

NORTH SEA PETROLEUM RESERVES: THE VALUE TO DEVELOPED NATIONS' ECONOMIES

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Grade Level: 7th

Purpose/Overview:

The North Sea petroleum reserves have been an important energy resource for many nations' economies since their discovery. Oil was first found on the shores of the North Sea in 1851, but it was not until 1964 that the first offshore oil well was drilled. The North Sea is known for its turbulent weather, which makes drilling dangerous, and many lives have been lost on the drilling platforms. The United Kingdom, Norway, the Netherlands, Germany, and Denmark are the five countries involved in energy production from the North Sea. The purpose of this lesson is for students to gain an understanding of the value of the North Sea petroleum reserves to the economies of Europe, both those nations that produce the energy, and the ones that consume the oil and natural gas found there. Through observing and analyzing maps, graphs, and charts of data and other information, students will integrate visual information, draw conclusions, and make predictions and inferences, to gain an understanding of the economic interconnectedness of these countries.

National Geography Standards from *Geography for Life*

Geographic Elements & Standards:

The World in Spatial Terms –

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information.

Human Systems –

11. The patterns and networks of economic interdependence on Earth's surface.

Oklahoma Academic Standards for the Social Studies:

Grade 7 World Geography: Eastern Hemisphere

7.PALS2.B.4.9:

Literacy Skills Standard 2: The student will develop and demonstrate Common Core Social Studies writing literacy skills.

B.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

B.9. Draw evidence from informational texts to support analysis, reflection, and research.

7.CS1.1-4:

Content Standard 1: The student will analyze data from a geographic perspective using the skills and tools of geography.

1. Cite specific geographic information to support analysis from primary and secondary sources located in texts, documents, newspapers, magazines, journals, political cartoons, and online news sources.

2. Integrate visual information, draw conclusions, and make predictions from geographic data and analyze spatial distribution and patterns by interpreting that data as displayed on globes, graphs, charts, satellite and other forms of visual imagery including data from bar and line graphs, pie charts, thematic maps, population pyramids, climographs, cartograms, contour/relief maps, GIS systems, and diagrams.

3. Apply the concept of scale, distance, direction, relative location, absolute location, and latitude and longitude.
4. Integrate visual information and apply the skill of mental mapping of the political and physical features of Earth's surface and to organize information about people, places, and environments.

7.CS5.1.D:

Content Standard 5: The student will analyze the interactions of humans and their environment in the Eastern Hemisphere.

1. Cite specific textual and visual evidence to describe the relationship between the distribution of major renewable and nonrenewable resources and evaluate how the three levels of economic activities (primary, secondary, and tertiary) contribute to the development of a country or region including the
 - D. Value of North Sea petroleum reserves to developed nations' economies.

Geographic Themes: Human-Environment Interaction, Movement

Objectives:

1. Students will analyze primary and secondary sources of visual information, as well as printed and digital texts, to discover the interdependent relationships between the countries that produce North Sea energy resources and those that consume them.
2. Students will write a short essay illustrating (a) the importance of North Sea petroleum reserves to the economies of both producing and consuming nations of Europe, and (b) the interconnectedness of the economies of these nations.

Materials:

Computer, LCD projector (or equivalent), and Internet access

PowerPoint -- *The Value of North Sea Petroleum Reserves to Developed Nations' Economies*.

Copies for each student of the following (see **Teacher Resources**):

Europe Region Political Map

Europe Region Physical Map

(Note: All maps are best viewed as color copies.)

Copies for each student of the following Table/Charts (**provided below**):

Petroleum Production of Five North Sea Energy Producing Countries

Petroleum Consumption of Five North Sea Energy Producing Countries

Natural Gas Production of Five North Sea Energy Producing Countries

Natural Gas Consumption of Five North Sea Energy Producing Countries

Renewables: Electricity Generation of Five North Sea Energy Producing Countries

Copies for each student of the following written resources (see **Teacher Resources**):

Norway Supplies More Than 20% of Europe's Natural Gas Needs

Norway – Country Analysis Brief Overview

United Kingdom – Country Analysis Brief Overview

Germany – Country Analysis Note

Netherlands – Country Analysis Note

Denmark – Overview data for Denmark (Petroleum & Natural Gas Tabs only)

yellow highlighters and pencils for each student

blank notebook paper for note-taking (if needed)

Time Frame: Four to five 60-minute class periods (more for **Extension** activities)

Procedures:

Day 1 – Maps and PowerPoint Presentation

Pass out copies of the Europe region political map and the Europe region physical map to each student. Make sure each students also has a yellow highlighter and a pencil.

