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|MASTER THESIS

Energy Consulting in Austria: Organization, Quality Management and Ways to Improve the Communication between the Involved Parties

unter der Leitung von

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KURZFASSUNG

Die EU-Mitgliedstaaten haben sich verpflichtet, auf mehreren Ebenen zu den Klimazielen beizutragen und geeignete Maßnahmen umzusetzen, um die Ziele für 2050 zu erfüllen. Politische Anreize und Programme, die darauf abzielen, den Gesamtenergieverbrauch zu senken und gleichzeitig die Energieeffizienz zu erhöhen, gelten dabei als wichtige Maßnahmen. Die Energieberatung stellt eine solche Maßnahme dar. Diese Arbeit beschäftigt sich mit der Energieberatung für die Sanierung von Wohngebäuden in Österreich. Dem Gebäudesektor wird ein hohes Potenzial zur Reduktion von Treibhausgasemissionen durch thermische Sanierung, Steigerung der Energieeffizienz und Implementierung nachhaltiger Energieträger zugeschrieben. Energieberatung hilft dabei, die Sanierungsrate und auch die Qualität der durchgeführten Sanierungsmaßnahmen zu erhöhen, einerseits durch ihre bewusstseinsbildende Wirkung und andererseits durch spezifische technische Lösungsansätze. Dazu werden die Arbeitsgrundlagen für die Energieberatung, wie internationale und nationale gesetzliche Grundlagen und Förderungen für thermische Sanierungsmaßnahmen dargestellt. Weiters wird die Entwicklung der Energieberatung in Österreich, sowie die aktuelle Situation beleuchtet. Die Ausbildungsprogramme für Energieberater werden evaluiert und anschließend werden die Herausforderungen und Hemmnisse für die Energieberatung, welche die Umsetzung von thermischen Sanierungsmaßnahmen und damit die, von der EU gesetzten Einsparungsziele beeinflussen, analysiert. Es wird die Hypothese aufgestellt, dass Energieberatung ein effektives Instrument zur Energieeinsparung ist und die Annahme getroffen, dass durch die Weiterentwicklung und Verbesserung der Energieberatung in Österreich Einsparungen vorangetrieben werden können. Dazu wurden qualitative Experteninterviews mit Vertretern der Energieberatungsagenturen in den Bundesländern geführt. Dabei wird davon ausgegangen, dass diese Experten über das erforderliche Wissen und auch über ausreichend Einblick verfügen. Es wurden Interviews mit Vertretern von sechs Energieberatungsagenturen durchgeführt. Durch die Auswertung der Aussagen der Experten und den Abgleich mit der vorhandenen Literatur wurde deutlich, dass Energieberatung ein sinnvolles politisches Instrument ist, um zur Erreichung der Klimaziele beizutragen, sich jedoch die Grundlagen ändern und weiterentwickeln müssen, um „mehr“ erreichen zu können: Gesetzliche Vorgaben müssen angepasst und Förderungen vereinfacht werden.

Keywords: Energieberatung, Sanierung, Energieeffizienz, Energieeinsparung, Politische Rahmenbedingungen

ABSTRACT

To reduce greenhouse gas emissions the EU Member States are obliged to contribute to the climate objectives at several levels and implement suitable measures in order to fulfill the 2050 targets. Political incentives and programs aiming at decreasing the total use of energy and, at the same time increasing the energy efficiency, are thereby considered important measures. Energy consulting represents such a measure. This thesis deals with energy consulting services for the renovation of residential buildings in Austria. The building sector is supposed to bare a high potential for reducing greenhouse gas emissions through thermal retrofit, increasing energy efficiency, and implementing sustainable energy sources. Energy consulting thereby helps increasing the rate of thermal retrofit and also the quality of the implemented renovation measures, on the one hand through its awareness-raising effect and on the other hand through specific technical solution approaches. Therefore, the working basis for energy consulting such as international and national legal foundations and subsidies for thermal retrofit measures are outlined. Further the development of energy consulting services in Austria, as well as the current situation are examined. The education programs for becoming an energy consultant are evaluated and subsequently the challenges and impediments for energy consulting, which affect the implementation of thermal retrofit measures and thus the saving targets set by the EU, are analyzed. The hypothesis is stated, that energy consulting is an effective tool for energy savings and the further the assumption is made, that savings can be advanced by further developing or improving energy consulting services in Austria. The method of conducting qualitative expert interviews with representatives of the energy consulting agencies in the federal states of Austria has been chosen to prove this hypothesis because these experts are believed to have the required knowledge and also sufficient insight. Interviews with representatives of six energy consulting agencies have been conducted. By evaluating the statements of the experts and cross-checking them with the existing literature, it became clear, that that energy consulting is a useful political instrument to contribute to the climate goals, though in order to achieve more, the fundamentals need to change. Legal requirements have to be adapted and subsidies need to be simplified.

Keywords

energy consulting, thermal retrofit, energy efficiency, energy saving, political incentives

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Dedicated to my father.

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LIST OF ABBREVIATIONS

ARGE EBA ..... Arbeitsgemeinschaft Energieberater Ausbildung

EPBD..... Energy Performance of Buildings Directive

EED ..... Energy Efficiency Directive

EEffG..... Bundes-Energieeffizienz-Gesetz (Federal Energy Efficiency Law)

GHG ..... Greenhouse Gas

MRG ..... Mietrechtsgesetz (Tenancy Law)

WEG..... Wohnungseigentumsgesetz (Condominium Law)

KSG..... Klimaschutzgesetz (Climate Protection Law)

1 INTRODUCTION

1.1 Overview

In order to reduce GHG emissions, the EU Member States are obliged to contribute to the climate objectives on several levels and are required to implement suitable measures. Political incentives and programs aiming at reducing GHG emissions by decreasing the total use of energy and at the same time increasing the energy efficiency are thereby considered as important horizontal measures. Horizontal measures are thereby defined as a wide range of regulatory, tax and subsidy instruments by the federal states and the federal government, which are based on the distribution of powers under the federal Constitution. Horizontal measures therefore have a direct or indirect impact on almost all essential sectors and areas of energy and climate policy. Raising awareness for topics such as energy and climate protection, as well as anchoring them in education and training, build the bridge to enable broad and successful implementation of horizontal measures among the public. (BMWFJ, BMLFUW, 2010).

What is known as Energy consulting (in German: Energieberatung) represents such a measure. This master thesis deals with the political instrument of energy consulting in Austria and energy consulting for the renovation of residential buildings in particular.

Especially since the scarcity of energy in 1973 and the resulting oil price shocks, awareness about energy related topics has grown strongly (Kofler 1992: 1). Back then, energy consulting was more about saving energy and using energy reasonably by changing behavior and using household energy correctly (Büttner 1986: 61). Today energy consulting deals more with the thermal retrofit of buildings and improving building services such as heating, cooling and ventilation. The building sector is supposed to bare a high potential for reducing GHG emissions by reducing energy consumption through thermal retrofit and high building standards, increasing energy efficiency, and implementing sustainable energy sources (Feser et al., 2015: 134).

The field of energy consulting covers a wide range of tasks and topis, which are described in the Background chapter of this thesis. First, an overview about the current GHG emissions in Austria and especially the emissions in the building sector is provided. Subsequently, the political goals and requirements as well as the international and national legal foundations, which form the basis for energy consulting services, are outlined. Thermal retrofit of buildings and subsidies go hand

in hand, therefore a short outline of the subsidies, which are provided by the federal government and the federal state governments, is presented.

Further, the development and the perception of energy consulting are described and the existing energy consulting services for the renovation of buildings in Austria are examined. The available types of consulting services in Austria and their respective target audience are described. The competence for energy consultancy to private households is attached to the governmental level of the federal states of Austria. As such, these federal states run energy consulting agencies. Moreover, the organization and tasks of the different agencies are described.

Another important matter is the education of energy consultants. Educational programs to become an energy consultant are evaluated.

Subsequently challenges and impediments for energy consulting, which affect the implementation of thermal retrofit measures and therefore the saving targets for energy and GHG emissions are identified. These challenges are the foundation for the actual work of this thesis. The goal is to fill in the knowledge gap that became obvious during the literature review. Therefore, the identified challenges had been re-formulated as research questions. Subsequently, qualitative interviews with experts were identified as potential mean of answering these research questions. These experts – majorly representatives of the different energy consultancy agencies of the federal states of Austria - are assumed reliable sources to provide answers to the research questions due to their knowledge and sufficient insight into the issues connected with energy. Altogether, Interviews with six representatives of energy consulting agencies out of the nine federal states could be obtained.

In order to conduct the interviews, the research questions had to be transformed into interview questions. The developed questionnaire was sent to the representatives of the energy consulting agencies in advance and was used as guideline during the interviews. The interviews were held via video conferencing tools and lasted between one hour and two and a half hours. To exploit the interviews according to the research questions, some transcription and analysis efforts were required.

The answers of the different experts on the questions were then compared with each other as well as contrasted with the literature findings. These efforts helped to achieve answers to the research questions. Moreover, the results of the described endeavor allow for considerations pertaining to future improvements and changes in the field of energy consulting. The major goal of this work is to summarize the current opinions, filter them and determine, what kind of adjustments would be useful and which

improvements could be made in order to improve the quality of energy consulting services and hence increase the quality and the rate of thermal retrofit in Austria.

1.2 Motivation

Climate change is an issue that should concern everyone, due to the immanent effects that will affect humanity and society. The consequences of climate change are perceptible already and, in order to prevent larger damage, slow down the process, and mitigate its effects, the fight against climate change has to be taken as top priority. Therefore, most of the World's countries have committed to ambitious goals regarding the reduction of GHG emissions and signed multilateral treaties that formulate the global objectives, for example the United Nations Framework Convention on Climate Change from 1992, the Kyoto protocol from 1997 and the Paris Agreement from 2015 (UNFCCC n. d.).

The building sector is supposed to bare a high potential for reducing GHG emissions by reducing energy consumption through thermal retrofit and tight building standards, increasing energy efficiency, and implementing sustainable energy sources. According to the European Commission (2021b) the building sector is of crucial importance in achieving these goals. Moreover, energy efficient buildings regularly are considered to be beneficial to the economy and the society and offer a high degree of occupant comfort (ibid.).

Buildings are the single largest energy consumer in Europe and responsible for approximately 40% of the energy consumption and 36% of the GHG emissions in the EU. Almost 75% of the building stock in the EU is considered as energy inefficient. However, only about 1% of the building stock is renovated each year. Renovation of existing buildings could reduce the EU's total energy consumption by 5-6% and lower CO_2 emissions by about 5% (ibid.).

A study issued by the Prognos AG in 2013 that aimed at quantifying the growth effects triggered by the government-funded energy-efficient construction and modernization programs, came to a convenient conclusion: *"For the long-term trend in energy consumption and CO_2 emissions in the housing stock, the modernization rates, modernization efficiency, the efficiency of heating systems and the energy carriers used for heat generation are of key importance" (Prognos AG 2013: p. 12).*

In order to achieve these targets, it is crucial that people understand the reasons and the necessity of implementing energy saving and energy efficiency measures so that they approve of them and finally put measures into action. As such, energy consulting is an important political instrument that is supposed to help disseminate complex knowledge about the matter to the public and thereby to help reducing impediments for reaching the targets.

The topic discussed in this master thesis has been chosen due to the personal experience of the authors in the field of energy consulting. In addition to my university education and, with regard to a professional career in the field of sustainable design, thermal retrofit or building physics, I completed the training program to become a certified energy consultant according to the ARGE EBA (Arbeitsgemeinschaft Energieberater Ausbildung) guidelines in 2010. The practical training in the field of consulting was one of the reasons why I pursued this program. I wanted to acquire additional skills. However, during the education, especially during the practical lessons, which consisted of consulting sessions with clients, I started questioning the methods as well as the sufficiency of the quality and scope of the training program in view of its ability to meet the expectations the clients may have towards energy consulting.

In my opinion, improving the quality of energy consulting services could help to increase the rate and quality of thermal retrofit and encourage the general public for implementation of energy saving and efficiency measures.

1.3 Background

Climate change and its effects are undoubtedly the largest issues that need be dealt with in the 21st century. Increasing the rate of thermal retrofit of buildings is crucial next to energy efficiency measures and implementing sustainable energy sources to lower the total energy consumption as well as GHG emissions of buildings. Energy consulting is supposed to be an effective tool that contributes to these goals.

In this chapter the foundations, the origins, and the development of energy consulting as well as the current state are documented to provide an overview of the energy consulting scene in Austria.

1.3.1 Overview

Energy consulting covers a wide range of tasks and topics. To provide a comprehensive overview of energy consulting, it is necessary to outline several subject matters, that form the basis of action for energy consulting services.

First the political goals and requirements as well as the legal foundations are outlined. Hereby an overview about the GHG emissions of the Austrian building sector up to the year 2017 is provided. After that the EU legislatives and their implementation in the Austrian legislation are described.

Energy consulting for buildings deals with topics such as thermal retrofit, energy efficient heating and warm water systems, ecological building materials and subsidies for implementing energy efficiency measures and thermal retrofit. Energy consulting and subsidies go hand in hand, therefore a short outline of the subsidies, which are provided by the federal government and the federal state governments, is presented.

In the following the development and the perception of energy consulting are described and the existing energy consulting services in Austria are examined. It is shown, which kind of consulting services are available in Austria and for which target groups they are intended. The thesis focuses on energy consulting services for buildings, especially for private households, such as single-family homes and apartment buildings. These services are therefore considered in detail. The competence for private households lies with the energy consulting agencies of the federal states. The organization and tasks of the different agencies are also described.

Another important matter is the education of energy consultants. The framework conditions of the education program in Austria are determined by the ARGE EBA. The

education program as well as the organization and duties of ARGE EBA are illustrated.

Finally, the challenges and impediments energy consulting services are confronted with are described. These challenges and impediments affect many areas energy consulting deals with. For example, the current subsidy regulations and the restrictions in the condominium law and the tenancy law, which are hurdles for implementing thermal retrofit measures. Then there are challenges regarding the qualification of the energy consultants, their job description and their entitlement. Therefore, the different views in literature are described, whether the qualifications need to be raised or not or if the implementation of protected profession would be useful in order to increase the reputation of energy consultants. Another crucial issue is the independency of energy consulting. Is company-independent consulting essential or is it an obstacle for energy consulting services? Also, the role of energy consulting in the whole renovation process is outlined and the views in literature are presented. Is support by an energy consultant along the whole customer chain useful or not?

Based on these challenges the research questions should be determined in the further process of the work to help defining the interview topics, that should be discussed with stakeholders in the field of energy consulting. The goal is to fill the knowledge gap after the literature review in order to be able to determine possible ways of improvement as a conclusion.

1.3.2 Greenhouse Gas Emissions in the Austrian Building Sector

In the progress report according to § 6 Klimaschutzgesetz KSG 2011, issued in 2019 by the Federal Ministry of Sustainability and Tourism (BMNT 2019), the status of GHG emissions in 2017 is presented for the different sectors, that are defined by the KSG. This chapter focuses on the GHG emissions of the building sector. Figure 1 shows that besides the transportation sector, which is responsible for the majority of GHG emissions in Austria, the building sector accounted for 16,1 % of the emissions in 2017. Emissions that are subject to the Emission Trading System of the EU(EU ETS) are not included in this figure. The EU ETS limits emissions from heavy energy-using industries, such as power stations, industrial plants and airlines in the EU member states, Iceland, Liechtenstein and Norway. Around 40% of the EU's GHG emissions are covered by the EU ETS. Sectors outside the scope of the EU ETS, which account for almost 60 % of the total emissions, are transport, buildings, agriculture, non-ETS industry and waste (European Commission, Accessed 05.02.2021).

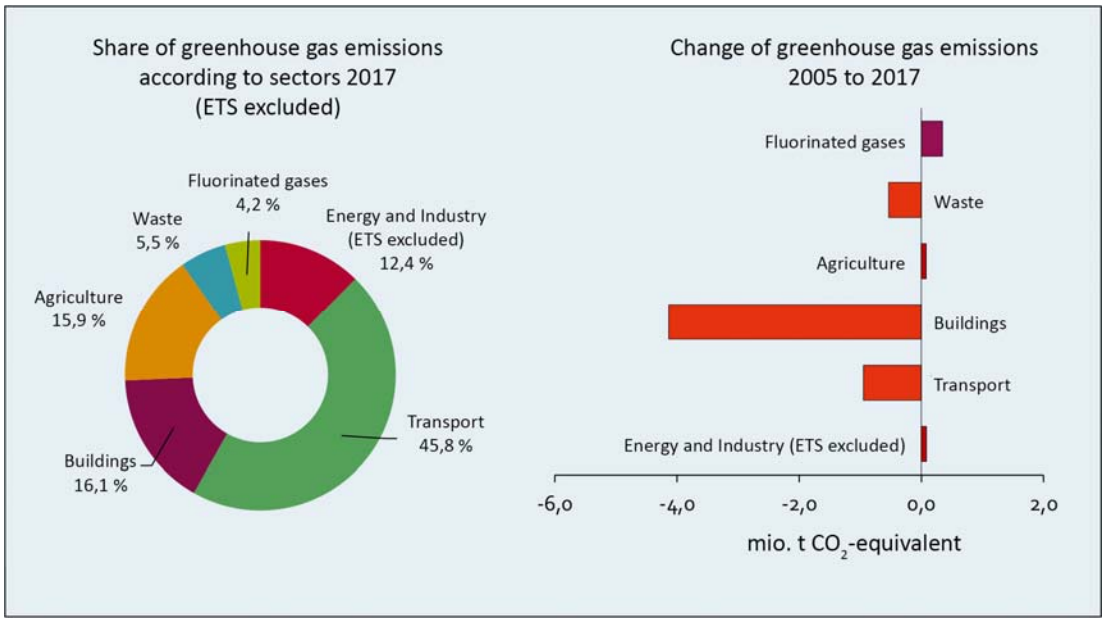

Figure 1: Greenhouse gas emissions according to sectors in 2017 and change of emissions between 2005 and 2017, (source: BMNT 2019: 16).

Figure 1 also shows that the greatest reductions of emissions have been achieved in the building sector between 2005 and 2017.

The main emitters of GHG in the building sector, as shown in figure 2, are private households. In 2017 private households accounted for about 86 % of the emissions, public and private services such as public and office buildings, hospitals and hotels on the other hand emitted 14 %. According to Brauner (2014) private households bear a significant potential for energy savings in the building sector.

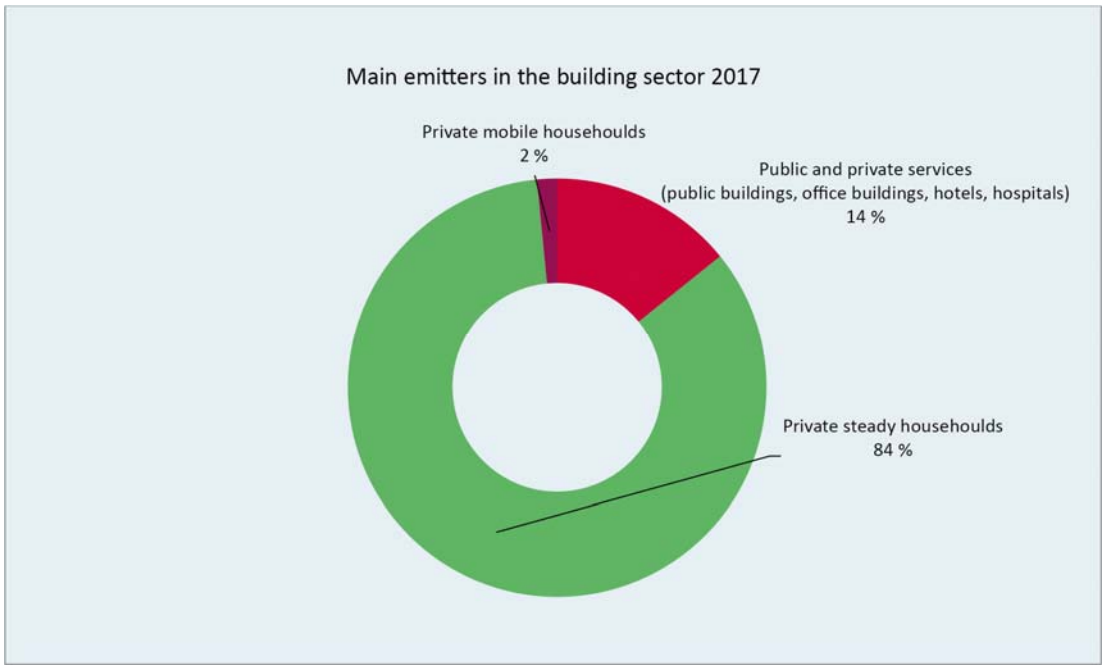

Figure 2: Main emitters in the building sector 2017 (source: BMNT 2019: 33).

While GHG emissions decreased by 3% between 1990 and 2005, they decreased by 33% between 2005 and 2017. GHG emissions in the building sector decreased predominantly between 2004 and 2012 (BMNT 2019: 31). Figure 3 illustrates the GHG emissions between 2005 and 2017 and also shows, that since 2014 emissions are increasing again.

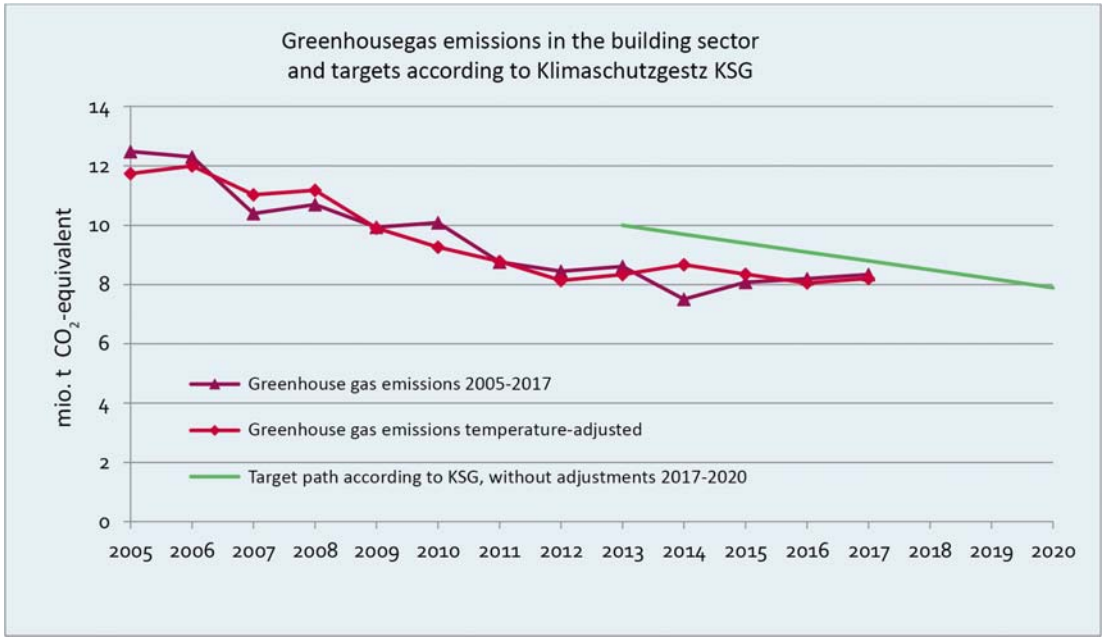

Figure 3: GHG-emissions 2005-2017 and target path according to KSG (source: BMNT 2019: 32).

Several circumstances are responsible for the increase of GHG emissions. In figure 4, these factors are shown. One cause is weather conditions such as colder winters with a higher number of heating degree days and therefore an increased use of fossil fuels. Another cause is the growth of the population, which has a direct impact on the demand for hot water and, due to the parallel increase in the number of primary residences, also on the heated floor space in private households. Further is the trend toward single-person households and the thereby decreasing number of occupants as well as the increased housing space per primary residence responsible for increasing energy demand (ibid.: 33–35).

