

For the years 2012 and 2013

# SUSTAINABILITY REPORT 2014

Our Responsibility for the Future



## PAINTING COMPETITION

The Brundtland Commission defines sustainability as a "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs and to select a lifestyle of their choosing."\* But do future generations – in particular, our youngest ones – already have a vision of what their world eventually is going to look like? That is what the institute's sustainability working group wanted to know and therefore in February 2014 asked the pre-

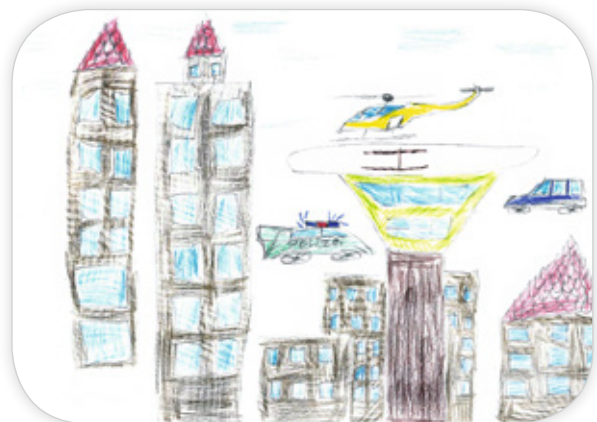
school and elementary school children of UMSICHT employees to participate in a painting competition. The task was: "What do you imagine earth to be like in the future?" The results were exciting pictures with interesting ideas of the future. Maybe influenced by reports of their parents or the media, but maybe also inspired by their own imagination, the pictures reflect current topics that will become a true challenge in the future (continued on last page).

\* Volker Hauff (pub.): *Unsere gemeinsame Zukunft. [Our Common Future]* Der Brundtland-Bericht der Weltkommission für Umwelt und Entwicklung, 1987. [The Brundtland Report of the World Commission on Environment and Development]



**David Kurek, 7 years old**  
(first place, elementary school children; cover page)

shifts the means of transportation to a higher level. This way, the cars are closer to the sun that provides for the needed drive energy. As a result, sufficient space remains available underneath the driving paths for a lot of green and friendly robots that move through the landscape on roller skates.



In parallel to this, David has also developed a scenario for cities. Tall houses are characterized by a large number of windows that let in a lot of light. Here, too, the locomotion is shifted to the air. In addition to helicopters that land on special roofs, normal cars also fly through the air but the adherence to the traffic rules continues to be monitored by the police, which is airborne, too.

# TABLE OF CONTENTS



Entrance of Fraunhofer UMSICHT

PREFACE .....	2	<b>5</b> NO MAN IS AN ISLAND – SOCIAL RESPONSIBILITY .....	22
<b>1</b> OVERVIEW OF THE INSTITUTE .....	3	Framework Conditions for our staff.....	22
Strategy and Analysis .....	3	Events/General Public .....	22
Institute Profile .....	6	Publications.....	23
Material Report Contents (Aspects) and Stakeholder Engagement .....	7	Stakeholder Engagement .....	24
Institute, Management, Ethics and Integrity .....	8	Cooperations/Engagement in the region .....	24
<b>2</b> RESPONSIBILITY FOR HUMAN RESOURCES .....	10	<b>6</b> RESPONSIBLE RESEARCH .....	26
Legal Basis.....	10	Expanded Understanding of Research and Development .....	26
Employment.....	10	Measures to Date at Fraunhofer UMSICHT .....	27
The Role of the Works Council in the Employer/ Employee Relationship .....	10	<b>7</b> MEASURES AND OBJECTIVES .....	30
Knowledge Transfer by Fraunhofer UMSICHT .....	12	<b>8</b> GRI CONTENT INDEX .....	32
Human Resources Development and External Further Academic Education.....	12	EDITORIAL NOTES .....	36
Diversity and Equal Opportunity .....	14		
<b>3</b> UMSICHT-INTERNAL FOOTPRINT .....	17		
Resource Efficiency and Environmental Protection ....	17		
A look inside: Sustainability at our Laboratories .....	20		
<b>4</b> ECONOMIC STABILITY .....	21		

*This report was prepared in accordance with the guideline for gender-sensitive writing of the Fraunhofer-Gesellschaft.*



Prof. Dr.-Ing. Göрге Deerberg, Deputy Director of the institute, Prof. Dr.-Ing. Eckhard Weidner, Director of the institute

Dear readers,

Right now, you are holding in your hands our fourth Sustainability Report, which covers the years 2012 and 2013. This report follows the guidelines of the *Global Reporting Initiative* (Version 4.0). For institutional anchoring, we appointed a sustainability manager as central point of contact in 2012.

We have opened ourselves further to society and on June 17<sup>th</sup>, 2014 conducted our first stakeholder dialogue with external groups (industry, customers, science, politics, and society). Here, we received valuable indications as to which aspects are most important to our stakeholders. In January, we conducted an internal dialog with a select subset of our staff and can therefore determine the material report contents. We would like to thank all parties involved for their commitment!

During the preparation of this report, we have once again found that the path towards a sustainable development for our institute is an on-going process and that we have to readjust our strategies and internal processes time and again. The reasons for this are changing political conditions (keyword: energy transition) and changing framework conditions in the financing at Fraunhofer. As such, a reduced basic financing leaves less leeway to proactively approach social challenges.

A social challenge is fittingly described by Schneidewind and Zahrnt in their book "Damit gutes Leben einfacher wird" [So that a good life becomes more simple] as:

*"Scientific insights and a multitude of personal experiences with rebound and growth effects with respect to efficiency increases are leading in more and more people to a loss of trust in that a sustainable development is possible with technology alone." <sup>1</sup>*

This increases our conviction that, in the future, we only want to establish those products and technologies on the markets that – in addition to their function – are ecologically, socially, and ethically harmless.

Please do not hesitate to contact us – there are exciting challenges that we can approach jointly.

Best regards,

Eckhard Weidner

Göрге Deerberg

<sup>1</sup> Uwe Schneidewind, Angelika Zahrnt: *Damit gutes Leben einfacher wird – Perspektiven einer Suffizienzpolitik* (So that a good life becomes more simple – Perspective of a policy of sufficiency); oekom Publishers, Munich (Germany), 2013.



Prof. Dr.-Ing. Gørgge Deerberg, stellv. Institutsleiter, Prof. Dr.-Ing. Eckhard Weidner, Institutsleiter

Liebe Leserinnen und Leser,

Sie halten gerade unseren vierten Nachhaltigkeitsbericht in den Händen, der die Jahre 2012 und 2013 abdeckt. Dieser Bericht folgt den Leitlinien der *Global Reporting Initiative* (Version 4.0). Zur institutionellen Verankerung haben wir 2012 einen Nachhaltigkeitsbeauftragten als zentralen Ansprechpartner benannt.

Wir haben uns der Gesellschaft weiter geöffnet und am 17. Juni 2014 unseren ersten Stakeholderdialog mit externen Gruppen (Wirtschaft, Kundenkreis, Wissenschaft, Politik und Gesellschaft) durchgeführt. Hier haben wir wertvolle Hinweise bekommen, welche die wichtigsten Aspekte für unsere Stakeholder sind. Einen internen Dialog haben wir im Januar mit einer Auswahl unserer Belegschaft durchgeführt und können damit die wesentlichen Berichtsinhalte bestimmen. Wir danken allen Beteiligten für ihr Engagement!

Bei der Erstellung dieses Berichts haben wir wieder festgestellt, dass der Weg zu einer nachhaltigen Entwicklung für unser Institut ein fortlaufender Prozess ist und dass wir unsere Strategien und internen Vorgänge immer wieder neu justieren müssen. Gründe dafür sind sich wandelnde politische Bedingungen (Stichwort Energiewende) und veränderte Rahmenbedingungen in der Finanzierung bei Fraunhofer. So lässt uns weniger Grundfinanzierung weniger Spielraum, gesellschaftliche Herausforderungen proaktiv anzugehen.

Eine gesellschaftliche Herausforderung wird von Schneidewind und Zahrnt in ihrem Buch »Damit gutes Leben einfacher wird« treffend beschrieben:

*»Wissenschaftliche Erkenntnisse und vielfältige persönliche Erfahrungen mit Rebound- und Wachstumseffekten bezüglich Effizienzsteigerungen lassen bei immer mehr Menschen das Vertrauen schwinden, dass mit Technik alleine eine zukunftsfähige Entwicklung möglich sei.«<sup>1</sup>*

Dies bestärkt uns in unserer Überzeugung, dass wir zukünftig nur Produkte und Technologien in den Märkten etablieren wollen, die – neben ihrer Funktion – ökologisch, sozial und ethisch unbedenklich sind.

Bleiben Sie uns gewogen und zögern Sie nicht, mit uns in Kontakt zu treten – es gibt spannende Herausforderungen, die wir gemeinsam angehen können.

Es grüßen Sie herzlich

Eckhard Weidner

Gørgge Deerberg

<sup>1</sup> Uwe Schneidewind, Angelika Zahrnt: *Damit gutes Leben einfacher wird – Perspektiven einer Suffizienzpolitik*; oekom verlag München, 2013.



Building complex of Fraunhofer UMSICHT

## Strategy and Analysis

Our guidelines reflect our self-image which is carried by the institute's staff. In accordance with our guidelines, we consider ourselves to be:

*"Pathfinders for technical changes to the environment, energy technology, process engineering, and safety. The prime objective of our work is to improve the quality of life of society as a whole."*

For this reason, the subject area of the sustainable transition to a sustainable material and energy management is at the focus of our work. To us, classic energy topics (renewable energies and resources), but also topics such as energy storage systems, innovative materials, water and wastewater engineering, as well as knowledge and resources management are among the areas of research of the future. The institute is supported internally by the sustainability working group, our sustainability management tool (Sustainability Balanced Scorecard) as well as Fraunhofer-wide by the Fraunhofer Sustainability Network.

Our sustainability strategy was created as a whole via a bottom-up process and is anchored accordingly at the institute. Staff, managers, as well as the institute's management are equally involved in the implementation of the sustainability management. As part of a SWOT<sup>2</sup> analysis, we therefore asked ourselves the following question in January 2014 within the scope of an internal workshop:

*"Which opportunities and risks do we see for Fraunhofer UMSICHT in a consistent alignment with the guiding principle of sustainable development?"*

Twelve staff members from different areas participated in the workshop (representatives of the scientific-technical committee, of the administrative leadership, of public relations, of the works council, the council of occupational safety, the speaker of the institute's directorate, scientific employees from different disciplines, a research assistant and the sustainability manager).

The result of the SWOT analysis, supplemented by the steering committee of the institute, is presented on the following pages.

With the SWOT analysis, the strengths and weaknesses of the institute (internal view, endogenous criteria, self-influenceable) as well as opportunities and risks that result from trends in the environment (external view, exogenous criteria, not-self-influenceable) can be diagnosed. From this, needs for change, fields of action and suitable strategies for achieving sustainability objectives can be derived. These recommendations can subsequently be compiled into an action matrix and prioritized.

Central **strengths** turned out to be experience and reputation as well as economic and scientific success in the innovation system – also well visible in the exterior space. The good image as employer as well as the numerous professional education/training and qualification options are attractive to both graduates and staff. A clear sustainability orientation is valued a lot by the staff. A good fit for this is that multiple Fraunhofer institutes, groups and alliances already cater to the "energy transition" and "Resource Savings" fields of action.

Project managers are thinking in complex and often holistic contexts and offer custom and system solutions to our customers.

<sup>2</sup> SWOT: Strengths, Weaknesses, Opportunities, Threats

# 1

## OVERVIEW OF THE INSTITUTE

STRENGTHS (S)	WEAKNESSES (W)	ENDOGENOUS
<ul style="list-style-type: none"> <li>■ A leading position within the field of R&amp;D (pioneer role)</li> <li>■ UMSICHT provides sustainability services and has guidelines</li> <li>■ Wide range of topics</li> <li>■ Added value for customers due to holistic solution approaches</li> <li>■ Staff is following suit (sensitization and commitment)</li> <li>■ Credibility due to open communication</li> <li>■ Integration of stakeholder-relevant topics</li> <li>■ High attractiveness as employer → acquiring employees</li> </ul>	<ul style="list-style-type: none"> <li>■ Potential lack of credibility in case of a rigorous definition of a sustainability guiding principle but required "flexible" selection of project/ research topics</li> <li>■ Loss of solution options in R&amp;D projects as a result of a narrowly defined sustainability guiding principle</li> <li>■ Projects are driven by financing, not always driven by ideas</li> <li>■ Broad thematic positioning → high expenditure to maintain excellent competency</li> </ul>	
OPPORTUNITIES (O)	THREATS (T)	EXOGENOUS
<ul style="list-style-type: none"> <li>■ Sustainability has been accepted as a social topic</li> <li>■ Existential crises that force sustainability</li> <li>■ Relatively positive situation in terms of public funding programs</li> <li>■ Economic feasibility and safeguarding of the future for customers can increase through sustainability</li> <li>■ Opportunity for unconventional projects due to new actors in the innovation process</li> <li>■ Directional certainty and early warning due to stakeholder and research dialogs</li> </ul>	<ul style="list-style-type: none"> <li>■ Risk of "missing" new topics outside of sustainability</li> <li>■ Customers are looking for other solutions that we cannot cover with sustainability</li> <li>■ Change of policy (e.g. steps backward in the energy transition, return to the fossil economy)</li> <li>■ Sustainability remains an insular topic in Germany, a German special path</li> <li>■ The population is losing interest in sustainability</li> <li>■ More competition in the research market</li> </ul>	

\*R&D: Research & Development

Fig. 1: Results of the SWOT analysis

Many projects are driven by financing and not always by ideas; the time and cost pressure associated therewith, and the risk of a lack of credibility in case of a sustainability definition that is too strict are apparent **weaknesses** (from an internal and external point of view).

