



Exploring Decarbonization Opportunities in Indonesia's Small-to-Medium Enterprises (SMEs)

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Global Warming and How Indonesia is Tackling it?





Sumber: www.twinkl.com.au

As of late 2022, the global average temperature had **risen by 1.2°C** from pre-industrial levels, leaving the carbon budget necessary to stay within 1.5 - 2°C window **very limited.**

Source: The Climate Book, 2022





In 2021, Indonesia's CO₂ energy-related emissions reached **600 MtCO₂**...

Excluding direct power generation, industry activities contribute the highest emissions, transport the 2nd, and followed by buildings and others.

Following the BaU, Indonesia is susceptible to double its emissions in 2050. ENDC target helps navigate where each sector should reduce its emission, although at a modest level.

Emission Trends of Industry Sector in Indonesia





GHG Emissions of Industry Subsectors, 2020



The GHG emissions from the industry sector grow following the country's economic growth. One of the reasons is the increase in coal use in the industry sector due to the DPO coal price has been ratified at USD 90/t (IETO 2024).

On the other hand, about 1/3 of emissions from the industry sector in 2020, came from the upstream side of five industries, most of which are large businesses (IDRI, 2024)

MSMEs is the Backbone of Indonesia's Economy -Yet, it is Currently Underexplored

The Business Scale Classification in Indonesia

Number of Businesses Based on Scale in Indonesia (2021)



63.955.369 193.959 44.728 5.550 ■ Micro ■ Small ■ Medium - Large

Other Significances



Total employment 96.9% Employment



MSME contribution to GDP 60.5%



Total MSME investment



MSMEs contribution to non-oil and gas exports 15.6%



Participation in the global chain 4.1%

economic growth. **SMEs' emissions** impact is often neglected and inadequately recorded. which potentially reveals substantial environmental consequences.

While driving

*Ministerial reg. no 64/M-IND/PER 7/2016 **Based on BPS classification

Emission Estimation of Indonesia's SMEs Based on Survey: Are SMEs the Missing Link in the Chain?

To represent more than 65 million SMEs, the survey was distributed to 1000 SME actors in 10 provinces with the highest SME share





Total Emissions: 216 MtCO₂/year



Data from the survey estimates that MSMEs from all sectors **emit 216 MtCO₂** in 2023 with trading as the highest contributor due to its high number of businesses and heavy use of gasoline for transporting and storing goods. Meanwhile, if considering the average emission intensity of SME sectors, manufacturing and construction, the two highest emitters due to the high electricity and fuel use required for its processes.

Emission Estimation of Indonesia's SMEs Based on Site Visit: Are SMEs the Missing Link in the Chain?

To verify the survey result, onsite data collections were also conducted. Following the onsite data, higher energy consumption is recorded.









(M)SMEs Contribution to National GHG Emissions: Are SMEs The Missing Link In The Chain?

European Union





Compare to large industry, average SME emits only 67 - 75 tCO₂/year in 2018 based on Environmental Impact Database for SMEs (EIDSME).

However, due to its large number, the collective share of SMEs in total enterprise emissions is high, at 63.3% of all CO2 and greenhouse gas emissions by enterprises.

Source: Annual Report on European SMEs 2021/2022

United States of America

Indonesia (this study)

Similar to EU and Indonesia, individual SMEs emissions are much smaller, but **collectively the estimation account for nearly 50% of the U.S GHG emissions.** The total national emissions of the country in 2022 was 4.6 GtCO2.

The very modest approximation of MSME emissions, based on survey, is 216 MtCO₂/year. Based on site visits, much higher emissions is very likely and possible to be higher than that of energy-related industry emissions.



Source: Ecohedge, 2024

Low-Hanging Fruit Solutions for SME Decarbonization

Cross-sectoral solutions that can lower emissions of SMEs

- Encourage SMEs to regularly monitor their energy usage and waste generation (help pinpoint energy savings through energy efficiency and management)
- 2. Empower SMEs through **incentives**, **shared centers**, and **collaborative support** from large corporations, governments, and academia
- 3. **Promote** the uptake of **RE** electricity and **fuel switching**
- 4. **Promote behavioral changes** by increasing SME awareness of climate change and how it may impact their business
- 5. Build a robust national **SME database** on energy, material use, and waste handling

Sectoral decarbonization solutions

Indonesia has unique and very diverse MSME business sectors. For all, **technology upgrade and electrification are the main solutions for MSME**. Each sectoral recommendations are given below,

- 1. **Textile and Apparel**: switch to electric boiler
- 2. F**oundry and leather tanning**: promote affordable/CAPEX-free VRE installation
- 3. **Construction**: increase the uptake of low carbon cement, recycled aggregates, innovative concrete formulation, propose EE appliances to the homeowner, etc.

This study mostly focuses to analyze and formulate decarbonization solutions to small-to-medium industries (SMIs), as they emit higher emission per business and provide substantial number of jobs to locals in all genders, making it a great tool to ensure a just transition, locally and nationally.

What Benefits will be Gained by SMEs if they Succeed to Lower, or even Eliminate their Emissions?

MSMEs can benefit economically from climate action:

- 1.LeadingtonewbusinessopportunitiesGlobally, 85 percent people had shifted their purchasing behavior towards more sustainable products in
thepastfiveyears.In Indonesia, same case has been identified firstly in ride-hailing service where more consumers have
turned on the "go-green" option and opted for electric vehicles, indicating that they are willing to pay
an extra charge to contribute to sustainability (The Diplomat, 2022)
- 2. Increasing **resilience** and reduce risks of climate change,
- 3. Ensuring positive environmental impacts,
- 4. Improving its production processes, profitability, and competitiveness.

All of this will impact to **increase brand value** and gain more **customer trust** and **unlock new financial opportunities** for the company.

Financial and Technical Support Mechanisms for SMEs





Green economic growth will require investment. The reason of this investment is to avoid the greater costs associated with maintaining the status quo. These cost can be reduced significantly by green economic growth approach. Green economy growth offer alternative way to prosperity.

Systematic efforts are required to focus on growth green economy in decision making related to policy, planning, and investment at national and regional levels, so that green investment planning can be created.



Thank You

Accelerating Low Carbon Energy Transition



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- 1. Global warming dan target penurunan emisi Indonesia
- 2. Seberapa banyak industri menyumbang emisi, dan dari mana saja; dari keseluruhan industri, sebenarnya bagaimana persentase business ukuran mikro hingga besar itu? Adakah upaya untuk mendorong itu?
 - a. What is SME, apa yang termasuk SME menurut peraturan di Indo
- 3. Motivasi penelitian, metodologi dan batasan
- 4. Hasil riset dan mapping: [Bagaimana lanskap SME di Indonesia, ekonomi, energi, dan lingkungan, stakeholder dan regulasi]
- 5. Estimasi emisi SMI; tinggi, komparasikan dengan large industry di indo, bandingkan dengan negara lain
 - a. Hasil site survey; komparasi ke hasil estimasi mapping
- 6. Bagaimana IESR melihat ini: mikro 🗆 sebaiknya didorong gimana? Small gimana, dan large gimana. Jelaskan kenapa focus yang bisa di dorong sekarang adalah yang small-to-medium industry
- 7. Rekomendasi awal, regulasi apa yang perlu didorong; data