

Cooperation Passive House between planners in Korea and Germany

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1 Memorandum of Understanding (MOU)

Currently, the global interest grows to investigate in a "green architecture". Especially in the cities and metropolitan the image of sustainability will be important for private and public companies. Many concepts and certifications for sustainability compete at international level with each other. Especially in Korea, where the focus on the USA is very intensive, it is surprising that interest in the passive house concept is so strong. In South Korea, although there is a highly developed technical building standards, but the actual implementation of passive house parameters are still in its infancy. The formation of a Korean-German Partnership MOU for example the cooperation between the architectural firm HUDIGM with Architekturwerkstatt Vallentin creates a win-win situation for all concerned and promotes the use of the passive house standard.



The MOU agreement was concluded on the 3rd of November, 2010 in Seoul, Korea
In-Suk Ko, Kee-Shik Cho (CEO), Gernot Vallentin, Rena Vallentin

Hudigm is a company in Seoul, Korea, with more than 700 employees that has established a name for themselves in the planning, development and execution of energy buildings. A planner department was founded under the direction of the architect Cho Yoon-Boum, there only task is to manage passive house projects. Some passive homes have already been built and are currently certified by the PHI.

The architekturwerkstatt Vallentin, at Dorfen, Germany plans and cares for many years projects in the passive house standard. The focus is pointed at the symbiosis of the passive house technology with a contemporary design.

The MOU shall support the exchange of different experiences with the passive house standard and shall support the individual projects such as:

- Lectures, seminars and workshops for training the employees of Hudigm.
- Exchange of staff, especially for the detailed design and construction supervision of projects/ visits to Germany.
- Acquisition of joint projects in Korea.
- Development of efficient passive house concepts with respect to regional climatic conditions. The Passive House standard requires a coordinated plan on the climate with regard to architecture and building services: cold winters/ hot and humid summers, the need for active cooling / shading / improvement of the microclimate. There are opportunities for new concepts, such as the use of the enormous solar gains available in the summer and even in winter time.
- Development of a shared understanding of all persons involved in efficient passive house designs and details of the available building materials and passive house suitable components. Avoidance of imports (to avoid long-distance transportation) and the establishment and support of regional companies.
- Developing of a common understanding of all parties, concerning the passive house standard design and construction process, particularly the precision of the calculation basis (PHPP) and quality assurance in the planning and execution phase.

2 Development of joint projects

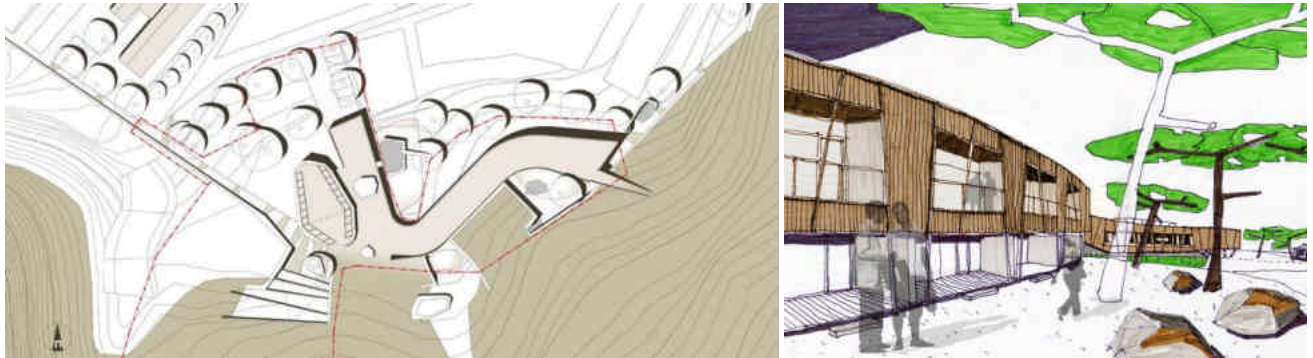
New building of a seminar and youth center in Goesan-Gun, Korea

The Pulmuone company is a Korean firm that produces organic food in Korea for national and international markets. In a separate guest house near Seoul, both employees and interested youth groups, will learn healthy and holistic lifestyle, especially organic food, and training for their preparation. With the expansion of the Academic Building a new building, with a seminar / lecture hall and overnight tract is planned. The client wants to implement a sustainable building concept such as:

- Ecological concept that fulfils both the company's philosophy, as well as the integration into the surrounding nature reserve.
- The building should be planned as a passive house by an experienced planner and will be certified by the PHI in Darmstadt. All planning fields like architecture, building

services, structural design and outdoor facilities shall be brought together by a general contractor. (Architekturwerkstatt Vallentin, Dorfen, Germany).

