

# **Kostensenkung durch Modifizierung vorhandener Regelwerke (Cost saving by modifications of existing regulations)**

Forschungsarbeit des  
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**Kurzbericht in englischer Sprache**

**(Summary)**

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# Cost saving by modification of existing regulations (summary)

## 1 Goal of this research

The goal of this research is to analyze the effects of existing regulations (including standards, codes and any kinds of regulations) in private house building in Germany. The significance of the statement “in Germany we build more costly because we are forced to do so” will be questioned. Based on the results of the research, opportunities concerning modifications of existing standards will be suggested to support cost savings in private house building.

## 2 Execution and results of this research

### 2.1 Cycle of use as examination period

Usually, the examination period for research projects is assumed to be a complete life cycle over 80 to even 100 years. However not only the technical condition of single building parts lead to investments. Any new cycle of use redefines the individual investment strategy. Thus the examination of a cycle of use of 30 years is more applicable for the majority of new buildings. This point of view leads to an investment strategy that is independent from the previous considerations which only focused on the technical lifespan of single parts of the building.

### 2.2 Cost structuring and cost priorities

The use cycle costs are being considered as a suitable parameter for a quantitative presentation of the effects of standards and regulations in private house building. The methods of dynamic investment calculation are applied for the calculations.

The structuring of the costs of a use cycle is done according to *DIN<sup>1</sup> 18960 : Nutzungskosten im Hochbau.*<sup>2</sup> The use cycle costs are mainly structured in capital costs, operating costs and maintenance costs. An individual consideration of depreciation in addition to the use cycle costs is not included in DIN 18960. However the depreciations can be compensated by the assumption of adequate maintenance costs. Hence a constant technical property value is maintained by building up a corresponding reserve fund.

The capital costs are being calculated using cost parameters based on cost structures of *DIN 276 : Kosten im Hochbau.*<sup>3</sup> The costs of the building land are being considered separately due to their significant influence.

Assumptions in the model calculations are used to quantify the resulting operating costs. Two scenarios show possible future cost developments.

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<sup>1</sup> Deutsches Institut für Normung (German organization for standards)

<sup>2</sup> Use cycle costs in building construction

<sup>3</sup> Costs in building construction

Maintenance costs are estimated for the individual trades (Standardleistungsbuch<sup>4</sup>). Therefore assumptions are made considering previous research results and the assumed previously mentioned investment strategy in private house building in this research.

As a result the costs of cycle of use consist of 55 % to 65 % capital costs, 25 % to 35 % operating costs and only 10 % maintenance costs depending on the applied scenario.

The building land is not included in these results. The average relative share of capital costs increases in the estimated calculations up to 70 % depending on the price and the size of the building land.

Due to these results the main emphasis of this research is placed on standards affecting the capital costs. Standards affecting the operating costs must only be analyzed in case of high operating costs far beyond the average numbers. Thus the often mentioned importance of operating costs as well as maintenance costs does not apply to private house building. The yearly maintenance costs within the cycle of use make up only 1 % of the investment costs (calculated as annuity).

This research neglects a possible value development of the building beyond the constant maintenance of the substance. A method which considers the value development of the building has yet not been applied successfully.

## **2.3 Analysis of relevant standards**

### **Standards in public building law**

The different standards of public building law are considered regarding the influence of use cycle costs by the aspects “costs of building land” and “costs by fixed building methods”.

#### a) Influence of use cycle costs by costs for building land

The effects on utilization costs are almost entirely limited to the capital costs. For the entire use cycle the savings of the use cycle costs add up to 83 ct/€ for each m<sup>2</sup> of building land.

The main savings can be realized by purchasing a reasonably priced building land. The prices for building land regionally vary in great ranges due to the linking to attainable market prices, based on fixed value assessment methods. Otherwise the prices of agricultural land close to the city could not be justified in comparison to the return of an agricultural use. Even with an assumed compensation based on the triple for agricultural areas savings beyond 100 €/m<sup>2</sup> would be possible. Even in rural areas significant savings are feasible.

Development costs are split up by the state between the owners of the building land. The amount depends on the actual resulting costs for the entire development (notice the legal regulations). They vary in a much closer range in comparison to the building land costs. Most important, the standards block comprehensive competition models. Furthermore, there are no considerable incentives or obligations to reduce development costs.

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<sup>4</sup> Standard trade definition in Germany

### b) Influence of use cycle costs by fixed building methods

The strict development plans have a similar effect on the investments as the mentioned building land costs and therefore affect directly the capital costs.

Specific examples concerning standards for rain water use and heating of non-drinking water are calculated. The best solution to realize cost savings in private house building during the use cycle is to avoid additional standards.

From the legal point of view savings have already been realized in the permit phase. Additional savings seem to be unrealistic.

The ETB<sup>5</sup> mostly consist of DIN-standards which are private regulations. A reduction or change of ETB cannot be questioned at all because these standards should first of all protect life and health.

The regulations concerning the minimum distances to the adjacent properties were already reduced for the private house building sector. They usually do not have a considerable impact on the use cycle costs.

### **Regulations of tax and contribution right**

The actual effects of regulations of tax and contribution right are substantially different depending on the characteristics of the region, the building land and the public household.

Especially the governmental subvention for private housebuilders can lower the entire use cycle costs from 7.000 € up to 20.000 €. However, the resulting taxes and contribution reduce this advantage substantially. For example an initial saving of 17.000 € in the use cycle costs by governmental subventions is neutralized by the real estate tax and the tax on real estate transactions from 55 % to 70 %. In some cases even an overall loss for the owner is possible. That shows the extent of taxation for residential property.

### **Trade guild rules**

The current trade guild rules have no considerable effect on the use cycle costs. Since 2004 a considerable number of trades are allowed to work without a license. A further reduction of bureaucracy for a higher number of trades could make sense for some trades as long as the work is not directly related to public safety or protection of life. The effects on costs yet cannot be estimated, as results from the reform in 2004 are still not available.

### **Inheritance law for buildings**

The savings on use cycle costs amount to 15 % of the costs for the building land in the model calculation. Hence the application of the inheritance law for buildings can lead to a substantial advantage for private house building under the assumed circumstances. However additional interest impacts concerning the remaining loan could affect these relative advantages negatively. This problem exists especially for buildings in areas with a low building land value.

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<sup>5</sup> Eingeführte Technische Baubestimmungen (obligatory construction rules)

### **Energy saving regulation**

This regulation is a good example for a successful combination of different goals. In this special case, the reduction of use cycle costs is as well possible as the improvement of the environmental protection. Depending on scenario use cycle cost savings from 1.000 € up to 4.000 € have been calculated.

Further savings are hardly possible because the cost-benefit-relation would be worse. Thus an extension of the energy savings regulation could make an economical house building more difficult.

### **Fee code for architects and engineers (HOAI)**

The HOAI<sup>6</sup> considerably affects the cost of project planning in private house building. It has a direct effect on the capital costs and is therefore a significant factor concerning the use cycle costs. During the model calculation the use cycle costs for the architect's performance came to about 20.000 € for HOAI phases 2 to 8.

At the moment the fixed fees of the HOAI are frequently undercut in practice by ignoring the existing regulations. Moreover the project planning is often provided by the builder or the contractor for residential buildings.

### **Private regulations**

Private regulations are not based and legalized by the law. Private institutions sometimes try to define obligatory for certain regions or trades. The associated intentions differ.

Standards of private institutions become legally significant through direct agreements, a reference in legal standards or jurisdiction. Especially DIN standards are important for the building industry.

These "private standards" rather lead to a cost increase in private house building as shown in the model calculations.

The DIN itself developed a concept that should consider cost effects in the development phase of the standard. The practical application of the concept seems to be insufficient so far. Besides the existing standards do not offer different levels of regulations which consider the individual requirements.

House building without considering all existing standards is hardly possible and very risky. Even if two examples in the research of technical simplifications result in savings in use cost cycles of approximately 1.000 € it must be advised against such action.

Contradictions in different private standards as well as outdated standards lead to uncertainties during the assessment of performance quality concerning the valid technical standards. As a consequence of these difficulties and supported by jurisdiction the more expensive variant of two possible standards is taken. Explicit calculations for sound-proofing standards show that the consequences of a standard increase can cause additional use cycle costs of about 7.000 €

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<sup>6</sup> Honorarordnung für Architekten und Ingenieure

### **3 Possible solutions**

Based on the previous results, changes of standards and regulations are suggested that could significantly contribute to the reduction of use cycle costs in private house building.

1. Introduction of model calculations to take use cycle costs as a basis for investment decisions
2. Supply of reasonably priced building land
3. Introduction of legal standards in order to ensure economical building methods
4. Effective support of economical private house building

A detailed development of the outlined solutions and the following introduction in the practice could lead to a significant expansion of economic private house building. Only substantial changes beyond the previous methods will lead to a noticeable decrease of use cycle costs in private house building. Changes with a limited range within the existing standards will not lead to any considerable progress.