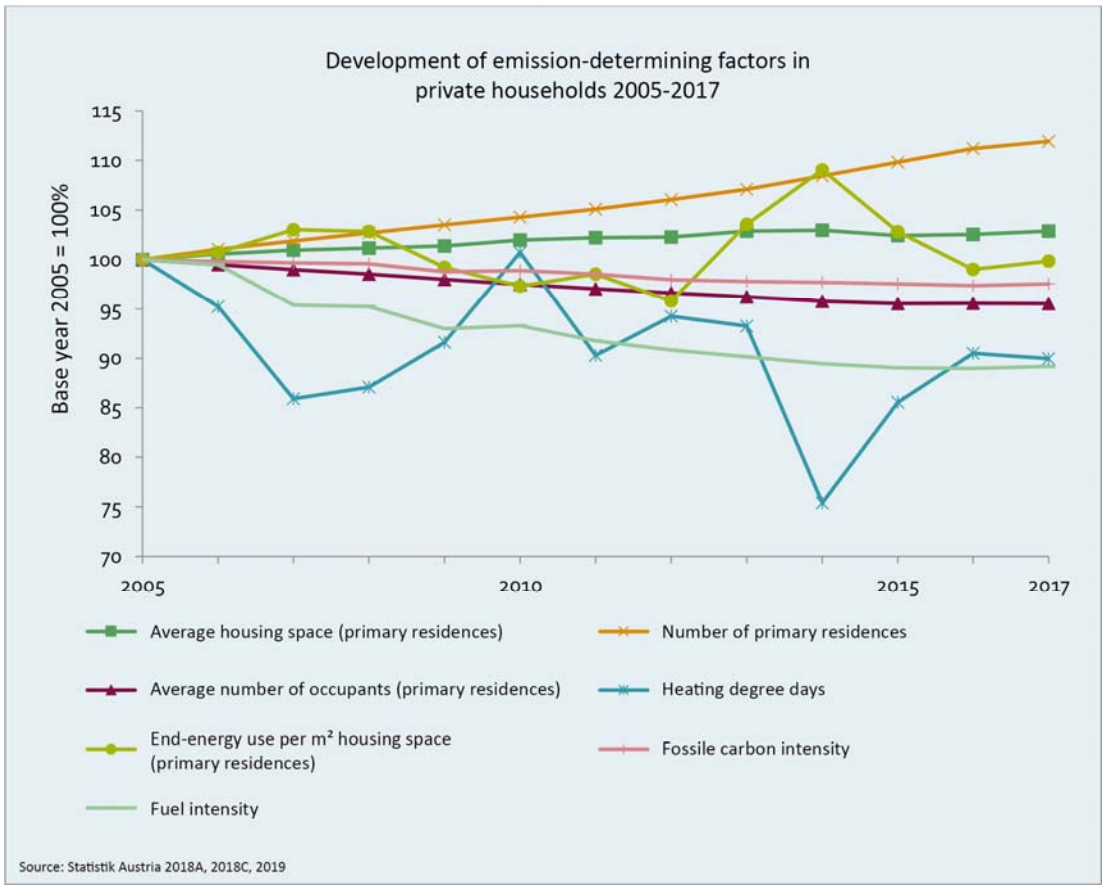

Figure 4: Development of emission-determining factors in private households 2005-2017 (source: BMNT 2019: 34).

The significant price increase for heating oil from 2010 to 2012 was a strong impulse for the thermal retrofit of buildings and the implementation of sustainable energy sources in private households. Due to the decreasing prices for heating oil, gas and electricity since 2012, this impulse diminished (ibid.: 35).

1.3.3 Political and Legal Foundations for Energy Consulting

In the following the political targets and legal foundations on international and national level, on which energy consulting is based, are documented to illustrate the scope of responsibilities and duties of this political instrument. Energy contributes in various areas to the implementation of the ambitious global and EU-wide climate targets.

European Targets

The goal of the EU is to be climate-neutral by 2050. An economy with zero net GHG emissions. This objective is the heart of the European Green Deal and corresponds with the EU's commitment to global climate action under the Paris Agreement (European Commission 2021d).

European Legislation

To implement these goals, the EU has established a legislative framework including the Energy Performance of Buildings Directive (2010/31/EU - EPBD), established in 2010, and the Energy Efficiency Directive (2012/27/EU - EED), established in 2012. These Directives were amended in 2018 and together they promote policies, that *"will help achieve a highly energy efficient and decarbonized building stock by 2050, create a stable environment for investment decisions and, enable consumers and businesses to make more informed choices to save energy and money*" (European Commission 2021b). In the following these two Directives are briefly outlined.

Energy Performance of Buildings Directive (EPBD)

The EPBD covers a wide range of policies and measures to support national EU governments to push energy performance of buildings and improve the existing building stock. The amended EPBD determines the following (ibid.):

- EU countries must establish long-term renovation strategies, aiming at decarbonizing the national building stocks by 2050.
- EU countries must set cost-optimal minimum energy performance requirements for new buildings, for existing buildings undergoing major renovation, and for the replacement or retrofit of building elements such as heating and cooling systems, roofs and walls.
- All new buildings must be nearly zero-energy buildings (NZEB) from 31st of December 2020. All new public buildings already need to be NZEB since 31st of December 2018.

- Energy performance certificates must be issued when a building is sold or rented, and inspection schemes for heating and air conditioning systems must be established.
- Electro-mobility is supported by introducing minimum requirements for car parks over a certain size and other minimum infrastructure for smaller buildings.
- An optional European scheme for rating the 'smart readiness' of buildings is introduced.
- Smart technologies are promoted, including through requirements on the installation of building automation and control systems, and on devices that regulate temperature at room level.
- Health and well-being of building users is addressed, for instance through the consideration of air quality and ventilation.
- EU countries must draw up lists of national financial measures to improve the energy efficiency of buildings.

Energy Efficiency Directive (EED)

The EED initially set binding measures to help the EU reach its 20% energy efficiency target by 2020. Thereby all EU countries are required to use energy more efficiently at all stages of the energy chain, including energy generation, transmission, distribution, and end-use consumption. Several important measures have been adopted throughout the EU to improve energy efficiency in Europe, including the following (European Commission 2020):

- Policy measures to achieve energy savings equivalent to annual reduction of 1.5% in national energy sales.
- Energy efficient renovations to at least 3% per year of buildings owned and occupied by central governments in each EU country.
- National long-term renovation strategies for the building stock in each EU country.
- Mandatory energy efficiency certificates for the sale and rental of buildings.
- Preparation of national energy efficiency action plans (NEEAPs) every three years.
- Minimum energy efficiency standards and labelling for a variety of products such as boilers, household appliances, lighting, and televisions (energy labels)
- Implementation of nearly smart meters for electricity and gas by 2020.

- Obligation schemes for energy companies to achieve yearly energy savings of 1.5% of annual sales to final consumers.
- Large companies conducting energy audits at least every four years.
- Protecting the rights of consumers to receive easy and free access to data on real-time and historical energy consumption.

As part of the 'Clean energy for all Europeans package', the new amended EED was agreed in 2018 to update the existing policy framework to 2030 and beyond (ibid.). The EU is pursuing the following three key targets until 2030 (European Commission 2021c):

- Reduce greenhouse gas emissions by at least 40% (compared to the level of 1990).
- Increase the share of renewable energy sources to 32%.
- Increase energy efficiency by at least 32,5 %.

In September 2020, the European Commission has already proposed though, as part of the European Green Deal, to raise the 2030 greenhouse gas emission reduction target, including emissions and removals, to at least 55% compared to 1990 (ibid.).

Renovation rate

While the EPBD sets minimum energy performance requirements for all buildings that undergo major renovation, the EED sets a binding renovation target for public buildings by stipulating, that all Member states of the EU shall ensure, that 3% of the total floor area of heated and/or cooled buildings owned and occupied by its central government are renovated each year to meet at least the minimum energy performance requirements (European Commission 2021e).

As mentioned earlier, the renovation rate of the building stock is about 1% per year (European Commission 2021b). The European Commission presented in October 2020 its renovation wave strategy, which claims: *“Its objective is to at least double the annual energy renovation rate of buildings by 2030 and to foster deep renovation (ibid.).”*

Implementation of EU Legislation in Austria

To fulfill the goal of to a climate-neutral society by the year 2050 the *"EU Member States are required to develop national long-term strategies on how they plan to achieve the greenhouse gas emissions reductions needed to meet their commitments under the Paris Agreement and EU objectives."* (ibid)

The Austrian government has put the EPBD and the EED into action in Austrian legislation. Among other national laws, the energy saving and heat insulation of the Austrian Institute of Construction Engineering, especially the OIB Guidelines 6, as well as the Bundes-Energieeffizienzgesetz – EeffG 2014 account as the main legal foundations for the field of energy consulting.

OIB Guideline 6

The EPBD is implemented in the different building regulations of the federal states of Austria and the OIB Guidelines harmonize these building regulations across the Austrian federal states (Trebut et al., 2013: 16). The OIB Guideline 6 thereby implements the requirements of the EPBD and defines, among other things, the maximum allowed heating demand in new buildings and in buildings that undergo major renovation, as well as requirements for building technology systems such as heating, warm water and so on. It also regulates the design of energy certificates.

Major renovation is defined in the OIB Guideline 6 as a renovation, in which more than 25% of the surface area of the building envelope undergoes renovation, unless the total cost of renovation of the building envelope and building mechanical systems is less than 25% of the value of the building, not including the value of the land on which the building was constructed (Österreichisches Institut für Bautechnik 2019: 7).

In its long term renovation strategy, issued in April 2020, the OIB states, that in order to support the mobilization of investments in renovation needed to achieve the EPBD objectives, the Member States *"shall facilitate access to appropriate mechanisms to establish accessible and transparent advisory tools, such as one-stop shops for consumers and energy advisory services, on relevant renovations to improve energy efficiency and financial instruments*" (Austrian Institute of Construction Engineering 2020: 8).

Bundes-Energieeffizienzgesetz (EEffG)

The EED is implemented in Austria by the EEffG. Besides other obligations, the requirements of Article 8 EED dealing with energy audits and management systems, have been implemented by the Federal Energy Efficiency Act. Article 8 EED stipulates, that *"Member States shall promote the availability to all final customers of*

high-quality energy audits which are cost-effective and carried out in an independent manner by qualified and/or accredited experts according to qualification criteria; or implemented and supervised by independent authorities under national legislation." Further the requirement for large companies to conduct recurrent external energy audits or the introduction of an energy or environmental management system is prescribed.

1.3.4 Subsidies

During energy consulting session for private households, subsidies and financial aids for thermal retrofit and energy efficiency measures are frequently discussed. In Austria there are several subsidies by the federal government and the nine federal state governments available, which can be claimed. Often subsidies can be combined and so a higher total amount of funding can be obtained. In this chapter a brief overview about the funding system in Austria is provided and the currently most important subsidies are presented.

Subsidies of the Federal Government

In 2009 the Austrian government launched the so-called “Refurbishment Offensive” (in German: Sanierungsoffensive), which has become a successful incentive to reduce energy consumption by the retrofit of buildings. The subsidy is given in the form of one-off, non-repayable grants (Austrian Institute of Construction Engineering 2020: 27). In the following the most important subsidies of the federal government are presented in detail.

Raus aus Öl und Gas (Phase out Oil and Gas)

The subsidy “raus aus Öl und Gas” promotes the replacement of fossil-fuel heating systems with climate-friendly technology in private residential buildings and amounts up to 5.000 Euro for single-family-homes or two-family-homes and up to 1.000 Euro per apartment in multistory housing. A maximum of 30% of the eligible costs can be subsidized. In order to make switching to a climate-friendly heating system even easier, in 2019 the subsidy supported the replacement of heating systems, whether thermal retrofit measures have been set at the same time or not. In this case, it was mandatory to submit a valid energy certificate for the residential building or an energy consultation report from the energy consulting agency of the federal state. The subsidy amounts stayed the same (ibid.: 28).

The funding applicant has to register the change of the heating system online and has to implement the measures within 20 weeks. The funding application can only be submitted after the heating system has been completely installed (Kommunalkredit Public Consulting GmbH 2020a).

Sanierungsscheck (Renovation Cheque)

The Sanierungsscheck is available for single-family-homes or two-family-homes as well as for apartment buildings. Thermal retrofit of private residential buildings that are

older than 20 years are supported with this subsidy (Kommunalkredit Public Consulting GmbH 2020b).

For single-family-homes or two-family-homes comprehensive renovations according to the klimaaktiv standard or good standard as well as partial renovations that lead to a reduction in heating demand of at least 40% are eligible for funding.

To fulfill the klimaaktiv standard, a reduction in heating demand to a maximum of 50 kWh/m²a at an A/V-ratio of less than or equal to 0.8 or to a maximum of 30 kWh/m²a at an A/V-ratio greater than or equal to 0.2 needs to be reached. To reach a good standard the heating demand needs to be reduced to a maximum of 63 kWh/m²a at an A/V-ratio of less than or equal 0.8 or to a maximum of 31.5 kWh/m²a at an A/V-ratio of 0.2 (Kommunalkredit Public Consulting GmbH 2020d).

The A/V-ratio is an indicator for the compactness of the building volume and is also known as the shape factor. It describes the ratio between the outside surface area of the thermal insulation of the building envelope and the heated volume (Lylykangas 2009).

The subsidy amounts to 4.000 to 6.000 Euro, depending on the type of renovation. If insulating materials are used, that are made from renewable raw materials, a bonus of up to 3.000 Euros can also be granted. A maximum of 30% of the eligible costs can be funded (Kommunalkredit Public Consulting GmbH 2020c).

Apartment buildings have to fulfill the requirements of the klimaaktiv standard. The subsidy amounts to 3.000 Euro per apartment for thermal measures. If the heating system is also changed another 1.000 Euro can be claimed and for renewable insulation materials another 1.000 Euro (Kommunalkredit Public Consulting GmbH 2020b).

Subsidies of the Federal State Governments

Since the 1990s, housing subsidies have played a key role in the implementation of climate targets in housing construction. Similar to building law, it is the responsibility of the federal states (Trebut et al., 2013: 16).

Due to the numerous subsidies available in the federal states, it is not possible and also not necessary to present the subsidies in depth within the scope of this thesis. The focus of this chapter is more on the funding modalities in order to create an understanding of the intentions, the advantages and disadvantages as well as the challenges and impediments, that are connected to the subsidies. Therefore, a short summery of the available subsidy models of the federal states is given.

The federal states in general have several different kinds of subsidies such as non-repayable grants, annuity subsidies and loans. However, many building owners do not want to take a loan for a renovation. To take this into account, several federal states also offer non-repayable grants with a lower cash value. The funding conditions and the values of the subsidies vary considerably among the federal states (ibid.: 36).

The subsidies distinguish between individual building component renovations including the replacement of building services equipment, comprehensive thermal renovations, "delta subsidies" and measures related to the disabled or senior citizens (ibid.: 34).

An important factor for increasing the annual renovation rate is the possibility to combine the renovation subsidies of the federal states within the framework of housing subsidies with the subsidies of the federal government (ibid.: 37). According to Trebut et al. (2013) the subsidies of the federal government offer significantly lower funding cash values than the models of the housing subsidies of the federal state governments, but have a great potential for mobilizing people, because they are designed very low-threshold and they are communicated much more widely due to their nationwide use. The cash value of the federal government subsidies on its own is generally too low to trigger renovation but in combination with the housing subsidies of the federal government it is practical (ibid.: 42).

1.3.5 Definition of Energy Consulting

Energy consulting is defined in different ways depending on the target group, for example enterprises, municipalities and private households.

Energy consulting is defined in the EEffG as communicating sufficient information about a consumer's existing energy use profile to identify and quantify opportunities for cost-effective energy savings.

The EED defines an energy audit as *"(…) a systematic procedure to obtain adequate knowledge of the existing energy consumption profile of a building or group of buildings, of an industrial operation and/or installation or of a private or public service, identify and quantify cost-effective energy savings opportunities, and report the findings."*

According to Haas et al. (2016) the definition in the EEffG can be narrowed down to cost-effective energy savings, though it does not take into account the necessity of energy consulting as supporting tool for a social development towards efficiency in energy use.

Energy Consulting for Enterprises

Large enterprises in Austria, according to § 9 EEffG, are obliged to regularly, at least every four years, conduct an energy audit based on the quality criteria described in § 17, § 18 and Annex III EEffG. Small and medium-sized enterprises are not obligated rather than encouraged to make use of energy consulting as far as possible. The achievements and effects of the energy audits are constantly evaluated on national basis and reported to the European Commission.

Energy Consulting for Private Households

The definition of energy consulting according to the EEffG is more indefinite than the definition of an energy audit for large enterprises. Kofler (1992: 5) states, that on client side the term energy consulting is associated with a wide range of expectations regarding the consulting topics.

Heidemeyer and Schumann (1989) define the following tasks for energy consulting:

- Raising awareness among the people for the need of energy savings by helping to change people's attitudes towards the matter.
- Enhancing the level of knowledge and competence regarding energy saving by providing sufficient information.
- Encourage the implementation of energy saving measures.

In their report “Handbuch für Energieberatung” (Guideline for energy consulting), Haas et al. (2016) define energy consulting as advising a client on energy-related topics such as building envelope, heating system, energy generation systems and technical devices. Thereby buildings and systems are analyzed and advice is given during the consultation on measures that can be implemented to reduce energy use, renewable energies or criteria, on which new acquisitions make sense. The goal is to work out energy-optimized solutions with economically reasonable investment costs depending on the consulting clients’ individual situation to provide a profound base for investment decisions.

Energy consulting should help creating awareness about energy efficiency measures amongst the people and encourage the thermal retrofitting of buildings (Feser et al., 2015).

Comparing these definitions, it can be observed, that the common ground is imparting knowledge about energy related topics, raising awareness about the necessity of implementing feasible energy saving and energy efficiency measures as well as providing specific information and solutions tailored to the needs of the consulting clients.

Qualification Requirements for Energy Consulting

The following characteristics are crucial to provide effective energy consulting (Wernhart 2013: 23):

The consulting competence of the energy consultant is the most important requirement for successful energy consulting.

An individual approach to the consulting situation is expected from an energy consultant in order to provide clients with specified information that cannot be obtained through other channels. The information should be presented understandable and customer-oriented.

An energy consultant should have very good technical knowledge and experience, should be informed about the latest technologies, should be able to determine various technical solutions and to see the consulting topic holistically.

A good energy consultant should also be able to refer to other experts.

It is also expected that energy consultants act independently of companies, are able to respond to the individual situation, use measuring instruments and are able to calculate energy savings.

According to Haas et al. (2016: 17) the purpose of counseling is not to determine what the right decision for client is. Clients have to choose independently from the various possibilities presented by the consultant. Counseling serves to generate solutions to a certain problem. The problem itself and its solution though belong to the client. Further it is also not the task of the counselor to motivate, because counseling can only tie in with existing needs of the client. Counseling though can determine existing problems and possible solutions, bring in new information and open up other perspectives.

1.3.6 Energy Consulting in Austria

Public administrations call for energy consulting as proper means for reducing energy consumption and climate protection, thus it is in the public interest to offer energy advice, that is also cost-effective. Most energy consulting services for households and businesses are therefore subsidized or even offered free of charge. The subsidy for energy consulting is usually tied to certain requirements, the consultation has to fulfill (e.g.: training of the consultant, protocols, duration of the consultation) (Wernhart 2013: 11).

Building-related energy consulting in Austria is organized at the level of the federal states through energy commissioners and the energy agencies of the federal states. On behalf of the federal states, these agencies provide energy advice to the public. The federal states contribute to the financing of the consulting services, so that the service is partly or entirely free of charge for the clients (Trebut et al., 2013: 43).

Types of Energy Consulting Services

The energy consulting agencies provide several forms of consulting services for private people, municipalities and businesses. Haas et al. (2016) and Trebut et al. (2013) have described the consulting services in detail and in the following these different types of services, which are offered by all energy agencies in Austria in more or less the same way, are briefly outlined.

Consulting Hotline

Consulting via telephone or E-Mail is used in case of simple and standardized questions such as subsidies, as well as for preliminary clarifications within the frame of other services (e.g.: necessary documents).

Consulting Office

A consultation session in an office of an energy agency is often used when comprehensive advice is needed, however an inspection of the object is not necessary (e.g.: boiler replacement, photovoltaic systems, electrical appliances). Clients who want to build a new house are also able to discuss the plans with a consultant face to face.

Onsite consulting

The onsite consulting is essential in renovation projects. This consulting service is also the most comprehensive service, the energy consulting agencies have to offer. The focus is on the inspection and evaluation of the building as well as the questioning of the users. It is used whenever an extensive consultation about renovation

measures regarding the building construction and the building services is necessary. In general, recommendations are summarized in a protocol and handed to the client.

Fairs and Exhibitions

The energy consulting agencies use trade fairs or exhibitions mostly for promoting their services among the public either with advice on current issues and short consulting sessions, where clients are provided with a rough appraisal about their possibilities. But the main purpose is to promote the consulting services, raise awareness and provide orientation.

Energy Consulting Software

For the management, organization and quality assurance of consultations as well as for the administration and verification of energy certificates, various databases are used in the federal states (Trebut et al., 2013: 59).

EBS-Manager

The EBS Manager is an Internet database for the electronic administration of energy consultations and the associated energy data. It manages client data, the consultant network, consultation protocols, and costs. Clients can register online via the EBS Manager for consulting services, energy consultants can handle their consultations, the EBS Manager collects data and provides a knowledge database in order to offer comprehensive administration options for the energy consulting agencies. The development of the EBS Manager was initiated by the government of Salzburg in 2003. In the meantime, the platform is already in use in 6 Austrian federal states. The database is constantly being further developed in cooperation with the platform operators in the provinces of Carinthia, Tyrol, Styria, Vorarlberg and Salzburg (ibid.).

ZEUS

The “Zentrale Energieausweis Umgebung Steiermark” (ZEUS) is a web-based database application that enables the central collection and management of energy performance certificates. The ZEUS database is used for the administration of energy performance certificates in the sense of the legal regulations, which were issued in the course of the implementation of the EU Building Directive. The platform was originally developed by the province of Salzburg and has since been developed in cooperation with the platform operators in Styria, Carinthia and Salzburg are constantly being further developed (ibid.).

Energy Consulting Software "Sanierungskonzept"

A new approach on conduct energy consulting is a software especially designed for the use in consultations for renovation projects.

After years of preliminary work in several energy consulting agencies of the federal states, a project consortium was founded in the fall of 2019, which created the foundations for the software implementation of a renovation concept (Sanierungskonzept). The goal is to receive market-ready programs for energy consulting offices and energy performance certificate calculators in Austria.

The cooperation is between the federal energy consulting agencies, the Office for Efficiency by Gerhard Moritz, the Federal Ministry for Climate Protection and the software companies, that provide energy certificate calculation software. Since March 2021, the software solutions are in testing.

Determining recommendations on renovation measures as part of a comprehensive concept is necessary in order to comply with the requirements for major renovations as stipulated in the current OIB Guideline 6 from April 2019. Therefore, the computer-aided tool shall make recommendations for a comprehensive renovation concept in the context of an on-site energy consultation. It should ensure a rapid and uniform consultation process, that generates comparable results based on the existing building, as well as the applicable standards and guidelines (Moritz 2021).

The State of Energy Consulting Agencies and Services in Austria

In this chapter the energy consulting services that are currently offered in Austria are shortly presented. The goal is to provide a sufficient overview about the organization of the federal state consulting agencies and the offered consulting services. In table 1 the consulting agencies, that operate on behalf of the federal states are listed. The Information presented in this chapter and the following sub-chapters is derived from the webpages of the institutions and the brochures that are available for download.

Table 1 Energy Consulting Agencies in Austria – Accessed on 21st of March.2021

Federal State	Consulting Agency	URL
Burgenland	Amt der Burgenländischen Landesregierung	www.burgenland.at/themen/energie/energie-beratung/allgemeines/
Carinthia	Netzwerk Energieberatung Kärnten	www.neteb-kärnten.at
Lower Austria	Energieberatung Niederösterreich	www.energieberatung-noe.at
Salzburg	Energieberatung Salzburg	www.salzburg.gv.at/themen/energie/energieberatung
Styria	Netzwerk Energieberatung Steiermark	www.net-eb.at
Upper Austria	OÖ. Energiesparverband	www.energiesparverband.at
Tyrol	Energie Tirol	www.energie-tirol.at
Vienna	Hauskunft	www.hauskunft-wien.at
Vorarlberg	Energieinstitut Vorarlberg	www.energieinstitut.at

This thesis deals with energy consulting services about renovation of residential buildings. All energy consulting agencies, that are described in the following provide consultation services for private households, municipalities and businesses, though only the consulting offers for renovation are described.

Burgenland

The brochure of the housing subsidies department, published by the office of the federal state government of Burgenland, is as well used as source of information in this subchapter (Leeb et al., 2018).

Consulting Agency

Energy consulting in the federal state of Burgenland is offered by the housing subsidies department and is called 'Wohnbauberatung mit Energie'. People can register online or via phone for an energy consulting session. The housing subsidy department will choose the consultant according to the requested consulting topics and provide the client with the contact information.

Consulting Services

In seven community offices throughout the federal state of Burgenland, energy-related short consultations are offered at certain consultation days to inform citizens as unbureaucratically as possible and in a target-oriented manner about alternative energy systems, subsidies for alternative energy systems and technical advice.

