

dena's international Energy Efficiency Award – encouraging the replication of best-practice examples in industry

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Abstract

Uncovering and widely publicizing innovative energy efficiency projects undertaken by industrial companies lies at the heart of an awareness-raising campaign run by the German Energy Agency dena. As a means to this end, dena initiated the annual Energy Efficiency Award – an international prize to honour companies which have implemented highly cost-effective projects to increase the energy efficiency of their operations. This approach has proven to be an effective way to encourage the replication of best practices in industry and production.

The idea behind the award is that by illustrating the benefits of energy efficiency other companies will be motivated to imitate those measures. Thus the award serves to drive demand for highly innovative techniques, technologies and related services to cut energy consumption, energy costs and CO₂ emissions. To achieve the award's goals, dena involves a wide range of actors from businesses, politics, civil society, academia and the media.

The paper draws a conclusion on dena's experiences, the successes as well as challenges of running an international competition on energy efficiency in industry by showing how the influence, criteria and standards of the competition have been developing since 2007 when the Energy Efficiency Award was offered for the first time. Since the 6th Energy Efficiency Award will be awarded on 18/19 September 2012, the paper will also provide insight into the current state of play in terms of participant numbers and applications submitted.

The Energy Efficiency Award is organised as part of the "Initiative EnergieEffizienz" campaign targeting the efficient use of electricity in all consumer sectors which is funded by the German Federal Ministry of Economy and Technology. dena offers a wide range of information and advisory services on the topic of energy efficiency in industry including the savings potential of cross-cutting technologies, energy management and best practices.

Introduction

"Despite the priority in many countries to increase energy efficiency, global energy intensity worsened for the second straight year", establishes the World Energy Outlook 2011 (Organisation for Economic Co-operation and Development/International Energy Agency, 2011, p 39). For the future, it estimates that, even if recent government policy commitments are implemented, demand for energy will grow by 40 percent between 2010 and 2035 (p 70).

Apart from the fact that following this prospect the international community will miss the goal of limiting the long-term increase in the global mean temperature to two degrees Celsius above pre-industrial levels, there is also an economic dimension to this rising demand for energy. Energy costs have been increasing strongly for the industrial sector over the last decade. In Germany alone, energy costs in industry and manufacturing rose to around 32.6 billion in 2009 compared to around EUR 18.3 billion in 1999 (Bundesministerium für Wirtschaft und Technologie, 2011). What is more, nine in ten industrial companies in Germany expect electricity prices to rise in the coming two years; every fourth company even anticipates a strong increase (Mindline Energy/Deutsche Energie-Agentur,

2011). These figures illustrate that energy efficiency is increasingly becoming an economic necessity for the production sector.

As part of its energy efficiency campaign “Initiative Energie-Effizienz” the German Energy Agency dena informs decision-makers in industry and production about the savings potentials by means of best available technologies, energy management and best practices. The campaign funded by the German Federal Ministry of Economics and Technology thus encourages the efficient use of energy and the relevant investments by showing how costs can be reduced if unnecessary energy consumption is avoided.

Objectives

A central method used to achieve the overall objective mentioned above is detecting and widely publicizing best practice examples representing a broad range of industrial sectors and cross-cutting technologies. As a means to this end, dena initiated the international Energy Efficiency Award. The annual prize honours industrial companies which have implemented innovative, highly cost-effective projects thereby reducing the energy consumption of their operations. Hence, the award has the following objectives:

Organisation

ANNOUNCING THE COMPETITION

The competition addresses industrial companies of any size which have successfully implemented innovative projects to increase the energy efficiency of their operations thereby sig-

nificantly cutting their energy consumption and CO₂ emissions. Cooperative entries may be submitted jointly by end users and the plant manufacturers, planners or consultants involved.

Given its international scope information announcing the competition is made available in Chinese, English, German, Russian, French and Italian both online and in print. In order to reach the target groups and achieve the award's goals mentioned above, dena involves a wide range of actors from businesses, politics, civil society, academia and the media into the award's organisation.

