Great Lakes Industrial Region of U.S.A.

Great Lakes Industrial Region

- ✓ **Growth engine** of North America
- ✓ 107 million population
- ✓ Great lakes manufacturing trends point to
  - **Manufacturers leveraging technology**,
  - **Geographic advantages**, and
  - An experienced **workforce** to drive growth
- ✓ in the region, the nation, and around the globe.
- ✓ The **6 U.S. States**

Illinois, Indiana, Michigan, Minnesota, Ohio, And Wisconsin

that make up the great lakes region are an economic powerhouse.

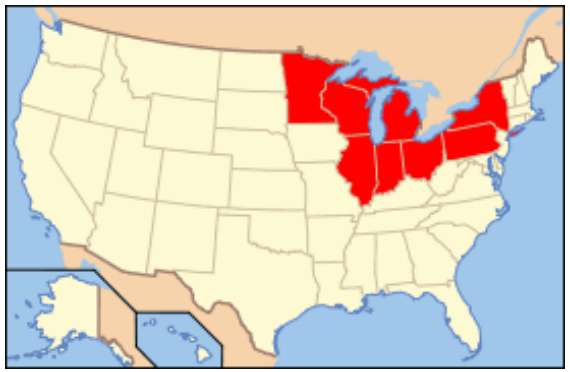
- **30% of US-Canada** economic activity takes place here
- More than **1/2 of US-Canada border trade** happens
- Over **200 million tons of cargo** are shipped annually
- The Great Lakes region is a **hotbed for innovation** with both sides of the border receiving healthy amount of research and development funding
- The area is home to some of the **world's leading educational institutions** in 2015-16, **18 of the top 100 universities in the world** could be found in the Great Lakes region
- **$278 billion** in **bilateral US-Canadian trade** (2015) in the Great Lakes area

more than the region trades with **Mexico, China, UK, Germany** and **Japan** combined

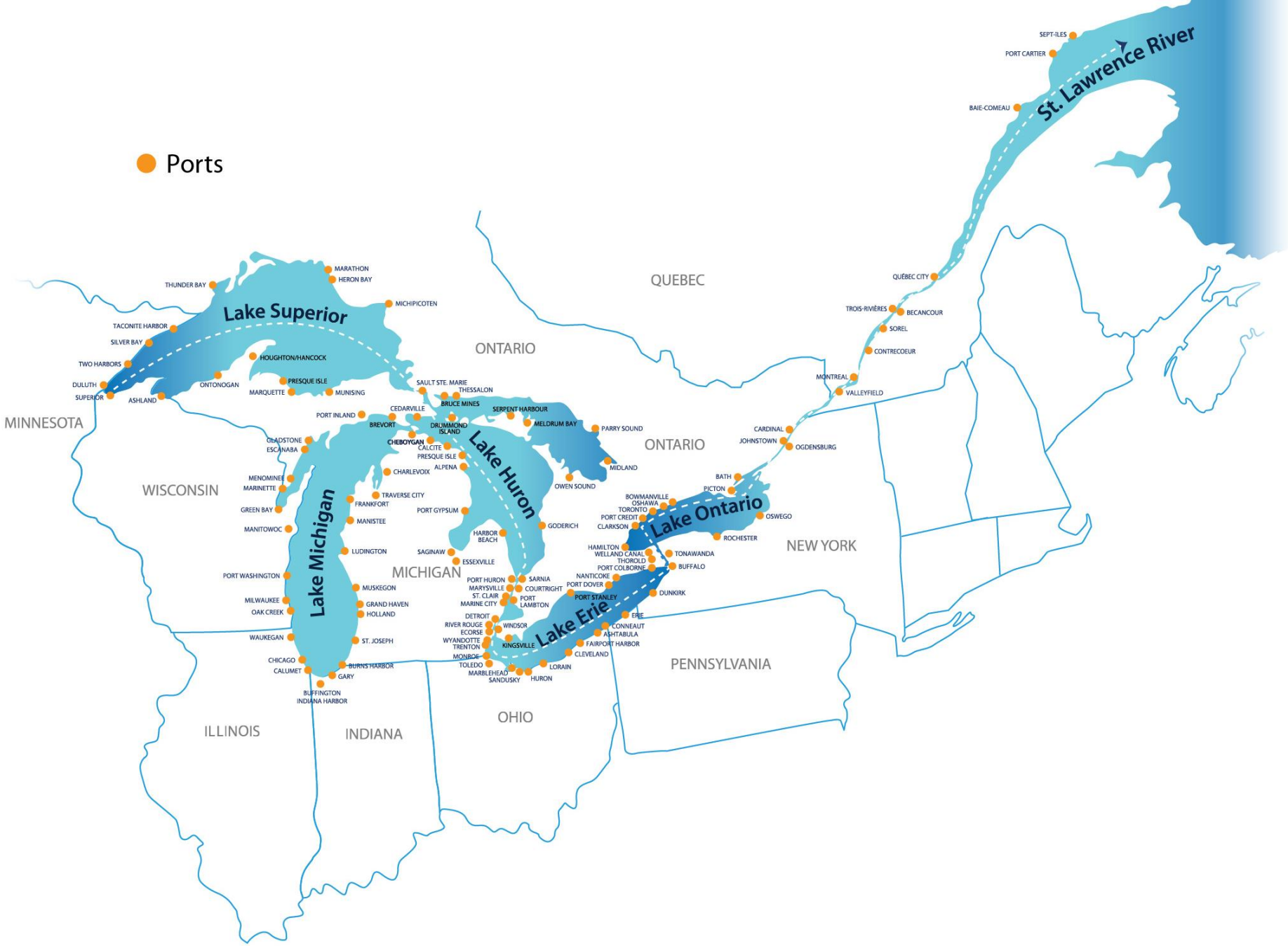

UNITED STATES OF AMERICA
WASHINGTON
Olympia
OREGON
Salem
IDAHO
Boise
MONTANA
Helena
WYOMING
Cheyenne
NORTH DAKOTA
Bismarck
SOUTH DAKOTA
Pierre
NEBRASKA
Lincoln
Great Salt Lake
Salt Lake City
UTAH
Denver
COLORADO
Carson City
NEVADA
Sacramento
CALIFORNIA
ARIZONA
Phoenix
Santa Fe
NEW MEXICO
KANSAS
Topeka
OKLAHOMA
Oklahoma City
TEXAS
Austin
MINNESOTA
St. Paul
IOWA
Des Moines
MISSOURI
Jefferson City
ARKANSAS
Little Rock
LOUISIANA
Baton Rouge
WISCONSIN
Madison
ILLINOIS
Springfield
MICHIGAN
Lansing
INDIANA
Indianapolis
OHIO
Columbus
KENTUCKY
Frankfort
TENNESSEE
Nashville
MISSISSIPPI
Jackson
ALABAMA
Montgomery
GEORGIA
Atlanta
FLORIDA
Tallahassee
SOUTH CAROLINA
Columbia
NORTH CAROLINA
Raleigh
VIRGINIA
Richmond
WEST VIRGINIA
Charleston
PENNSYLVANIA
Harrisburg
NEW YORK
Albany
Hartford
Montpelier
VT
NH
Concord
MAINE
Augusta
MA
Boston
CT
RI
Providence
NJ
Trenton
Dover
DL
MD
Annapolis
Washington D.C.
CANADA
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
NORTH PACIFIC OCEAN
Gulf of Mexico
NORTH ATLANTIC OCEAN
MEXICO
THE BAHAMAS
CUBA
ALASKA
Juneau
HAWAII
Honolulu
0 1,000 Miles
0 250 Miles
0 125 250 500 Miles
VT - Vermont
RI - Rhode Island
NH - New Hampshire
DL - Delaware
NJ - New Jersey
CT - Connecticut
MA - Massachusetts
MD - Maryland

Geography

- Lake **Superior**, Lake **Michigan**, Lake **Huron**, Lake **Erie**, and Lake **Ontario**, form the Great Lakes,
- The **largest group of freshwater lakes** in the world: about **20% of all the earth's fresh water**
- Several other minor lakes and rivers are also included in the Great Lakes region including the Niagra River, Detroit River, St. Lawrence River, St. Marys River, and the Georgian Bay.
- There are **35,000 islands** estimated to be located on the Great Lakes, created by **glacial activity.**




CANADA
MICHIGAN
V.T.
NEW YORK
WISCONSIN
MICHIGAN
Green Bay
Syracuse
Rochester
Buffalo
Madison
Saginaw
Grand Rapids
Milwaukee
Detroit
Scranton
Chicago
Rockford
Cedar Rapids
Toledo
Cleveland
Allentown
PENNSYLVANIA
N.J.
IOWA
Peoria
INDIANA
OHIO
M.D.
D.E.
Springfield
M.O.
ILLINOIS
WEST VIRGINIA
VIRGINIA
St. Louis
KENTUCKY


Ports
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
St. Lawrence River
MINNESOTA
WISCONSIN
MICHIGAN
ILLINOIS
INDIANA
OHIO
ONTARIO
QUEBEC
NEW YORK
PENNSYLVANIA
THUNDER BAY
MARATHON
HERON BAY
MICHIPICOTEN
TACONITE HARBOR
SILVER BAY
TWO HARBORS
DULUTH
SUPERIOR
ASHLAND
ONTONAGAN
HOUGHTON/HANCOCK
PRESQUE ISLE
MARQUETTE
MUNISING
SAULT STE. MARIE
THESSALON
BRUCE MINES
SERPENT HARBOUR
MELDRUM BAY
PARRY SOUND
MIDLAND
OWEN SOUND
PORT INLAND
CEDARVILLE
BREVORT
DRUMMOND ISLAND
CHEBOYGAN
CALCITE
PRESQUE ISLE
ALPENA
CHARLEVOIX
GLADSTONE
ESCANABA
MENOMINEE
MARINETTE
GREEN BAY
MANITOWOC
TRAVERSE CITY
FRANKFORT
MANISTEE
PORT GYPSUM
GODERICH
HARBOR BEACH
SAGINAW
ESSEXVILLE
LUDINGTON
PORT WASHINGTON
MUSKEGON
MILWAUKEE
GRAND HAVEN
OAK CREEK
HOLLAND
WAUKEGAN
ST. JOSEPH
CHICAGO
CALUMET
BURNS HARBOR
GARY
BUFFINGTON
INDIANA HARBOR
PORT HURON
SARNIA
MARYSVILLE
COURTRIGHT
ST. CLAIR
MARINE CITY
PORT LAMBTON
DETROIT
RIVER ROUGE
ECORSE
WYANDOTTE
TRENTON
MONROE
TOLEDO
MARBLEHEAD
SANDUSKY
HURON
WINDSOR
KINGSVILLE
LORAIN
CLEVELAND
FAIRPORT HARBOR
ASHTABULA
CONNEAUT
ERIE
PORT DOVER
PORT STANLEY
NANTICOKE
DUNKIRK
HAMILTON
WELLAND CANAL
THOROLD
PORT COLBORNE
BUFFALO
TONAWANDA
ROCHESTER
OSWEGO
BOWMANVILLE
OSHAWA
TORONTO
PORT CREDIT
CLARKSON
BATH
PICTON
CARDINAL
JOHNSTOWN
OGDENSBURG
MONTREAL
VALLEYFIELD
CONTRECOEUR
SOREL
TROIS-RIVIÈRES
BECANCOUR
QUÉBEC CITY
BAIE-COMEAU
PORT CARTIER
SEPT-ILES

The Formation of The Great Lakes

- **The Great Lakes Basin** (the Great Lakes and the surrounding area) **began to form** about **2 billion years ago – almost two-thirds the age of the earth**.
- About **2 million years ago**, it was **glaciers that advanced** over and back across the land.
- The **glaciers were upwards of 6,500 feet thick and further depressed the Great Lakes Basin**.
- When the **glaciers finally retreated** and melted **approximately 15,000 years ago**, **massive quantities of water were left behind.**

It is these glacier waters that form the Great Lakes today

- Many glacial features are still visible on the Great Lakes Basin today in the form of "glacial drift," groups of sand, silt, clay and other unorganized debris deposited by a glacier.
- Moraines, till plains, drumlins, and eskers are some of the most common features that remain.