Consultations are also carried out on site in case of renovation projects in order to be able to address the individual situation. The consultation is based on the requirements and wishes of the client and covers issues regarding thermal retrofit and building systems. It last about two hours and is free of charge. The consultant evaluates the condition of the building and the building technology. This assessment of the building is an important basis for the subsequent definition and planning of renovation measures tailored to the wishes of the occupants. With a computer program a renovation recommendation for the building envelope, also taking into account the cost-effectiveness of the planned measures is automatically calculated during the consulting session. Additionally, a comparison of several heating systems can be carried out according to the client's wishes, whereby the desired heating systems can also be combined with renewable energies and a ventilation system. The different heating systems are compared according to economic and ecological aspects. The cost comparison takes into account the total costs for the heating system over an average observation period of 20 years, consisting of the capital-related costs (initial investment) and the annual consumption-related costs (costs for energy sources, maintenance and repair). At the end of the consultation, the client receives a consultation protocol with a renovation recommendation, which can be supplemented by the consultant with additional comments and quality criteria. The consulting protocol can thus serve the client as an essential aid for obtaining quotations from companies.

Carinthia

The actual valid guideline for the renovation of private homes, other buildings and multi-story residential buildings, published by the office of the federal state government of Carinthia, is as well used as source of information in this subchapter (Amt der Kärntner Landesregierung, Abteilung 11 – Zukunftsentwicklung, Arbeitsmarkt und Wohnbau n. d.).

Consulting Agency

On the initiative of the energy officer of the federal state of Carinthia subsidized energy consulting for all people, who want to renovate their homes, are offered since 2009. The consultations provided by the province of Carinthia are carried out by qualified consultants of the Netzwerk Energieberatung Kärnten (netEB Carinthia).

At the time of application for the housing funding of the federal state, proof needs to be provided, that the obligatory on-site energy consultation was carried out in accordance with the guidelines of the netEB Carinthia. Therefore, the energy consulting protocol must be submitted electronically by the energy consultant.

Consulting Services

The netEB Carinthia provides an on-site energy check, which can be claimed once within 5 years per building and is free of charge. It is available for single-family homes and also apartment buildings. In the case of apartment buildings, the on-site energy check is carried out, if possible, in combination with a presentation in the course of a house meeting.

To register for an on-site energy check, clients contact the netEB Carinthia and then a suitable energy consultant in the area is assigned. The consultation lasts about two hours and provides clients with product-neutral information on thermal renovation of the building and the building services as well as subsidies with a special focus on the use of solar energy. The calculation of the Energy Certificate is offered as an additional service.

The federal state of Carinthia also funds a special program for supporting clients during a renovation project, called ‘Sanierungs-Coach’. This service includes the problem analysis regarding the building, support for funding applications and obtaining quotations from companies, advice on energy issues during the renovation and support in the control and billing of the construction work. This kind of consulting service has to be conducted by an authorized contractor. Planning services as well as supervision on the construction site and coordination of the disciplines are not included in the service.

Lower Austria

Consulting Agency

The Energie- und Umweltagentur Niederösterreich (eNu) is the energy and environmental agency of the federal state of Lower Austria. At six locations in all areas of the federal state the team of eNu is raising awareness for a prudent use of resources, conscious consumption and a sustainable lifestyle. The offered consulting services are aimed at citizens, municipalities and businesses.

The initiative Energieberatung Niederösterreich that is provided by the eNu is responsible for energy consulting in Lower Austria.

Consulting Services

The energy consultants from Energieberatung Niederösterreich provide company- and product-neutral advice and consult on topics such as new construction, energy efficiency, renovation and modernization, heating and building services and saving energy and electricity.

For answering quick questions, consulting via phone is offered. This service is free of charge.

An energy consultation lasts about two hours and takes place either free of charge in the office of the energy consultants in case of a new construction consultation. In case of a consultation regarding the renovation of an existing building or the check of a heating system, the consultation takes place at the home of the client. A travel fee of 40 Euro has to be paid. Clients can register for a consulting session by phone or online.

A collection of comprehensive brochures, folders and other information material about several topics related to the consulting topics can be obtained from the homepage of Energieberatung Niederösterreich. Personal advice is also provided at events and trade fairs.

Salzburg

Consulting Agency

In the federal state of Salzburg energy consulting is provided by the Energieberatung Salzburg and is a cooperation between the federal state government of Salzburg and the energy supplier Salzburg AG, which exists since 2004.

The given advice is independent, product-neutral and free of charge. A network of around 40 specially trained consultants ensures optimal support for the clients. The focus of the consultation is adapted to the individual wishes and questions of the client and covers all essential areas in new construction or renovation issues. The goal of Energieberatung Salzburg is to provide independent assistance in achieving sustainably lower energy costs through the best possible energy savings and efficient use of renewable energy sources.

Consulting Services

Consultation for new buildings and for concrete questions concerning renovation such as quotations or plans, take place in one of the regional consulting offices in the federal state with an energy consultant of Energieberatung Salzburg. The registration for a consultation can be made by phone or online.

Energieberatung Salzburg offers one-site energy consulting for renovation projects with a duration of about two hours. In case of comprehensive renovations in multi-story residential buildings, Energieberatung Salzburg offers a special program with at least two on-site appointments to support decision makers of owners' associations, property managers as well as private persons in the implementation of energy-saving and sustainable measures. In addition to the initial consultation, follow-up meetings are held to support the opinion-forming processes of homeowners and tenants or coordination with the property management.

Energieberatung Salzburg also offers its expertise in the form of lectures and trade fair appearances throughout the province of Salzburg.

Styria

Consulting Agency

In order to support people in Styria in the search for competent and independent energy advice, the network Energieberatung Steiermark (netEB Styria) was founded in 2010 by the Energie Agentur Steiermark (back then LandesEnergieVerein Steiermark). For a common stronger appearance, the netEB Styria was brought together with the “Ich tu's” initiative of the federal state of Styria for energy and climate protection with beginning of 2014 and since then, the Energie Agentur Steiermark has been organizing and managing the network on behalf of the federal state of Styria.

Consulting Services

Currently there are three different consulting services available that are funded by the federal state. Not all services are free of charge. The fee will be refunded though if measures are implemented within 12 months of the consultation.

Energy Advice is offered by phone, during an appointment at the energy consulting agency or at home and is about energy saving potentials in the household, energy cost reduction, renewable energy and climate protection. The advice by phone or in the agency is free of charge, for the on-site consultation a fee of 50 Euro is demanded.

The ‘Vor-Ort-Gebäudeckeck’ is intended for the renovation of single-family-homes or two-family-homes. The consultant inspects the building on site, draws up an individual renovation concept for the building and heating system, and advises customers individually on implementation and funding. The consulting fee amounts to 200 Euro.

The third consulting service is a comprehensive on-site consultation on energy efficiency and possible energy savings. It is designed especially for low-income households and is completely free of charge for the clients.

The calculation of the Energy Certificate is offered as an additional service.

On the Homepage of the netEB clients can register for one of the consulting services and also have access to a comprehensive collection of customer-friendly and easily understandable information brochures about the wide range of consulting topics.

Tyrol

Consulting Agency

Energie Tirol is a non-profit association and the independent advice center of the federal state of Tyrol. Private individuals, municipalities and companies can get information about energy issues from Energie Tirol. The headquarter in Innsbruck coordinates the energy consulting service throughout Tyrol and ensures that consulting offices are available in every region.

Consulting Services

There are three main consulting rails available in Tyrol.

The Mini-Consulting is a short consulting via phone or E-Mail to answer certain questions about certain topics such as subsidies or advantages and disadvantages of different heating systems and, it is free of charge.

The Midi-Consulting is a consultation that takes place in one of the energy consulting offices in Tyrol and lasts about 45 minutes. Clients can discuss their intended construction or renovation project with the energy consultant free of charge.

The Maxi-Consulting is the most comprehensive service offered by Energie Tirol, takes place on-site and lasts about two hours. It is supported by the federal state of Tyrol, although it is not free of charge. The fee is 120 Euro for buildings with a maximum of three living units.

The so-called ‘Doppelplus’ program is available for households with low income in order to help people to contribute to the energy and climate strategy of the federal state of Tyrol according to their possibilities and at the same time improve their financial situation and quality of life.

Energie Tirol also offers, as part of their initiative ‘TIROL 2050 energieautonom’, a consulting service especially tailored to the subsidy ‘raus aus Öl und Gas’.

Upper Austria

Consulting Agency

The Energiesparverband Oberösterreich, an institution of the federal government of Upper Austria, has been the central point of contact for product-independent energy information since 1991. It offers services for households, companies and municipalities in the field of energy efficiency, renewable energy and energy innovation.

Consulting Services

The Energiesparverband Oberösterreich offers a telephone hotline for short consultation and questions, that can be answered quickly.

Energy consulting for new homes is offered free of charge throughout Upper Austria in the consulting offices and lasts about one hour. Clients therefore have to make an appointment at the Energiesparverband Oberösterreich. A consultation is also possible without an appointment during the office hours of the headquarters in Linz.

Consultations on renovation or implementing a new heating system usually take place on-site, last about one hour and are also free of charge.

A consultation by the Energiesparverband Oberösterreich is necessary in order to apply for housing subsidies.

Further the Energiesparverband Oberösterreich is taking part in trade fairs and exhibitions and provides several brochures for different target groups such as private people, municipalities or businesses on its homepage, that cover a wide range of topics such as energy saving tips, technical information about insulation, heating systems, photovoltaics or subsidies.

The Energiesparverband Oberösterreich furthermore is hosting one of Europe's largest annual conferences covering energy efficiency and renewable energy called 'World Sustainable Energy Days', with over 600 delegates from over 50 countries.

Vienna

Consulting Agency

In October 2020 a new energy consulting agency in Vienna was founded, the so-called ‘Hauskunft’. It was established as a result of the ‘RenoBooster’ project, an EU-funded initiative to boost the renovation rate in Europe. Hauskunft operates in close cooperation with the City of Vienna and networks with the Viennese business community in order to motivate people to invest in maintaining the value of buildings. This service is specialized on consulting services for thermal retrofit of single-family-homes and apartment buildings and gives advice about legal, technical and organizational issues concerning maintenance, modernization and the thermal retrofit of buildings as well as accessibility, summer suitability and funding opportunities.

Consulting Services

As a contact point for renovations in Vienna, Hauskunft supports owners of apartments, apartment buildings and single-family-homes through all project phases of a renovation process, from the initial idea to the successful implementation of the measures.

Advice via telephone or a consulting session that is called ‘Zukunfts-Check’, which takes place in the office of Hauskunft are offered so far. The service is free of charge.

Vorarlberg

Consulting Agency

The Energy Institute Vorarlberg is a non-profit association supported by ten institutional members, first and foremost the state of Vorarlberg, illwerke vkw, Vorarlberg Netz and the Vorarlberg Raiffeisen banks. Founded in 1985 as an energy saving association, its main task today is to accompany committed individuals from all sectors on their way to energy autonomy.

Consulting Services

There are a lot of different consulting services available. On the energy telephone the consulting team answers questions free of charge. Then there are several different consulting services for different kinds of areas such as new buildings and renovation, heating and building systems or electrical energy savings. In the following the most important for renovation are described in detail.

For renovation there are several services available. The ‘Gebäude-Check’ is an on-site consultation of about two hours, where the thermal quality of the building envelope and the building services are evaluated. The client receives a protocol with results and recommended measures. The fee is 50 Euro.

The ‘Sanierungs-Vor-Ort-Beratung’ is a very comprehensive consulting service that answers detailed questions before starting a renovation project and aims at a sustainable renovation of the building over the next decades. This consulting service intends to recognize the full potential of a building, rethink living space and finding the most attractive of many possibilities. Best conditions for the start of concrete planning shall be created. The initial meeting, which defines the direction and scope of the consultation, is free of charge. After that, a maximum of 20 consulting hours for a fee of 600 Euro can be claimed.

The most comprehensive consulting service is the ‘Sanierungslotse’. First of all, there is a free initial consultation to determine the need for advice, then a concept, which forms the basis for the consulting contract, is drafted free of charge. All following services such as recommendation of measures, support with subsidies and support during the renovation project need to be paid by the client.

Another important service is the platform ‘Partnerbetrieb Traumhaus Althaus’, which is a quality network of planners and craftsmen who are supervised by the Energy Institute. There, clients can find qualified experts to carry out their construction or renovation project.

Quality Management

The energy consulting agencies in the federal states have implemented quality management systems and procedures to constantly evaluate the performance of the consultants and the effect of the consultation services. In the following the information that could be obtained from the homepages or from literature are shortly described.

In Styria for example all consultants who participate in the network undergo a predefined quality control. The netEB Styria evaluates all consultations on a regular basis and passes the feedback on to the consultants and therefore it forms the basis for further development of the consulting services and trainings. In this way, a high quality-standard of the services shall be achieved and maintained (Homepage of Netzwerk Energieberatung Steiermark, see table 1).

In Lower Austria the consultation protocols, which are filled out during an energy consulting session, must be transferred to the previously mentioned database, the EBS Manager. Furthermore, the consulting clients receive a feedback questionnaire to rate the consulting performance and the energy consultant. Additionally, telephone surveys are carried out with customers and the consulting protocols are checked on a random basis. If the consulting quality of a consultant does not meet the requirements, the contract can be terminated.

1.3.7 ARGE-EBA – Education Program for Energy Consultants

This chapter is about the energy consultant him- or herself. The profession should be outlined and it should also be elaborated, who even can become an energy consultant, which kind of education is needed and which education programs for energy consultants are available and how are they designed. Further the challenges that come with the profession are described.

In Austria the so-called Arbeitsgemeinschaft Energieberaterinnen-Ausbildung (ARGE-EBA), an association of all Austrian federal states or their energy agencies is responsible for the concept and design of the energy consulting education program in Austria since the early 1990s. In the following the tasks and goals of ARGE-EBA are described. The information is derived from two sources. On the one hand the internet-homepage of the ARGE-EBA (https://arge-eba.net, accessed on 22nd of March 2021) and on the other hand a report by Ulrike Wernhart from 2013, that deals with the topic (Wernhart 2013).

Profession Outline – Energy Consultant

First it is necessary to outline the profession of an energy consultant as well as the challenges connected to it.

Energy consultants are challenged on several levels. They are obliged to have technically sound and comprehensive knowledge, an overview of the entire energy sector in order to be able to capture the consulting topic in a larger and cross-linked context and, they should be able to conduct a consulting interview. Trained energy consultants should be able to identify energy saving potentials, which can be achieved by technical measures, user behavior or organizational measures. They also should be able to advise their clients, which measures are suitable for reducing energy costs, energy consumption and GHG emissions and provide an individual basis for investment decisions or behavioral changes in order to contribute not only to energy savings, the conservation of resources and economic advantages, as well as to an increase in comfort (https://arge-eba.net, accessed on 22nd of March 2021).

Actually, there is no protected professional title Energy Consultant in Austria, which is subject to generally accepted standards or rules. Therefore, in Austria everyone is allowed to call himself or herself an energy consultant and carry out energy consulting services in consideration of possible restrictions according to commercial law. The consequence of a professional title that is not regulated by law is furthermore, that the educational quality of a person cannot be represented. ARGE EBA therefore is

striving to eliminate this uncertainty by harmonizing the education and setting standards throughout Austria for the certification of energy consultants. The goal is to establish a well-known brand or certification that can keep up with a professional title (Wernhart 2013: 6).

Development and Objectives of ARGE-EBA

In the 1980s, the lack of training in the beginning of energy consulting services in Austria led to different interpretation of energy consulting and thus turned out not to be a credible and trustworthy service. Therefore, the early organizations of energy consulting services, first and foremost representatives of the energy associations of the federal states and energy supply companies founded the Arbeitsgemeinschaft Energieberaterinnen-Ausbildung (ARGE EBA). This group developed a framework for the training of energy consultants throughout Austria. Thereby also professional standards were established and the so-called Handbook for Energy Consultants, a professional guideline for energy consultants to work with, was published (ibid.: 5–6).

In 2011, the more or less loose working group was constituted as an association, as it has proven useful in many ways, to be able to act as an institution and thus better ensure the quality of the meanwhile significantly more extensive and complex training. Today, ARGE-EBA sees itself primarily as an organization that has set itself the goal of maintaining the training of energy consultants at a qualitatively high level and ensuring the further development of the training courses. In addition, new topics such as mobility consultations are to be integrated into the training program (https://arge-eba.net, 22.03.20210).

Free Trade and Regulated Trade

The Austrian Trade Law (Gewerbeordnung – GewO 1994) distinguishes between two different types of trades. One the one hand the free trade and on the other hand the regulated trade. For the registration of a free trade, no proof of professional knowledge is required. When registering for a regulated trade, a certificate of competence, that is required for this trade, must be provided. The trade regulations define the type and scope of the certificate of competence for each trade. Each trade is assigned a certain scope of activities, which distinguishes the activities from other trades and also from activities that may be carried out with a free trade.

In order to be able to carry out energy consulting on one's own account, a trade license is required. The trade authority must decide, which trades permit the activity

as an energy consultant. Certain trades are authorized to issue energy certificates. These trades are certainly eligible for the practice of energy consulting (ibid.: 8–11).

ARGE-EBA Education Program

Due to the objectives of the ARGE-EBA an education program was developed, which is understood as a practice-oriented additional qualification and which opens up a comprehensive insight into the subject area of energy efficiency in construction, renovation and building services. The acquired knowledge can be applied in many areas of the construction industry as well as the energy and real estate industry. ARGE-EBA therefore defines the professional standard for the training of energy consultants throughout Austria.

The program includes a beginner's course, the so-called A-Course and the advanced course, the so-called F-Course. These courses have been developed in the early 1990s and are still offered today. They form the basis of the training for energy consultant. Further education and training courses for special target groups, the so-called S-Courses have also been developed over time.

This standardized training makes it possible to maintain a high-quality standard of consulting and a high degree of awareness of the profession. Above all, it guarantees comparable results from the different consulting agencies. ARGE-EBA is also responsible for the commission examinations at the end of the courses and thus ensures the high quality of the training. By passing the final exam, the consultants have shown that their special knowledge and consulting skills distinguish them actively from others on the market (https://arge-eba.net, accessed on 22nd of March 2021).

A short outline of the course topics is given in the following sub-chapters according to a document by the energy consulting agency of Lower Austria, that summarizes the goals and contents of the education program (Energie- und Umweltagentur des Landes NÖ n. d.).

A-Course

The A-Course consists of 50 teaching units in total, that are conducted in 6 days and is meant an introduction to the field of climate, environment, technology and energy, as well as a continuing education for people, who already work in this fields. Technical fundamentals are taught with regard to construction technology, heating technology and renewable energy. Special emphasis is placed on understanding what has been learned and, being able to apply this knowledge cross-linked to various issues. This

course provides the basis to independently master consulting situations and tasks. Therefore, teaching units for communication training are offered. There are no technical prerequisites to participate in the A-Course. Participants should have a certain basic technical understanding. The Course is completed with a written exam and a certificate.

Course contents are for example:

- Energy use in households
- Greenhouse effect
- Definition of physical terms such as Energy, Power etc.
- Building envelope
- Comfort and indoor climate
- U-value calculation of building components
- Energy demand of buildings, Energy performance indicators
- Building materials, insulation materials, building constructions, windows
- Ecology of insulation materials
- Calculation of heating load, calculation method of heating demand
- Determination of energy savings through insulation measures
- Heating systems and efficiency of heating systems
- Water heating and hot water distribution
- Renewable energy
- Biomass
- Heat pumps
- Photovoltaics
- Household appliances, lighting
- User behavior, Rebound effect

F-Course

The F-Course consists of 120 teaching units in total, that are conducted in 16 days and covers the contents worked out in the A-Course in a greater depth. The course days are organized in modules over half a year. In addition to the lecture units, consultations must be carried out under the guidance of experienced energy consultants and a project work has to be done. The F-Course is then concluded with an oral examination by a commission.

Further Education Programs

The energy consulting agencies in the federal states have their own programs for further education to provide target groups in the field of energy with information about technical innovation, changes in legal matters or subsidies and many more topics. These programs are also used for networking and exchange of experience. This chapter outlines the different programs available in the federal states, the information is taken from the homepages of the consulting agencies mentioned in table 1.

The program Energie Akademie Tirol for example offers a wide range of information and further education in the field of building construction and technology, renewable energies and energy efficiency for several target groups, such as planners, professionals or end customers.

The Energy Academy of the Energiesparverband OÖ offers further education with focus on technology innovations, subsidies as well as cost-efficient planning and implementation of energy solutions. Target groups include planners, developers, energy consultants and auditors, banks, the different disciplines and many more. More than 70 experts from companies, the public sector and science are available as expert speakers at the Energy Academy. Around 30 events are held each year. The training program shall contribute to raise awareness and support public relations work in line with the energy strategy of the province of Upper Austria.

Academic Programs

There are also different academic programs for further education available.

In 2012 a postgraduate education program called "academic energy consultant" became available at Danube University. This education builds up on the energy consultant education according to ARGE EBA and has been developed for in-depth topics of residential construction. The training takes three-semester and concludes with the title "Academic Expert", the four-semester training concludes with the title "Master" (Wernhart 2013: 17)

In the federal state of Salzburg students of the “Smart Building” study program can complete the energy consultant training according to ARGE EBA in connection with the study program. Therefore, the students receive assisted consultations from Energieberatung Salzburg. After completion of the sixth semester and an external examination, students acquire the confirmation of the A-course and F-course (https://www.fh-salzburg.ac.at/studium/ing/smart-building-bachelor/zusatzkompetenzen., accessed on 23rd of March 2021).

1.3.8 Challenges for Energy Consulting

There are several challenges energy consulting has to deal with, such as legal restrictions in housing law, the sheer number and the complexity of the available subsidies and the limitations regarding the field of action of energy consulting. In the following sub-chapters some of these challenges, that are described in the existing literature and are found to be interesting and important to be discussed in the further course of this thesis, are presented.

This chapter also provides the basis for the actual work on this thesis. It is shown, in which areas knowledge gaps are to be found and which questions are not sufficiently answered with regard to the Austrian situation.

Housing Law in Austria

The responsibilities for housing policy in Austria are with the federal government, the federal states and to a lesser extent, the municipalities. At federal level within civil law, the Tenancy Law (Mietrechtsgesetz - MRG), the Non-Profit Housing Law (Wohnungsgemeinnützigkeitsgesetz - WGG) and the Condominium Law (Wohnungseigentumsgesetz - WEG) are the most important legal acts. The federal states are responsible for laws regarding subsidies, spatial planning and the building law (Trebut et al., 2013: 11).

Building renovation is overly complex in terms of terminology in the legal framework. The terms maintenance and improvement are hereby distinguished. According to the MRG, buildings must be maintained to a customary standard, hence maintenance is more than merely preserving an existing condition. However, no continuous modernization obligation is derived from this. The term maintenance describes measures that benefit the individual tenant or owner. Term improvement on the contrary, describes measures that predominantly benefit the general public. This is one reason why thermal-energetic measures have been classified as maintenance only in the case of a significant need for repair, otherwise it is assigned to improvement. This distinction between maintenance and improvement has extensive legal consequences. Maintenance measures are to be carried out in any case, improvement measures only if sufficient funds are available (ibid.: 17–18). Property managers therefore have only a limited scope for implementing thermal-energetic measures.

Tenant-Landlord-Dilemma

Especially in multi-story-housing the so-called Tenant-Landlord-Dilemma, also known as the User-Investor-Dilemma has a great impact on the implementation of thermal retrofit in this building category.

The Tenant-Landlord-Dilemma describes the circumstance that energy-saving investments are not made in rental buildings, because the landlord cannot achieve a long-term return on his investment, while the tenant would benefit from the energy savings achieved through the renovation (EnergieAgentur.NRW 2015). Figure 5 provides an visualization of the problem.

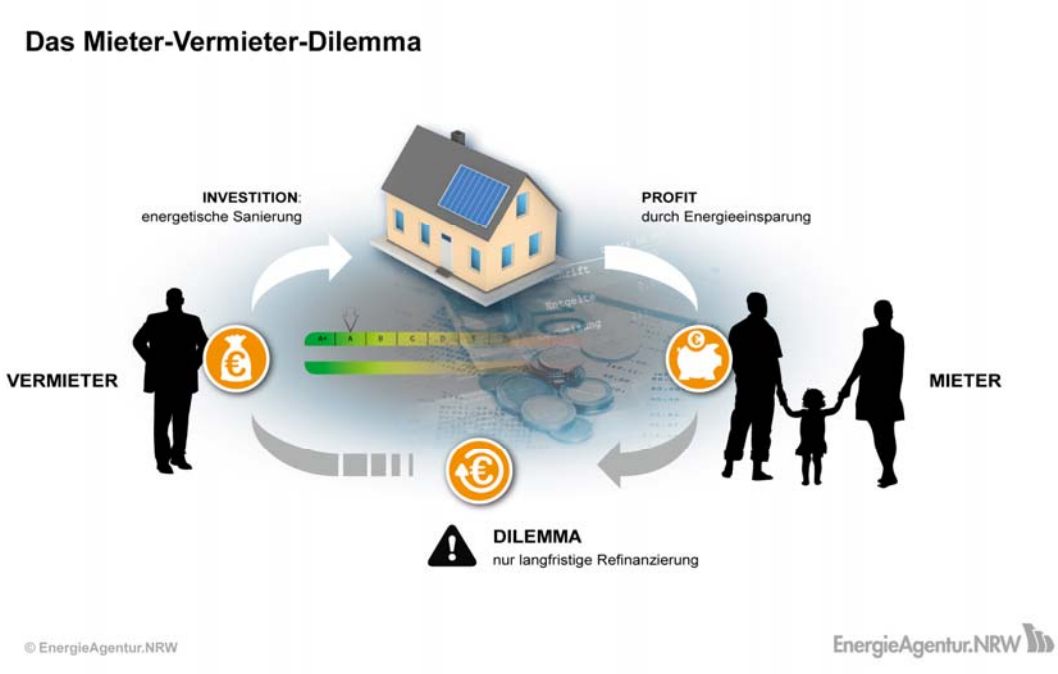

Figure 5: Tenant-Landlord-Dilemma (EnergieAgentur NRW 2015).