Since the beginning in 2007, the competition has been held under the patronage of the respective German Federal Minister of Economy and Technology. Moreover, the award has always been offered in cooperation with private partners such as Deutsche Messe, DZ Bank, Imtech, KfW Bankengruppe and Siemens. These project partners do not only sponsor the award but also communicate the competition widely via their business networks, customer magazines and websites. dena also uses business associations and chambers of commerce as multipliers: For instance, information on the competition is distributed via the German Chamber of Commerce's national and worldwide network as well as via the representations of international chambers of commerce in Germany. Additionally, the German Foreign Office encourages its embassies worldwide to promote dena's Energy Efficiency Award e.g. on their websites and at events.

dena also contacts businesses directly via its own network as well as its presence at major conferences and trade fairs such as the German American Energy Conference and Hannover Messe.

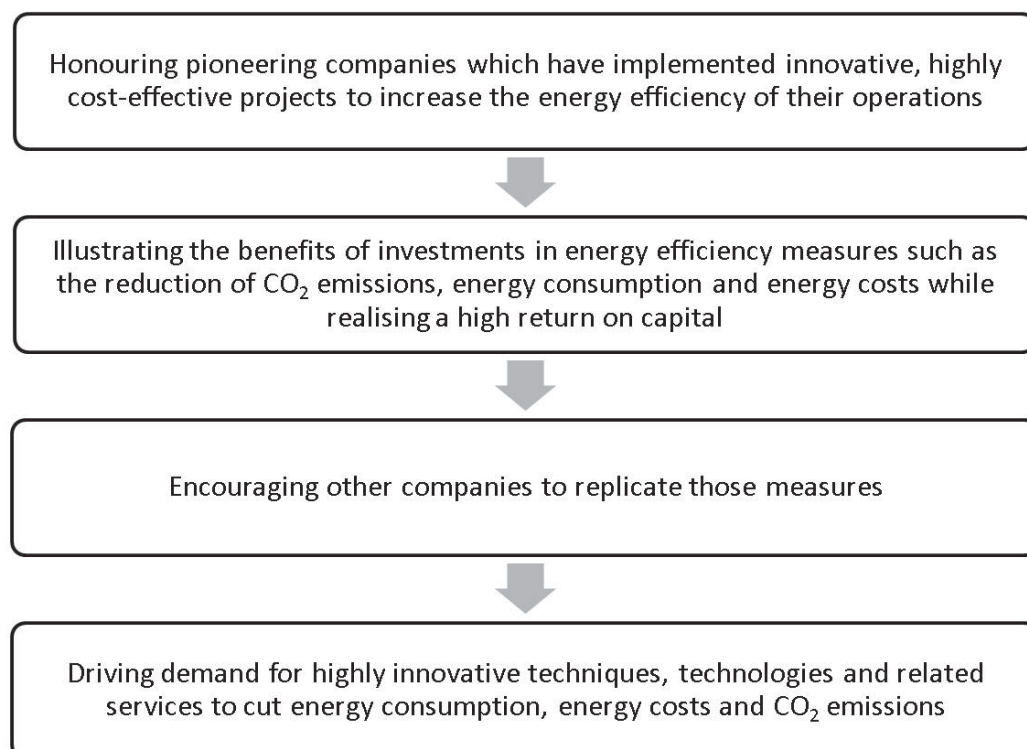


Figure 1. dena's objectives for organising the international Energy Efficiency Award.

