





## EURAC and partners

### EUROPEAN ACADEMY BOLZANO

The EURAC is an innovative institute for research and scientific training in South Tyrol. Founded in 1992 as private institution, the EURAC is divided in 10 research institutes, with 180 researchers coming from 15 different European countries. They are active in research activities within five specific areas: applied linguistics, minorities and autonomies, sustainable development, management and corporate culture and life sciences. In 2006 the EURAC registered a balance of 9.9 millions Euros, more than 5 millions of which coming from external funds.

In addition to its variety of perspectives, the EURAC is characterized also for its aim to find a just equilibrium between local and international concerns. South Tyrol has always been a meeting point for three linguistic and cultural areas, German, Italian and Ladin. Taking advantage of this privileged position, the EURAC is able to conduct projects of immediate local interest while simultaneously pursuing research of international scope. Its studies thus provide an important basis not only for South Tyrol's autonomy, but also for Cyprus or Kosovo. Similarly, the data from the Institute of Alpine Environment contribute to the Alpine Convention, whose Permanent Secretariat has its office of technical operations at the EURAC. All the institutes of the EURAC are involved in collaborative projects in close co-operation with other national and international research establishments and universities.

### INSTITUTE FOR RENEWABLE ENERGY

The Institute for Renewable Energy supports industry partners in the implementation and launch of innovative energy technologies by offering services such as specific tests in test stands, monitoring of pilot and demonstration plants as well as system simulation and optimisation. Moreover, the Institute assists industry partners in the development of new products and systems. The Institute's philosophy gives priority to professionalism and to the search for solutions. The Institute guarantees a strictly confidential data processing. Research activities are focusing on three main fields and are developing around the common vision of an active solar building:

- solar heating and cooling systems;
- energy systems in buildings;
- photovoltaic systems integrated in the architecture.

In these fields the Institute is involved in bilateral co-operations with industry partners, in European and international research projects, in consulting activities for technicians, financial institutions and public partners like municipalities and schools.

With the support of the

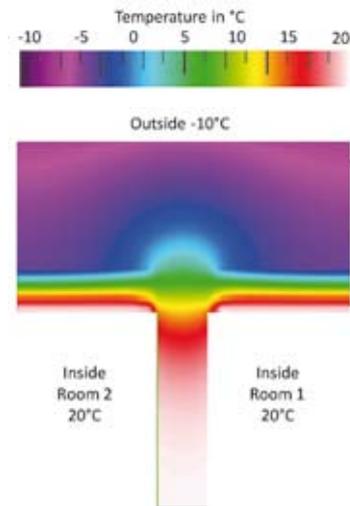
STIFTUNG SÜDTIROLER SPARKASSE  
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### RESEARCH ACTIVITY

The need to ensure decent tempered room conditions and at the same time to minimise the energy consumption in buildings, is driving towards an integrated planning, aiming at combining the technical installation with the characteristics of the building envelope. The Institute for Renewable Energy studies innovative technologies for energy production and examines single installation solutions, combined with passive energy systems, in order to deliver guidelines for the achievement of a high energy efficiency in buildings. The energy optimisation is applied also to existing and to historic buildings. Moreover, particular interest is devoted to the research in buildings with passive standards, which has to confine not only to winter but also to summer conditions.



Study of the heat transfer in the masonry of a historic building.

### PROJECT EXAMPLES

The Institute is involved in many monitoring and optimisation projects, like for instance the monitoring of Italy's first multiple family passive house for social dwellings.

In January 2008 the monitoring of a historic building was started, that was refurbished specifically in order to reduce its heating demand from 450 kWh/m<sup>2</sup>a to less than 30 kWh/m<sup>2</sup>a.

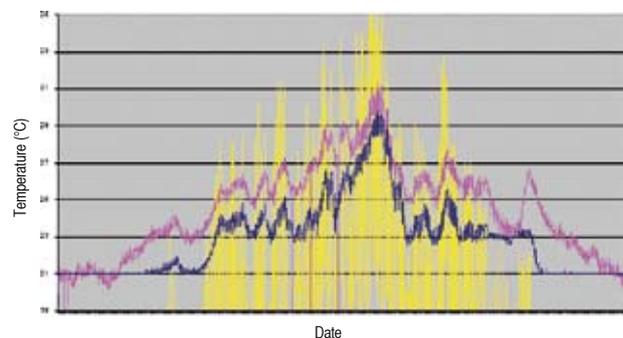


Historic building that was refurbished to reduce its energy consumption from 450 kWh/m<sup>2</sup>a to 30 kWh/m<sup>2</sup>a.

### OFFERED SERVICES

Following services in the field of energy systems in buildings are offered by the Institute for Renewable Energy:

- Control and evaluation of the energy performance of buildings and plants through monitoring activities;
- Planning and optimisation of innovative energy systems with the help of simulation studies;
- Energy comparison between different technique- and building structure options, with the help of simulation studies;
- Dissemination of knowledge related to energy systems.



Optimisation of the summer behaviour of a building. The pink and the blue line show the measured and the simulated average temperature while the yellow line represents the trend of the ambient temperature.