The Industrial Great Lakes

- ✓ Today, 200 million tons a year are transported using this waterway.
- ✓ Major cargoes include iron ore (and other mine products), iron and steel, agriculture, and manufactured goods.
- ✓ The Great Lakes Basin also is home to 25%, and 7% of Canadian and U.S. agricultural production, respectively.
- ✓ Cargo ships are aided by the system of canals and locks built on and between the lakes and rivers of the Great Lakes Basin. The two major sets of locks and canals are:

1) **The Great Lakes Seaway,** consisting of the Welland Canal and the Soo Locks, allowing ships to pass by the Niagra Falls and the rapids of the St. Marys River.

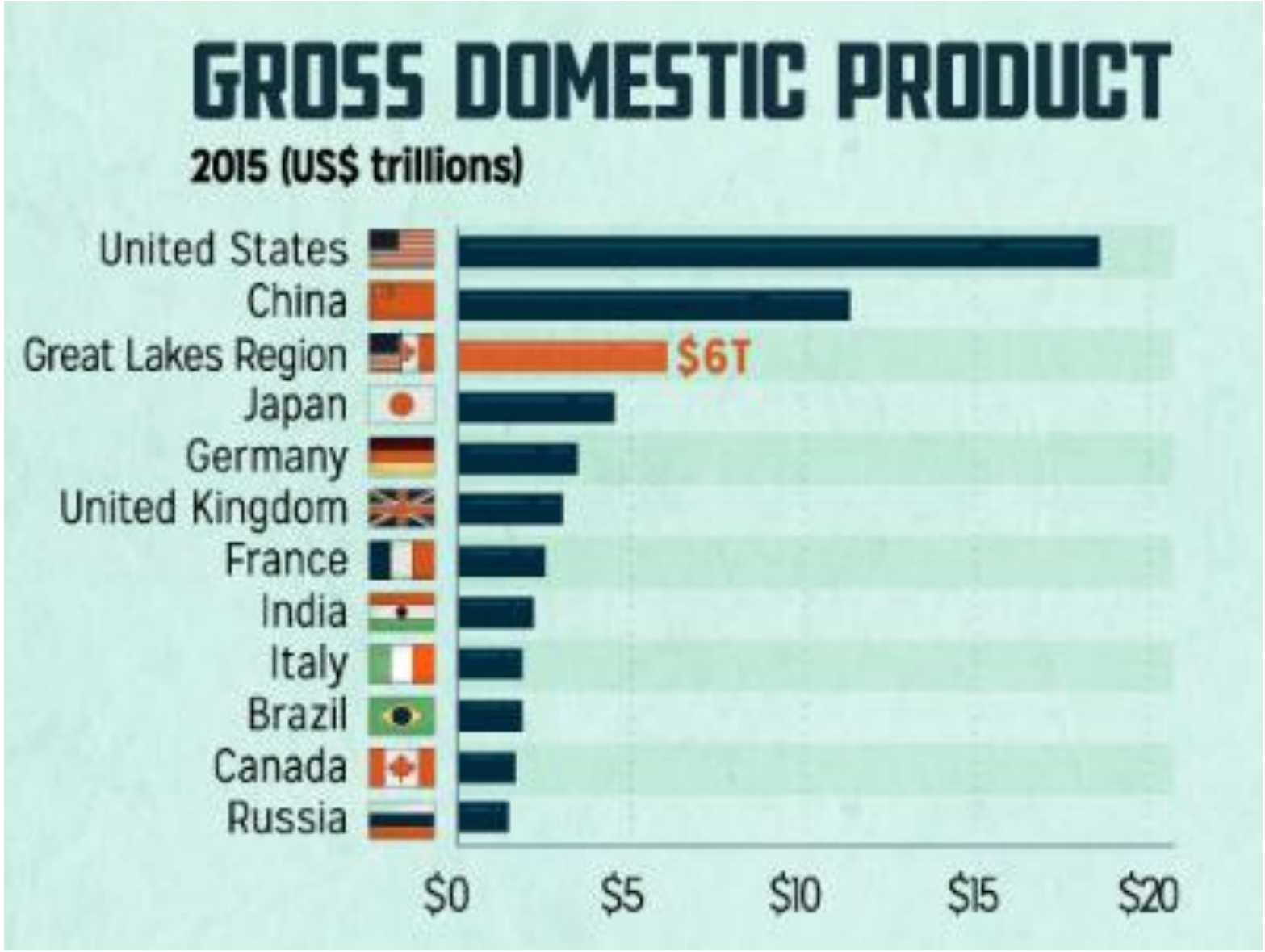
2) **The St. Lawrence Seaway**, extending from Montreal to Lake Erie, connecting the Great Lakes to the Atlantic Ocean.

There are around **65 ports** located on Great Lakes-St. Lawrence Seaway system. 15 are international and include: Burns Harbor at Portage, Detroit, Duluth-Superior, Hamilton, Lorain, Milwaukee, Montreal, Ogdensburg, Oswego, Quebec, Sept-Iles, Thunder Bay, Toledo, Toronto, Valleyfield, and Port Windsor.

The Economy

- The value of the extensive **forests** and **fertile land** in the region was soon realized, and lumbering and agriculture became important.
- **Large coalfields and deposits of iron, copper, salt, limestone, and other minerals were found along or near the extensive shorelines**.
- The combination of these **vast resources** with a plentiful water supply naturally favored the development of huge industries and large metropolitan areas around the Great Lakes.
- Major **urbanized areas** include a band that extends from

Milwaukee, Wisconsin, through Chicago and around southern Lake Michigan; a band that stretches southward from Detroit, Michigan, and then continues along the southern shore of Lake Erie; and the Toronto-Hamilton area on the northern shore of Lake Ontario.



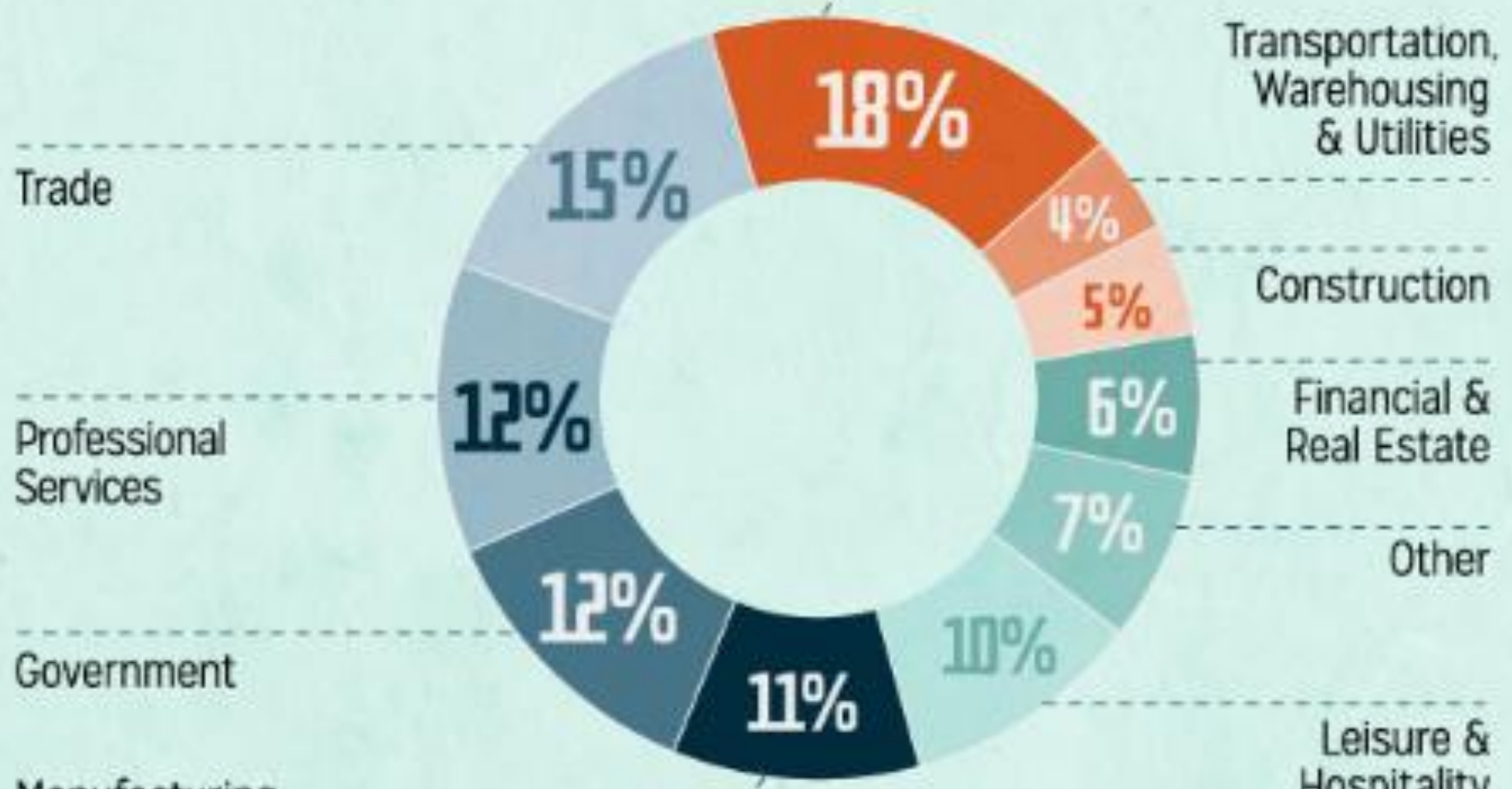
In fact if it were a country, it would be the 3rd largest in the world by GDP

TOP DESTINATIONS FOR MERCHANDISE EXPORTS

from the Great Lakes Region 2015

EMPLOYMENT BY INDUSTRY

Great Lakes-St Lawrence Region 2016



Resources

- The **ranges around Lake Superior**—such as the **Mesabi** in **Minnesota** and the **Marquette** in Michigan—are a **major source of iron ore** for the United States.
- Peak production occurred in 1953, when almost 100 million net tons were produced.
- The **large deposits of rich ores have since been depleted,** but low-grade taconite ores are now efficiently processed into iron-ore pellets.
- Lake Superior's Keweenaw Peninsula was once a major source of **copper**; sources outside of the lakes are now relatively more important.
- **Hydroelectric** generating stations exist on the St. Marys, Niagara, and St. Lawrence rivers.
- **Numerous coal- and nuclear-powered generating plants** around the lakes utilize lake water for cooling.

