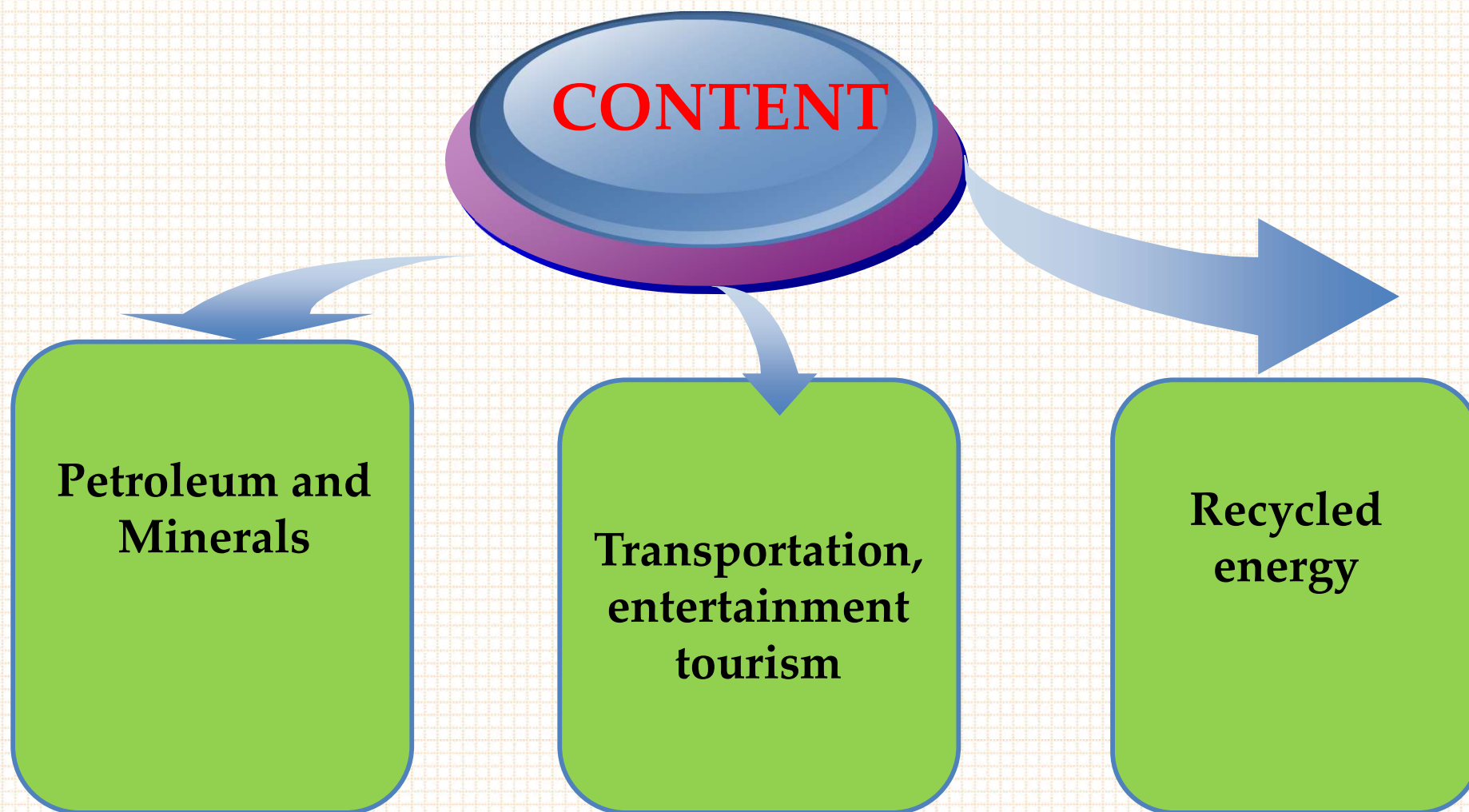


HCMC UNIVERSITY OF NATURAL RESOURCES AND ENVIRONMENT
FACULTY OF MARINE RESOURCE MANAGEMENT

Topic 2 - MARINE RESOURCES

2.1. Benefit of Non-living resources

Lecturer: MSc. Dang Thi Thanh Le
MSc. Tran Thi Kim
MSc. Phung Thi My Diem

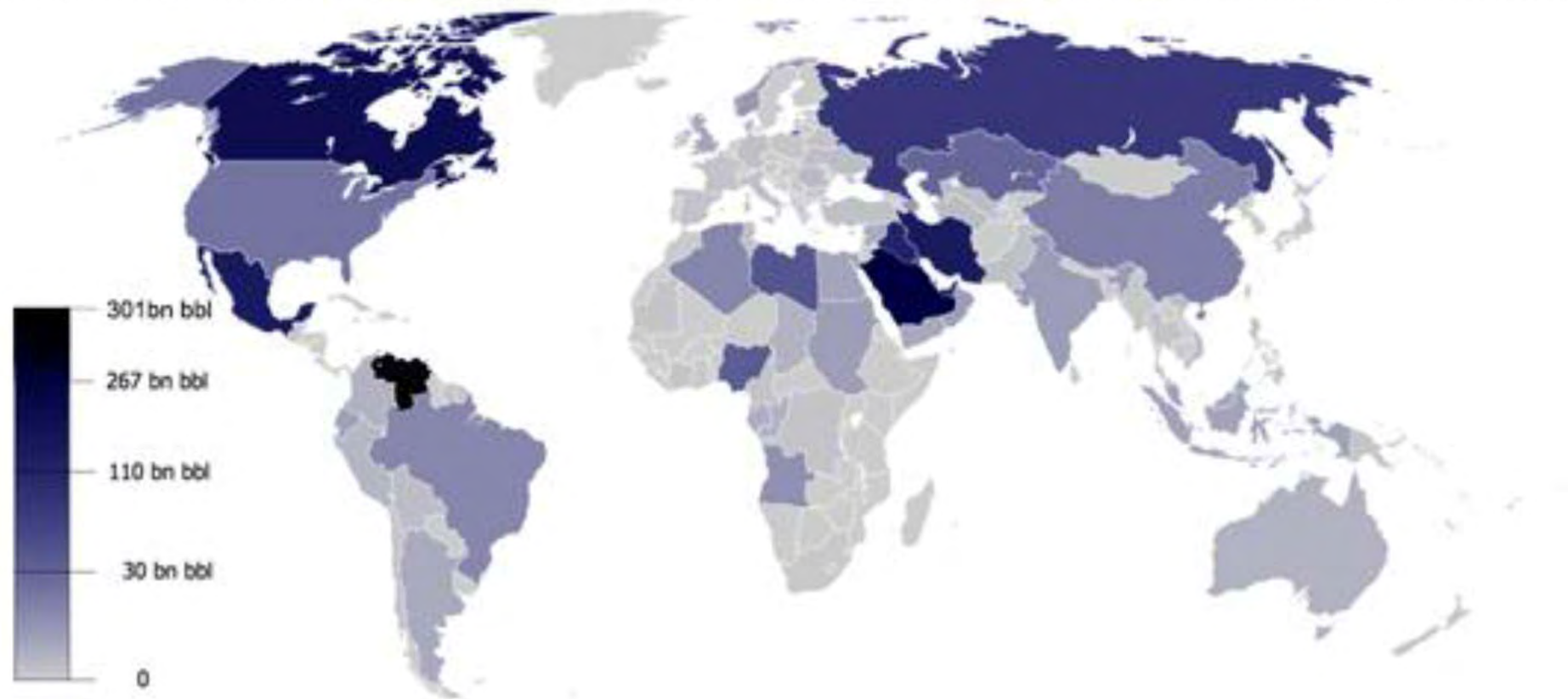


1) Oil and gas

- Gas and oil form in the sea over a period of millions of years, as the remains of animals and plants sink to the ocean floor. Combined with particles flushed from the land, they are buried and compressed into layers of sediment several kilometres thick on the ocean floor.
- Petroleum is widely distributed on continents and ocean floors.
According to the 1985 exploration data, the world's oil reserves were 95.8 billion cubic tons.
- The sources of oil and gas are not endless. At the current rate of production, the world's oil reserves are only enough for another few decades.

