Sustainable Energies

connected - sustainable - integrated

FRITZ
Planung GmbH

From

FRITZ Planung GmbH

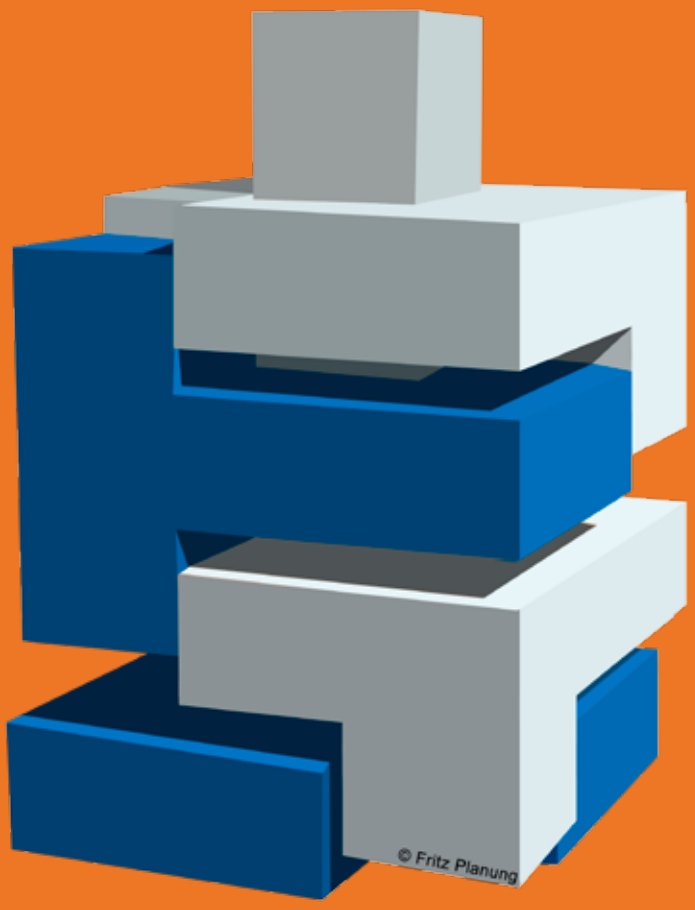
interdisciplinary advisor for the

energy mix of the future

…connected

…sustainable

…integrated



Preface

The future energy policy of Germany will be essentially defined by the principle of sustainability. This means that traditional forms of energy production considered to by risky or harmful to the environment will have to be replaced step by step - especially those utilizing nuclear power and fossil fuels.
This path is full of obstacles. No other alternative exists when one considers how fast the climate is changing. Unfortunately, there is no nostrum for solving all energy problems. On the contrary, a turning point in the energy policy is only possible if a series of individual long-term steps, even those that are small, are simultaneously implemented with the common objective of sustainability in the production and use of energy.
Energy sustainability requires knowledge, technical concepts, comprehensive reasoning, and different types of solutions without ideology. This is our approach.
Our fully integrated and technical concepts always examine the task from all necessary angles - regardless of whether the task concerns solar, geothermal, evolving energy production principles or efficient, individual, optimized, and renewable sources of energy. We can accomplish this because the engineers required for the task work together in our office. We form teams of engineers who have specialized knowledge. This allows the engineers to provide our customers with quality advice, which is an important step in the overall process. Examples of this approach are summarized on the next page.

Dipl.-Kfm. Karl Schmitt
Managing Director
of the Fritz Planung GmbH

Photovoltaics

Energy extraction through photovoltaic plants - is this an old concept? No! The field requires innovative ideas and concepts.
This is how the Fritz Planung GmbH could service and implement a photovoltaics plant with a total output of 600 kVA in one of their last projects. The solar panel modules were adjusted to the sun by using a simple cable winch system.
During another project the photovoltaic modules were installed into the sealing foil of a flat roof in such a way that was architecturally appealing and without incurring additional cost.

Architectural integration of innovative photovoltaics energy concepts into building structures is only one part of the equation. Optimizing the application and its control is the other part.
The Fritz Planung GmbH offers professional expertise with its team of specialists in the areas of process measuring and control technology.

Solar heat

Solar energy or solar heat is used to describe heat extraction with so called solar panels from the thermal radiation of the sun. The main application of solar thermal plants falls under the field of low temperature use (low temperature heating). These solar panels are best suited for heating drinking water, for auxiliary heating systems, and for the storage of solar heat during the summer.
Both large and small solar heating plants will be promoted by the government through a market incentive program after the „Renewable - Energy - Heat Law“ (EEG Erneuerbare Energien Gesetz) goes into effect this year. If you would like more information on this subject please do not hesitate to contact us. We would be happy to provide you with advice!