## RESEARCH ACTIVITY

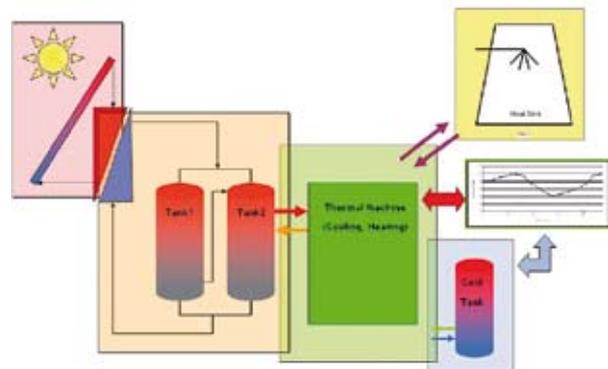
In the field of solar heating and cooling the institute participates in projects on national as well as on international level. By the investigation and the development of applications for residential buildings and for the industrial sector these projects enhance and accelerate the market establishment of products using solar energy all the year round. Thereby the interest is mainly focused on solar cooling. Besides the monitoring of already installed plants a test facility is currently in construction. This test facility allows systematic analyses of these so-called "Solar-Combi-Plus-Systems" by flexible alterable basis conditions, e.g. the system placement in a changed climate region. Furthermore, the test facility serves for testing of thermally driven heat pumps and accordingly cooling machines for heating and cooling.



View onto the solar collectors installed on the EURAC building

## PROJECT EXAMPLES

EURAC is leadpartner of the European project "SolarCombi+", where the Institute for Renewable Energy develops, together with 12 European industry and research partners, standardised and economical interesting solutions for small scale solar heating and cooling applications. On international level, the institute is involved within two projects (IEA Task 38/ "Solar Air Conditioning and Refrigeration" and IEA Annex 34/ "Solar Thermally Driven Heat Pumps for Heating and Cooling"). Thereby it is on the one hand relevantly involved in developing good practice guidelines and dissemination strategies for the planning of solar cooling plants and on the other hand in investigating thermally driven heat pumps for heating and cooling, also in terms of standardisation and cost effectiveness. Both projects are coordinated by the International Energy Agency (IEA).

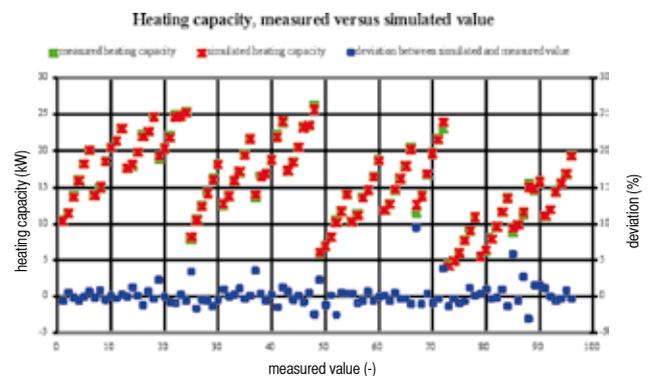


Concept of the test facility under construction at EURAC's Institute for Renewable Energy.

## OFFERED SERVICES

The Institute acts as a scientific partner and/ or consultant for the investigation and the development of solar driven cooling machines as well as for entire systems. It offers the following services:

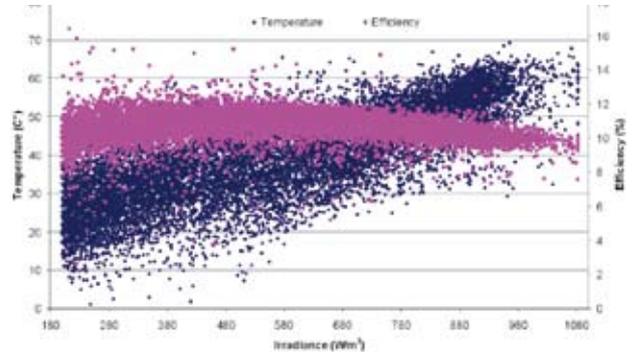
- monitoring and simulations of entire systems for the evaluation and the improvement of their performances;
- product development and performance determination of single system components and entire systems;
- feasibility studies for projects with innovative energy concepts.



Measured (green) and simulated (red) cooling capacities and corresponding deviations (blue) of an absorption machine, installed at an industrial plant.

## RESEARCH ACTIVITY

In the field of photovoltaics the Institute is involved in research projects with national and international partners, aiming at the diffusion of technology, at the test and development of photovoltaic systems and modules and at the realization of models for efficiency forecasting. Particular attention is given to the components' development and to the drawing up of best practices for the total integration in the building's envelope.



Yield efficiency of crystalline silicon modules in operational conditions.

## PROJECT EXAMPLES

On industries' demand EURAC is carrying out studies on the integration of the photovoltaic technologies in building components. EURAC, together with five other photovoltaic companies, is the founding partner of COPES, a cooperation project aiming to realize PV demonstration systems, enhance the quality of installed systems and promote the integration of PV in urban centers. The project is part of the European program "Applied Spatial Management ASM". Within this project EURAC is monitoring 10 plants with an installed capacity of over 2 MW.

The Institute is realizing demonstration plants and is cooperating in the field of know how transfer projects in South East Asian countries.



Photovoltaic cells on the roof of EURAC

## OFFERED SERVICES

The Institute assists public and private institutions as scientific consultant in applied research projects for the study and the development of innovative photovoltaic systems and components. To this purpose the Institute offers the following activities:

- feasibility study of plant solutions using simulation instruments;
- evaluation of operational features of innovative modules;
- support at the development of photovoltaic products, particularly in the field of the integration in coverings and facades;
- monitoring and evaluation of the plants efficiency;
- yield simulations aiming to evaluate the investment.



Detailed measurements at a photovoltaic plant by an EURAC expert

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<b>Bolzano</b>	München: 277.66 km	Wien: 587.91 km	Bruxelles: 1011.53 km
<b>Bozen</b>	Milano: 280.24 km	Roma: 651.14 km	Paris: 1054.18 km
	Zürich: 391.78 km	Praha: 664.88 km	Amsterdam: 1105.23 km
	Zagreb: 487.81 km	Berlin: 861.93 km	London: 1376.13 km

Research programs in which the EURAC is active:

