This file serves as Supplementary Material 2 for:

**How accurate are LCAs for pyrolysis and gasification in the context of plastic waste management?**

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# Supplementary Information 1: Process flow diagram for PYRO (ASP)

A diagram of electrical wiring

AI-generated content may be incorrect.

# Supplementary Information 2: Process flow diagram for GASI (ASP)

A diagram of a computer

AI-generated content may be incorrect.

# Supplementary Information 3: Application of PRISMA in this study(Page, et al., 2021)

**Identification of studies via databases and registers**

Records identified from:

* Web of science (n = 399)
* Scopus (n = 360)

Records removed before screening:

* Removed by automation tool: 225
* Duplicates removed by Python: 135

Records screened (n = 399)

Records excluded: 182

Records sought for retrieval

(n = 217)

Records no retrieved: 2

Records assessed for eligibility (n = 215)

Records excluded: 148

Records selected (n = 67)

**Identification**

**Screening**

**Included**

# Supplementary Information 6: Methodology for literature review and data collection.

This paper applied the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method to identify, screen and select the appropriate life-cycle assessment studies for pyrolysis and gasification of plastic waste (Page, et al., 2021). Using the Web of Science and Scopus academic databases, the following search query was applied: (plastic\* OR “plastic waste” OR “plastic waste management” OR “mixed plastic” OR polyethylene OR “polyvinyl chloride” OR polypropylene OR polystyrene) AND (“chemical recycling” OR “thermochemical recycling” OR “feedstock recycling” OR “advanced recycling”) AND pyrolysis NOT (“life cycle assessment” OR “life-cycle assessment” OR “lifecycle assessment” OR “life cycle analysis” OR “life-cycle analysis” OR “lifecycle analysis” OR “life cycle impact assessment” OR “life cycle inventory” OR “carbon footprint” OR “sustainability assessment” OR “techno-economic analysis” OR composite OR “carbon fibre” OR epoxy OR tire). The last search was made on 11th November 2024. The term ‘techno-economic analysis' (TEA) was included in the query to collect TEA articles that provide operational data for pyrolysis and gasification processes.