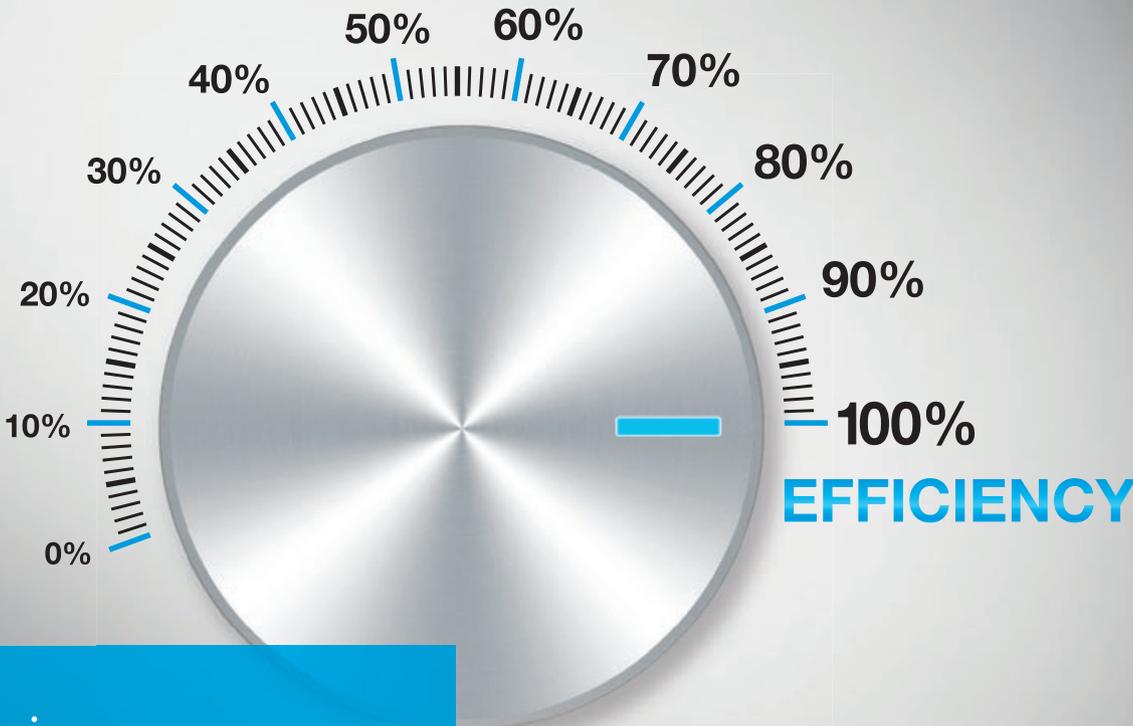




Zentrum
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Our mission:
resource efficiency

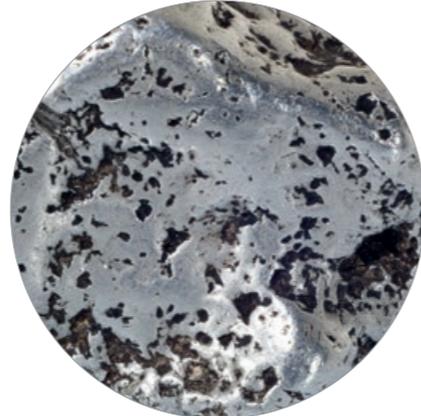
Copper



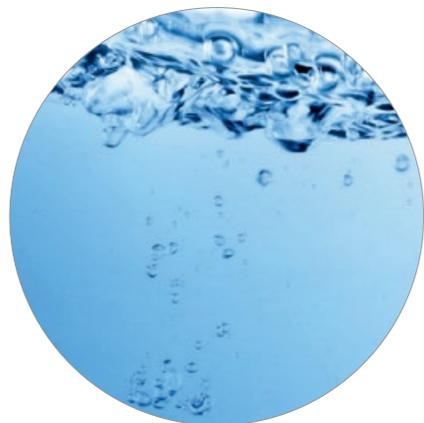
Plastics



Platinum



Water



Wood



Boron



Mineral oil



Steel



Gravel



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Dr Volker Kefer, President of the VDI: “Resource efficiency makes business activities more successful. In this regard, the VDI Centre for Resource Efficiency is a sought-after adviser, supported by the expert network of the VDI, the largest technical-scientific association in Germany.”

