

## Challenges for aircraft industry clusters in Japan and roles of local small and medium enterprises - What to learn from the Quebec model -

### Executive Summary

#### 1. This research's objectives and targets

This research aims to clarify the challenges to form aircraft industry clusters in Japan and local small and medium enterprises' roles. This project is a voluntary research project that began in earnest in FY 2018. In FY 2019, an overseas research was conducted in addition to the research on the formation status of aircraft industry clusters in Japan. Specifically, in Japan, hearing surveys were conducted for the activities of Nagano Prefecture, which focuses on aircraft systems (equipment), Akita Prefecture and the Tohoku region, which have received international orders for jigs and other equipment, and the Kinki region and the area around Kobe City. Also, overseas, targeting research and development consortiums, business support organizations and think tanks, education and training organizations, and aerospace universities, hearing surveys were conducted for the aircraft industry clusters in Quebec, Canada, which have attracted attention as a model to form aircraft industry clusters. The viewpoints of this research are as follows.

#### <This research's viewpoints>

- Hearing surveys for promoters of major aircraft industry clusters in Japan
- Hearing surveys for promoters of aircraft industry clusters in Quebec, Canada
- Providing challenges for forming aircraft industry clusters in Japan and roles of local small and medium enterprises

#### 2. Research's frame

As shown in the basic framework of this research, this research consists of two pillars: research in Japan targeting initiatives in Akita Prefecture and the Tohoku region, Nagano Prefecture, the Kinki region and the area around Kobe City, and overseas research in Greater Montreal (wide Montreal), Quebec, Canada targeting research and development consortiums, business support organizations and think tanks, education and training organizations, and aerospace universities. In particular, for overseas research, the concept of triple helix is used to analyze the "Quebec model," and then the findings obtained from research in Japan and overseas research are sorted out, and the challenges for forming clusters in the aircraft industry in Japan and the roles of local small and medium enterprises are presented.

Table 1 Research's basic frame

**[Research in Japan]**

**Trend research of aircraft industry clusters in Japan**

- Efforts by Akita Prefecture and the Tohoku Region
- Efforts by Nagano Prefecture
- Efforts by the Kinki Region and around the area of Kobe City

**Case analysis and characterization of each cluster**

- Composition of promoting organizations
- Process of cluster formation and growth
- Target markets for the aircraft and

**[Overseas research]**

**Trend research of aircraft industry clusters in Quebec**

- Research and Development Consortium
- Corporate support organizations and think tanks
- Education and training organizations
- Aerospace universities, etc.

**Analysis based on the concept of triple-helix**

- Analysis of triple helix space
- Analysis of triple helix circulation
- Clarification of features of the Quebec model

**Sorting out findings**

- Suggestions from the Quebec model
- Challenges for forming aircraft clusters and roles of local small and medium enterprises

### 3. Outline of the composition and findings of this research report

This research report is constituted from Chapter 2 as follows. First, Chapter 2 reports (1) cases in Akita Prefecture, (2) the Tohoku Aerospace Industry Forum (TAIF), (3) cases in Nagano Prefecture, and (4) cases in the Kinki region and the area around Kobe City, on the trend in aircraft industry clusters in Japan in detail. Next, Chapter 3 reports (1) the background and objectives of the field research, (2) the research targets of the aircraft industry clusters in Greater Montreal (wide Montreal), (3) the outline of the main actors' activities, and (4) the result of analysis based on the triple helix concept, on the aircraft industry clusters in Quebec, Canada. Chapter 4, the final chapter, presents (1) the suggestions from the Quebec model and (2) the challenges of aircraft industry clusters and roles of local small and medium enterprises, based on findings obtained from the above hearing surveys in Japan and overseas. The findings of this research are summarized as follows.

#### <Outline of findings of this research>

- Aircraft industry clusters have been formed in various parts of Japan. This research covered the leading aircraft industry cluster regions in Japan through active industry-academia-government collaboration activities.
- This system is characterized by its use of regional resources (Industrial clusters and universities), including mid-sized enterprises, and the strategic selection and specialization of the aircraft and aircraft component field that suits the region.
- In addition, with regard to the direction of aircraft industry clusters in Japan, the trend of wide-area coordination of cluster formation (regional expansion) can be seen from the cases of each cluster.
- On the other hand, the aircraft industry (aerospace industry) clusters in the Montreal region, Quebec, Canada is characterized by a clustering of major actors (such as aircraft-related companies, universities and research institutes, business support organizations and think tanks, education and training organizations) forming clusters in an area called Greater Montreal.
- In other words, while Quebec is about four times as large as the Japanese Islands, the main actors in the aviation industry (aerospace industry) clusters are concentrated in Greater Montreal, facilitating communications between the actors by their geographic proximity.
- Furthermore, the fact that the province is the only province in Canada with French as its official language fosters social and cultural closeness among actors, contributing to global linkage (collaborations on business and education) with countries and regions with French as their official language abroad.
- The Quebec model's characteristics in terms of the triple helix concept can be explained by the triple helix circulation. In other words, in Greater Montreal, people, information, and products circulate within and between individual helices, such as regional industries and enterprises, universities and research institutes, and the provincial government and local governments. There are "cluster engines" and "cluster reactors" to generate this circulation continuously.

- Specifically, consortiums and think tanks organized by enterprises, universities, and the provincial government actively conduct committees, joint research, and events. In particular, programs are working to induce innovation among local mid-sized enterprises, which play an important role as suppliers.
- Based on the above, it can be pointed out that Japan's problems in forming aircraft industry clusters include (1) establishing an organization to implement the functions of cluster engines and cluster reactors continuously, and (2) establishing an organization to develop and strengthen local small and medium enterprises' aircraft human resources (such as technical and skill training centers to process aircraft components.)