Industrial Regions

8 major Industrial Regions of USA and Southern Canada are

1. Southern New England
2. Mid-Atlantic States
3. Pittsburgh-Lake Erie Region
4. Detroit Industrial Region
5. Lake Michigan Region
6. Southern Appalachian Region
7. Eastern Texas
8. Pacific Coastal Region

1. Pittsburgh-Lake Erie Region:

- **The industry spreads northward up to Shenango valley to Sharon, up the Beaver-Mahoning valley to Youngstown and into Canton, Massillon, and other eastern Ohio towns.**
- It also spreads down the Ohio River to Weirton, Steubenville, wheeling Huntington, Ashland, Ironton and Portsmouth and up the Miami valley to Middletown.
- This is the region having **greatest concentration of ferrous industries**.
- This region accounts about **1/4th of ferrous and ferro-alloy products** of the country.
- The famous **Youngstown-Pittsburgh-Johnstown iron and steel triangle** is located in the region.
- The other steel-producing areas are: **Wheeling, Cleveland, Louisville, Rookford, Flint, Steubenville** and **Detroit**

1. Pittsburgh-Lake Erie Region:…

- The other manufacturing centres engaged in diversified manufacturing activities are:

  Chicago, Anderson, Midland, Iowa, St. Louis, Minneapolis

- Most of the iron and steel towns are spun in the vicinity of Pittsburgh, such as Mckeesport, Braddock, Carnegie, Homestead and Johnstown.
- **Pittsburgh** also has the **largest glass industry** in the United States.
- **Johntown**, to the east of Pittsburgh, has a **coal, iron and steel industry**.
- Most of the **ore comes from Lake Superior**
- **Cleveland**, on Lake Erie, is noted **for iron goods, electrical engineering and machineries**.

2. Detroit Industrial Region:

- This is the **greatest automobile manufacturing region of the USA**, centered at **Detroit**.
- The city was at first a centre for wagon and carriage-making which **later led to the assembly of automobiles in the region.**
- It is the **headquarters of several giant motor corporations** including

  Ford, Chrysler, and General Motors
- Other locational advantages were the **large market for cars in the Midwest**, where **other forms of transport**, e.g., railways, were relatively poorly developed in the early 20th century; and the ease of transporting steel from Pittsburgh via Lake Erie.
- **The automobile industry extends** to many other towns **around Detroit, e.g., Lansing, Flint, Jackson, Pontiac, Dearborn and Toledo**
- Car assembly is linked with other branches of manufacture such as

  tyre-making, electrical wires, glass, batteries, paints, polishes, alloyed steel, spare parts and components.
- **Other industries**: motor vehicles, machinery, fabricated metals, machine tools and electronics.

3. Lake Michigan Region:

- This area lies on the southern shores of Lake Michigan with **Chicago (second largest city in the United States) as a main centre.**
- There are some **10,000 factories** in and around Chicago, amongst which **the iron and steel plants** are the most important.
- The manufacturing industries around Lake Michigan are **confined largely to Chicago and Gary** where **iron ore of the Lake Superior** and of north meets **coal from the south**.
- Railways from the north-west are obliged to pass through it in rounding Lake Michigan to reach the Atlantic

3. Lake Michigan Region:…

- ✓ Chicago concentrates on **motor vehicles and trucks, cement, chemicals, iron and steel goods, furniture, paper, cereal, baby food and pharmaceuticals.**
- ✓ Other industries are based on the **agricultural products** of the surrounding regions, e.g., **meat-packing, grain milling and the making of agricultural implements and machinery.**
- ✓ **Gary** is another important for **iron and steel production**.
- ✓ Closely associated with the **Chicago metropolitan area** are such urban centres as **Milwankee, Racine** and **Kenosha** with their extensive iron and steel, motor vehicle, beverage, machinery, meat packing, leather and leather goods establishments.

INDUSTRIAL REGIONS

- USA
- Ruhr
- Ukraine
- Japan

Region at a Glance

- **Location: Germany, North of *Westphalia* province**
- Geographical extension: North - South: 65 km ; East-west : 120 km

  It is situated in the **middle of the European industrial belt**. (The location of the region makes it well connected to other major European cities and metropolitan areas like the *Randstad*, the *Flemish Diamond* and the *Frankfurt Rhine Main* Region.)

  The region is bordered by the rivers:

  The ***Ruhr*** –to the *South*: The ***Rhine-*** to the *West*, and ***Lippe-*** to the *North*

  Minor Rivers: Emscher, Ennepe, Volme, Wupper

- **Proximity to** West German's only source of **iron ore**
- The largest German industrial region **Germany has four major industrial regions :**

1. **The Rhine Ruhr region**
2. **The Central German region**
3. **Southern Saxony Region**
4. **The middle Rhine region**

- Water source often promoted textile industry, small streams fostered metallurgical industry, and coalfield and iron ores were critical to the great industrial development.

- **Coalfield distribution** substantially contributed to the industrial pattern in the Ruhr area. Coal near the south was **near the surface** and thus very easy to mine. In contrast, coal to the north went deeper under the ground and was hard to obtain, but it contained more volatile components and thus had more usage than the southern coal.

- The fact that mining the **northern coal of high quality** needed more refined and developed technology induced the northward stride of the industrial center point in the Ruhr area throughout the nineteenth century.

- Geologically, the region is defined by coal-bearing layers from the upper **Carboniferous** period. The coal seams reach the surface in a strip along the river Ruhr and dip downward from the river to the north. Beneath the Lippe, the coal seams lie at a depth of 600 to 800 metres (2,000 to 2,600 feet). The thickness of the coal layers ranges from one to three metres (three to ten feet). **This geological feature played a decisive role in the development of coal mining in the Ruhr**.

- The coal mines of the region are considered to be **one of the largest coal mines in the world**. The **coal belt** to the east and west of Ruhr river extends **65 km in length** and **16 km in width**.

- Marked by **large concentration of cities** it is the **largest metropolitan region** in Germany with **over 10 million inhabitants**.

- Industrial region is dotted with **Iron and steel** works, **Locomotives**, **Chemical plants** and factories for **manufacturing equipment for mines** and **steel mills**.

- ***Dinsburg*** is the *leading Rhine port* and the **largest inland port** of Europe.

- **Natural resources such as coal, iron ore and limestone** enabled the **iron and steel** industry to flourish in the Ruhr.
- The **chemical** and **textile** industries also grew due to **good transport links** and available workforce.

- The area developed industrially in the **1930s and 1940s** to supply arms for Germany.


150 km
North Sea
Hamburg
NETHERLANDS
Amsterdam
Berlin
Rotterdam
Westphalia
GERMANY
Ruhr
SEE ENLARGEMENT
Antwerp
Cologne
BELGIUM
Rhineland
Rhine
Frankfurt
LUX.
North Rhine-Westphalia
Lippe
Rhine
Ruhr
Bochum
Dortmund
Essen
Ruhr
Duisburg
Dusseldorf
25 km
Major conurbations


Regierungsbezirk Münster
Kreis
Kreis
Lippe
Recklinghausen
Wesel
Rhein
Dorsten
Kreis
Hamm
Recklinghausen
Castrop
Herten
Wesel
Dinslaken
Gladbeck
Gelsen-
kirchen
Bergkamen
Lünen
Unna
Unna
Bottrop
Ober-
hausen
Herne
DORTMUND
DUIS-
BURG
Moers
ESSEN
BOCHUM
Witten
Mülheim
a.d. Ruhr
Regierungsbezirk Arnsberg
Regierungsbezirk Düsseldorf
Ruhr
Hattingen
Ennepe-
Ruhr-
Kreis
Hagen
WUPPERTAL
DÜSSELDORF

- It has extensive **high-grade deposits of coking coal**. Estimated **reserves- 42 billion tonnes** of coal.

- The region accounts for roughly **15% of the GDP of the German economy**, which would place it as the **4th largest GDP of metropolitan area in the European Union** and **the 16th largest GDP in the world**.

- It is one of the **world's 10 largest economic regions.**

- **Iron and steel manufacturing** has concentrated in the Rhine—Ruhr Valley because of proximity to large coalfields. Access to iron and steel production stimulated the location of other **heavy-metal industries, such as locomotives, machinery, and armaments.**

