

## **A Digital Twin Approach for Sustainable Territories Planning: A Case Study on District Heating**

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**Abstract :** The energy planning process is a very complex task that involves several stakeholders and requires the consideration of several local and global factors and constraints. In order to optimize and simplify this process, we propose a tool-based iterative approach applied to district heating planning. We build our tool with the collaboration of a French territory using actual district data and implementing the European incentives. We set up an iterative process including data visualization and analysis, identification and extraction of information related to the area concerned by the operation, design of sustainable planning scenarios leveraging local renewable and recoverable energy sources, and finally, the evaluation of scenarios. The last step is performed by a dynamic digital twin replica of the city. Territory's energy experts confirm that the tool provides them with valuable support towards sustainable energy planning.

**Keywords :** climate change, data management, decision support, digital twin, district heating, energy planning, renewables, smart city

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