

How many LCIs are necessary for Eco-Labeling schemes? A case study in Thailand

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Introduction & Objectives

Sustainable production and consumption is an important starting point for changes in economic and social conditions to sustainable development. The beginning of data and informatics era has made impacts to LCA applications, such as eco efficiency, eco labels, circular economy, etc. All of these require Life Cycle Inventory (LCI) databases. One of the important questions is how many data are needed to be sufficient in both quantity and quality. Thailand has targeted on the global trend since 90s, starting with the promotion of cleaner technology and seeking for green solutions throughout the supply chain, along with the country's development strategies that state on green growth directives over the past decades.

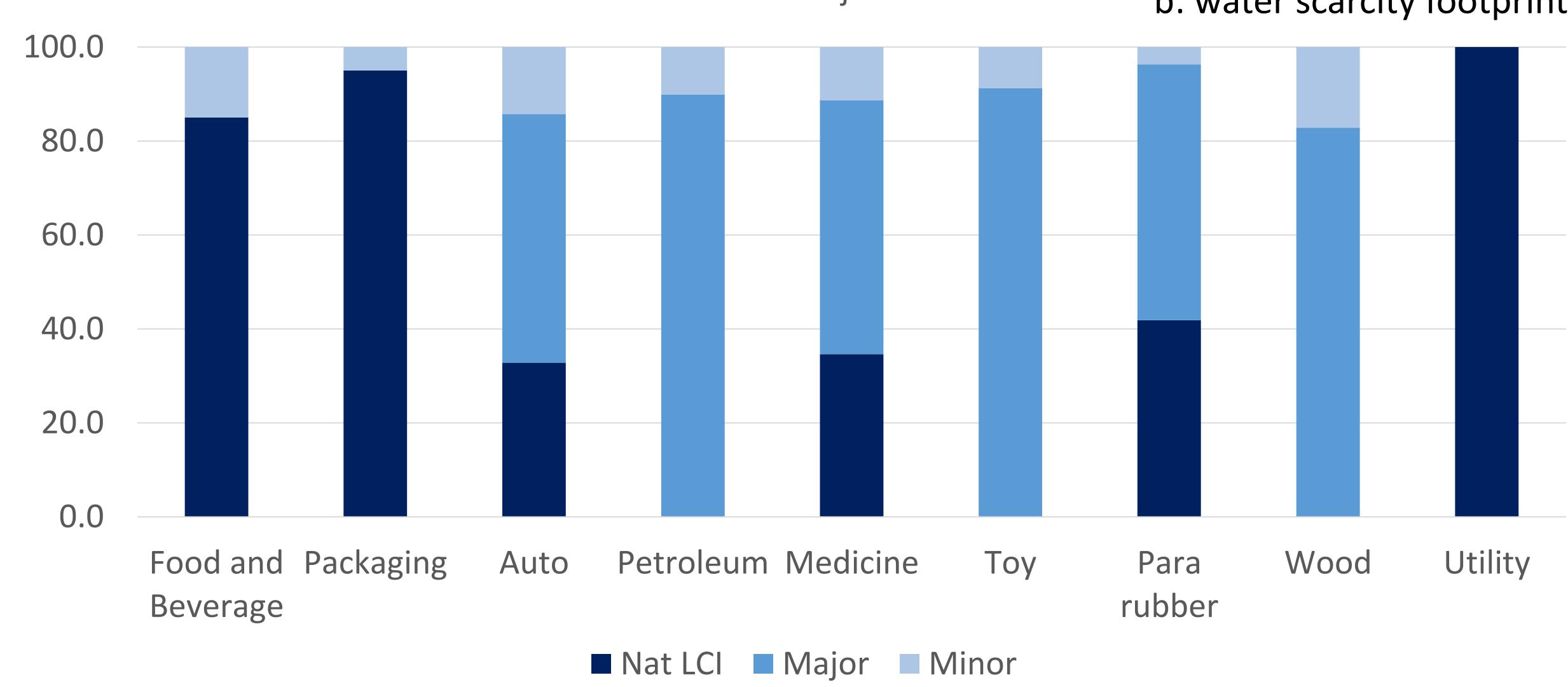
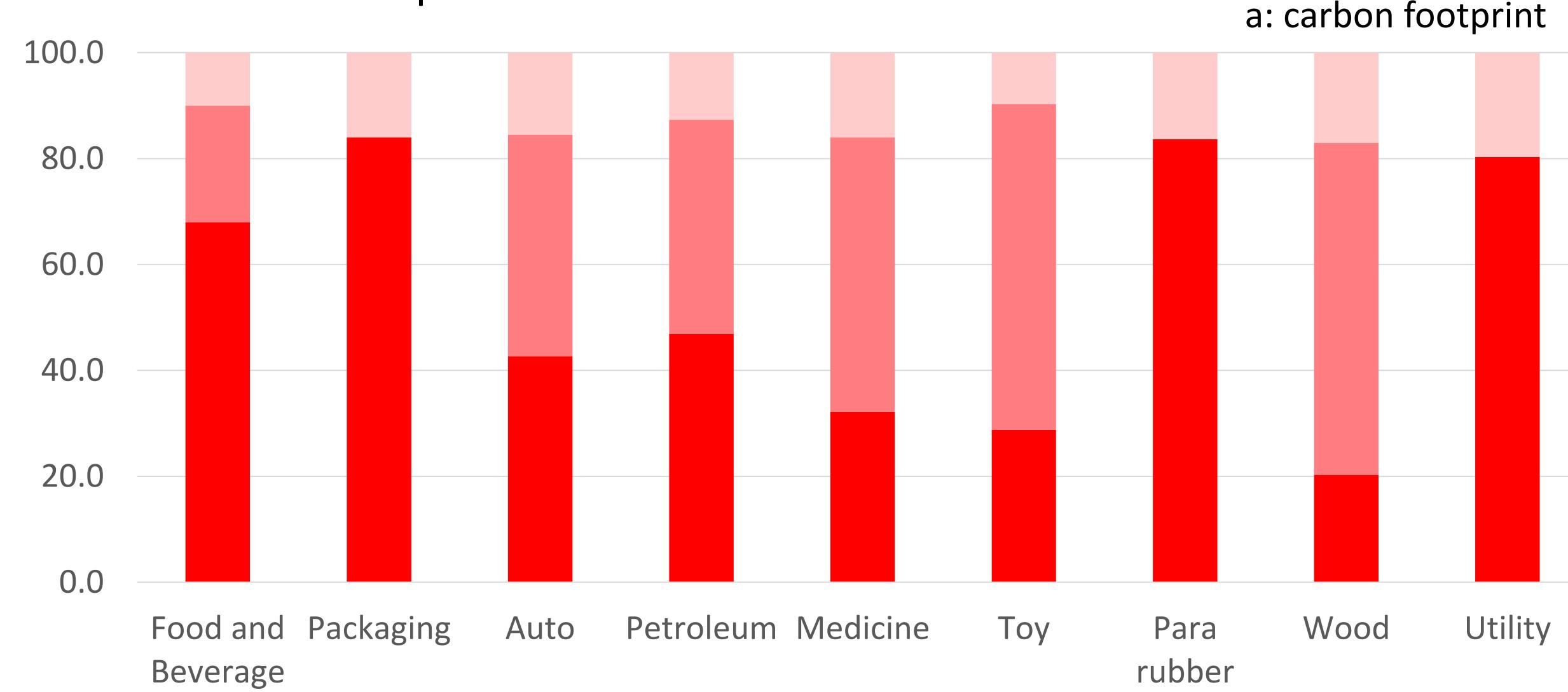


Figure 2. Percentage of National LCI, Major, and Minor contribution in (A) carbon and (B) water scarcity footprint for various business sectors in 2018 (Method: IPCC 2013 and Water scarcity)

Thailand has developed LCI data for more than 10 years. There are more than 1200 databases (gate to gate and cradle to gate). However, it is not fully covered all assessments with some limitations. NSTDA therefore suggests criteria to develop LCI data in accordance with current needs, about 80% of completeness in evaluating products or services is the expected target.

