

S3.3.3 ENERGY CONSUMPTION REDUCTION AND PFC EMISSIONS CONTROL IN POINT OF USE WET-THERMAL-WET ABATEMENT OF PECVD CHAMBER CLEANING

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Perfluorocompound (PFC) by on-site generation can be used by the semiconductor and photovoltaic industry for plasma enhanced chemical vapor deposition (PECVD) chamber cleaning. Avoidance of the emission of the PFC gases is required because they have a high global warming effect and high atmospheric life-time. In this work an estimation is made of the energy saving and detect from the abatement of these gases in chamber cleaning. The energy saving is calculated as the total greenhouse gas emissions over the whole life-cycle of the gases. The steps in the life cycle are the following: production of the compounds and distribution in the fab (connection of cylinders), energy use in the process, abatement to destroy the unreacted gases and take-back of cylinders. Emissions from each step can be direct (from emission of the fluorinated gases) or indirect (from energy use). Preliminary results partly based on best guesses, indicate that the life-cycle greenhouse gas emissions are dominated by 30% energy saving and 1% rest emissions of NF₃, N₂O, SiH₄, NH₃, SiF₄, HF, and F₂ gases after abatement in the usage phase.