Tell students that the North Sea petroleum reserves have been an important energy resource for many nations' economies since their discovery. Oil was first found on the shores of the North Sea in 1851, but it was not until 1964 that the first offshore oil well was drilled. The North Sea is known for its turbulent weather, which makes drilling dangerous, and many lives have been lost on the platforms. The United Kingdom, Norway, the Netherlands, Germany, and Denmark are the five countries involved in energy production from the North Sea. Tell students that the purpose of this lesson is to help them gain an understanding of the value of the North Sea petroleum reserves to the economies of Europe, both the nations that produce the energy, and the ones that consume the oil and natural gas found there. Tell them that they will be observing and analyzing maps, graphs, and charts of data and other information, will integrate visual information, draw conclusions, and make predictions and inferences, to assist them in gaining a better understanding of the economic interconnectedness of these countries.

Divide students into groups of 4-5. Tell them to look at both the physical map and the political map of Europe for several minutes and discuss in their group what they observe. (i.e.: Some countries are islands or peninsulas; there are many different gulfs or seas; there are many different sized countries, both large and small; some countries are located in the Arctic Circle, etc.) Discuss briefly together their observations, and answer any questions they may have. Guide them to gain a spatial understanding of this region of Europe, its place in the world, and where the North Sea is located in relation to the other countries involved with producing and consuming energy resources from the North Sea. (This will help them have a frame of reference when analyzing the table/charts, and reading information about the countries.)

Tell them to use their yellow highlighter to mark the name and location of the following: North Sea, United Kingdom, Norway, Denmark, Germany, and the Netherlands.

Present the PowerPoint -- *The Value of North Sea Petroleum Reserves to Developed Nations' Economies*. Guide the students in observing, analyzing, drawing conclusions, and making inferences about the information presented in the photographs, charts, graphs, and other forms of visual information.

Tell students to keep their maps in a safe location and bring to class every day. The maps and other activities will be used to assist them later with a written assignment. All materials will be turned in together with the final written assignment for a grade.

Day 2 – Table/Chart Analysis Activity

Pass out copies for each student of the following Table/Charts (**provided below**):

Petroleum Production of Five North Sea Energy Producing Countries

Petroleum Consumption of Five North Sea Energy Producing Countries

Natural Gas Production of Five North Sea Energy Producing Countries

Natural Gas Consumption of Five North Sea Energy Producing Countries

Renewables: Electricity Generation of Five North Sea Energy Producing Countries

Divide students into their small groups of 4-5 students again.

Remind students that written texts are not the only sources of information. As we saw yesterday in the PowerPoint, much information can be gleaned and extracted from visual representations such as photographs, graphs, charts, and as in today's activity --- tables of data.

Explain the meaning of the word **data**: Facts or statistics collected together for reference or analysis.
Explain the meaning of the word **table**: A set of facts or figures systematically displayed, especially in columns. (definitions provided by Google – no url)

Explain to students that each table or chart contains a different set of data about the five North Sea energy-producing countries. In their small groups, they are to look at the information found on each of the charts, try to determine what it is showing, analyze the information, and draw four conclusions or inferences about the data to write down, as well as explain what they think it might mean, or why they think it might be happening. [For example: On the Petroleum Production table, I could write down: I see that Norway is producing more barrels of oil per day than the other nations. They must have more oil reserves than the others, or more drilling rigs, or ??? I could say: I notice the countries are not producing as many barrels of oil per day in 2013 as they were in 2009. Perhaps they are running out of oil to produce. I could also compare one table against another – looking at both the Petroleum Production table and the Petroleum Consumption table I could say: Norway is producing more oil than the other countries, but is using much less than the other countries. I think they must have more oil to sell to others.] When comparing or contrasting two or more different charts, you can write your answer on any one of them you choose.

