



**Dream of Aerospace**  
**NAGOYA**  
**Aerospace Industry Guide**



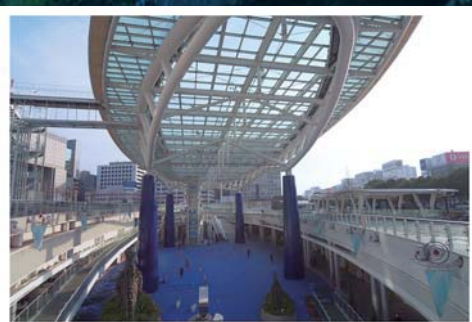
# Introduction

Located in the center of Japan, the Nagoya area is the capital of the country's aerospace industry.

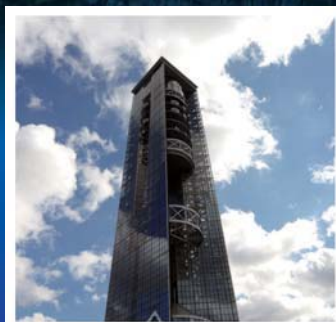
Home to many major Japanese aircraft makers, the area accounts for about 50% of all aircraft and aero parts production in Japan, including the production for Boeing such as the main wings and fuselage. The production of aircraft parts requires high-level manufacturing technologies. With a large number of related industries clustered together such as materials, machine tools and automobiles, this area contributes immensely to the development of the aerospace industry in Japan.

In 2008, commercialization of the nation's first commercial jet(MRJ) was decided, flight test facilities were opened, and JA2012, the Japan International Aerospace Exhibition, was planned. These are examples of further progress in the nation's aerospace industry through close collaboration between local enterprises, universities and governments. This pamphlet introduces you to such companies in the Nagoya area that thrive on passion and vision. We hope that after reading this, wherever you are in the world, you will consider becoming a business partner in the Nagoya area.

Nagoya Castle



Oasis 21 complex



Higashiyama Sky Tower



Nagoya International Exhibition Hall



# Manufacturing DNA is deeply engrained in the people and city of Nagoya.

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## Preview of NAGOYA

It was in 1610 when Nagoya Castle and its castle town started being built by order of Iyeyasu Tokugawa, who had formed the Edo government. Since then, an outstanding variety of Japanese traditional artistic culture – such as theater plays, noh plays, kyogen plays, tea ceremony and flower arrangement – have flourished in this castle town, the topmost of the three branch families of the Tokugawa house. As a mercantile city, Nagoya has developed remarkably into a metropolis, after Edo (Tokyo), Kyoto and Osaka.

Many craftsmen and artists gathered, and in the glamorous art and culture many artistic machines and tools were manufactured, such as Japanese clocks and mechanical dolls. These technologies later led to the basis for today's manufacturing industry.



**Tea serving doll  
(manufactured by the 9th Shobei Tamaya)**

Without using any metal, this doll works skillfully, using wooden gear and cam. A mechanical doll is the root of today's mechatronics industry. (Courtesy by Inuyama Artifacts Museum)



