1 Introduction

MTU Aero Engines AG (MTU) provides its services to sectors with very stringent regulatory obligations. PFAS are used for maintenance, repair, and overhaul (MRO) in the aerospace industry (civil and military). 30% of all aircraft have MTU technology on board. On a global scale, MTU faces competition from GE Aerospace, which is based in the USA and is a subsidiary of General Electric. Further competitors based in the USA are Pratt & Whitney, StandardAero, Component Repair Technologies Inc., Ceral USA and Praxair USA. Other competitors are Pratt & Whitney Canada and Lufthansa Technik, based in Germany. Unlike other sectors some competitors are also OEMs. Importantly, for any modification, prior approval from the OEM is an absolute necessity. Indeed, their requirements are based on very strict industry standards for the aerospace industry to ensure passenger safety. The aerospace industry involves diverse fields such as navigation, engineering, development, and maintenance, serving both civil and military/defense sectors. The final products within this industry include aircraft, airships, helicopters, and other flying vehicles, along with related equipment, systems, and structures. Undoubtedly, it stands as a highly intricate and multifaceted sector, directly impacting the safety and well-being of EU citizens. The following sections explain the most important regulations in this sector. The lifecycles of an aircraft engine ranges from 25 to 50 years. More than 11,000 engine experts work at 17 locations. At the moment there are 300 technology projects, 2,675 patents and 700 inventors. The revenue is around € 5.3 billion the EBIT adj. € 655 million. In the past years and decades MTU was able to establish itself among other major competitors.

2 Supply chain and sectors involved

This comment revolves around the usage of PFAS on fixtures for electroplating uses. The fixtures are coated with PFAS to prolong their lifetime. The coating is done by different external companies and the whole fixture will be delivered to the specific sites.

3 Employment and economic information

Currently only the employees who work in the electroplating facilities are in contact with PFAS products. The products are in a closed loop and are therefore not in contact to the environment. No more useable products are collected and will be separately disposed. This means it will be incinerated in a hazardous waste incinerator.

4 PFAS use in aircraft engines

There is no direct use of PFAS fixture coatings in aircraft engines. The fixtures are used to process blades and disks in electroplating facilities.

5 PFAS alternatives offered in the market, considering the technical suitability

The polymers in the market identified as a substitute are not suitable for the application in the aero engine market. Even if there is any product available it takes a lot of time of sorting it out. Various technology projects are currently running to substitute PFAS. Considering the average duration of comparable tests it will be impossible to substitute PFAS within 18 months. Nevertheless the final approval whether a substitute is useable or not is has to be given by the OEM manufacturer of the aircraft engine (e. g. GE, Pratt&Whitney) based in the Unites States. The decision making process takes a lot of time because carrying out admission tests and alternative testing in production under near-series conditions is necessary. Therefore it is not possible to estimate a timeline for transition to alternatives.

6 Potential impacts of the restriction

In the case of a PFAS restriction it would be much more difficult to process electroplating processes. Therefore the turnaround time of repair and overhaul of aircraft engines will increase. The sustainability of fixtures will massively decrease, because of the lack of chemical resistance. This means there will be more waste in the environment.