Geothermal power / energy

Geothermal power that is used wisely can become a fundamental element of our energy supply.
This type of energy can:
- regenerate itself continuously from the inside of the earth and through the decomposition of radioactive elements
- is always available and environmentally safe
- is base-loadable
- economical and innovative

The following systems are best suited for the utilization of geothermal power:
- Systems for geothermal energy near the surface (e.g. geothermal power panels and geothermal probes, energy stakes, ground water wells) together with heat pumps and surface heating plants.
- Systems for deep geothermal energy (e.g. hydro-geothermal wells and duplicates, deep geothermal power probes and HDR plants).

The Fritz Planung GmbH is your project partner in every phase having operated for over 30 years in the geothermal energy sector. We prepare feasibility studies and profitability analyses, develop projects based on geophysical preliminary inspections and utilize geothermal probes and well systems drilled to a depth of several thousand meters. Thereafter, the extracted energy is integrated into existing electricity and heat networks.
In addition to developing concepts for the installation of technical equipment in buildings the Fritz Planung GmbH also manages the licensing procedure with the environmental and extraction authorities.
We configure systems for the utilization of cold long-distance heat in which the groundwater is used for heating and cooling. Flat geothermal power probe systems can supply new housing areas and also be utilized for the restoration and retrofitting of existing energy supply systems.

Geothermal energy can be utilized as a mono-fuel or in combination with other renewable sources of energy (e.g. solar heat systems).

Hydroelectric power

Hydroelectric power is one of the oldest sustainable forms of energy generation and can be utilized via several methods. One of the methods is conventional hydroelectric power for projects involving river and water power stations.

Another is the so called drinking water - small power station method which utilizes small Pelton turbines or reverse stream high pressure centrifugal pumps in existing or newly planned water supply stations as an easy and cost efficient method for producing electricity. The Fritz Planung GmbH has a corresponding specialty department for each type of operation. All subtasks are processed repeatedly before implementation regardless of whether the subtask concerns the selection and dimensioning of turbines or generators, electric or hydraulic integration into the existing system, or profitability or amortization calculations.

Both of the energy extraction options are promoted by the EEG. We would be happy to provide you with advice concerning the respective feed-in tariff options.

River power station

The tariffs for producing electricity from hydroelectric power were raised after the Renewable - Energy - Law EEG 2009 was amended.
At present, the tariff for new plant constructions with up to 500 kW of output is 12.67 ct/kWh.
The tariff for existing plants undergoing modernization with up to 500 kW of output is 11.67 ct/kWh.
Ecological continuity and passage of fish and microbes must be ensured in order to retain this tariff.

The Fritz Planung GmbH is your knowledgeable partner for process measuring and control technology and construction of fish passage systems.

Wood pellets

The bio-renewable raw material of wood is a future alternative to fossil fuels which continue to become more scarce and expensive in the field of heat extraction / heating. Wood is the most important biological energy source in Germany. This type of heating fuel can be broken down into split logs, wood pellets, and wood chips.

Wood pellets are made from wood shavings and saw dust and are a bi-product from the wood industry. The cylindrical pellets are pressed together under pressure; they have low water content and therefore a high heat value. The heating plant using heating pellets is fully automated. A conveyor unit transports the pellets from a storage room right into the combustion chamber. The leftover ash is then collected.

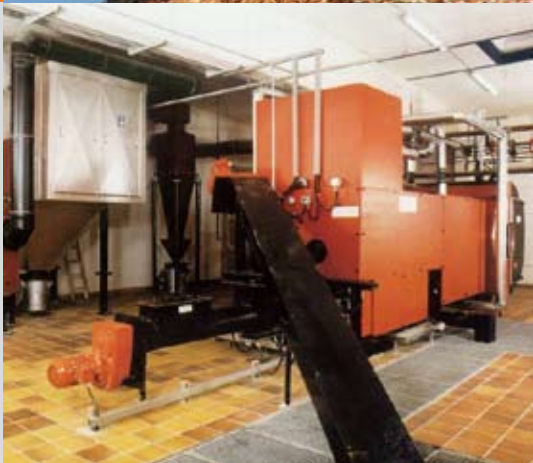
Consumption for an average single family home lies in the range of 3-4 t of pellets per year. The leftover ash comprises approx. 30 kg.

Wood chips

Wood chips are crushed wood from the timber industry - as with pellets, this source is 100% bio-renewable. The principle of heat extraction can be compared to the process of heating with wood pellets. Only the type of energy source is different in this connection. The energy content and consequently the fuel value of the wood chips can vary significantly depending on the type of tree, water content, drying, and storage.