Allow students to work together and assist each other. Give examples, model, or assist your students where needed. **Tell them not to make it too hard.** Just look at what they see, state it, and give a possible reason as to what it means or why it may be happening. The goal is to help students practice obtaining information from visual sources and analyzing for meaning. Work together as much as needed until they are able to comfortably do it themselves.

Remind students to keep their maps, and now their Table/Chart Analysis Activity sheets in a safe location and bring to class every day. They will all be used to assist them later with the written assignment. All materials will be turned in together with the final written assignment for a grade.

Day 3 – Locating Information from Written Sources

Pass out copies for each student of the following written resources (see **Teacher Resources**) and a yellow highlighter. (make sure they also have a pencil):

Norway Supplies More Than 20% of Europe's Natural Gas Needs

Norway – Country Analysis Brief Overview

United Kingdom – Country Analysis Brief Overview

Germany – Country Analysis Note

Netherlands – Country Analysis Note

Denmark – Overview data for Denmark (Petroleum & Natural Gas Tabs only)

Divide students into their small groups of 4-5 students. Tell them that today they are going to be looking at written sources of information about the five North Sea energy-producing countries. Explain to students that many times when doing research for information, they may encounter an article that may be somewhat difficult to read, or long and filled with more information than they need. Going through the article step-by-step, skimming if necessary, and marking only information they feel is important or useful with a highlighter can help them uncover and understand information better. Allow students about half the class period to work together in their groups, assisting each other, and marking with a highlighter the information they feel is important to know about each country.

Next, as a whole class, review what the students found out and marked in each article as important. Discuss together and allow them to make any changes or additions as needed. The goal today is for students to find additional information that will help explain, expand, or reinforce what they have previously learned about the five North Sea energy-producing countries and their economic interconnectedness.

Remind students to keep safely their maps, their Table/Chart Analysis Activity sheets, and today's written highlighted sheets in a safe location and bring to class tomorrow to assist with their written assignment. Remind them that all materials will be turned in together, with the final written assignment, for grading.

Day 4 – Synthesize, Review, and Revise Information

Divide students into their groups of 4-5. Tell them to get ALL their maps, their Table/Chart Analysis Activity sheets, and their written highlighted information sheets out. Tell them they will have 20 minutes to share and discuss with each other what they learned and recorded the past two days. They can help each other, and can add to, or revise, any information as needed.

Next, share and discuss as a whole class what they have learned about the importance of the North Sea petroleum reserves to the economies of both producing and consuming nations, and their interconnectedness with each other. Allow students to continue to take notes and revise or add information as needed.

Tell them tomorrow they will receive their written assignment. Remind students to place their maps, their Table/Chart Analysis Activity sheets, and their written highlighted information sheets in a safe place, and bring everything to class tomorrow to assist with their written assignment.

Day 5 – Written Assignment

Students will write a short essay illustrating the (a) importance of North Sea petroleum reserves to the economies of both producing and consuming nations of Europe, and (b) the interconnectedness of the economies of these nations.

(Note: This assignment can be done in class, or sent home as an out-of-class assignment, as teacher desires.)

Assessment Options:

1. Informal Assessment: Teacher observation of student participation in group and whole-class discussions, Table/Chart activities, and written source highlighting activity.
2. Formal Assessment: Written paper-short essay assignment. The essay should be evaluated on (1) whether or not student has followed directions, (2) how clearly and thoroughly the student demonstrated an understanding of the importance of the North Sea petroleum reserves to both producing and consuming nations, and (3) how well the student supported his/her statements with accurate information, examples, and evidence.

Teacher Resources:

PowerPoint -- *The Value of North Sea Petroleum Reserves to Developed Nations' Economies*.

Maps from CIA The World Factbook References Regional and World Maps:

<https://www.cia.gov/library/publications/the-world-factbook/docs/refmaps.html>

Europe Political Map

Europe Physical Map

(Note: All maps are best viewed as color copies.)