Figure 2. demonstrates that national LCI could represent 20-80% of carbon footprint and 0-100% of water scarcity footprint depend on sectors. Some data could be major contributors. In summary, around 500-600 gate to gate data are sufficient.

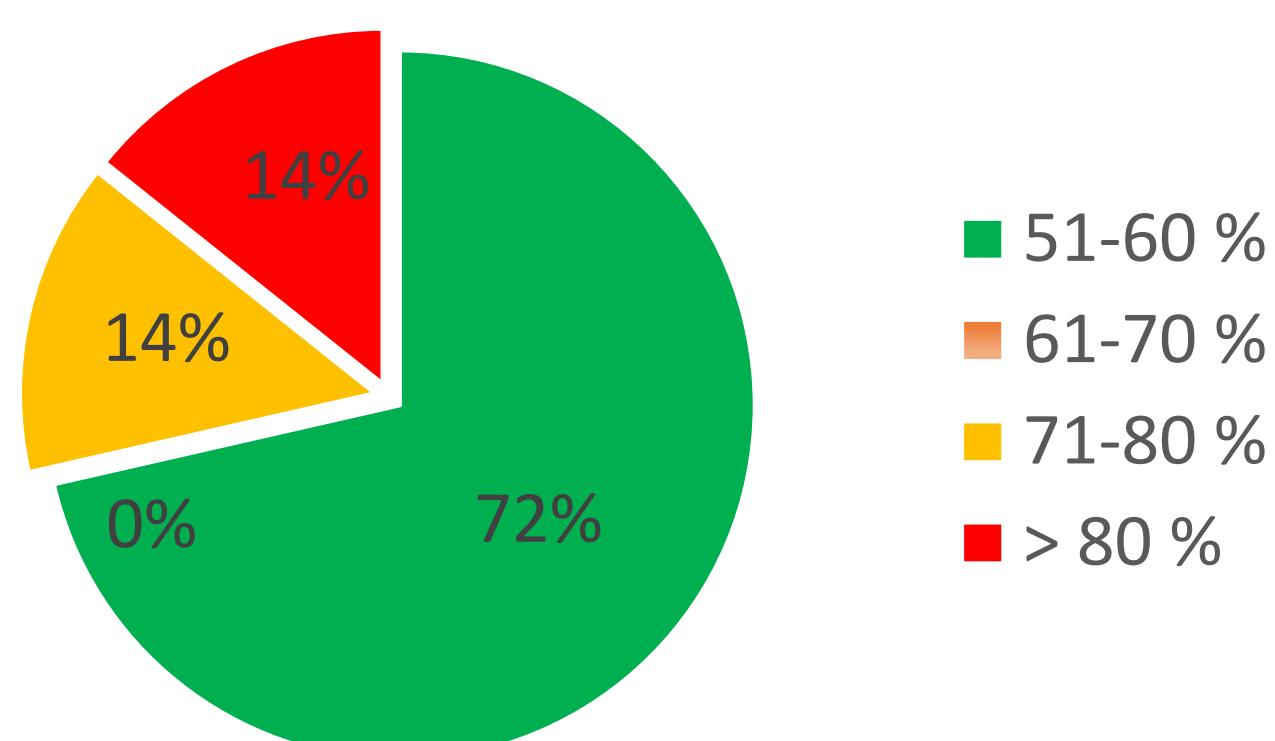


Figure 4. Local LCA practitioners reflect to sufficiency of national LCI coverage