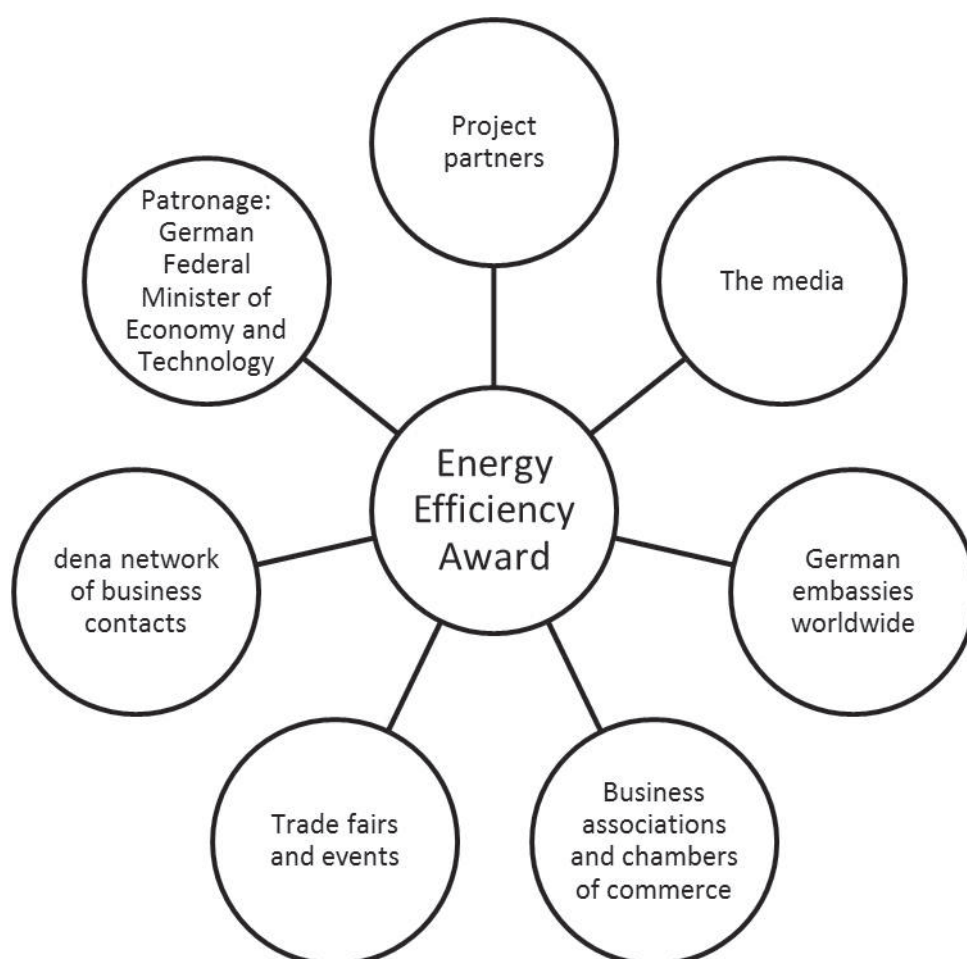


Figure 2. dena's network for announcing the Energy Efficiency Award internationally.

To publicise the competition in the media, press releases are issued in German, English and further languages usually including Chinese, French, Japanese, Portuguese and Spanish. However, applications for the Energy Efficiency Award are accepted in English and in German only.

SELECTING THE LAUREATES

All projects submitted are assessed by an independent jury composed of experts from politics, businesses, academia and the media, including the respective director-general in the German Federal Ministry of Economics and Technology as well as renowned scientists and economists.

The jury evaluates the entries based on the following criteria:

- **Energy savings**, i.e. the reduction in energy demand achieved by the increase in energy efficiency (before/after).
- **Environmental impact, especially the relevance to climate protection**, i.e. the reduction in CO₂ emissions.¹
- **Economic viability**, i.e. the cost savings achieved by the energy efficiency measures weighed up against the investments made.
- **Transferability to other companies**, i.e. the market potential for implementing similar projects in other companies (in the same sector or in general).

- **Innovation level**, i.e. the existence of significant innovations regarding technology, production methods, process management, organisation or a combination of the aforementioned aspects as well as the impetus for further development.

AWARDING THE ENERGY EFFICIENCY AWARD

The laureates receive their prize during a high-level award ceremony, usually at the presence of the German Federal Minister of Economy and Technology. From 2007 to 2010 the Energy Efficiency Award was awarded as part of the World Energy Dialogue (at Hannover Messe) in April; since 2011 the award ceremony takes place at dena's annual energy efficiency conference in autumn. By awarding the prize on a platform where scientists, consultants, politicians and decision-makers from industry meet dena promotes the exchange of experiences and consequently the distribution of these best practices.

In addition to the award ceremony, several public relations activities ensure that the prize-winning projects are communicated widely to the media and the relevant interest groups. dena publishes, among other things, short trailers describing the projects, fact sheets, press releases and scientific news articles.

Results

PARTICIPANT NUMBERS

In the course of the award's first five years a total of around 350 companies came forward with energy efficiency projects. Proposals submitted cover companies of any size – from small and medium-sized enterprises such as small breweries and medium-sized engineering companies to international corporations such as automaker Daimler and paper manufacturer SCA. The participation of small and medium-sized companies reached a peak in 2010 at 56 percent.