International Energy Statistics: Table Generator from the U.S. Energy Information Administration (EIA). (You can use the tabs provided to begin a data search, and make your own tables of energy information about countries throughout the world.) – This site was used to create the Table/Charts below:

<http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm>

Copies for each student of the following Table/Charts (**provided below**):

Petroleum Production of Five North Sea Energy Producing Countries

Petroleum Consumption of Five North Sea Energy Producing Countries

Natural Gas Production of Five North Sea Energy Producing Countries

Natural Gas Consumption of Five North Sea Energy Producing Countries

Renewables: Electricity Generation of Five North Sea Energy Producing Countries

Countries: U.S. Energy Information Administration (EIA). (A portal where data, reports, and analysis briefs can be found for countries of the world.)

<http://www.eia.gov/countries/>

Copies for each student of the following written resources found at the above online source. (If you have access to a computer lab with Internet connection, you could alternatively have students look up the country and take notes.)

Norway Supplies More Than 20% of Europe's Natural Gas Needs, U.S. Energy Information Administration (EIA), May 16, 2014.

<http://www.eia.gov/todayinenergy/detail.cfm?id=16311>

Norway – Country Analysis Brief Overview

<http://www.eia.gov/countries/country-data.cfm?fips=NO>

United Kingdom – Country Analysis Brief Overview

<http://www.eia.gov/countries/country-data.cfm?fips=UK>

Germany – Country Analysis Note

<http://www.eia.gov/countries/country-data.cfm?fips=GM>

Netherlands – Country Analysis Note

<http://www.eia.gov/countries/country-data.cfm?fips=NL>

Denmark – Overview data for Denmark (Petroleum & Natural Gas Tabs only)

<http://www.eia.gov/countries/country-data.cfm?fips=DA>

Other References:

U.S. Energy Information Administration (EIA) Website

(The U.S. Energy Information Administration (EIA) collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment.)