Subsidies

Subsidies are a very important topic for clients, though due to federalism there is a very large amount of all kinds of different funding possibilities available, clients can choose from. Often, subsidies can be combined and sometimes this is not possible. The field of subsidies is closely linked to legal circumstances, that are often not really comprehensible for laymen. Therefore, the term ‘Förderdschungel’ (Funding Jungle) has established in language use. Energy consultants should support clients in finding the perfect compilation of subsidies for their project by explaining them in an understandable way. There are several challenges for energy consultants regarding subsidies, that are described in the following.

Limits of Subsidies

According to Trebut et al. (2013) the incentives of housing subsidies have their limits because strict requirements regarding energy efficiency, land conservation and ecological measures often are responsible, that households or developers are deliberately refusing to apply for subsidies. This phenomenon is called 'escape from subsidies'. Another reason is, that building laws, general zoning and legal minimum requirements pursue far less ambitious goals than the housing subsidy systems of the federal states. Trebut et al. also stated, that the EU intends to set building regulations at the level of a nearly zero-energy house by the year 2020 and that the gap between legal requirements and subsidy requirements will close up.

Comprehensive renovation versus individual renovation measures

Relevant energy savings can only be achieved through comprehensive renovation measures that affect the entire building and to a certain extent also through properly coordinated and successive individual measures. Despite the significantly improved systems of renovation subsidies, one of the main problems is to persuade the subsidy recipients to undertake greater depths of renovation. Comprehensive renovation is often perceived as a great hurdle by building owners and is therefore not implemented. The renovation of individual building components on the other hand is attractive for funding agencies, as well as for funding recipients because of the easy administration and implementation, the easy visible success and the low costs. The step from individual renovation measures, which have already been implemented frequently, to complete renovations is of great importance for the implementation of the renovation goals according to the climate strategy (ibid.: 86–87).

The study 'WoZuBau' of Trebut et al., where the information for this chapter was taken from, was issued in 2013. The question now is, if anything has changed over the last years regarding the subsidies. Has the perception of subsidies changed in the public? Which major problems are still there?

Effectiveness of Energy Consulting

To determine how effective energy consulting works, it is necessary to determine the energy savings, that result from the consulting, although this is not an easy task.

In order to determine the effectiveness of energy consulting, it is not sufficient to determine who actually implemented the recommended measures after the consulting session and which concrete energy savings are associated with these measures. Further it must be taken into account, that clients would have implemented the same or at least a similar energy-saving measure even without receiving counseling. In this

case, the savings success would not be attributable to the consulting service, or at least not completely. If this possibility is not taken into account, the consulting success is overestimated. Therefore, when evaluating a policy measure such as energy consulting, it is essential to distinguish between gross and net effects. In contrast to the gross effect, which results from all measures that are implemented after the consulting, the net effect of the consulting service consists only of those measures and the resulting energy savings that can be causally attributed to the advisory service over and above the investments that were planned anyway. The difference between gross and net effects therefore can be considerable (Frondel et al., 2008: 99).

According to Feser et al. (2015: 135) energy consultants can help to lower the financial risk of thermal renovation measures, whereby professional advice and the subsequent faster amortization of investments can lead to greater acceptance among the population. Intermediaries with a high degree of expertise and consulting competence play a key role in the continued success of energy-efficient building refurbishment. The influence of energy consultants as intermediaries though is limited because the demand for thermal retrofit is influenced by the energy consultants themselves only to a limited extent.

However, a comparison of the measures implemented between advised and non-advised households, that was conducted by Frondel et al. suggest, even under the most favorable interpretation, that the actual effect of energy consulting is quite low. These findings put the promotion of consulting services through public funds into question (Frondel et al., 2008: 101). The study of Frondel et al. was issued in 2008 and dealt with the energy consulting market in Germany. The question arises, how the effects of energy consulting are determined and to which extent energy consulting contributes to energy savings in Austria?

The Perception of the Energy Consulting

The success of a political instrument is given, if it is accepted by the public.

According to Feser et al. (2015: 139) the public funding of energy consulting services leads to a negative perception in professional circles, since they are often seen only as a means for obtaining subsidies and not as influential advisors in the implementation of renovation measures. The success of energy consulting depends on the benefits energy consulting provides and how they are perceived by the public. As long as energy consultants are only used for the purpose of maintaining subsidies or as a free additional service, the impact of energy consulting regarding enhancing the renovation rate remains small. Nevertheless, the authors come to the conclusion,

that alone the use of energy consulting has an additional positive effect on thermal retrofit.

Feser et al. (2015: 141) state as well, that energy consulting struggles to be seen as a trusted commodity due to the fact that on one hand the quality level of energy consulting is difficult to comprehend in advance and, on the other hand, the effect of consulting on the renovation project can only be insufficiently reconstructed in retrospect.

According to Werrnhart (2013: 7) it is also important that energy consultants are in professional consensus with colleagues. Comparable statements from different consultants contribute to the credibility of the statements and the professional image in general.

Therefore, it would be interesting to find out, how energy consulting services in Austria are perceived by the public currently.

Obligatory Energy Consulting

As mentioned before, energy consulting is often used only to obtain subsidies. This implements that, if energy consulting is mandatory, it is seen as an additional burden on the way to funding and not as a possibility for improving the renovation project.

In order to receive financial subsidies in some federal states (e.g.: Carinthia, and Upper Austria, see chapter 1.3.6) an obligatory energy consulting session is prescribed. Henger et al. (2015: 15) state, that obligatory energy consulting is not sensible or even feasible because an obligation, which resembles compulsion, would not necessarily increase the acceptance and willingness of households to implement renovation measures. More effective information, incentives, a reliable funding framework and tax incentives for building renovation would be a better way.

Qualification of Energy Consultants

As established in chapter 1.3.7 the qualifications and abilities of energy consultants are very important for successful energy consulting. They must have a comprehensive technical knowledge, although first and foremost, they should be able to conduct a consultation. The question is, how the education of energy consultants is currently designed and organized in Austria and, if perhaps improvements are necessary? Would perhaps a limited access to the education programs put forth better trained and suited energy consultants?

Henger et al. (2015: 13) state, that there is consensus among experts in the field of energy, that the quality of energy consulting varies widely and, that this is because on

one hand, the profession Energy Consultant is not a protected profession and basically open to anyone who wants to work in this field, and on the other hand, specialists with different technical qualifications and professional focuses are completing the training programs to become a certified energy consultant.

Feser et al. also see this as a problem and state, that the public perception of energy consultants is particularly affected by their different professional backgrounds. The unprotected professional title leads to confusion, as it is not possible to identify which training the respective energy consultant has. This high degree of intransparency makes it more difficult to establish the energy consultant as a quality brand. According to Feser et al. (2015) improved and standardized training can therefore be a decisive for a higher acceptance of energy consulting. They also state though, that the need for academically educated energy consultants cannot be estimated and, in addition, a university degree as an entry requirement would exclude the trades from the profession. Ultimately, a decision must be made in the further development of energy consulting, whether the diversity of perspectives should be maintained or an academization should be favored, since this can lead to the acceptance of energy consulting (ibid.: 142).

Consulting Tools

According to Henger et al. (2015: 19) so-called renovation roadmaps are an important tool for successful energy consulting. Due to the fact that comprehensive renovations are rarely implemented and single measures are more likely to be implemented in the course of measures that are carried out anyway, step-by-step renovation measures must be coordinated and scheduled. In addition, such a renovation roadmap would make it possible to standardize its preparation and thus establish a uniform, high-quality consulting procedure on the market. Coordinated individual measures within the framework of renovation roadmaps are often easier for homeowners to implement than cost-intensive and complex comprehensive renovations. Henger et al. (ibid.) further state, that the threshold for decision-making is lower regarding single measures and therefore they are more likely to lead to the start of a chain of measures that may ultimately bring the same savings effects as a comprehensive renovation.

In chapter 1.3.6 the software ‘Sanierungskonzept’ has been outlined shortly. The software is currently tested by the energy agencies of the federal states (https://arge-eba.net, accessed on 22nd of March 2021). Such a software tool is considered to be helpful in the process of energy consulting sessions.

Independent Energy Consulting

All energy consulting agencies of the federal states constitute on their homepages, that their service is company-independent. What exactly does this mean? During the education to become an energy consultant I experienced during the consulting sessions with clients, that they almost always ask for further recommendations of planners, companies and certain products. It seemed to me, that the constraint, not to mention products or give away names of companies was often disappointing for the clients. After the consultation they maybe have an idea of what needs to be done yet not, who is suited to do it.

Wernhart (2013: 7) states, that company-independent energy consulting is free of a sales interest or follow-up orders and the task is to find the best possible result for the consulting client. Independent consulting in the sense of representing the customer's interests is to be distinguished from a sales consulting, which is not oriented to company-wide solutions, though offers possibilities, the company can provide.

Feser et al. (2015: 140–141) define economic independence by the fact that energy consultants must not be involved in in the planning, the supervision of the construction work or the execution of a renovation project. The neutrality of energy consultants is thus a central quality feature. Further the authors state, that it is difficult to identify a truly independent energy consultation because every consultation is influenced by the perspective and professional background of the consultant and this often leads to a negative external perception. The heterogeneous professional backgrounds of the consultants therefore are seen as cause of quality problems for energy consulting.

Henger et al. (2015: 14) have conducted expert interviews on energy consulting in Germany and draw a heterogeneous picture about the independence of consulting. To some experts the independence of energy consulting should be defined by an independence clause in order to provide objective and high-quality advice. Others thought, that energy consulting would potentially be more successful, if an independence clause did not exist, because it is important for the craftsmen, to offer competent and technically correct advice themselves.

In this thesis, it is considered important to figure out how the issue of independency is handled in Austria. Are energy consultants strictly bound by such an independency clause or are they entitled to provide clients with recommendations (e.g.: companies, building products, planners)?

Energy Consulting in the Renovation Process

Energy savings targets are often not achieved after renovation measures have been implemented. One reason is the change in the behavior of the occupants that leads to lower savings than targeted, for example, an increase in the heated living space or an increase in room temperature. These so-called 'rebound effects' can also occur if the occupants are not optimally informed about the use of energy-saving technologies or ventilation behavior (Trebut et al., 2013: 91). Therefore, Trebut et al. state, that it is very important to carry out follow-up inspections after measures have been implemented in renovation projects. This is the only way to ensure that renovation measures are actually effective.

Feser et al. (2015: 142) state, that energy consulting is mostly limited to the phases of providing information before the renovation and that no attention to follow-up control is paid. According to the authors though, this is necessary in order to evaluate the success or failure of the renovation project and ensure the qualitative and quantitative further development of energy efficiency in the building sector.

Another important factor for a successful renovation is the availability of companies that can guarantee the desired quality of the renovation. Energy consulting services therefore should operate with an appropriate network to ensure that reliable partners are selected for the energy-related refurbishment. Energy consultants thereby have a coordinating function in order to ensure a good relationship between the various parties and achieve a balance of the respective interests (ibid.: 140).

The 'REQUEST' project (Downy et al., 2012) was a collaborative project across 11 EU Member States with the goal to develop tools and practices to increase the uptake of recommendations from energy performance certificates and to provide a quality standard for low carbon renovation. Besides the face-to-face advice, key conditions such as partnership structures between supply and demand side actors and on-site-management are found to be required to build trust and create favorable conditions for homeowners to implement energy efficiency measures. According to the authors, there is little or no emphasis on ensuring high quality of the energy efficiency measures and therefore it is possible that predicted energy savings, that have been promised to the customer, are not actually realized and the trust in the supply chain is reduced. (ibid.iii-iv).

In order to create these favorable conditions for the homeowner to act, the whole typical customer journey was developed within the 'REQUEST' project with a number of clear stages and smooth transitions from one stage to the other. In order to achieve

the complete customer journey, as shown in figure 6 below, support for the demand as well as the supply side must be provided by the following interventions (ibid.: 4):

- Communication and information campaigns
- Training and building skills in the supply chain
- Financing mechanisms
- Energy performance tracking (before and after)

The figure shows which supporting measures are useful in the different stages of the customer chain.

Figure 6: The unbroken customer journey and quality assured supply chain (Downy et al., 2012: 4).

This supply chain and the close collaboration between all parties, that are involved in a renovation project are considered to be essential for the success of a renovation project. The question is, how is this handled currently in Austria? Are there efforts made by energy consulting agencies to support customers throughout a project and is this even possible and/or considered to be necessary in Austria?

2 METHOD

In this thesis questions about the effects, challenges and chances of energy consulting are discussed with experts. Especially the impact of energy consulting on implementing and increasing the thermal retrofit rate in the building sector in Austria is considered to be of crucial importance. Therefore, the method of conducting qualitative expert interviews with representatives of the energy consulting agencies of Austria is considered to be an appropriate research tool.

In order to explain, why the methodology described in the following chapters has been chosen, it is essential to take into account the long period of time that the work on the present thesis has covered. It started off in 2012 and throughout the years the applied methodology had to change due to published results of more recent studies and research projects. Initial research question became irrelevant to ask anymore because they have been answered by more recent literature. The approach of the thesis, respectively the methodology, has been adapted towards building upon the more recent findings.

2.1 Overview

In the following sections the process of determining the used methodology, as well as the methodology itself is explained. The finally chosen approach to answer the research questions consists of several steps.

In the first step the available literature on the topic is reviewed in order to figure out issues that have not been dealt with sufficiently in the literature and also to determine circumstances that have changed over time, such as enhanced legal requirements and technical standards for thermal retrofit or changes in funding.

In the second step qualitative interviews with stakeholders in the energy consulting business are conducted to discuss these issues. Therefore based on the results of the literature review, research questions are established, which are then translated into interview questions (Bogner et al., 2014: 27–34). The resulting questionnaire is used as guideline during the interview.

In order to exploit the results of the interviews they need to be transcribed in a third step according to the rules of simple transcription as described by Dresing and Phel (2015: p. 20-23).

In the next step the interviews are analyzed and the results are collected and assigned to the research questions.

After stating the different statements and opinions of the interviewed stakeholders, these statements are compared with each other and also compared to the results of the literature review in order to answer the research questions. Discussing the outcome of the interviews should culminate in a conclusion, whether the research questions could have been answered sufficiently and if not, the reasons for this should be explained.

In the final step, possibilities and considerations for future improvements and changes in the field of energy consulting are proposed according to the results of the discussion. The goal is to summarize the current opinions, filter them and determine, what kind of adjustments would be useful and which improvements could be made in order to improve the quality of energy consulting services and hence increase the quality and the rate of thermal retrofit in Austria.

2.2 Hypothesis

Feser et al. (2015) state, that energy consultants play a major role as a policy instrument for increasing the renovation rate.

One major task for energy consulting services is raising awareness for energy efficiency measures, thermal retrofit and so on among the people. Greisberger (2015) states, that social awareness for the enforcement of energy-efficient technologies, besides other non-technical factors is essential for implementing an efficient and renewable energy system. To achieve this, broad knowledge about energy efficiency and concrete options for action among the public is crucial. According further to Greisberger (2015), energy consulting serves to create this knowledge at several levels, such as private households, municipalities and enterprises, on the basis of concrete decision-making situations.

In order to assess the effectiveness of energy consulting, numeric values of generated energy or CO_2 savings are used. However, in the existing literature, it is repeatedly emphasized that the effects of energy consulting cannot be clearly derived by numbers. According to Feser et al. (2015) the empirical evidence of the success of energy consulting can only be proven to a limited extent. Frondel et al. (2008) come to the conclusion, after comparing the implemented measures of households that received energy consulting and others who did not, that the actual effect of energy consulting is quite low. Further they state, that when evaluating a policy measure such as energy consulting, the distinction between gross and net effects is very important, because otherwise measures, that would have been implemented with or without energy consulting, can falsely be attributed to the consulting service (ibid.).

However, despite the uncertainties regarding the measurability and presentability of the effects that energy consulting has on actual energy and CO_2 savings, there is a broad consensus, that it is a strong policy instrument to achieve savings and thereby contribute to the EU climate targets.

In summary, energy consulting should help increasing the rate of thermal retrofit and the quality of the implemented renovation measures. On the one hand through its awareness-raising effect and on the other hand through specific technical solution approaches, which have to be communicated to the building owner in an effective way. Therefore, the hypothesis that energy consulting is an effective tool for energy savings is stated in the present thesis. Further the assumption is made that savings can be advanced by further developing or improving energy consulting services in Austria.

2.3 Literature Review

In the first step an extensive literature research has been conducted to gather knowledge about the field of energy consulting as well as the legal framework that provides the basis and necessity for this kind of political instrument. The goals are to document the current state of energy consulting services in Austria, to assess their achievements and to point out ways for improving the services, as well as the collaboration between the parties involved in a thermal retrofit project.

When this thesis started in 2012 there have not been many published studies or other materials regarding the state of energy consulting and its effect in Austria. Several publications between the 1980s and the beginning of the 21st century dealing with the early years of energy consulting services in Austria have been found, although no extensive literature since then could be obtained.

Kofler (1992) and Pointecker (1995) for example have analyzed the situation of energy consulting in Austria in the 1990s in their theses. Back then, energy consulting was more about saving electrical energy than thermal retrofit and energy efficient heating systems.

Since 2012 more recent and suitable literature to support the objectives of the present thesis became available, therefore the focus of the present thesis has shifted towards reviewing and analyzing the meanwhile existing literature and deriving the research questions from this literature. In 2013, for example, the study 'WoZuBau: Zukunft Wohnbauförderung - Energiepolitische Effektivität der Wohnbauförderung und Energieberatung steigern - Blue Globe Report 14 / 2013' was issued by the Klima- und Energiefonds of the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (Trebut et al., 2013). This study illustrates the situation of energy consulting in Austria up to the year 2013. The findings of Trebut et al. (2013) are a main source of information and are also included in chapter 1.3.

In the further process the research questions are determined from the literature review. Interviews with experts in the field of energy consulting should answer these questions eventually.

2.4 Research Questions

In order to elaborate a questionnaire, respectively an interview guide that supports and generates the type of knowledge, which the expert interviews aim at, several research questions have been formulated in the course of the literature review.

These research questions are considered to be interesting and important because they have not been answered sufficiently in the existing literature on the one hand. On the other hand, the requirements and objectives of energy consulting services are dynamic and change over time due to political demands and social impacts.

The research questions address the structure of the energy consulting agencies, their task area, the offered consulting products as well as current chances, challenges, problems and obstacles regarding for example the job description of an energy consultant, the legal framework for thermal retrofit, the available funding possibilities in Austria, as well as the attitude of the population towards energy saving measures.

The objectives of the research questions are providing a profound overview of the current state of energy consulting in Austria and, possibly showing, in which areas adjustments and improvements are necessary to improve the situation for energy consulting services in order to be able to contribute in a greater scale to fulfill the national and international climate targets

Therefor the following subject areas for research questions have been established.

2.4.1 RQ 1 - Foundations of Energy Consulting

Due to various climate protection agreements, the field of energy consulting has been developed. Global climate protection agreements and regulations at the EU level determine the energy savings targets, that have to be achieved by the EU Member States in the building sector, alongside other sectors such as the industry or the transportation sector.

To create an understanding of the field of energy consulting, the remit and the principals for action of the energy consulting services of the federal states of Austria should be described. The goal is to elaborate the working basis of these organizations. The purpose of energy consulting should be explained as well as the obstacles and barriers.

In the literature review a lot of information to answer this question could be obtained. In the expert interviews the gathered knowledge should be cross-checked with the statements of the experts.

2.4.2 RQ 2 - Energy Consulting in Austria

The current situation of energy consulting in Austria should be illustrated in order to create an understanding of the field. Questions about how energy consulting is organized in Austria and which consulting services are available, should be answered. Due to the limited scope of the thesis, the focus is on consulting services for thermal retrofit in the residential sector (single-family and multi-story housing).

This research question could have also been answered to a great extent by the extensive literature review. The goal is the same as for the previous research question about the foundations for energy consulting. Compare and cross-check the obtained knowledge with the statements of the experts.

2.4.3 RQ 3 - Profession Outline Energy Consultant

The job description of an energy consultant raises numerous questions, which are dealt with in this thesis. Some of these questions could have been answered by the existing literature and also by obtaining information from the homepages of the energy consulting agencies of the federal states as well as from the ARGE EBA. The expert interviews should help to render the expert's opinions and attitudes towards the subject matter. Two topics are found to be particularly interesting: first the admission criteria for energy consulting education programs and their scope and secondly, the possible need to introduce a professional title and maybe a regulated trade for energy consulting services.

RQ 3.1 - Education for Energy Consultants

Several questions occurred about the qualifications and education of an energy consultant during the literature review. Who is even allowed to become an energy consultant in Austria? Are only members of certain professions or disciplines, such as architects, builders, craftsmen and so on allowed to become energy consultants, or is this possibility open to everyone? Which education or training programs are currently available in Austria, how comprehensive are they and is there perhaps need for improving these programs? Is the education organized differently among the federal states or are there universal standards, as well as sufficient offerings for further education and training? Would it possibly be useful to offer an academic education program to increase the acceptance of energy consultants as experts?

RQ 3.2 - Protected Title Energy Consultant

As established before, the professional title Energy Consultant is not a protected title according to commercial or trade laws (Wernhart 2013). In the available literature this fact is considered a problem regarding the scope of activities of an energy consultant. In a renovation project, numerous planners and professionals are involved. The tasks of an architect, master builder or plumber are familiar to most people. However, the tasks and skills of an energy consultant are less familiar. The aim is to reveal the cause of this problem and to come up with measures that could help to strengthen the image and perception of energy consultants. Would the creation of an independent protected profession or a regulated trade possibly be helpful?

2.4.4 RQ 4 - Effects of Energy Consulting

According to the available literature, the extent of the effectiveness of energy consulting has not yet been adequately investigated (Frondel et al., 2008). However, it is undisputed that energy consulting contributes to the implementation of energy saving goals.

The question therefore arises, which consulting services in Austria have the greatest effect and why. Where is potential for improvement in the ??? and how can this potential be exploited?

2.4.5 RQ 5 - Energy Consulting in the Process of Thermal Retrofit

In the literature, the view is often expressed that the use of energy consulting over the entire duration of a renovation project can have a positive effect on the quality of the final result and the effectiveness of thermal measures (see chapter 1.3.8). How is the situation in Austria? Are there initiatives to support clients throughout a project? Are there collaborations with planners or companies?

2.5 Expert Interviews

After reviewing the literature and deriving the research questions from it, expert interviews are conducted to answer the questions that arose during the literature review in order to fill the knowledge gap. The method of conducting qualitative expert interviews was chosen because the topic of the thesis is more a political topic than a technical one. Therefore, a qualitative approach is assumed to be the best possible way to obtain detailed knowledge about the current situation and views in the energy consulting scene. The energy consulting agencies are federal state organizations and interviewing stakeholders of these organizations should render the current sentiment of the field in the best way. The heads of the energy consulting agencies of the federal states are thereby assumed to be reliable sources to answer the research questions because they are believed to have the required knowledge and also sufficient insight into the issues, energy consulting has to deal with.

As mentioned before, in 2012 a first attempt has been made to conduct qualitative interviews with stakeholders in the energy consulting sector, which included mainly representatives of the energy consulting agencies of the federal states as well as one representative of an energy supply company. The interviews took place in the offices of the representatives and have been conducted personally face to face.

Several mistakes were made in preparing, as well as in executing the expert interviews. Only a rough and unstructured interview guide, based on the research question, has been used. As a result, the interviews went in different directions because the interviewed persons often took the lead and talked about topics, that were convenient for them. Also, the interviews have not been recorded on tape, so they were only documented in brief written form. The collected information then turned out to be insufficient to answer the research questions.

In January and February 2021 eventually a second attempt was made to conduct interviews with stakeholders of the energy consulting agencies of the federal states of Austria.

