

عنوان مقاله:

Life Cycle Assessment of a Direct Air Capture with Fischer-Tropsch System for Diesel Production

محل انتشار:

بیست و نهمین همایش سالانه بین المللی انجمن مهندسان مکانیک ایران و هشتمین همایش صنعت نیروگاه های حرارتی (سال: 1400)

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خلاصه مقاله:

As the transport sector is the largest CO₂ emitter in Iran, decarbonizing the fuel used in this sector can cut the emissions significantly. In this paper, a direct air capture system (DAC) coupled to a Fischer-Tropsch Synthesis (FTS) system is proposed to convert ambient CO₂ into fuels. A life cycle assessment is conducted to evaluate the global warming impacts of the proposed system. The results indicate that about ۶.۹۱g CO₂ is emitted per ۱g CO₂ captured; meaning, it is not environmentally friendly yet. However, Since the most important factor in determining the carbon neutrality of this system is the emission factor of the grid, we analyzed the carbon intensity (CI) of the grid and found out that for this system to be environmentally friendly, the CI must be one-tenth of its current figure. This suggests that before implementing this technology, focus should be on decarbonizing the electricity grid and lowering its CI which is heavily reliant on fossil fuels

کلمات کلیدی:

Direct Air Capture, Fischer-Tropsch Synthesis, Life Cycle Assessment, Carbon-Neutral Fuels

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