The share of companies from outside Germany applying for the award has been steadily increasing from 13 percent in 2007 to 36 percent in 2011 (figure 3). A more detailed analysis of the international applications shows that this trend is largely due to

a remarkable rise in applications from emerging markets such as India, Russia, China and Brazil (figure 4)².

Figure 5 shows an overall rising trend in participant numbers. On the whole, application numbers seem to reflect the general economic situation: The 2009 drop in application numbers indicates that the global economic crisis forced companies to focus on their core business activities instead of investing in energy efficiency. Further evidence to this development provides dena's annual survey on energy efficiency in industry and production which detected that during the economic crisis nearly half of the companies in Germany (47 %) did neither implement energy efficiency measures nor planned to do so (Mindline Energy/Deutsche Energie-Agentur, 2009). Before the crisis, this share was at only 15 % (Mindline Energy/Deutsche Energie-Agentur, 2008).

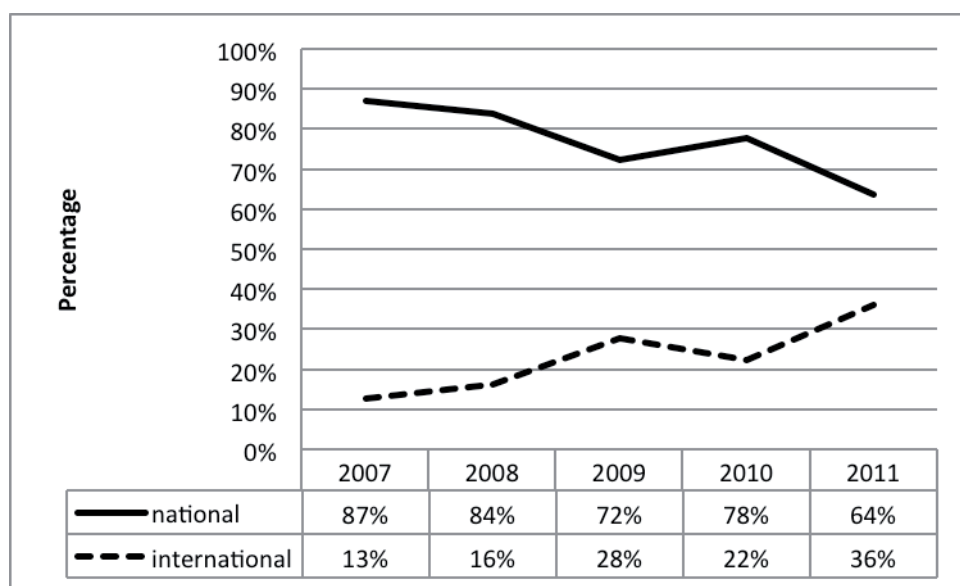


Figure 3. Development of national and international applications numbers.

