scientific knowledge in the environment, food, consumption and health field, leading to new, integrated and locally or regionally differentiated approaches to a paradigm shift in agriculture and consumption; this includes analyses on knowledge and action, in this context specifically with a view to the relationship between ignorance, everyday knowledge and scientific knowledge.

6.8 Citizens and Governance

We welcome the establishment of a priority area of this kind. It offers great scope, though this scope is only partly exploited in the existing description of the research. We consider the primary task of such an area to be research into providing the socio-political framework for sustainable development and prosperity. The choice of citizens and government as addressees is too restrictive, however. In our analysis, industry, too, is experiencing considerable growth in importance within the framework of polycentric control processes under globalisation. Accordingly, we propose that industry be incorporated into this priority area and the title changed to **Citizens, Industry and Governance**.

The focus of this priority area is, firstly, to develop new proposals for ways of implementing sustainable development into everyday policies. Secondly, it should deal with superordinate aspects of sustainable economic activity and integrated product policy.

Particular attention should be paid to the contribution of a sustainability-oriented national and international regulatory framework towards strengthening industrial innovation and competitiveness. In addition to aspects such as the resulting improvements in production process engineering, the research should investigate the

modernisation of business strategies and structures and the development of new forms of communication and cooperation at regional and global level as deciding factors in global competition.

7 Euratom Research

The current state of debate in Europe on the development of sustainable energy supplies does not justify fusion research to the extent planned. Fusion will not make any contribution to Europe's energy supplies in the next 40 to 50 years. Considering the cuts in the research budget for renewables and energy efficiency relative to the Fifth Framework Programme, the budget for fusion research must be considered far too large. In view of the urgency of climate protection problems, we are of the opinion that at least 25% of the currently planned fusion research budget should be redirected to research in renewables and energy efficiency.

In the medium term, the Euratom research programme should be brought under the democratic control of the European Parliament. Only then will it be possible for research funds in the policy area of energy and climate protection to be allocated in an appropriately targeted manner.

8 Summary

We welcome the general policy approach and basic structure of the Sixth Framework Programme. They offer opportunities for a further strengthening, compared with the Fifth Framework Programme, of European-level research with a problem and actor focus. It is not yet apparent, however, how the current plans will secure the continuity with the Fifth Framework Programme that the dictates of efficiency and synergy require (use of existing instances of cooperation between research efforts; incorporating and elaborating the knowledge acquired by the various projects). Moreover, and more importantly, those areas where further detail has been added exhibit a strong technological bias and a less actor-focused approach falling behind the innovative standards of the Fifth Framework Programme – for example by addressing sustainable development only in a global context to the neglect of regional and local domains, or by failure to properly integrate socio-economic aspects into science and technology-based research projects.

The lowering of administrative barriers is to be welcomed. However, this must be done in such a way as to guarantee equal opportunities for all applicants. The existing ratio of approved to submitted applications (1:10 for environmental projects under the Fifth Framework Programme) and the high initial investment involved in preparing applications effectively serve as criteria to exclude small research centres lacking broad institutional funding, since these cannot recoup their pre-approval costs.

In summary, we would like to record the following:

- The Commission's proposals so far fail to give due consideration to transdisciplinary research approaches and only marginally address social science, social economy and social ecology approaches.
- The conflict of goals between free market competition and sustainable development has already been settled in favour of competition. This makes it impossible for the scientific and research community even to identify potential synergies between these two goals.

- Sustainable development should not be treated sectorally; instead, sustainable development aspects must form part of the analysis and derivation of solutions in all areas of research.
- As things stand, small research centres remain restricted to the area of contract research ('Anticipating Scientific and Technological Needs'). This is too little to involve the non-profit sector alongside state and industrial research in the development of the European Research Area (and hence in the creation of a European knowledge industry).

