1. Personal information	
Interviewer	
Interviewee	
Company	
Date	
2. Information phase	
Background This interview is part of a research project in the building energy sector of Germany that is funded by the Federal Ministry of Economic Affairs and Climate Action. One important aspect are the capacities of the craftwork to realize modernization measures in buildings. Therefore, we ask craftwork experts about the realization times for various modernization measures and would like to ask you concerning the building envelope and/or the heating supply system. All collected information as well as personal data will be used for research purposes only and will not be published in detail. After interviewing various experts, an average value is calculated for each measure, which is used in our further analyses. Before the actual start, we would like to ask for your consent to use the received information to the above extent.	
Working hours and example building We would like to document the craftworkers' working hours of a typical building. The roof can be either a flat roof consisting of a concrete ceiling or a pitched roof covered with clay tiles. The building shall have a unheated basement. In general, we would like to record data concerning the man-hours required to carry out the various modernization measures, i.e. how many employees do work how long on a measure. This time should include your mean total effort concerning the following aspects: - Preparation and manual planning - Travel and delivery of the tools and the system(s) - Assembly/installation (implementation of the measure) - Disposal (e.g. old equipment) - If necessary, coordination with other trades/building owners - Acceptance by site management/building owner Aspects that should explicitly not be included in the time: - Waiting times for equipment or tools as well as delivery delays - Delays in the construction process - Additional expenses due to errors of other trades (any kind of supplements)	
3. Data phase	
Question	**Answer**
3.1 Building envelope	
3.1.1 Facade	
How many man-hours does it take to insulate a facade with a composite thermal insulation system in h/m^2	
Can this value be applied to other buildings based on their facade area? If not, why?	
Would the time in h/m^2 change if significantly larger or smaller facade areas than that of a typical building are insulated?	
3.1.2 Flat roof	
How many man-hours does it take to insulate a flat roof in h/m^2	

Can this value be applied to other buildings based on their facade area? If not, why?	
Would the time in h/m^2 change if significantly larger or smaller roof areas than that of a typical building are insulated?	
3.1.3 Pitched roof	
How many man-hours does it take to insulate a pitched roof in h/m^2	
Can this value be applied to other buildings based on their facade area? If not, why?	
Would the time in h/m^2 change if significantly larger or smaller roof areas than that of a typical building are insulated?	
3.1.4 Basement ceiling/floor	
How many man-hours does it take to insulate a basement ceiling/floor in h/m^2	
Can this value be applied to other buildings based on their facade area? If not, why?	
Would the time in h/m^2 change if significantly larger or smaller roof areas than that of a typical building are insulated?	
3.1.5 Windows	
How many man-hours does it take to replace a typical existing window and install a new window with thermal insulation glazing?	
Are there any differences in time when using a window with higher or lower insulation standards?	
Can this value be applied to other buildings based on their window area? If not, why?	
Would the time in h/m^2 change if significantly larger or smaller window areas than that of a typical building are insulated?	
3.2 Energy supply system	
3.2.1 Deinstallation of heat supply devices	
How many man-hours does it take to remove a small gas/oil boiler out of a typical building?	
Do the man-hours change with a larger building or with a larger device?	
How many man-hours does it take to remove a large gas/oil boiler out of a typical building?	
Are there other individual reasons that influence/change this time?	
How many man-hours does it take to replace a single standard radiator and install a new low-temperature radiator?	
3.2.2 Installation of new heat supply devices	
How many man-hours does it take to install a new gas boiler?	
Does the size/power of the device change something in that time?	
How many man-hours does it take to install a new biomass boiler?	
Does the size/power of the device change something in that time?	
How many man-hours does it take to install a new combined heat and power device?	
Does the size/power of the device change something in that time?	
How many man-hours does it take to install a new fuel cell?	
Does the size/power of the device change something in that time?	
How many man-hours does it take to install a new district heating system?	
Does the size/power of the device change something in that time?	
3.2.3 Installation of new heat pump systems and chillers	
How many man-hours does it take to install a new air-to-water heat pump?	
Does the size/power of the device change something in that time?	
How many man-hours does it take to install a new air-to-air heat pump?	
Does the size/power of the device change something in that time?	

How many man-hours does it take to install a new geothermal heat pump without the geothermal collector/probes?	
Does the size/power of the device change something in that time?	
How many man-hours does it take to install a new geothermal collector and connect it to the heat pump in h/m^2collector	
How many man-hours does it take to install one new geothermal probe and connect it to the heat pump?	
How many man-hours does it take to install a compression chiller?	
Does the size/power of the device change something in that time?	
3.2.4 Installation of new solar systems	
How many man-hours does it take to install one PV module on the roof?	
Does the working time per module decrease if more modules are installed, and if so, to what extent?	
How many man-hours does it take to install one solar thermal energy module on the roof?	
Does the working time per module decrease if more modules are installed, and if so, to what extent?	
3.2.4 Installation of new storage systems	
How many man-hours does it take to install a small new thermal water storage?	
Does the size/power of the device change something in that time?	
How many man-hours does it take to install a large new thermal water storage?	
How many man-hours does it take to install a new battery storage?	
Does the size/power of the device change something in that time?	
4. Completion	
Thank you very much for your participation! If you have any questions about the interview or further important information, do not hesitate to contact us.	