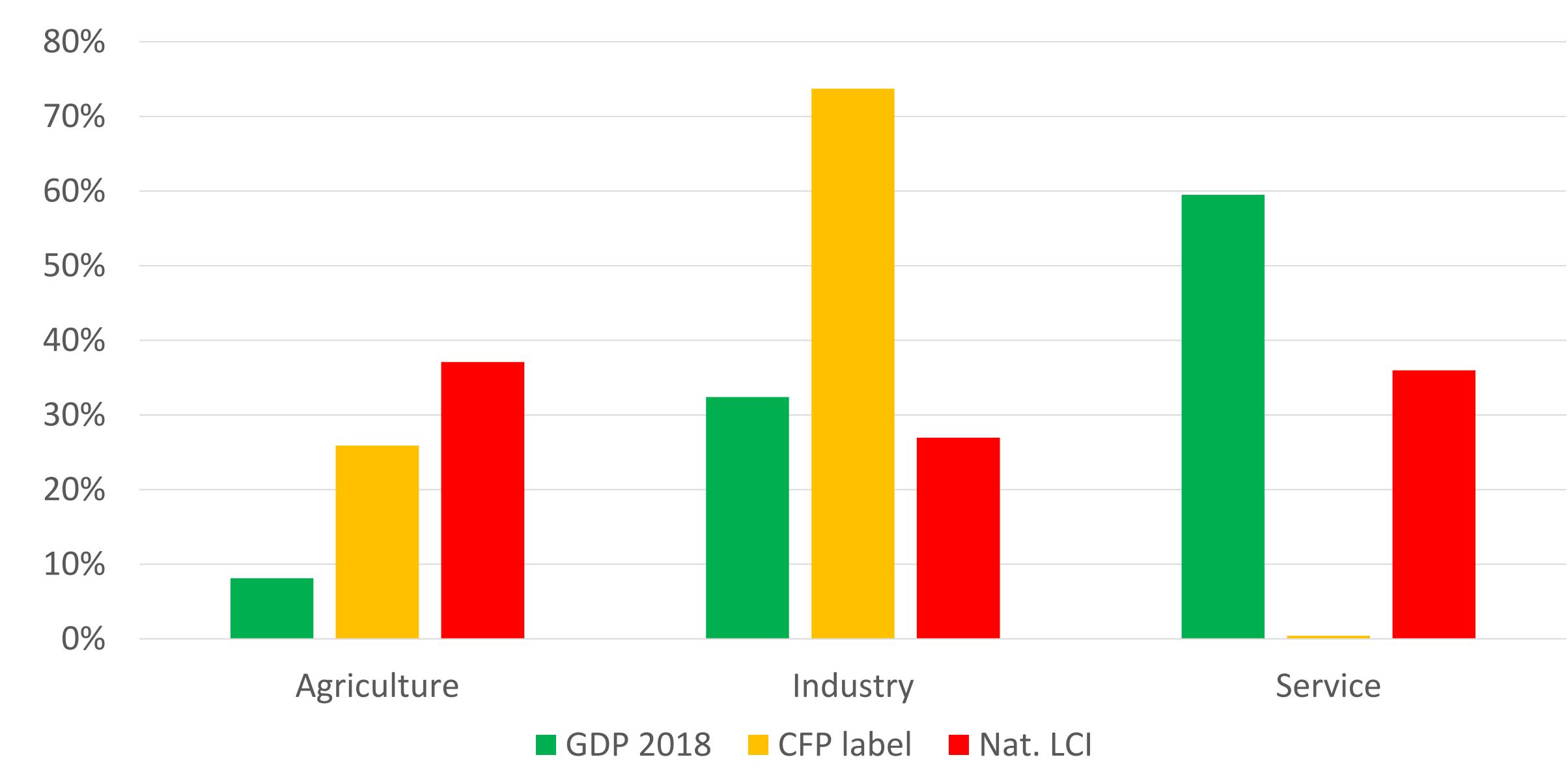


Figure 1. Percentage of GDP 2018, amount of Life Cycle Inventory and Carbon footprint of Product in 2018

Results & Discussion - Conclusions

Figure 1. shows relations among three domains which are national gross domestic product (GDP), Number of carbon footprint of product (CFP) and amount of LCI data. The trend for agriculture and industry are rather similar for GDP and CFP. However, it contrast for the number of LCI data. The main reason is Thailand is an agricultural country. Government has to prepare necessary data for producers. However, the agriculture product prices are rather low compare to other sectors.