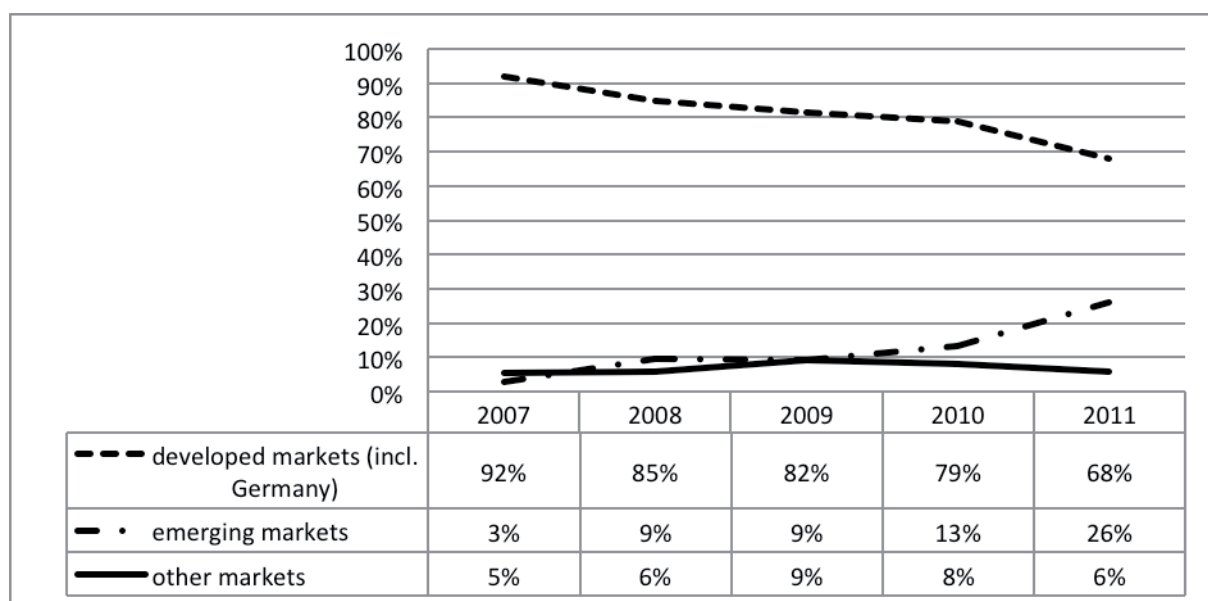


Figure 4. Development of applications from companies in developed and emerging markets.

However, it can be assumed that in the long run economically difficult times encourage businesses to unlock their energy saving potentials to increase the cost-effectiveness of their production. Accordingly, in 2009 one in three companies in Germany stated that the issue of energy efficiency became more important for them due to the economic crisis (Mindline Energy/Deutsche Energie-Agentur, 2009).

The slight decline in participant numbers in 2011 can be attributed to the change in the award's organisation mentioned above which shifted the closing date for applications from January to July. Multipliers such as business associations for whom the competition had become a set annual date in their calendars still have to adapt to the new timetable.

MEASURES AND SECTORS

Businesses applying for dena's Energy Efficiency Award span all industrial sectors with the highest number of applications stemming from the food processing (34 applications), engineering (33) and automotive engineering (33) sectors. The analysis of all the applications submitted proves that in the course of the award's five years the share of applications from energy-intensive sectors has been steadily rising from 18 % in 2007 to 30 % in 2011 (figure 6)³. This trend is also reflected by the jury's selection of the award-winning projects: In 2011, for the first time all prizes were awarded to businesses from energy-intensive industries namely a pulp and paper manufacturer, a dairy and a cement manufacturer.

As regards energy efficiency measures, the analysis of projects submitted illustrates a distinct trend from implement-

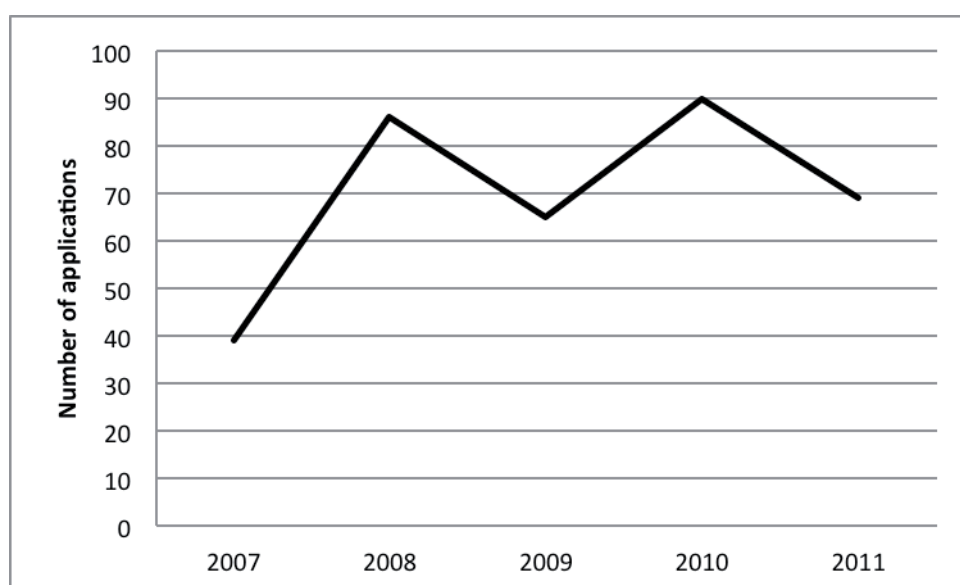


Figure 5. Development of the numbers of applications submitted from 2007 to 2011.