Orientation through expertise

The VDI Centre for Resource Efficiency (VDI ZRE) is closely connected with VDI, the Association of German Engineers. With about 150,000 members, the largest association of engineers in Germany pools experts for interdisciplinary dialogue and propagates knowledge of current developments in the fields of science and research, economy, society and policymaking. The VDI ZRE cooperates closely with the professional associations and regional organisations of the VDI, which connect the Centre to the network of over 12,000 voluntarily active members of the VDI.

The VDI ZRE was launched in 2009 as a cooperative project of the former Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the VDI. As the competence centre for resource efficiency, the VDI ZRE works at the interface between business and science and pools know-how gleaned from both theory and practice.

VDI guideline work

An example of this close cooperation is the VDI guideline work on resource efficiency, which is among the responsibilities of the VDI. Apart from the input from research institutions, industry, authorities and other stakeholders, it also incorporates the expertise of the VDI ZRE. VDI guidelines are scientifically substantiated. They describe the current state of the art and set standards that serve as orientation for engineers in their daily work.

Supporting resource efficiency, VDI experts have created the VDI guideline series VDI 4800 and guideline VDI 4801. These guidelines define, among other things, methodical, systematic essentials for evaluating resource efficiency and illustrate which strategies are most successful.



Dr Eric Schweitzer, President of the Association of German Chambers of Commerce and Industry (DIHK): “Using resources efficiently is the principle of successful management. The VDI Centre for Resource Efficiency offers competence and practical help – an ideal partner for small and medium-sized businesses and Chambers of Commerce and Industry.”

Resource efficiency pays off

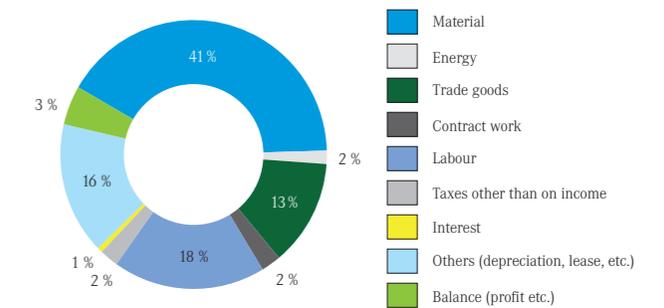
In the manufacturing industry, material costs are the primary cost factor. In 2016, they accounted for 41% of total costs. Savings in this field have a significantly greater impact on a company's profitability than labour costs or the much-discussed energy costs. Resource efficiency helps companies conduct their business more successfully: the reduction of energy and material consumption enables them to reduce costs and produce more competitively. The innovative processes and technologies thus developed can be sold worldwide, thereby strengthening Germany's position as a business location. Resource efficiency creates growth that safeguards jobs, while the economical use of resources protects our environment.

But what exactly are resources? In the first instance, these are all means used in the production process. Natural resources are energy or raw materials used to generate energy, such as coal or natural gas, as well as non-energy raw materials, such as metals and industrial minerals. Also included are biotic raw materials, such as water, soil or farmed areas as well as air and their capacity to absorb greenhouse gases. There are many approaches to the more efficient use of resources.

Our mission: know-how for SMEs

Small and medium-sized enterprises (SMEs) often lack the capacity to deal with resource efficiency. The VDI ZRE was established by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the VDI in order to close this gap. The mission: knowledge transfer for resource-efficient management – in the interest of the environment and the enterprises.

Cost structure in the manufacturing industry



Source: Federal Statistical Office 2018

Naemi Denz, Managing Director for Waste and Recycling Technology and head of the department Technology and Environment of the Association of German Machinery and Plant Manufacturers:

“The increasing consumption of resources and resource availability issues require long-term efficiency and innovative solutions. The manufacturing industries often search for improvement potential and optimisation tools. The toolkit the VDI ZRE provides is an important and useful component in this regard.”