Major Industries

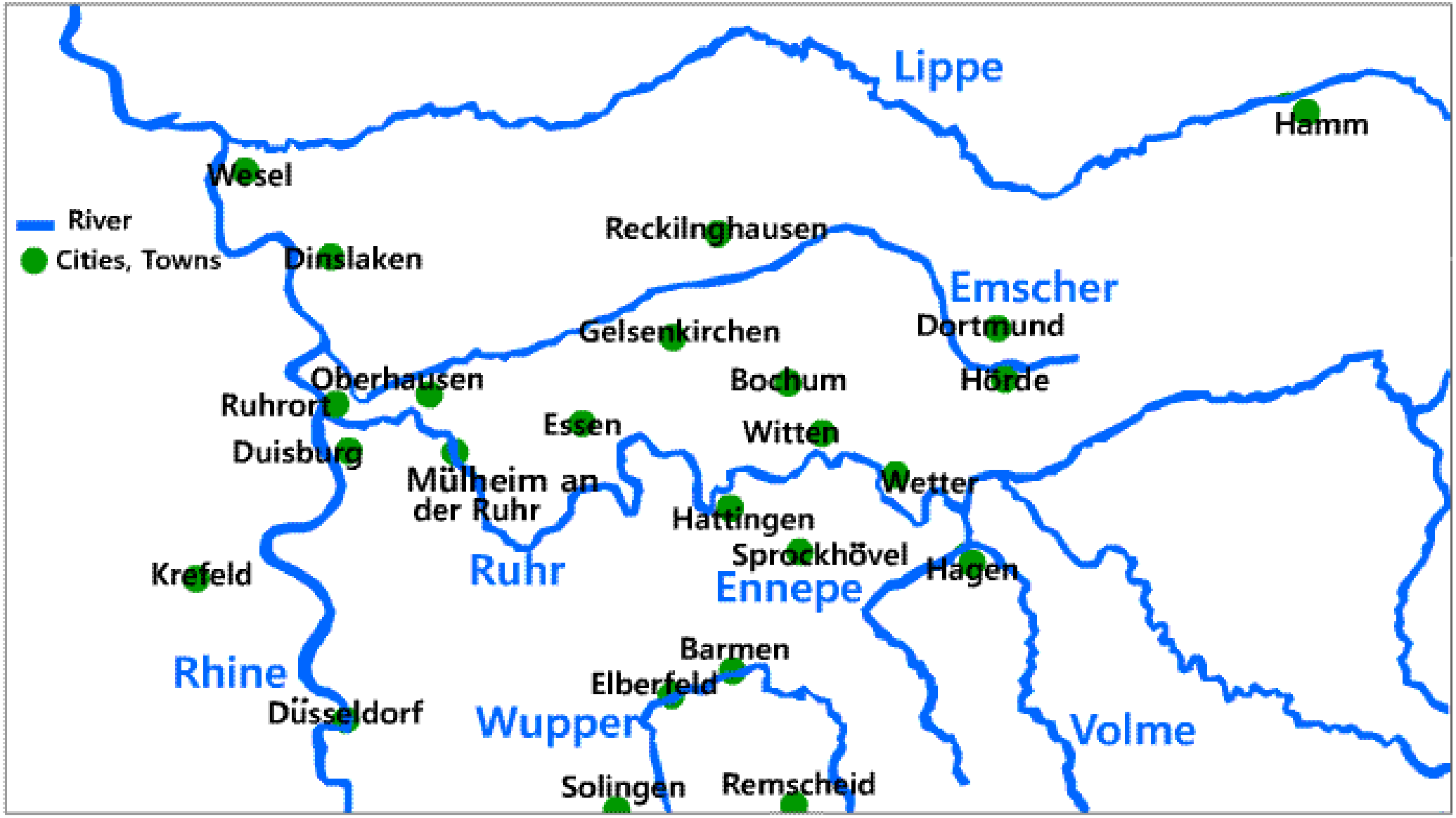
- Iron and Steel
- Heavy Engineering
- Machines
- Chemicals
- Textiles
- Automobiles
- Locomotives

Major Industrial Centres

- **Major : Dusseldorf, Essen** & **Cologne** are by far the largest economic centers.
- Other major economic centers are **Bonn** and **Dortmund**.
- Other Centres:

  Barmen, Bochum, Dinslaken, Duisburg, Elberfeld, Gelsenkirchen, Hagen, Hamm, Hattingen, Hörde, Krefeld, Müheim/ Ruhr, Oberhausen, Recklinghausen, Remscheid, Ruhrort, Solingen, Sprockhövel, Wesel, Wetter, Witten
- The **main industrial area** lies to the **north of Ruhr river** from **Duisberg to Dortmund.**
- **Essen, Bochum, Gelsenkirchen, Dusseldorf, Duisberg and Dortmund** are major spots producing Heavy engineering, rail engines, trains, automobiles, machines, cranes, bulldozer, steel products.
- **Hagen, Remscheid and Solingen** are famous for the manufacturing of scientific instruments and armaments.
- **Mülheim, Ruhrort, and Duisburg** thrived as **port cities** due to their suitable positions near the Rhine and the Ruhr

- It is neighbored by regions engaged in **Textiles**, **Machines** and **Metallic** industries in the *south-west* and *north-west*.
- Heavy engineering industries are situated in iron and steel producing areas. (**Dusseldorf, Bochum, Dortmund, Duisburg, Essen, Hagen, Oberhausen**)
- **Chemical industries** are associated with coking coal regions. **(Essen, Dortmund, Bochum, Duisburg, Gelsenkirchen & Recklinghausen)**
- **Textile industries** are established in the **southern and western part** of the region in **Wuppertal, Seizberg, Reader Colonge, Monchengladbach, Dormagen & Krefeld** areas.


River
Cities, Towns
Lippe
Hamm
Wesel
Recklinghausen
Dinslaken
Emscher
Gelsenkirchen
Dortmund
Oberhausen
Bochum
Hörde
Ruhrort
Essen
Witten
Duisburg
Mülheim an der Ruhr
Wetter
Hattingen
Sprockhövel
Hagen
Krefeld
Ruhr
Ennepe
Barmen
Rhine
Elberfeld
Düsseldorf
Wupper
Volme
Solingen
Remscheid

Major Centres In Brief

Dortmund:

- The favorable situation of the town in the center of the **Westphalian coal basin** and extensive beds of iron ore in the vicinity, made it the leading industrial city in the region
- Improved transportation system gave further advantage to the location of the town. The **Köln-Mindener Railroad** opened in 1847 to connect Düsseldorf, Duisburg, Oberhausen, Dortmund, Hamm, and Minden. The **Bergisch-Märkische Railroad** was soon built and went through Düsseldorf, Elberfeld, Hagen, Witten, and Dortmund.
- In 1877, as the importance of overseas ore increased, plan for the canal construction from Dortmund to the river Ems was suggested and was executed within 10 years.
- With two flourishing steel works, ***Dortmunder Union*** and ***Hoesch,*** Dortmund showed relatively varied industrial structure in comparison with Essen and Bochum.

Duisburg :

- Throughout the nineteenth century, diverse industries were set up and flourished in Duisburg and aided its industrial growth.

Düsseldorf :

- It is one of the **most important steel-using centers**.
- **Riverside location** and **favorable railroad connection** functioned as advantages.
- It is the major **banking center** of the Westphalian coal and iron trade
- It has **cotton spinning, weaving, calico printing, yarn-spinning, dyeing and other various industries as well as iron industries**.
- With Duisburg, it functioned as the **western hub of transportation of the Ruhr area**.

Essen:

- **Abundance of coking coal** of high economic value in the Essen basin.
- It is a **center of steelmaking and steel-using**.
- Situated at the **center of the railway network**, it has access to various Westphalian iron and coal fields. **The large iron and coal fields of the Essen basin has contributed to Essen's great prosperity**.

TRANSPORTATION

- ✓ Canals and rivers such as the Rhine are used for **transport and power**. The Rhine River is Europe's most important inland waterway.
- ✓ Transport networks in the Rhine-Ruhr region are **dense** and **effective**.
- ✓ **Dusseldorf** has the **highest highway and rail density** in Europe.
- ✓ **Dortmund** is home to the **largest canal port in Europe**, and **Duisburg** is the **largest inland river port** in Europe
- ✓ The area has ***four international commercial airports***, and multiple smaller aerodromes for general aviation
  1. **Düsseldorf Airport**
  2. **Cologne Bonn Airport**
  3. **Dortmund Airport &**
  4. **Weeze Airport**
- ✓ North Rhine-Westphalia has the ***densest network of Autobahns*** in Germany.
- ✓ **Duisburg Port**(Duisport) and **Dortmund Port** are **large industrial inland ports** and serve as hubs along the Rhine and the German inland water transport system
- ✓ Well developed **Public transportation** network

Factors Associated with the Development of The Ruhr Industrial Region: A Summary

1. Ruhr basin has the **largest reserves of coking coal** in the Europe. (Four in Germany: Ruhr, Sarr, Saxony & Silesia)
2. It is situated in the **middle of the European industrial belt**.
3. **Densest**, **effective** and **cheap inland** (rivers and canals) **waterways** is the key transportation factor.

   Sea ports provide the **international market** outlet for the region.
4. The region has fertile lands for **agriculture** in the **north** and **dense forest** in the **south** providing great opportunity to obtain **raw materials** from them.
5. Iron-ore is imported from Sweden, Lorraine, Spain, Algeria, Tunisia, etc.
6. Cotton, wool and raw fiber is also exported.
7. Technology: **Deep-cast coal mining** and **shaft mining** promoted the northward progression of the mining industry and brought light to the northern cities.

INDUSTRIAL REGIONS

- USA
- Ruhr
- Ukraine
- Japan

Industrial Region: Ukraine

Location: East of Europe,

It lies to the north-west of **Black Sea**, with **Russia** to the East, **Belarus** to the north, **Poland** to the north-west, **Slovakia** & **Hungary** to the west, and **Romania** to the south-west.

Population: 42.5 million

- The industrial setup **started after 1870**
- It is a renowned **Iron & Steel producing region**
- It lies in close proximity to oil producing centres : **Baku, Grozny, Maykop**, etc.
- It is the **densest populous region of Erstwhile U.S.S.R.** (availability of **skilled labour** and **large market**)


Arctic Ocean
North Sea
Baltic Sea
Ukraine
Atlantic Ocean
Crimea
Black Sea
Mediterranean Sea
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Region at a Glance

- Ukraine was the **biggest coal** and **metallurgical base** of *Erstwhile U.S.S.R.* along with major source of its **food supply**.
- Ukraine is **relatively rich in natural resources**, particularly in **mineral deposits**. Although **oil and natural gas reserves in the country are largely exhausted**, it has other important energy sources, such as **coal**, **hydroelectricity** and **nuclear fuel** raw materials.
- **Coal** from **Donets field** & **Iron-ore** from **Kryvyi Rog** has made possible the development of a **large ferrous metallurgical industry** in the Ukraine
- **Natural resources:**

  Iron ore, Coal, Manganese, Natural Gas, Oil, Salt Sulphur, Graphite, Titanium, Magnesium, Kaolin, Nickel, Mercury, Timber and abundance of arable land
- The large part of the Ukraine's **chemical industry** is engaged in the manufacture of **fertilizers** due to availability of ***salts*** and ***phosphate***.

Region at a Glance...

- **Energy:**

The energy demand of the region is fulfilled by **electric stations** built under the **five year plan.** However, Ukraine **imports most energy supplies**, especially ***oil*** and ***natural gas.*** It also depends largely on Russia for its energy supplier.

25% of the natural gas in Ukraine comes from **internal sources**

35 % comes from **Russia**

40 % from **Central Asia** through transit routes that Russia controls.

Region at a Glance...

Transportation:

Of particular importance for Ukraine's economy was the construction of **railroads** during the **1870s and 1880s**.

It brought many benefits through **low-cost transportation**. Cheaper coal from the **Donbass** and **iron ore** from the **Krivi Rog Iron-ore Basin** led to phenomenal growth in ferrous metallurgy and related industries. (*Raw-material*)

Cheaper transport also stimulated **exports of grain**, other agricultural products and various **industrial products (sugar, spirits, coal, rails).**

Railroad expansion gave impetus to industries **ancillary to railroad construction**.

