

Evaluation of sustainable carbon monoxide production via electrochemical CO<sub>2</sub> reduction reaction

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Carbon monoxide is one of the most significant chemicals as a base material of chemical industrials. However, a conventional production process of carbon monoxide causes a high amount of CO<sub>2</sub> emission, which causes climate change. Electrochemical CO<sub>2</sub> reduction based technology is proposed as one of the ways to replace the conventional process. In addition, this technology is a feasible and sustainable technology where both CO<sub>2</sub> utilization and storage of the excess electricity from renewable energy power plants simultaneously. In this study, new processes of the technology using an electrochemical reaction is proposed and designed. For a comprehensive and comparative assessment of the environmental and techno-economic performance of this CO<sub>2</sub> capture and utilization option, CO<sub>2</sub> lifecycle assessment (LCA) and techno-economic analysis (TEA) are conducted.