## The birth of aerospace industry

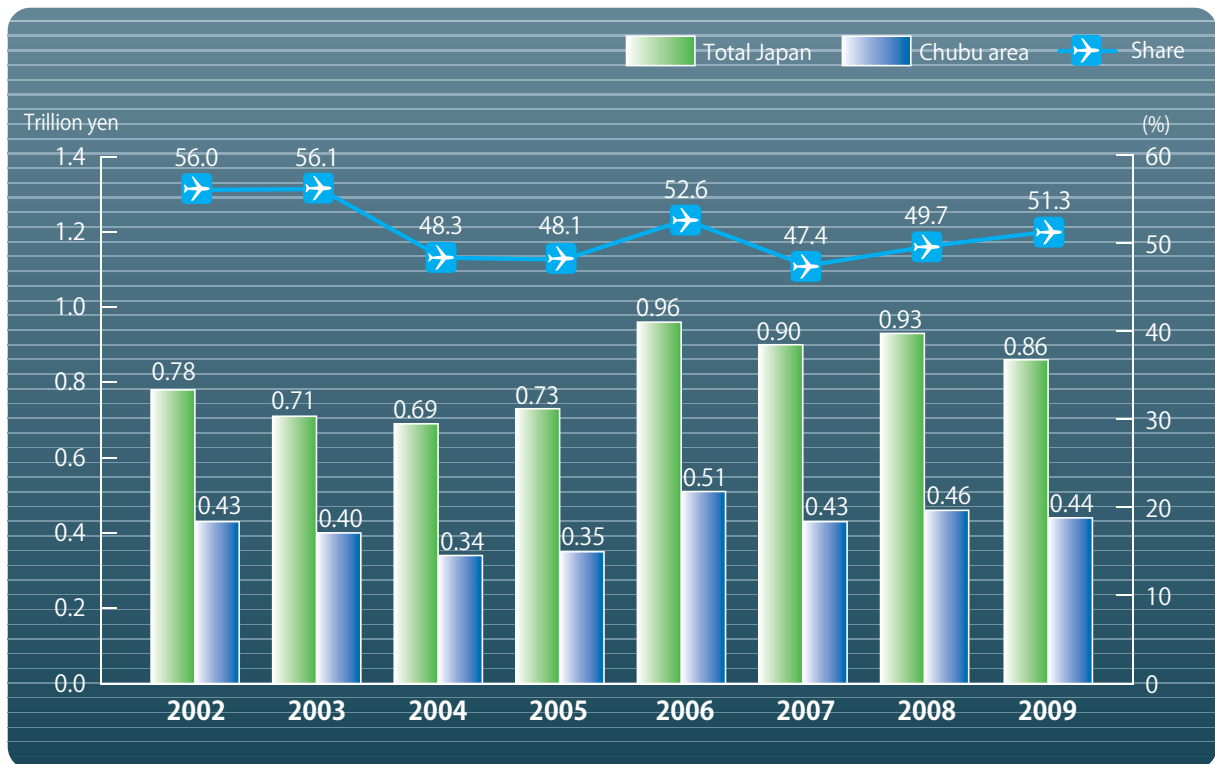
The Nagoya area has long had been a distribution center for high quality wood. By utilizing the technologies of craftsmen from the Edo period, today's industrial wood technologies have developed. After many years, high-level wood processing technology was used to produce aircraft. Early on, components such as propellers and the fuselage of various aircraft and the pontoons of seaplanes were assembled using wood products.

In later years, the Nagoya area went on to produce the Nippon-go, Zero fighters and the YS-11, becoming today the largest manufacturing area for the aerospace industry in Japan.

### **The Nippon-go** (Courtesy by MHI)

In 1932, the twin-engine transport plane Nippon-go, the most up-to-date aircraft of its time, flew around the world. Flying a total of 52,860 km in 56 days, including through some difficult parts spotlighted Japan's high-level aircraft technology to the world.





**Movement of production volumes for aircraft and parts (Total Japan: Chubu area)**

(Source: Ministry of Economy, Trade and Industry, Chubu industrial statistics survey)

## The situation in the world aircraft industry and Japan

In the coming years, the global aircraft industry is expecting 4% annual growth in the number of civil aircraft and in the next 20 years, market size is expected to grow to about 26,000 aircraft (worth approx. 300 trillion yen). In Japan, aircraft makers have been producing main components and parts for aircraft makers such as Boeing and Airbus by collaborating with their subcontract companies.

Today, in view of future market expansion, more than 10 industry clusters have been formed in various parts of Japan, and development of a new production system is under way. These clusters include aircraft parts makers seeking direct orders from overseas and makers seeking to newly enter the industry based on their material and parts processing technologies.

