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A new comprehensive evaluating method for assessing the sustainability credentials of the central air-conditioning system

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A new comprehensive evaluation method for assessing the sustainability credential of central air conditioning systems has been developed. The parameters of costs (energy consumption costs, economic running costs and environmental impact) and benefits (indoor air quality and thermal comfort) are used for the evaluation. The parameters are then ranked with an index value for each component that make up the air-conditioning system and the total index value (K) would be used for the overall evaluation. The feasibility of the method is illustrated by three case studies. The evaluation index can identify shortcomings of components in the air-conditioning system and to identify the relative environmental impacts and costs as well as the performance in using the system. The evaluation index would thus allow designers and building managers to target performance improvements and guide designers to optimize functions in terms of costs and benefits to minimize environmental impacts. The index method would provide a rating classification of air-conditioning systems for standard specification and selection in terms of cost effectiveness for appropriate building service required.

Experience:

Prof Chuck Yu is the Editor-in-Chief of the SCI journal Indoor and Built Environment, Chairman of the International Society of the Built Environment (ISBE), also an Overseas Distinguished Professor and an Honorary Professor at Xi'an Jiaotong University. He previously worked for over 20 years at the Building Research Establishment (BRE) in the UK. During his time at BRE, he contributed to BREEAM, BRE Digest and Best Practice Guides on: stratospheric ozone depletion, control of pollution at construction sites, materials emissions and indoor air quality (IAQ); as well as EIA (Environmental Impact Assessment) issues relating to surface water quality and sustainable urban drainage systems (SUDS). He contributed to CEN TC88 standards for thermal insulating plastic foams and validation of CEN and ISO standards for determination of VOC emissions from building materials and indoor air quality. During the past 8 years he has been collaborating with various universities in China, particularly in Hunan Province, on various researches on built environment and environmental engineering, such as HVAC and natural ventilation. At Xi'an Jiaotong Univeristy, his research is mainly on outdoor air pollution and preservation of ancient relics.