



Dresden Institute for Building Systems Engineering
Research and Application GmbH
Prof. Felsmann - Dr. Hartmann - Prof. Oschatz - Dr. Werdin

Development of a guideline for the reconciliation of Energy demand – Energy consumption *Summary*

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The responsibility for the content lies with the author.

Project partners: ITG Dresden, IWU Darmstadt, FH Braunschweig/
Wolfenbüttel, Schiller Engineering, W. Reiners,
Fraunhofer IBP, Ages, IBUS Berlin

Project manager: Prof. Dr.-Ing. Bert Oschatz

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1 Intention

Energy performance certificates can be established calculative by using the energy demand or based on the measured energy consumption. If recommendations for energetic and economic useful reconstruction measures on existing building (e.g. during an energy consulting) should be designed, then energy demand and energy consumption has to be evaluated. The calculation of requirements gives evidence about the distribution of the energy losses in the building envelop and system components under standardised boundary conditions. On the basis of the consumption data the conclusion of the calculation can be reviewed. Therewith the accuracy of the proposed reconstruction measures can be increased. The evaluated data for energy demand and energy consumption of a concrete object does not match normally, the difference can be considerable.

The energy consultant has to adjust energy demand and energy consumption. For this purpose does not exist an acknowledged rule of technology. The necessary demand and consumption adjustment tends to resultant inevitable in a certain insecurity of the energy consultant, in the long term also insecurity of the building owners as costumers of energy performance certificates and energy consulting can be expected.

In the research project „Erarbeitung eines Leitfadens zum Abgleich Energiebedarf – Energieverbrauch“(Development of a guideline for the reconciliation of energy demand – energy consumption) shall be given a detailed instructions for the adjustment of energy demand and energy consumption. The project group of IWU Darmstadt, FH Braunschweig/Wolfenbüttel, Schiller Engineering, W. Reiners, Fraunhofer IBP, Ages, IBUS Berlin and ITG Dresden has developed a guideline which as draft standard had been introduced to the DIN Committee GA 005-56-20 „Energetische Bewertung von Gebäuden“(Energetic evaluation of buildings).

With the collected data of the ratio energy demand and energy consumption can possibly be required adjustments of the boundary conditions during the determination of requirements deviate.

2 Procedure

The project group possess an extensive experience in the domain calculation of energy requirements and energy consulting. In the course of the project handling was at first the present knowledge analysed. The following illustration 1 shows exemplarily data for energy demand and energy consumption.