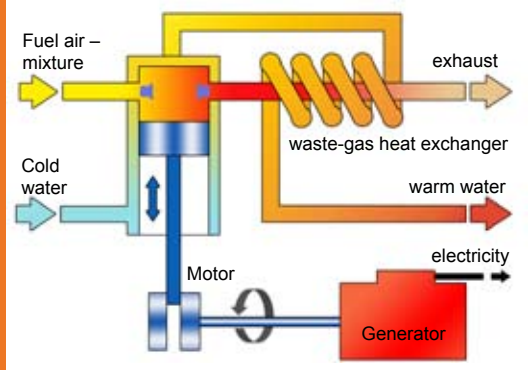
Combinable

Both heating systems can be combined with other heat production plants and are therefore flexible as a supplier of heat.
Such heating plants were successfully designed and implemented in connection with other plants such as a BHKW plant during several projects by the Fritz Planung GmbH.



Block heating station (BHKW)

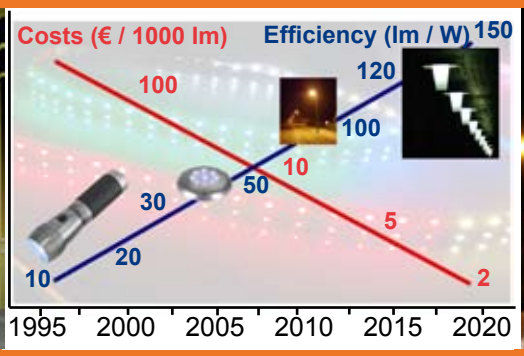
BHKW are plants built with a modular design and used for the generation of electricity and heat.
The plants utilize the principle of heat and power co-generation (KWK). The principle of (KWK) can be implemented with any fuel and any source of energy. In addition to the use of fossil fuel energy sources (natural gas or heating oil) these types of plants can also be operated with renewable energy sources such as biogas and vegetable oil. The electricity generated can be used directly or fed into the national grid at an suitable tariff. The remaining heat can be used for heating purposes or fed into the long-distance or district heating network.
„Mini-BHKWs“ are quiet and low maintenance aggregates (the size of a washing machine) that generate electricity and heat efficiently on a daily basis in the heat cellars of apartment buildings, hotels, and other commercial buildings.
Different promotional programs by the government make the purchase of BHKWs more cost-effective than ever before.
The Fritz Planung GmbH with its knowledgeable team of professionals is also happy to assist you in designing projects related to this field.



Energy savings

Energy savings is the largest energy source of the future from both an economic and environmental point of view.

Two examples based on numerous options should make this point clear.



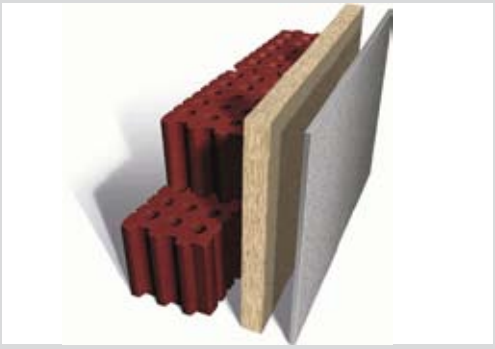
Street lighting

The installation of energy efficient lights and lighting fixtures to include street lighting is an interesting option for townships. Many of the areas are already equipped with LED and NA high pressure technology lighting. The advantages of this type of lighting are clearly evident:

- low maintenance with extremely long service life
- low electricity consumption at the same level of lighting quality
- compact designs

In addition to the technical and economical advantages the conversion to energy saving light fixtures for street lighting is now vigorously promoted by the government.
The Fritz Planung GmbH is the right partner for coordinating the conversion of your street lighting system. The company assists in the preparation of a street lighting cadastral as well as in the technical design and calculation of lighting needs

Thermal insulation composite system (WDVS)



Buildings that comply with the heat insulation - standards of the 1970s consume several times more heating energy than buildings that comply with the current standards. Up to 75% of the heat loss is caused by a lack of insulation on the exterior walls. A WDS - system generally consists of 3 main components which can be attached to all of the outside walls:

- Insulating material (such as expanded polystyrene, mineral wool or mineral foam sheets),
- Reinforcement for the support of the insulating board and to prevent cracks in the finishing plaster
- Final coat or exterior shell made of plaster, wood, ceramic, brick, or metal.

The insulation thickness that is recommended today is approx. 16-20 cm.
In addition to its experience as a building renovator the Fritz Planung GmbH also provides expertise on calculating heat insulation or on energy passes.