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10 oekoforum Portrait

oekoforum - Environmental Research Network

oekoforum is a network of seven ecologically-focused scientific institutions in Germany, Austria and Italy:

- Contract KG, Karlsruhe, Germany
- Institute for Ecological Economy Research (IÖW), Berlin/Heidelberg/Hannover/Wuppertal, Germany
- Institute for Social-Ecological Research (ISOE), Frankfurt am Main, Germany
- Katalyse e.V., Cologne, Germany
- Öko-Institut Freiburg/Darmstadt/Berlin, Germany
- Öko-Institut Südtirol/Alto Adige, Bolzano, Italy
- Ökologie-Institut Austria, Vienna/Bregenz

oekoforum pursues pathways towards sustainable development. It does this by developing ecologically acceptable, economically viable and socially attractive concepts and implementation strategies for the future. **oekoforum** complements and augments the work of its members institutions.

Resolving the complex issues on which sustainable development crucially depends increasingly requires interdisciplinary collaboration. Specifically, it demands cooperative effort between the natural, engineering, social, economic and legal sciences. It is increasingly difficult for a single research institution to achieve this sort of cooperative endeavour on its own. **oekoforum** was founded in 1990 in response to this identified need. The member institutions offer a broad spectrum of competencies and fields, and boast a cross-border presence throughout the German-speaking region. After only one year, the institutions involved were able to overcome the boundaries between their individual study areas and remits, setting shared environmental goals and establishing joint communication structures. The resulting common platform formed a sound base for ensuing projects and for the continuation of their cooperative efforts.

oekoforum's goals are achieved through:

Innovation: Refining and resolving issues of sustainable development, with innovation not only in subject matter but also in scientific method and implementation strategies. **oekoforum** is a forum for both the science and the practice of ecology.

Translation: Conveying basic and applied knowledge, and specialist and user knowledge with the objective of real social change. **oekoforum** offers a forum for ecological discourse with politicians, industry, lobbies, social institutions and the actors of everyday life.

Networking: Cooperative links between the institutions aiming to achieve greater synergies in concept development and implementation. **oekoforum** offers a forum for cooperation between European institutions

for joint elaboration and treatment of transnational issues such as those relating to the EU and new challenges in connection with the development problems of global society.

The institutions comprising **oekoforum** offer a wide range of study areas in which they work both individually and in cooperation: **Chemicals, Consumption, Energy, Environment Management, Environmental Policy, Food, Industry, Law, Mobility, Organisational Consultancy, Planning, Products, Safety, Scenario Planning, Waste, Water.**

Within these focus areas, the institutions develop concepts and implementation strategies, prepare expert reports and provide expert witnesses. Institution staff sit on committees and commissions and act as advocates for the environment at hearings.

Research contracts come from both home and abroad, mostly from the public sector, including municipalities, federal states and national and transnational institutions. Further contracts come from industry, the retail and services trades, lobbies, citizens' initiatives and unions.

oekoforum's approach is:

Integral: Rather than treating individual aspects of solutions discretely and additively, **oekoforum** offers holistic solutions, usually giving account to ecological, economic and sociocultural aspects.

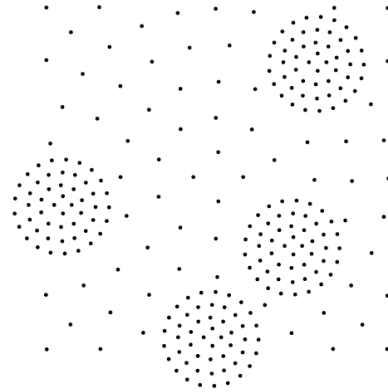
Transdisciplinary: The wide range of skills available in the institutions makes possible the interdisciplinary approach which is a prerequisite for the integrated solutions offered by **oekoforum**.

Solution-focused: **oekoforum** involves the actors; it operates in the *forum*, the marketplace, where vendors, consumers, regulators, industry and politicians meet and act, where the exchange of goods and opinions takes place and where problems are solved in practice.

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