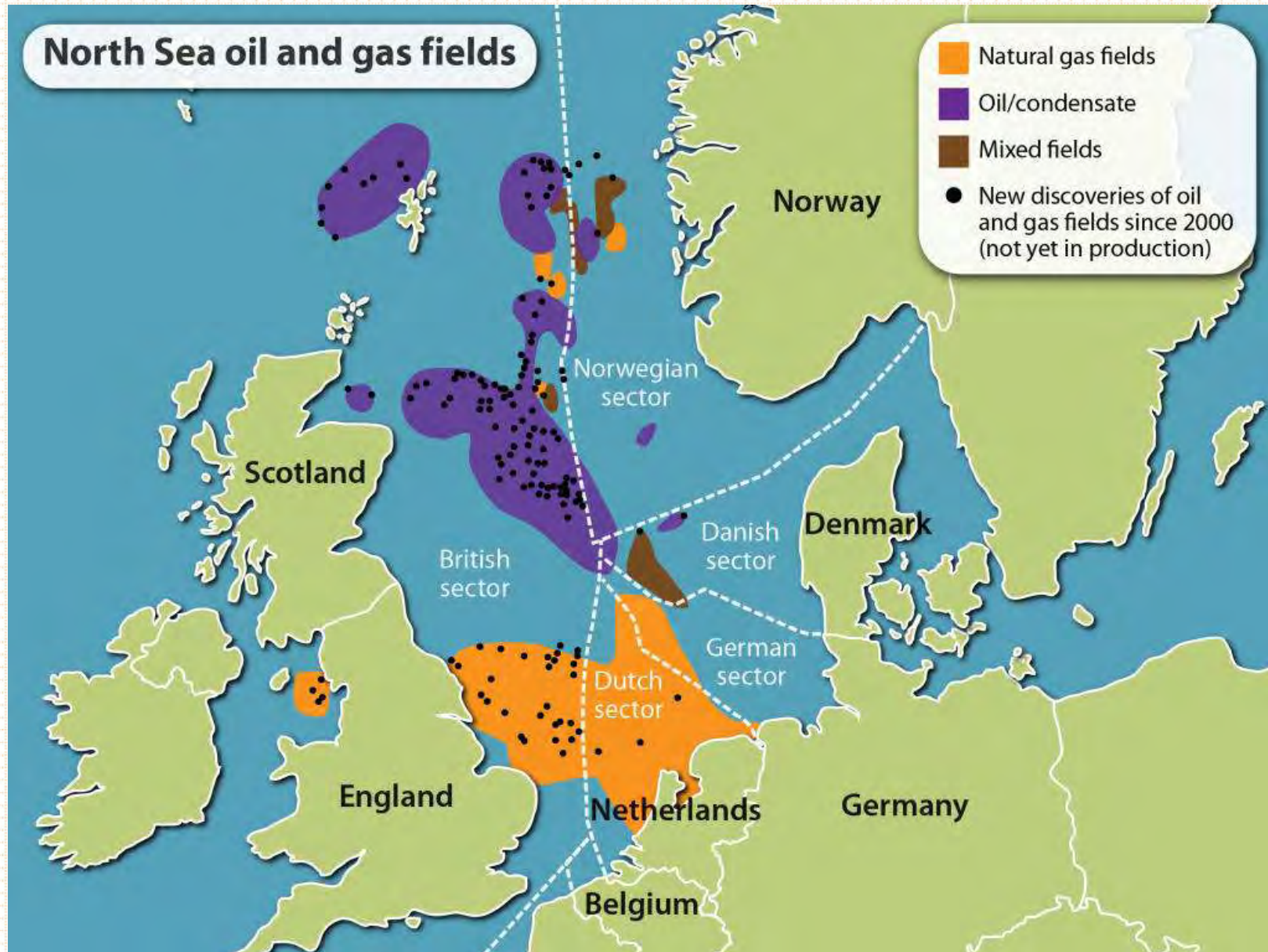
1) Oil and gas

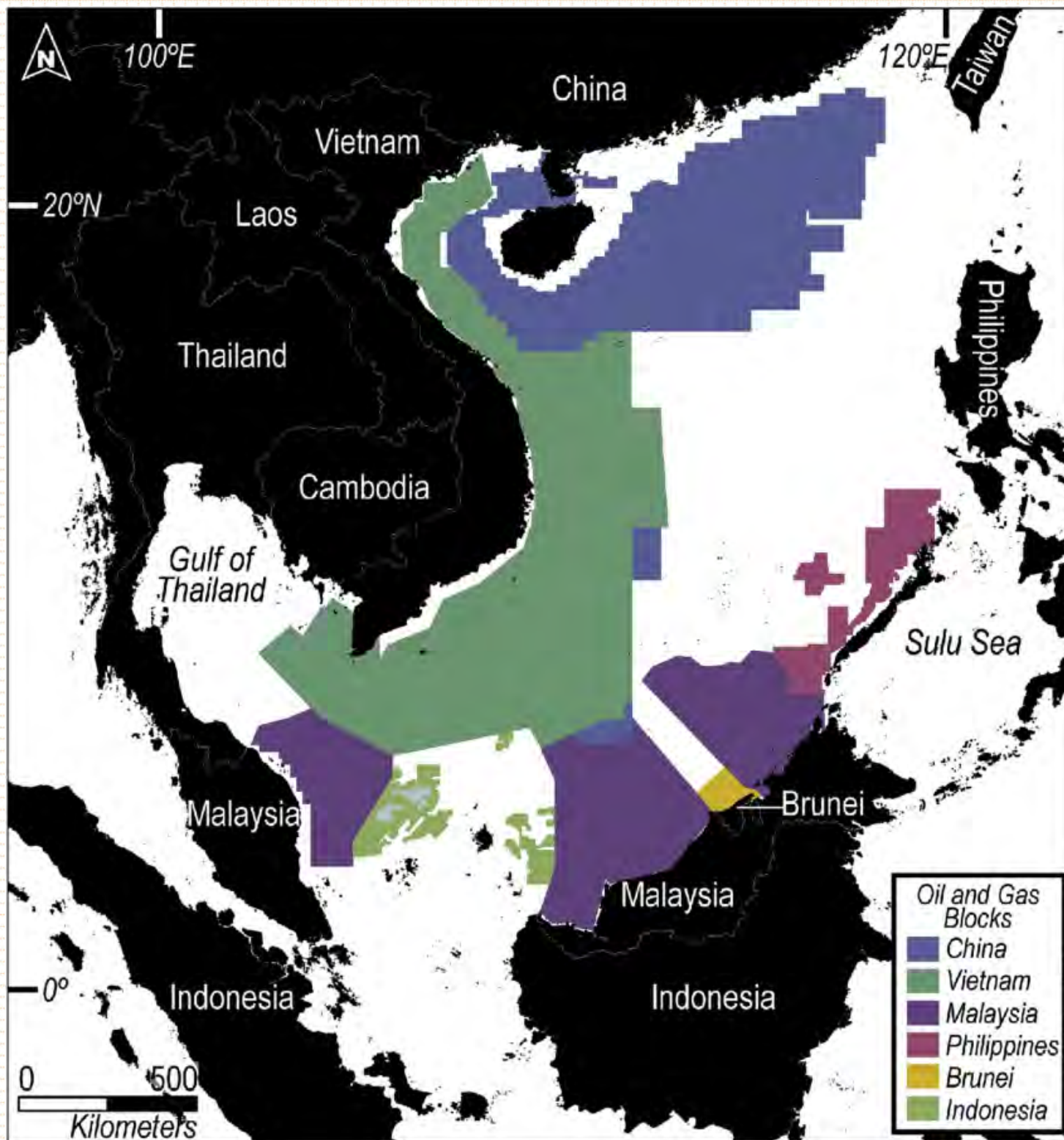
Oil reserves



Map of world oil reserves in 2013

1) Oil and gas





Mineral resources, oil and gas:



- Along the coast of Vietnam, many areas have favourable conditions for salt production.
- Our waters have many placer deposits: titanium oxide, and white sand.
- The continental shelf of our country has an accumulation of oil and gas, with many fields continuing to be discovered, explored and exploited