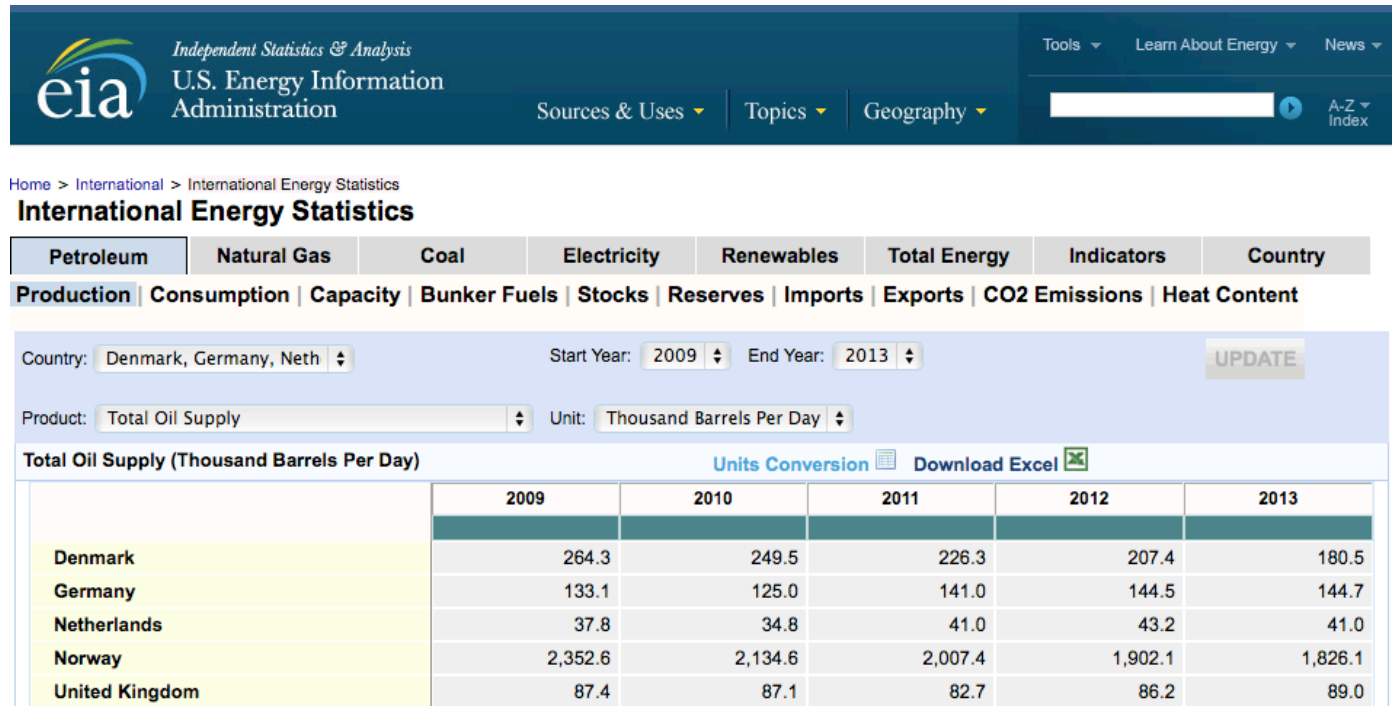
<http://www.eia.gov>

Extension and Enrichment:

Students will use the resources found on the *U.S. Energy Information Administration (EIA)* website (see **Other References**), and the *International Energy Statistics* Table Generator from the U.S. Energy Information Administration (EIA), and *Countries*: U.S. Energy Information Administration (EIA) (see **Teachers Resources**) to explore and prepare reports about other topics related to this study, or to explore energy information about other countries around the world.

Name: _____

Petroleum Production of Five North Sea Energy Producing Countries:



<http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=5&pid=53&aid=1&cid=DA,GM,NL,NO,UK,&syid=2009&eyid=2013&unit=TBDP>

Look carefully at the data on this Petroleum Production chart of the five North Sea energy-producing countries. Compare and contrast the information you see. (a) Record four observations about the data, and (b) for each, state what you think it might mean, or why you think it might be happening.

1.

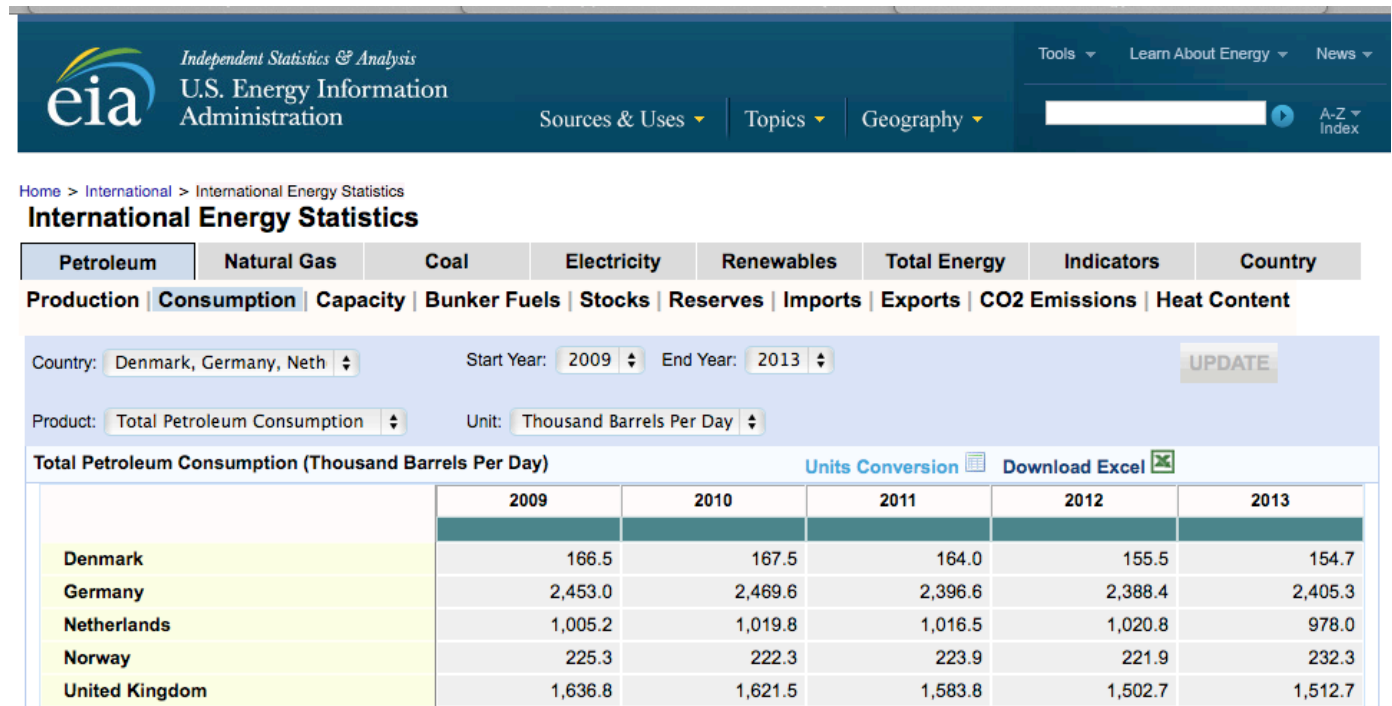
2.

