Taiwan Semiconductor Manufacturing Company, Ltd. (the “TSMC”) has made following efforts to ensure the semiconductor manufacturing process in accordance with the Part A and B of IEEE Standard for Environmental and Social Responsibility Assessment of Computers and Displays (IEEE Std 1680.1™-2018) Criterion 4.1.10.2 Optional – Reduce fluorinated greenhouse gas emissions from semiconductor production. The fluorinated greenhouse gas (F-GHG) emissions inventory has been reported and F-GHG emissions have been reduced for all TSMC’s 300mm process semiconductor manufacturing facilities, which including Fab 12A, Fab 12B, Fab 14A, Fab 14B, Fab 15A, Fab 15B, and Advanced Backend Fab3 (the “Fabs in Scope”).

For Part A
We develops a F-GHG emissions inventory by the method of the IPCC 2006 Tier 2b methodology, multiply the IPCC 2006 Tier 2b emissions by a factor of 1.13 to obtain adjusted IPCC 2006 Tier 2b emissions from etching and chamber cleaning processes with 100-year global warming potentials (GWPs) from the IPCC Fourth Assessment (IPCC AR4). In addition, TSMC annually commissions a third-party to perform a verification of greenhouse gas assertions, including emissions of fluorinated GHGs used in plasma etching/wafer cleaning and chamber cleaning processes, on the basis of ISO 14064-1: 2006, and publicly reports the result on our CSR report.

For Part B
Our abatement equipment is electrically heated, fuelled-combustion, plasma, and catalytic devices that are specifically designed to abate F-GHGs, are used within the manufacturer’s specified process window and in accordance with specified maintenance schedules, and whose DREs have been measured and confirmed under actual process conditions, using a technically sound protocol, which accounts for known measurement errors including, for example, CF₄ by-product formation during C₂F₆ abatement as well as the effect of dilution, the use of oxygen or both in combustion abatement systems.

We calculate that F-GHG emissions based on the equation stated below and the reduction percentage we are adopted is >75% as the fluorinated heat transfer fluids (F-HTFs) are excluded from the reduction assessment.

Percent of Total Reduction Emissions

\[
100\% \times \left[ 1 - \frac{\sum T E_{FAB}}{\sum B E_{FAB}} \right]
\]

where:

- \( T E_{FAB} \) is the total emissions per fab in scope calculated using the methodology in Part A.
- \( B E_{FAB} \) is the baseline emissions per fab calculated using the following equation.
\[ \text{BE}_{\text{Fab}} = (\text{CEW} \times W\text{F}_{\text{EW}}) + (\text{CCC} \times W\text{F}_{\text{CC}}). \]

where:

- \(\text{CEW}\) is the total consumption of all F-GHGs by all etching and wafer cleaning processes within the fab in reporting year.
- \(W\text{F}_{\text{EW}}\) is the weighting factor for etching and wafer cleaning that is 5940.
- \(\text{CCC}\) is the total consumption of all F-GHGs by all CVD chamber cleaning processes within the fab in reporting year.
- \(W\text{F}_{\text{CC}}\) is the weighting factor for CVD chamber cleaning that is 8260.

### F-GHG Reduction Emissions Result for 2018 to the Fabs in Scope

<table>
<thead>
<tr>
<th>Fabs in Scope</th>
<th>Fab 12A</th>
<th>Fab 12B</th>
<th>Fab 14A</th>
<th>Fab 14B</th>
<th>Fab 15A</th>
<th>Fab 15B</th>
<th>Advanced Backend Fab 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction % = 1 - (TE_{Fab}/BE_{Fab})</td>
<td>91.5%</td>
<td>96.1%</td>
<td>93.4%</td>
<td>95.5%</td>
<td>95.5%</td>
<td>95.3%</td>
<td>91.2%</td>
</tr>
<tr>
<td>TE_{Fab} (MT CO2e)</td>
<td>150,511</td>
<td>23,811</td>
<td>134,294</td>
<td>91,236</td>
<td>96,795</td>
<td>95,570</td>
<td>2,700</td>
</tr>
<tr>
<td>BE_{Fab} (MT CO2e)</td>
<td>1,771,646</td>
<td>604,864</td>
<td>2,023,535</td>
<td>2,032,602</td>
<td>2,152,861</td>
<td>2,032,792</td>
<td>30,548</td>
</tr>
<tr>
<td>CEW (kg)</td>
<td>59,645</td>
<td>23,660</td>
<td>76,360</td>
<td>64,892</td>
<td>82,455</td>
<td>148,183</td>
<td>4,873</td>
</tr>
<tr>
<td>CCC (kg)</td>
<td>171,592</td>
<td>56,214</td>
<td>190,067</td>
<td>199,412</td>
<td>201,341</td>
<td>139,538</td>
<td>194</td>
</tr>
</tbody>
</table>

Han-Wen Fung  
Director of Corporate ESH Division  
September 25, 2019