**Opportunities** are derived from the socially established discussion regarding the topic of sustainability as well as the desire of the industry to be thinking ahead, unconventionally, and holistically in alternatives. Existential crises such as the financial crisis can accelerate change processes. New actors in the innovation system (e.g. committed non-experts, fab lab and repair culture) cooperate with research institutes in unconventional projects in order to develop decentralized and less complex solutions. Through active stakeholder and research dialogs, last, but not least, the directional certainty of

innovations can be increased and early warning signals in case of acceptance problems can be observed.

**Threats** exist in that the focusing on sustainability neglects other attractive topics, or that the customer base is looking for solutions that they don't think UMSICHT has. Sustainability is strongly driven by the formation of public opinion and intent: Upon shifting political focal points and also in case of a lack of interest by society, sustainability-driven projects quickly lose in importance (and thereby in earning power). But even if sustainability remains on the agenda in Germany, this does by far not apply on a global scale. The risk of a purely German special path in a domestic R&D market with increasing competition can lead to a situation where the demand is no longer sufficient for all providers so that the guiding principle orientation will need to be reduced.



David Kurek, 7 years old

Despite some risks (such as the changed framework conditions in case of the energy transition), the institute is – from the staff's point of view – well positioned and has numerous opportunities to contribute to a sustainable development. Sustainability is process that is pursued constantly and is continuously solidified at the institute (adjustment of service portfolio).

Based on the challenges of the last sustainability report, we would like to once more provide an outlook into the future:

- The integration of the branch of the institute in Sulzbach-Rosenberg has been completed, good cooperations are being intensified (example: Center for Energy Storage), joint funding applications are being filed. It was also possible to improve the infrastructure at the institute branch in Sulzbach-Rosenberg (e. g. IT connectivity). The branch of the institute has in the meantime arrived in the world of Fraunhofer! But the process has not yet been fully completed, even in the next years the business processes must be adjusted further and the integration must be continued. For this reason, the sustainability report at hand only covers the main location in Oberhausen and the Willich branch office; the branch of the institute in Sulzbach-Rosenberg is not yet being taken into consideration.
- The challenge of "Acquisition of new customer bases" was successfully approached. In 2012, 71 new customers were added, and 44 in 2013.
- In the years ahead, it is important to increase customer retention – but also to optimally provide the customer by analyzing their needs and also to offer solutions from other areas of the institute, and – where applicable – to arrange the corresponding contacts.

- The focusing of our key areas takes place in the 2014 strategy audit, in which external experts check our institute's strategy.
- As implementation of the results from the employee survey, a restructuring of the institute took place in 2013. This addressed the wish of managers for a reduction of the scope of leadership as well as the wish by a lot of staff for more responsibility. Furthermore, subsequent to the employee survey, workshops were conducted in the individual departments during which various measures were developed, such as to conduct brainstorming breakfasts.

New strategic objectives for the next 3 to 5 years are:

- An increase of the business revenues through more industry projects
- An increase of the scientific visibility through an increased number of press releases and publications, particularly in peer-reviewed journals
- A more efficient quality management in order to increase the rate of success of applications despite stiff competition (e. g. by universities and over-subscription of programs)



# 1

## OVERVIEW OF THE INSTITUTE

### Institute Profile

As an institute of the Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e. V., which is a fixed part of the German research landscape and which has its headquarters in Munich, we are bound by its rules of association and do not have any legal capacity of our own. You can find any and all information regarding the organizational structure, the board, the presidential council, the scientific-technical committee, as well as the legal form on the Internet pages of the Fraunhofer-Gesellschaft. The Fraunhofer-Gesellschaft is active worldwide in numerous countries and pursues its own internationalization strategy. Our day-to-day work at Fraunhofer UMSICHT at the locations Oberhausen and Willich is shaped by the staff of the three operative divisions: Products, Processes, and Energy. We develop technologies, innovative products and cycles that are intended to sustainably cover the basic needs of the people at minimal consumption of resources. This way, we support the following willingness demanded by the Fraunhofer-Gesellschaft which is stipulated in the guiding principle "Fraunhofer Mission":

*"The Fraunhofer-Gesellschaft supports the striving for a sustainable design of society, business, and environment. Through the responsible implementation of new technologies as well as through research and studies for public clients, its institutes contribute towards these objectives."*

Our operational divisions are supported by the Organization division with which we are working jointly on our future topics. Those are modeled after the domestic and European economic and research policies. In this, our research is always independent and maintains neutrality towards the interests of individual groups from politics, business, and society. Our new think tanks help to provide the necessary space and time for a sustainable success of Fraunhofer UMSICHT. We are internationally active in different sectors. For detailed informa-

tion regarding our organizational structure and size (number of employees), c. f. our annual report.

#### THE MOST IMPORTANT BRANDS, PRODUCTS AND SERVICES OF FRAUNHOFER UMSICHT

In February 2014, the institute possessed more than 91 live patent cases, 25 of them with patents filed abroad, 9 registered designs, and 40 brands, with 9 of them filed abroad. The institute's most important word trademarks are CryoSol<sup>®</sup>, DUBAnet<sup>®</sup>, Q-TE-C<sup>®</sup>, rodentics<sup>®</sup>, polymerO<sup>®</sup>, sustainnovate<sup>®</sup>, inFARMING<sup>®</sup>, BioSX<sup>®</sup>, BryoEngineering<sup>®</sup>, cleantan<sup>®</sup>; the most important word/image trademarks are BIO-raffiniert<sup>®</sup> and cleantan<sup>®</sup>.

Important development are, for instance, our wasterwater-free leather tanning processes, developments in the area of bio-based plastics, the "Bioenergy" innovation cluster and our services for energy savings and process improvements (e. g. through the utilization of organic rankine cycles ORC in energy systems). For comprehensive information regarding current projects and our service portfolio, please see our annual report.

For the years 2012 and 2013, report boundaries are the headquarters in Oberhausen and the Willich branch office. In 2013, we have published a flyer regarding the development of our sustainability activities and have setup an Internet presence of our own regarding this topic.



MORE INFO  
ABOUT ANNUAL REPORT



Sina Borelbach, 10 years old

## Material Report Contents (Aspects) and Stakeholder Engagement

For the sustainability report in accordance with the GRI G4 standard, UMSICHT immersed itself deeper in the stakeholder dialog. In a first workshop (p. 3), those aspects/topics were worked out that the employees expect in the sustainability report of Fraunhofer UMSICHT. The results were clustered and in February 2014 presented to the steering committee of the institute. The latter then conducted a prioritization and supplementation. In June 2014, a workshop followed with external stakeholders from business, science, politics, and society in which additional aspects relevant to UMSICHT were found.

The workshop took place at Haus Ripshorst in Oberhausen, where – in an intense and fruitful discussion – the following aspects were worked out as being considered of particular importance from an external point of view: employee integration and participation strategy, "sustainable view of

the person", contribution of the institute to transformation processes (e. g. energy transition) and trans-disciplinary, comprehensible presentation ("translation") of scientific results in a social dialog. Additional aspects are: regional effects of the R&D results and UMSICHT as an impulse generator for innovative R&D for customers as well as proactive networking. These aspects were primarily attributed to the areas of responsibility for human resources, innovation process, responsible research, and responsibility for society (as well as for the region).

It was, furthermore, demanded that UMSICHT – as a credible, independent expert – increasingly makes contributions in participation processes as well as takes concrete positions as neutral opinion leader. In addition, the stakeholder circle made first suggestions for measures such as a customer satisfaction analysis and development of generally comprehensible assessment criteria for sustainability in projects. In a follow-up to the event, the materiality matrix prepared for the first time containing the identified, material aspects (Figure 2) was finalized. In preparation of the next report, the results of the stakeholder dialogs are now being assessed and transferred into a road map.

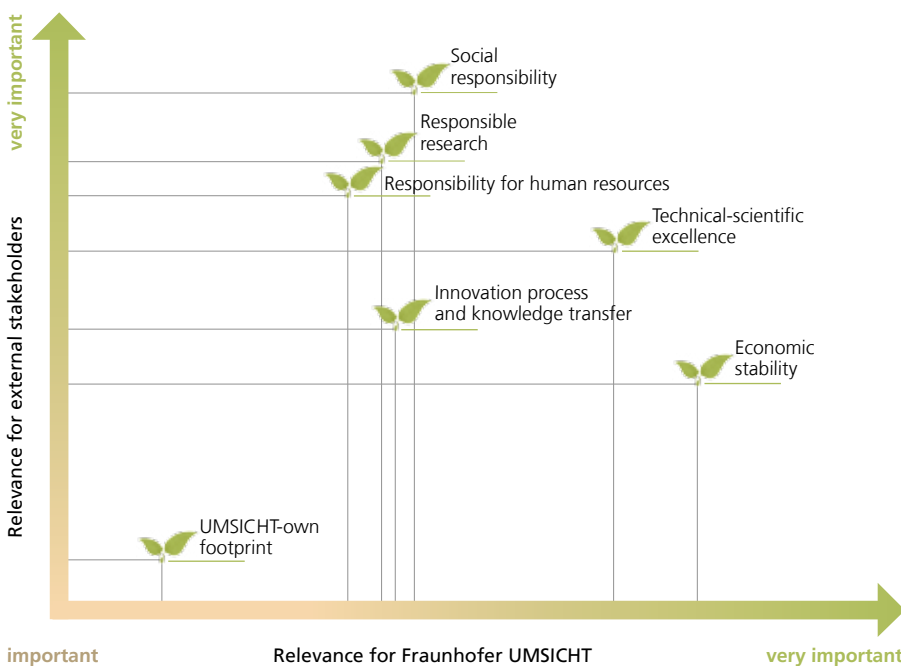


Fig. 2: Materiality matrix of Fraunhofer UMSICHT of the year 2014

# 1

## OVERVIEW OF THE INSTITUTE

### Institute, Management, Ethics and Integrity

#### INSTITUTE'S MANAGEMENT AND EXCHANGE AT THE INSTITUTE

The highest-ranking decision-makers are the director of the institute and his deputy. The next management level consists of the division management, followed by department and group management. Our organizational chart introduces this new structure that became effective January 1<sup>st</sup>, 2013; c.f. Internet presence.

Our networks and committees (Advisory Board, Circle of Friends and Patrons, spin-offs, Fraunhofer Alliances and Groups) are also published on the Internet.

In relation to the previous report, significant changes took place regarding the committees and office-holders at the institute: A network steering committee was implemented which meets twice a year to consult the institute's management. In 2012, the institute's management appointed a sustainability manager. He is a member of the network committee and has the right to speak at the monthly meetings of the steering committee. This committee consists of the institute's management, the division heads, the head of the branch of the institute in Sulzbach-Rosenberg, the speaker of the institute's management, and the representative of the scientific-technical committee. In addition, monthly meetings take place in the divisions, departments, and groups.

#### SUSTAINABILITY MANAGEMENT

Our management tool for the assessment of indicators regarding the achievement of the institute's objectives, the Sustainability Balanced Scorecard (SBSC), will continue and will further be synchronized with the data in the sustainability report. Due to the change of the infrastructure and the appointment of the sustainability manager, the utilization of the SBSC changes as depicted in figure 3.

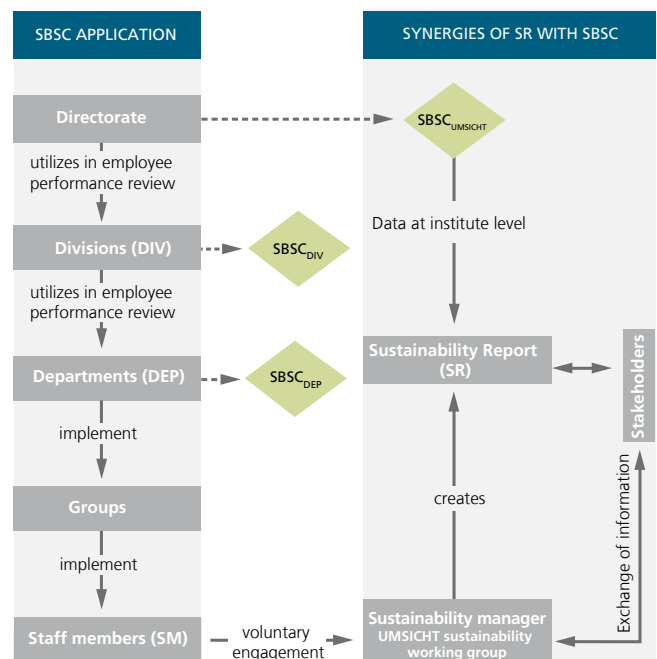


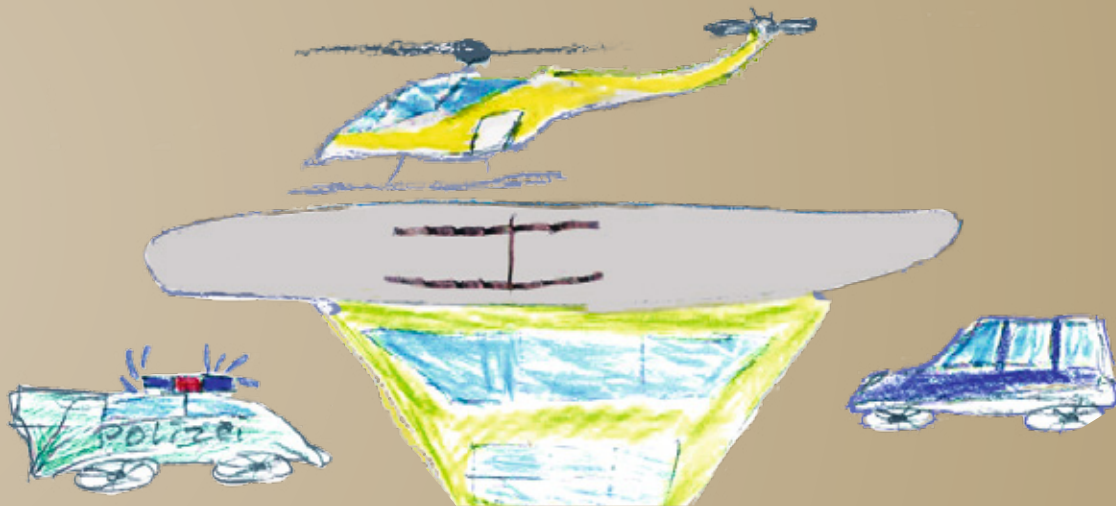
Fig. 3: Sustainability Balanced Scorecard (SBSC) for UMSICHT

In addition to the SBSC, the strategic analysis of the institute by the Fraunhofer headquarters serves as an important management instrument.

