"We create world class **innovations"**

Report "House of the Future"

#WeKnowWhy

About Us

INC Innovation Center

The INC Innovation Center is your holistic partner for the development and implementation of technology-based innovations with the clear aim of strengthening the competitiveness of our customers. At our six locations worldwide, our team of technology, innovation and venture experts supports a wide range of projects from the initial idea through validation, evaluation and piloting to implementation in concrete products and services. Our close-knit network of international industry partners and renowned research institutes enables us to gain in-depth insights into current market requirements and promising technology trends. Over 450 satisfied customers have already been convinced by our forward-looking methods, consulting, training and implementation services as well as our research and development activities. As passionate entrepreneurs, we combine methodological expertise, business acumen and decades of project experience.

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Executive Summary

The house of the future requires a holistic approach and an open exchange.

- Owners are looking for sustainable and energy-efficient solutions that are cost-effective and reliable in order to future-proof their homes.
  - Professional Planners need stable regulations and integrated tools in order to plan sustainable, energy-efficient buildings efficiently and collaboratively.
- Contractors require qualified professionals and modern tools to efficiently meet the high demand for high-quality services and resource-efficient solutions.
  - Energy efficiency consulting requires, among other things, modern, data-based tools and stable funding landscapes in order to be able to provide effective advice on sustainable refurbishment concepts.
- Residential construction companies strive for efficient, sustainable construction methods and clear regulations in order to create high-quality and affordable living spaces.

April, 15th until June, 15th 2024

Contractors, energy efficiency consulting, residential construction, portfolio management, professional planning, component manufacturers

> 200 interviews requested, of which
~ 25 expert interviews conducted

> 50 validated Hypotheses

Study „House of the Future“ (2024)

Key Trends

- **Digitalization & AI**
- **ESG* & Sustainability**
- **Demographic change**
- **Individualization**
- **Resilience**

Property Owners

Key Insights

Sustainability is taken into account in purchasing decisions

Complexity leads to overload

Trust is created through objectivity

Cost-benefit analysis plays an overarching role

The target group of Property Owners includes private individuals who either own real estate or are planning construction or renovation projects for acquired properties. These individuals have already gained experience with construction projects or are about to start such a project. They place great importance on sustainability, energy efficiency, and the integration of modern technologies into their living environments.

The interviews show that sustainability and energy efficiency are highly valued and considered central elements of the "House of the Future." However, the price-performance ratio remains the decisive criterion in decision-making. Decisions are strongly influenced by the quality of the materials.

A significant challenge lies in the objectivity and complexity of construction or renovation projects. Finding reliable and independent sources of information, as well as extensive funding opportunities, proves difficult. Manufacturer information is often perceived as not objective. Additionally, the availability and reliability of craftsmen are critical points that complicate the implementation of projects.

The owners show a clear preference for sustainable and energy-efficient construction methods, complemented by modern technologies such as smart home and automation. Despite the high importance of sustainability and energy efficiency, economic considerations and the price-performance ratio play a decisive role in decision-making. There is a high demand for independent advice and comprehensive system solutions, as the complexity and organizational challenges of construction and renovation projects are often overwhelming.

The analysis of the interviews highlights that sustainable and energy-efficient construction methods combined with modern technologies are the main interests of the owners. To effectively serve this target group, it is crucial to offer cost-efficient solutions that also ensure high quality and reliability. Independent and comprehensive advice guiding the owner through the complexity of construction and renovation projects is essential. Improving the availability and reliability of craftsmen, as well as providing objective and accessible information, are also key factors for success in this market segment.