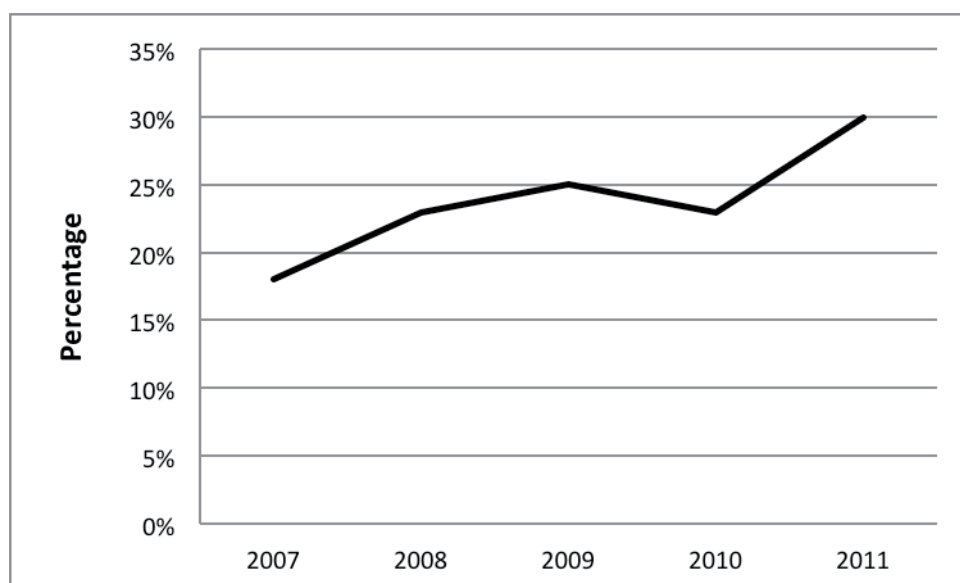


Figure 6. Share of applications from enterprises in energy-intensive sectors.

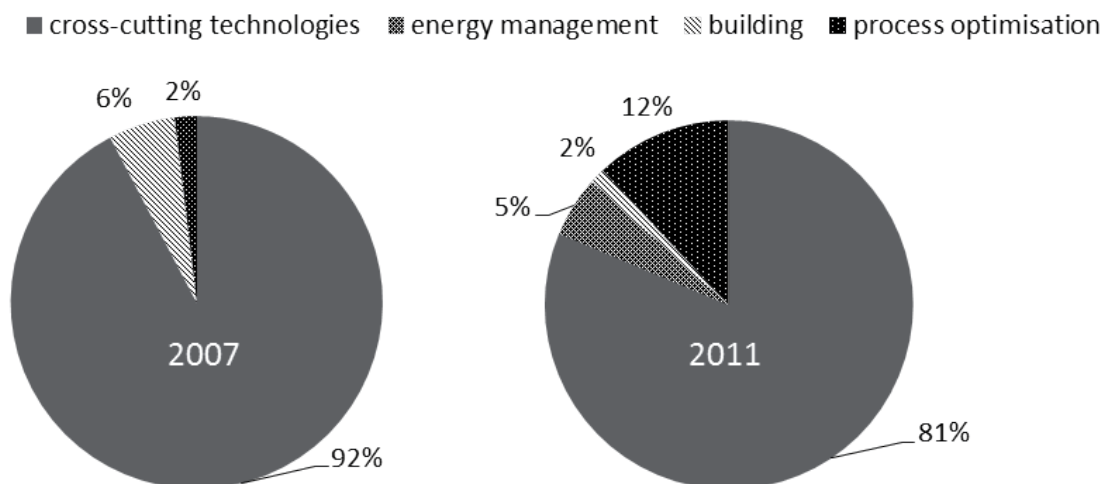


Figure 7. Comparison of energy-efficiency measures submitted in 2007 and 2011.

Table 1. Key data regarding average savings and investments made of the projects submitted for the Energy Efficiency Award.

