# Additional Information on Proposed Methodology

"Installation of all-electric injection molding machine with power regeneration"

## 1. Reference injection molding machine

### 1.1 Market share of injection molding machines in Indonesia

Although there are mainly 2 types of injection molding machines marketed and used worldwide, namely all-electric type and hydraulic type, the hydraulic injection molding machine is more popular than all-electric injection molding machine in Indonesia according to the interview with the major injection molding machine supplier in Indonesia. There are no official statistics on industrial injection molding machines in Indonesia.

There are more than 10 major manufacturers of injection molding machines of all-electric type worldwide but no one in Indonesia. These machines are mostly exported to Indonesia from China, Japan, European countries, and other countries. Company A is one of the major manufacturers of injection molding machines of hydraulic type in Indonesia.

Table 1 shows 9 cases of the electricity consumption by hydraulic and all-electric injection molding machine under the same molding conditions which cover wide range of injection molding products expected to be produced by the project injection molding machines.

The same molding conditions mean that the clamping force[kN] of injection molding machine, the time [sec] for holding, injection, plasticizing, clamping, and ejection are all the same to produce the same injection molding products.

Table1 The electricity consumption of hydraulic and all-electric injection molding machines

| clamping force of injection molding machine [kN] | 1000 | | | 2750 | | | 5400 | | |
|---|---|---|---|---|---|---|---|---|---|
| molding product case No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| (A) specific electricity consumption of hydraulic type [kWh/h] | 7.9 | 5.1 | 3.0 | 15.6 | 11.9 | 13.6 | 61.6 | 40.4 | 20.1 |
| (B) specific electricity consumption of all-electric type [kWh/h] | 2.5 | 2.0 | 1.3 | 6.8 | 5.2 | 7.0 | 27.5 | 20.8 | 10.7 |
| (RR) reduction ratio of specific electricity consumption (=B/A) | 0.316 | 0.392 | 0.433 | 0.436 | 0.437 | 0.515 | 0.446 | 0.515 | **0.532** |

Source: Company A

## 1.2 Setting Reduction ratio of Reference Injection molding machine

Reduction ratio (RR) of specific electricity consumption of the project injection molding machine to the reference injection molding machine, which is provided as a default value in this methodology, is conservatively set *ex-ante* in the following manner to ensure the net emission reductions.

As shown in Table, RR of injection molding machine varies from 0.316 to 0.532. It is conservative to apply 0.532 as RR to calculate emission reductions in the proposed methodology. Therefore, it is set as a default value in the methodology.

$$\mathbf{RR} = \mathbf{0.532}$$