Our remuneration policy is stated in the chapter "Responsibility for Human Resources".



OUR NEW ORGANIZATIONAL CHART



David Kurek, 7 years old

## VALUES AND PRINCIPLES, STANDARDS OF CONDUCT AND NORMS

In addition to its mission, the Fraunhofer-Gesellschaft has published a declaration towards third parties as part of the project business in which the foundations for dealing with business partners, with staff, for ensuring the quality of the cooperation, and for social responsibility are described.

In addition to adhering to the basic principles for ensuring good scientific practice and the necessary standards, Fraunhofer UMSICHT is following its guidelines which provide ethical guidelines for our project work (c.f. also chapters 5 and 6). Specific information regarding the institute's management and our guidelines are published on the Internet.

In this report, we will cover the instrument of works agreements more in-depth (chapter "Responsibility for Human Resources").

## UTOPIA CHANGEMAKER

In late 2013, the signing of the *Changemaker Manifesto* of the *Utopia Foundation* was brought on its way. Utopia Changemakers are companies or organizations which have – in terms of sustainability – set standards in their industry already today, or which are recognizably diligent on their path towards it. Prerequisite to becoming a Utopia Changemaker is the signing of the *Changemaker Manifesto*, with which organizations that want to make a credible contribution to a sustainable development enter into a voluntary self-commitment and – as part of the Manifesto – commit to ambitious sustainability goals in ten commitments.

The *Changemaker Manifesto* was developed by the *Utopia Foundation* whose objective it is to more firmly anchor thoughts of sustainability in society. As a research institute aware of its responsibility, Fraunhofer UMSICHT aims at increasing the value that the institute generates for both society and preserving an intact environment. By signing the

*Manifesto*, Fraunhofer UMSICHT is voluntarily committing itself to documenting measures in the area of sustainability with full transparency.

## AWARD AS "PLACE OF PROGRESS" ("ORT DES FORTSCHRITTS")

In September 2012, the Minister of Science of the German state of North Rhine-Westphalia, Svenja Schulze, presented the institute with the "Place of Progress" award. At the award ceremony, the minister lauded the institute especially for its research achievements in connection with the energy transition and conservation of raw materials. "UMSICHT allows for safe, cost-efficient and climate-friendly solutions in the energy supply", declared Minister Schulze. The "Place of Progress" award recognizes special contributions to progress in the German state of North Rhine-Westphalia (NRW). Minister Schulze singled out the numerous inter-disciplinary activities of the institute: "UMSICHT does not close itself off, but rather seeks exchanges with society at large through 'discussion events' such as the Global Young Faculty, the Fraunhofer Environmental Talent School for high school students, or the award of the UMSICHT Science Award for journalists." This way, UMSICHT helps to bundle competencies, promote the exchange of communication, and develop holistic technological innovations and establish them on the market.

Subsequently, in 2014, the "Interdisciplinary Distance Learning Course for Environmental Sciences (*infernium*)" in Hagen receives the "Place of Progress" award. *infernium* is a further academic education course of study for professionally qualified experts with or without their first university diploma that is carried jointly by the Hagen Distance Learning University (FernUniversität in Hagen) and Fraunhofer UMSICHT. Interdisciplinary contents are supplemented by the objective of sustainable development. As such, the students do, for instance, develop solutions for environmentally relevant issues from their professional practice that can be implemented at the companies.

# 2

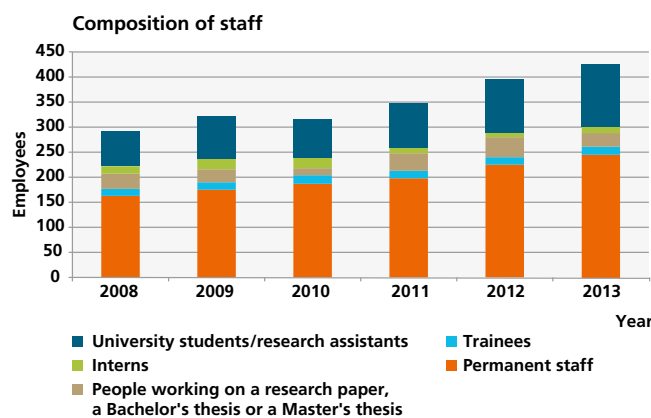
## RESPONSIBILITY FOR HUMAN RESOURCES

### Legal Basis

The operational life at Fraunhofer UMSICHT is regulated by different legal sources (laws, ordinances, collective bargaining agreements). This includes the laws of individual (e. g. working hours act, social security code volumes, youth employment law) and collective (e. g. works council constitution act, collective bargaining act) labor law. Located in between the collective

bargaining agreements and the contract of employment as a contract under private law are the works agreements that are negotiated between the works council and the employer.<sup>3</sup> To Fraunhofer UMSICHT, the provisions of the collective bargaining agreement for civil service employees (TVöD - Tarifvertrag des Öffentlichen Dienstes) of the federal government are valid.

### Employment



In 2013, UMSICHT had a staff of 427, including 245 permanent staff members (SM). There has been a significant growth in staffing since 2010.

Fig. 4: Employees by type of employment

### Role of the Works Council in the Employer/Employee Relationship

Since 2003, the rights of the staff of Fraunhofer UMSICHT have been represented by a local works council (BR - Betriebsrat) as organ of employee representation. Issues that affect Fraunhofer-Gesellschaft as a whole and/or more than one institute are being represented by the central works council (GBR - Gesamtbetriebsrat). Furthermore, the GBR chair persons assist the local works council as well as individuals in case they have any questions. The GBR consists of delegates elected by the works councils of the institutes. Two members of the UMSICHT works council are handling tasks at the GBR. Thus, the UMSICHT

delegates participate in the GBR committees "Human Resources Development" and "GBR Report", respectively. The term of office of the works council is four years. With the increasing number of employees of the institute, the number of works council members increases, too. During the preceding term of office (2010 to 2014), the works council consisted of nine members; in the current term of office, eleven colleagues are committed to the interests the interests of the staff. The works council meets every two weeks for a works council meeting in which topics are discussed that affect the institute's staff, and –

<sup>3</sup> Knoop, P.; Huber, C.; Habermayr, M.: *Gesetzessammlung für die betriebliche Praxis (Collection of Laws for Business Practice)*, 6<sup>th</sup> ed. 2013, ifb-Verlag der Betriebsrat KG, Seehausen am Staffelsee.



Sina Borelbach, 10 years old

where applicable – resolutions are adopted. The works council sub-committee "Personnel" consists of five works council members who meet on a weekly basis to take care of rights of co-determination in case of personnel-related individual measures (both university students and TVöD contract issues). Every month, shortly after the meeting of the steering committee, a meeting between the institute's directorate and the chair person of the works council takes place: the works council and the institute's directorate inform about and discuss current and future topics affecting the staff. Furthermore, the works council is also represented in committees of the institute such as the committee for occupational safety.

Up to four times a year, a meeting for the staff prepared and moderated by the works council is held during which the activity report of the works council is presented. In addition, a current topic (e.g. bonuses and allowances) is examined in more detail through presentations and discussions.

The works council has different participation and co-determination rights in case of measures that affect the institute and its staff. These are detailed in figure 5.

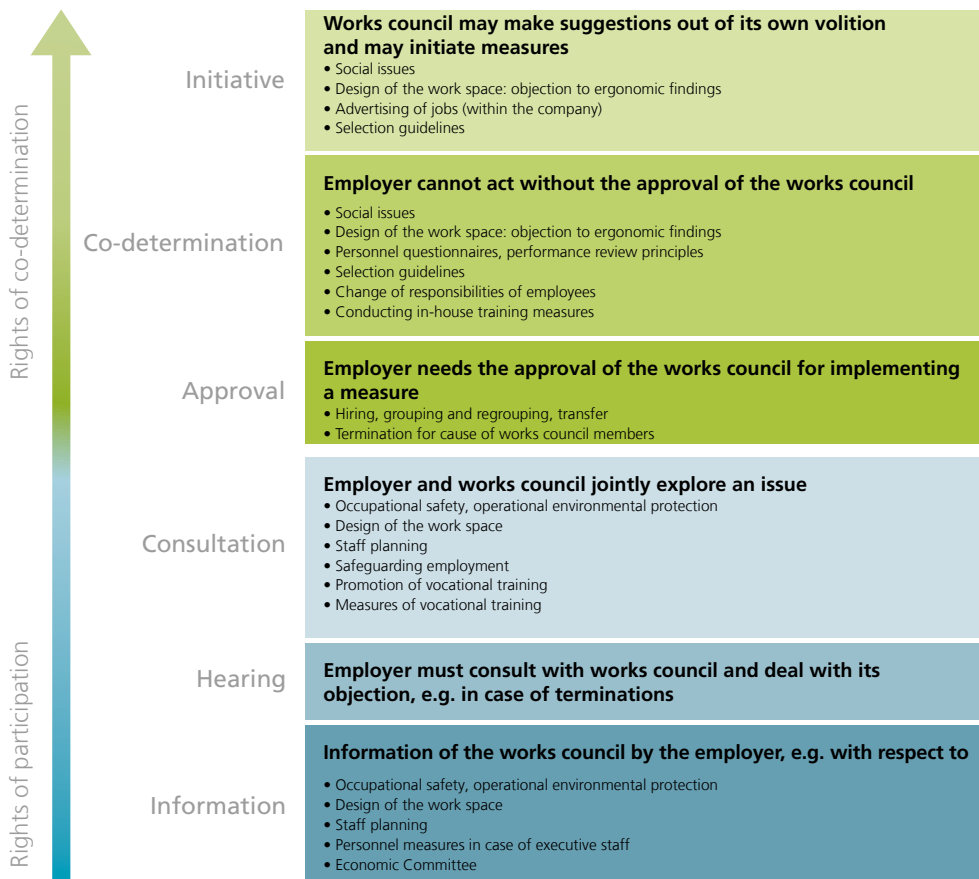


Fig. 5: Rights of the works council [Graphics changed based on: Knoop, P.; Huber, C.; Habermayr, M.: Gesetzessammlung für die betriebliche Praxis (Collection of Laws for Business Practice), 6<sup>th</sup> edition, 2013]

# 2

## RESPONSIBILITY FOR HUMAN RESOURCES

The negotiation of agreements between the institute's management and the works council is one of the most important activities in the area of co-determination. At Fraunhofer there are master works agreements that affect multiple institutes and/or the whole Fraunhofer-Gesellschaft which are negotiated between the central works council and the board as well as local works agreements that are negotiated at the individual institutes between the works council and the respective institute's management. At Fraunhofer UMSICHT, there are works agreements regarding the topics of video surveillance, telecommuting, phone system, research allowances and promoting the future generation of scientists. In accordance with the master works agreement regarding the award of special payments, the institute's

management and the works council in 2014 must also negotiate a local works agreement regarding the topic of special payments in accordance with which, in the future, bonuses can be paid transparently and performance-based. This negotiation will be a crucial area of responsibility in 2014. Furthermore, in 2014, the works council will constructively accompany the planned implementation of a system for customer relations management (CRM) and – maintaining its obligation to consultation and co-determination – will become actively involved in the shaping of specialist careers.

In addition to the works council, the manager for corporate integration management (CIM)/disability management (DM) is a point of contact for our staff.

### Knowledge Transfer by Fraunhofer UMSICHT

In 2013, 66 university students were mentored as part of a thesis. In addition, numerous external qualification theses were being advised. In 2013, 16 young people received job training at Fraunhofer UMSICHT. Overall, Fraunhofer UMSICHT offers twelve different cooperative education professions, natural

science and technical job training as well as job training in the areas of IT and administration.

In addition, staff of Fraunhofer UMSICHT held more than 20 classes for students (block seminars, lectures) in 2012 and 2013, respectively.

### Human Resources Development and External Further Education

Effective January 1<sup>st</sup>, 2013, the department "UMSICHT Academy" was established at Fraunhofer UMSICHT which bundles the institute's activities in the areas of human resources development as well as external scientific continuing education under one roof.

#### HUMAN RESOURCES DEVELOPMENT

The success and performance of Fraunhofer UMSICHT is decisively influenced by the staff's competencies. Human resources management and development are therefore

considered to be central responsibilities at the institute. In addition to the promotion of young talents, human resources marketing and recruiting, both the needs-oriented qualification as well as the individual development planning of the staff are the focal points of human resources development. As part of the systematic human resources development at Fraunhofer UMSICHT, a comprehensive training program is being offered that includes thematic and cross-thematic qualification measures. The qualification measures serve to strengthen and further develop the thematic, scientific, business and



Amélie Pollerberg, 5 years old

social expertise of the institute's scientific and non-scientific employees. Among the qualification measures are seminars, training sessions, further training and workshops that can take place target group specific in-house (such as acquisition seminars, promotion coaching, communication training), or externally, as well as events such as congresses, conferences and trade fairs, insofar as they contribute to the objective of the aforementioned development of expertise.

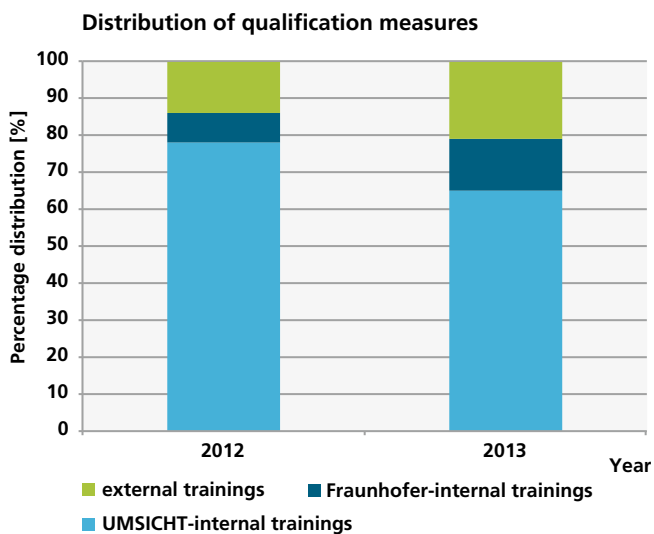


Fig. 6: Distribution of qualification measures

In 2012, staff members attended continuing education on a total of 607 qualification days, and in 2013 on 623 days. With this, the qualification rate per employee was 2.7 days in 2012 and 2.5 days in 2013.