Vietnam's oil and gas production



- With estimated crude oil reserves of 4.4 billion barrels, Vietnam ranks 2 in East Asia in terms of oil reserves..
- Vietnam's crude oil production is about 340,000 barrels per day

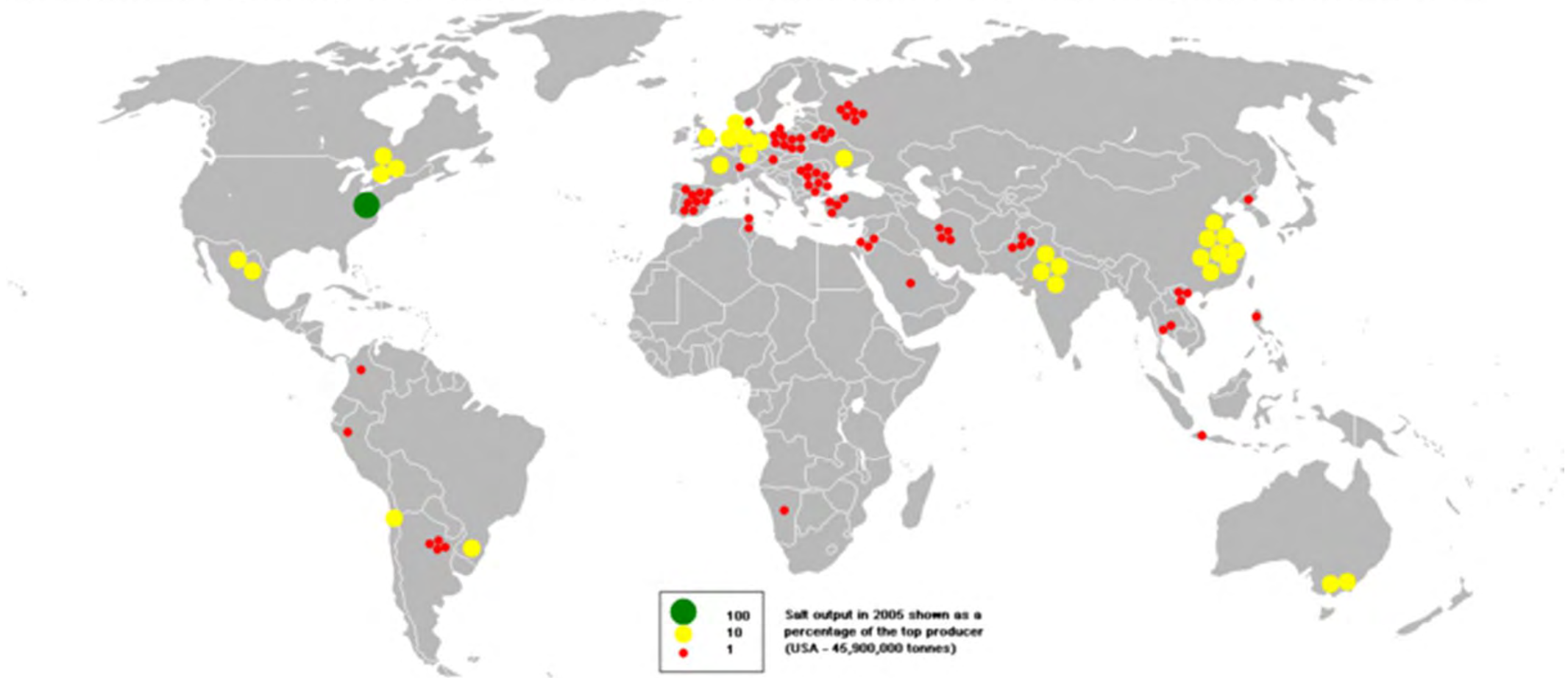
2) Chemicals and minerals

- Many chemicals are mined both on land and at sea such as table salt, sulfur, manganese, gold, etc.



- Diamond, quartz, sand, clay, kaolin, limestone... and many other compounds of many important industries.. found in the sea.