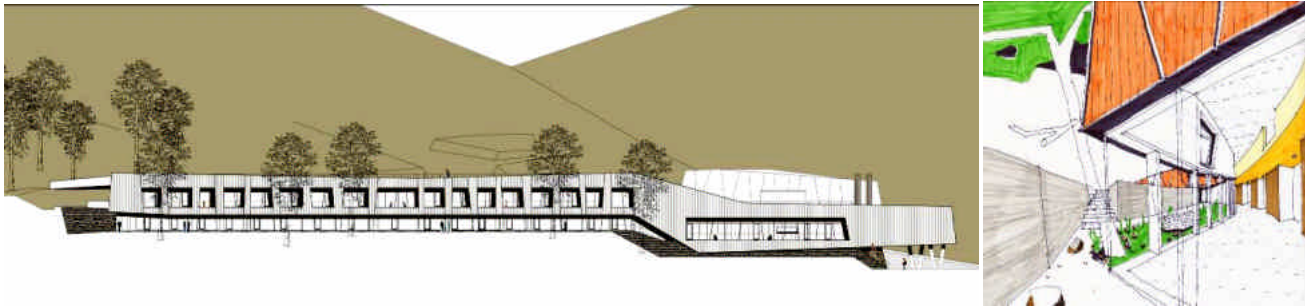
- The design is intended as a "natural design" to express the environmental and technical aspects. The responsibility for our environment and the all year-round comfort in the building is to be experienced by all employees and users.
- Accompaniment by an experienced design and construction company in Korea, which also has experience in constructing energy buildings. (Hudigm, Seoul, Korea)



Site plan and drawing seminars and youth hostel for Pulmuone (©aw vallentin 2010)

Even if the electronic communication makes coordination easier planning over a great distances can only be successful if a close and fruitful cooperation between all parties is given. The MOU facilitates the required close coordination between Hudigm and architekturwerkstatt Vallentin:

- Development of the concept and general planning is done in Germany by the architectural workshop. The coordination for certification is routine. The required climate data will be provided by the PHI.
- Deadline coordination in the planning phase in Korea with the clients and the Cooperation Office is required. These dates are used beside the project work for training seminars and workshops for the employees of Hudigm.
- Coordination of design and planning with national and regional standards and regulatory requirements by Hudigm. Thus, the mandatory installation of a sprinkler system and a transformer station in the building can not easily be integrated in the passive house planning, because of the enormous size of water tanks and electric units. Furthermore specialities concerning calculations, slope height of ramps and fire protection requirements are to be taken into account. The use of the "ondol" (= floor-heating) in Korea is traditionally required also in a passive house.
- The transfer of the planning takes place in the detailed design. Vallentin compiles the necessary reference details, while Hudigm compiles the actual execution plan.
- The supervision of construction and the construction itself lies is in the hands of Hudigm. Some site dates from Vallentin are necessary for the final vote.



View seminar and youth center for Pulmuone (©aw vallentin 2010)

Design of Passive House concept in cities and metropolitans

Skyscrapers in Seoul are usual buildings. The development of high-rise buildings in passive house design shows considerable potential, as already shown in investment cost savings. Holistic ecological concepts, including a city landscape and an improved micro-climate are attractive concepts.



Passive Houses in the sky ...upon a natural urban landscape (©aw vallentin 2011)

3 Support for current Korean projects

Example: New building of the ornithological clinic in Cheorwon, Gangwondo Korea

In this project at a late stage of realization the modification of the façade was necessary because of the clients request. This had a lot of influence to the passive house standard.

- Discussion of the work planning and advice about detailing, especially concerning the base points and other terminal points.
- Discussion and advice about the conduit management of the housing technology in particular the air conditioning and heating. The concept for heating the entire building was not conclusively solved, since not all rooms could be heated by heating facilities. By the expansion of the Ondol in the entire building, this weak point was corrected.
- The planned installation of an extremely disturbing porch was deleted, because in places with constant visitor traffic a wind screen makes anyway no sense.

- By restructuring of the facade the exhibition rooms could be arranged more generous and the wall opening could be moved to an energetically optimal position. The attic now encloses the balcony, and thus on all sides clearly defined walls are given.



Building site of the Ornithological clinic in Cheorwon, Gangwondo Korea (Photos Yoon-Boum Cho)

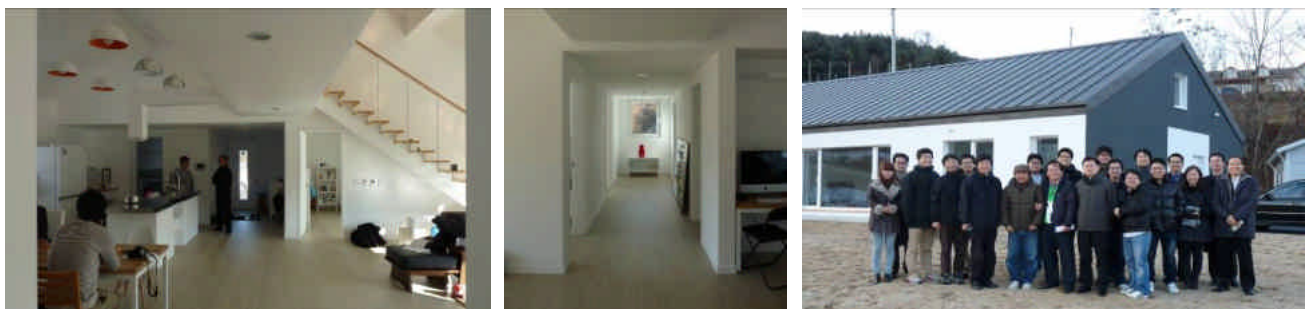
Technical data of the Ornithological clinic