	2007	2008	2009	2010*	2011
Reduction in energy consumption [kWh/a]	3,528,452	10,900,003	19,684,825	3,540,979	41,673,399
Reduction in CO₂ emissions [t/a]	1,319	4,457	8,738	1,490	14,531
Reduction in energy costs [EUR/a]	143,103	776,443	969,454	436,741	1,976,675
Investments [EUR]	359,322	1,301,118	1,884,917	721,723	2,032,058

* The 2010 data reflects the high number of applications from small and medium-sized enterprises in that year. The number of companies which realised very high energy savings (of more than 10 million kWh) was significantly lower in 2010 than in 2009.

ing measures affecting a specific area of production towards optimising the whole production system. Figure 7 shows that in 2007 only 2 % of all projects submitted concerned the optimisation of production processes while no energy management projects were handed in at all. By way of comparison, in 2011 the share of process optimising projects rose to 12 % while energy management projects accounted for 5 % of all applications. Nevertheless, the lion's share of measures still concerns single cross-cutting technologies with industrial heating systems, the utilization of waste heat and compressed air installations accounting for the highest number of technologies affected. The Energy Efficiency Award strives to promote the most innovative among these technological measures, which have the potential of being taken up by other companies and sectors.

AVERAGE SAVINGS

As mentioned above the jury evaluates the projects submitted inter alia based on their reduction of CO₂ emissions, energy consumption and energy costs⁴. The comparison of the projects' average savings in 2007 and 2011 provides another evidence for the increasing importance of energy efficiency measures for industry and production. While in 2007 an applicant's average energy savings was at 3.5 million kWh, it amounted to almost 42 million kWh in 2011. As a consequence, a com-

pany taking part in the competition in 2007 reduced its energy costs on average by around EUR 143,000 – a figure that by 2011 has reached almost EUR 2 million. Accordingly, the average reduction in CO₂ emissions of an energy-efficiency project in the competition increased more than ten-fold from around 1,300 tons per year in 2007 to more than 14,500 tons per year in 2011. In comparison, in 2007 a participating company invested on average around EUR 359,000 for the energy-efficiency measures handed in. These average investments rose to more than EUR 2 million in 2011.

The projects which entered the competition prove that energy efficiency measures are generally very cost-effective. Several projects submitted report a very high return on capital which may reach more than 100 %. By way of example, the investments of Brazilian aluminium producer Alunorte – Alumina do Norte do Brasil S.A., who received a special mention in the 2010 Energy Efficiency Award, amortized within less than a year.

PRESS COVERAGE

Press releases on both the start of the competition and the awardees are issued in nine languages and sent to news agencies, general and specialised media as well as more than 5,500 websites, databases, search engines and social media platforms in around 110 countries. In Germany, most business and technol-

ogy media report both on the start of the competition as well as on the awardees. In 2011, the Energy Efficiency Award was covered by German print media with a print run of more than 2 million papers while articles by German online media generated an estimated 2.8 million page impressions.

Conclusion

The in-depth analysis of the projects submitted for the Energy Efficiency Award mirrors the fact that the importance which industrial companies attribute to the issue of energy efficiency is slowly growing. In particular, the rising number of applications from emerging economies indicates that the awareness for energy efficiency potentials is increasing globally. Nevertheless, a good proportion of businesses still remains unaware of the key economic benefits of improving the energy efficiency of their operations. Despite the high cost-effectiveness of energy efficiency measures four out of ten industrial companies in Germany, for instance, did not implement any such measures during the past two years (Mindline Energy/Deutsche Energie-Agentur, 2011). dena's international Energy Efficiency Award is a vital tool to visualise the large energy savings potentials which exist in the industrial sector.

Organising an annual international prize to honour pioneer companies which implemented highly cost-effective energy efficiency measures has proven to be an effective method to widely publicise best practices and best available technologies. By actively encouraging companies to replicate best practices, dena's Energy Efficiency Award accelerates the diffusion of the most innovative technologies and related services to cut both CO₂ emissions and running costs.

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Endnotes

1. To make the data provided by the applicants comparable, energy savings are assessed with the standard emissions factors for energy sources according to the Global Emission Model for Integrated Systems (GEMIS). GEMIS calculates CO₂ emissions resulting in primary energy production of electricity and fuels.
2. The classification into developed and emerging markets is based on the August 2011 Dow Jones Total Stock Market Indexes (CME Group Index Services, 2011).
3. Companies are classified as "energy-intensive" if they belong to a sector where a company's electricity costs can account for at least 15 per cent of gross value added.
4. Data provided here is based on the parameters provided by the participants in their application documents. In some cases companies did not provide specific parameters such as the level of investments made.