Salt industry

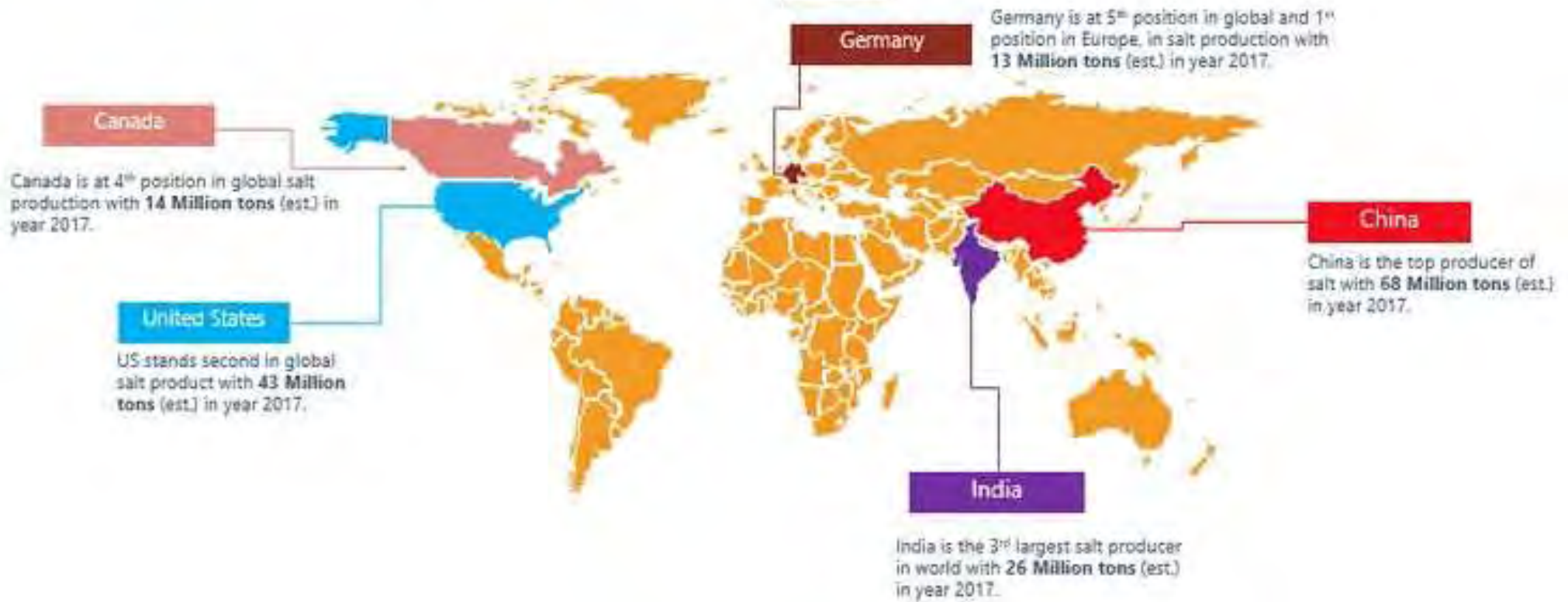


Salt industry



Global Salt Production

Top 5 Countries



Vietnam salt industry

Vietnam is considered as a country with great potential for the development of salt production, with a coastline of 3,260 km (excluding islands) extending from Ca Mau cape to Mong Cai headland, with a tropical climate. Hot sea water, with high salinity (from 3.2 to 3.5%). The total salt reserve of our country is about 120-130 billion tons of salt.

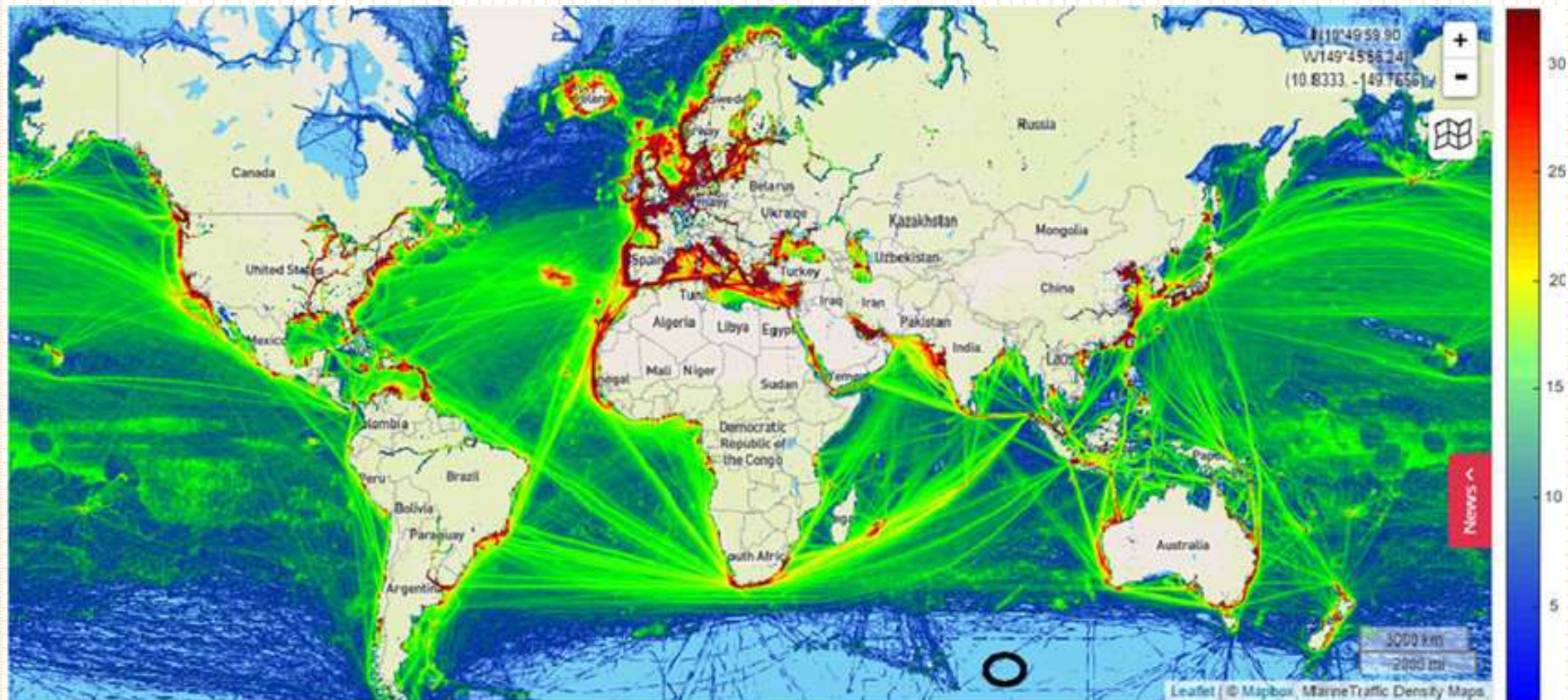


2) *Potential for development of maritime traffic*

- About 80% of the world's merchandise are transported by sea.
- Most of the valuable resources are concentrated in 3 regions: North America, Western Europe and Japan - Korea through sea transportation. This is explained by the development of 48 countries in the 3 regions mentioned above. develop strongly in the marine economy. Marine economy includes 6 industries: shipbuilding, seaports, oil and gas, tourism, seafood and sea reclamation.

