

A three-tier evaluation approach for chemical industry: how does it contribute to SDG globally, industrially and locally

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Submission Category:

(B) Indicators to measure the impact of chemical engineering on the SDGs.

SDGs Targets/Indicators:

All 17 Sustainable Development Goals and 169 SDG targets are covered in our proposal.

Abstract:

Chemical engineering (ChE) has its essential position in the global supply chain, covering the fields of energy, food, materials, medical, transportation and environment, which is closely related to almost all industries. However, adverse impacts of chemical industry would also inevitably cause public concern such as Chemophobia. Thus, chemical industry would play an important role in achieving UN sustainable development goals. There is a knowledge gap of how to evaluate its contribution. A holistic assessment approach would not only enhance the sustainable production and consumption for practitioners in this industry, but also bridge a public-friendly channel to the society, branding chemical industry and its impacts accessibly, comprehensively and scientifically. We propose a three-tier evaluation approach for chemical industry to measure how chemical engineering (industry) could contribute to SDG at the global, industrial and local level. Globally, we categorize the impacts of ChE - both positive and negative - to match 169 SDG targets and then to indicate the chemical relevance of 17 SDGs. Further, a quantitative evaluation will be conducted by coupling SDG indicator framework and GMRIO model (Global Multi-Regional Input Output), covering both consumption- and production- perspective. Industrially, the indirect impacts of chemical industry to SDG will be assessed by network analysis in SDG-GMRIO framework. Locally, as the industrial park are considered as a great grasp for policy governance, a SDG Aligned Indicator Library for Industrial Park would be proposed by organizing the existing indicator sets: to provide SDG advantage for local decision makers and to offer the friendly showcase to the public. Then we will actively pitch and brand our ideas to academic and industrial association as well as industrial parks and seek their partnership to conduct case studies and to further broadcast the relevance and significance of SDG and chemical engineering to the public.

¹ Four team members and the supervisor are all from Department of Chemical Engineering, Tsinghua University. Mr. Meng JIANG is a PhD candidate. Mr. Minghao XU and Mr. Zijian REN are PhD students. Ms. Xin CHEN is a master student. M.J., M.X., X.C. and Z.R. designed and wrote the proposal. M.J. led the literature review and modeling. M.X. led the questionnaire survey and SDG analysis. X.C. led the experts interview and industrial parks part. Z.R. led the brainstorming and organizing the research plan.

Graphical Abstract:

