Development of optimal H_2 supply network model with facility location problem

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Since H_2 has gradually drawn increasing attention in various sectors such as industry, transport, etc, how to produce and distribute them economically and safely is an eminent issue. This study addresses design of Optimal H_2 supply Network Model which considers facility location problem. The proposed H_2 supply network model allows us to determine where and how much produced H_2 to be stored at apt local storages, where to build and transport, and where and how to share physical form of H_2 on the purpose of maximizing the total net profit of handling a given demand of H_2. Especially, this study addresses not only changeable demand with respect to two H_2 physical forms –compressed gas, liquid– on each region, though total H_2 demand on each region is fixed, but changeable inventory together with two H_2 physical forms, not previously addressed in the literature in spite of important issue. We also address the impact of demand's fraction served from production facilities according to local selling price of H_2. The applicability of the proposed model will be demonstrated by a case study of Korean H_2 supply network with some remarks. The gained results aid determining policy to plan in the budget of supplying H_2.