Professional Planning

Key Insights

Development of BIM skills

Openness to AI solutions for support

Increasing complexity due to e.g. regulatory requirements

Energy efficiency as a key driver for planning measures

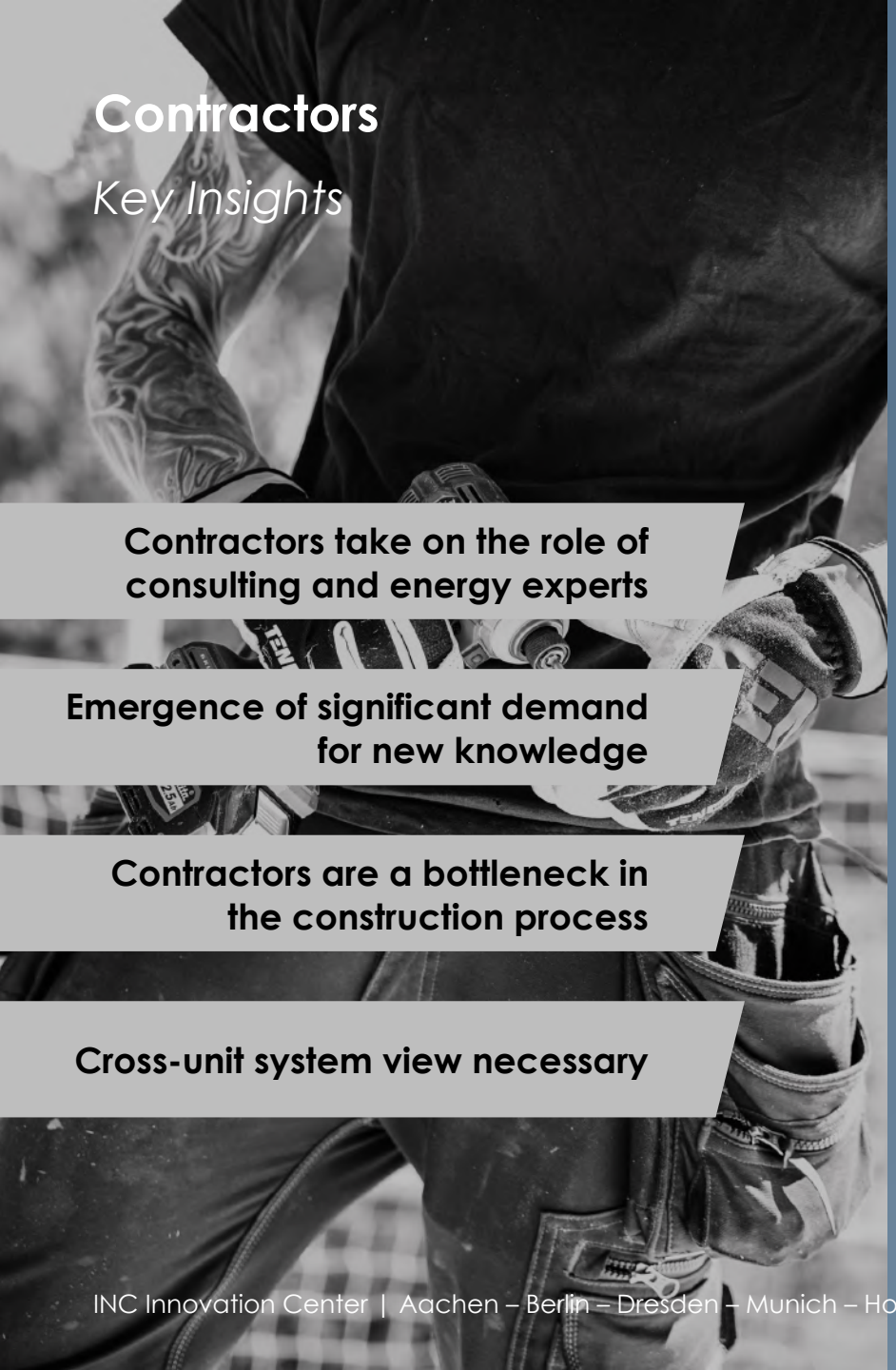
The target group of professional planning includes, among others, professional planners, project managers, and sustainability experts who are involved in the planning and provision of technical building equipment („TGA“) and electrical engineering. These individuals work in large companies, real estate offices, and engineering firms, and are responsible for the development, tendering, calculation, and project management of construction and renovation projects. Their focus is on the integration of sustainable solutions and the use of modern technologies in construction projects.

The interviews show that sustainability and energy efficiency are central elements in specialized planning. Great emphasis is placed on energy-autonomous and comfortable buildings, with the use of renewable energies and the reduction of fossil fuels being paramount. Digitization and building automation are also significant topics that will play a central role in the future.

One of the biggest challenges in specialized planning is the rapid and often unpredictable change in laws and standards, which can lead to significant additional costs and delays. The interoperability of systems and collaboration with various stakeholders, including certifiers, are crucial for the success of projects. Planners see the necessity of increasingly relying on collaboration with certifiers and the use of supportive tools like BIM* and AI to enhance efficiency and quality in the future.

The analysis of the interviews highlights that professional planning has a clear focus on sustainable and energy-efficient construction methods, complemented by the integration of modern technologies such as BIM and building automation. To effectively support this target group, it is essential to create stable and reliable regulations at the political level and to ensure open interfaces for the interoperability of different trades and systems at the component manufacturers' level to ultimately support holistic consideration. Promoting collaboration between various stakeholders within the construction industry (including professional planning, architects, component manufacturers) and providing comprehensive support tools are also key factors for success in this market segment. By utilizing AI and other innovative technologies, efficiency can be increased and the complexity of planning processes can be reduced.