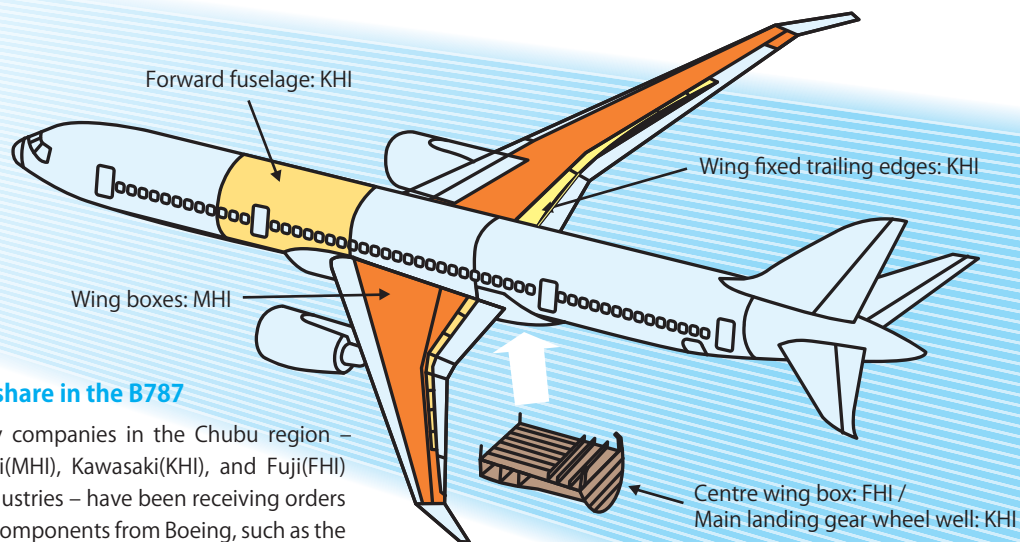


## The situation in the aerospace industry of the Nagoya area

The Nagoya area is the largest aerospace production area in Japan, accounting for about 50% of the nation's aircraft production. In the 1960s, production of the YS-11, the only commercial aircraft built in Japan, was carried out. Today, commercialization of the MRJ, the first Japanese commercial jet, has begun, and its development is ongoing. Production of main

components for the B787, the next-generation jet from Boeing, is also under way. In the outer space area, as well, production of parts and assembly of the H-IIB launch vehicle, developed and produced by JAXA/MHI, were carried out in this area, with successful launches accomplished in September 2009 and January 2011.

(JAXA: Japan Aerospace Exploration Agency)



### Japan's share in the B787

Three key companies in the Chubu region – Mitsubishi(MHI), Kawasaki(KHI), and Fuji(FHI) Heavy Industries – have been receiving orders for main components from Boeing, such as the main wings and fuselage. Japan's share ratio has steadily increased from 15% of the B767, 21% of the B777, and up to 35% of the B787.

### YS-11 airliner

(Courtesy by MHI)

The only commercial aircraft in Japan produced in the Nagoya area (first flight: 1962). Short distance takeoffs and landings were possible.





**Image of MRJ**

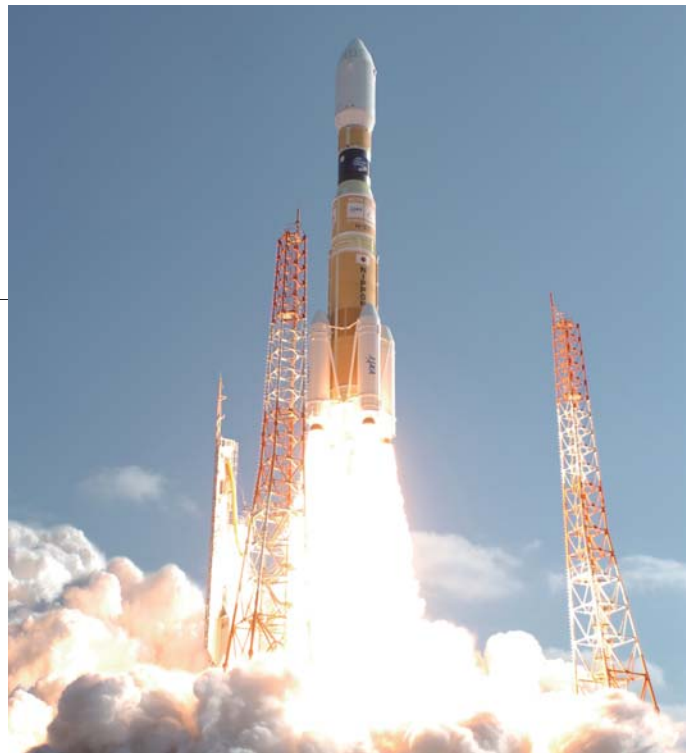
(Courtesy by the Mitsubishi Aircraft Corporation)

Adopting cutting-edge technologies, this next-generation regional jet will feature the highest levels of environmental performance and economic efficiency, as well as improved cabin comfort. Initial delivery is aimed for 2014 (as of September 2009)

**Image of the H-IIB launch vehicle**

(Courtesy of JAXA)

The H-IIB launch vehicle, designed and produced by JAXA/MHI, was successfully launched in September 2009. It carried the first H-II Transfer Vehicle (HTV), which connects to the International Space Station (ISS). In January 2011, its second launch, carrying the H-II Transfer Vehicle (KOUNOTORI2 or the HTV2), was successfully accomplished.