The resource checks can be ordered online or offline at

www.resource-germany.com/tools/resource-checks/

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Tools for practical use

The VDI ZRE develops instruments that help enterprises implement measures for higher resource efficiency. Its team consists of experienced experts of diverse disciplines who address the objective of economical material and energy consumption from different perspectives. The VDI ZRE offerings are free of charge, industry-specific and practically oriented.

Fields of excellence

The VDI ZRE makes its expertise widely available to SMEs. Its thematic priorities are the field of industrial production and the construction industry. For example, the VDI ZRE offers tools for manufacturing processes in the metalworking industry

and in plastics processing, for foundry and forming technology as well as for chemical industry. In the construction sector, enterprises will find information on topics such as building services, engineering and large-scale projects such as hospitals.

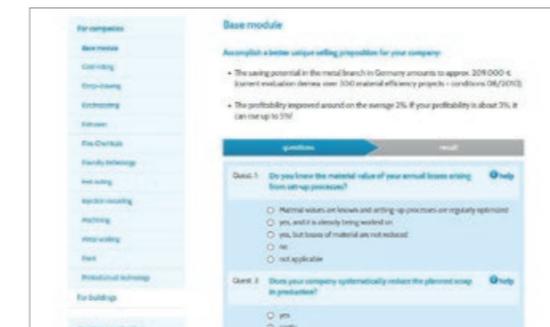
The Resource Check

The starter – the Basic Check

With the Basic Check, it takes enterprises only a few minutes to find out where in their businesses the savings potentials are to be found. To this end, they need to answer seven general questions on their operational procedures. A detailed evaluation will provide preliminary indications on how they can use resources more efficiently. In addition, more detailed checklists will help to identify further savings potential.

Industry-specific in-depth module

Resource efficiency means different things to each branch of industry and each process. For this reason, the VDI ZRE has developed in-depth Resource Check modules that are particularly designed for important technologies in the manufacturing industry. The range is constantly being enhanced and permanently supplemented by new branches.



Just how resource-efficient is your company? Take the test!

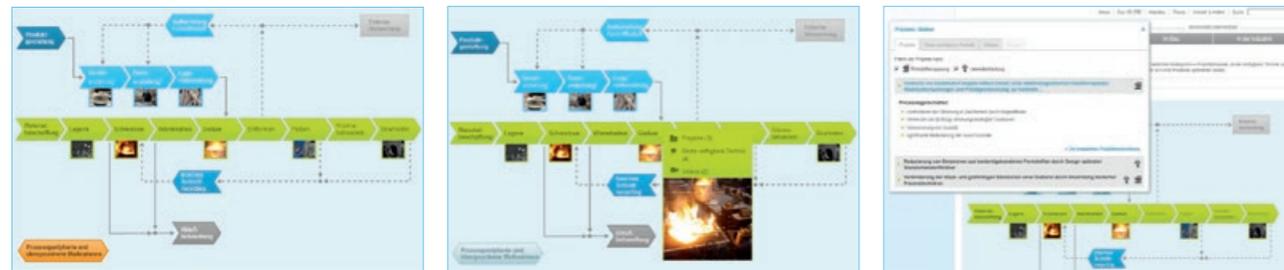
The process chain - step by step

It is the innate goal of successful management to produce as efficiently as possible. Science and industry continuously work on new technologies and process innovations that companies can use to increase their resource efficiency and save money. The VDI ZRE compiles the know-how available along the process chain of a specific field of technology. The systematisation by means of process chains provides decision-makers, within a few minutes, with insight into how they can realise savings in individual process steps. To help you along, interactive graphics depict the individual process chains. Simply click on the pertinent points to access in-depth information.

Resource efficiency starts with product design, includes the actual manufacturing process and takes into consideration the handling of waste and exhaust air as well as the recycling of material.