2.5.1 Interview Type

For the second attempt in the beginning of 2021, the interviews have been prepared conscientiously.

As interview type the theory-generating expert interview has been chosen. With this kind of expert interview, the focus lies on the subjective dimension of the expert knowledge such as action orientation, decision making maxims, perceptual patterns

guiding action, world views, routines and so on. The target is the interpretive knowledge of the interviewed expert. This knowledge does not have to be completely reflexively available; implicit knowledge is also relevant (Bogner et al., 2014: 25).

The research questions have been revised, adapted and grouped into subject areas in order to set up a questionnaire respectively an interview guideline. The design of the questionnaire is described in the following chapter.

2.5.2 Interview Guideline

Research questions need to be translated into interview questions for conducting an expert interview (ibid.: p. 33-34) in order to create a convenient conversation situation with the expert.

An interview guideline consists of different topic areas. For each topic area one to three main questions are stated, which serve as incentives for the discussion. These are supplemented by various dependent questions that serve to provide further detail such as various follow-up questions on individual aspects of the topic or supplementary discussion incentives (ibid.: 28–29). According to these rules the interview guideline was drawn up and the seven following subject areas have been defined. The German expressions used in the questionnaire are put in parentheses.

- General / Introduction (Allgemeines / Einleitung)
- Consulting Services (Beratungsleistungen)
- Goals and Achievements of Energy Consulting (Ziele und Erfolge der Energieberatung)
- Subsidies (Förderungen)
- Profession Outline Energy Consultant (Berufsbild Energieberater)
- Cooperations (Kooperationen)
- Future of Energy Consulting (Zukunft der Energieberatung)

According to Bogner et al. (ibid.: 27) such guidelines have a dual function. They serve to structure the subject area of the survey and as a concrete aid in the survey situation.

In Chapter 8, Annex A, the interview guideline (written in German), that was also handed out to all interviewed people in advance, is shown. In order to provide the experts with information about the topic of the thesis, also a short summary about the concept of the thesis including the motivation, the methodology and the research questions was elaborated.

2.5.3 Conducting the Expert Interviews

In February 2021 all nine energy consulting agencies of the federal states of Austria have been contacted via E-Mail and asked for an interview. Finally, with representatives of six energy consulting agencies interviews have been conducted. Table 2 shows the respective energy consulting agencies as well as the date and the duration of the interviews. All interviewed persons are in leading positions at the different consulting agencies.

Table 2 Expert Interviews

Federal State	Consulting Agency	Date	Duration
Lower Austria	Energieberatung Niederösterreich	23.02.2021	1,25 h
Salzburg	Energieberatung Salzburg	17.02.2021	2,25 h
Styria	Netzwerk Energieberatung Steiermark	19.02.2021	1,50 h
Tyrol	Energie Tirol	22.02.2021	1,00 h
Vienna	Hauskunft	26.02.2021	1,45 h
Vorarlberg	Energieinstitut Vorarlberg	23.02.2021	1,00 h

The interviews have been conducted via video chat (Microsoft Teams). All interviewed experts have been asked for permission to record the interviews with a Dictaphone in advance.

The expert interviews have been conducted in German because it is the mother tongue of all experts and myself. The goal was to avoid misunderstandings and create a relaxed conversation atmosphere.

Since I have worked for more than eight years in the field of thermal retrofit, the experts have accepted me more or less as a co-expert and the interviews have taken the form of an open technical discussion. According to Kaiser (2014) this has a great importance, because it can have a negative effect on the success of the survey under certain circumstances. For example, when an expert uses the interview as an opportunity to talk about all the problems and frustrations that the profession entails. However, this is also the situation in which an expert is most likely to deviate from the

official line of his organization so therefore an expert survey can develop its greatest potential (ibid.: p. 82-83).

2.5.4 Interview Analysis - Method

The interviews have been transcribed from the recorded audio files in order to exploit the results. The transcribing method according to the rules of simple transcription as described by Dresing and Phel (2015: p. 20-23) has been used. The transcripts are not attached in chapter 8 Appendix due to protection of the privacy of the interviewed persons.

After transcribing the interviews, they have been analyzed and coded. The results are presented in the following sub-chapters according to the topic areas from the interview guideline and are summarized in a second step according to the research questions.

In the following chapters the results are described and finally compared to the findings of the literature review in the following chapter. In the end, recommendations for improvements shall be made and food for thought in the future shall be provided.

3 RESULTS

3.1 Overview

In this chapter the results of the expert interviews are presented according to the interview questions. The questions about the foundations of energy consulting and the organization of the consulting agencies as well as the consulting services could have been answered to a large extent by the conducted literature review. These results are included as background information in the previous chapters. However, during the interviews, questions about these topics have been asked in order to square the existing data and confirm the already collected knowledge from the literature review. The interpretation and discussion of the collected results follows in the next chapter of the thesis. At this point only the statements of the experts are stated.

The interview guideline is divided into seven subject areas, which are shortly outlined in the following:

The first subject area is about the background, the function and the responsibilities of the interviewed experts and should help to start the conversation.

The second subject area deals with the consulting services, which are also a result of the literature review and the online research and presented in the background chapter of this thesis. The statements of the experts regarding this topic are nevertheless summarized.

The next subject area is about the effectiveness of energy consulting as a political instrument for raising awareness about energy related topics.

Housing subsidies are a very important topic in energy consulting and therefore the questions from this subject area should help to gather knowledge about the current trends regarding subsidies, as well as the opinions of the experts on the funding system in Austria. Another topic in this section of the interview guideline deals with the question, whether obligatory energy consulting, for example in connection with subsidies, is useful to raise awareness among the people about the importance of thermal retrofit and energy efficiency or not.

The teaching objectives for the education of energy consultants are prescribed by the ARGE EBA association. The questions of this subject area aim at the opinions of the experts on the status of the current education opportunities and possible adjustments.

Further their attitude towards the implementation of a professional title and the prerequisites for becoming an energy consultant should be rendered.

The sixth subject area is about collaborations among the parties involved in building renovation (e.g.: clients, energy consultants, planners, executing professionals). Energy consulting is advertised on the homepages of the energy consulting agencies of the federal states as independent service. The experts are asked, what independent energy consulting means to them. Further the goal of the questions in this subject area is to find out, whether the experts appreciate a closer collaboration with executing professionals or not and how such collaborations could be working and how they would affect the independency of energy consulting services. Another question deals with the scope of energy consulting. The expert's attitudes towards a support by energy consultants along the whole customer chain until the completion of a renovation project is asked.

Within the last subject area, the experts are asked about their opinions on topics, that will be important in the future regarding energy consulting.

3.2 Expert Interviews - Results

In order to present the results in a comprehensible way and to make it easily perceptible, which expert made which statement, abbreviations, respectively codes are used in the following. When referring directly to the experts, the expert code is used. When referencing to one of the interviews, the interview code is stated. In table 3 the codes for the experts and the interview codes are provided.

Table 3 Expert Interviews – Expert and Interview Codes

Expert Code	**Energy consulting agency**	**Interview Code**
E1	Energieberatung Salzburg	EI-01
E2	Energieagentur Steiermark	EI-02
E3	Energie Tirol	EI-03
E4	Energieberatung Niederösterreich	EI-04
E5	Energieinstitut Vorarlberg	EI-05
E6	Hauskunft Vienna	EI-06

3.2.1 Interview Questions - Results

The results that could have been gained in the expert interviews are presented according to the topic areas and the associated interview questions from the interview guideline. Therefore, the interview questions are translated from German to English. The interview guideline in German, including the outline of the thesis was meant to inform the experts about the content and the goal of the thesis in order to prepare them for the interview. It is presented in chapter 8 – Annex A.

As already described in chapter 2.5.2, the interview guideline consists of main questions (e.g.: Question 1, Question 2 and so on) serving as incentives for the discussion and dependent questions (e.g.: Question 1.1, Question 2.1 and so on), which are either follow-up questions or aim at certain knowledge or the expert's opinion.

In the following, the results obtained in the course of six qualitative expert interviews with representatives of the energy consulting agencies in the federal states of Salzburg, Styria, Tyrol, Lower Austria, Vorarlberg and Vienna are presented for each interview question.

The consulting agency Hauskunft in Vienna has been established in October 2020 and is still under development. Therefore, detailed information about the consulting services and the achievements of the consulting agency could not be obtained. Though the goals and the general orientation of the energy consulting agency as well as attitudes towards certain subject matters have been discussed in the interview.

General / Introduction

The first topic area in the interview guideline was designed to start the conversation and gain knowledge about the background, the function and the responsibilities of the interviewed experts.

Question 1:

In the beginning, can you describe your role in the energy consulting agency and your professional background?

All experts have completed technical studies such as in Architecture, Mechanical or Electrical Engineering and have been working for a long period of time in the field of energy consulting.

Question 2:

Can you briefly explain the tasks and organization of your institution?

This question could have been answered to a great extent by the literature review, respectively the investigation of the homepages of the energy consulting agencies of the federal states. In chapter 1.3.6 the tasks as well as the organization of the energy consulting agencies are outlined.

The experts presented their organization and its focus.

The organization is quite different throughout the federal states. In Tyrol and Vorarlberg for example, the agencies are organized as non-profit associations and are organized in a centralized way. The consultants work directly for the energy consulting agency. In Salzburg and Lower Austria there are so-called external consultant-pools, which are managed and supported by the agency. The agency itself provides the consultants with consulting cases and handles the documents, the consultants need for their work (e.g.: protocols, information materials and so on) and also run the quality management.

In Styria the consultants have to acquire consulting cases themselves, the Energieagentur Steiermark supports the consultants with materials and stipulates the goals and course of the consulting, as well as the form of the consulting protocol. The agency handles the accounting though (EI-02).

In Vienna the consulting agency Hauskunft was founded in October 2020 in the course of the program ‘RenoBooster’, which is subsidized by the EU-program “Horizon 2020”. Within the framework of the ‘RenoBooster’ program the One-Stop-Shop Hauskunft which deals with building renovation has been developed. The consulting agency is still under development. In the end though, clients should be supported along the whole customer journey, beginning with the initial phase until the utilization phase of a renovation project (EI-06).

The focus of the energy consulting agencies lies on the renovation of residential buildings, especially single-family homes. According to E1, most consulting sessions deal with the renovation of a single-family home. In Styria, the Energieagentur Steiermark focuses as well on energy consulting for municipalities and households with low income (EI-02). Since there are a lot of multi-story residential buildings in Vienna, the One-Stop-Shop Hauskunft focuses on single-family-homes as well as multi-story housing. However only regarding renovation. The other consulting agencies also consult on new buildings.

E3 states, that the task of Energie Tirol is to promote the economical, environmentally friendly and socially acceptable use of energy and, especially the regional and renewable energy sources are to be promoted.

Consulting Services

The findings regarding the offered consulting services have been derived to a great extent from the literature review and the online research and are presented in the background chapter of this thesis. The statements of the experts on this topic are nevertheless summarized in the following.

The consulting services are similar throughout the country. There are mainly three consulting rails, that are offered by all energy consulting agencies in one way or the other.

First point of contact for clients is the advice via phone. It is used for short consultations in order to answer quick questions about delimited subject areas such as subsidy requirements or information on certain building products or heating systems. Consultations via phone are free of charge in all federal states.

Further there are consulting hours offered in the offices of the consulting agency. These consultations take up to one hour, are also free of charge and are intended mostly for new buildings or specific questions about building services such as changing the heating system.

The third level of consulting services is also the most important and most frequently used consulting service in all federal states. The on-site consulting is designed for renovation projects in the residential building sector. A consultant visits the clients at home, inspects the building and the building services and determines renovation measures according to the client's wishes and according to the objectives of the energy agencies. The task of every energy consulting session is the proposal and outline of a comprehensive renovation that is sustainable and contributes significantly to the reduction of energy consumption and CO_2 emissions in order to increase the rate of thermal retrofit in Austria. On-site consulting is limited to two hours and is free of charge in the federal states of Salzburg, Carinthia and Burgenland. In Upper Austria the on-site consultation is limited to one hour and is also free of charge. In the other five federal states clients have to pay fees for single-family homes between 40 Euro and 200 Euro. In Styria, the fee is refunded if the measures are put into action within 12 months.

Question 3:

In my thesis, I focus on energy consulting services for the thermal retrofit of residential buildings. Which consulting services regarding this are available at your consulting facility and which target groups do they address?

In Vienna the consulting services are still under development. In the future different consulting services along the customer journey should be offered by Hauskunft, such as consulting for the initial phase of a renovation project, the planning phase, during the implementation phase, as well as in the phase of using a building. The consulting services should consist of three steps, that can all be used independently or in sequential combination. The first step, a service called 'Orientierungsberatung' can already be taken up by clients. The consulting session lasts for about one hour and currently takes place via phone or online due to the COVID-19 pandemic. The service is separately available for homes and multi-story residential buildings. In the future on-site consulting services for home owners and property managers as well as condominium owners of multi-story residential buildings will be available. A third step, besides the 'Orientierungsberatung' and the on-site consultations shall be a consulting service, which is located between the initial phase and the planning phase of a renovation project and works with the computer aided tool 'Sanierungskonzept', which is presented in chapter 1.3.6. Hauskunft intends not to issue these renovation concepts themselves. Over a quality platform, that is also a part of the 'RenoBooster' project, professionals on the free market such as architects, engineering offices and so on should carry out this task. Hauskunft concentrates only on consulting and raising awareness for the importance of sustainable and high-quality renovation as well as the need for multidisciplinary planning. Hauskunft does not want to compete with the private sector. (EI-06).

Question 3.1:

How do the consulting offers differ from those of other providers?

Regarding the three consulting rails that have been mentioned previously, there are no big differences among the federal states.

In Vorarlberg though consulting services by the Energieinstitut Vorarlberg are limited to a certain extent. According to E5 the introduction of the energy performance certificate for buildings has changed the working field of the Energieinstitut Vorarlberg. The Chamber of Commerce of Vorarlberg has affiliated energy consulting services to

those professions entitled to issue energy performance certificates and therefore the Energieinstitut Vorarlberg can only provide clients with preliminary information and recommend to make use of the consulting services offered on the free market by architects, master builders or other disciplines. These comprehensive renovation consulting services have to be paid by the client and are refunded up to 75% or an amount of 1.600 Euro by the housing subsidies department in case the renovation was carried out. E5 sees here a great uncertainty for clients to make use of these consulting services because they fear to be stuck with the costs in the end (EI-05). The Energieinstitut Vorarlberg also offers a special consulting service that aims at a sustainable renovation on several levels (see chapter 1.3.6).

In Styria, consulting for low-income households seems to be a much greater issue than in other federal states according to the information obtained from the homepage as well as the statements from E2 (EI-02).

In Salzburg the possibility of follow-up consulting sessions is given in order to support certain more comprehensive or complicated renovation projects. E1 states, that currently three to five follow-up appointments are possible (EI-01).

Question 3.2:

Which consulting services are best received by clients?

The on-site consulting services are best received by the clients according to the experts. The other services are received well too. In Salzburg about 90 % of the consulting sessions are on-site renovation consultations (EI-01).

In all federal states consulting in order to receive the subsidy ‘raus aus Öl und Gas’ is very popular among clients currently because clients either have to submit an energy performance certificate or an energy consulting protocol in order to gain the subsidy.

Question 3.3:

Which consulting services are less well received and why?

E2 mentions, that consulting for low-income households is not perceived very well due to several reasons. The target group is not sufficiently informed about the possibility and they do not see the additional value of the service (EI-02).

According to E3 it depends on the situation and the specific questions of the client, which consulting service is best suited (EI-03).

Question 3.4:

What issues are most important to consulting clients?

Currently the subsidy 'raus aus Öl und Gas' that is provided by the federal government is the most popular topic. E4 states, that the change of heating systems is a popular topic because of the currently available subsidies and the fact, that changing the heating system is a very limited field of action (EI-04). According to E5 about two thirds of all consulting cases in the Energieinstitut Vorarlberg are consultations regarding phasing out oil and gas and the associated subsidies (EI-05).

Question 3.5:

Where do you see a need for improvement or change in consulting services to advance thermal retrofit of buildings?

E4 sees no need for improvement in the service itself, though wants to change the appearance of the protocol that is handed out to the clients after the consulting session (EI-04). E3 thinks too that the protocol always needs to be adapted and improved. The most important thing though is to maintain a high quality regarding the technical knowledge of the consultants and their communication skills (EI-03).

E2 mentions, that people need a lot more support during a renovation project and services such as the 'Sanierungs-Coach' in Carinthia or the 'Sanierungslotse' in Vorarlberg therefore are good examples. The financing of such comprehensive consulting services though is a problem (EI-02).

E5 identifies a need for improvement in the consulting services offered on the free market by the various disciplines and states, that some kind of quality management needs to be implemented therefore because being authorized to do something (e.g.: calculating energy performance certificates and providing energy consulting services) is far away from being qualified to do it (EI-05).

E1 identifies two possible needs for improvement for the consulting services. First, it is necessary to achieve that professionals and energy consultants provide the client with the same information in order to eliminate uncertainties on client side. Secondly, the gap after the consultation is a big problem according to E1. How does the client gain knowledge about professionals to put the measures, that have been suggested during the consultation, into action (EI-01)?

Question 4:

Renovation consultations often take place at the client's home, as the existing building is inspected. Can you briefly describe how such an energy consultation takes place? Is there a standardized procedure?

In Salzburg the consulting procedure is highly standardized since 2011 according to E1. A highly automated, computer aided approach, further called "the tool" is aiming at providing a complete renovation concept according to the comprehensive renovation stipulated in the OIB Guideline 6. The tool is developed by software companies that provide calculation software for energy performance certificates and based upon this calculating technique. This tool has been currently developed further and improved (EI-01). In chapter 1.3.6 the software 'Sanierungskonzept' is presented.

According to E2 the on-site consultation is very standardized and similar in every federal state. The goal is to make a thorough inspection of the building and the building services, provide the client with possibilities for improvement and inform about subsidies (EI-02).

Question 4.1:

Do you see room for improvement in on-site consultations? Regarding for example the course of the consultation, the duration or the materials used (e.g.: consultation protocol, information brochures, and so on)?

According to E1, the recommendations made in a consulting session have to fulfill at least the standard of a comprehensive renovation according to OIB Guideline 6 in order to push thermal retrofit. Currently the recommendations are proposed by the consultants themselves and not all of them take into consideration the overall goal of the so-called 2050-fit building. E1 is clearly convinced, that the computer-aided tool and the automatically generated renovation concept as the final result of a consulting session helps to push thermal retrofit. It needs to be used though by professionals on the free market (e.g.: issuers of energy performance certificates) in order to be successful. Whenever an energy performance certificate for existing buildings is issued, a renovation concept according to OIB Guideline 6, that is easily comprehensible by clients, has to be issued as well (EI-01).

In some federal states, for example in Styria and Lower Austria, this computer aided approach with the tool as described in Question 4, is also used during consulting. Paper protocols, which are filled out on-site, are though still used anyway. According

to E4 a digital protocol will be the future because with digitalization it is unavoidable (EI-04). E2 on the other hand states, that compared to a highly automatized protocol, a hand-written protocol is maybe more suitable to provide the client with easily comprehensible information. Consultants in Styria are free to use either the computer-aided protocol or a hand written one or both. According to E2, several consultants did not like to work with such a tool in the past because it is not easy to customize it for the client (EI-02).

Goals and Achievements of Energy Consulting

These questions aim at the assessments of the experts regarding the effectiveness of energy consulting as a political instrument for raising awareness about topics such as energy efficiency, thermal retrofit, renewable energy sources and so on. Further, the experts are asked, what needs to change in order to push thermal retrofit and hence the renovation rate of buildings.

Question 5:

How do you evaluate the effectiveness of energy consulting regarding the awareness-raising effect in the population?

According to E1 the effects and success of energy consulting are hard to grasp because raising awareness works only in several stages. In one consulting session there cannot be done much. Another important factor is the need for congruent statements from the professionals and the consulting agency towards the customer in order to create trust in the proposed measures (EI-01).

E5 states to have noticed during several obligatory energy consulting sessions (obligatory consulting has been established by the housing subsidies department of Vorarlberg once), that energy consulting has an awareness raising effect. After evaluating the subsidized renovation projects, it can also clearly be identified, that buildings, who's owners made use of energy consulting, show a better result regarding heating demand and energy efficiency in contrast to buildings without consulting. Therefore, E5 states, that the effect of energy consulting on raising awareness is perceptible (EI-05).

E2 is under the impression, that the awareness among the people for topics such as energy in general and energy savings has increased over the last years, though E2 also criticizes a very self-centered behavior of the people, which prevents progress regarding energy savings (EI-02).

According to E3 energy consulting would be more effective if used at the right time, in the beginning of a renovation project and not after implementing measures in order to gain subsidies (EI-03).

Several experts stated, that it is not possible to determine exactly how high the savings are due to energy consulting, because it is not possible to track, which measures have been implemented by the clients.

Question 5.1:

Which factors are decisive for the success of energy consulting?

For all experts the trust of the clients in the service and the competence of the consultant, especially an excellent communication is the key for successful energy consulting. Technical knowledge is seen by all experts as a basic requirement in order to maintain a high-quality consulting standard.

E2 states for example, that a consultant needs to be highly empathic and the way of presenting a subject to a client is often more important than the subject itself (EI-02).

According to E4 successful energy consulting is personal, product-independent and practically oriented, meaning that a consultant should be able to give comprehensive interdisciplinary advice, which is at the same time understandable for clients (EI-04).

For E1 it is of importance, that the client gets the feeling, that both, the energy consultant and the professional, are on the same side and correspond to the same solution. Then the client will more likely put also comprehensive measures into action (EI-01).

Question 5.2:

Preconceptions about the negative effects of thermal renovations (e.g.: mold due to thermal insulation and so on) still persist. I also observe this frequently in my everyday professional life. How can energy consulting effectively help to dispel such prejudices?

According to the experts, the competence of the consultant is crucial in order to clarify the situation and eliminate prejudices about certain measures. When the facts are presented in a confident and reliable manner, the possibilities are high, that clients follow the recommendations of the consultants and let go of their prejudices. Thereby it is important, to not offend the client in any way.

E3 states, that concerns about thermal insulation of facades with materials such as EPS (Expanded Poly-Styrene) occur in waves throughout the years (EI-03).

E1 states, that there are less concerns because meanwhile fewer errors occur during the implementation of the measures. E1 also states, that energy consulting is perfectly suitable to dispel residual doubts in clients (EI-01).

Though all experts agree, that there will always be people who are resistant to advice and cannot be approached by consulting services.

Question 5.3:

Which measures are necessary to increase the knowledge about the necessity of thermal refurbishment due to climate protection goals, its mode of action as well as its positive effects (e.g.: increase of living comfort, reduction of heating costs etc.) among the population and thus increase the acceptance of thermal refurbishment in the population?

E6 mentions, that more public relations work would be helpful to advertise the energy consulting service in order to create awareness among people. E6 further states, that if people do not know about the service, they cannot use it and defines the marketing budget as limitation for the possible impact of energy consulting services. E6 points out, that the energy consulting agency in Lower Austria and their services for example, are well precepted by the public because the federal state of Lower Austria attaches great importance to marketing (EI-06).

E2 on the other hand proposes simpler rules for funding because, if clients have the feeling that the consulting and the funding possibilities are supporting their goals, the acceptance of energy consulting services would be higher (EI-02).

E1 defines the availability of strong subsidies and the communication of the three pillars of the 2050-fit building consisting of the sufficient thermal insulation of the building envelope, a renewable energy source for heating and warm water and the generation of energy on site as necessary. The concept of the 2050-fit building has to reach the minds of the people and the professionals (EI-01).

Question 6:

The annual renovation rate is below policy expectations. The promotion of thermal retrofit in multi-story residential buildings could make a major contribution to increasing the renovation rate. Due to legal regulations (e.g.: tenancy law and condominium law), thermal retrofit is often prevented. An important role plays the so-called 'Tenant-Landlord-Dilemma', which states that energetically sensible investments are not implemented because the landlord cannot make a profit in the long term, while the tenant would benefit from the energy savings resulting from the renovation. How could this dilemma be counteracted?

Several experts identify the legal requirements especially the condominium law in multi-story residential buildings as a real problem to push thermal retrofit and thus an impediment to increase the renovation rate.

E1 states, that only legal constraint and clear rules can be effective to ease the dilemma, although they are politically delicate. E1 proposes, that comprehensive renovation should be demanded within a time frame and so build up pressure and further states, that with enough lead time it would be reasonable and appropriate to implement a kind of renovation obligation (EI-01).

E2 believes, that the relevant laws have to be changed as well as implementing financial incentives for building owners or landlords is essential, so that not only the tenant but also the landlord can profit from the implemented measures. However, E2 states, that the financial aspect cannot be disregarded. Some people simply cannot afford to implement comprehensive thermal retrofit measures (EI-02).