<b>TOPICS</b>	<b>Other current information about the Nagoya area</b> (as of September 2009)
	R&D facilities for the aircraft will be built adjacent to Nagoya Airport, and will include jet test facilities (planned for 2011).
	Technological development is being pursued in the area of CFRP (carbon fiber reinforced plastic) products.
	Japan International Aerospace Exhibition (Japan Aerospace 2012), organized by the Society of Japanese Aerospace Companies, will be held at Port Messe Nagoya and Central Japan (Chubu) International Airport (also known as Centrair).



## Other industries

The value of shipments from the Nagoya area accounted for 19.1% (approx. US\$620 billion 407 million) of the total manufactured goods in Japan, a larger ratio than for areas such as Tokyo (17.8%) and Osaka (12.7%). In particular, transport machinery and appliances have achieved significant market share, as high as 42.6%.

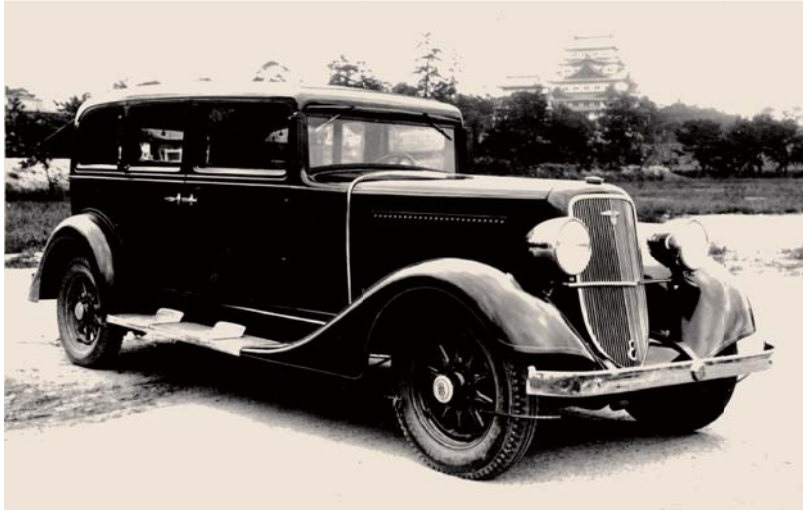
(at an average exchange of 103.36 yen/dollar in 2008)

Total production for this area was US\$448.1 billion with total production per capita of \$40,359, which is similar to the level of France and Germany. Total exports amounted to approx. US\$97 billion 665 million. Of this, approx. US\$23 billion 779 million was to the U.S. and the amount to the E.U. rose to approx. US\$15 billion 287 million.

(Source: Ministry of Economy, Trade and Industry, Chubu Bureau, Point of the economy in the Tokai region)

(at an average exchange rate of 117.75 yen/dollar in 2007)

Nation's first passenger car 'Atsuta-go'



## Automobile

In 1929, a new "Nagoya-as-Japan's-Detroit Initiative" was proposed by the mayor of Nagoya City, leading in 1932 to the first jointly developed passenger car, Atsuta-go. This initiative was later taken over by Toyota Motor Corporation, with the whole Nagoya area eventually becoming a world-class hub of the automobile industry.



TOYOTA Hybrid car 'PRIUS'

# Machine tools

Sukezaemon Tsuda, who repaired clocks for Iyasu Tokugawa in the early 17th century, along with his descendants, handed down to future generations their manufacturing technology of clocks. This technology led to the creation of a high-precision Japanese clock based on the lunar calendar, and was later developed for the manufacture of mechanical dolls, eventually being used in the machine industry. Today, the Nagoya area is a mecca of the machine industry and industrial robots, where many leading makers are gathered from fields such as machine tools, casting machines, laser processing machines, injection molding machines, and chip mounters.



