

## **Industrial Implementation Issues of Total Site Heat Integration**

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### **Summary**

Heat Integration has been a well-established energy conservation strategy in the industry. Total Site Heat Integration (TSHI) has received growing interest since its inception in the 90s. The methodology has been used with certain simplifications to solve TSHI problems. This paper investigates the main issues that can influence the practical implementation of TSHI in the industry. The main aim is to provide an assessment and possible guidance for future development and extension of the TSHI methodology from the industrial perspective. Several key issues have been identified as being of vital importance for the industries: design, operation, reliability/availability/maintenance, regulatory/policy and economics. Design issues to consider include plant layout, pressure drop, etc. For operation, issues such as startup and shutdown need to be considered. Reliability, availability and maintenance (RAM) are important as they directly affect the production. Relevant government policy and incentives are also important when considering the options for TSHI. Finally, a TSHI system needs to be economically viable. This paper highlights the key issues to be considered for a successful implementation of TSHI. The impacts of these issues on TS integration are summarised in a matrix, which forms a basis for an improved and closer-to-real-life implementation of the TSHI methodology.

### **Main Findings**

Several key issues that have influence on TSHI solution have been identified. The impacts of these issues on TSHI have been specifically highlighted in two examples. The relevance of these issues to the targeting and optimisation stages of the TSHI is shown in Fig. 3. By considering these issues, design, operations, RAM, regulatory and policy and economics, in the early stages a closer-to-real-life TSHI solution can be derived for implementation. This approach provides more insights to TSHI design from the industrial perspective. The development of the TSHI methodology to incorporate those quantifiable issues and those issues which are to be qualitatively assessed is the subject of future work by the authors. So far, the issues have been analysed for industrial units type TSHI, however the methodology should be extended for TSHI including services, businesses, residential and even agriculture units – locally integrated energy sector (LIES) – introduced by Perry et al. This is going to be the subject of future studies on TSHI.