E5 on the other hand states, that the current state of legislation only needs to be executed. E5 is of the of the opinion that jurisdiction is far behind the actual legal possibilities. As an example, E5 mentions that the repair or restauration of building parts such as the renovation of a facade, has already to be executed according to the state of the art, meaning that thermal insulation is obligatory, though courts do not interpret it this way (EI-05).

E6 states, that a change of generations is needed in order to push thermal retrofit because the next generation would be more likely to put measures into action. The goal of Hauskunft is to address this problem particularly by supporting property managers and condominium owners in the future in implementing thermal retrofit and energy efficiency measures (EI-06).

Question 6.1:

Which legal principles would have to be adapted to increase the refurbishment rate in multi-story residential buildings and in which way?

A majority of the experts said, that they are not that familiar with the matter and therefore do not want or are not able to make a statement regarding legal matters. There is a great consensus though, that changes in tenant law and condominium law, as well as in the funding area are to be made in order to push the renovation rate.

E1 is of the opinion, that property managers of multi-story residential buildings for example should be given a greater scope of action when it comes to orderly management (in German: Ordentliche Verwaltung). E1 states, that maybe an approach similar to the implementation of the energy performance certificate would be helpful (property managers are responsible for the existence of a valid energy

performance certificate in case there is not an agreement on the contrary by the apartment owners) and mentions, that maybe a kind of reversal burden of proof needs to be implemented in order to get the required consent of the apartment owners. Therefore, E1 states that property managers should be obliged by law to put thermal retrofit measures into action and apartment owners have to actively declare their rejection of the retrofit measures. The right for objection though should not be simply overridden because this would mean restricting democratic rights (EI-01).

According to E6, property managers request to simplify the numerous subsidies offered by the several departments in Vienna (EI-06).

Question 6.2:

In your opinion, which other factors prevent or make it difficult to meet the targeted renovation rate?

E1 states, that there is also a problem regarding resources. The market demand is greater than supply because of the great subsidies that are available at the time (EI-01).

In Vienna there is a working package within the 'RenoBooster' project that deals with legal fundamentals, recommendations to policy makers and the design of subsidies, though the project is still ongoing. First results are to be expected in about one and a half year. (EI-06).

Subsidies

The housing subsidies are very different throughout the country (see also chapter 1.3.4). These interview questions are designed to gather knowledge about the current trends regarding subsidies. Further the opinions of the experts on the funding system in Austria are asked. The goal is to find out whether the funding system is reasonable, or if changes need to be made. Another topic in this section of the interview guideline deals with the question, whether obligatory energy consulting, for example in connection with subsidies, is useful to raise awareness among the people about the importance of thermal retrofit and energy efficiency or not.

Question 7:

Subsidies for construction and renovation projects are an important topic in energy consulting. Is the use of subsidies the main concern?

According to all experts, subsidies are a main topic during energy consulting sessions. E4 for example states, that energy consulting should not only be consulting in order to gain subsidies and therefore the qualification of the consultant is again crucial. The consultant's task is to outline possibilities for improvement regarding the building and the building services and in almost every consulting case the consultant is able to draw the client's attention to a topic, that is interesting for the client besides subsidies (EI-04).

E1 is of the opinion, that the subsidy departments are not able to communicate their own subsidies sufficiently to the people and that energy consultants have to give funding advice additionally to the technical advice during a consulting session. E1 further states, that this is very exhausting work because of the various available subsidies (EI-01).

Question 7.1:

On which subsidies do building owners most often want advice on?

All experts confirm, that people are very interested in the subsidy offered by the federal government for changing oil-based heating systems (raus aus Öl und Gas).

Then the different housing subsidies of the federal states for thermal retrofit as well as the subsidies for photovoltaics are very popular.

Question 8:

In some federal states, energy consulting is mandatory for obtaining subsidies. In your opinion, does this make sense?

On this subject, the experts have different opinions. Some of them think that it would be helpful if energy consulting was obligatory in order to obtain subsidies and, before a renovation project is even put into action in order to be able to get the best possible and sustainable renovation result.

E3 states, that the obligatory energy consulting for gaining the subsidy offered by the city of Innsbruck turned out to be making sense because people need to apply for it in advance and prove, that they have had an energy consulting session. Nevertheless, it would be nice to get rid of the obligation according to E3 (EI-03).

E4 is strictly against obligations and is convinced, that people need to realize on their own, that energy consulting makes sense. E4 is also of the opinion, that receiving consulting before putting measures into action could help preventing mistakes, though points out that this only works if there is enough lead time. The timing is important in order to benefit from energy consulting. E4 states the example, that in case professionals are starting renovation the day after the consulting session, it is unlikely that changes for the better are being implemented because everything is set (EI-04).

E6 is of the opinion, that raising awareness and getting a lot more people to energy consulting would be the better way. Obligation could lead to defiance among the people and furthermore E6 doubts the usefulness of mandatory counseling if the implementation of renovation measures is not mandatory at the same time (EI-06).

E1 does also not want energy consulting to be obligatory and states, that the energy performance certificate in combination with the tool ‘Sanierungskonzept’ should rather be obligatory (EI-01).

E2 on the other hand thinks that obligatory energy consulting in the course of a renovation project would definitely make sense. For new buildings it is already obligatory. E2 further states, that the timing needs to be right in order for energy consulting to intervene and help getting a better result. In Styria people also make use of energy consulting after the building is finished only to apply for subsidies (EI-02).

E5 mentions, that most of the architects and planners are doing a good job in consulting their clients, therefore a further obligatory consulting is not necessary. Though with some cases E5 is of the opinion, that an obligatory consulting would make sense, though the success depends a lot on the people involved.

Question 8.1:

What are the advantages and disadvantages of mandatory energy consulting?

As an advantage E2 states, that through obligatory consulting clients eventually get a second opinion, provided that the consulting takes place before the implementation of measures. A disadvantage is the timing. If obligatory energy consulting is used too late, people perhaps cannot gain subsidies in the worst case and then their resentment about the consulting service outweighs the positive aspects.

Question 8.2:

Would mandatory energy consulting in the course of procedures, which are treated only by building authorities, make sense in order to possibly provide incentives to building owners and thus achieve a higher thermal quality of the building project?

E4 does not recommend obligatory energy consulting, though demands an obligation for a high quality in planning and pleads for having plans drawn only by authorized people such as architects or builders, because in Lower Austria it is still very common that people draw their own plans and just let them be stamped by an authorized person in order to apply for permission at the building authorities (EI-04).

E1 states, that building authorities in Salzburg would have to demand an energy performance certificate in the course of a comprehensive renovation as defined in the OIB Guideline 6, though this is not done currently (EI-01).

E2 states, that most people are turning to the municipalities, which are at the same time building authorities, in the beginning of a project in order to gather the legal requirements and fundamentals regarding their project. Within the office hours of the building authorities, it could possibly be helpful when people are made aware that they can make use of energy consulting (EI-02).

E6 also proposes, that in the course of preliminary discussions with the building authority people should be recommended to contact energy consulting services for support. The voluntary use of consulting services thereby is crucial because in order to encourage someone to put measures into action, the person has to accept the measures and recommendations (EI-06).

Question 9:

The requirements of the funding agencies regarding the thermal quality of the building envelope, the used building materials and the building service systems are relatively high compared to the requirements of the building code. Do building owners decide against claiming subsidies because they consider the technical and financial effort too high compared to the benefits?

According to E5 the construction industry actively advises clients against applying for subsidies by telling them that funding is very complicated because they fear the quality management of the subsidy department in Vorarlberg. E5 states, that professionals for example tell their clients that the thermal insulation is 16 cm. They do not mention the thermal quality though. In the energy performance certificate, the best values for thermal insulation are used. These products are then not used for the renovation later on. If the housing subsidy department would check on the project, the scam would be revealed and the subsidy would lost for the client (EI-05).

E3 has absolutely no sympathy for people arguing, that applying for funding is too complicated, because the subsidy amounts are really high at the time and spending a little time and effort in order to get a lot of free money is surely acceptable (EI-03).

According to E1 with multi-story residential buildings it strongly depends on the property manager whether or not they choose to apply for funding. Larger property management companies usually apply for funding because they have the resources to deal with the effort. Regarding single-family homes, E1 states, that people often think of impediments such as loans and income limits when it comes to subsidies, though this is still relevant only in case of funding for new buildings. When renovating a building there are no such limitations anymore. People just do not realize, that funding modalities for renovation have changed (EI-01).

Question 9.1:

Are the subsidy guidelines too strict or should they rather be tightened?

The experts have slightly different views on the sufficiency of subsidy criteria (e.g.: technical requirements such as U-values for building components). All experts state though, that subsidy requirements should be at least on building code level or even stricter.

E1 thinks, that the funding system in the federal state of Salzburg is very good and the requirements are motivating for clients. If comprehensive measures are implemented the amount of the subsidies can get really high (EI-01).

According to E2 subsidy requirements definitely should be stricter than the current building codes because on one hand the federal state is obligated to invest in the future and therefore implement sustainable building or renovation standards. On the other hand people get free money and should therefore fulfil higher standards. E2 further is of the opinion, that the requirements currently are sufficient and do not need to be strengthened. In the opinion of E2 the complexity of funding though is an impediment. A funding system that offers substantial funding to a greater scope of renovation projects instead of very high funding for a few outstanding projects, such as renovation according to passive house standard for example, would be more convenient according to E2 (EI-02).

E4 also thinks, that funding requirements need to be stricter than the building code and is of the opinion that requirements are not strict enough (EI-04).

E3 is proposing a stricter subsidy model where exceptionally good renovation measures receive more funding and the currently lowest funding level is cancelled or funded with less money (EI-03).

Question 9.2:

In your opinion, is it necessary to quickly raise the requirements of the building code further (e.g.: to build new buildings exclusively according to the passive house standard or to impose even stricter requirements for renovation)?

E5 sees the lobby for property development as an impediment in order to raise standards for new buildings in the building code. In Vorarlberg the required U-values of building components for renovation are higher than for new buildings. According to E5 this is because of the demands and desires of the construction industry. The very strong property development lobby in Vorarlberg tries to avert higher standards for thermal quality of the building envelope because every centimeter of insulation reduces the maximum floor space, that can be sold and hence their profits. For renovation there is no such lobby, because the more measures people implement, the more expensive it gets. E5 further states that according to a study that focuses on the building stock in Vorarlberg, the climate goals for the year 2050 can only be reached if the requirements in the building code are defined properly, otherwise these

goals cannot be reached until the year 2070. The building code for new buildings is not yet sustainable (EI-05).

Question 10:

In order to receive funding for the comprehensive renovation of a building, it is often necessary to carry out thermal improvement measures on several building components. Often, it is not possible to carry out all the renovation measures at the same time for financial reasons. For this reason, subsidies are also available for the renovation of individual components or step-by-step renovations. What is your opinion of these subsidies?

All experts are of the opinion that step-by-step renovations should be avoided. On the one hand subsidies are usually better and on the other hand, the quality of the renovation is higher if all measures are implemented at once. In case a step-by-step renovation cannot be avoided, a proper renovation concept should be outlined providing the client with a schedule for implementing the step-by-step measures over time. The goal of the concept should be a comprehensive renovation at last.

E5 for example states, that step-by-step renovation is not a good option because there are no financial savings possible. Such an approach is rather expensive because the renovation costs are currently increasing by 10-12% per year and interest rates are constantly at a level of 0,5% (EI-05).

E1 too pleads for implementing comprehensive renovation due to financial issues and states, that according to a sample calculation by the Energieberatung Salzburg, the amortization of comprehensive measures is reached far earlier than with individual measures in the course of a step-by-step renovation. E1 further states, that the computer-aided consulting tool ‘Sanierungskonzept’ is able to show clients these amortization calculations in a very understandable way. Therefore E1 hopes, that once people understand the benefits, more comprehensive renovation projects are put into action (EI-01).

Question 10.1:

Do you believe that step-by-step subsidies and individual component renovations will be used more often in the future than subsidies for comprehensive thermal renovation?

E3 states, that step-by-step renovation cannot be avoided due to financial reasons and sometimes because of other issues such as the current use of the building or logistics (EI-03).

E4 emphasizes the importance of the correct order of implementing measures and mentions the so-called lock-in effects regarding step-by-step renovations and states the example, that heating systems are often oversized when it is renewed before the thermal envelope is improved (EI-04).

E2 also sees comprehensive renovation as an optimum and states though, that due to financial issues it is often not possible for people to implement those measures. Renovating only one building component though should not be subsidized according to E2 (EI-02).

Question 11:

What improvements or changes should be made in the subsidy system to achieve a higher renovation rate in your opinion?

The experts agree that the so-called funding jungle needs to be simplified.

In Vienna, one goal of the 'RenoBooster' project is also to set up a one-stop-shop for subsidies because there are numerous subsidies from several departments available. E6 thinks, that it is very important to offer one central point of contact for the public, where information about all subsidies regarding buildings, building renovation and building services can be obtained. E6 also states, that the subsidies must be secure in terms of availability. In the past it was often the case, that the funding pot was suddenly empty and people got no funding for their already implemented measures (EI-06).

E1 also identifies the availability of funding as a huge problem. Further E1 states, that this causes turbulence on the market because from the moment on, when funding is available it is very hard to hire professionals for the implementation, because everybody is asking for them at the same time. This also raises the renovation costs. And when the funding pot is empty the demand collapses instantly (EI-01).

E5 on the contrary questions the instrument of housing subsidies for private homeowners at all and is of the opinion, that only public housing objects, which are committing to strict rules regarding financial reserves and not private homeowners should receive subsidies. According to E5 private homeowners want all rights that come with ownership and none of the duties. Therefore, they usually do not care about

building up financial reserves for renovation and then demand, that the renovation of their private property should be funded by the tax payer. Funding should only be available for private homeowners if they really cannot afford the renovation (e.g.: people who live on a minimum pension). In this cases the subsidies should be very high though (EI-05).

Profession Outline Energy Consultant

The teaching objectives for the education of energy consultants are prescribed by the ARGE EBA association since the early 1990s, constantly evaluated and adjusted since then with the goal to create a training standard among all federal states of Austria (EI-01). These questions aim at the opinions of the experts on the status of the current education opportunities and possible adjustments. Further their attitude towards the implementation of a professional title and the prerequisites for becoming an energy consultant should be rendered.

Question 12:

The training to become an energy consultant is regulated by the ARGE EBA association (A- and F-Course). How do you evaluate this training opportunity? In your opinion, is the training sufficient to work as an energy consultant?

All in all, the experts see the ARGE EBA training as a good foundation and sufficient basic education for energy consultants. All of them believe though, that soft skills regarding communication such as the ability to conduct a consultation and break down complex technical subjects for laymen, in order to help them benefit from the consultation, are crucial for being a good energy consultant.

In the federal states of Salzburg and Tyrol, the completion of the ARGE EBA training is obligatory in order to work as an energy consultant for the federal state agency (EI-01), (EI-03). In Lower Austria the ARGE EBA training is not mandatory yet preferred (EI-04).

Question 12.1:

Is there a general need for improvement regarding the training or qualification of energy consultants?

E1 states, that the subject scope for energy consulting is getting more comprehensive with time. Yet the timeframe of the A- and F-course should not be changed because then the training would be as comprehensive as a university study program and this is basically not the intention of the ARGE EBA training (EI-01).

E6 mentions, that according to feedback from several trainees a focus on urban space is requested because the training currently focuses mainly on rural spaces and single-family homes (EI-06).

E2 is of the opinion, that the education program needs to be dusted off a little bit and take into consideration topics, that will occupy energy consulting in the near future such as electrical storage technologies (EI-02). Also E4 thinks, that the education needs to be dusted off al little and should be more interactive (EI-04).

E3 states, that the A- and F-course build a very good foundation, though E3 emphasizes the constant need for further education in order to be a good energy consultant. (EI-03).

Further education of the energy consultants is crucial for all experts. Every federal state offers further education programs that are partly mandatory for the consultants. In Salzburg and Lower Austria for example, there are quarterly meetings for further education and networking. In all federal states the energy consulting agencies constantly provide the consultants with information regarding technical innovations, changes in the funding landscape and so on or hold seminars on current issues.

Question 13:

Anyone can be trained to become an energy consultant. In your opinion, does this make sense or should only people with relevant previous training in construction and/or building technology, such as master builders, architects or building technology companies be admitted to energy consultant training?

The experts agree that it is necessary to have background knowledge in the field of construction and/or building technology or building services. A previous education in these areas is surely helpful to be also a good energy consultant. The intention of ARGE EBA though is, that the training is open to everybody and this attitude is shared by the experts. Several experts further state, that the experience shows, that practically only people with a correspondent former education are actually working as energy consultants, career changers meanwhile are very rare.

E4 for example states, that the ARGE EBA training should be available for everybody because it is a very broad education and it provides useful additional knowledge for several professions. As an example E4 mentions the example of a secretary of an architectural office, who was glad to have done the training because it showed her, what her employers have to deal with and therefore she was able to support them in a more efficient way (EI-04).

According to E3, the expectations of clients regarding the technical knowledge of a consultant are meanwhile so high, that energy consultants have to have a technical basic education (EI-03).

E2 states, that based on experience, people who have no basic education in the field of construction or building services often find it difficult to cope with a consultation. E2 though does not want to restrict access to education because it depends very much on the individual characters, whether they become good consultants or not (EI-02).

E6 represents the same opinion as E2 and E4. Prior knowledge is preferred and necessary to become a good energy consultant, the ARGE EBA training should stay available for everybody though.

E5 is of the opinion, that only for comprehensive renovation consultations it is really necessary to be properly educated regarding building construction and building services. E5 further states, that due to the fact that consultations for renovation projects in the course of funding applications are only allowed to be offered by professionals on the free market, who are as well authorized to calculate energy performance certificates, these professionals should have the required knowledge anyway.

Question 13.1:

There are also academic programs such as the academic energy consultant at Danube University Krems. Does it make sense to academicize the energy consulting training more in order to support the perception of energy consultants as experts in the population?

The experts are not against an academic training program, though the majority questions whether it is really necessary.

E6 states, that the ARGE EBA training takes already a lot of time and an academic program would take up even more time and E6 is not sure, if people are willing to spend that much time on further education alongside their everyday profession (EI-06).

E4 thinks, that the education at Danube University Krems is technically excellent, the main quality of a consultant is though the consulting competence. Therefore, E4 compares an energy consultant to an iceberg. The consultant conveys all the knowledge beneath the surface and the consulting competence, which is the tip of the iceberg, is perceptible for the client.

As E6, E4 is of the opinion, that people are not willing to invest a lot of time in the education.

According to E1 there is a great study program at the University of Applied Sciences in Salzburg called 'Smart Building'. The program deals with all theoretical issues regarding the building. Students, who completed this study program are allowed to take the exam for completing the ARGE EBA F-course in addition, without taking the course, because they are supposed to have gained the knowledge through the study program (EI-01).

Question 14:

Energy consulting is not a protected professional field. In principle, anyone in Austria can call themselves an energy consultant and work as one. In your opinion, is this a problem?

Almost all experts reject the idea of a protected professional title. In their opinion the professionals who are already on the market should be able to provide high quality energy consulting. Some experts state, that it might be possible to implement a protected professional title, though they do not really expect that something will change because of it.

E4 states, that there should be an obligation to have a certain proof of qualification to be allowed to offer energy consulting services, such as the ARGE EBA training. E4 is not sure, if a protected professional title would change something.

Question 14.1:

To what extent could the introduction of a regulated profession establish the position of the energy consultant as an independent expert in the construction or renovation process?

According to E1 a professional title would only cause unnecessary intersections between the professions and is also not wanted by the Chamber of Commerce. This is also the reason, why the calculation of energy performance certificates was attached to the existing professions in the first place. E1 states further, that the issuers of energy performance certificates are theoretically the best suited people to offer energy consulting because of their professional background and therefore, the existing professions need proper training regarding energy consulting within the

primary education. Energy consulting should be for example a part of the curriculum of studies such as Architecture. According to E1 the free market should carry out energy consulting so that the agencies of the federal state could concentrate on information about subsidies or support clients independently if there are residual doubts (EI-01).

E2 also thinks, that a professional title for energy consulting is not necessary and the existing professions should offer energy consulting and should be properly trained to do it. Further E2 mentions, that it would probably be hard to establish a professional title because of the liabilities that come with a professional title. If you already have a professional title it is a lot easier to offer energy consulting because the liabilities are covered by the initial profession (EI-02).

E3 states, that being an energy consultant is never a fulltime job and therefore E3 does not think, that a professional title would be of any use (EI-03).

Collaborations

First the experts are asked to state what independent energy consulting means to them. Further the goal of these questions is to find out, whether the experts appreciate a closer collaboration with executing professionals or not and, how such collaborations could be working and how they would affect the independency of energy consulting services. Another question deals with the scope of energy consulting. The expert's attitudes towards a support by energy consultants along the whole customer chain until the completion of a renovation project is asked.

Question 15:
It is repeatedly emphasized that energy consultants are independent. What does that mean exactly?

All experts emphasize, that product-independent and company-independent energy consulting is a key element and should be free from sales interests.

According to E2, independent consulting means, that the consulting service must strictly be separated from other services, the consultant offers. E2 further states though, that this is difficult to survey because it depends on the honesty of the consultant and is of the opinion, that consulting is still independent, if the consultant calculates the energy performance certificate or even acquires a job from the consulting. Although, only if this is in the best interest of the client and there is no solution, that would fit better (EI-02).

E3 on the contrary is very strict regarding product-neutral and company-independent consulting and states, that energy consulting should provide a basis for decision making and not recommend companies or products or even sell something. Energie Tirol also does not allow representatives from executing disciplines in the consulting team for this reason, only members of engineering offices (EI-03).

E6 summarizes that there are two philosophies regarding the independence of consulting services. Some federal states are very strict about independency and say that consulting must be free from sales interests and others are of the opinion that consulting is not paid very well and therefore it is ok, if the consultants also calculate energy performance certificates for example. E6 states, to tend to strict independency, yet does not know how this will be implemented in Hauskunft in the future because the service is still under development (EI-06).

Question 15.1:

Are consultants allowed to recommend planners or executing companies, for example?

E1 states, that the consultants should not name particular companies or products. Ideally, they should refer to certified lists. such as lists from the Chamber of Commerce or the list of energy performance certificate issuers. E1 further states, that clients are often begging the consultant for names. In that case, consultants should name at least three companies or products (EI-01).

E4 attaches great value to independent consulting as well. Energy consultants should not sell further services or products. E4 states though, that consultants should at least name three different options (EI-04).

According to E2 companies in Styria sometimes complain about the energy consultants taking away their possible orders and have an advantage because they are allowed to offer energy consulting. E2 further states, that it would be preferable if more executing professionals become consultants in order to provide the clients with the best possible solutions (EI-02).

E3 states, that the market is very sensitive about the energy consultants. If consultants would not obey the independency rules, Energie Tirol would hear from it very soon from the professionals themselves (EI-03).

Question 15.2:

In your opinion, does it make sense to establish collaborations with executing companies and planners in order to be able to recommend suitable companies to building owners in the course of energy consulting?

Within the scope of the 'RenoBooster' project, a quality platform for certified companies shall be established in Vienna. The goal is, that clients take up energy consulting with Hauskunft and within the consulting session they are advised to contact the quality platform, which will accompany the clients further in their search for professionals. E6 states, that therefore it is very important to provide clients with a good consulting protocol, which they can use as memory aid when contacting the quality platform. Further it is important, that the quality platform is aware of the purpose of the protocol in order to understand, what the energy consultant was aiming at in the consulting session. A functional network between the consulting agency, the

quality platform and the professionals is crucial according to E6 in order to support people in the best possible way along the customer journey (EI-06).

E2 thinks, that it would be helpful for the clients to have collaborations between energy consultants and professionals, so that they can get everything from one source. E2 further is of the opinion, that the exchange of knowledge among all participants would also create security for the client, because professionals often do not recommend the same measures as the consultants and also sometimes speak badly about them. Therefore, E2 states, that a closer collaboration with professionals as well as constant further education of professionals would be a good idea in order to bring consultants and professionals on a common level, keep the professionals up to date regarding technical innovations and therefore avoid implementing outdated solutions. But E2 also emphasizes, that this is a very difficult venture, because it is difficult to answer the question, which companies are allowed to collaborate in such a network (EI-02).

In Tyrol an initiative called 'Tiroler Sanierprofi' has been established once, where builders collaborated with Energie Tirol. Thereby the professional sent the clients to the energy consulting agency and takes over again after the consultation. E3 states, that this service was not accepted by the clients because they were of the opinion, that the renovation costs would be lower if they pick the companies themselves and not engage a general contractor. E3 on the one hand thinks, that a network of certified partner companies for example would be interesting to establish. On the other hand, E3 mentions, that every network needs financing and if the public sector would not finance the network, the companies themselves would have to. Therefore, the network manager has to acquire orders, which is tricky according to E3, because if acquisition is necessary, the quality may not be the highest goal of the network (EI-03).