3.

4.

Name: _____

Petroleum Consumption of Five North Sea Energy Producing Countries:



<http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=5&pid=5&aid=2&cid=DA,GM,NL,NO,UK,&syid=2009&eyid=2013&unit=TBPD#>

Look carefully at the data on this Petroleum Consumption chart of the five North Sea energy-producing countries. Compare and contrast the information you see. (a) Record four observations about the data, and (b) for each, state what you think it might mean, or why you think it might be happening.

1.

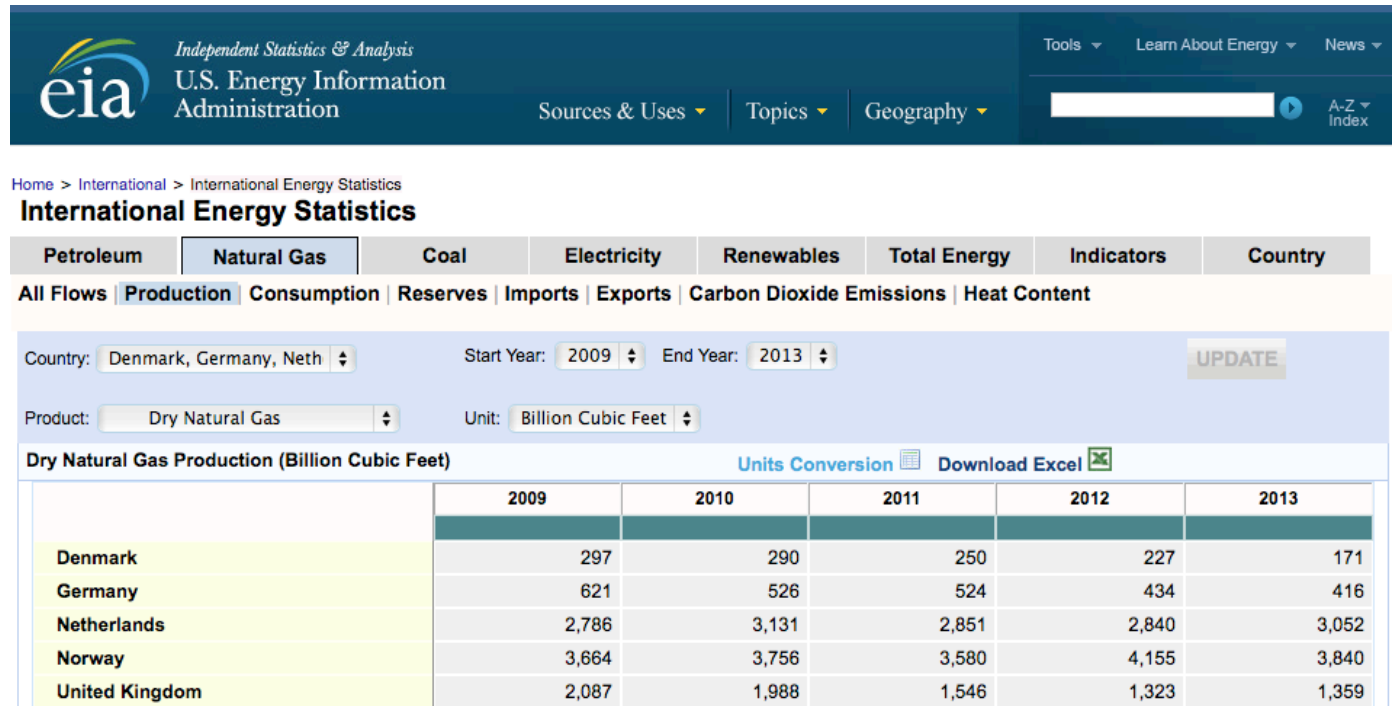
2.

