

Essays on tariff structures for water related utilities multiple objectives in critical situations

Summary

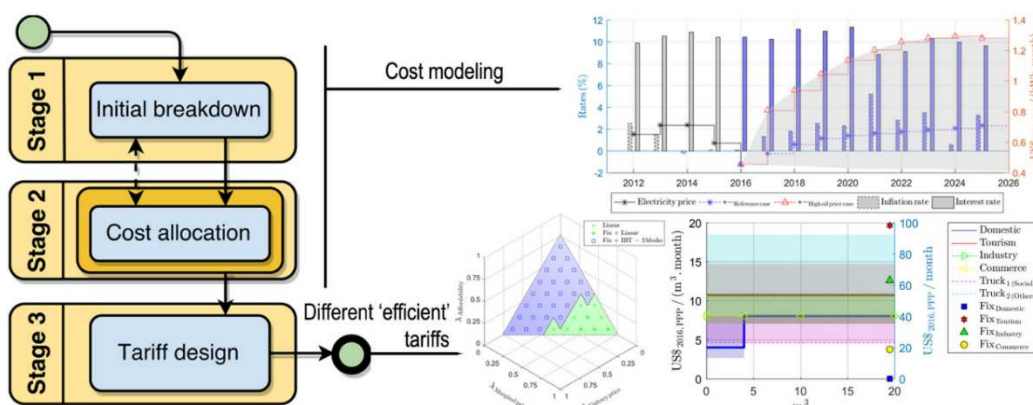
Water tariffs are a powerful management tool that require their components to strike a balance between multiple objectives of water supply and sanitation services. However, those objectives present important tradeoffs that are context specific and become highly complex under extreme sustainability situations and regulatory demands. For that purpose, and since the tariff setting process may be found lacking due to, namely, politicized viewpoints, the rationale to adopt general guidelines, or regulatory recommendations, is explored. Nonetheless, due to case specificity, there is a requirement to assess diverging objectives, being important to measure 'what matters' to promote a sound regulation. For this objective, a regulatory tool is set, based on multi-criteria decision analysis method, to provide a requisite framework able to consider the multiple dimensions of water tariffs, as well as the assessment of specialists, practitioners and other legitimate stakeholders in the 'tariff structure setting' decision making process.

Furthermore, to cope with those increasingly demanding objectives, water utilities may have to resort to innovative tariff solutions, and thus, the inclusion, or adjustment, of tariff structure components is paramount not only to counter the problem directly from the 'demand side', as in situations of resource scarcity, but also the 'supply side', assessing the feasibility of different technological solutions, as in the adoption of alternative sources of water. To reach such an objective a framework for suitable prices is developed is built, based on a multiobjective optimization model, to deal with diversified requirements (e.g., energy costs, affordability, cost recovery, or administrative simplicity). Different situations are assessed using this tool. First, a case of resource scarcity where the tariff structure is fixed a priori and the customers price elasticity is considered. Second, an instance where different desalination investments are considered but the tariff structure is not fixed, allowing to provide a significant perception of possible revenue options (and their impact) to the decision makers.

Finally, since revenue options, and the role of tariffs therein, are critical for project implementation and are often inappropriately assessed, a framework is devised for preliminary consideration of reuse options, and associated funding structures, within a variety of physical and socioeconomic circumstances. The mentioned outputs allow to measure tariff suitability and to build tailored tariff policies, within their useful life time, i.e., considering that all policies have to be adjusted / updated to the current challenges.

Keywords

Tariff structures, water utilities, sustainability, multiple objectives, decision-making tools.



Tariff design considering cost stochastic variables and the achievement of different tariff objectives.



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