

Carbon Dioxide: Containment Issues, Effective Management and Optimal Use In Iran

Ahmad Shaabani^{1,*}

Iran has emitted over 20 billion tons of carbon dioxide by the year 2024, ranking sixth globally with a 2% share of total emissions. It is estimated that power plants consume approximately 71 billion cubic meters of gas annually, releasing 118 million tons of carbon dioxide into the atmosphere. The economic value of these emissions is roughly equivalent to Iran's total petrochemical exports, which is \$11.8 billion. Additionally, considering that one ton of carbon dioxide is emitted for every ton of cement produced, and Iran's annual cement production stands at approximately 72 million tons, the economic value of carbon dioxide emissions in this sector is estimated to be \$7.2 billion. In addition to the economic value of carbon dioxide, it seems essential to control and manage the emission of this gas from the perspective of social responsibility, environmental considerations, climate change, legal requirements, and possible future restrictions on the sale of carbon-based products. Carbon dioxide is a valuable resource with wide and diverse applications in the food, chemicals, petrochemicals, pharmaceuticals, construction, refrigeration industries, and most importantly in enhancing oil recovery (CO₂-EOR). Given its economic and industrial value, adopting effective strategies for carbon dioxide management and utilization is essential. This article explores the status of carbon dioxide emissions in Iran and globally, examines methods for its optimal management and utilization, and proposes strategies for leveraging this national resource.

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* Corresponding Author. Professor. Tel:(9821)29904362, Fax :(9821)22431671, Email: a-shaabani@sbu.ac.ir

¹ Faculty of Chemistry, Shahid Beheshti University, G. C., P. O. Box 19396-4716, Tehran, Iran