3.

4.

Name: _____

Natural Gas Production of Five North Sea Energy Producing Countries:



<http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=3&pid=26&aid=1&cid=DA,GM,NL,NO,UK,&syid=2009&eyid=2013&unit=BCF>

Look carefully at the data on this Natural Gas Production chart of the five North Sea energy-producing countries. Compare and contrast the information you see. (a) Record four observations about the data, and (b) for each, state what you think it might mean, or why you think it might be happening.

1.

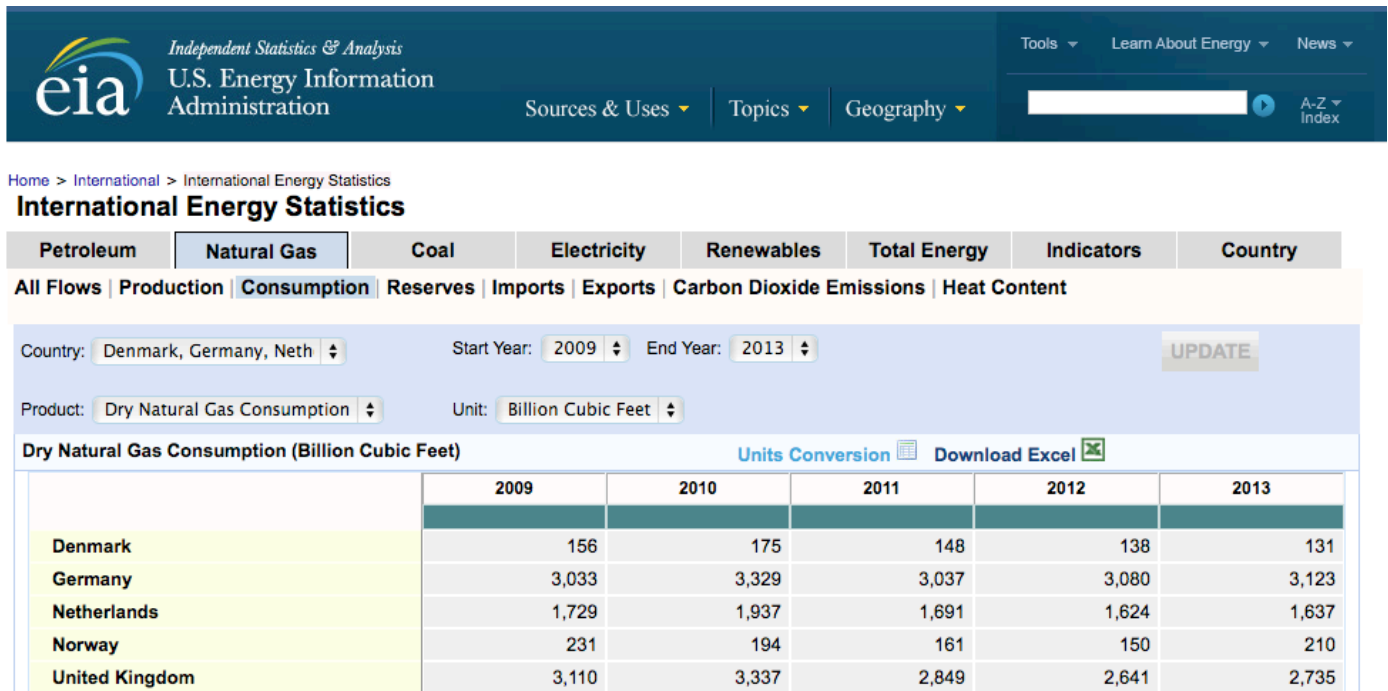
2.

3.

4.

