

Task Development on Energy: Cross-border Education Between Philippines-Malaysia

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Analysis of Primary Energy Supply of the Philippines and Malaysia

- Level: Grade 7
- Topic: Gathering, Organizing, Presenting, and Analyzing Data
- Prerequisite Knowledge/Skills: Kinds of graphs

Analysis of Primary Energy Supply of the Philippines and Malaysia

- Objectives:

The students should be able to:

1. communicate and exchange ideas with fellow students from another country
2. apply their knowledge and skills in gathering and presenting data in a table and graph as well as reading and interpreting graphs
3. analyze the relationships of the primary energy supply by source (e.g. coal) and different sectors (e.g. indigenous production)
4. think mathematically and appreciate the importance of using life-long learning skills to gain a better understanding of concerns related to energy and of their role as citizens of the society

TASK 1: Analyzing Indigenous Production

- Choose a primary energy supply by source common to the two countries.
- Visit the APEC Energy Database.
(<http://www.ieej.or.jp/egeda/database/database-top.html>)

TASK 1: Analyzing Indigenous Production

- Considering the data from 1994-2014, draw the graphs on one coordinate plane. For sector and unit, choose indigenous production and kTOE, respectively.
- Make 3 observations. Explain possible reasons for your observations.

TOPIC: Primary Energy Supply

- What is primary energy supply?

Primary energy supply is defined as energy production plus energy imports, minus energy exports, minus international bunkers, then plus or minus stock changes.

- What is primary energy source?

Primary sources can be used directly, as they appear in the natural environment: **coal**, oil, natural gas and wood, **nuclear fuels** (uranium), the sun, the wind, tides, mountain lakes, the rivers from which hydroelectric energy can be obtained and the Earth heat that supplies geothermal energy.

TOPIC: Primary Energy Supply

- What are the primary energy sources in the Philippines and Malaysia?

Philippines : oil, coal, natural gas, geothermal, hydro, biomass, biofuel, wind, solar

Malaysia : crude oil, petroleum products, natural gas, coal and coke, hydropower, biodiesel, biomass, biogas

- What is the difference between primary and secondary source of energy?

Fossil fuels (coal, oil and gas), biofuels, wind, waves, solar radiation and nuclear fuels are all **primary sources of energy**. A **secondary energy source** is one that is produced using a **primary** source, e.g. electricity is a **secondary** source, which can be generated by a number of different **primary sources**.

TOPIC: Primary Energy Supply

- What are the units of energy? What is kTOE?

1 kTOE (kilotonne of oil equivalent) = 10^{10} kcal

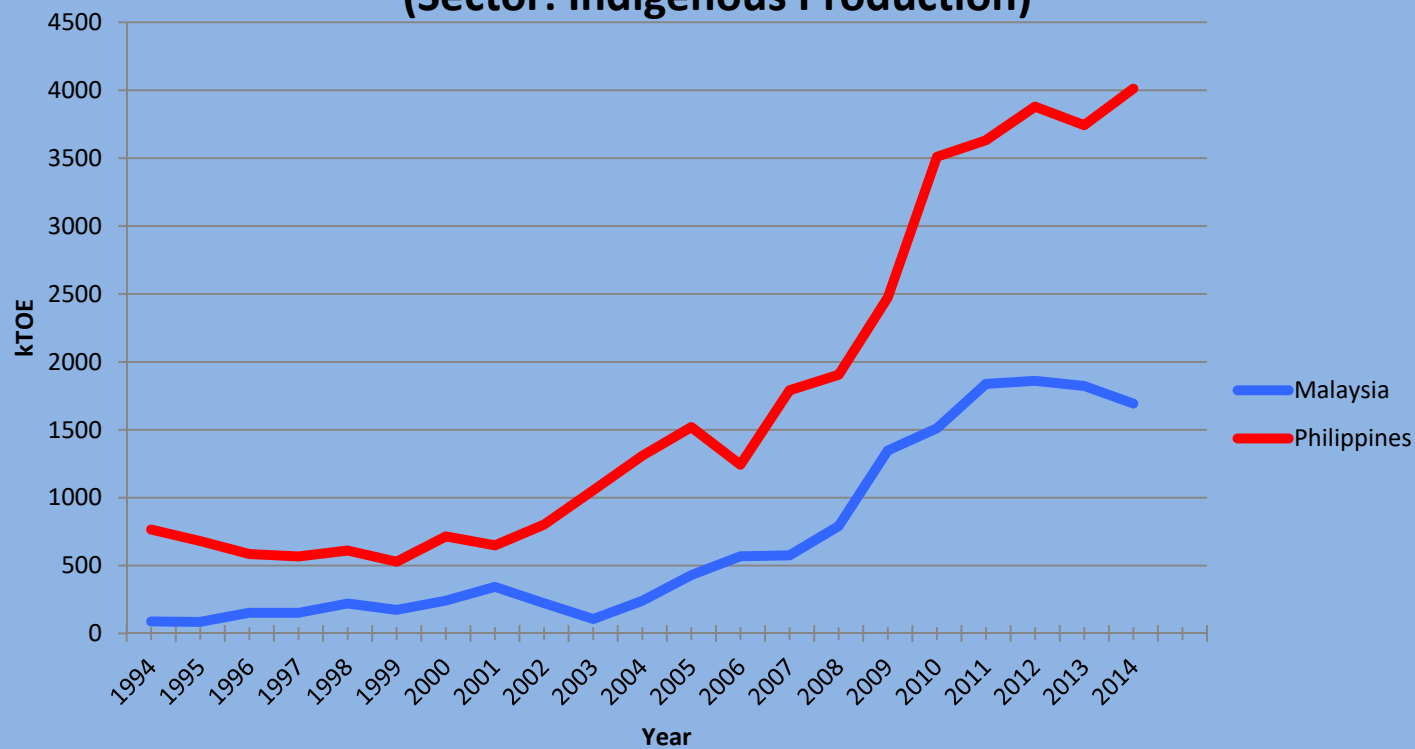
- What is indigenous production?

Indigenous production is one that is within a particular region/country.

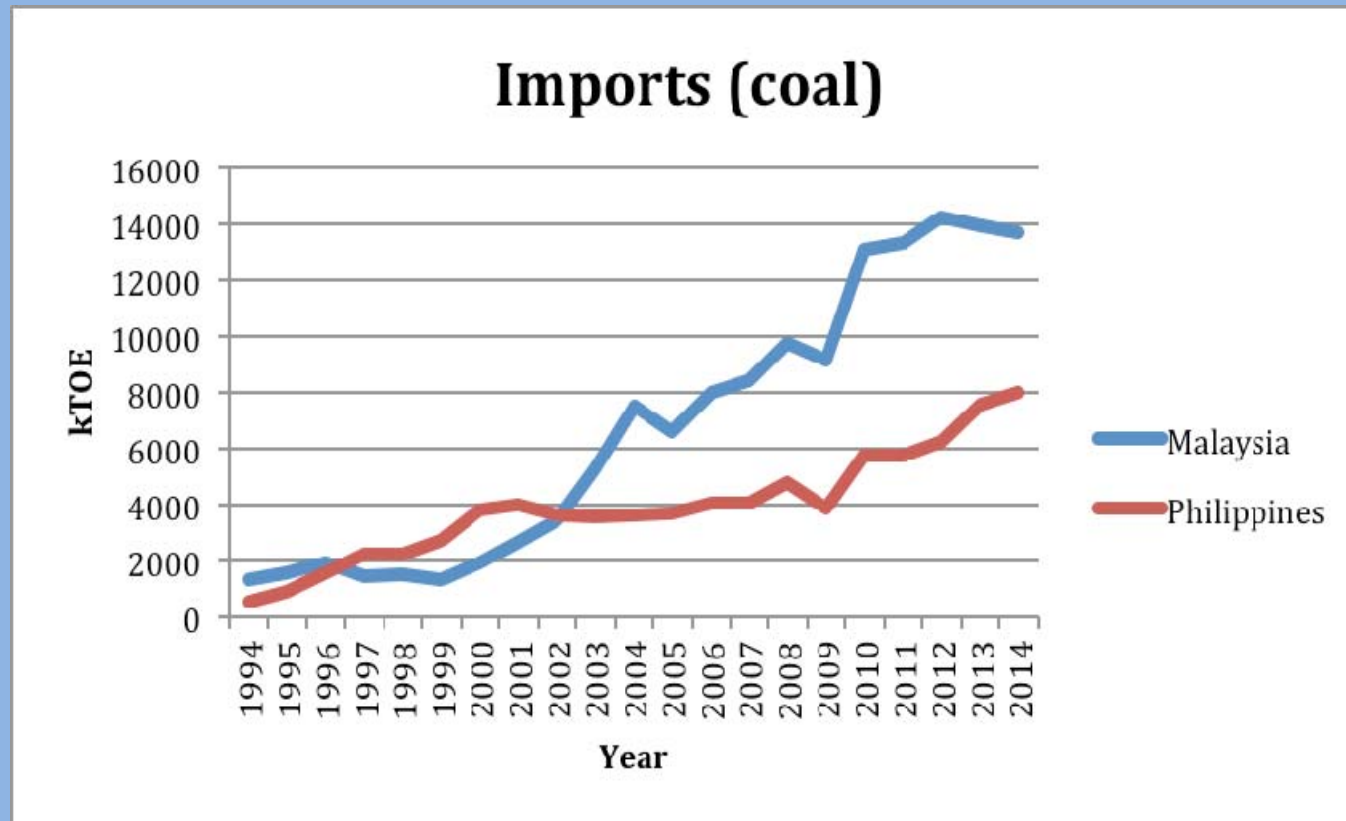
Example: Primary Energy Supply from Coal