Based on project examples from enterprises, information about the best technologies available, and illustrative videos, the process chains provide structured access to information for each production step required by SMEs in order to implement resource efficiency.

Each new technological development will immediately be included in the VDI ZRE portfolio, which will be constantly expanded in order to give companies a comprehensive overview.



Information for various fields of technology is set up along the process chain in a systematic way

Making know-how available

No matter whether information on funding programmes, contacts to consultants or networks for experience exchange is required, such information is pooled in databases and studies and made available to decision-makers.



Using the Innovation Radar to find practical solutions for resource efficiency

The Innovation Radar - trends and innovations

On behalf of the enterprises, the VDI ZRE uses the Innovation Radar to trace the latest technological developments and process optimisations with the potential

to sustainably reduce material and energy consumption. Prior to their entry in the database, the technological fields and phases of the product life cycle, for which a project may be relevant, are analysed, enabling SMEs to gain access to innovations from other fields and industries, which may also be applicable to their companies. Examples of what has already proven to work are listed among the good practice examples.

Studies and publications

The regular publications of the VDI ZRE provide a comprehensive overview of contemporary knowledge regarding resource efficiency in selected fields of technology. The *Resource Efficiency Via Industry 4.0* study treats the range of opportunities and challenges involved in digitalising industrial production processes. The study results reveal that among small and medium-sized businesses, Industry 4.0 is still in its infancy. We provide purposeful orientation and support to help your business to make the transition.





Toolbox to enhance resource efficiency

Online tool - "Strategies and Measures" Resource Efficiency Guidelines

Taking steps toward resource efficiency in a manufacturing company of a given trade can be extremely varied and diverse. To give you an idea of just how diverse these steps can be, VDI ZRE has published an online tool on its website: *Strategies and Measures*. Manufacturing companies are shown relevant strategies and measures to increase their operations-related resource efficiency. The tool differentiates between product-related and process-related strategies and measures as well as those independent of your products or processes. You will see the goals, functions, application areas and limits of each strategy and measure as well as the parties responsible for their implementation. Practical references provide in-depth resource efficiency aspects and solid application examples, defining possible advantages and the potential for saving resources.

VDI ZRE's Resource Efficiency Guidelines help you get your bearings when you decide to launch a resource efficiency project for your company. The guidelines illustrate which of the selected methods and tools can be applied to each step in the process. They depict and describe methods and tools for production analysis, for your product's life cycle, for developing solutions to improve your product and processes, for evaluating measures, and for application and monitoring. As a user, you will also receive important pointers regarding the data you need to compile and how you can access it.

A photograph of Prof. Mario Schmidt, a middle-aged man with short grey hair, wearing a light-colored trench coat over a dark suit and a green patterned tie. He is standing in a vineyard with rows of grapevines and some autumn-colored leaves in the foreground. The background shows more trees and a bright sky.

Prof. Mario Schmidt, Director of the Institute for Industrial Ecology (INEC) of Pforzheim University: “We need young people who take the careful use of our natural resources seriously. This is not only a task for engineers, but also for a new generation of managers. The formation and in-service training provided by the VDI ZRE makes students and employees aware of precisely that.”

Qualification in resource efficiency

Practice-oriented know-how is indispensable when resource efficiency is concerned. Therefore, the VDI ZRE provides current and future decision-makers and professionals with the know-how needed to render their company resource-efficient.

Qualification courses in resource efficiency

With its qualification courses in resource efficiency, the VDI ZRE has, for the first time, developed standardised professional training that imparts the essential methods for the analysis of optimisation potentials and the realisation of efficiency projects. The qualification courses are offered to consultants and to company employees in the manufacturing industry. In conducting these courses, VDI ZRE works closely with experienced industrial consultants, local professional associations, partner organisations and/or regional efficiency agencies. The result is hands-on, field-related advanced education of the highest quality. The resource efficiency qualification courses run from one to several days, depending on the subject matter.

From the basis ...

