

Business Model Analysis of Geo-TABS Buildings with Predictive Control Systems

Qian Wang ^{1,2} and Suleyman Dag ²

¹Division of Fluid and Climate Technology, Department of Civil and Architectural Engineering, KTH Royal Institute of Technology, Brinellvägen 23, 100 44 Stockholm, Sweden

²Uponor AB, Hackstavägen 1, 721 32 Västerås, Sweden
qian.wang@uponor.com

Abstract. This paper investigates the conceptual framework and impacts of business models (BM) in model predictive control (MPC)-based geothermal *Thermally Active Building System* (Geo-TABS). The analysis is done by compiling technical, political, economic, social and environmental analytical frameworks of MPC Geo-TABS. The elements of the business model Canvas are identified and analyzed in this application. Theoretical bases of business model generation are verified by substantiating arguments and potential profit analysis for stakeholders via four demonstration buildings. The focused building types/cases involve office building, schools, elder-care houses and multi-family house. Methods to verify the proposed value propositions in the BM are given special interests. The results show that correctly sizing and combining the four major components: MPC, geothermal, TABS and suitable building types, are the core in both technical and business development perspectives. Complete design guidelines are crucial for promoting MPC Geo-TABS business in its service chains. Transforming the conventional economy-oriented business development method to holistic sustainability-oriented profit matrix can further strength the value propositions of MPC Geo-TABS. The findings aim at supporting decision-makers and further improving engineering guidelines in implementing MPC based Geo-TABS in a larger scale in Europe.

Keywords: Business Model, Geo-TABS, MPC, Sustainability, EU Buildings