**Machining center**  
(Credited by Mori Seiki Co., Ltd.)

# Ceramics



Since old times, the ceramic ware industry has been active in the Nagoya area, witnessing the industry's evolution from traditional Japanese ceramic ware to modern ceramic ware for export. Several world-famous companies were born in the area such as Noritake Co., Limited, NGK Insulators Ltd., and NGK Spark Plug Co., Ltd. As a cluster for the fine ceramics industry today, the Nagoya area is expanding technologies in various fields such as electronics, energy, ecology, fuel cells and photocatalysts.

**Large numbers of Western-style tableware are exported overseas.**

(Credited by Noritake Co., Limited)



## Aerospace industry support in the Nagoya (Chubu) area

### Aerospace industry forum

With the aim of expanding the aircraft market in the mid-to-long term, in 2008, the activity called "Aerospace Industry Forum" was started through the joint efforts of industry, academia and government. This activity strives to improve the level of Japan's aerospace industry by enhancing international specialization and competitiveness. By promoting the aerospace industry collectively, the activity offers a vital

opportunity to integrate and cultivate players in the aero parts industry and encourage newcomers to join, whatever field or business they are in. Our support actions focus on three areas: 1. Enhancing suppliers (improving technologies and supply chains), 2. Expanding the market and promoting the entry of newcomers, and 3. Cultivating and procuring human resources.

### Aerospace Industry Forum

The Aerospace Industry Forum was launched in April 2008, in order to promote Japan's aerospace industry collectively, and offer a vital opportunity to integrate and cultivate players in the aero parts industry, without necessarily being affiliated with a particular manufacturer, and also encourage newcomers to join. A committee was formed to give support and suggestions to the activities and direction of the Forum.

### Support activities by the Aerospace Industry Forum

→Support focused on the 3 areas

1.R&D	2.Expand markets	3.Human resources cultivations
<b>Cultivate/Enhance suppliers</b>	<b>Market expansion, newcomers</b>	<b>Cultivate/procure human resources</b>
Following flight research facilities by JAXA, a total support system, from R&D to commercialization, is being reviewed under collaboration between Industry, Academia & Government. Individual support, by using the industry support system, the aid on new innovative products and so on.	Dispatch of an overseas mission, etc. -Support for Paris Air Show and Farnborough Air Show. Seminars and the like. where domestic equipment makers seek for a new vendor.	Comprehensive human cultivation programs in wider regions, including R&D of aircraft, designing, production technology/skills, production management, etc.

Committee for the promotion of the Forum  
(Collective view of all the related bodies)

- [ **Chairman** ] Mr. Fumio Kawaguchi (Chairman of Chubu Economic Federation and C-ASTECC)
- [ **Industry** ] Chubu Economic Federation, C-ASTECC, Mitsubishi Heavy Industries, Ltd Nagoya Aerospace Systems, Kawasaki Heavy Industries, Ltd. Aerospace Company, small/medium aircraft parts manufacturers
- [ **Academia** ] Nagoya University, College of Naka-Nippon Aviation
- [ **Government** ] Chubu METI (Ministry of Economy, Trade and Industry), Aichi Prefecture, Gifu Prefecture, Nagoya City

# GNIC (Greater Nagoya Initiative Center)

Greater Nagoya Initiative Center is to promote foreign direct investment and business alliance between overseas and Japanese companies.