Floor area:	285 m ²
Special Space Heat Demand	15 kWh/m ² a calculated according to PHPP
Special Primary Energy Demand	116 kWh/m ² a calculated according to PHPP
air tightness test	not executed
Building construction cost	€ 362.000

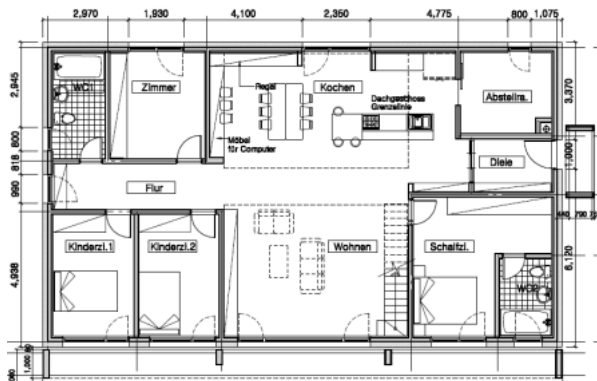
Example: Residential in Dunnae, Korea

This building was supposed to be the first certified passive house in Korea, but then problems delayed execution and completion. Since the exporting construction company had difficulties with the proper installation of windows, therefore Hudigm together with the manufacturer organized a seminar for the installation of windows. In this way expertise was passed to many in passive house interested persons. For this persons verifiable results on the efficiency of the system must still be delivered.

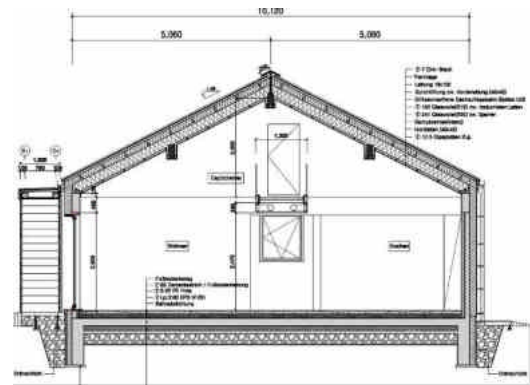
- Discussion on work planning and about detailing, especially on the base points and other terminal points.
- Discussion and advice about the conduit management of the housing technology, in particular the ventilation system.
- Training of the Korean employees during installation of the passive house windows within the framework a specially organized seminar.



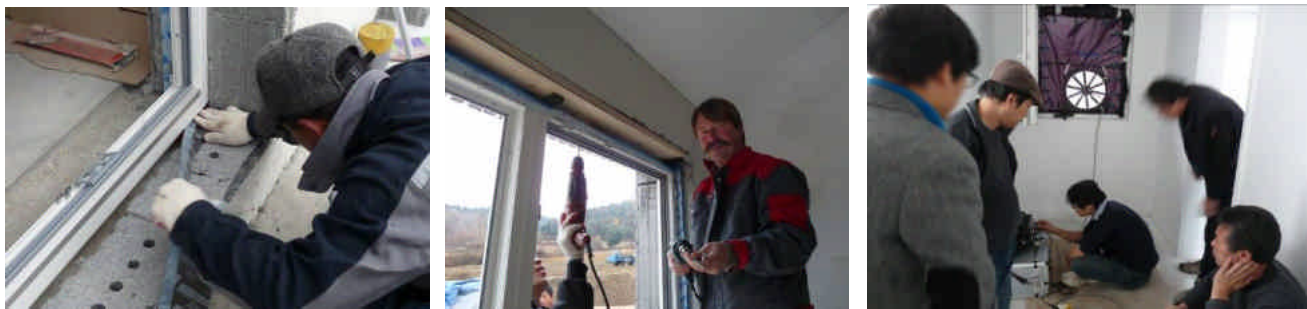
Residential Building Dunnae, Hoeingseong, Gangwondo, Korea (Photo Yoon-Boum Cho)



Ground floor plan (© hudigm 2010)



Detail section (© hudigm 2010)



window seminar at the building site in Dunnae (Photos Yoon-Boum Cho)

Technical data of the Residential Building Dunnae

Floor area:	178 m ²
Special Space Heat Demand	13 kWh/m ² a calculated according to PHPP
Special Primary Energy Demand	94 kWh/m ² a calculated according to PHPP
air tightness test	0.18-h not executed
Building construction cost	€ 165.000
Total construction cost	€ 228.000

4 Outlook

The passive house will be spread with the help of planners communities effectively and quickly throughout the country. For Korea, this means that the passive house standard is safe and easy to implement, thus Korea will be in the field of energy building technology up to date. Hudigm has the intention to get a certification body for Korea.



The finished passive house (Photo Yoon-Boum Cho)