Marine transportation is very precious and important.

2) *Potential for development of maritime traffic*



2) *Potential for development of maritime traffic*

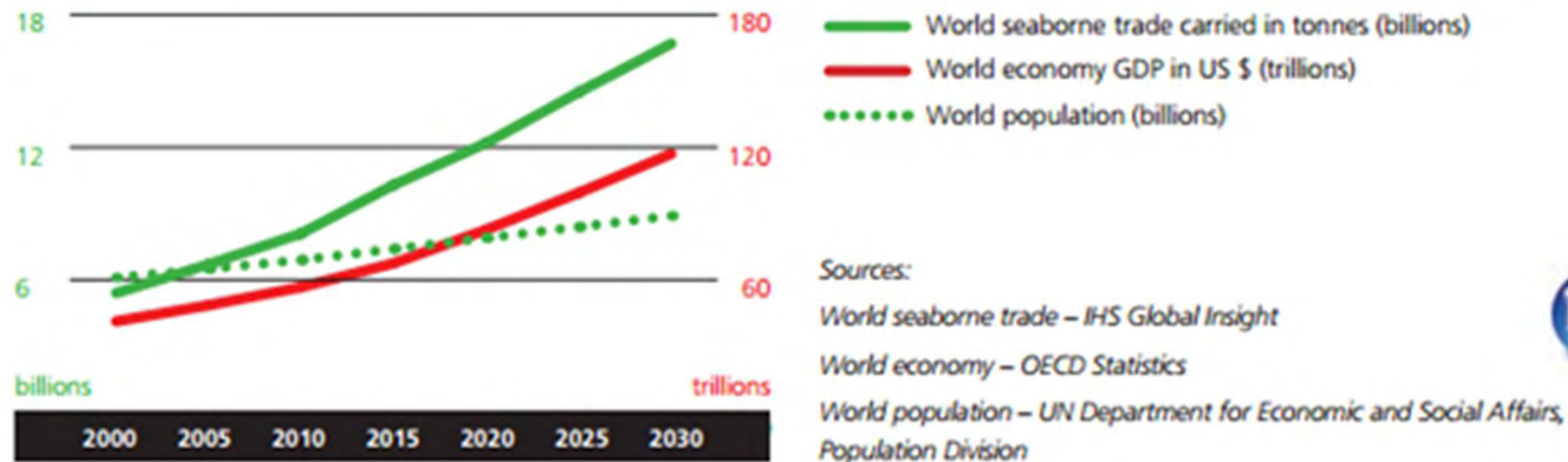
Figure 1. A Snapshot of Global Vessel Traffic Based AIS Data



Source: MarineTraffic.

Note: Different types of vessels are shown in different colors.

PREDICTED INCREASES IN WORLD SEABORNE TRADE, GDP AND POPULATION



Source: ics-shipping

- About 11 billion tons of merchandises are transported by ocean liner every year. This number shows about 1.5 tons/person based on the current global population.
- As of 2019, the total annual value of world shipping trade has reached more than 14 trillion US dollars

Vietnam's seas and coasts have conditions for marine transportation development:

Regarding conditions for development of sea transport:

Located near international maritime routes in the East Sea .

Along the coast, there are many closed bays that are favorable for the construction of deep-water ports. Many estuaries are also favorable for port construction.

Cam Ranh Bay



Van Phong Bay



Da Nang Bay

In Vietnam



- The volume of goods through Vietnam's seaport system in 2019 increased by 14%; container volume increased by 6%; Passengers through the port increased by 22%. Vietnam's fleet ranks 4th in the ASEAN region and 29th in the world... These are impressive figures of the maritime industry after the period 2014-2015 "negative growth".

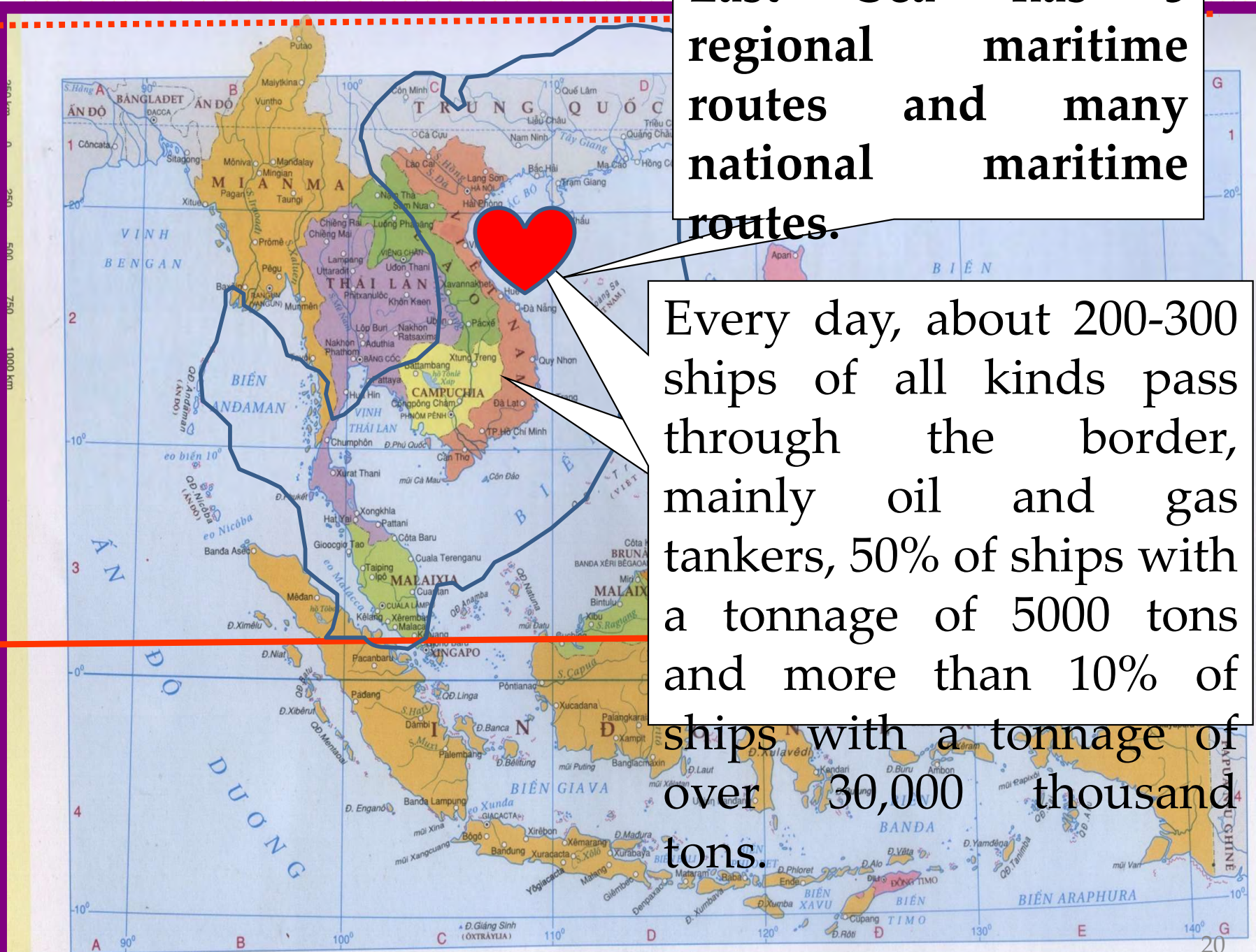


This is the vital maritime
route connecting
Europe – Asia;
Middle East - Asia.