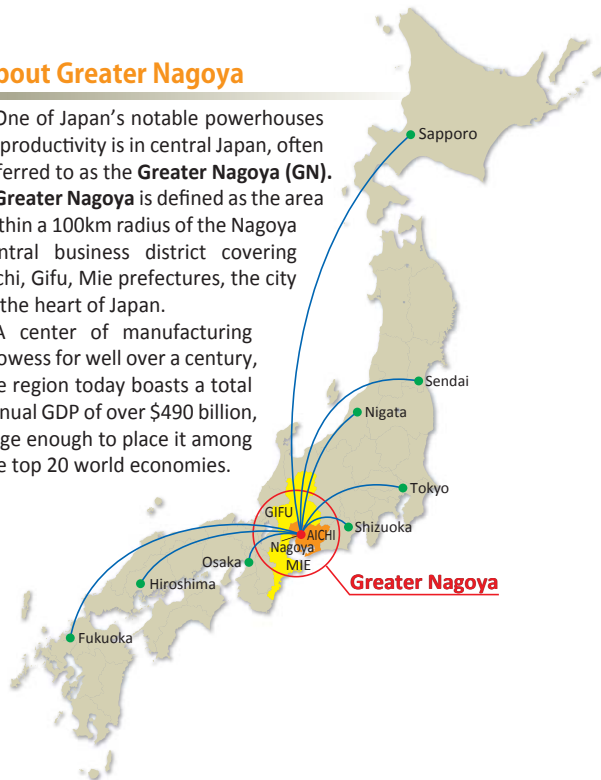


## About Greater Nagoya

One of Japan's notable powerhouses of productivity is in central Japan, often referred to as the **Greater Nagoya (GN)**.

**Greater Nagoya** is defined as the area within a 100km radius of the Nagoya central business district covering Aichi, Gifu, Mie prefectures, the city at the heart of Japan.

A center of manufacturing prowess for well over a century, the region today boasts a total annual GDP of over \$490 billion, large enough to place it among the top 20 world economies.

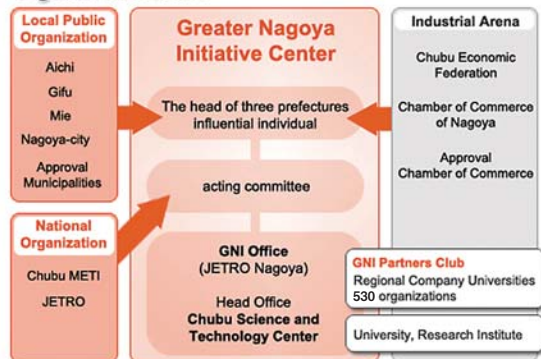


## Organization

Home to many of the world's leading companies, supported by a network of small and medium sized enterprises along with robust physical and IT infrastructure, herein lies a wealth of opportunities for any global company looking to grow their business both in Japan and internationally.

**Greater Nagoya Initiative Center (GNIC)**, a joint organization of national and local governments, industries and academia, is to promote foreign direct investment into **Greater Nagoya** region and business alliance between overseas and Japanese local companies in the region.

### Organization Chart

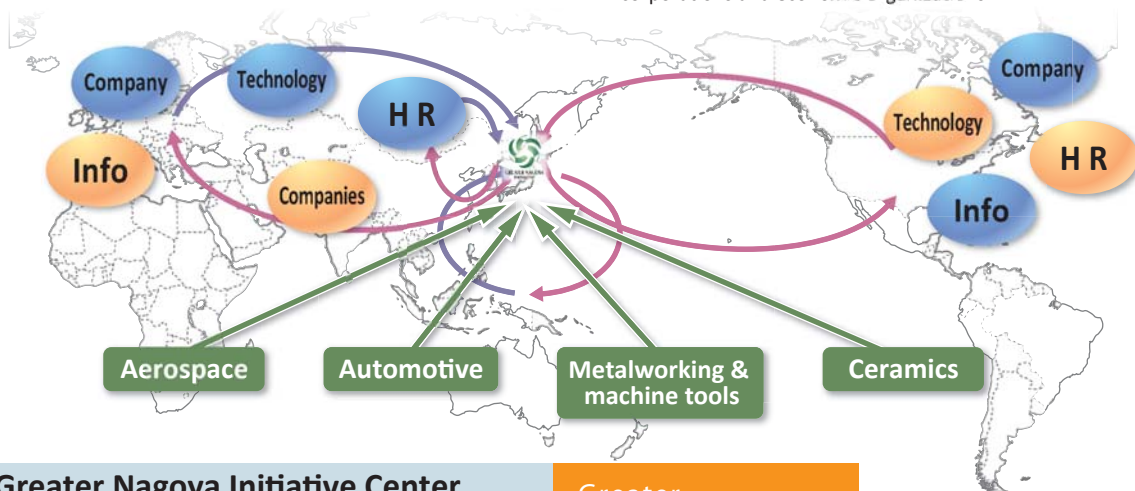


And with its highly developed infrastructure with a 24-hour international airport, Chubu Centrair International Airport, linking it to the rest of Japan and the world, plus the research prowess and scientific know-how of Nagoya University (boasting three Nobel laureates) at its heart, the **Greater Nagoya** area has a future that will only be growing.