To achieve a level of knowledge and expertise and/or a comparable level of qualification for managers at the institute that is as consistent as possible, part of the qualification program is mandatory for managers and for employees with certain function and/or areas of responsibility (e.g. project management). In 2013, due to the restructuring of the institute, all new managers were mandatorily subject to further qualification

(seminars: management training, and conducting employee performance reviews).

In addition to this mandatory program, qualification measures are offered that are available to all employees upon consultation with their supervisor. Special scientific qualification programs are geared towards employees (in particular, students working on a doctoral thesis), who are looking for a scientific career in research or industry.

Each year, the training and education program is adjusted to the institute's current requirements and needs. The determination of the needs primarily takes place via personal employee interviews which are carried out at least once a year. The department Human Resources Development receives a documentation page from the respective review that lists the further training needs of the employee.

The individual qualification measures of the training program are continuously being evaluated. Subsequent to each continuing education measure, a questionnaire is handed out that asks, in a differentiated fashion, for different criteria of the satisfaction of the attendees and the usefulness of the measure for the professional practice. Based on the evaluation results, a continuous quality control and optimization of the qualification measures takes place.

The human resources policy of the Fraunhofer-Gesellschaft implies an above average fluctuation, in particular of the scientific staff. For this reason, a thorough and systematic succession planning for important thematic and management positions is of considerable importance for the long-term success of Fraunhofer UMSICHT. In view of this background, the key functions as well as the expertises and potentials of the staff are captured in a structured fashion in annual one-on-one human resources development meetings with the managers and building upon this, individual measures (e.g.



# 2

## RESPONSIBILITY FOR HUMAN RESOURCES

promotion of the course of study, UMSICHT grant, mentoring coaching) are specified or individual human resources development plans are worked out for high potentials.

### EXTERNAL SCIENTIFIC FURTHER EDUCATION

In addition to the systematic human resources development for the staff, the UMSICHT Academy is also active in the area of scientific further education for external parties.

The focus of the external further education activities is on the interdisciplinary distance learning program "Environmental Sciences" (infernium) which offers a future-oriented further education in the area of sustainability in parallel to family and job. The established study program has been offered since 2000 in a cooperation between the FernUniversität in Hagen and Fraunhofer UMSICHT. infernium is a component of the Fraunhofer Academy and cooperates – as part of its teaching portfolio – with the Centre for Sustainability Management (CSM) of the Leuphana University Lüneburg as well as the Wuppertal Institute for Climate, Environment and Energy.

With currently more than 700 admitted students, the Master's degree course of study that has already been accredited successfully for the second time is characterized by its interdisciplinary orientation, by the thematic range of the teaching portfolio, and by the flexibility of the organization. With these unique features, infernium covers a gap in the area of further education in environmental sciences. It meets – in light of the high topicality of the issues of environmental protection and sustainability and their increasing importance in the future as well as the necessity of life-long learning – a continuing increasing demand in the further education market.

The staff of Fraunhofer UMSICHT as provider of the course of study is provided with additional qualification options by infernium. By taking on teaching activities such as the authoring of distance learning units or video lectures, the presentation at or content management of presence seminars, and the supervision of papers, homework, or master theses, experience in academic teaching can be gained and solidified.

## Diversity and Equal Opportunity

The Fraunhofer-Gesellschaft supports equal opportunity measures and is actively pursuing diversity management: all employees are treated and valued without prejudice – independent of gender, nationality, ethnicity, religion or world view, disability, age, sexual orientation and identity. Fraunhofer acknowledges that work and family need to get along with one another and in this respect supports the employees with flexible offers. In 2011, the topic of diversity was declared a board-level topic by Dr. Alexander Kurz, Executive Vice President Human Resources, Legal Affairs and IP Management of the Fraunhofer-Gesellschaft.

In order for the staff to be taken care of accordingly and supported as necessary, the employees at each institute elect an Equal Opportunity Officer for a term of four years as an obligating body. These are considerably networked amongst one another and take action beyond the institute's borders also with local equal opportunity officers of the respective cities and municipalities as well as the local universities and universities of applied sciences.

The institutes receive a total of EUR 250,000 per year to be able to establish measures for improvement in the area of reconcilability of work and family.



David Kurek, 7 years old

### EQUAL OPPORTUNITY

A central measure is the TALENTA program started in 2013 by the Fraunhofer-Gesellschaft. "Fraunhofer TALENTA" is a targeted and holistic supporting and development program to attract and develop female scientists which approaches career development in three ways on its different levels. Two candidates from Fraunhofer UMSICHT have been participating since 2013 in this program for two years.

In the recruiting area, Fraunhofer UMSICHT conducts programs for the promotion of young talent (Fraunhofer-Talent-School and Girls' Day), in order to, in particular, interest girls in MINT professions. Fraunhofer UMSICHT has, furthermore, entered into a cooperation with the initiative "ChanceMINT.NRW" in order to specially promote female students in MINT courses of study.

In 2011, the permanent staff consisted of 198 employees, 74 of them women. In the growth in staff levels to 245 people in 2013, it was possible to increase the women's share from 37 to 40.5 percent (Figure 7).

While in 2011 3 women worked in management positions at Fraunhofer UMSICHT, the number was already 21 in 2013.

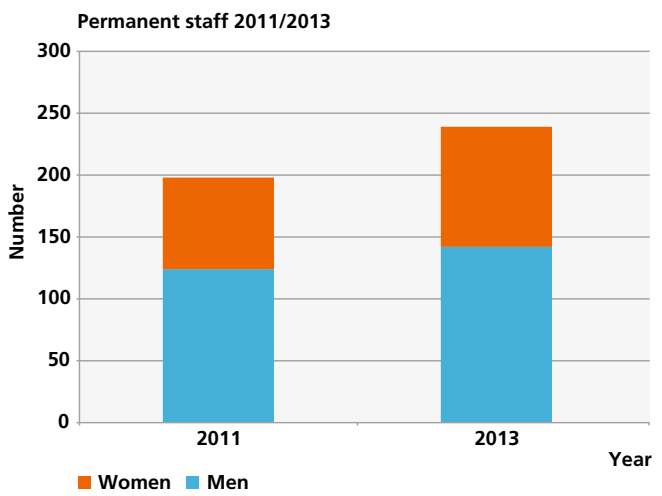


Fig. 7: Share of employees in 2012 and 2013

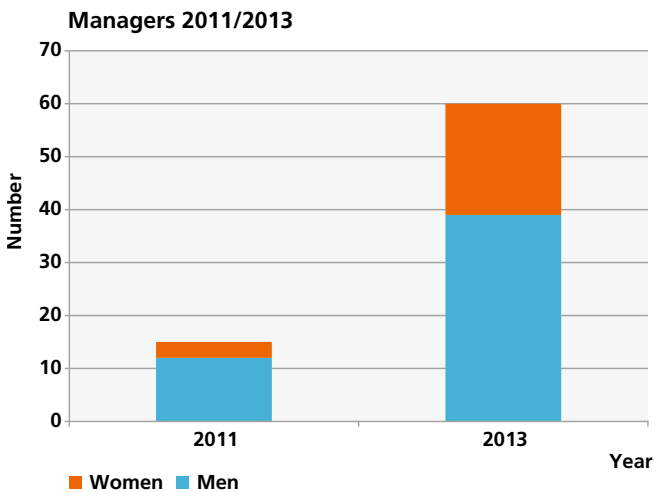


Fig. 8: Distribution of women and men in management positions

# 2

## RESPONSIBILITY FOR HUMAN RESOURCES

The imbalance in the number of women and men in the scientific area has been recognized. For this reason, in 2011 a decision was made that the Fraunhofer-Gesellschaft strives for an annual increase of the percentage of female scientists by 0.5 percent in the next 4 years. At Fraunhofer UMSICHT, a slight increase in the percentage of women can already be observed (Figure 9).

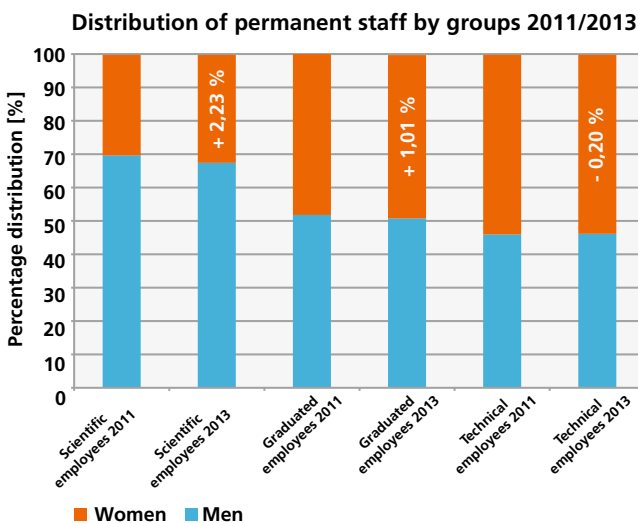


Fig. 9: Overview of scientific employees, graduated employees and technical employees in 2011 and 2013

### DEVELOPMENT OF SALARY GROUP DISTRIBUTION

Figure 10 depicts the ratio of the basic salary of women and men by salary group (SG). It shows the percentage rate distribution at the institute relative to the permanent staff, distributed by women (orange) and men (blue).

The categorization of the salary groups takes place as follows:

SG 13 – SG 15Ü = Scientific employees (S);

SG 9 – SG 12 = Graduated employees (G);

SG 2 – SG 8 = Technical employees (T).

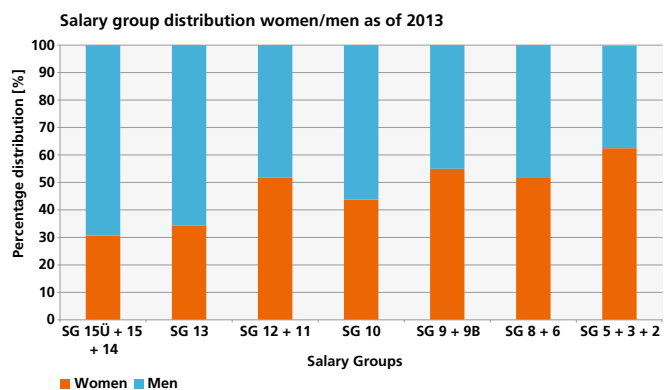


Fig. 10: Distribution of salary groups by gender

### EMERGENCY CHILD CARE AND ELDERCARE

The Fraunhofer-Gesellschaft has entered into a master agreement with pme Familienservice GmbH in order to provide its staff a further unburdening with respect to the reconcilability of work and family. Thus, with the cooperation agreement, both emergency child care and eldercare consulting are available free of charge. In spring 2014, an information event regarding this topic was held for the staff.

# 3

## UMSICHT-INTERNAL FOOTPRINT



David Kurek, 7 years old

### Resource Efficiency and Environmental Protection

In light of the increasing scarcity of resources as well as negative consequential effects of resource consumption, Fraunhofer UMSICHT wants to make a significant contribution to resource-saving and to environmental protection.

At present, the ecological footprint, i.e., the space on earth that is needed to provide the resources that allow for the life-style and standard of living of a person (under today's production conditions) in the long-term amounts to approx. 4.6 ha/person in Germany ([www.footprintnetwork.org](http://www.footprintnetwork.org)). However, in total only approx. 1.8 ha/person are available world-wide. This means that in Germany above average sized amounts of resources are being consumed. But through the development of particularly resource-efficient and environmentally friendly technologies, it may be possible to allow for a similar standard of living with a lower utilization of resources even in the future.

Fraunhofer UMSICHT develops resource-saving and environmentally friendly technologies and concepts for producing companies. These do sustainably contribute towards securing the quality of life in Germany and to the preservation of resources.

The efficient handling of electricity, gas and water as well as consumables also plays an important role in the day-to-day work at Fraunhofer UMSICHT. Therefore the amounts of electricity, gas and water as well as consumables Fraunhofer UMSICHT consumes in the course of day-to-day work are recorded, and serve as a knowledge base for a handling of the resources that is as efficient as possible.

At the same time, it must be taken into consideration that tests and practical development activities in the labs and technical shops lead to temporarily increased consumptions of resources.

These do not necessarily have to be considered negatively since they often allow for later resource savings. In light of this, it does not seem to make sense to align the ecological objectives of Fraunhofer UMSICHT exclusively with the resource consumptions tied to the development activity.

#### ENERGY CONSUMPTION

The sum of the natural gas consumption<sup>4</sup> (direct energy consumption) and the indirect energy consumption via the purchase of electricity is depicted in figure 11. In 2013, the total energy consumption amounted to approx. 18.7 million MJ. In comparison to 2012, the annual consumption of electricity has dropped slightly, whereas the gas consumption has increased slightly. The drop in the consumption of electricity can be traced back first and foremost to lower power consumption at the Willich site.

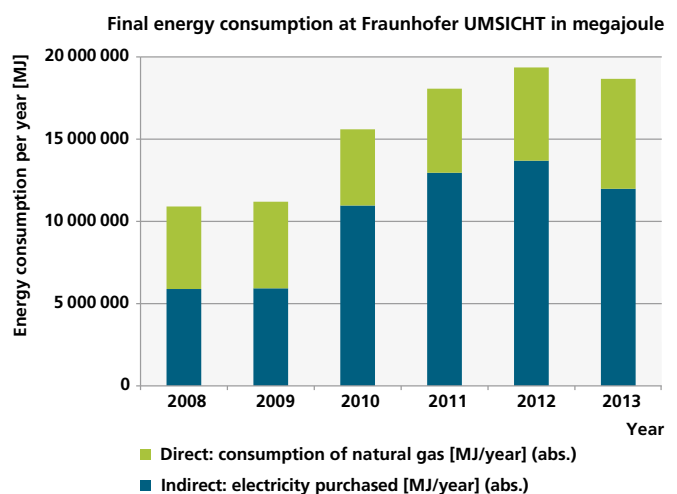


Fig. 11: Final energy consumption per year for natural gas and electricity

The comparison of the annual consumption of electricity per staff member (SM) in the past years shows that it has been continuously reduced from approx. 18,200 kWh/SM

<sup>4</sup> For the calculation of the energy consumption by means of natural gas, the lower calorific value of 31.74 MJ/Nm<sup>3</sup> was utilized.