Rail transport in Ukraine connects all major **urban areas**, **port facilities** and **industrial centres** with neighboring countries.

The heaviest concentration of railway track is the Donbass region.

Dnieper, Sever sky Donets, Dniester, Southern Bug rivers provide **cheap water transportation**


Minsk
Poland
Belarus
Russia
Ukraine
Bug R.
Warsaw
Pripyat' R.
Dniepr R.
Vistula R.
Desna R.
Don R.
Shostka
Chernihiv
Konotop
Sumy
Kovel'
Korosten'
Chornobyl
Luts'k
Rivno
Pryluky
Kiev
Zhytomyr
Kharkiv
L'vov
Ternopol'
Khmel'nyts'kyy
Poltava
Cherkasy
Slovakia
Vinnytsya
Kremenchuk
Kramators'k
Ivano-Frankivs'k
Uzhhorod
Dnestr R.
Uman'
Luhans'k
Chernivtsi
Tisza R.
Kirovohrad
Dnipropetrovs'k
Donets'k
Hungary
Prut R.
Pervomays'k
Kryvyy Rih
Zaporizhzhya
Dnepr R.
Nikopol'
Moldova
Mykolayiv
Mariupol'
Melitopol'
Chisinau
Berdyans'k
Kherson
Romania
Odesa
Sea of Azov
Izmayil
Yevpatoriya
Kerch
Simferopol'
Feodosiya
Bucharest
Sevastopol'
Yalta
Danube R.
Black Sea
Bulgaria
Sophia
0 100 200 km
0 50 100 150 mi
50°
45°
35°
30°
25°
N
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(805) 685-3100 www.maps.com


BELARUS
POLAND
RUSSIA
ROMANIA
MOLDOVA
UKRAINE
Polesian Lowland
Central Russian Upland
Dnieper Lowland
Dnieper Upland
Podolian Upland
Eastern Carpathians
Donets-Azov Plateau
Black Sea-Azov Lowland
Kiev
Chernihiv
Konotop
Nizhyn
Sumy
Lutsk
Rivne
Zhytomyr
Bila Tserkva
Cherkasy
Kharkiv
Poltava
Kremenchuk
Lysychansk
Kramatorsk
Luhansk
Dnipropetrovsk
Horlivka
Donetsk
Makiyivka
Kryvyy Rih
Zaporizhzhya
Nikopol
Mariupol
Berdyansk
Melitopol
Kherson
Mykolayiv
Odessa
Kerch
Yevpatoriya
Simferopol
Sevastapol
Lvov
Ternopil
Khmelnytskyy
Drohobych
Vinnytsya
Ivano-Frankivsk
Kamyanets-Podilskyy
Chernivtsi
Uzhgorod
Kirovohrad
Pripyat
Desna
Bug River
Dniester
Dnieper
Donets
Southern Bug
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Major Industrial Areas

1. **Donbass area:**

- **Metallic industries** and **machine manufacturing** industries and large number of their factories
- **Luhansk** & **Kramatorsk**: World known **machine industry**
- **Volgograd**: World known **tractor manufacturing**
- **Donetsk** : **Steel, machines and machine tools production**
- Other: **Makeyevka**, **Voroshilov**, **Voroshilovgrad**
- Production of : **heavy industries, railway tracks, steel sheets, iron blocks, bulldozers, cranes, agriculture machinery**, etc.

2. Dnieper area:

- Dneprodzerzhinsk,
- Dnipropetrovsk,
- Zaporozhia,
- Dneproges,
- Kirovograd

- Various hydroelectricity power plants have been established by constructing dams on Dnieper river.
- **Four major manufacturing centres** based on these hydro-power plants are:
    1. Dneprodzerzhinsk
    2. Dnipropetrovsk
    3. Zaporozhia,
    4. Dneproges
- **Major industries**: Aluminum, Steel, Chemicals, Machine Tools

3. Kryvyi Rog area:

- **Iron-ore region** *extended from* **Kryvyi Rog** to **Nikolay**

- *Large scale* **steel mills** and **cotton textile mills** occupies the industrial landscape

- **Nikolay** & **Odessa** : **Agriculture Machinery**, **Textiles** & **Ship Building**.

4. Azov sea coastal region: (Mariupol)

- Major centres: Rostov, Zhdanov, Taganrog, Berdyansk, Krasnodar & Kerch

  Major industries:

  Steel, Metallurgical, Machines, Equipment, Electric Products, Scientific Instruments, Chemical and Sugar

- Rostov, Simferopol & Sevastopol: Ship Building

5. Kiev-Kharkov region:

Centres: Kiev, Kharkov, Lvov, Poltava, Chernigov, Piryatin

- Cotton & Woolen Textiles
- Electric Products
- Scientific Instruments
- Chemical
- Sugar
- Watches
- Pesticides
- Medicines

Three minor industrial region:

1. **Krivi Rog to Voroshilovgrad:** It posses maximum number of industries. This eastern portion of the Ukraine has major concentration of industrial setup: **95% iron-steel production** and metallurgical products ; **75% cement, chemicals, building material, glass**, etc.

2. **West of Dnieper river**

3. **Near Black Sea from Odessa to Kherson**

Industries of the region

- Iron & Steel
- Ferrous Metallurgy
- Machine Building
- Non-ferrous Metallurgy
- Electric Power
- The Fuel Industry
- The Chemical Industry
- The Petrochemical Industry
- The Metalworking Industry
- The Lumber Industry
- The Woodworking Industry
- The Paper Industry
- The Construction Industry
- The Building-materials Industry
- The Glass Industry
- Light Industry
- The Food Industry
- The Microbiological Industry
- The Medical Technology Industry
- Flour Milling
- The Mixed-feed Industry And
- The Printing Industry

Industrial Regions

- USA
- Ruhr
- Ukraine
- Japan

Industrial Regions of Japan

Geography

Location:

- An island nation
- Area: 3,77,801 sq. km (***11.5% of India***)

  (Rajasthan is 10.4% of India: 3,42,239 sq. km)
- Consists of **6,852 islands**
- **Four** main island in **north to south** sequence is :
  1. **Hokkaido**
  2. **Honshu**
  3. **Kyushu**
  4. **Shikoku**
- It is surrounded by **Sea of Japan** (East Sea) in the **west**, **Sea of Okhotsk** in the **north-west** and **North Pacific Ocean** in **the south-east**.
- **Neighboring countries**: North & South Korea, China
- It is situated on the **'Pacific ring of fire'** with more than **50 active volcanoes**
- The country is prone to large number of **frequent earthquakes**


Sea of Okhotsk
CHINA
RUSSIA
Asahikawa
Kuril Is. (Disputed)
Sapporo
Kushiro
Hokkaidō
Aomori
Sea of Japan (East Sea)
NORTH KOREA
Morioka
Akita
Honshū
JAPAN
Yamagata
Sendai
Niigata
Fukushima
Iwaki
Shinano
Nagano
Hitachi
Kanazawa
Utsunomiya
Yellow Sea
SOUTH KOREA
Fukui
Urawa
TOKYO
Tottori
Gifu
Kōfu
Chiba
Matsue
Kyōto
Fuji
Yokohama
Kōbe
Nagoya
Shizuoka
Tsushima
Hiroshima
Ōsaka
Kitakyūshū
Wakayama
Kōchi
Tokushima
Fukuoka
Ōita
Nagasaki
Shikoku
Ryukyu Is.
Kumamoto
Miyazaki
Kyūshū
North Pacific Ocean
Kagoshima
Okinawa
Naha


JAPAN
LOW / HILLS / MOUNTAINS
Russia
China
North Korea
South Korea
Seoul
Sea of Okhotsk
Ownership of these islands in dispute (Japan & Russia)
HOKKAIDO
Sapporo
Kushiro
Hakodate
Aomori
HONSHU
Akita
Morioka
Niigata
Sea of Japan (East Sea)
Shinano River
Sendai
Fukushima
Nagano
Nagoya
Mito
Japan
Kyoto
Tokyo
Hiroshima
Kobe
Yokohama
Pacific Ocean
Fukuoka
Lake Biwa
Mount Fuji
Osaka
Nagasaki
Kochi
SHIKOKU
Miyazaki
Kagoshima
KYUSHU
300 mi
300 km
East China Sea
Ryukyu Islands
Izu Islands
worldatlas
Philippine Sea
Bonin Islands
Okinawa
©GraphicMaps.com

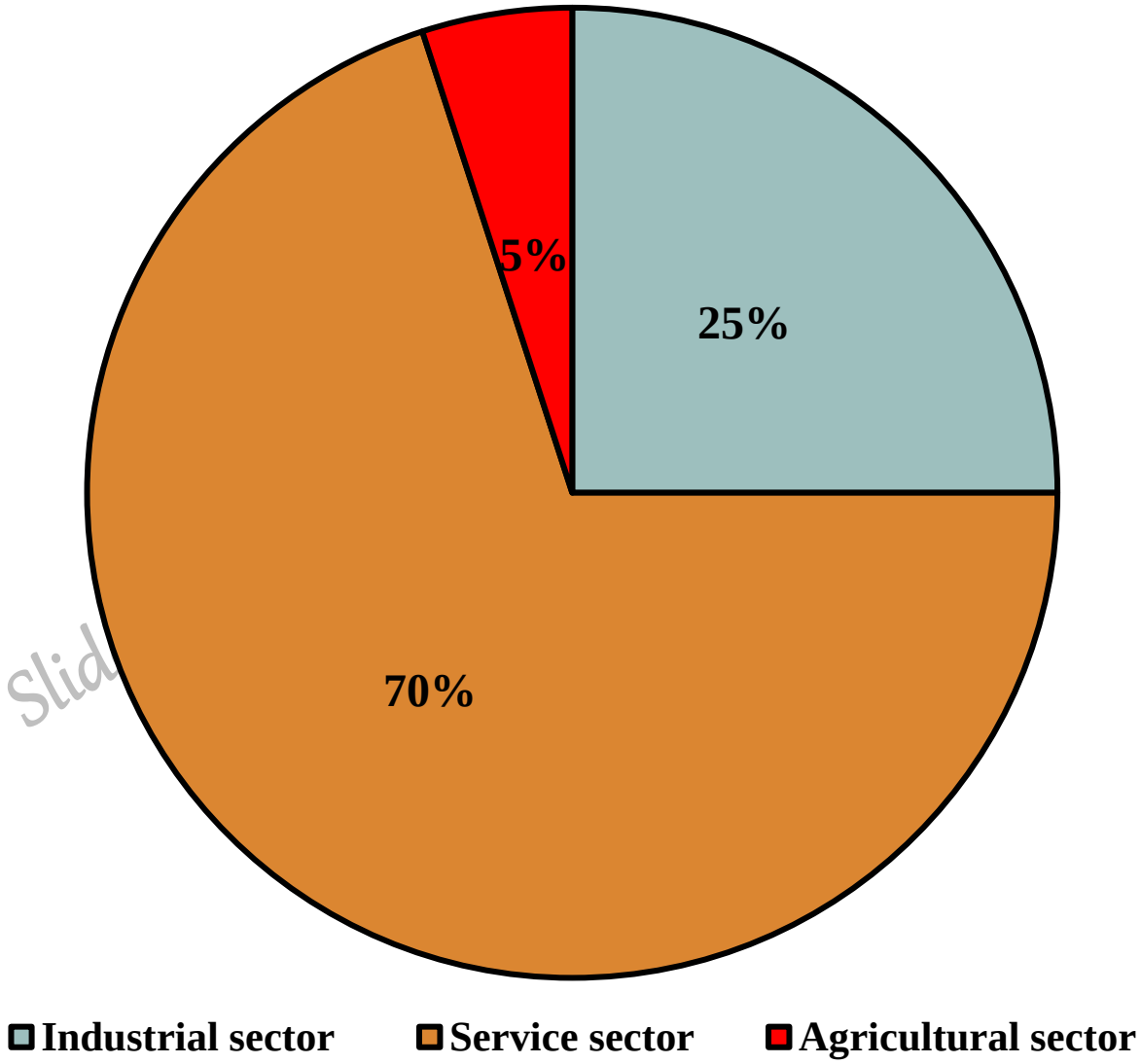
Topography:

- **75 %** mountainous region
- **16 %** plain area (mainly in the form of coastal plains)
- **70 %** area of Japan is covered with **dense forest**

Population:

- **128 million** (2010) (**8th most populous nation**)
- **Density**: **340 persons per sq. km** (*India:382 persons per sq. km)*
- **Urban** population: Japan has a high population concentration in urban areas (around **91%** of it's total population lives in cities.) (***India: 31.16%)***
  - **25%** population is engaged in **Industrial sector**
  - **70%** in **Service sector**
  - Only **5% of labor force** working in **agricultural sector**

Percentage of Population Engaged in Various Economic Activities



Economic overview:

- It is world known as an **industrial** and **developed** country.
- The **first country of Asia** to develop to the **levels of European countries** in technological advancements.
- Th economy is mainly **market oriented** and **manufacturing** based. The industrial landscape has a long tradition of development in Japan.
- It is the **third-largest in the world by nominal GDP**

  (USA > China > Japan > Germany > India) and the **world's second largest developed economy (***after USA***). (***source: IMF outlook October, 2018)***

Economic overview…

- The **traditional handicrafts** and **textile** industry marks the first industrial setup in Japan.
- The traditional handicraft (**silk clothes, clay utensils & toys,**) industry were in a well-developed status **became the base for the industrial development of Japan in 1870**.
- The **industrial output** when extended to **large scale production** were exported to the **international markets** and **traded for different products**.
- **Textile industry** mainly flourished on large scale with the establishments of the big textile mills.

- The **industrial boost** was observed during the **2nd World War (1930) where heavy industries** in the industrial scenario of Japan evolved.

- Despite its **dependence on Iron and coal imports from outside world**, Japan accounted for **105.15 million metric tons of the global production of crude steel** (2015) in the world, **ranking second after China**.

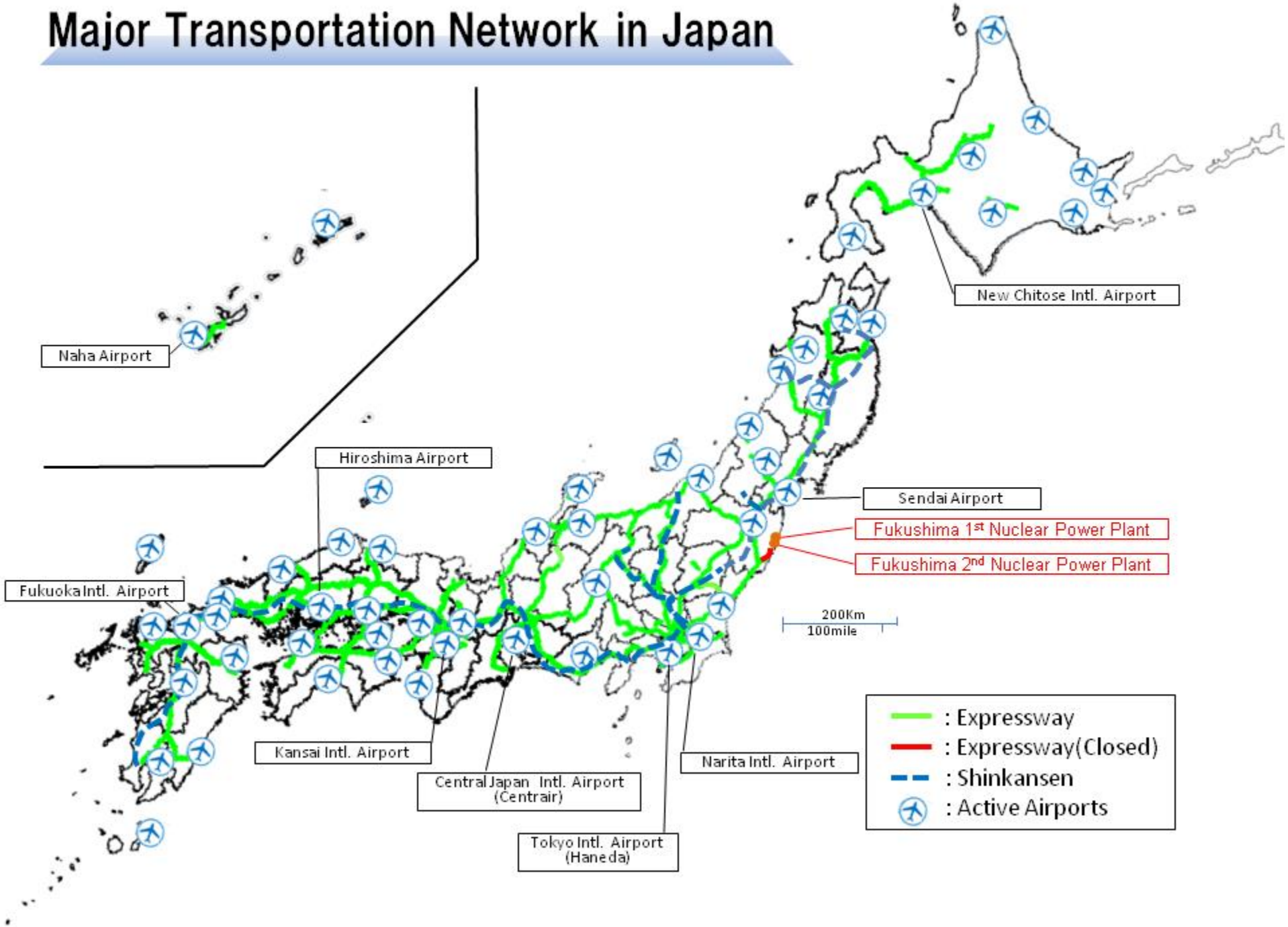
- Production of **steel is mainly centralized around city ports** such as **Kobe-Osaka, Himeji and Tokyo-Yokohama** to facilitate **shipping of exports** and **importation of raw materials**.

Transportation:

- Japan's transport system is highly developed, with road and rail networks covering virtually every part of the country together with extensive air and sea services.

- ***Shinkansen***, or **Bullet trains** (**250-300 km per hour**) are the **fastest and safest railroad systems in the world**.

Major Transportation Network in Japan



Major industries:

- Japan has the most **diversified manufacturing industry** sector with various advanced industries which are exceedingly successful.
- The **manufacturing** accounts for the **24% of the country's GDP**.
- It is the **third largest manufacturer of Automobile. (Europe > Japan > USA)**
- It has the **largest electronics and goods industries** where it has consistently ranked among the top countries.

Major export industries:

- **Automobiles** (Toyota, Honda, Nissan, Suzuki, Mazda, Mitsubishi, Isuzu, Yamaha, Kawasaki etc.)

Toyota is currently the world largest car maker

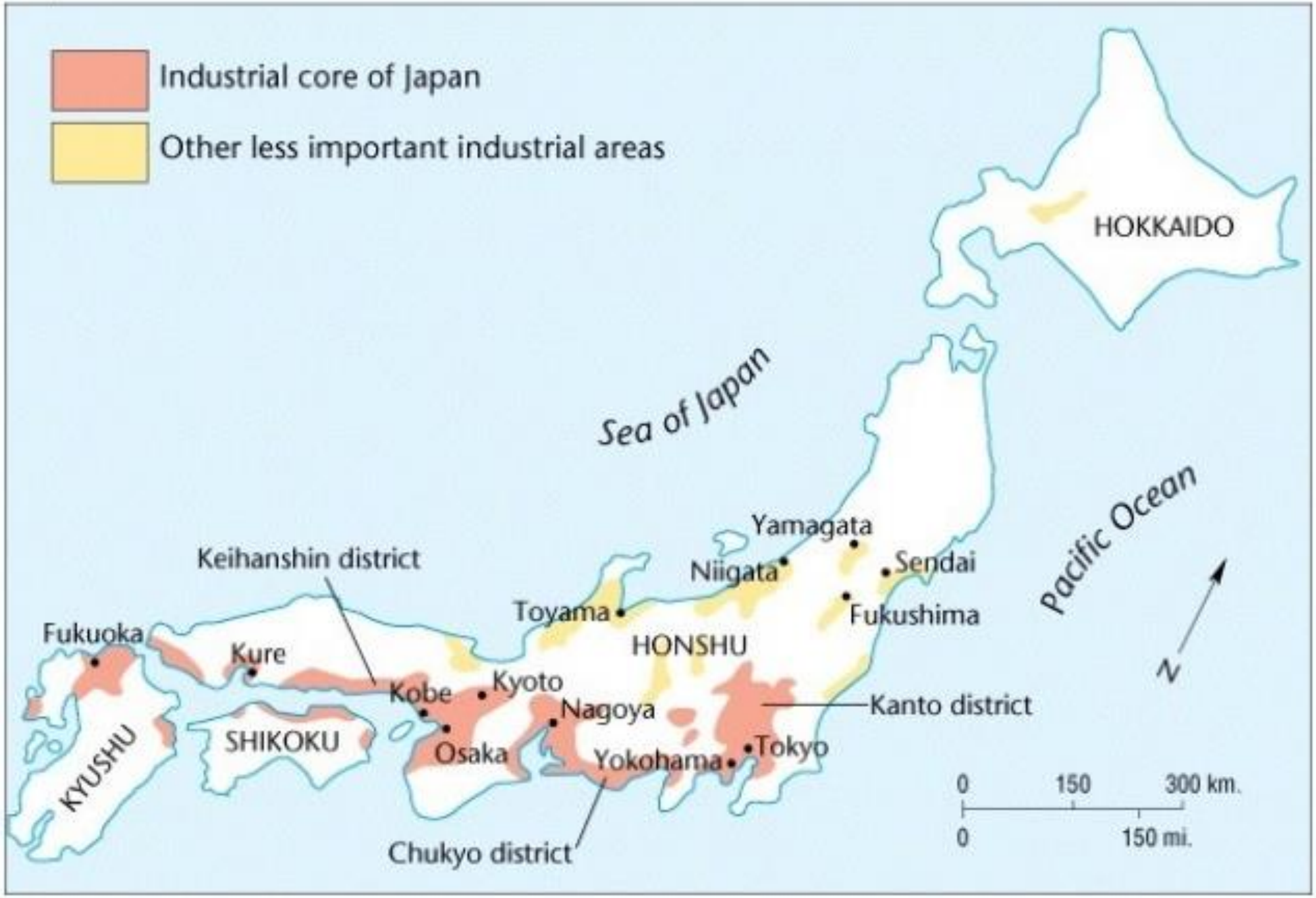
- **Consumer Electronics, Computers, Semiconductors, Copper, Iron** and **Steel**.
- Japan dominated **shipbuilding** for long earlier (replaced by South Korea in 2004)
- Other industries: **Petrochemicals, Biotechnology** & **Pharmaceuticals**