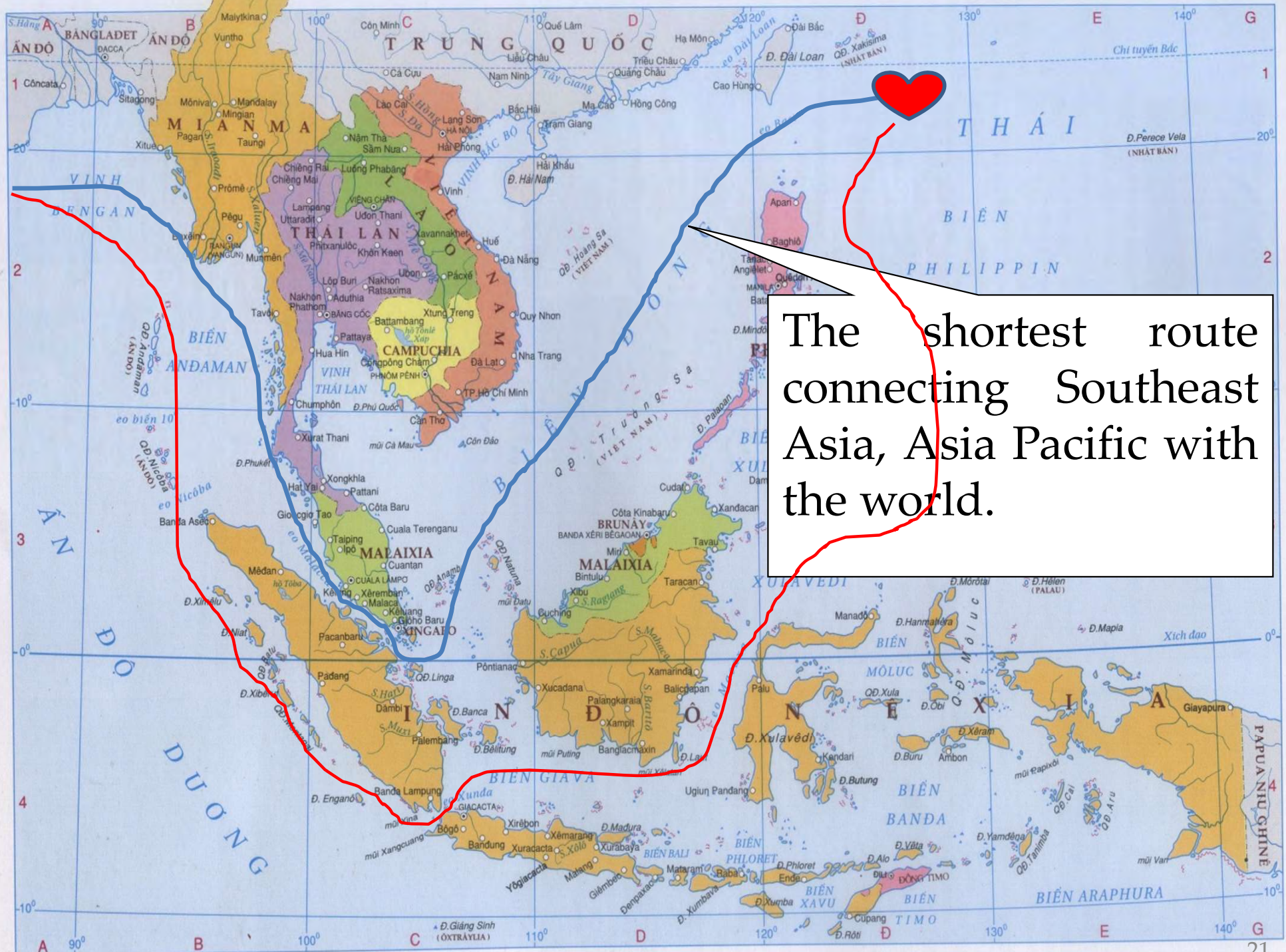
continent?

East Sea has 5 regional routes and many national maritime routes.

Every day, about 200-300 ships of all kinds pass through the border, mainly oil and gas tankers, 50% of ships with a tonnage of 5000 tons and more than 10% of ships with a tonnage of over 30,000 tons.