Service sector has different context compare to agriculture and industry. Reasonably less data needed for more GDP. Normally, this sector contributes lower environmental impacts (per GDP)

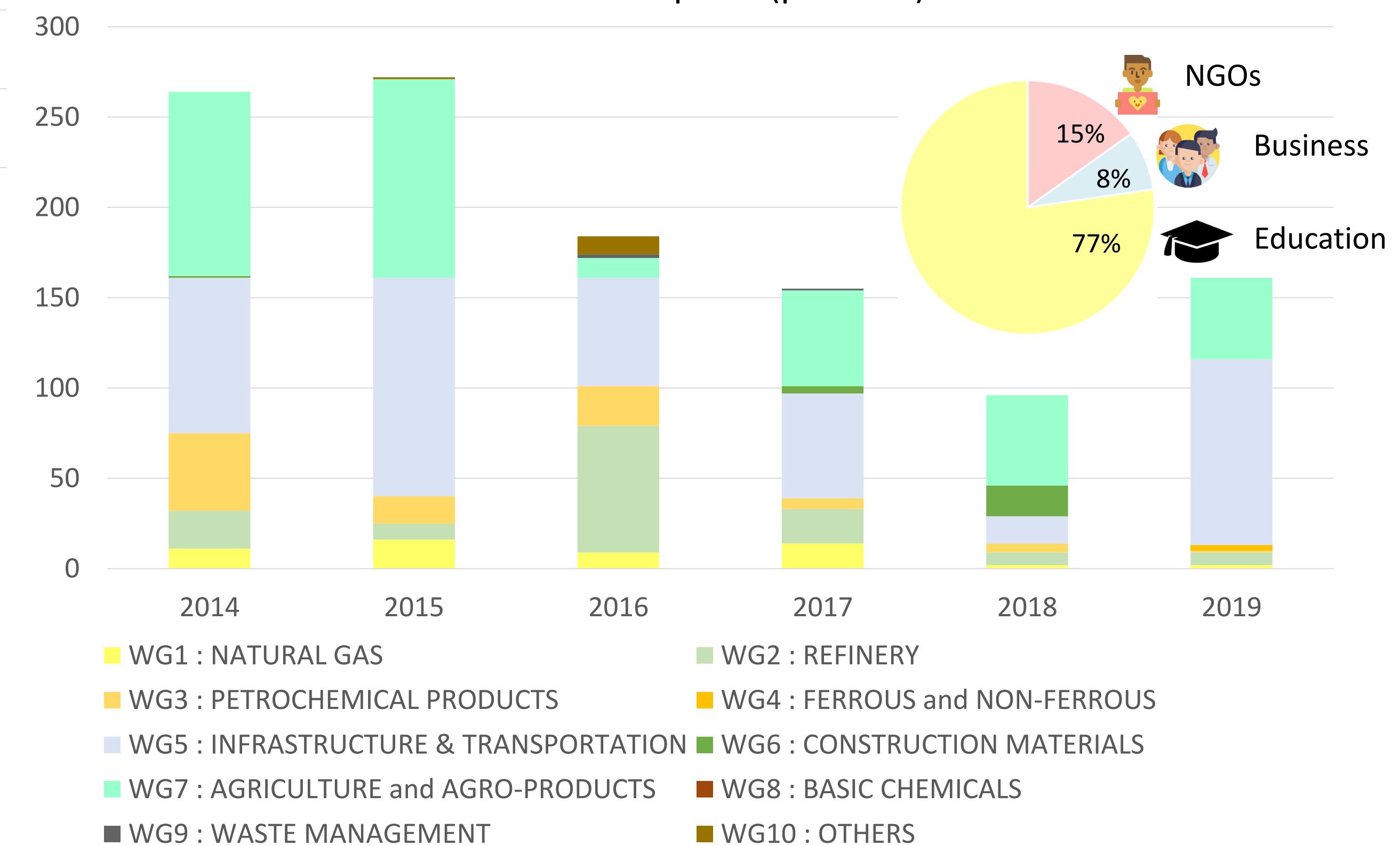


Figure 3. Frequency of LCI request from education, business and NGOs in 2014-2019 (not include Eco label) - classified by categories

Figure 3. shows that the requests are around 100-200 per year. Top 3 LCI are electricity, water and transportation. However, Agricultural products and infrastructure have high demands. The figure is not include the use of LCI for national carbon and water scarcity footprint schemes (> 4000).

Figure 4. Local LCA practitioners mentioned that more national LCI data are needed to assess more reliable & representative results. 72% of users estimate that National LCI cover around 51-60% for their applications.