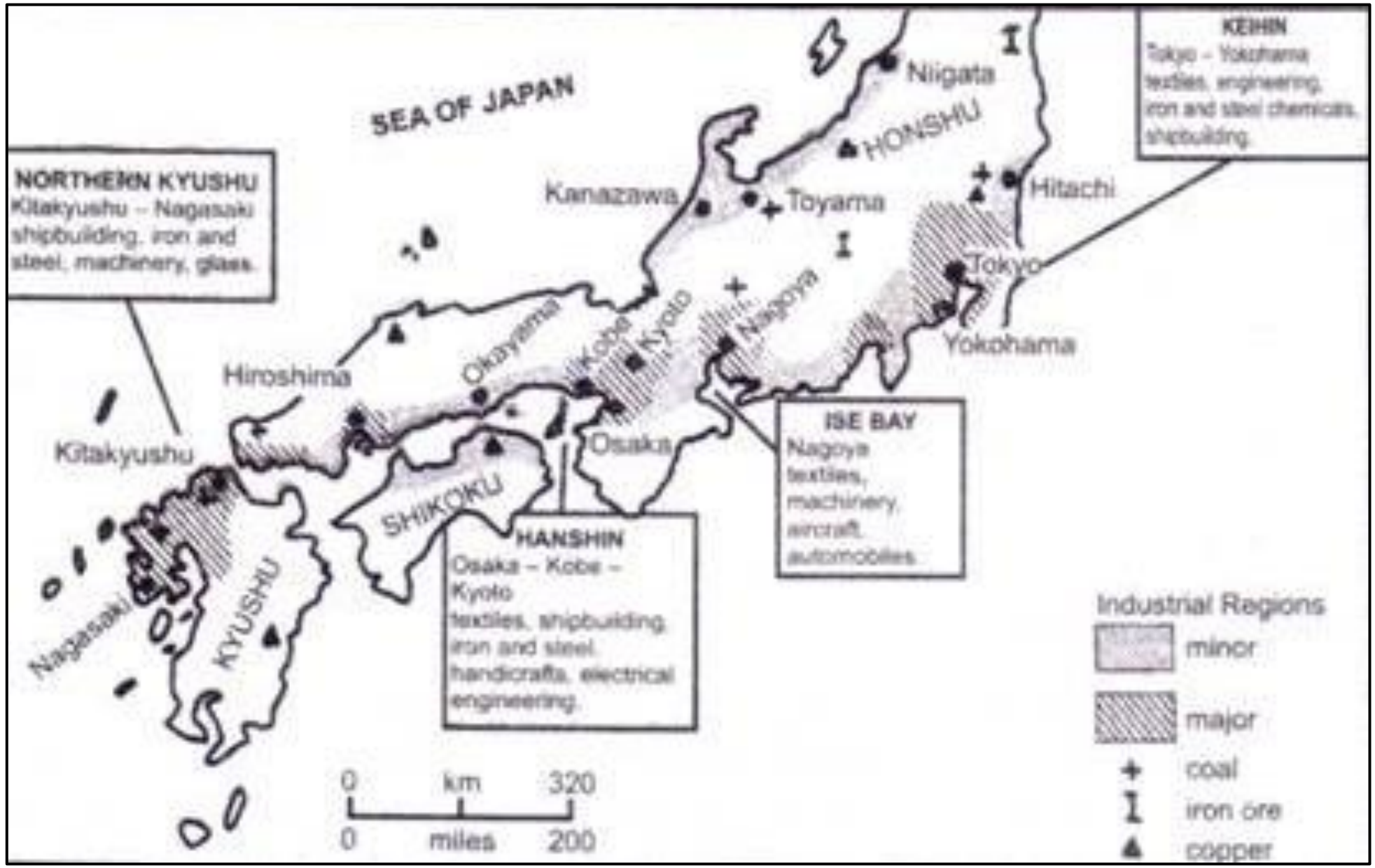
Industrial Region: Japan

There are four leading industrial regions of Japan:

1. **Kwanto region: Tokyo-Yokohama-Kawasaki**
2. **Kinky region or Osaka, Kobe and Kyoto Region**
3. **Nagoya region**
4. **Northern Kyushu Region**

Other: **Southern Hokkaido** & **Sendai region**


Industrial core of Japan
Other less important industrial areas
HOKKAIDO
Sea of Japan
Pacific Ocean
Yamagata
Niigata
Sendai
Fukushima
Toyama
HONSHU
Keihanshin district
Fukuoka
Kure
Kobe
Kyoto
Nagoya
Kanto district
Osaka
Yokohama
Tokyo
KYUSHU
SHIKOKU
Chukyo district
N
0 150 300 km.
0 150 mi.


SEA OF JAPAN
NORTHERN KYUSHU
Kitakyushu – Nagasaki
shipbuilding, iron and
steel, machinery, glass.
KEIHIN
Tokyo – Yokohama
textiles, engineering,
iron and steel chemicals,
shipbuilding.
Niigata
HONSHU
Kanazawa
Toyama
Hitachi
Tokyo
Yokohama
Nagoya
Kobe
Kyoto
Okayama
Hiroshima
Osaka
Kitakyushu
SHIKOKU
KYUSHU
Nagasaki
ISE BAY
Nagoya
textiles,
machinery,
aircraft,
automobiles.
HANSHIN
Osaka – Kobe –
Kyoto
textiles, shipbuilding,
iron and steel,
handicrafts, electrical
engineering.
0 km 320
0 miles 200
Industrial Regions
minor
major
coal
iron ore
copper

The reasons of rapid industrial growth in Japan are:

1. Availability of **hydroelectric power**.
2. **Coastal location** and **large ports** which helps in import of raw material and also in export.
3. **Proximity** to **mainland of Asia** providing a ready market. Japan also has a **worldwide market** for its products.
4. Country's large population provides a ready source of **skilled labour**.
5. **Technological development**
6. Government:

   Since World War 2nd the state intervention and control over industries increased. The **iron & steel**, **petroleum refinery** and **ship building** were brought under strict control of the government.


Major Ports in Japan
Tomakomai
Muroran
Sakata
Niigata
Naoetsu
Toyama
Tokyo
Shimizu
Chiba
Yokohama
Toyohashi
Nagoya
Kobe
Osaka
Yokkaichi
Wakayama
Takamatsu
Mizushima
Kure
Hiroshima
Moji
Hakata
Busan
Sakaiminato
Ulsan

Koriyama pump place
Hydroelectric Power Plant

[City water]

Shinkarebushi Power Plant

[River water]

Momuradaini Power Plant

[Agricultural water]

Miyagawa Dam Power Plant

[River maintenance
Discharge water]

Kachugawa Small Hydroelectric
Power Plant for residents

[Changeable velocity large-scale water
mill power generation system with
new dust removal device]

Seiwa Power Plant

[Check dam water]

Saginuma Power Plant

[City water]

Examples of Small and Medium Hydroelectric Power Plants

1. Kwanto region (Tokyo-Yokohama Region):

- Situated on the ***Honshu island***, Kwanto plains and the eastern coast of Japan comprises the **greatest industrial area**.
- The **raw material**, **coal** and **petroleum** for the industries are ***imported from different countries.***

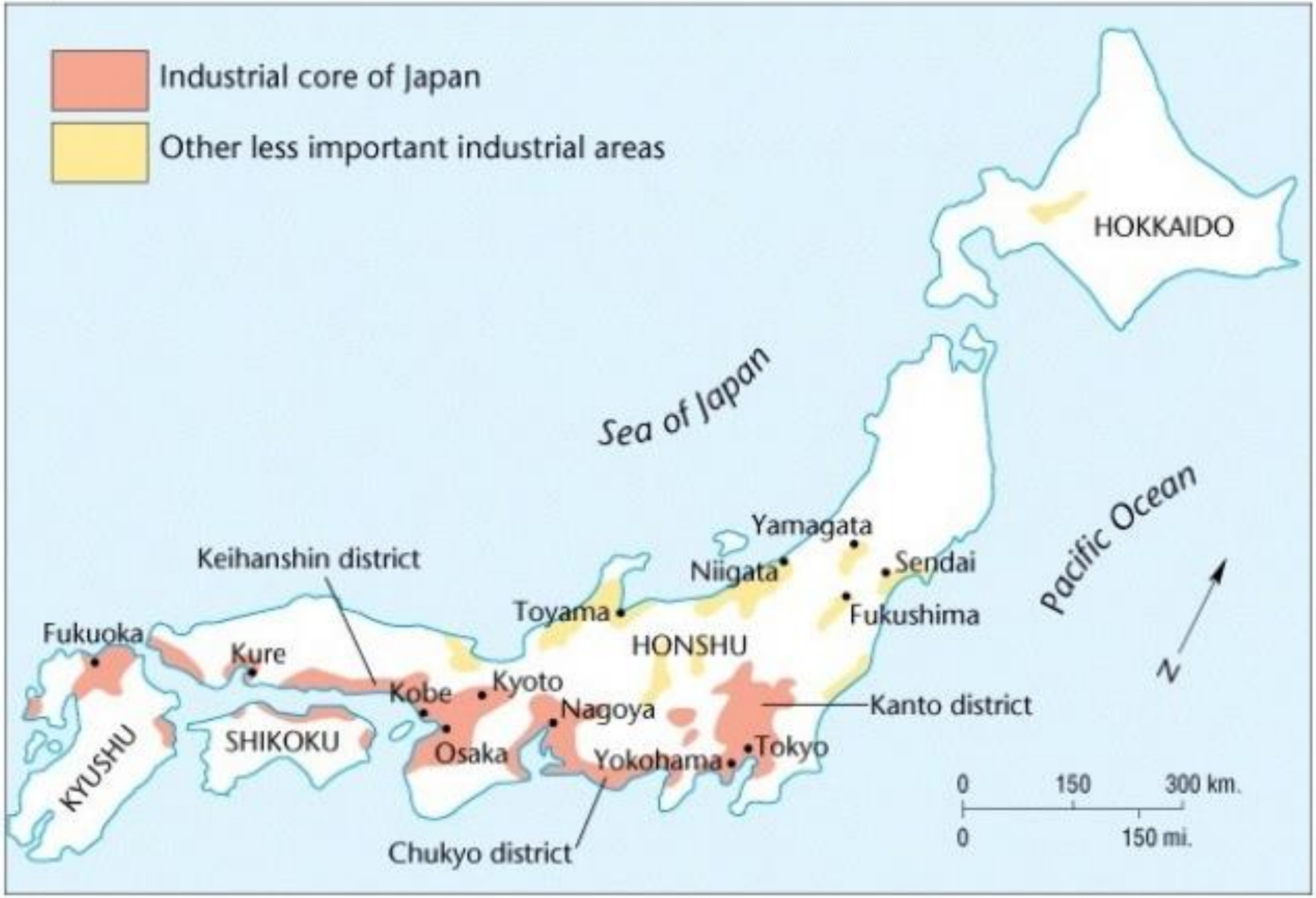
  Iron-ore from: **Philippines**, **Malaysia, Indonesia, India & Australia**

