

CLIMATE ENERGY SERVICES
 GEOGRAPHIC INFORMATION SYSTEM SMART HOMES
 STORAGE HEATER HEAT REGISTER
 POTENTIAL SUPPLY DISTRICT HEATING
 EFFICIENCY ENERGY MANAGEMENT SMART HOMES SOLAR
 SUN COMBINED-HEAT-AND-POWER
 POWER SUPPLIER DEMOGRAPHICS
 HEAT REQUIREMENTS SUPPLY STRATEGY DISTRIBUTION STRATEGY
 POWER GRIDS
 ENERGY SYSTEMS ANALYSIS
 RENEWABLE ENERGY INTEGRATION
 CO₂ SUPPLY CONCEPTS COST-EFFICIENCY
 ELECTROMOBILITY kWh HUMAN AND ENVIRONMENT
 RESIDENTIAL AREA CONCEPTS DECENTRALIZED
 BUSINESS SEGMENT DEVELOPMENT NETWORK EXPANSION



HEAT DEMAND MAPS AND ENERGY SUPPLY CONCEPTS

Future supply concepts

Though the discussion about the energy revolution has mainly focused on electricity, the supply of heat is also constantly under development. The pursuit of climate protection objectives and the integration of renewable energies are important driving forces. This is connected to an increasing localization of generation; former consumers are becoming generators. Building rehabilitation and demographic developments have resulted in a decrease in heat requirements. This brings rise to questions regarding customer retention options and the business fields of the future: Will public utilities move from being a power supplier to a full-service energy provider for its customers?

A comprehensive understanding of the supply sector is the basis for an integral examination of an energy supply framework

concept. Such concepts can pursue different objectives:

- Building-specific determination and presentation of the heat and power requirements
- Identification of suitable areas for the expansion of a remote/local, CHP or gas supply system
- Economic evaluation and optimization of existing or future supply strategies
- Illustration of external developments (e. g. building renovation)
- Detailed analysis of specific areas
- Determination of measure for achieving objectives (e. g. with regard to CO₂ emissions)
- Expansion and integration options for renewable energies

Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM

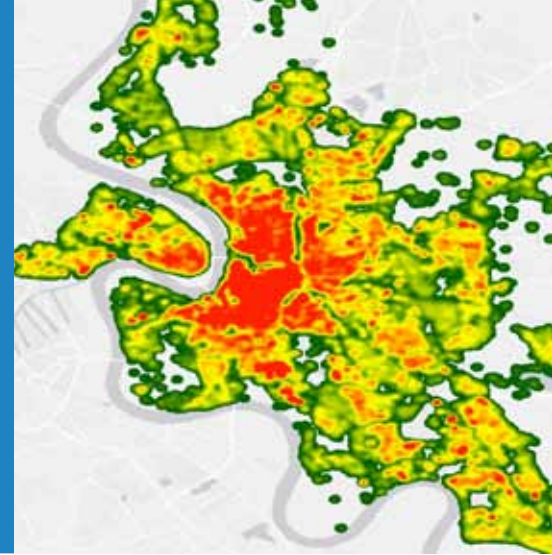
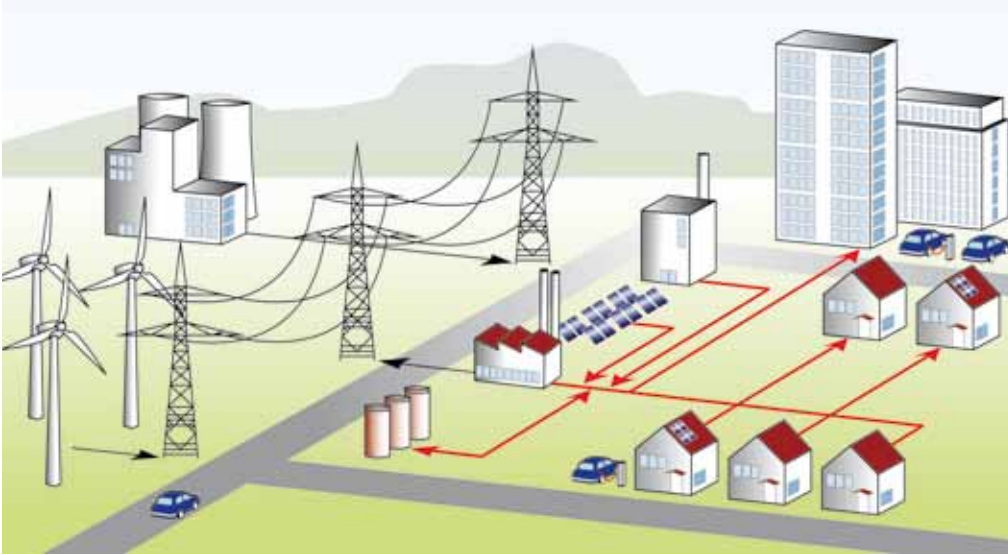
Wiener Strasse 12
 28359 Bremen | Germany

Institute director
 Prof. Dr.-Ing. habil. Matthias Busse

Contact

Energy System Analysis
 Dr. Bernd Eikmeier
 Phone +49 421 2246-7023
 Fax +49 421 2246-7030
 bernd.eikmeier@ifam.fraunhofer.de

www.ifam.fraunhofer.de



Cities and municipalities or group of actors such as housing associations often face similar challenges, some of which must be solved in cooperation with the public utilities.

Our services

We offer analyses of the following:

- Creation of a building-specific, digital heat and power requirement atlases in a GIS (geographic information system) for later internal use
- Visualization of the results (e. g. grid and heat line density maps)
- Development of a customized building typology
- Analysis of settlement and requirement structures
- Energy and CO₂ footprints: Determination of status quo and savings potentials
- Economic efficiency of individual measures and expansion strategies
- Determination of CHP potentials
- Scenario calculations on the effects of external developments (e. g. Energy policy framework conditions, expansion of renewable energies, customer behavior)
- Evaluation of company strategies (e. g. Proposals for energy services, system integration of batteries and heat stores)

Sample project: Energy efficiency in the historic Botanical Garden quarter in Göttingen

The quarter is characterized by a variety of residential structures with institutional and private owners as well as a number of historical buildings.

In a first step, the project analyzed comprehensive options for energy savings, while always keeping an eye on preserving the architectural cultural characteristics of listed historic buildings. In this context the project included creating a building catalog as a means of documenting current and future heat requirement.

Building on these results, the project examined potential measures for supplying heat with a focus on connecting to the preexisting district heat grid. Further applicability to the entire downtown Göttingen area and comparable areas in other cities was taken into account at all times.

Sample project: Heat development plan Düsseldorf

In 2016, the most efficient gas and steam turbine power plant in the world will start operation in Düsseldorf. It can release 300 MW of district heat. For this reason, the Düsseldorf public utilities, with the support of the Fraunhofer IFAM, developed a heat development plan. The basis of this central tool in the company strategy is a building-specific, updatable heat atlas. This is GIS-supported and based on energy consumption data from several years and a building typology specially derived from this data for Düsseldorf as well as all urban development plans.

This heat requirement map is used to determine the most worthwhile expansion clusters and sections for remote heating and to perform an economic efficiency calculation and investment plan for these clusters and sections.