## The One-stop Solution

In cooperation with affiliated organizations, **GNIC** provides **"one-stop"** services to overseas corporations interested in starting or expanding business into **Greater Nagoya** region.

Such complimentary services for overseas businesses include providing information on the region, incentives and consultation services for business start-ups, business events, business-matching arrangements with appropriate corporations and economic organizations.



### Greater Nagoya Initiative Center

Nagoya Center Building Annex 8F  
 2-22 Nishiki, 2-chome, Naka-ku, Nagoya 460-0003 Japan  
 Tel: +81-52-223-7340 / Fax: +81-52-223-7341  
 URL: [www.greaternagoya.org](http://www.greaternagoya.org) / E-mail: [invest@greaternagoya.org](mailto:invest@greaternagoya.org)

Greater  
 Business  
 Opportunities



## JETRO (Japan External Trade organization)



JETRO contributes to the growth of local economies and the revitalization of Japan's economy by supporting the international development of local SME's in emerging markets in East Asia.

### Overseas expansion of SME's brings many difficulties

- **Lack of information**.....information on international markets, systems
- **Difficulties associated with international markets**.....language, business practices
- **High costs**.....trade shows alone can cost several hundred thousand to millions of yen
- **Challenge after challenge**.....legal, labor, intellectual property protection

With 72 international offices and 38 domestic locations, JETRO provides attentive support tailored to the needs of individual localities and companies through the Institute of Developing Economies network

**JETRO forms the fundamental infrastructure enabling Japanese companies to expand internationally**

## Specific examples of JETRO's support activities

### Revitalizing local economies through the international expansion of SME's

#### 1. Support the development of international markets for agricultural and marine products and the products of local SME's

- ◆ *Investment and trade consultation*
- ◆ *Supporting international trade fair exhibitions, etc.*
- ◆ *Individual assistance for developing overseas markets*
- 85,000 cases of trade and investment counseling for East Asian countries
- In the food industry, 8 buyers from 7 countries were invited to a business conference with 30 Japanese companies (manufacturers and producers) in August 2010.
- Supporting international trade fairs on behalf of other Asian countries. (64 exhibitions, 67,662 consultations)
- 1,500 international seminars on business related issues.

#### 2. International development assistance for Japan's best IP products

- Supporting the Tokyo International Film Festival, Japan Fashion Week, the Design Fair (The "Sensitivity Exhibition" in Paris, New York, Hong Kong and Kanazawa), etc.

#### 3. Helping to attract foreign companies to the region through the promotion of FDI

- Working to attract foreign companies to cooperate locally (A total of 121 cases in 2009, with Aichi successfully attracting 7 foreign companies.)
- Matching foreign and Japanese companies for domestic exhibitions. (Invited 20 foreign companies interested in investing in Japan during Mechatronics Technology Japan 2009 in Aichi-ken. Held discussions with Japanese companies.)

### Supporting businesses in emerging markets

#### 1. Assist in expansion in promising emerging markets

- Providing information for the local advancement of SME's
- Business missions and investment for India, Vietnam and other Asian countries. Negotiation and information exchange between local government and business.
- Set up international Business Support Centers (BSCs) in major Asian cities to help overseas expansion. Established an SME support center in Vietnam (Hanoi) in October 2009.

#### 2. Research and seminars for intellectual property rights

- Investigating intellectual property infringements in China, etc. at the request of individual companies. Identify and expose IPR infringers.
- Organize seminars on IP protection across the country and provide information to SME's on IP related problems. • 2,828 consultations relating to intellectual property rights.
- JETRO is in charge of administering the International Intellectual Property Protection Forum (IIPPF).

### Business development support for the environmental, energy, infrastructure and industrial fields

#### 1. Helping to organize trade shows in the environmental, energy and high-tech fields.

- Helping to organize trade shows and conferences related to the environment and energy such as POLLUTEC HORIZONS 2009 (Paris, December 2009), RETECH2010(America, February 2010), etc.
- Supporting conferences at trade shows for bio and ICT, etc. for high-tech fields.