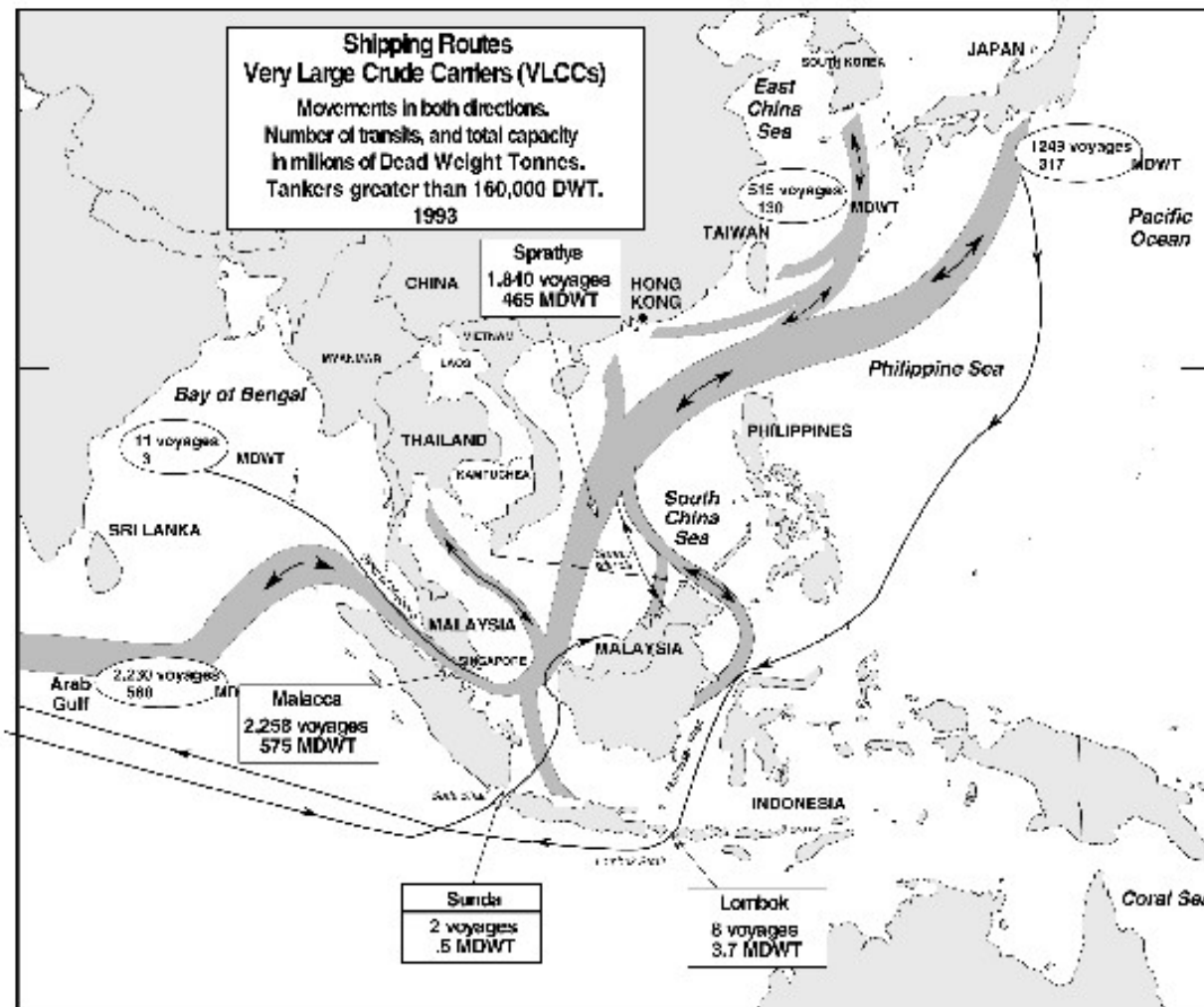


0 250 500 750 1000 KM



The shortest route connecting Southeast Asia, Asia Pacific with the world.

Why is the East Sea important to the world?



- More than 50% of the world's waterways and crude oil are transported through the East Sea.
- The amount of crude oil transported through the South China Sea is 3 times higher than through the Suez Canal, 5 times more than through the Panama Canal.
- More than 80% of crude oil from Japan, South Korea and Taiwan is transported through the South China Sea.

NON- BIOLOGICAL RESOURCES

2) Potential for tourism and entertainment development

- Tourism is a necessity of life and it has become an industry, contributing its strengths to the national income.
- One of the consequences caused by tourism without planning and guidance is environmental pollution in coastal areas .
- WOMEN the risk of losing rare species of animals and plants or being threatened with destruction due to overexploitation.

Our country has a coastline ~ 3,260 km with many beautiful beaches with an average slope of 2 - 30, high clarity (especially beaches in the Central region): Tra Co, Cat Ba, Cua Lo, Nha Trang, Vung Tau...In addition, the Central Coast has long and beautiful sandy beaches that attract tourists.



**Nha
Trang
Bay**



Nam Chu Islands



Phu Quy Island

Coastal island : Vietnam has over 2273 large and small islands with a total area of over 1700 square kilometers, of which:

- Over 100 km²: Phu Quoc, Cai Bau, Cat Ba
- From 50 to 100 km²: Tra Ban, Con Lon
- Under 50 km²: Phu Quy, Quan Lan, Co To, Cu Lao Cham, Ly Son...Island

Distribution: The province with the most islands is: Quang Ninh (75%), Hai Phong (8.8%), Kien Giang (5.7%)...



