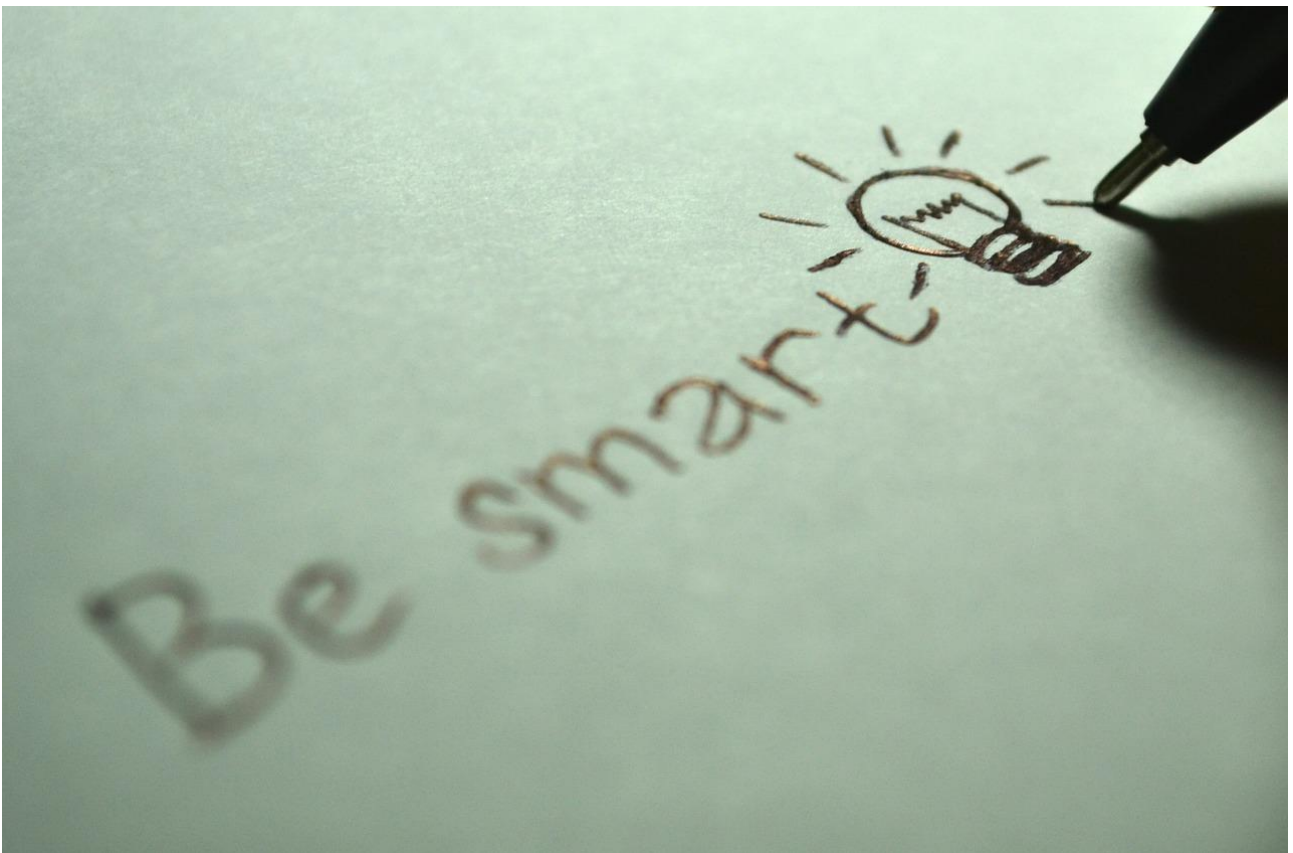


## Comparative analysis of standardized indicators for smart sustainable cities: what indicators and standards to use and when?



The choice of the most suitable indicator framework is crucial, but difficult, as it requires expert knowledge. To help cities in their choice, this paper compares seven recently published indicator standards for Smart sustainable cities.

The world is seeing a constant growth of population in cities. Cities must be prepared to handle growth and transform their environments and residents. This challenge is becoming extremely crucial and citizens worldwide are becoming more and more familiar with the concept of smart city. Over the past years, this smart city model has changed and evolved towards a more users-centric and collaborative approach. **Today's smart cities are connected, networked, and collaborative and the cooperation between government, businesses, academia and the civil society is becoming vital.**

The spotlight is slowly but constantly shifting from connecting infrastructures to connecting people with the final aim to improve the services and the quality of life or rather to create liveable environments where people and businesses can thrive. Increasingly, cities are putting data in the hands of end users to drive better decision-making. These changes lead to a more democratic management of cities and upend the conventional roles of institutions and citizens. With the concept of smart city changing so fast and becoming of crucial importance, to help policy makers in their decision-making process. **Despite technology is still – and always will be – at the core of the smart city paradigm, the success of tomorrow's smart cities will be evaluated by a number of indicators to measure the impacts and provide decision makers with guidelines to improve their cities' environments.**

**City managers need indicators for target setting, performance assessment, monitoring, management and decision-making purposes.** The choice of the most suitable indicator framework is crucial, but difficult, as it requires expert knowledge. To help cities in their choice, **this paper compares seven recently published indicator standards for Smart sustainable cities.** A taxonomy was developed to evaluate each of their 413 indicators against five conceptual urban focuses (types of urban sustainability and smartness), ten sectoral application domains (energy, transport, ICT, economy, etc.) and five indicator types (input, process, output, outcome, impact). The results clearly discriminate between indicator standards suited for evaluating the implementation of predominantly smart city approaches versus standards more focused on sustainability assessment.

A further distinction is possible in standards almost fully oriented towards impacts reached, and standards that allow for progress evaluation according to steps in the implementation process. Some standards provide a narrow focus on output indicators evaluating the progress in implementing smart urban ICT solutions (e.g. number of smart meters installed). Cities are encouraged to complement such evaluations with impact indicators that demonstrate the effects of those solutions. **This paper provides guidance for city managers and policy makers to select the indicators and standard that best correspond to their assessment need and goals and align with their stage in Smart sustainable city implementation.**

To learn more you can upload the [full publication here](#).