Qualification courses introduce practical, dependable tools. Participants can learn the criteria and methods to identify a company's resource efficiency potential and, drawing on this potential, apply appropriate measures.

... to practical application

Over several course days, in an operational environment, participants can practically apply what they have learned. They can analyse the status quo on-site and elicit appropriate resource efficiency measures. With the course leader's assistance, participants can devise a plan for implementing resource efficiency measures.



Dr Andreas Blaeser-Benfer, Project Manager in the field of innovation at the RKW Competence Centre:
“The challenges our companies face with regard to improving resource efficiency can only be tackled jointly. This is why we are committed to utilising the excellent partner networks created by the VDI ZRE, which enable us to jointly provide companies with the expert knowledge they need for sustainable management.”

VDI ZRE: Well connected

Its specialised know-how makes the VDI ZRE a sought-after interlocutor in the world of politics – regionally, at federal level and worldwide. It examines what impedes and what motivates companies to produce in a more resource-conserving way. Politics can establish the framework for removing barriers and furthering resource efficiency.

Its networks make the VDI ZRE strong and enable the competence centre to identify innovations and new technologies in order to learn from the experiences of the network partners and develop industry-relevant offers. To this end, the VDI ZRE experts cooperate with numerous science and research institutions, associations and chambers, with information centres nationwide and regionally and also with policymakers at national level, in the federal states and in Europe.

In the regions

In cooperation with regional trade and industry associations, with chambers of industry, commerce and crafts locally as well as with efficiency agencies, economic development agencies and local organisations, the VDI ZRE presents its tools

to SMEs in the various regions. Moreover, the VDI ZRE experts gather experiences from companies, prepare them and provide them as examples.