Ancient Tea



Hai Thinh



**Door of
Assembly**



Thien Cam



**Update
rate**



Door Tung



Thuan An



Lang Co



Sa Huynh



Vung Tau



Nha Trang



Van Phong Bay



Da Dia Rapids



Non Nuoc



**Jumping
Rock**



Ning Chu

3) *Clean energy sources on the sea*

Ocean Energy

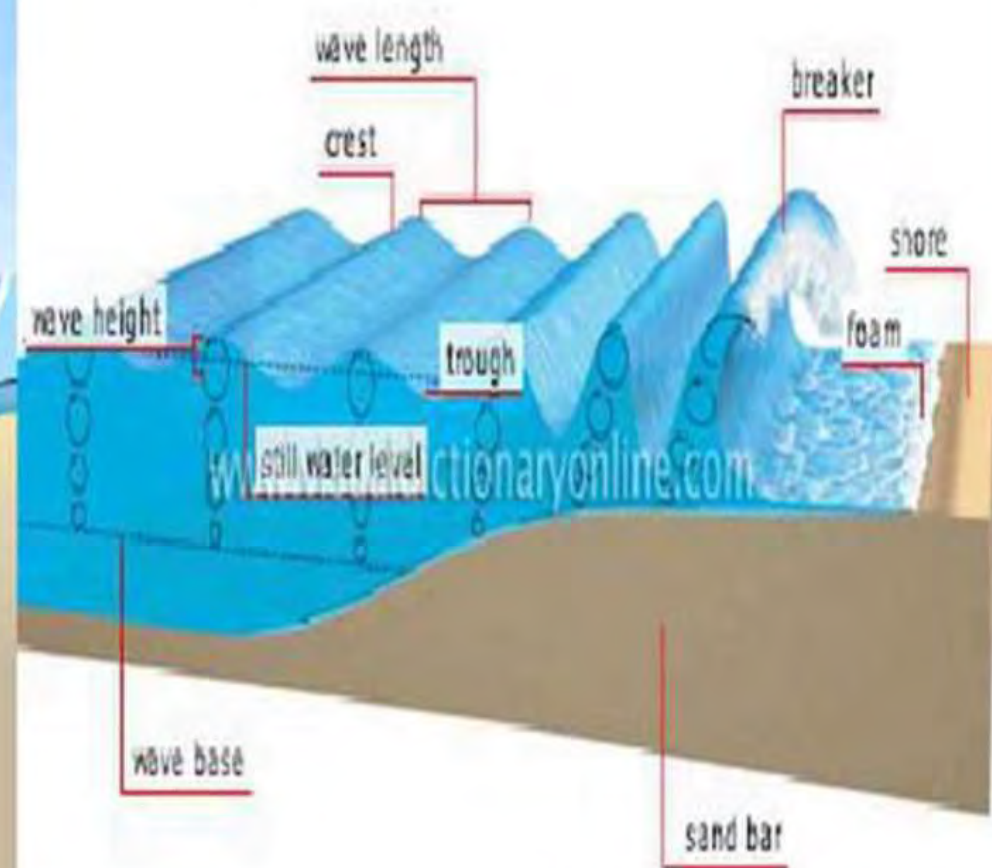
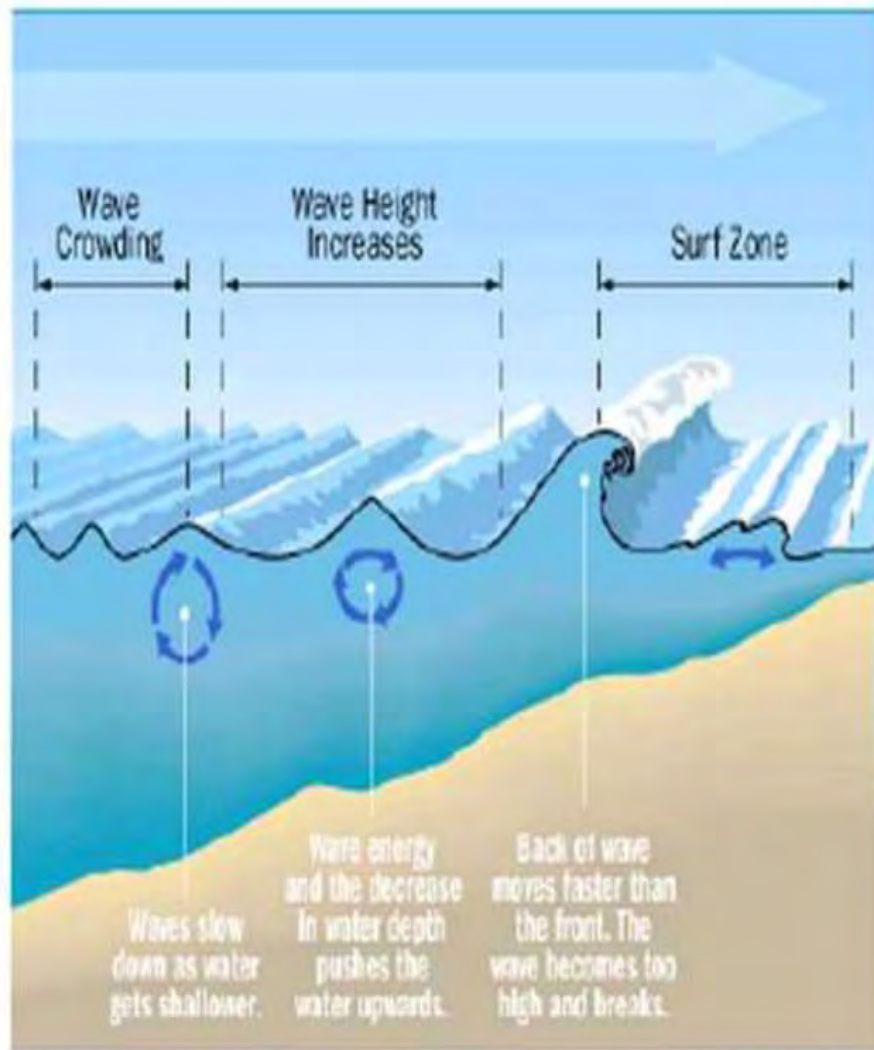
Wave energy

Tidal energy

Energy of the flow

Ocean Thermal Energy

Energy solar wind



The estimated total theoretical wave energy potential in 2010 is 32,000 TWh/year (nearly double the total global power supply in 2008 (16,800 TWh/year)).

In the East Sea, there is an irregular semi-diurnal tide regime, large tidal amplitude and potential for exploiting this energy source

Tidal energy

40

Tidal power systems :

The system works based on the tidal turbine method.

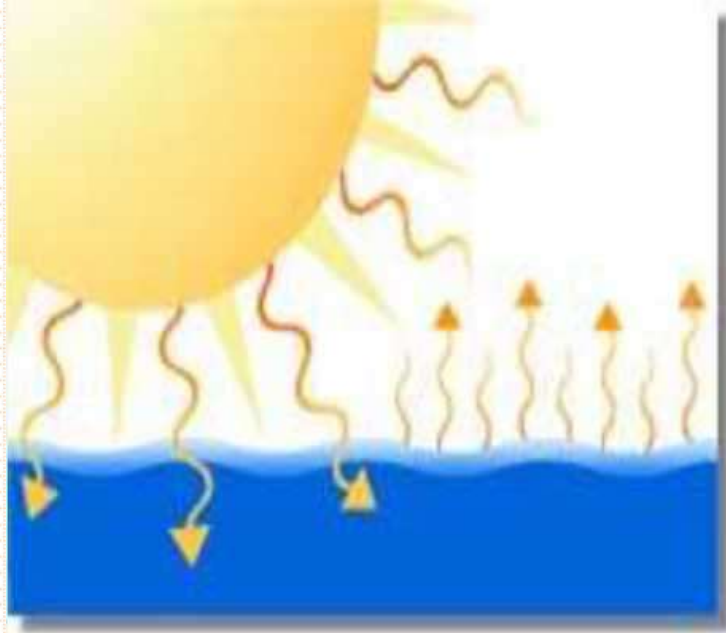
- ❖ Each structure consists of 4 turbines attached to a tubular buoy. Water is filled into the buoy so that it sinks, leaving only the top of the float to rise, pulling the turbines into position.

- ❖ A long arm connects the buoy to a heavy base that rests on the seabed. The arm is designed to be moved up and down, left and right, allowing the turbines to drift to the position of the strongest tidal currents.



System Tidal Stream

Ocean Thermal Energy



About 15% the total amount of solar energy reaching the Earth's surface is reabsorbed by the oceans as heat energy, central mainly in upper class. The biggest difference can be 20 - 25 degrees C



*Engine unit 100 kW live
Hawaii- America*

Wind enery



Trach Dong, Bac Lieu province



Review questions



Along the coast of our country
How many beaches are there?
eligible

To exploit for tourism activities:

A. 100.

B. 120.

C. 125.

D. 130.



Review questions



**Our country begins
In what year do you exploit oil?**

A. 1980.

B. 1985.

C. 1986.

D. 1990.

RUNG CHUÔNG VÀNG

36



Review questions

Which of the following is not the meaning of development our country's sea transportation:



- A. Bring economic benefits to the country.
- B. Contributing to strengthening security and defense.
- C. Take advantage of geographical position and natural conditions.
- D. Contribute to the implementation of exchanges between localities.



Review questions



The most important cause, make our country conditions for the development of salt industry are:

- A. Long coastline.**
- B. Large market.**
- C. The salinity of sea water is high.**
- D. People have experience in salt production.**



Review questions



According to ability exhausted, oil and gas, What kind of resource is it classified as?

- A. Recovery is possible.
- B. Unrecoverable.
- C. Endless resources.
- D. Resources do not run out.

THE END