# In-Depth Analysis: CH4 Emissions from Industrial Combustion

## 1. Full-Series Trend (1970–2024): A Microcosm of Acceleration

Methane from industrial combustion (a byproduct of incomplete combustion) is a very minor source of emissions, growing from just ~**0.7 Mt CO2eq** in 1970 to ~**4.4 Mt CO2eq** in 2024. Its scale is insignificant in the national context.

However, its *pattern* is a perfect microcosm of India's industrial story. The trend shows a clear and dramatic acceleration, proving that even minor emission sources are closely following the country's high-growth trajectory.

## 2. Breakpoint Detection: A Story of Compounding Growth

The analysis identifies breakpoints at **1992, 2005, and 2020**, which align well with the major phases of industrialization. The slopes tell a story of compounding acceleration: [**0.01, 0.05, 0.08, 0.21**].

- **1970–1991:** For the first two decades, growth was negligible (slope of ~0.01).
- **1992–2004:** The growth rate quintuples as industrial activity begins to pick up.
- **2005–2019:** The rate increases again, aligning with the main industrial boom.
- **2020–2024:** The post-COVID break is **highly significant (p-value** *approx* **0.0000006)**. The growth rate nearly triples, mirroring the explosive rebound seen in the main CO2 emissions from industry.

## 3. Conclusions: A Canary in the Coal Mine

- **A Perfect Mirror:** This tiny emission source acts as a perfect, sensitive indicator of the underlying rate of industrial combustion. Its history is a textbook case of acceleration.
- **Post-COVID Intensity:** The dramatic acceleration in the final regime confirms that the post-COVID industrial recovery has been incredibly intense.
- **Not a Climate Threat:** While the pattern is insightful, the absolute scale of these emissions is too small to be a significant climate concern. The primary issue remains the CO2 produced by the same industrial combustion processes.