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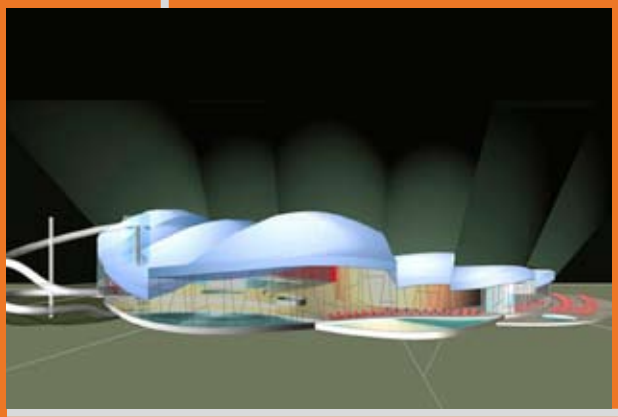
Ihr Generalplaner



Architecture

Pool construction

Landscaping of outdoor premises

Technical equipment

Electrotechnology

Geology / geothermal energy

Water supply

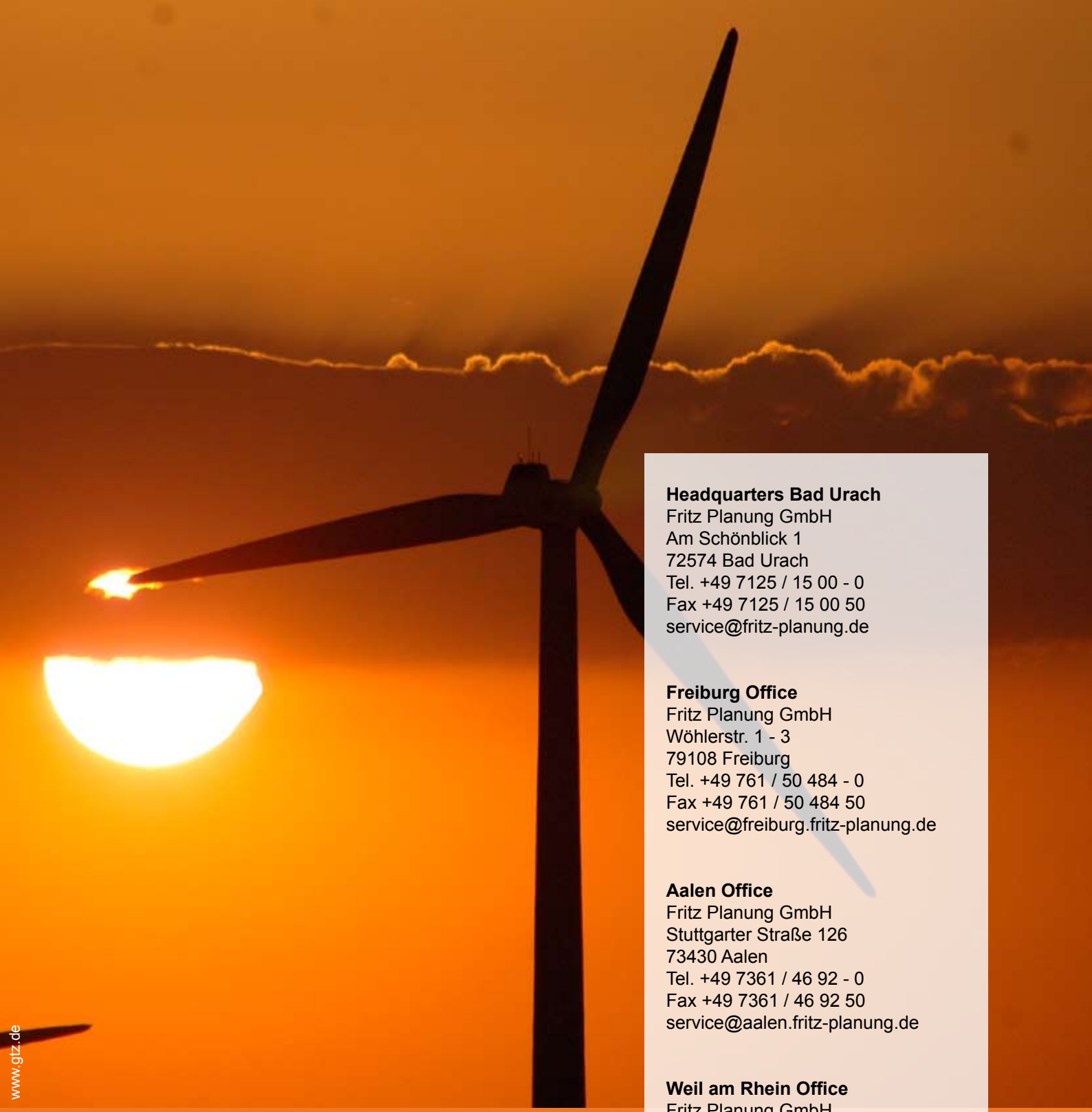
Site development

Wastewater disposal

Hydraulic engineering

Support structure planning

Surveying



www.gtz.de

FRITZ
Planung GmbH

Your knowledgeable partner for all questions and projects pertaining to the field of „Renewable Energies“

Your benefits:
Long-term experience and first hand expert knowledge from an interdisciplinary team of engineers

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