# 3 UMSICHT-INTERNAL FOOTPRINT

in 2011 to approx. 16,900 kWh/SM in 2012, and further to 13,600 kWh/SM in 2013. On the other hand, the annual gas consumption per employee remains constant at approx. 800 m<sup>3</sup> of natural gas. With the drop in final energy consumption, the primary energy expenditure by Fraunhofer UMSICHT has also dropped from 50.5 million MJ/year (2012) to 46.4 million MJ/year (2013). The primary energy expenditure – in addition to the consumption of electricity and gas – also includes the energy required for business trips. The primary energy expenditure is a meaningful and practicable indicator for the assessment of the utilization of energy resources and the energy-related environmental pollution such as emissions of greenhouse gases and air pollutants.

## GREENHOUSE GASES AND OTHER AIR POLLUTANTS

With the drop of the primary energy expenditure, the greenhouse gas emissions dropped last year, as depicted in figure 12. While the total in 2012 amounted to approx. 2700 tonnes of CO<sub>2</sub> equivalent, they amounted to barely 2500 tonnes of CO<sub>2</sub> equivalent in 2013. Of those 2500 tonnes of CO<sub>2</sub> equivalent, 80 percent were caused by the consumption of electricity, 13 percent by the consumption of natural gas, and 7 percent by business trips.

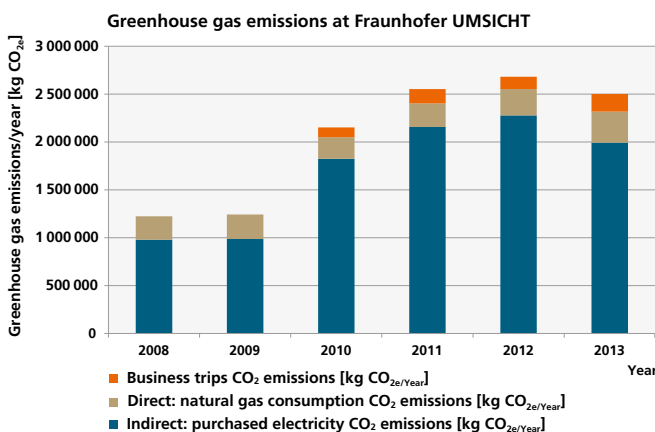


Fig. 12: Greenhouse gas emissions - electricity, natural gas, and trips

The greenhouse gas emissions per staff member and year have dropped from 10.8 t of CO<sub>2</sub> equivalent/SM in 2011 to 10.1 t of CO<sub>2</sub> equivalent/SM in 2012 and 8.1 t of CO<sub>2</sub> equivalent/SM 2013. In Germany, approximately 951 million tons of greenhouse gases were emitted in 2014, which is equivalent to 11.7 t CO<sub>2e</sub> per citizen of the Federal Republic of Germany.

The greenhouse gas emissions caused by business trips amounted to 0.75 t CO<sub>2</sub> equivalent/SM in 2013. Overall, 60 percent of the business trips were conducted via railroad (41 percent) and the public transport system (19 percent). In 25 percent of the business trips, a company car was used, and in 15 percent an airplane. Despite the dominating utilization of the railroad, almost half of the kilometers were spent on air travel, as illustrated in figure 13. The reason for this is that some projects required business trips to South America and Asia.

## Business trips kilometers

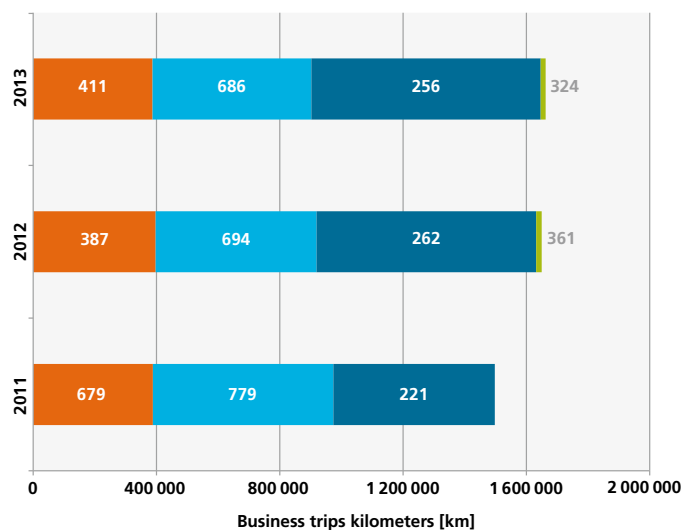


Fig. 13: Business trips kilometers categorized by means of transportation



Lotta Franke, 5 years old

The utilization of fuels leads to greenhouse gas and nitrous oxide emissions. In 2013, approx. 200 t CO<sub>2</sub> equivalent and 590 kg NO<sub>x</sub> were emitted across all modes of transportation. The NO<sub>x</sub> emissions (444 kg) caused by air travel are significantly higher than the NO<sub>x</sub> emissions caused by other modes of transportation. Therefore, the objective is to reduce the number of domestic flights and to increasingly use the railroad.

While the amount of greenhouse gases emitted by business trips slightly increased in the past years from 172 t in 2011 to 199 t [in 2012] and 202 t in 2013, it has remained constant on a per staff member basis. Since 2010, electricity from regenerative sources is used for railroad trips of the Fraunhofer-Gesellschaft, so that the factual greenhouse gas emissions are lower than the calculated emissions.

### WASTE

At UMSICHT, the amounts of waste are recorded by means of a waste code number as part of a waste balance sheet. This is of particular relevance for hazardous wastes which, however, is not regularly generated as part of the research and development activity. For residential and paper waste as well as glass waste, collection receptacles are available which, however, are not weighed. Because of this, the amount of waste is calculated based on the container size, the density as well as the emptying interval. As part of the data collection for this sustainability report, it turned out that this approach entails some uncertainties. For the next sustainability report (2014/2015) we will therefore focus on a more reliable estimation of the volume of waste at the institute.

Based on the calculations to date, the total waste amount was 58 t in 2012 and 79 t in 2013.

	2008	2009	2010	2011	2012	2013
Total volume of waste [t/year]	94	58	56	61	58	79

Table 1: Volume of waste per year

### WATER

Despite an increasing number of staff, the fresh water consumption in the past years has remained constant at approx. 15,000 m<sup>3</sup>/year. In 2013, the fresh water consumption amounted to approx. 14,700 m<sup>3</sup>.

### PAPER CONSUMPTION

We were able to further reduce the paper consumption, by allowing – for instance – holiday requests and since 2013 also requests for business trips to only be filed and processed digitally. Furthermore, digital copies are being used increasingly, and the double-sided black&white print mode has been setup as default on all printers. Despite increasing staffing levels, all these measures have led to a continuous reduction in paper consumption from 1.05 million DIN A4 sheets of paper in 2008 to 830,625 DIN A4 sheets of paper in 2013. In addition, Fraunhofer UMSICHT only utilizes paper that complies with the international sustainability requirements (FSC®, EU Ecolabel). Figure 14 illustrates the development of the paper consumption per staff member in the years 2008 to 2013.

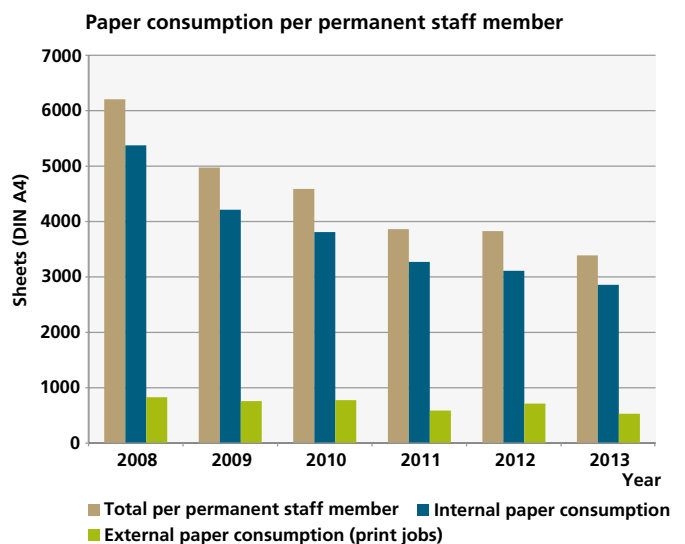


Fig. 14: Paper consumption (FSC® seal)

# 3

## UMSICHT-INTERNAL FOOTPRINT



Chemicals in the laboratory  
© Fraunhofer UMSICHT / Matthias Holländer

## Insight: Sustainability at our Laboratories

In a lot of places at UMSICHT, consumptions of materials and energy are already being recorded in order to derive measures for improvement of sustainability. To date, in the area of our laboratories this has been the case only to a limited extent. The gas consumptions, for example, are being recorded. The consumptions of water and energy are only being recorded for UMSICHT as a whole. Therefore, the sustainability working group has decided to pay more attention to this topic in cooperation with the laboratory management.

Which issues do we want to start with?

In principle, we perceive three different starting points for more sustainable laboratory work, here:

### 1. WORK IN THE LABORATORY

This relates to the consumptions of energy, media (water, gas, etc.) and materials in day-to-day lab work.

- Taking inventory: How high are the consumption levels of energy, media, and materials (consumables such as rolls of paper, gloves, disposable syringes)?
- Complete investigation of the procurement and disposal paths
- Prevention: Avoiding both waste as well as wasting of consumables and energy → development of suggestions for more efficient methods of work, in particular for those persons who are not part of the permanent laboratory staff.
- Avoidance of substances that pose a hazard → a list with suggestions for substitute materials for frequently recurring working steps at the laboratory is under development. This relates to substances that are not covered by the hazardous substance replacement check conducted to date.

### 2. PROJECT PLANNING

This relates to the utilization of sustainable substitute materials in case of known syntheses and sustainable process alternatives. Such optimization cannot be "taken care of" within projects that are on-going, but rather are the content of new projects or must be implemented as work package in new projects.

- Utilization of renewable resource, whenever possible
- Products to be developed should be planned such that they have a toxicity that is as low as possible while providing for full functionality.
- Development of durable but not persistent products
- Actually a matter of course, but nevertheless important: to maximize efficiency! This means: processes should be able to work with a minimum of time, energy, and material.

### 3. CONSTRUCTION MEASURES

In the planning of future conversion or construction measures, the sustainability working group would like to participate early on with constructive ideas. The assessment of the sustainability of an existing building in accordance with the established assessment systems is very costly. Nevertheless, a corresponding assessment is planned in order to be able to suggest improvement measures.

What is the long-term objective?

Even though there are no governmental regulations for this, yet (similar to, for instance, the energy savings ordinance (EnEV - Energieeinsparverordnung) or the workplace ordinance (Arbeitsstättenverordnung) or the workplace safety ordinance (Betriebssicherheitsverordnung) for other areas), our medium-term objective is the self-assessment of our laboratories in accordance with the certification criteria of the German sustainable building council (DGNB).<sup>5</sup>

<sup>5</sup> Certification criteria that include the construction prerequisites for the laboratory as well as its operation to date only exist for new constructions but not yet for existing laboratories.

# 4 ECONOMIC STABILITY

## Economic Stability

In 2013, Fraunhofer UMSICHT generated an operating budget of EUR 27 million at the Oberhausen and Willich sites. Approx. EUR 12 million from research and development orders with partners from the industry, e.g. with small and medium-sized enterprises contributed to the funding. Another EUR 7.5 million in public project funds were attracted, among others, from federal ministries, the state, municipalities, and the EU. Based on these revenues, UMSICHT had a basic funding of EUR 8 million available for internal research and Fraunhofer-internal research projects. With these funds, UMSICHT can react proactively to business and social needs, and can create the foundations for needed product and service innovations.

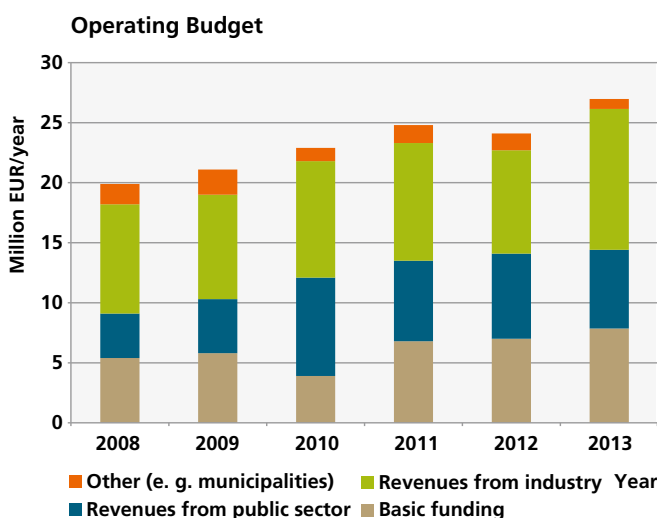


Fig. 15: Development of the institute's budget (Oberhausen/Willich)

In 2012 and 2013, UMSICHT furthermore invested approx. EUR 4.7 million in total into the establishment of new laboratory facilities, among other things in the research focus areas of biomass processing and redox flow systems, in technical equipment with innovative milling, laser and photonics technology as well as in the IT infrastructure of the institute.

The growth trend of the last few years has primarily been borne by the growth of highly qualified scientist positions in the staff as well as through the strategic expansion of industrial customer acquisition. The latter becomes apparent in the promising initiation of large projects with partners from industry, research and the public sector.

On-going challenges for UMSICHT are the attraction of increasingly scarcer sized private sector and public sector R&D budgets, the increased competition with universities and universities of applied sciences, and the trend of partially decreasing effective funding rates. Positive signals, on the other hand, are current improvements in the funding conditions in the German state of North Rhine-Westphalia.

UMSICHT features an established controlling and planning system to identify the risks and to control them through strategic measures. Serving this are, among other things, regular meetings between the controlling department and other departments in order to discuss risks and to develop solutions.



# 5

## NO MAN IS AN ISLAND<sup>6</sup> – SOCIAL RESPONSIBILITY

*"A sustainable society is technically and economically possible. It could be much more desirable than a society that tries to solve its problems by constant expansion. The transition to a sustainable society requires a careful balance between long-term and short-term goals and an emphasis on sufficiency, equity, and quality of life rather than on quantity of output. It requires more than productivity and more than technology; it also requires maturity, compassion, and wisdom."*<sup>7</sup>

Aristotle defined the human being as *zoon politikón*<sup>8</sup>, as a social, political being. No man is an island – we all live and work in interdependent relationships and in the resonances of social, technical, economical, and ecological systems and their impacts on the future. Research and development too, must always be embedded in the social, economical and ecological contexts. Fraunhofer UMSICHT combines strategic economical action and social commitment and develops up-to-date instruments and measures of taking on social responsibility.

### FRAMEWORK CONDITIONS FOR OUR STAFF

We create framework conditions that excite and motivate our staff, provide them with leeway, and enable them to further develop their individual capabilities – this is also to the advantage of the families of the staff members and other people in their environment. We actively promote work/life balance, health, family-friendliness, further education, and personal further development of our staff members. We want critical minds, creative discussions, and ideas that are not only

innovative but rather go far beyond that. We want to solve conflicts and problems in a participatory way. It is important to us to perceive our scientific work not just as an end in itself, as pure means of attracting third party funding, or for the utilization of knowledge and research results<sup>9</sup>. As a matter of principle our research is carried out without any preconceived conclusions. We are now asking ourselves how we can make a significant contribution to the protection of the environment and to socially appropriate social development. Our staff members are expected to think outside the box, to look beyond their own nose, and to reach for the stars. They bear responsibility for the application of their work results and pose questions regarding the possibilities and the limits of the research. We are looking for cross-thematic and cross-cultural discussion and the dialog with the public. This goes along with an awareness of the interconnections of technically-scientific, economical, ecological and social systems and their effect on the future and on future generations.

### EVENTS/GENERAL PUBLIC

A tradition at our institute are events and formats that promote social discourse regarding social, ecological, and ethical concerns. As such, for example, an information day regarding the topic of fair trade with informational material, product samples and a subject matter lecture was organized for the colleagues in September 2013 as part of the Fair Week by the sustainability working group. However, numerous events are also open to external interested parties. The UMSICHT debate for instance dealt with "Burn-out versus Bore-out" or asked

<sup>6</sup> "No man is an island, entire of itself; every man is a piece of the continent, a part of the main. If a clod be washed away by the sea, Europe is the less, as well as if a promontory were, as well as if a manor of thy friend's or of thine own were" (John Donne, Meditation XVII, 1623).

<sup>7</sup> From: *Beyond the Limits; Confronting Global Collapse, Envisioning a Sustainable Future* by Donella H. Meadows, Dennis L. Meadows, and Jorgen Randers, 1993.

<sup>8</sup> Aristotle, *Politika III*, 6.

<sup>9</sup> cf. Jürgen Habermas' dictum of the "Scientification of Technology" (Habermas, Jürgen: *Technik und Wissenschaft als Ideologie (Technology and Science as Ideology)*. Frankfurt: Suhrkamp, 1995 [16th edition]).



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"No place for God?". All interested parties have a standing invitation to the UMSICHT debate or to events of the "Art and Culture" group. These offers are used by customers, partners, former staff, and public at large. Fraunhofer UMSICHT is an open institute and regularly conducts guided tours for visitor groups ranging from school classes to senior citizen clubs. Fraunhofer UMSICHT publishes its research.

In 2012 and 2013, 58 and 50 press releases were prepared, respectively, and 20 and 25 events were held, respectively. Each year, the institute participates in more than 10 trade fairs.

The local public is also integrated via guided tours of the institute. In 2012 and 2013, 33 and 35 guided tours were performed, respectively, with 338 and 603 people, respectively. The 2013 figure is very high due to guided tours of large groups of students – over the course of the year, those figures amounted to between 300 and 400 attendees.

	NUMBER IN 2012	NUMBER IN 2013
Press releases	58	50
Events	20	25
Trade fair participation	12	11
Guided tours/ visitor groups	33	35
Participants in the guided tours	338	603

#### PUBLICATIONS

Our research results are not only communicated to our client but also to the scientific community and the public at large. This is, however, not always possible, in particular, when these are project completion reports that are subject to a confidentiality agreement. Figure 16 therefore only provides an overview of the publicly available publications that were reported to our library. To increase the number of publications, in 2014 an incentive system was implemented, due to the dropping number of publications.

Table 2: Development of press releases, events, trade fairs, and guided tours

# 5

## NO MAN IS AN ISLAND – SOCIAL RESPONSIBILITY

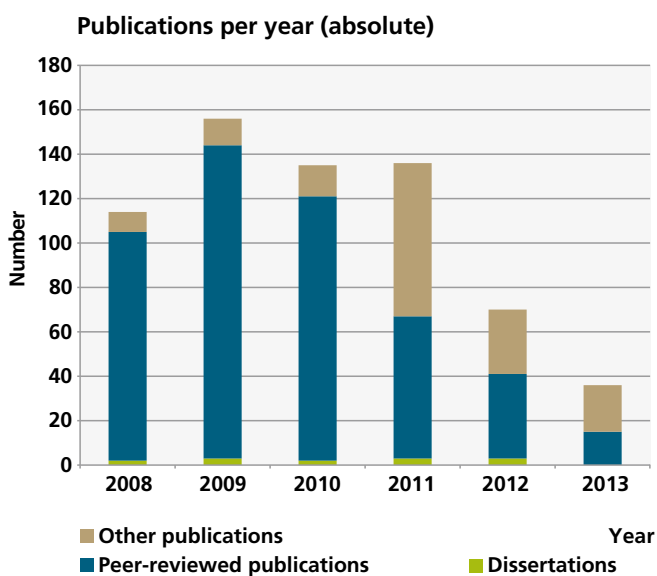


Fig. 16: Publications by UMSICHT

Citizens increasingly develop an interest in projects that may affect their quality of life. Fraunhofer UMSICHT supports consultation processes, for instance via citizen dialogs, and will further expand its participatory elements. One project did, for example, investigate to what extent the installation of a filter can reduce the fine dust load in the *Einhorn Tunnel* in Schwäbisch Gmünd. For this tunnel project, new, transferable forms of the citizen dialog were developed. In the future, citizens should be included early on and should be scientifically informed in ecologically and socially relevant investment decisions. This does apply, similarly to the development of climate protection concepts and to the question regarding the image and acceptance of biogas technology.

Social networks such as Facebook, Google+ and LinkedIn, professional public relations, events, and trade fairs ensure that our research results are communicated widely.

### STAKEHOLDER ENGAGEMENT

Two of our most important stakeholder groups are the Board of Trustees of the institute and the UMSICHT Circle of Friends and Patrons. The members of the Board of Trustees actively contribute (e.g. in workshops) to important strategic questions. The UMSICHT Circle of Friends and Patrons targetedly promotes projects and spin-offs, and in 2014 has awarded the UMSICHT Science Award for the fifth time already. One scientific work and two journalistic works, each, receive an award – of particular importance to us is the promotion of dialog. Not only should science be comprehensible to non-experts, but to the contrary, science should also profit from different ways of thinking (all in the spirit of Lichtenberg: "Those who understand nothing but chemistry, won't quite understand the latter, either"<sup>10</sup>). As an institute of the Fraunhofer-Gesellschaft, we cooperate in a spirit of partnership with the Board, the headquarters, and other institutes. They are equally a part of the scientific community that is networked with us such as universities, non-university research facilities, and industrial partners in the R&D environment.

### COOPERATIONS/ENGAGEMENT IN THE REGION

Since 2012, UMSICHT has been cooperating with the Sophie-Scholl-Gymnasium high school in Oberhausen. In concrete projects, the students are introduced to the practice at a research institute in order to get them excited about future developments. As part of a project course, 24 students of the grade Q1/Q2 did visit our institute every six weeks - spanning across school years - and worked in three groups on the topic of sustainability. In this, the focus was on three different aspects: philosophical-social issues, sustainability reporting by schools, and "personal fabrication" – 3D printing.

<sup>10</sup> Georg Christoph Lichtenberg, *Sudelbücher Heft J (860)*, (Rough Books, Book J).



Robin Borelbach, 7 years old

In the philosophy group, it was discussed in-depth which contribution each individual person can make towards preserving our planet for future generations. These discussions were exemplarily summarized in excellent essays. The different priority of the topic of sustainability in other countries was also broached. As such, for instance, online surveys of students at partner schools in Australia and South Korea were conducted in order to determine how people there of the same age think of sustainability topics, what role sustainability plays in their day-to-day life (e. g. in separating waste), whom they believe to be responsible for our environmental problems, and what the reason may be - in their opinion - why so few people live environmentally conscious.

Figure 17 depicts the results for the question: What is the reason – in your opinion – why so few people live environmentally conscious?

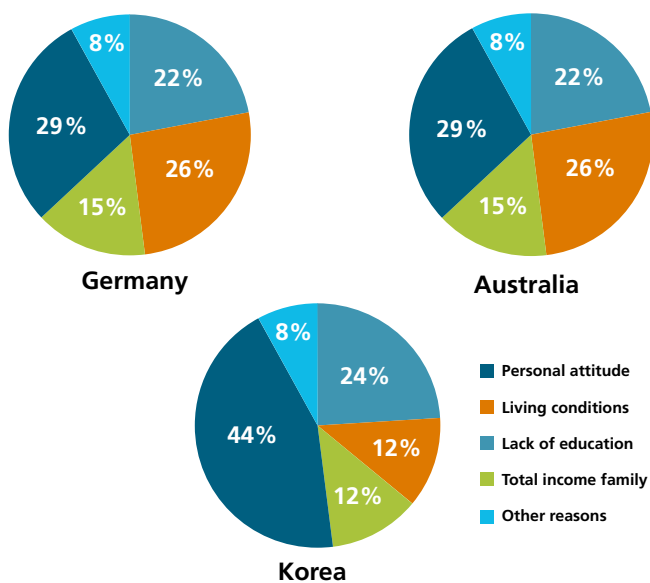


Fig. 17: While the teenagers surveyed in Germany and Australia completely agreed on this issue in the survey, there were clear deviations in Korea. ©Sophie-Scholl-Gymnasium

The work was very practice-oriented in the area of 3D printing. Different 3D print programs were tested and assessed, and subsequently the 3D printing was compared to the traditional manufacturing processes of milling and injection molding with respect to quality and energy consumption.

Active with just as much commitment was the team that prepared the sustainability report for the school. Firstly, the participants analyzed reports of large reports of large companies and derived from that which data and information is important for sustainability reporting. Then they researched the necessary data, compiled information, conducted numerous interviews, conducted surveys amongst students and the teaching staff, and summarized the quintessence from this in the report. But that was not the only thing – in addition to capturing the status quo, they also made suggestions for measures with which the sustainability at the Sophie-Scholl-Gymnasium could be further optimized. The complete report is available for download on the web pages of the school.

The results of the course were presented to the younger grades on the sustainability day at the Sophie-Scholl-Gymnasium. The new grade Q1 will continue the sustainability report in the project course.

Since January 2014, Fraunhofer UMSICHT has even closer ties to the Local Agenda of the City of Oberhausen. One of our employees who had already been active for two years in the Agenda working group "Fair Trade" was elected as a representative of the citizens in the steering committee of the Local Agenda and as such can intensify the local networking.

# 6

## RESPONSIBLE RESEARCH

### Expanded Understanding of Research and Development

It has – for the most part – become consensus that research and development can no longer hide behind the claim of the neutrality of technology by assigning the whole responsibility to the manufacturers' and users' side.<sup>11</sup> Therefore, the objective must specifically be the self-commitment of the parties involved to an expanded understanding of research and development and innovation (R&D&I) – towards a mode of research with social responsibility (responsible research and innovation, RRI).

*"Responsible Research and Innovation (RRI) is a transparent, interactive process by which social actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and social desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)."*<sup>12</sup>

RRI refers to a mode of research and development that acknowledges the responsibility for society and the environment – and not in the sense of a patronizing by the powerful towards those not knowing, but rather as "being accountable toward", as "process of explanation and dialog" (responsiveness) towards the other affected parties – society, and the environment.

Such a responsibility includes the willingness towards dialog and towards critical questions of one's own approach and one's own results. It is not only the contribution towards scientific progress and economic profitability that counts but also the social acceptance of the results and their contribution towards sustainable development (i. e., the future-capability

of an innovation measured by its direct or indirect contribution towards solving pressing problems such as scarcity of resources, climate change, and lack of distributive justice both between countries and continents as well as between the generations).

In this, an external sustainability expertise does not matter, initially, nor to precisely balance negative consequences, but rather the fundamental willingness to critically question the scope and depth of intervention of one's R&D ("reflexivity"<sup>13</sup>) and to maintain an open eye for alternative actions during the R&D process. The objective is to dynamically design the R&D process internally such (to "modulate") that it moves into the direction of sustainable development.

Responsibility is a multi-layered term – responsibility for a project, responsibility towards the employer, towards the circle of clients, towards the law, towards one's own consciousness, and last but not least also towards society and towards the environment – therefore, conflicts may arise between these different dimensions.

As a result, the objective must be to develop robust methods for a technology assessment accompanying innovation and to subsequently develop an instrumentation, a manual, or a toolbox with which the parties involved from R&D can self-reflectingly steer their actions in the direction of responsible development. Here, accompanying innovation means that the assessment does not take place a single time but rather is a process that is integrated into the project, featuring increments similar to those of the research process itself and thus always allowing for corrective actions.

<sup>11</sup> cf. VDI guideline 3780 regarding technology assessment.

<sup>12</sup> René von Schomberg: *A Vision of Responsible Research and Innovation*; in: Richard Owen, John Bessant, Maggy Heintz (ed.): *Responsible Innovation*, Wiley & Sons, 2013, p. 51.

<sup>13</sup> cf. the term of "reflexive modernization", Ulrich Beck: *Risikogesellschaft – Auf dem Weg in eine andere Moderne (Risk Society – Towards a New Modernity)*, Frankfurt/Main, 1986, p. 254 f.



Amélie Pollerberg, 5 years old

Specifically, participation and interdisciplinary and/or transdisciplinary work represent opportunities to intertwine such a design and assessment of the research process with one another and to help provide them with a broad base.

**Interdisciplinarity:** Cooperation between (lat. *inter*) different disciplines of science in order to work on new problems via the exchange and further development of methods (e. g. biomimetics).

**Transdisciplinarity** (in a comprehensive sense): Goes beyond interdisciplinarity (see above), since it includes a going past (lat. *transgressio*) the existing borders between disciplines and even the border between science and society. This may also include the participation of non-experts in the research process ("open innovation") and stakeholder dialogs<sup>14</sup>.

## Measures to Date at Fraunhofer UMSICHT

In November 2013, the first Fraunhofer *Research Dialog* took place. Research dialogs are result-oriented discussion forums in which people from industry, civil society, and science as well as staff from R&D matter-of-factly discuss opportunities and risks of a controversial and socially relevant technology and capture the results.

The topic of the kick-off event in Berlin was the material and energetic utilization of biomass in which staff of the most diverse groups of society, industry and science participated. As a basis, all attendees provided a brief written statement in advance in order to position themselves with respect to the core questions asked by UMSICHT. During the discussion, essential issues and positions were captured via minutes and presentations which in turn formed the basis for the follow-up and additional results. Ultimately, the objective is the development of an Internet presence where – on the one hand – the results and positions can be viewed, but which – on the other hand – also will contain a form in which the discussion can be continued.

In 2015, the iLENA platform will go online Fraunhofer-wide. It is an information portal that was developed by the Sustainability Network, in which UMSICHT is actively participating. iLENA provides information knowledge from practice regarding sustainability and sustainability reporting at the institutes.

Structurally, this portal is modeled after the structure and contents of the Global Reporting Initiative (GRI) for companies, but it also contains additions and deviations wherever a transfer of the GRI standard to R&D was not possible. Subsequent to logging in, interested parties can click through different fields of activity, indicators, and best practice measures in order to receive generally comprehensible information and suggestions all around sustainable R&D and business processes of the institutes.

<sup>14</sup> In this, stakeholders may for instance be NGOs, civic groups, customers, members of federal organizations, or other persons or groups who are directly or indirectly affected by the project.

# 6

## RESPONSIBLE RESEARCH

UMSICHT is considerably participating in the collaborative project "Sustainability Management Guideline" (LeNa) which was started in October 2013 with a period of three years, and which is a cooperation of additional institutes of the Fraunhofer-Gesellschaft as well as the Helmholtz-Gemeinschaft and the Leibniz-Gemeinschaft.

It is of particular interest here that the sub-project "Research with social responsibility", whose objective it is to provide R&D and/or project managers with a handbook for an improved integration of sustainability aspects. This "**Handbook for Sustainable Research Practice**" is based on an idea that was conceptualized by Fraunhofer UMSICHT in the Fraunhofer-internal strategy process for sustainability 2012, and which now is going to be implemented as part of the LeNa project of the Federal Ministry of Education and Research (BMBF). It is going to support the transdisciplinary and sustainability-oriented support of research and development projects by providing checklists as decision aids and help when dealing with target conflicts.

The handbook is structured by performance criteria that cover the whole life-cycle of products and technologies and which comprise one chapter, each. This includes, for instance, "research-efficient", "low in harmful substances", "gender-sensitive", "from fair trade", "recyclable", etc. For each of these criteria methodological knowledge, best practices, and indicators are included that allow for a taking into consideration already in the early phases of innovation processes. This toolbox that is modeled after research practice is supplemented by general aspects regarding the operationalization of the guiding principle of sustainable development and regarding the relationship triangle between science, freedom, and responsibility.

To achieve a high acceptance and distribution of a "Sustainable Research Practice", the handbook is to be developed by

a multi-author collective from multiple non-university research organizations (approx. 100 people). In May 2014, the project was introduced at the "Sustainability in Science" symposium in Berlin in order to discuss additional contents, and to attract coordinators for chapter responsibilities and authors who are willing to share their knowledge in these chapters.

Additional preliminary work for this sub-project consisted of the **interviews regarding the topic of science with social responsibility** conducted by UMSICHT in January 2014.

These constitute an internal status assessment, a sample-like survey of the "base" of R&D at UMSICHT as first stakeholder integration into the project. For this, 15 staff members from R&D were interviewed regarding their opinion of guiding principles, responsibility for research, and the (sustainability) assessment of R&D. Table 3 depicts the results of the survey in excerpts: Cells shaded in gray indicate economical aspects, those shaded in green indicate ecological and social ones. Fields shaded in beige cannot be allocated unambiguously. Since the interviews consisted of 15 samples, a weighting based on frequency of indication was only implemented to a limited extent in the sequence of mentions.

The following objectives and/or the following need for action was derived from these results:

- How do we arrive at a "culture of technology impact assessment" so that considerations regarding the social and environmental compatibility are no longer mere "annoying compulsory exercises" peripheral to projects? (bottom-up)
- How can sustainability aspects – even those that bring economic disadvantages with them in the short term – be made better visible in the existing controlling and quality management instrumentation? (top-down)
- How can interdisciplinarity and trans-disciplinarity be intensified in the day-to-day business activities of R&D? (both)



Amélie Pollerberg, 5 years old

In March 2014, UMSICHT held the first cross-divisional and cross-departmental **workshop discussion regarding the topic of microplastics**. The objective of this first internal event regarding the topic initially was to identify the need for research and action with respect to the pressing problem of microplastics particles in our in our waters. In the subsequent workshop discussions, the approx. 15 attendees want to approach specific projects and initiatives.

In May 2014, UMSICHT - jointly with the Folkwang University of Arts and the Wuppertal Institute for Climate, Environment and Energy - organized an event regarding the topic of sustainable design under the title "Designers don't care". The title is to be understood as a provocation because it should then be broached in debates and impulse presentations to what extent designer do have and do realize responsibility, opportunities to influence, and leeway for the development

of sustainable products. Furthermore, it should be critically questioned why the eco-design even decades after it was invented still has not been adopted at a large scale.

As far as the tool development for responsible research and development is concerned, since June 2014 also a cooperation with the Wissenschaftsladen Bonn e. V. ("science shop") regarding the topic of **Toolbox for Responsible Research and Innovation** has been taking place. Its objective is to bring together different involved parties from the intercession of science, development and civil society in result-oriented workshops.

Motivation and guiding principle	Individual responsibility ...	Whose interests do you represent in R&D?	Assessment of projects, role of sustainability aspects in this	Dealing with conflicts, early identification of opportunities and risks of technologies and products
Integrity (professional and individual ethics)	... to provide "good work"	That of the institute That of my one	Actual vs. target: The application/project plan determines what is important	Educational work: Informing consultingly and scientifically
Customer satisfaction		That of the customer	Follow-up orders	Experience helps ...
Ecology Ethically-socially	... for society and the environment ...	That of society ...	Occasionally: Eco-balances or LCAs (most of the time, only if/when explicitly requested by the responsible body)	Screening of ingredients "Communication beyond one's own nose", holistic point of view
	... depends on the topic ...	... social acceptance is generally recognized as important, but ...	Accompanying: Advisory committee (expert or citizen participation) ... is depends on the topic	"Often, asking the question already helps": Willingness to rethink the project's direction/give in, where necessary
"Technical progress to the benefit of society and the environment" ... "as long as it pays off for the institute"	... sensitive topics bring more responsibility with them	... the attitude regarding stakeholder dialogs is split, especially where the integration of lay persons is concerned	The criterion of adaptivity: economical, political, and scientific usability	A clear commitment by the institute's directorate – consistency and follow-through for a clear positioning regarding sustainability

Table 3: Central results of the survey



# 7

## MEASURES AND OBJECTIVES

In table 4, measures are presented by subject area. We present a transparent look back onto the measures mentioned in the Sustainability Report for 2012 and provide a preview of the planned measures.

Table 4: Improvement measures

MEASURE	PERIOD	RESPONSIBILITY	ACHIEVEMENT OF OBJECTIVE	STATUS
<b>IMPLEMENTED MEASURES</b>				
With child office	since 2009	Christine Mühleib	Measure has been accepted, approx. 16 utilizations per year	
Poster campaign "Sustainable Behavior"	since 2010	Markus Hiebel, PR	Is made available on the Internet ( <a href="http://s.fhg.de/uE7">s.fhg.de/uE7</a> )	
Implementation of measures from Diversity Charter	since 2011	Fraunhofer	Fraunhofer has hired a diversity manager (p. 14)	
Creation of the position of a sustainability manager	2012	ISC, executives	Markus Hiebel appointed as sustainability manager	
Capturing of qualification days by external and internal training	since 2011	Anja Gerstenmeier	Data captured (p. 13)	
Analysis of the employee survey in 2011	2012	IM	Analyzed; results were presented; employee workshops were held in all business units and measures were implemented	
<b>CONTINUOUS MEASURES</b>				
Green IT	continuously	IT	Number of thin clients increased from 199 to 287; continue to monitor since the number of PCs also increased from 247 to 300. Reason: increasing number of employees	
Green procurement	continuously	Administration / Purchasing	Paper once again FSC®-certified, p. 19	
Reduce paper consumption	continuously	IT, all employees	Changed print settings to b&w and double-sided; continue to monitor	
On-site equipment documentation system	since 2011	Rasit Özgüç	Not been implemented due to capacity bottlenecks	
Machine-specific and system-specific mobile consumption system for water, energy, and other media	since 2012	Rasit Özgüç	Mobile electrical energy measuring system can be utilized	
Awarding of the UMSICHT Science Award	annually	Görge Deerberg	p. 24	
Donation of old shredded optical media (CD/DVD). Passing on to the Sophie-Scholl-Gymnasium high school in Oberhausen for sale → Proceeds towards a local animal park and animal shelter	since 2012	Berxedan Ali	Since 2014 passing on to Sophie-Scholl-Gymnasium, prior to that to an organization in Essen	

IM=Institute Management, SM=Staff Member (employee), SUS= Sustainability, PR=Public Relations, DH=Department Heads

Measure completely implemented    Measure partially implemented    Measure not implemented    Measure started (no estimate possible, yet)



Robin Borelbach, 7 years old

MEASURE	PERIOD	RESPONSIBILITY	ACHIEVEMENT OF OBJECTIVE	STATUS
GEVIS II – central hazardous substance administration and information system of the Fraunhofer-Gesellschaft	continuously	DH, supported by Kai Girod, Peter Schwerdt, Bärbel Egenolf-Jonkmanns, Thomas Klein, Rodion Kopitzky, Erich Jelen, Iris Romeike	Physical, chemical, and toxicological data of approx. 25,000 different chemicals and preparations; workplace-specific operating instructions, safety data sheets, risk assessments, checklists, instruction documents, operating instructions, laboratory rules	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Information of employees regarding sustainability	continuously	Markus Hiebel	Takes place regularly in internal employee magazine for:um, institute meetings, meetings of the sustainability working group	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Vacation childcare for UMSICHT children between age 5 and 13	since 2011	Christine Mühleib	Takes place three times per year and is being well accepted	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
U3 care		Christine Mühleib	Is presently not needed	<input type="checkbox"/>
pme Familienservice (Partner for Employee Development)	May 2014	Christine Mühleib, Central Administration of Fraunhofer	Information event for employees held (p. 16)	<input type="checkbox"/>
Stays abroad by UMSICHT employees (UMSICHT grant)	since 2013	Andreas Weber	3 people were abroad for a limited period of time	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Further development of Sustainability Balanced Scorecard (SBSC)	November 2013	Administration, sustainability working group	SBSC has been updated	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
Prepare and continue materiality matrix	January, February, June 2014	Markus Hiebel	Held workshops with internal stakeholders, institute's directorate and external stakeholders (p. 7)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
<b>OPEN AND NEW MEASURES</b>				
Green procurement	2015	Administration / Purchasing	Fair trade coffee in meetings	<input type="checkbox"/>
Green procurement	2015	Administration / Purchasing	Obtaining of eco-electricity	<input type="checkbox"/>
Green IT	2014	IT	Checking extension of leasing periods for monitors, Igel and PC from 3 to 5 years	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
Development of an internal policy regarding the communication of R&D results	since 09/2012	Iris Kumpmann, Jürgen Bertling, Markus Hiebel	Delayed, but still current	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Creation and commissioning of a web platform for sustainable open innovation (sustainnovate)	since 2012	Jürgen Bertling, Sabrina Schreiner	Will be pursued again from 2014 on	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
Compendium: Invent the Future – a Handbook for sustainable innovations	since 2013	Jürgen Bertling	Search for authors is on its way; already several interested parties; publishing house has already been selected	<input type="checkbox"/>
Travel: Check whether employees may be allowed to choose train instead of airplane in case of similar trip times without additional costs to be borne by them, despite higher costs	2014	Nina Junen, Aylin Hustermeier	In justified cases, trips may be conducted by rail even at higher costs in comparison to other modes of transportation (role model function in the context of the institute's objectives)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Cooperation with Wissenschaftsladen Bonn ("science shop")	since 2014	Jürgen Bertling, Charlotte Knips	The objective is to conduct joint workshops	<input type="checkbox"/>
Continuation of the cooperation with Sophie-Scholl-Gymnasium (development of SR)	since 2013	Manuela Rettweiler, Markus Hiebel	Teenagers are further sensitized to the topic of sustainability (use of Resources, education), p. 24	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>