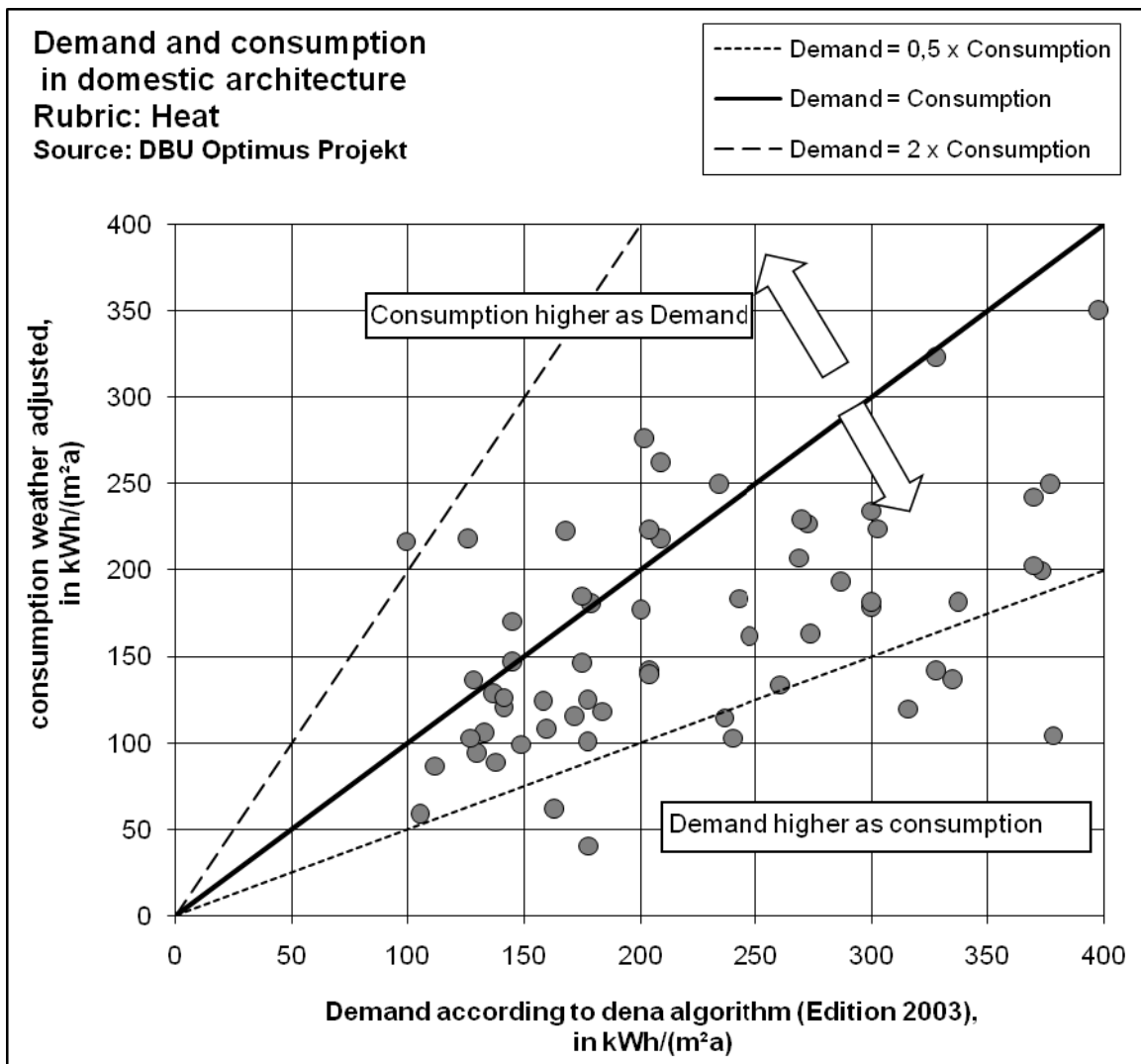


Illustration 1 final energy heat – demand and consumption of residential buildings (Source: Optimus, FH Wolfenbüttel)

Building on that a concept for a guideline for the adjustment of energy demand and energy consumption was formulated. This draft was then discussed in a workgroup and as draft standard introduced to the DIN Committee GA 005-56-20 „Energetische Bewertung von Gebäuden“(Energetic evaluation of buildings).

3 Summary of results

Calculative evaluated data of energy demand and measured consumption do not match normally. If recommendations for energetic and economic useful reconstruction measures for an existing building (e.g. during an energy consulting) should be designed, then energy demand and energy consumption has to be evaluated. The energy consultant has to conduct an energy demand und energy consumption adjustment. The present guideline shows a detailed procedure for the reconciliation of energy demand and energy consumption. Furthermore it gives details for the evaluation of consumption data, for the review of calculation of requirements as well as for the detailed analysis of consumption data and whose interface to the demand.

The project group has developed a guideline for the reconciliation of the consumption with the demand which allows a uniform procedure. It contains:

- Details for the evaluation of consumption data (typical mistakes, boundaries of the balance sheets, weather adjustment)
- Details for the review of calculation of requirements (Details for the sensitivity of the input data, filtration of input values with high influence on the balance sheet result as well as for data with a high spread in practice)
- A detailed evaluation of the consumption data and whose interface to the demand (Evaluation and evidence of monthly measured values, energy signature of the customers, detailed evaluation of heat generators, load profile analysis).

A publication of the guideline as supplementary sheet 1 to the DIN V 18599 was decided during the conference of the DIN community committee GA 005-56.20 at the 27th of May 2009, a requirement therefore is the approval of the auditing agency of engineering standards.

The analysis of the demand and consumption values in this research project shows that there are systematic differences between energy demand and energy consumption. In order to analyse the reasons therefore and eliminate these if necessary then there should be the calculation of requirements in additional works be reviewed.