Primary Energy Supply Table																					
Coal	Indigenous Production	Unit:K TOE																			
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Japan	80907	84831	86619	88642	86653	89292	93293	95766	94995	105549	110354	112146	109614	113951	116443	99284	112519	107169	112341	117556	116485
Malaysia	1563	1612	2053	1569	1660	1374	2308	2911	4133	5717	7304	6822	8213	8854	9496	10547	14601	14655	15796	15290	15258
Philippines	1350	1584	2160	2810	2870	3279	4539	4661	4446	4641	4990	5230	5316	5449	6225	5310	7030	7726	9316	10003	10642

Primary Energy Supply from Coal (Sector: Indigenous Production)



Graph

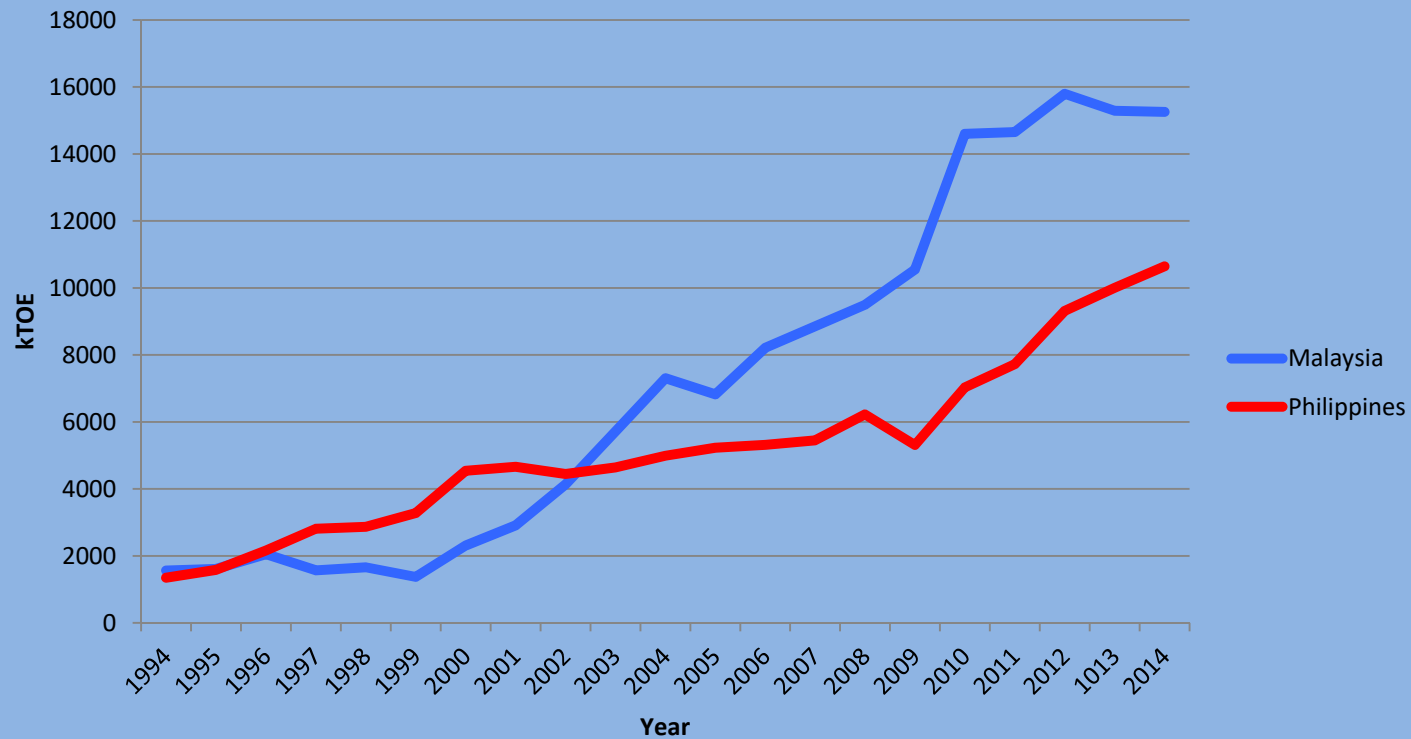


TASK 2:

Investigate the total primary energy supply of the two countries.

Graph