*BIM – Building Information Modeling



Contractors

Key Insights

Contractors take on the role of consulting and energy experts

Emergence of significant demand for new knowledge

Contractors are a bottleneck in the construction process

Cross-unit system view necessary

The target group of contractors includes workers and installers who work in various fields such as plumbing, HVAC, heating, and electrical. These professionals operate in small to medium-sized enterprises and offer a wide range of services, from repairs to comprehensive building renovations. They undertake both planning and execution tasks, placing great emphasis on high-quality work and customer satisfaction.

The interviews show that contractors face significant challenges, particularly due to a shortage of skilled workers and high demand for their services. The availability of system data (e.g., operational, efficiency, and condition data) and its integration into a comprehensive system for targeted analysis and use is another major challenge that will only be fully resolved in the coming years.

A significant trend is the increasing automation and digitization in the trades, including remote maintenance and predictive maintenance. This requires new skills and knowledge, especially in dealing with modern technologies such as heat pumps and refrigerants. Standardization, modularization, and prefabrication are seen as important steps to reduce effort and increase efficiency.

Collaboration with other trades and a cross-trade perspective are considered crucial for success. There is a high demand for internal training and knowledge management to keep pace with technological developments and ensure the quality of services.

The analysis of the interviews highlights that contractors are particularly challenged by the shortage of skilled workers and the high demand for their services. To effectively support this target group, it is crucial to advance automation and digitization while simultaneously creating comprehensive training opportunities. Collaboration with other fields and the integration of system data are key factors for future success. By utilizing modern technologies and standardizing processes, efficiency can be increased, and costs or efforts can be reduced.

Energy Efficiency Consulting

Key Insights

The energy efficiency expert of the future is a generalist

Data-based analysis and advice hardly possible today

Need for automation and modern support tools

Funding landscape brings challenges

The target group of energy efficiency consulting includes energy efficiency experts who specialize in the consulting and planning of energy-efficient renovations and optimizations of buildings. These professionals offer services ranging from creating individual renovation roadmaps to accompanying construction projects, with a focus on improving the energy efficiency of existing buildings.

The interviews show that energy efficiency experts face significant challenges, particularly due to reliance on outdated and inadequate software as well as often insufficient data availability. The consulting primarily focuses on the thermal optimization of the building envelope and the subsequent consideration of energy technology. The interoperability of systems and the interaction of individual components are still poorly standardized but will gain importance in the future.