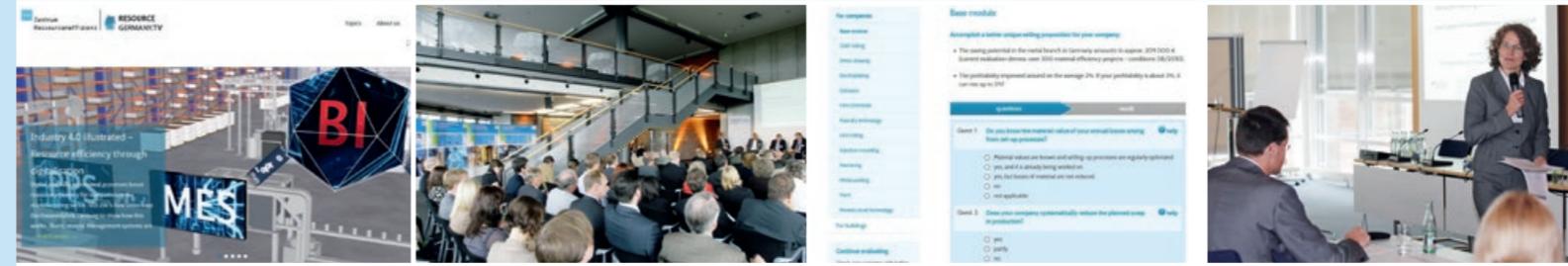
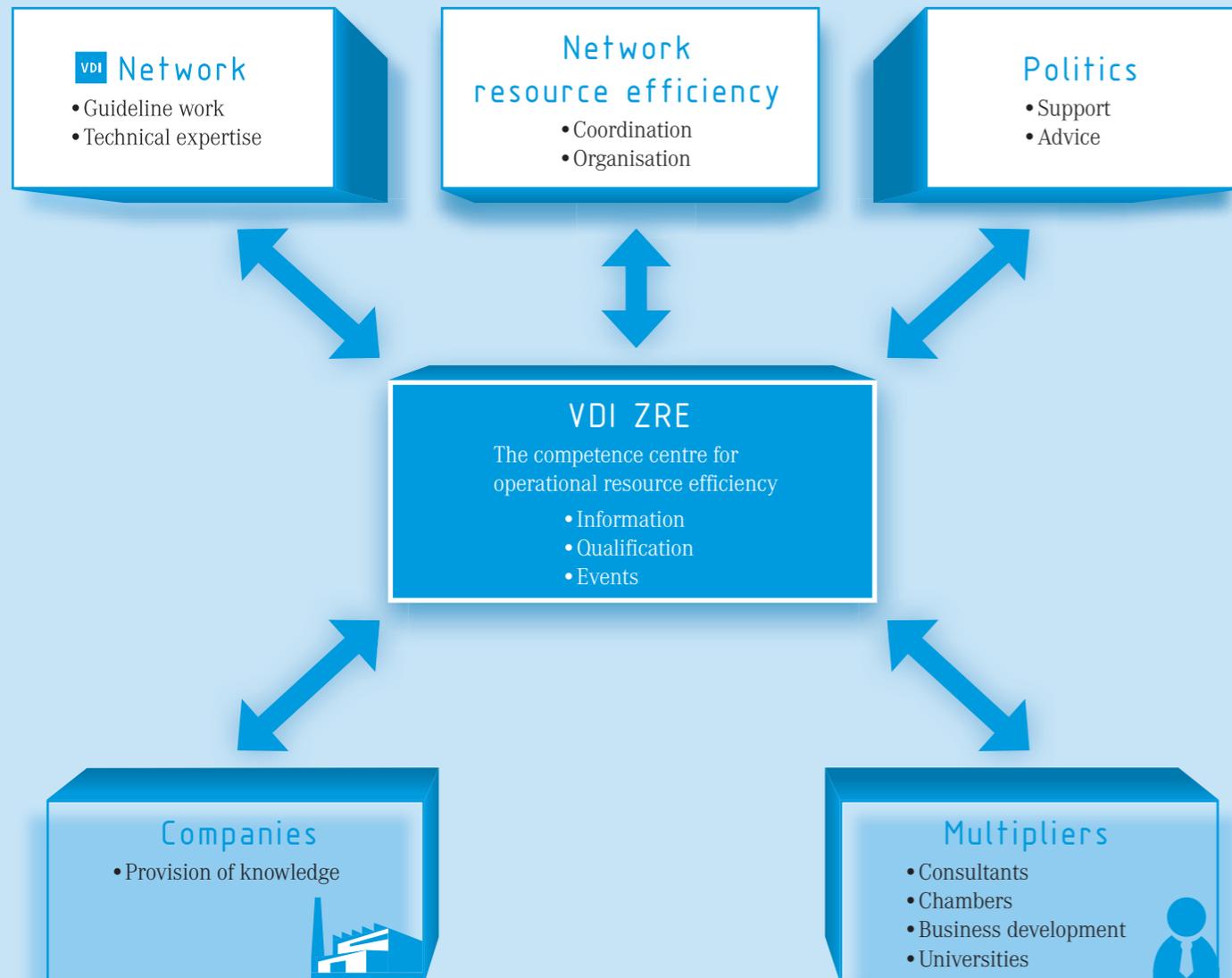
Nationwide

As coordinator of the nationwide Resource Efficiency Network, the VDI ZRE pools resource efficiency stakeholders. Since 2011, the competence centre has acted as network coordinator and regularly organises regional events and nationwide network conferences with more than 100 participants. At these events, participants discuss good-practice examples, options for supporting companies and new solutions for more resource-conserving production.

Internationally

The VDI ZRE provides its professional expertise at European level and exchanges experiences with international organisations. With its international exchange strategy, the competence centre provides German companies with access to other countries' experiences with resource efficiency. Furthermore, the VDI ZRE presents “Germany as a location for efficiency” to the world by introducing examples of good practice developed in Germany in talks and lectures.

VDI ZRE: Know-how and networking for more resource efficiency



VDI ZRE in figures

2,900 participants in the event series "Resource efficiency on-site"

About **3,000** website visitors per month

>1.3 million times – that's how often the films have been watched on YouTube

30 member companies in the Industrial Club Resource Efficiency (founded in 2016)

743 participants in the qualification courses "Resource efficiency" since 2011

42,600 downloads of publications and offline tools



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