  Coal: **Australia** and **USA**

  Petroleum and **Natural Gas:** **South-west Asia** and **Indonesia**

  Food demand of the region is also met by large **imports**.
- It is formed by the *conurbation of three chief cities*

  1. **Tokyo**
  2. **Kawasaki**
  3. **Yokohama**


Industrial core of Japan
Other less important industrial areas
HOKKAIDO
Sea of Japan
Pacific Ocean
Yamagata
Niigata
Sendai
Fukushima
Toyama
HONSHU
Keihanshin district
Fukuoka
Kure
Kobe
Kyoto
Nagoya
Kanto district
Osaka
Yokohama
Tokyo
KYUSHU
SHIKOKU
Chukyo district
N
0 150 300 km.
0 150 mi.

Tokyo:

- The **capital** of the country and the **most urbanized city in the world (2019)(38 million) (Delhi NCR: 3rd Largest – 28 million)**
- It is favorably **situated in the middle of a small fertile plain known as *Kwanto plain***
- Carries on many artistic industries.
- It is noted **for electrical engineering** such as **transistors, radio television sets, washing machines, refrigerators and computers**.
- It also ranks high in **blast furnaces, steel mills, machines and tools, chemicals, refineries, shipbuilding, airplane, factories of consumer goods, electrical machinery, textile and canning industries, etc.**

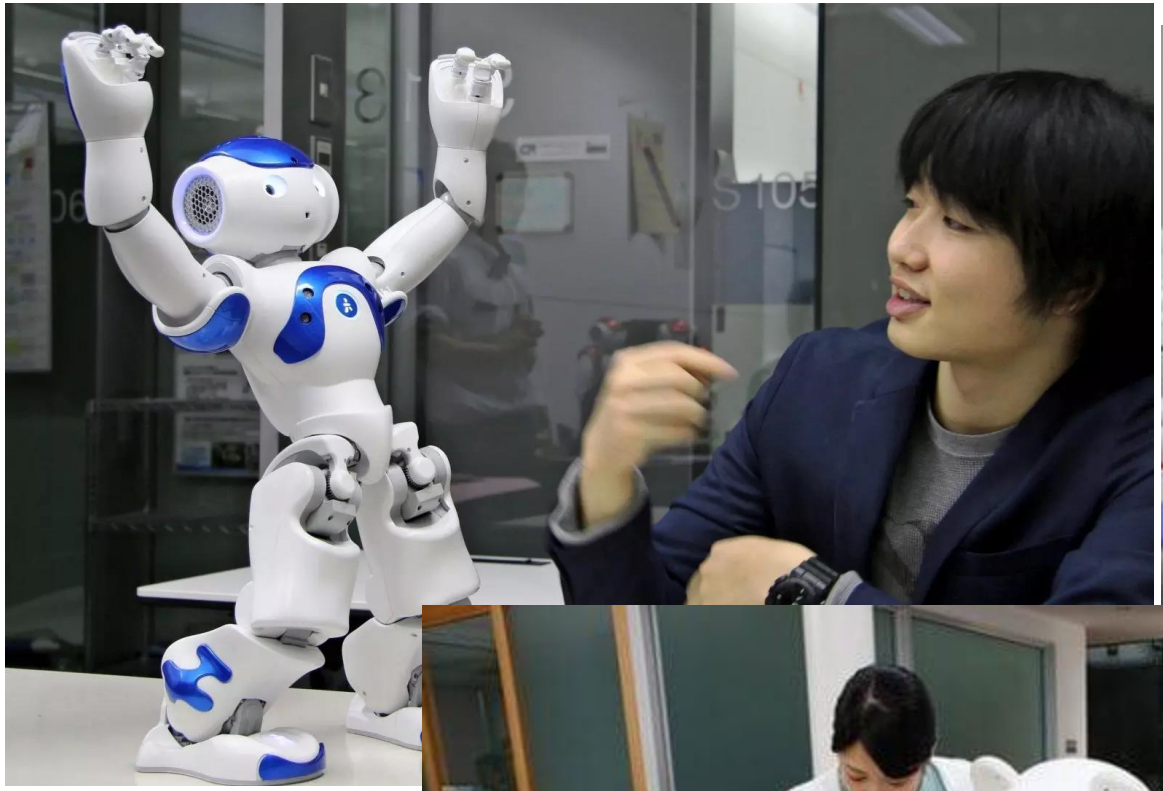
Yokohama:

- It is a **port city** where **manufacturing has been overshadowed by trade**.
- One reason for the slower development of industry has been **restricted area of level land** suitable for the expansion of factory sites.
- It has **Precision Engineering, Shipbuilding, Oil Refining, Petrochemicals** and **Port Industries**.

Kawasaki:

- Its **Heavy Industries Ltd.** is Japan's **top manufacturer of industrial robots.**

  Though about 90 per cent of robots it makes at present are arc welders for sale to car manufacturers. It will be placing heavier emphasis from now on to the output of robots for other purposes, such as spray painting and assembling.



Shipbuilding

Oil Refining

2. Kinky region or Osaka, Kobe and Kyoto Region:

- In the **Hanshin or Kinki region** *(Honshu island)*are three of the Japan's six great cities – **Osaka, Kobe** and **Kyoto.**
- *Osaka* and *Kobe* are the **great deep-water ports**.
- The **manufacturing** structure of the Hanshin region is one of great **diversity**. (***Textiles*** & ***Shipbuilding***)
- Until recently at least, **textiles lead all other industries**.

  The **cotton industry** is carried on chiefly at **Osaka** and other towns in the fertile plain that borders the northern shore of the inland sea.
- **Osaka** is the **greatest cotton-textile town** and is generally known as the **Manchester of Japan.**
- The naturally **dense population** makes **labour cheap**, and affords a **good market.**

- The Osaka-Kobe industrial region is as smoky, noisy and unattractive in appearance as are most regions of **heavy industry**.
- **Kobe** is the busiest port of Japan. It concentrates on **Shipbuilding, Oil Refining, Petrochemical Industries Including Synthetic Textile a**nd **Rubber Manufacture**.
- **Kyoto** is also known as the "***City of small workshops***"


130°
140°
0 300 km
0 200 mi
China
Russia
Lake Khanka
La Perouse Strait
Iturup (Etorofu)
Wakkanai
Kunashir
Shikotan To
Habomai Islands
Asahikawa
Hokkaido
Kushiro
Sapporo
Hakodate
Tsugaru-kaikyo
Aomori
N
40°
North Korea
Sea of Japan
Akita
Morioka
Yamagata
Sendai
Sado
Honshu
Niigata
Fukushima
Ullung Do
Tok Do (Liancourt Rocks)
Oki-Gunto
Kanazawa
Utsunomiya
Fukui
Nagano
Urawa
Otsu
Kyoto
Gifu
Tokyo
Kofu
Chiba
Matsue
Hiroshima
Tottori
Kobe
Shizuoka
Yokohama
Nagoya
Yellow Sea
South Korea
Pacific Ocean
Korea Strait
Yamaguchi
Fukuoka
Shikoku
Nara
Cheju Do
Uwajima
Osaka
Saga
Fukue Jima
Oita
Wakayama
Tokushima
Nagasaki
Matsuyama
Kumamoto
Kagoshima
Miyazaki
Kyushu
Nampo Islands
Sumisu
Izu Islands
Tori-shima
Osumi-Shoto
30°
Tokara-Retto
East China Sea
Amami Gunto
Philippine Sea
Bonin Islands (Ogasawara-Gunto)
Okinawa Gunto
Ryukyu Islands
Senkaku-Shoto
Naha
Sakishima-Shoto
Kita Daito Jima
Volcano Islands (Kazan-Retto)
Iwo Jima
Okino Daito Jima
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3. The Nagoya Industrial Region:

- **Nagoya** and **Takayama** are the **major textile centres**.
- Nagoya also process local silk, imported cotton and **Synthetic Fibres; Engineering Industries,** including all kinds of **Machinery, Automobiles, Locomotives** and **Aircraft.**
- Textile, including silk reeling, cotton spinning, cotton weaving and wool weaving lead all other industries.
- Much of Nagoya's woolen industry is relatively new and Australian wool is chiefly used.
- It is also one of the **country's foremost aircraft manufacturing centres.**

4. Northern Kyushu Region:

- This industrial region is located close to the **south-western** limit of the general **manufacturing belt in northern Kyushu**.
- Credited with **50 % steel production** of Japan.

  It the chief steel supply centre for industrial regions of Japan
- ***Chikuho*** **coalfield** is situated in close proximity of this heavy industrial centre.
- Textiles are not an important element of the industrial structure of this region; of first importance are the **heavy industries**, especially **iron and steel manufacturing**.
- Other industries: **Ship Building, Cement, Chemicals, Glass**, etc.
- **Yumata**, **Kokura**, **Moji**, **Fukuoka** are the industrial centre of this region.

- Outside the above four major industrial regions there are several scattered industrial towns-

Iron and steel: **Muroran**

Oil refining is important: **Akita** and **Niligata**

Engineering: **Hiroshima**

Shipbuilding: **Kure**

Textiles: **Okayama**

Hakodate and **Sapporo** in Hokkaido