Climate change is one of the greatest challenges of our time. All industries must drastically reduce their carbon footprint to limit global warming. To meet the Paris Agreement, Dow Terneuzen aims, by 2050, to cut its CO₂ emissions to more than 80%. This PDEng project provides a recommendation for a long-term strategy towards this goal.

The production site of Dow Terneuzen is one of the largest energy consumers and CO₂ emitters in the Netherlands. To decrease its emissions to more than 80%, large modifications and investments are required. Various combinations of technologies for CO₂ reduction are analyzed. These technologies must be implemented step by step. The time schedule for implementation highly affects the economics and the speed by which CO₂ emissions can be reduced over time and is affected by many factors. A computer model is developed and used to compute over 20 million different scenarios, from which the optimal combination of technologies and planning for implementation can be selected. This approach allows to be used for other production sites as well.

The result of this project is a recommendation for the best technologies for CO₂ reduction of Dow Terneuzen and a planning for implementation of these technologies over the period 2018-2050.