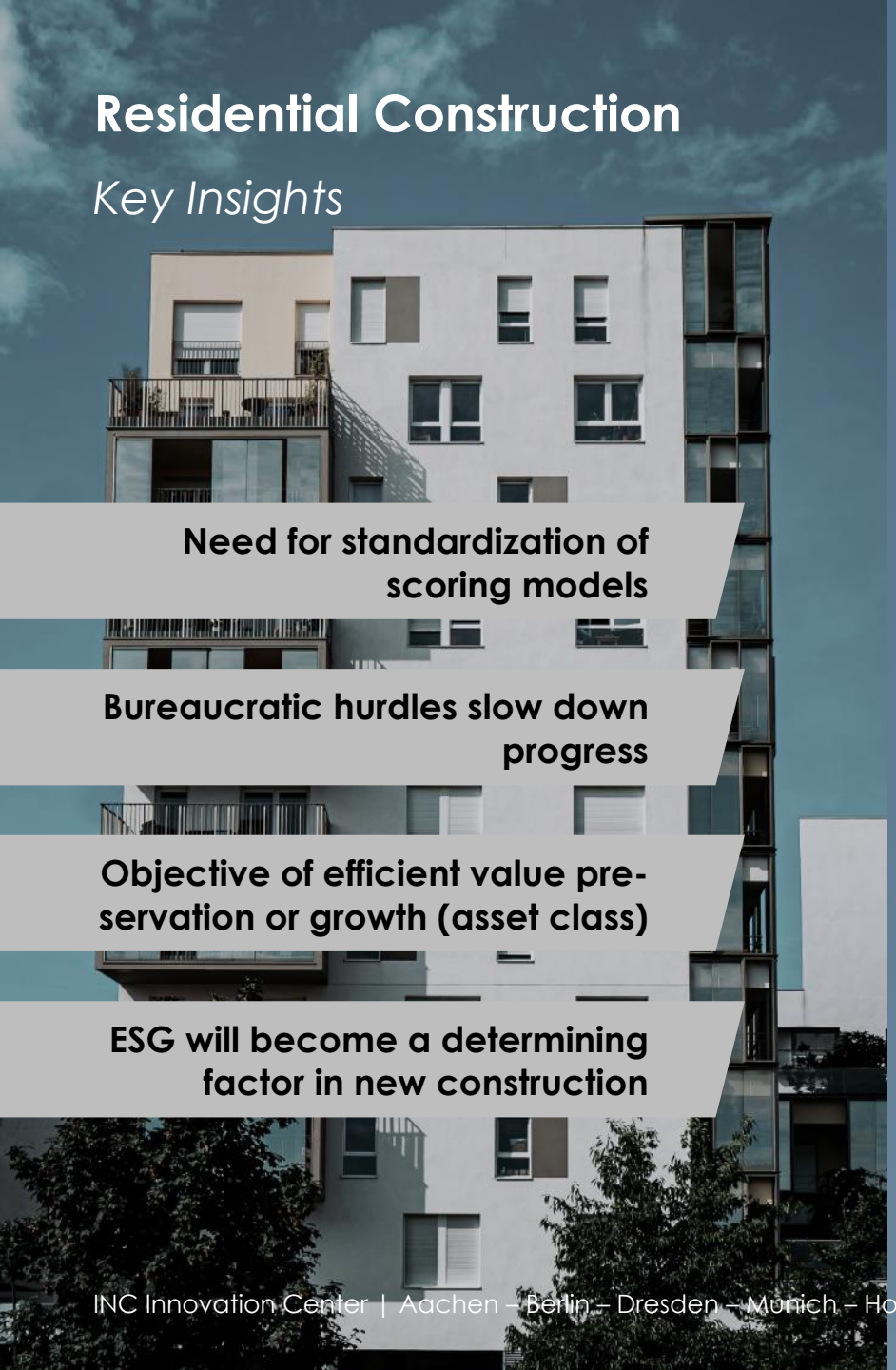
An important trend is the increasing significance of automation and digitization in the field of energy efficiency consulting. The experts see the necessity to develop data-based approaches and use modern tools to make their work more efficient and precise. Collaboration with other trades is crucial to improving the quality of consulting.

Subsidies and the regulatory environment play a central role in the work of energy efficiency experts. Uncertainties and changes in the funding landscape, as well as complex legal requirements, pose significant challenges that complicate the planning and implementation of projects.

The analysis of the interviews highlights that energy efficiency consulting is primarily characterized by the challenges of data availability and reliance on outdated software. To effectively support this target group, it is crucial to develop modern, integrated tools and software solutions that enable better data utilization. Promoting collaboration between various trades and developing standardized approaches to system interoperability are also key factors for future success. By utilizing modern technologies and automating processes, efficiency can be increased, and the quality of consulting can be improved.

Residential Construction

Key Insights



Need for standardization of scoring models

Bureaucratic hurdles slow down progress

Objective of efficient value preservation or growth (asset class)

ESG will become a determining factor in new construction

The target group of residential construction manages a wide range of residential and commercial properties and is responsible for the long-term value preservation, modernization, and leasing of their assets. They place great emphasis on sustainability, energy efficiency, and meeting regulatory requirements within specific asset classes.

The interviews show that residential construction companies face significant challenges, particularly due to the high demands for energy efficiency and sustainability of their buildings. These requirements are driven by ESG criteria and the expectations of tenants and investors. While reducing operating costs is an important goal (specific to asset classes), long-term value preservation and tenant satisfaction are prioritized.

A significant trend is the increasing importance of digitization and automation to reduce operating costs and increase efficiency. Asset managers are heavily occupied with the operational management of assets and need modern, data-based tools to perform their tasks more efficiently and improve the quality of their decisions.

Collaboration with external partners, such as energy consultants and planners, is crucial for the success of renovation and modernization measures. Continuous adaptation to changing regulatory requirements presents another major challenge.

The analysis of the interviews highlights that residential construction companies are primarily shaped by the challenges of sustainability and regulatory requirements. To effectively support this target group, it is essential to develop modern, integrated tools and software solutions that enable better data utilization. Promoting collaboration between various trades and developing standardized approaches to support interoperability between individual trades and systems (e.g., water storage, PV, heating, etc.) are also key factors for future success. By utilizing modern technologies and automating processes, efficiency can be increased, and the quality of property management can be improved.

Key Findings

Core terms show the relevance of current topics.