Name: _____

Natural Gas Consumption of Five North Sea Energy Producing Countries:



<http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=3&pid=26&aid=2&cid=DA,GM,NL,NO,UK,&syid=2009&eyid=2013&unit=BCF>

Look carefully at the data on this Natural Gas Consumption chart of the five North Sea energy-producing countries. Compare and contrast the information you see. (a) Record four observations about the data, and (b) for each, state what you think it might mean, or why you think it might be happening.

1.

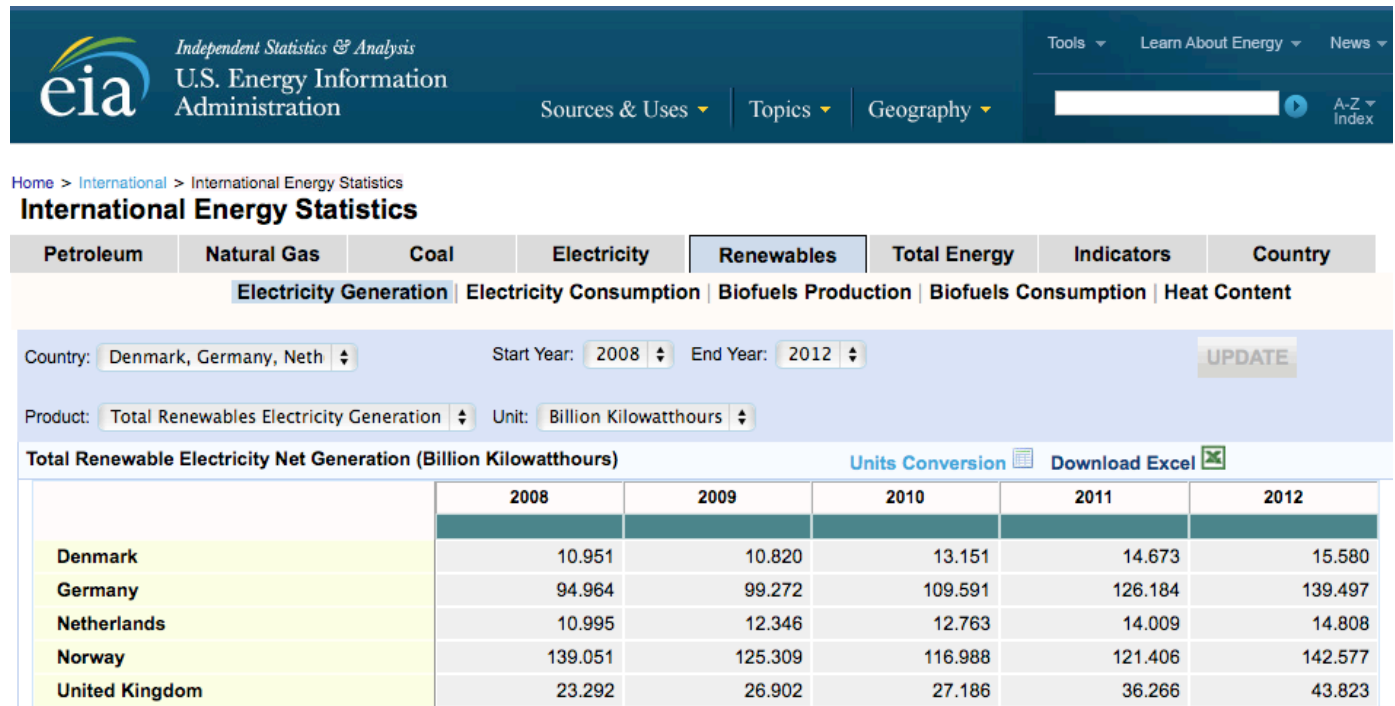
2.

3.

4.

Name: _____

Renewables: Electricity Generation of Five North Sea Energy Producing Countries:



<http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=6&pid=29&aid=12&cid=DA,GM,NL,NO,UK,&syid=2008&eyid=2012&unit=BKWH>

Look carefully at the data on this Renewables: Electricity Generation chart of the five North Sea energy-producing countries. Compare and contrast the information you see. (a) Record four observations about the data, and (b) for each, state what you think it might mean, or why you think it might be happening.

1.

2.

3.

4.