E4 states, that there is constant exchange with the professionals. A closer collaboration can only take place on a superordinate level, meaning that professionals should understand, that the energy consultants are supporting the professionals by preparing the field for them. E4 is not of the opinion, that energy consultants should name companies or products (EI-04).

E1 states, that some professionals actually seek the support of the energy consulting agency and further states, that in such a constellation, where professionals and consultants recommend the same measure, the clients are most likely to implement the measures, because they trust them to be best solution. The key according to E1 is, that energy consultants and professionals have to tell the client the same (EI-01).

Question 15.3:

Which requirements would have to be met to become a cooperating company?

E2 is of the opinion, that there need to be requirements but E2 could not tell, which ones (EI-02).

Also E3 states to not have an idea, in which way such a network needs to be established in order to provide clients and companies with benefits (EI-03).

Question 16:

In your opinion, would it make sense for an energy consultant to accompany a construction or renovation project through all project phases up to completion?

E3 is of the opinion, that support by energy consultants in the course of the renovation project would be a good idea but E3 does not think that it would sell. E3 further states, that most people think, that they are capable to supervise the implementation of the renovation measures themselves but afterwards they know better. E3 estimates that about 90% of the people would state after a renovation, that professional support during the execution until the completion is necessary and useful, but not before (EI-03).

E2 thinks that people definitely need more support, than one consulting session of two hours can offer. They also need support in the implementation phase of a renovation project. E2 states, that clients would profit enormously from it but the financing of such a program is the problem, because E2 does not think people would pay for the service (EI-02).

E1 thinks, that supervision of the construction is very important but it is not for the energy consulting agency. The consultants should rather encourage clients to make use of supervision but not do it themselves. E1 states, that also liabilities come with offering such a service and therefore, it is better if this is carried out by the professions that are already authorized to do that, such as architects. Further E1 states, that people do not see the benefit of supervision yet and are therefore not willing to pay for it (EI-01).

The Future of Energy Consulting

The experts are asked about their opinions on topics, that will be important in the future regarding energy consulting.

Question 17:

Which topics will occupy energy consulting in the future? Which areas will become more important or should be included in the range of consulting services?

For E2 and E1 questions regarding mobility are future topics (EI-02), (EI-01).

E5 identifies the use of living space as crucial for the future and states the question, whether old buildings should be renovated or rather teared down and new buildings with a higher density of living space and better energy efficiency should be built instead (EI-05).

Also, E3 is of the opinion that a higher density of living space will be needed in the future and states further, that moving away from fossil fuels and implementing renewable energy sources is the overall goal until 2050 (EI-03).

E6 states, that in Vienna sustainable solutions to replace fossil fuels is important, because in Vienna most of the buildings are supplied with fossil fuels (EI-06).

Several experts are of the opinion, that it is too late to stop climate change and therefore, we need to learn to live with it and adapt our buildings according to the climate change in the future. E4 and E6 mention in this context the problem of overheating during summertime and shading possibilities as important topics for the future (EI-04), (EI-06).

Question 18:

What would be your wishes for the future of energy consulting?

All experts state, that simpler funding possibilities are necessary.

E1 wishes for the professionals to take over some of the energy consulting knowledge and offer it to their clients in order to relieve and support the consulting agency (EI-01).

3.2.2 Interview Questions – Summary of Results

In the following the previously stated results are presented in a short summary. Some interview questions aimed at gaining knowledge or background information about topics such as organization, consulting services, funding possibilities or education programs. These questions could have been answered to a great extent by the literature review (see chapter 1.3), nevertheless they are summarized briefly. Other questions aimed at the experts' opinions. To make these opinions on the discussed issues easily perceptible, a graphic presentation is provided as well in table 4.

Consulting Services

The focus of all energy consulting agencies is on the renovation of residential buildings, especially single-family homes. Raising awareness and providing homeowners with advice on economically feasible and reasonable renovation measures as well as the use of renewable energy sources are key tasks. Consulting services are similar throughout the country. There are three main consulting rails offered by all energy consulting agencies (consulting hotline, office hours and onsite consulting). Those are precepted very well by the clients according to the experts. The use of consulting software is perceived as useful by the majority of the experts. Some though prefer hand-written protocols. The experts agree, that consulting tools need to be evaluated, adapted and improved constantly.

Goals and Achievements of Energy Consulting

All experts are of the opinion, that energy consulting definitely has an awareness raising effect. Determining the concrete energy savings though is difficult according to the majority of the experts since the implemented renovation measures cannot be tracked conclusively. The most important factor for a successful consultation, besides others such as technical knowledge and knowledge about funding possibilities, is the communication competence of the consultant.

Subsidies

In Austria there are several subsidies available for renovation projects (e.g.: thermal retrofit, energy efficiency measures or energy generation using renewable energies) on several levels (e.g.: federal government, federal states, municipalities).

Subsidies are a significant topic during consulting sessions. All experts are of the opinion, that the current funding possibilities are very good from the financial point of view. The whole funding system though needs to be simplified. According to the

experts, the number of subsidies needs to be reduced and centralized funding agencies or one-stop-shops would facilitate processing for all parties involved.

Mandatory Energy Consulting

On the subject of mandatory energy consulting within the framework of a funding application the experts have different opinions. Some experts believe mandatory consulting to be an effective tool in the beginning of a renovation project. This way it is possible to counteract in time and achieve the best solution for the building and the owners. Other experts doubt the success of mandatory consulting on the grounds that obligation could create aversive behavior. From their point of view, raising awareness and providing customers with information is the better approach.

Step-by-Step Renovation

All experts are of the opinion that step-by-step renovations should be avoided. On the one hand subsidy amounts for comprehensive renovation are usually higher and on the other hand, the renovation shows a higher quality. In case a step-by-step approach cannot be avoided, a proper renovation concept should be drawn up.

Profession Outline Energy Consultant

The experts agree that the ARGE EBA training is a good foundation and sufficient basic education for energy consultants. Soft skills regarding communication such as the ability to conduct a consultation or breaking down complex technical subjects for laymen, are though crucial for being a good energy consultant.

According to most experts, the access to the ARGE EBA training should not be limited, though a previous education in building construction or building services is preferred. Academic training is not considered necessary by the experts because there are no real career perspectives for energy consultants. Mainly energy consulting is a secondary profession.

Professional Title Energy Consultant

The majority of the experts rejects the idea of a protected professional title. In their opinion, the professionals already on the market should be able to provide high quality energy consulting.

Collaborations

All federal state energy consulting agencies state on their homepages, that they provide the people with product- and company-independent advice. The experts have been asked, what this means exactly. All experts emphasize, that product-

independent and company-independent energy consulting is a key element of energy consulting and should be free from sales interests. Some experts though are of the opinion that consulting is still independent, if the consultant calculates an energy performance certificate or even acquires a job from the consulting.

The experts further have been asked, if they think that recommending companies or a collaboration with companies during the renovation process would make sense in order to ensure a high-quality renovation standard. According to the experts, customers do not yet consider it worthwhile to be accompanied throughout the entire construction project. There have been attempts in the past, which have not been accepted by the people. In retrospect, most clients recognize the advantages of supervision in general and not only by energy consultants very well.

In the following chapter the opinions and statements found most important are summarized and displayed in a graphic way.

3.2.3 Summary of Expert Opinions

Table 4 shows the most important questions and statements from the interviews and the expert's opinions on them. The explanation of the characters used for rating is provided below table 4.

Table 4: Summary of expert opinions

Question / Statement	Rating
Energy consulting has an awareness raising effect	+ + +
Energy consulting contributes to energy savings	+ + +
Software tools help to ensure a standardized consulting process	+
Successful consulting depends on the consultants' communication skills	+ + +
Financial funding needs to be simplified and centralized	+ + +
Mandatory energy consulting in case of funding application	- -
Energy consulting before a renovation project has the greatest impact	+ + +
ARGE-EBA training is a good basic education for energy consultants	+ + +
Access to ARGE-EBA training only for people with adequate background	-
Academic education programs for energy consulting	- -
Professional title for energy consultants	- - -
Product- and company-independent energy consulting is indispensable	++
Recommending professionals to clients should be allowed	- -

Rating Criteria

+ + +	Overall Approval
+ +	Predominant Approval
+	Scattered Approval
- - -	Overall Disapproval
- -	Predominant Disapproval
-	Scattered Disapproval

4 DISCUSSION

In this chapter the results, that have been obtained in the course of the six expert interviews are compared to each other. Further the differences and similarities of the different statements and opinions are being worked out according to the stated research questions. The results of the expert interviews are also compared to the existing literature. The goal is to outline possible ways of improvement in order for energy consulting services to be more successful in the future.

4.1.1 Foundations of Energy Consulting

The foundations of energy consulting are first of all European laws and regulations, which have been adapted to national law. Austria and all other Member States are legally required to push thermal retrofit and therefore they have to implement measures or incentives for raising awareness among the public and help trigger renovation measures as well as energy efficient energy use. In the building sector in Austria there are two strong political incentives that are intended to accomplish this task. Housing subsidies and energy consulting services. Subsidies provide financial incentives to push the implementation of energy efficiency and renovation measures and energy consulting services impart technical knowledge about these measures and also inform on subsidies. In the course of literature review some challenges regarding the legal foundations for energy consulting as well as subsidies have been determined, which will be discussed in the following.

Housing Law in Austria

In the reviewed literature the regulations in Austrian housing laws are identified by Trebut et al. (2013: 17) as insufficient conditions for energy-efficient renovation and further no continuous modernization obligation can be derived from the current regulations. Especially in multi-story-housing the so-called Tenant-Landlord-Dilemma has a great impact on the implementation of thermal retrofit (EnergieAgentur.NRW 2015).

The experts also believe, that the regulations in housing laws are obstructive in order to push thermal retrofit and would welcome changes to the legal foundations but most of them did not want not mention specific changes. Some experts though stated, that implementing an obligation for thermal retrofit would be a possible way. E1 mentioned an interesting approach on the issue and is pleading for changes in the Condominium Law. The rules on voting could be changed, so that anyone who did not vote actively

against the measures, automatically agreed. In this way, personal rights of objection could be preserved and the chance of implementing comprehensive redevelopment measures increased (EI-01).

E5 contradicts the statement of Trebut et al., that it is not possible to derive a modernization obligation from the current laws by stating, that the legal obligation can be derived very well, but the courts do not interpret the law this way so far, because the right of the individual obviously weighs more than the welfare of all according to available court decisions (EI-05).

In order to implement thermal retrofit in multi-story-housing, most experts agree on the need for better incentives and funding possibilities, so that landlords are willing to consent to the measures because they also profit from the renovation.

Subsidies

Trebut et al. (2013) claim, that funding in Austria is often not taken into consideration when renovating a building because comprehensive renovation is often perceived as a great financial hurdle by building owners and also funding requirements are considered too strict. The interviewed experts also state, that people often do not make use of funding because of these reasons. This problem has its roots within the great number of subsidies and their complex organization according to the experts. The experts also think, that subsidies are financially very attractive at the time (e.g.: subsidy of the federal government 'raus aus Öl und Gas') but the funding system in Austria definitely needs to be simplified in order to be a successful incentive and help pushing thermal retrofit. Subsidies have to be harmonized throughout the federal states, a central organization for subsidies in each federal state should be established and the funding possibilities need to be communicated in an easy comprehensible way.

Further, the experts agree, that technical funding requirements (e.g.: U-values, maximum heating demand) should be stricter than requirements in the building code, because people are receiving a lot of money from the public sector, hence the tax payers, for renovating their private homes.

Trebut et al. (2013) further stated, that in case the building regulations are getting closer to sustainable standards such as the nearly zero-energy-building, the gap between legal requirements and subsidy requirements will close up and funding recipients will undertake greater depths of renovation. Meanwhile the standards in the building code have risen to the nearly zero-energy-building standard. According to the

experts though, people still do not excessively consider implementing comprehensive renovations due to financial issues and reservations about funding. They rather implement individual measures. All experts agree, that averting individual measures is important and necessary, because these kinds of renovations are not sustainable in their opinion and are not contributing enough to reaching the climate goals set by the EU for the year 2050.

In summary it can be said, that the subsidy system needs to be simplified and the existing housing laws need to be changed in order to facilitate the implementation of thermal retrofit.

4.1.2 Energy Consulting in Austria

Energy consulting in Austria is offered by the energy consulting agencies of the federal states. The goal of all consulting agencies is to provide the public with information on energy related topics and funding possibilities, raise awareness among the people and thereby initiate comprehensive renovation measures.

The offered consulting services are similar throughout the country. There are three main consulting rails offered by all energy consulting agencies throughout the country. The quick advice via phone, consulting sessions in the offices of the agencies, which are used for new building projects or distinct questions and the on-site consultation. This is the most comprehensive consulting rail and at the same time the most popular regarding renovation projects. The information about the organization and the offered services have been obtained through literature review and online research. The results are also presented in chapter 1.3.6.

In Vorarlberg the on-site consulting offered by the public agency Energieinstitut is according to E5 limited to a so-called pre-consultation on building renovation due to restrictions of the Chamber of Commerce. The consultants of Energieinstitut assess in the consulting session, if the client needs further advice and then refer them to the consultants on the free market.

In some federal states the on-site consulting is not fully subsidized by the federal state governments. In Vorarlberg, Lower Austria, Tyrol and Styria clients have to pay fees, in all other federal states this service is free of charge. In Styria the fee will be refunded in case the measures are implemented within a year. In Vorarlberg due to the fact, that renovation consultation is handled by the free market, the situation is different. Clients have to pay themselves for the consulting service and get up to 75% of the costs refunded if they are applying for housing subsidies.

The experts are content with the services. Some state, that consulting protocols need to improve in layout in order to support the client in a more efficient way with information. Following on from this, a currently developed computer-aided consulting tool called ‘Sanierungskonzept’ should help to improve the on-site consultation process by automatically providing a comprehensive renovation concept based on a sustainable standard. With this tool it should also be possible to plan sustainable step-by-step renovations, as the measures can be coordinated in the best possible way with the help of the tool (EI-01). Henger et al. (2015) also state in their work, that a renovation roadmap would make it possible to standardize the consulting process regarding step-by-step renovation and thus help establish a uniform, high-quality

consulting procedure on the market. Such a tool apparently is considered in general to support the goals of energy consulting and raise the quality of thermal retrofit. According to E1 the implementation of the tool in Austria will take a while. Although E1 expects a huge success if this tool is also used on the free market by different disciplines and first and foremost the issuers of energy certificates (EI-01).

In summary, the on-site consultation for renovation projects is considered by the experts to be an established, well working and effective tool but, according to all experts, the success of the consultation depends highly on the consultant and his or her ability to explain complex technical issues to client. A tool such as the fully automated renovation concept is perceived as useful, but the communication skills, the empathy and the ability of the consultant to be able to connect with clients and determine their needs and wishes is the most crucial issue for energy consulting to be successful in the end.

Obligatory Energy Consulting

The experts have been asked, whether obligatory energy consulting in the course of funding application would make sense or not. Henger et al. (2015: 15) state, that obligatory energy consulting is not sensible or even feasible because an obligation, which resembles compulsion, would not necessarily increase the acceptance and willingness of households to implement renovation measures. More effective information, incentives, a reliable funding framework and tax incentives for building renovation would be a better way.

On this subject, the experts have different opinions. Two experts think, that it would be helpful if energy consulting was obligatory in order to obtain subsidies and before a renovation project is even put into action in order to be able to get the best possible and sustainable renovation result. At this point it has to be mentioned, that these experts (E2 and E3) have experience with obligatory consulting. In Styria consulting is mandatory in order to obtain subsidies for new buildings (EI-02) and in Tyrol there is, according to E3, an obligation also for renovation projects in case people want to obtain the subsidy from the city of Innsbruck (EI-03). The other experts are convinced, as Henger et al., that obligation is never the right way to get people to do something and prefer voluntary action, which depends on being informed properly. E4 for example would rather implement an obligation to have building plans only issued and not only signed and stamped by authorized persons in order to create high quality in planning and therefore better buildings (EI-04).

4.1.3 Profession Outline Energy Consultant

After reviewing the literature and interviewing several experts from the field of energy consulting, the professional requirements energy consultants have to meet can be summarized in the following way: Energy consultants are challenged on several levels. They are obliged to have sound and comprehensive technical knowledge regarding building construction and building services. Therefore, they have to be familiar with several technical topics such as thermal retrofit measures, building physics, building materials, heating systems, photovoltaics and many more. Further energy consultants need to have a profound general knowledge about subject areas, which are connected to the main consulting subject areas, such as subsidies, legal foundations and requirements, for example the building code in order to capture the consulting topic in a larger and cross-linked context. An energy consultant must as well be able to calculate energy savings and the financial amortization of renovation measures. Yet importantly, an energy consultant has to be able to conduct a consulting interview and be able to and break down complex technical information for laymen. A consultant should be able to identify the needs and wishes of the clients and meet them on their level in order to help the clients to gain as much as possible from the consultation. A consultant also has to be open to all possible technical possibilities in order to be able to provide clients with the best possible solution, that is tailored to their needs. Therefore, consultants have to be willing to continuously educate themselves.

ARGE EBA Training

The teaching objectives for the education of energy consultants in Austria are prescribed by the ARGE EBA association since the early 1990s and aim at creating a training standard among all federal states of Austria. The training is organized by each federal state individually and therefore it is structured differently among the federal states, though the requirements of the ARGE EBA have to be fulfilled.

According to the experts, the ARGE EBA training is a good foundation and sufficient basic education for energy consultants. All experts believe though, that soft skills regarding communication, such as the ability to conduct a consultation and break down complex technical subjects for laymen, in order to help them benefit from the consultation, are crucial for being a good energy consultant, as well as constant education.

Admission Criteria ARGE EBA Training

The qualification requirements for working as an energy consultant for the consulting agencies of the federal states are very similar among the federal states. In most federal states a prerequisite is the completion of the ARGE EBA training. In Tyrol though, it is not possible to become an energy consultant for the federal state agency if someone has not completed a professional prior education in addition to the ARGE EBA training, because according to E3, the ARGE EBA training is not enough anymore (EI-03). The other experts agree, that prior knowledge and education in connected fields are necessary to become a good energy consultant and also are preferred by the consulting agencies, but the ARGE EBA training should stay available for everybody according to the experts. The A-course thereby is intended to provide people from several professional backgrounds with basic information about the subject areas in order to raise awareness. The F-course though is intended for professionals to gain the technical foundations, that are needed to be able to advise clients.

Henger et al. (2015) state, that due to the fact that specialists with different technical qualifications and professional focuses are completing the training programs to become a certified energy consultant, the quality of energy consulting varies widely and according to Feser et al. (2015) improved and standardized training can therefore be decisive for a higher acceptance of energy consulting.

Ultimately it can be stated, that the ARGE EBA training tries to fulfill exactly this task of providing a qualitative high training standard among Austria in order to guarantee a high-quality service throughout the country and, according to the experts, it is an established training standard that is perceived very well. Though whether someone is a good energy consultant can not only be determined by the kind of prior education he or she has completed, because so many other skills are important to be a good consultant and therefore, most of the experts agree on not restricting the admission for the ARGE EBA training.

Academic Education

In the literature the need for academically educated energy consultants cannot be estimated and, in addition, a university degree as an entry requirement would exclude the trades from the profession (Feser et al., 2015). According to Feser et al. (2015) it needs to be decided, whether a diversity of perspectives should be maintained or an academization should be favored, since this can lead to the acceptance of energy consulting.

The interviewed experts are of the opinion, that academic programs for energy consulting, such as the program at Danube University Krems or the program “Smart Buildings” at the University of Applied Sciences in Salzburg are excellent programs for gaining the necessary technical knowledge for working as an energy consultant. They also think, that these programs are too comprehensive and require a lot of time in order to be taken up by people as further education. The extent of the ARGE EBA training (A-course and F-course), which consists in total of 22 days of teaching units, several consultations under supervision, a project work and the exam, is already often perceived by the attending people as too much effort regarding time. The experts also do not think that there is a need for academically educated energy consultants, because on the one hand the perspectives to work as a consultant full time and make a living out of it are not really there and, on the other hand, that many consultants are not needed in order to justify the establishment of an academic program.

In summary energy consulting is perceived by the experts as an additional service, professionals in the planning business such as architects, builders, planners for building services and executing disciplines in building services are intended to offer. An academic program is nice to have for those who are interested, but the experts are of the opinion that if more professionals took up the ARGE EBA training, the effects would be higher, because the professionals are then trained sufficiently in order to recommend and implement suitable energy efficient measures and comprehensive thermal retrofit measures.

Professional Title for Energy Consultants

When reviewing the existing literature, it became clear that the fact, that energy consulting is not a protected professional title is perceived as a problem because the profession is basically open to anyone. The professional background and the scope of activities of an energy consultant are not clearly comprehensible by the client. Therefore, the unprotected professional title leads to confusion and therefore it is difficult to establish the energy consultant as a quality brand. According to Henger et al. (2015: 13), as well as Feser et al. (2015: 139) the public perception of energy consultants is affected by the lack of a professional title.

Almost all experts reject the idea of a protected professional title because in their opinion the professionals, who are already on the market should be able to provide high-quality energy consulting. Some experts are not against the idea of a professional title or a regulated business for energy consulting, but they do not expect a profit from it. According to E1 a professional title would only cause unnecessary

intersections between the professions and is also not wanted by the Chamber of Commerce (EI-01).

According to the statements of the experts and especially according to E5 of the Energieinstitut Vorarlberg, it seems, that the Chambers of Commerce in the federal states are protecting the existing professions from having to give up a share of their working field and losing privileges and benefits.

4.1.4 Effects of Energy Consulting

The methods for determining the effectiveness of energy consulting are critically discussed in the literature. According to Frondel et al. (2008: 99) it is essential to distinguish between gross and net effects when evaluating the effects of energy consulting regarding energy savings. Thereby the net effect of the consulting service consists only of those measures and the resulting energy savings that can be causally attributed to the consulting service over and above the investments that were planned anyway. They further state, that even under the most favorable interpretation the actual effect of energy consulting is quite low.

Several experts stated during the interviews, that it is not possible to determine the exact savings due to energy consulting since it is not possible to track, which measures have been implemented by the clients. According to E5 the effect can very well be derived from the applications for housing subsidy, since the people, who have received energy consulting in general have implemented more and better measures, according for example to the U-values, than people who did not take up on energy consulting. And therefore, E5 states, that the effect of energy consulting on raising awareness is perceptible (EI-05). According to E3 energy consulting would be more effective if used at the right time, in the beginning of a renovation project and not after implementing measures in order to gain subsidies (EI-03).

According to the experts, energy consulting would be more effective if it achieves to create an understanding among the people, that a comprehensive renovation pays off sooner than individual measures. Due to the achieved energy savings, the higher subsidy amounts and the synergies, that are generated when implementing all measures at once. Feser et al. (2015: 135) also state, that professional advice and the subsequent faster amortization of investments can lead to greater acceptance among the population. E1 for example is convinced, that with the currently tested tool ‘Sanierungskonzept’ it should be possible to accomplish the implementation of more and better renovation measures and thus higher energy and CO_2 savings, because people can easily recognize the financial benefit through it (EI-01).

In summary it can be stated, that energy consulting would be more successful in triggering thermal retrofit and energy efficiency measures if the service was able to provide clients with reliable estimations regarding cost savings and amortization time spans. Therefore, clients can comprehend the complex matter more easily, accept the benefits of the measures and are finally more likely to implement them.

4.1.5 Energy consulting in the Process of Thermal Retrofit

In the literature, the view is often expressed that the use of energy consulting over the entire duration of a renovation project can have a positive effect on the quality of the final result and the effectiveness of thermal measures. Trebut et al. (2013: 91) for example state, that it is very important to carry out follow-up inspections after measures have been implemented in renovation projects in order to prevent rebound effects and ensure that renovation measures are actually effective. Also, Feser et al. (2015: 142) state, that energy consulting is mostly limited to the phases of providing information before the renovation. They further state, that it is necessary to perform follow-up inspections in order to evaluate the success or failure of the renovation project and ensure the qualitative and quantitative further development of energy efficiency in the building sector.

The experts are also of the opinion, that in general the support by energy consultants in the course of a renovation project would be a good idea in order to ensure the quality of the implemented measures, but all of them doubt out of experience, that such a service would be accepted by the clients. According to several experts, on the one hand people do not recognize the high potential supervision during a renovation project can have in order to prevent mistakes, because they think they can do it by themselves and, on the other hand clients would not want to pay for this service. The experts also state, that it would not be possible for the public sector to finance such a comprehensive service. E1 also is of the opinion, that it is not for the energy consulting agency to offer support during the construction phase because it comes also with liabilities and therefore E1 suggests, that this service should be offered by the professions, that are already authorized to do it, such as architects for example. The consultants should rather encourage clients to make use of supervision but not do it themselves. (EI-01).