# GRI CONTENT INDEX

GRI	GENERAL STANDARD DISCLOSURES	ADDITIONAL INFORMATION AND REASONS FOR AN OMISSION	REFERENCE, CHAPTER
<b>ASPECT: STRATEGY AND ANALYSIS</b>			
G4-1	Statement by the executive management	Preface by the institute's management	P. 2
G4-2	Impacts of business activity as well as risks and opportunities		Pp. 3–5
<b>ASPECT: ORGANIZATIONAL PROFILE</b>			
G4-3	Name of the organization	Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT as an institute of the Fraunhofer-Gesellschaft	P. 6
G4-4	Primary brands, products, and services		P. 6
G4-5	Location of the organization's headquarters	Oberhausen for UMSICHT, Munich for Fraunhofer	P. 6
G4-6	Countries where the organization operates	Primarily Germany, Europe, but also Africa, Asia, and South America	
G4-7	Nature of ownership and legal form	Registered association (e. V.)	P. 6
G4-8	Markets served	Germany, Europe, but also Africa, Asia, and South America	
G4-9	Scale of the organization		P. 6
G4-10	Number of employees/types of employment relationships		P. 10
G4-11	Percentage of employees covered by collective bargaining agreements	100 % of staff covered by TVöD (Collective Agreement for Public Service Employees)	P. 10
G4-12	Supply chains of the organization	variable supply chains due to lack of direct production	
G4-13	Changes during the reporting period	Integration of the Sulzbach-Rosenberg site (c.f. G4-17)	P. 5
G4-14	Precautionary approach or principle of the organization	established risk management	P. 21
G4-15	Charters, principles, or initiatives	Utopia Changemaker, Diversity Charter, German Sustainability Codex	P. 5, p. 9, p. 14
G4-16	Memberships in associations	UMSICHT and individual employees are members in different associations/committees (VDI, DECHEMA, ...)	
<b>ASPECT: IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES</b>			
G4-17	Listing of all entities that are listed in the consolidated financial statements	Sites: Oberhausen and Willich; Sulzbach-Rosenberg became a branch of the institute 07/2013, but is not yet taken into consideration here	P. 6
G4-18	Process for defining the report contents	internal and external stakeholder dialog	P. 7
G4-19	Material aspects for defining report content		P. 7
G4-20	Aspect boundaries for each material aspect (within the organization)		P. 7
G4-21	Aspect boundaries for each material aspect (outside the organization)		P. 7
G4-22	Effects of any restatements of information provided in reports	no change	
G4-23	Significant changes in the scope and the aspect boundaries	c.f. internal and external stakeholder dialog	P. 7
<b>ASPECT: ENGAGEMENT OF STAKEHOLDERS</b>			
G4-24	Stakeholder groups engaged	internal: employees, institute's management; external: industry, science, politics, society	P. 7
G4-25	Basis for identification and selection of stakeholders	Selection in sustainability working group	P. 7
G4-26	Approach to stakeholder engagement	Dialog form, workshop	P. 7
G4-27	Key topics and concerns of stakeholders	c.f. materiality matrix	P. 7



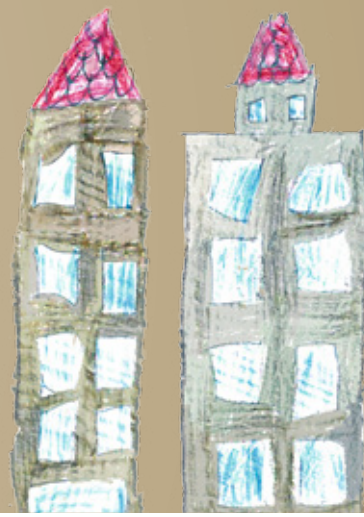
Robin Borelbach, 7 years old

GRI	GENERAL STANDARD DISCLOSURES	ADDITIONAL INFORMATION AND REASONS FOR AN OMISSION	REFERENCE, CHAPTER
<b>ASPECT: REPORT PROFILE</b>			
G4-28	Reporting period	2012 to 2013; partial year 2014	
G4-29	Date of most recent previous report	May 2012, for the years 2010/2011	Sustainability Report s.fhg.de/D&S
G4-30	Reporting cycle	biennial	
G4-31	Contact person for questions	Markus Hiebel (sustainability officer)	
G4-32	"In accordance" option	Core	
G4-33	External assurance	No	
<b>ASPECT: GOVERNANCE</b>			
G4-34	Governance structure of the organization		P. 8
<b>ASPECT: ETHICS AND INTEGRITY</b>			
G4-56	The organization's values, principles, standards and norms of behavior	Mission of Fraunhofer-Gesellschaft, UMSICHT's own guidelines	Pp. 8–9
GRI	SPECIFIC STANDARD DISCLOSURES	ADDITIONAL INFORMATION AND REASONS FOR AN OMISSION	REFERENCE, CHAPTER
<b>CATEGORY: ECONOMIC</b>			
<b>ASPECT: ECONOMIC PERFORMANCE</b>			
G4-DMA	Management approach		Pp. 21
G4-EC1	Direct economic value generated and economic value distributed		Pp. 21
<b>CATEGORY: ENVIRONMENTAL</b>			
<b>ASPECT: ENERGY</b>			
G4-DMA	Management approach		Pp. 17–18
G4-EN3	Fuel consumption within the organization		P. 17
G4-EN4	Energy consumption outside the organization		P. 17
G4-EN5	Energy intensity		P. 17
G4-EN6	Reduction of energy consumption		P. 17
<b>ASPECT: EMISSIONS</b>			
G4-DMA	Management approach		Pp. 17–19
G4-EN15	Direct greenhouse gas (GHG) emissions		Pp. 17–19
G4-EN16	Energy indirect GHG emissions		Pp. 17–19
G4-EN17	Other indirect GHG emissions		Pp. 17–19
G4-EN19	Reduction of GHG emissions		Pp. 17–19
<b>ASPECT: EFFLUENTS AND WASTE</b>			
G4-DMA	Management approach		P. 19
G4-EN23	Total weight of waste by type and disposal method		P. 19



## GRI CONTENT INDEX

GRI	SPECIFIC STANDARD DISCLOSURES	ADDITIONAL INFORMATION AND REASONS FOR AN OMISSION	REFERENCE, CHAPTER
<b>CATEGORY: SOCIAL (LABOR PRACTICES AND DECENT WORK)</b>			
<b>ASPECT: EMPLOYMENT</b>			
G4-DMA	Management approach		P. 10
G4-LA1	New employee hires and employee turnover		P. 10
G4-LA2	Benefits provided to full-time employees only	none	
<b>ASPECT: OCCUPATIONAL HEALTH AND SAFETY</b>			
G4-DMA	Management approach	no changes since last sustainability report	
G4-LA6	Occupational diseases, lost days and absenteeism, and work-related fatalities	In 2013, there was one commuting accident; no other accidents 2012/2013. The absentee rate due to illness, for the first time determined in the last report, is constantly hovering around 3 percent. In 2012, it was at 2.7 percent, and in 2013 at 3.3.	
<b>ASPECT: TRAINING AND EDUCATION</b>			
G4-DMA	Management approach		Pp. 12 – 14
G4-LA9	Average hours of training per year per employee		P. 13
G4-LA10	Programs for skills management and lifelong learning		Pp. 13 – 14
G4-LA11	Performance and career development reviews		Pp. 13 – 14
<b>ASPECT: DIVERSITY AND EQUAL OPPORTUNITY</b>			
G4-DMA	Management approach		Pp. 14 – 16
G4-LA12	Diversity of the employees and governance bodies	Recorded women's share	P. 15
<b>ASPECT: EQUAL REMUNERATION FOR WOMEN AND MEN</b>			
G4-DMA	Management approach		P. 10
G4-LA13	Ratio of basic salary and remuneration of women to men	TVöD (collective bargaining agreement), no differences	P. 10
<b>ASPECT: LABOR PRACTICES GRIEVANCE MECHANISM</b>			
G4-DMA	Management approach	possible via works council	Pp. 10 – 11
G4-LA16	Number of grievances about labor practices filed, addressed, and resolved through formal grievance mechanisms	16 grievances to the works council in 2012, and 4 in 2013	Pp. 10 – 11
<b>CATEGORY: SOCIAL (HUMAN RIGHTS)</b>			
<b>ASPECT: NON-DISCRIMINATION</b>			
G4-DMA	Management approach		P. 14
G4-HR3	Incidents of discrimination and corrective actions taken	There are no known incidents of discrimination during the reporting period.	P. 14
<b>CATEGORY: SOCIAL (SOCIETY)</b>			
<b>ASPECT: ANTI-CORRUPTION</b>			
G4-DMA	Management approach		
G4-SO3	Sites assessed for risks related to corruption	Fraunhofer UMSICHT is assessed regularly (e. g. through the in-house audit).	
G4-SO5	Confirmed incidents of corruption and actions taken	In the report years, no incidents of corruption were reported. The training of the employees at regular intervals is being continued.	



David Kurek, 7 years old

GRI	SPECIFIC STANDARD DISCLOSURES	ADDITIONAL INFORMATION AND REASONS FOR AN OMISSION	REFERENCE, CHAPTER
<b>ASPECT: PUBLIC POLICY</b>			
G4-DMA	Management approach		
G4-SO6	Total value of political contributions	As a non-profit organization, no political contributions are being made.	
<b>CATEGORY: RESEARCH AND DEVELOPMENT (ASPECTS SPECIFIC TO FRAUNHOFER UMSICHT)*</b>			
<b>ASPECT: RESPONSIBILITY FOR RESEARCH</b>			
G4-DMA	Management approach		Pp. 26 – 29
R&D1	Increasing the sensitivity of the employees for sustainability		Pp. 26 – 29
R&D2	Contribution of the institute to transformation processes (e. g. the energy transition)	c.f. 2013/2014 annual report, c.f. e. g. p. 27	Annual Report: s.fhg.de/fGv
<b>ASPECT: TECHNICAL-SCIENTIFIC EXCELLENCE</b>			
G4-DMA	Management approach		Pp. 22 – 24
R&D3	Creation of leeway for the employees' creativity	e. g. creation of think tanks	P. 22
R&D4	Employee integration and participation strategy	Employee survey	P. 5, p. 6, pp. 22 – 24
<b>ASPECT: SOCIAL RESPONSIBILITY FOR EDUCATION</b>			
G4-DMA	Management approach		Pp. 22 – 25
R&D5	External engagement	infernum study program, project with the local high school Sophie-Scholl-Gymnasium, debates, Girls' Day, Fraunhofer Environmental Talent School	P. 14, p. 15, pp. 22 – 24
R&D6	Education service	Lectures/classes by UMSICHT employees	P. 12
<b>ASPECT: INNOVATION PROCESS AND KNOWLEDGE TRANSFER</b>			
G4-DMA	Management approach		
R&D7	Knowledge Transfer	e. g. via advising of qualification theses	P. 12
R&D8	Contribution as independent expert in participation processes	<a href="#">Acceptance of biogas, Tunnel dialog</a>	P. 24
R&D9	Publications	Publications, dissertations	P. 24
R&D10	Industrial Property Rights		P. 6

\* In this report we do for the first time point out R&D-specific aspects for Fraunhofer UMSICHT in the index. These will continuously be developed further.

#### Self-publisher and editor



**Fraunhofer Institute for Environmental,  
Safety, and Energy Technology**

#### The institute's directorate

Prof. Dr.-Ing. Eckhard Weidner, Prof. Dr.-Ing. Görgo Deerberg  
Osterfelder Straße 3  
46047 Oberhausen  
Germany

Phone +49 208 8598-0  
Fax +49 208 8598-1290

Internet [www.umsicht.fraunhofer.de](http://www.umsicht.fraunhofer.de)  
E-mail [info@umsicht.fraunhofer.de](mailto:info@umsicht.fraunhofer.de)

#### Contact:

Markus Hiebel  
[nachhaltigkeit@umsicht.fraunhofer.de](mailto:nachhaltigkeit@umsicht.fraunhofer.de)

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*Fraunhofer- Gesellschaft zur Förderung der angewandten Forschung e. V.  
Hansastr. 27 c  
80686 Munich  
Germany*

#### Board

*Prof. Dr.-Ing. Reimund Neugebauer, President, Business Policy  
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Business Models  
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and Commercialization*

*Register court: Amtsgericht (District Court) Munich  
Register No. VR 4461  
VAT ID No. DE 129515865*

#### Authors and editorial team

*Jürgen Bertling, Matthias Fischer, Anja Gerstenmeier,  
Markus Hiebel, Nina Junen, Charlotte Knips, Daniel Maga, Asja Mrotzek,  
Christine Mühleib, Sandra Naumann, Hartmut Pflaum, Manuela Rettweiler,  
Annette Somborn-Schulz, Daniel Sperl*

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Maria Benkendorf  
Matthias Holländer  
Silvia Lorenz  
Barbara Vatter

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**Amélie Pollerberg, 5 years old**  
(first place, preschool children, back cover)

clearly considers mobility as an important field of research and senses that we will explore new spaces. For this, colored houses, cars, and even scooters get wings – all without any sponsoring by energy beverage manufacturers.



**Lotta Franke, 5 years old**

Renewable energies are the topic of 5-year-old Lotta, who is fully counting in wind power for this. Within green meadows there is a wind park under a bright blue sky and bright sunshine. However, the monotonous gray/white of today's wind turbines is considerably spiffed up by blue and black poles and bright red rotors.



**Sina Borelbach, 10 years old**

Mobility is also the central topic for 10-year-old Sina. In her vision, we are switching to electro mobility. The electricity needed is generated by the sun which shines on beautifully colored houses, and the road is the "charger" with the help of which the cars are recharged directly while driving.



**Robin Borelbach, 7 years old**

Embarking into the air also happens for Robin, 7 years old. In his happy, colorful vision of the future, the mobility problem is solved by us no longer driving cars but rather moving along directly with our house which is lifted into the air by colorful balloons. Located on the tree tops are parking spots for the houses and between the individual house parking spots there are connecting paths. Accessory drives via balloons also exist for butterflies.





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