SUMMARY

The habilitation thesis of the undersigned, Associate Professor Manea-Andrei DAMIAN, of the Technical University of Civil Engineering Bucharest, summarizes my scientific activity from the last 17 years after sustaining the PhD thesis, on 11 July 2003, and granting the PhD in Civil Engineering (Génie Civil) by the Technical University of Civil Engineering Bucharest and by the La Rochelle University (France), based on a joint-degree type of agreement signed between the two universities.

The summary of my research activity presented in the habilitation thesis focuses on the two major directions of research addressed throughout the professional career, respectively:

A) Thermal comfort and air quality in buildings and indoor environment, and

B) Methods for increasing energy efficiency in buildings and related installations, by using heat recovery systems, cogeneration/tri-generation systems and systems using renewable energy sources

The direction of research A) focused mainly on scientific contributions based on both theoretical research, using mathematical models whose solutions were obtained by advanced numerical methods, as well as experimental investigation, which referred to the transfer of gaseous pollutants into ventilated indoor spaces, to the physico-chemical interactions between them and the building construction materials (adsorption-desorption phenomena), to statistical models for predicting the indoor concentrations, as well as to the impact of certain systems for ensuring the thermal comfort on the indoor air quality. The selection of the articles that have been fit for this direction of research includes four articles published in WOS Thomson Reuters indexed journals, with an impact factor higher than 1, and three articles published in indexed journals belonging to recognized scientific databases (BDI ProQuest and EBSCO). This direction of research naturally followed the research topic addressed in the PhD thesis (zonal modeling of air quality for ventilated premises), as well as the teaching career developed at the Technical University of Civil Engineering Bucharest, Faculty Of Building Services, oriented towards teaching of courses, seminars and practical works related to indoor thermal comfort, indoor air quality and ventilation and air conditioning installations in buildings.

The direction of research B) focused on evaluating the energy performances of buildings and related installations, integrating renewable energy sources in buildings and using alternative energy production systems, such as cogeneration/tri-generation systems. In this context, the author's activity was much more intensive in relation to the direction of research A), offering a justification for his wish to apply for obtaining the Certificate of Habilitation in the field of Energy Engineering. Three articles resulted, published in WOS Thomson Reuters indexed journals (one with an impact factor higher than 1) and 25 articles in WOS Thomson Reuters indexed conferences volumes and in journals and conferences volumes indexed in scientific databases (BDI) internationally recognized (SCOPUS, ProQuest, EBSCO, Index Copernicus or SpringerLink).

All published articles that were mentioned can be found in the habilitation thesis submitted by me to the PhD School of the Politehnica University of Bucharest.

In the last section of the habilitation thesis, I addressed the future research perspectives and the directions of evolution of the professional career from a scientific point of view. These perspectives are related to extending the knowledges concerning the energy performance of buildings to a higher level, which include a complex urban environment with all that implies it as a built space and its functions with energy impact: buildings, road

infrastructure, waste collection, energy urban transport networks. All this integrated features, managed efficiently and smart at the local level, may lead, depending on criteria well established by law and other regulations, to the status of "Smart City". I believe that the researches that need to be performed in order to define, create and implement the requirements of the Smart City in Romania are still in the pioneering phase, and my actual experience related to energy efficient and smart managed buildings (generically called "Smart Buildings") will be proven useful and must be capitalized. At our country's level, the creation of Smart City urban centers becomes a necessity, considering that the increasing number of inhabitants and comfort requirements obviously involve a substantial increase in energy consumption, the degree of air pollution and the volume of household waste to be sorted and collected. My wish is to contribute, through researches performed in the direction of the construction of smart buildings and respectively smart cities, in a short and medium term future, to motivate local and central public authorities and the general public to support and successfully implement these concepts in Romania.

The habilitation thesis concludes with a list of bibliographic references consulted by me in the scientific activity of research and elaboration of the published articles.

Date :
15,06,2020

Signature :