Ultimately it can be stated, that supervision during the construction phase is perceived as important and usefull service by the experts as well as in the existing literature to ensure high-quality renovations, though it is not perceived as usefull by the public yet.

Feser et al. (2015: 140) define as an important factor for a successful renovation the availability of companies that can guarantee the desired quality of the renovation and energy consulting services therefore should operate with an appropriate network to ensure that reliable partners are selected for renovation projects. Energy consultants thereby have a coordinating function in order to ensure a good relationship between the various parties and achieve a balance of the respective interests. The close

collaboration between all parties that are involved in a renovation project is considered to be essential for the success of a renovation project by Downy et al. (2012).

Within the project 'RenoBooster' in Vienna the establishment of such an unbroken customer chain is currently under development (EI-06).

The unbroken customer chain ideally represents a win-win situation for all stakeholders that participate in a renovation process. The client profits from getting the best technical, and at the same time cost-optimized solution and the quality of the implemented measures would improve because companies would have to get certified according to certain quality guidelines in order to join the network and profit from getting orders through the network. Energy consulting could actually concentrate on its main task, which is raising awareness among the people for the need of sustainable renovation and efficient energy use, providing people with a profound basis for decision making and show them the further steps along the customer chain.

5 CONCLUSION

Conclusively it can be stated, that energy consulting generally is a useful political instrument to help reach the climate goals set by the EU by raising awareness and thereby push thermal retrofit and energy efficiency measures. In Austria, the consulting agencies of the federal states help to contribute to this goal by providing the public with a low-threshold high-quality consulting service, that is either free of charge or partly subsidized by the public sector. There are a few critical issues about the organization and direction of energy consulting services in Austria though, that are stated in this final chapter.

5.1.1 Independent Energy Consulting

Product- and company-independent consulting is a central issue for all energy consulting agencies in Austria. A problem arises although from the fact, that executing trades offer energy consulting as an additional service and, according to most of the interviewed experts, are meant to offer it in order to increase the quality of renovation projects. On the one hand, the approach that executing trades should offer energy consulting makes sense, since the professionals probably offer and implement better solutions in terms of construction technology and energy efficiency due to the fact, that they have undergone the ARGE EBA training. On the other hand, however, it is hard to imagine a professional recommending something other in the course of an energy consultation, than what he or she is selling in the main profession. Of course, this is more likely to be the case in the building services sector, where specific systems and products are sold. For example, a company for building services, that specializes in heat pumps will not likely recommend district heating, even if it passes in front of the house.

This is where the energy consulting agencies of the federal states are called upon to prevent this with quality management. Of course, it is difficult to check whether the recommended measures are the best solution for the customer or not because customer surveys, that are conducted by the energy consulting agencies do provide information about customer satisfaction regarding the energy consulting service and the consultant him- or herself but, clients simply cannot evaluate themselves whether the recommended measures are reasonable and sustainable, since most clients are laymen and make use of consulting exactly because of this reason. It is not really possible for clients to tell whether the measures have been recommended only in their interest, or if the consultant generates an advantage for him- or herself.

Independency is not handled very strictly by some federal states, the implementation of suitable and goal-oriented measures seems to be the overall goal. A consulting session should though certainly not result in a sales pitch, but canvassing is not generally prohibited according to the statements of the respective experts. Other federal states are stricter in this respect and do not work with executing professionals as consultants (e.g.: Tyrol and Vorarlberg), also for the reason that disputes between the professionals, the Chamber of Commerce and the consulting agency are to be avoided.

Really independent consulting is only given if the consultant does not even have the possibility to sell a service or a product. A separate profession would therefore perhaps be a way to establish true independence. Due to the predominantly economic interests in the building industry and the construction business, it is not very likely, that it will be possible to establish truly independent energy consulting bodies. A One-Stop-Shop, such as the one, that is currently being set up in Vienna, could possibly be a solution in order to emphasize the independent character of the consulting agency. The energy consulting agency of the federal state hereby is the first point of contact along the customer chain, provides clients only with advice and sends them further along the customer chain to the next stage, for example the one-stop-shop for subsidies or the quality platform, where clients are advised on suitable professionals and planners for their project. However, the various players involved along the customer chain must be well connected and know about the tasks and working methods of each other in order to provide the customer with the best possible service throughout the entire project. When it comes to choosing planners and professionals, a network with certified planners and professionals such as the intended quality platform can help the client choose the right companies and therefore, get the best result regarding energy efficiency, comfort and costs. But of course, this network needs a strict and comprehensive quality management system.

5.1.2 Marketing Measures

In order to increase the awareness among the public for energy consulting, marketing actions need to be increased but not only for energy consulting services but also for subsidies.

5.1.3 Obligatory Energy Consulting

I personally agree with the experts, that obligation should not be the means chosen, though in the context of funding application it could be useful to provide clients with

energy consulting in order to get the best possible solution regarding energy efficiency and emission savings. The most important thing although is, that the consulting service must take place before any measures are implemented or, even before planning has started yet. Therefore, it is suggested, that the application for funding should not be possible, after the renovation project is finished. This way chances are high, that possible mistakes can be revealed and fixed, as well as the quality of the measures can be increased.

5.1.4 Education

The ARGE EBA is fulfilling the task of standardizing and harmonizing the education for energy consultants in Austria and seems to work very well according to the statements of the experts. I have completed the training myself in 2010 and come to the same conclusion. The education is a good basis in order to be able to provide energy consulting but, as all experts also stated, it is very important to constantly further educate one due to the fact that requirements (e.g.: legal, technical or funding requirements) change really fast.

The F-Course should probably only be open for people, who have an appropriate previous technical education in building construction or building technology, because only these people are able to make use of the gained knowledge in their profession.

There is a possible potential for improvement according to the structure of the course. Maybe a modular approach would be possible, where people that come from building construction do not have to take lessons on related topics and building technicians do not need to participate in lessons for heating systems. They all have to take the same exam though in order to prove their knowledge in both subject areas. At the same time the teaching content could be intensified in the two separate modules, so that the depth of knowledge in the unfamiliar subject area is increased after completing the F-course.

5.1.5 Housing Law

A very strong effect on the thermal retrofit rate could have changes to the current laws and regulations, especially the housing laws such as the Condominium Law and the Tenancy Law. The approach of E1 to reverse the voting modalities, so that all votes not cast in the course of a house meeting automatically mean consent would be an approach that is suitable to maintain the individual rights of each apartment owner and at the same time raise the chances for thermal retrofit to be implemented (EI-01).

Another possible way would be to implement obligatory requirements for building renovation within a certain time span. For example, by the year 2040 certain building parts (e.g.: walls, roofs, windows) have to have certain U-values. Therefore, property managers must be given more rights in order to be able to enforce the measures without needing consent of the owners.

These would be measures, that would actually, also according to some of the interviewed experts, help raising the rate of thermal retrofit in Austria. But experience shows that obligatory measures, especially since renovation measures cost a lot of money, are not well received by the public. Obligatory renovation measures are therefore probably difficult to implement from the political point of view.

And last , one important factor, that is essential in reaching not only climate and energy efficiency goals, but all goals a society wants to achieve, is the common interest in the goal. Some experts stated during the interviews, that our social structure plays a key role when it comes to achieving the goals set by the EU for the year 2050. The rampant selfishness of people is a serious problem according to some of the experts. Since people only see themselves and their own interest and advantage but not the common good, it will probably take a long time before the goals are achieved.

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7 LITERATURE

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8 APPENDIX

A. Expert Interview Guideline

Leitfaden Experteninterviews

Energy Consulting in Austria:
Organization, Quality Management and Ways to Improve the Communication between the Involved Parties

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0425403

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1 FORSCHUNGSFRAGEN

1.1 Hypothese

Energieberatungen sollen einerseits über ihre bewusstseinsbildende Wirkung und andererseits über konkrete technische Lösungsansätze, welche dem Gebäudeeigentümer in der Beratung vermittelt werden, zu einer Steigerung der Sanierungsrate, aber auch der Qualität der umgesetzten Sanierungsmaßnahmen beitragen. In der vorhandenen Literatur wird wiederholt hervorgehoben, dass die Untersuchungen zur Energieberatung, speziell die Effekte von Energieberatung, noch nicht hinreichend untersucht sind. Es herrscht jedoch zum Großteil Einigkeit, dass die Energieberatung ein starkes politisches Instrument darstellt, um Energie- und CO_2-Einsparungen und dadurch die EU-Klimaschutzziele zu erreichen.

Es wird in der vorliegenden Diplomarbeit daher die Hypothese aufgestellt, dass Energieberatung ein wirkungsvolles Mittel zur Energieeinsparung darstellt, jedoch Einsparungen weiter voran getrieben werden können durch die Weiterentwicklung bzw. Verbesserung der Energieberatungsleistungen.

1.2 Forschungsfragen

Die nachfolgenden Forschungsfragen wurden im Zuge der Literaturrecherche erstellt und beschäftigen sich mit der Geschichte und der Struktur der Energieberatung sowie den aktuellen Herausforderungen, Problemen und Hindernissen, wie z.B. dem Berufsbild der Energieberater, den rechtlichen Rahmenbedingungen, den Fördermöglichkeiten und der Einstellung der Bevölkerung gegenüber Energiesparmaßnahmen.

1.2.1 Grundlagen der Energieberatung

Durch diverse Klimaschutzabkommen wurde die Energieberatung quasi ins Leben gerufen. Globale Klimaschutzabkommen und Verordnungen auf EU-Ebene bestimmen die Energieeinsparungsziele, welche im Gebäudesektor - neben zahlreichen anderen Sektoren - von den EU-Mitgliedsstaaten erreicht werden müssen. Zu Beginn der Arbeit werden daher die gesetzlichen Bestimmungen, welche als Grundlage der Energieberatung fungieren, erörtert.

1.2.2 Energieberatung in Österreich

Die gegenwärtige Situation der Energieberatung in Österreich soll anschließend dargestellt werden. Wie ist die Energieberatung in Österreich organisiert, welche Beratungsangebote gibt es? Aufgrund des Umfanges konzentriert sich die Arbeit auf Beratungsangebote für thermische Sanierungen im Wohnbereich (Ein- und Mehrfamilienhäuser). Die übrigen Angebote werden der Vollständigkeit halber jedoch kurz umrissen.

1.2.3 Berufsbild Energieberater

Das Berufsbild des Energieberaters wirft zahlreiche Fragen auf, welche in dieser Arbeit behandelt werden sollen.

Ausbildung zum Energieberater

Wer darf in Österreich Energieberater werden? Dürfen nur Angehörige bestimmter Berufsgruppen wie z.B. Architekten, Baumeister, Handwerker etc. die Ausbildung zum Energieberater machen oder steht diese Möglichkeit jedem offen?

Welche Ausbildungsprogramme gibt es derzeit und welche Fähigkeiten vermitteln sie? Gibt es einheitliche Ausbildungsstandards sowie ausreichend Weiterbildungsangebote für Berater?

Wie sinnvoll ist es, die Energieberaterausbildung als akademische Ausbildung anzubieten, um eventuell die Akzeptanz von Energieberatern als Experten in der Bevölkerung zu steigern?

Energieberatung als geschütztes Gewerbe

Die Berufsbezeichnung des Energieberaters ist nicht geschützt. Dies stellt in der Literatur ein großes Problem bei der Akzeptanz der Energieberatung als wertvolle Dienstleistung in der Bevölkerung dar. Bei einem Bau- oder Sanierungsprojekt sind in der Regel zahlreiche Fachplaner und ausführende Unternehmen beteiligt. Die Aufgaben eines Architekten, Baumeisters oder Installateurs sind den meisten Leuten bekannt, die Aufgaben und Fähigkeiten eines Energieberaters hingegen jedoch seltener.

Es soll beantwortet werden, was die Ursachen dieses Problems sind und welche Maßnahmen getroffen werden können, um das Bild des Energieberaters in der Bevölkerung zu stärken. Würde die Schaffung eines eigenen geschützten Berufszweiges (reglementiertes Gewerbe) möglicherweise hilfreich sein?

1.2.4 Effekte der Energieberatung

Das Ausmaß der Effektivität von Energieberatung ist laut der vorliegenden Literatur noch nicht ausreichend untersucht worden, es finden sich dazu unterschiedliche Meinungen. Dass die Energieberatung ihren Beitrag zur Umsetzung der Energieeinsparungsziele leistet, ist jedoch unbestritten.

Es stellt sich daher die Frage, welche Beratungsangebote in Österreich den größten Effekt erzielen und weshalb. Wo gibt es Verbesserungspotential bei den Beratungsangeboten und wie kann dieses Potential ausgeschöpft werden?

1.2.5 Die Rolle der Energieberatung im Bau- oder Sanierungsprozess

In der Literatur wird des Öfteren der Standpunkt vertreten, dass der Einsatz von Energieberatern über die gesamte Projektdauer hinweg einen positiven Effekt auf die Ausführungsqualität und die Effektivität von thermischen Maßnahmen haben kann.

Wie ist die Situation in Österreich? Welche Initiativen gibt es dazu? Gibt es z.B. Kollaborationen mit Planern oder ausführenden Unternehmen?

Wird die Einbindung von Energieberatern im Zuge von Bau- und Sanierungsprojekten in Zukunft verstärkt erfolgen? Welcher Mehrwert kann daraus resultieren?

2. Methode

Als probates Mittel zur Beantwortung der vorhin aufgestellten Forschungsfragen dienen einerseits eine umfassende Literaturrecherche und andererseits qualitative Interviews mit Experten aus dem Bereich Energieberatung.

2.1 Literaturrecherche

Die Grundlagen der Energieberatung sind in der Literatur im Wesentlichen gut dokumentiert und werden anhand der zu beantwortenden Forschungsfragen zusammengefasst.

Zum Thema Ausbildung werden die Ausbildungsprogramme, die in Österreich zur Verfügung stehen dokumentiert und analysiert und anschließend den Programmen in Deutschland gegenübergestellt.

Des Weiteren werden die Ergebnisse verschiedener Studien zu den Effekten der Energieberatung sowie zum Einsatz von Energieberatung über den gesamten Bau- oder Sanierungsprozess zusammengefasst und im Hinblick auf die Forschungsfragen erläutert.

2.2 Experten-Interviews

Um jedoch im Endeffekt Aussagen über mögliche Verbesserungsmaßnahmen (z.B. in Bezug auf die Ausbildung der Berater, die Beratungsangebote oder die Zusammenarbeit mit Planern und den ausführenden Firmen) treffen zu können, sollen Experten aus den betreffenden Bereichen in qualitativen Interviews befragt werden.

Als Experten werden z.B. Mitarbeiter der Energieberatungsstellen der Bundesländer oder der Förderstellen angesehen, da vermutet wird, dass diese Stellen über das erforderliche Wissen zu Beantwortung dieser Fragen verfügen.

2.2.1 Themenbereiche Interviews

Um die Forschungsfragen in Interview-Fragen zu übersetzen wurden Themenbereiche festgelegt, zu denen die jeweiligen Experten befragt werden sollen. Zu folgenden Themenbereichen wurden Interviewfragen entwickelt:

- Beratungsleistungen
- Ziele und Erfolge der Energieberatung
- Förderungen

- Berufsbild Energieberater
- Kooperationen
- Zukunft der Energieberatung

3. Leitfaden Experten-Interview

3.1 Allgemeines / Einleitung

Frage 1:
Können Sie zum Einstieg schildern, welche Funktion Sie in der Energieberatungsstelle innehaben und wie Ihr beruflicher Hintergrund aussieht?

Frage 2:
Können Sie mir kurz die Aufgaben und Organisation ihrer Einrichtung erläutern?

3.2 Beratungsleistungen

Frage 3:
Ich konzentriere mich in meiner Arbeit auf Energieberatungsangebote für die thermische Sanierung von Wohngebäuden. Welche Beratungsangebote gibt es dazu in Ihrer Beratungseinrichtung und welche Zielgruppen sprechen sie an?

Frage 3.1:
Inwiefern unterscheiden sich die Beratungsangebote von denen anderer Anbieter?

Frage 3.2:
Welche Beratungsleistungen werden von den Kunden am besten aufgenommen?

Frage 3.3:
Welche Beratungsleistungen werden weniger gut aufgenommen und warum?

Frage 3.4:
Welche Themen sind für die Beratungskunden am Wichtigsten?

Frage 3.5:
Wo sehen Sie Verbesserungs- oder Veränderungsbedarf bei den Beratungsleistungen, um die thermische Sanierung von Gebäuden voranzutreiben?

Frage 4:
Sanierungsberatungen finden oft beim Kunden vor Ort statt, da das Bestandsgebäude in Augenschein genommen wird. Können Sie mir kurz schildern wie eine solche Energieberatung abläuft? Gibt es einen standardisierten Ablauf?

Frage 4.1:
Sehen Sie Verbesserungsbedarf bei den vor Ort stattfindenden Beratungen? Beispielsweise im Hinblick auf den Ablauf der Beratung, die Dauer oder die

verwendeten Materialien (z.B. Beratungsprotokoll, Informationsbroschüren etc.)?

3.3 Ziele und Erfolge der Energieberatung

Frage 5:
Wie bewerten Sie die Effektivität der Energieberatung in Bezug auf die bewusstseinsbildende Wirkung in der Bevölkerung?

Frage 5.1:
Welche Faktoren sind ausschlaggebend für den Erfolg der Energieberatung?

Frage 5.2:
Vorurteile über die negativen Auswirkungen von thermischen Sanierungen (z.B. Schimmel aufgrund von Wärmedämmung etc.) halten sich nach wie vor hartnäckig. Ich beobachte dies auch häufig in meinem beruflichen Alltag. Wie kann die Energieberatung effektiv dazu beitragen, solche Vorurteile auszuräumen?

Frage 5.3:
Welche Maßnahmen sind notwendig, um das Wissen in der Bevölkerung über die Notwendigkeit von thermischer Sanierung aufgrund der Klimaschutzziele, ihre Wirkungsweise sowie ihre positiven Auswirkungen (z.B. Erhöhung Wohnkomfort, Heizkostenreduktion etc.) zu steigern und so die Akzeptanz von thermischer Sanierung in der Bevölkerung zu erhöhen?

Frage 6:
Die Sanierungsrate pro Jahr liegt unter den Erwartungen der Politik. Einen großen Beitrag zur Erhöhung der Sanierungsrate könnte die Forcierung von thermischen Sanierungen im mehrgeschoßigen Wohnbau leisten. Aufgrund von rechtlichen Bestimmungen (z.B. Mietrecht und Wohnungseigentumsrecht) werden thermische Sanierungen oftmals verhindert. Eine wesentliche Rolle spielt dabei das sogenannte „Mieter-Vermieter-Dilemma“, welches besagt, dass energetisch sinnvolle Investitionen nicht umgesetzt werden, weil der Vermieter langfristig keinen Ertrag erzielen kann, während der Mieter von den Energieeinsparung durch die Sanierung profitieren würde.

Wie könnte man diesem Dilemma entgegenwirken?

Frage 6.1:
Welche rechtlichen Grundlagen müssten angepasst werden, um die Sanierungsquote im mehrgeschoßigen Wohnbau zu steigern und auf welche Weise?

Frage 6.2:
Welche Faktoren verhindern oder erschweren Ihrer Meinung nach außerdem noch die Erfüllung der angestrebten Sanierungsrate?

3.4 Förderungen

Frage 7:
Die Förderung von Bau- und Sanierungsvorhaben ist ein wichtiges Thema in der Energieberatung. Ist die Inanspruchnahme von Förderung das Hauptanliegen?

Frage 7.1:
Zu welchen Förderungen wollen Bauherren am öftesten beraten werden?

Frage 8:
In manchen Bundesländern ist eine Energieberatung verpflichtend für den Erhalt von Fördermitteln. Ist dies Ihrer Meinung nach sinnvoll?

Frage 8.1:
Welche Vor- und Nachteile hat verpflichtende Energieberatung?

Frage 8.2:
Wäre eine verpflichtende Energieberatung im Zuge von rein baubehördlichen Verfahren sinnvoll, um den Bauherren eventuell Anreize geben zu können und somit eine höhere thermische Qualität des Bauvorhabens zu erzielen?

Frage 9:
Die Anforderungen der Förderstellen in Bezug auf die Qualität der thermischen Hülle, die verwendeten Baustoffe sowie die haustechnischen Systeme sind gegenüber den Anforderungen der Bauordnung relativ hoch. Entscheiden sich Bauherren gegen die Inanspruchnahme von Fördermitteln, weil ihnen der technische und finanzielle Aufwand gegenüber dem Nutzen zu hoch erscheint?

Frage 9.1:
Sind die Förderrichtlinien zu streng oder sollten sie eher verschärft werden?

Frage 9.2:
Ist es Ihrer Meinung nach notwendig, die Anforderungen der Bauordnung rasch weiter anzuheben (z.B. Neubauten ausschließlich gemäß Passivhausstandard zu errichten oder noch strengere Anforderungen an die Sanierung zu stellen)?

Frage 10:
Um eine Förderung für die umfassende Sanierung eines Gebäudes zu erhalten ist es oft nötig, thermische Verbesserungsmaßnahmen an mehreren Bauteilen durchführen zu lassen. Oft ist die Durchführung aller Sanierungsmaßnahmen zugleich aus

finanziellen Gründen nicht möglich. Es werden daher auch Einzelbauteilsanierungen bzw. „Step-by-Step“-Sanierungen gefördert. Wie beurteilen Sie diese Förderschienen?

Frage 10.1:
Glauben Sie, dass „Step-by-Step“-Förderungen und Einzelbauteilsanierungen aufgrund der steigenden Anforderungen in Zukunft öfter in Anspruch genommen werden, als Förderungen für umfangreiche thermische Sanierungen?

Frage 11:
Welche Verbesserungen bzw. Änderungen sollten im Förderwesen vorgenommen werden, um Ihrer Meinung nach eine höhere Sanierungsquote zu erzielen?

3.5 Berufsbild Energieberater

Frage 12:
Die Ausbildung zum Energieberater wird durch den Verein ARGE EBA geregelt (A- und F-Kurs). Wie bewerten Sie diese Ausbildungsmöglichkeit. Ist die Ausbildung Ihrer Meinung nach ausreichend, um als Energieberater tätig zu sein?

Frage 12.1:
Besteht generell Verbesserungsbedarf in Bezug auf die Ausbildung bzw. Qualifikation von Energieberatern?

Frage 13:
Jeder kann sich zum Energieberater ausbilden lassen. Ist das Ihrer Meinung nach sinnvoll oder sollten ausschließlich Personen mit einschlägiger bautechnischer und/oder haustechnischer Vorbildung, wie z.B. Baumeister, Architekten oder Haustechnik-Unternehmen zur Energieberater-Ausbildung zugelassen werden?

Frage 13.1:
Es gibt auch akademische Programme wie den akademischen Energieberater der Donau-Universität Krems. Macht es Sinn die Energieberaterausbildung stärker zu akademisieren, um die Wahrnehmung der Energieberater als Experten in der Bevölkerung zu unterstützen?

Frage 14:
Die Energieberatung ist kein geschütztes Berufsfeld. Prinzipiell kann sich in Österreich Jeder als Energieberater bezeichnen und als solcher tätig sein. Ist das Ihrer Meinung nach, ein Problem?

Frage 14.1:
Inwiefern könnte die Einführung eines reglementierten Gewerbes die Position des Energieberaters als eigenständigen Experten im Bau- oder Sanierungsprozess etablieren?

3.6 Kooperationen

Frage 15:
Es wird immer wieder betont, dass Energieberater unabhängig sind. Was bedeutet das genau?

Frage 15.1:
Dürfen von den Beratern beispielsweise Planer oder ausführende Firmen empfohlen werden?

Frage 15.2:
Ist es aus Ihrer Sicht sinnvoll, Kooperationen mit ausführenden Firmen und Planern aufzubauen, um die passenden Unternehmen im Zuge der Energieberatung an die Bauherren empfehlen zu können?

Frage 15.3:
Welche Voraussetzungen müssten erfüllt sein, um ein Kooperationsbetrieb zu werden?

Frage 16:
Wäre die Begleitung eines Bau- oder Sanierungsprojektes über sämtliche Projektphasen bis hin zur Fertigstellung durch einen Energieberater Ihrer Meinung nach sinnvoll?

3.7 Zukunft der Energieberatung

Frage 17:
Welche Themen werden die Energieberatung in Zukunft beschäftigen? Welche Bereiche werden wichtiger oder sollten in das Beratungsangebot aufgenommen werden?

Frage 18:
Was wären Ihre Wünsche für die Zukunft der Energieberatung?

B. Expert Interviews - Transcripts

The transcripts of the interviews are not published due to the protection of the interests and the privacy of the interviewed persons. The transcripts remain with the author and can be requested directly from the author via E-Mail.

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