#### 2. Supporting international expansion of plant and infrastructure businesses.

- For developing countries, a significant increase in demand is expected for infrastructure such as railroads, highways and water treatment facilities. We support international expansion of Japanese companies by inviting dignitaries, organizing domestic and international seminars and business matching.



## ACCJ (American Chamber of Commerce in Japan) Chubu Chapter – Aerospace Industry Subcommittee

<b>Address</b>	Marunouchi Fukao Bldg. 5F, 2-11-24 Marunouchi, Naka-ku, Nagoya Aichi, Japan
<b>Tel</b>	+81-52-229-1525
<b>URL</b>	<a href="http://www.accj.or.jp">http://www.accj.or.jp</a>
<b>E-mail</b>	chubu@accj.or.jp
<b>Contact person</b>	Mike Wright, Aerospace Industry Subcommittee chair



### Company Profile

Founded : June 2010

### Major Activity

Provide a venue for addressing issues of interest to the member companies

### Major Customers

United Technologies (Pratt & Whitney, Sikorsky, Hamilton Sundstrand), Boeing, Lockheed Martin, Raytheon, Federal Express, Continental Airlines, American Consulate



### Our Strengths

The member companies of the Committee represent an annual US\$3-4 billion U.S. aerospace goods and services trade surplus with Japan. The Committee primarily serves as a venue for exchanges between Chubu-region U.S. aerospace manufacturers, Japanese government officials and aerospace companies to discuss issues of interest regarding U.S.-Japan commercial and government aerospace programs.





## C-ASTEC

(Chubu Aerospace Technology Center)

The aerospace industry in the Chubu (Central Japan) region has begun a new phase since the launch of various new development projects and JAXA's plans to establish a test flight research center in this area.

The Chubu Aerospace Technology Center will be proactive with respect to these changes and continue to make a difference as it plays a role as a substantive hub organization for aerospace-related fields in the region.

### 3. Gathering and disseminating information

- Collecting data and books related to the aerospace field
- Establishment of a network necessary for the aerospace-related companies
- Periodically disseminating information

# C-ASTEC

Industry

### 1. Research study and planning activities

- Research study and planning concerning subjects such as aerospace-related research facilities
- Research study concerning aerospace-related technology and industries

### 2. Enhancing technological sophistication and supporting R&D through industry academia-government collaborations

- Development of industries related to next-generation aircraft
- Promotion and the guidance for the base technology R&D
- Holding of study groups
- Dispatching advisors on technology and management
- Matching activity between technological seeds and needs

### 4. Information/awareness sessions and exchanges

- Holding exhibitions
- Exhibits at domestic and international air shows and other exhibitions
- Holding forums, symposiums and seminars
- Support for various aerospace businesses
- Exchanges with other domestic and international aerospace organizations

### 5. Others

- Human resources development
- Collaboration with government agencies

## Governments

### Characteristics of C-ASTEC Members

The C-ASTEC membership is highly varied and is made up of people and organizations from industry, academia, and government; it includes manufacturers of aerospace vehicle bodies, manufacturers of aerospace-related parts and peripherals, manufacturers of aerospace-related materials, companies with an interest in new technologies that may or may not be in an aerospace-related field, sales companies, financial companies, venture companies, trade groups in the Chubu region, local municipalities, university-affiliated people, and other individuals.

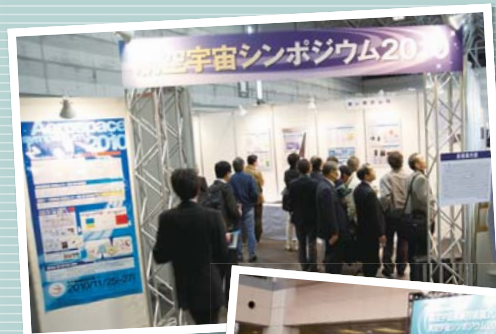
## Academia



Aircraft engineer advanced training course



Farnborough airshow 2010, JAIF chalet



Aerospace Symposium 2010



### Industry-academia-government activities in the Chubu region

C-ASTEC works to integrate the aerospace industry in the Chubu region and supports proactive industry-academia-government activities. This region has universities, research laboratories, a harbor, and an airport, and further development of this region is expected going forward.

### Chubu Aerospace Technology Center

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**City of Nagoya**

This pamphlet is printed on recycled paper, including recycled pulp.