Primary Energy Supply from Coal Sector: Total Primary Energy Supply



TASK 2:

Possible Response

The trend of primary energy supply is increasing for both the Philippines and Malaysia.

Philippines: The primary energy supply from coal is increasing. This may be due to coal being the cheapest of the fuel options. Also, consumption increase steadily as new coal-fired power plants are installed and industries switch to coal because of the highly volatile price of oil.

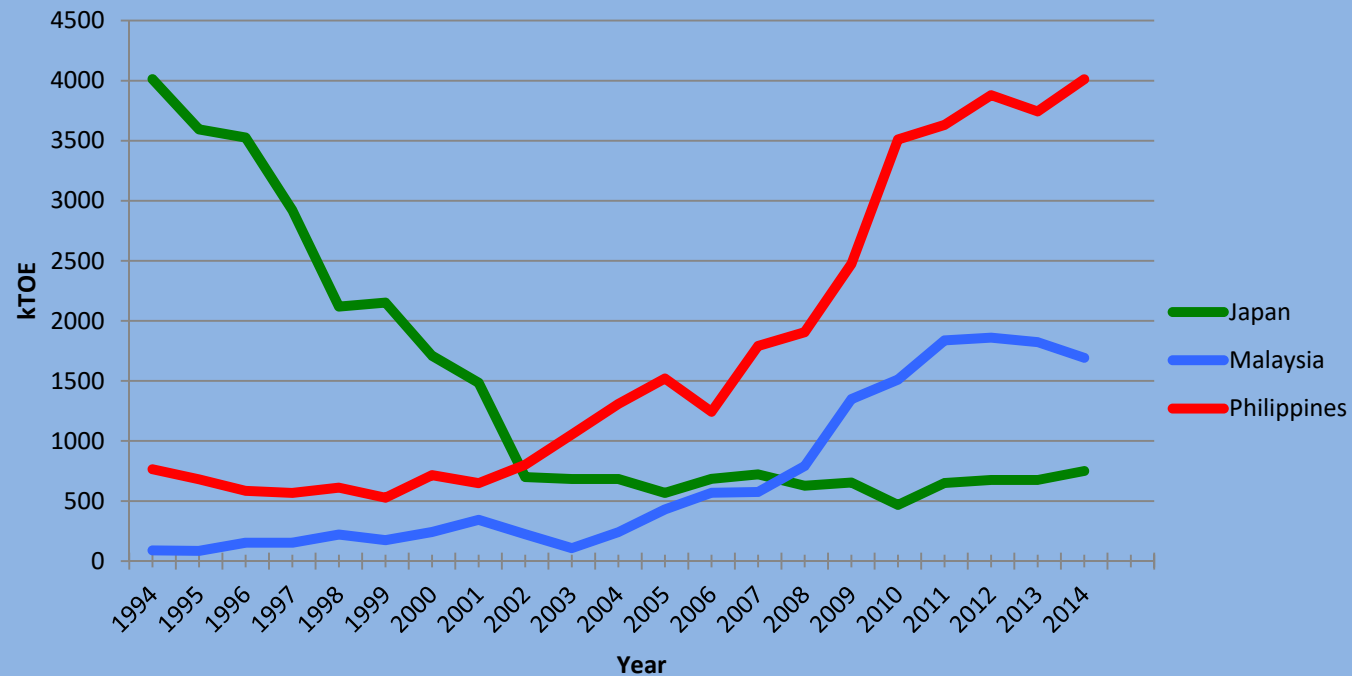
Malaysia: Coal is cheaper than natural gas. With the rapid increase in clean-coal technologies, many coal power plants were put up.

Extension:

Investigate the total primary energy supply of the two countries and another country (e.g. Japan)

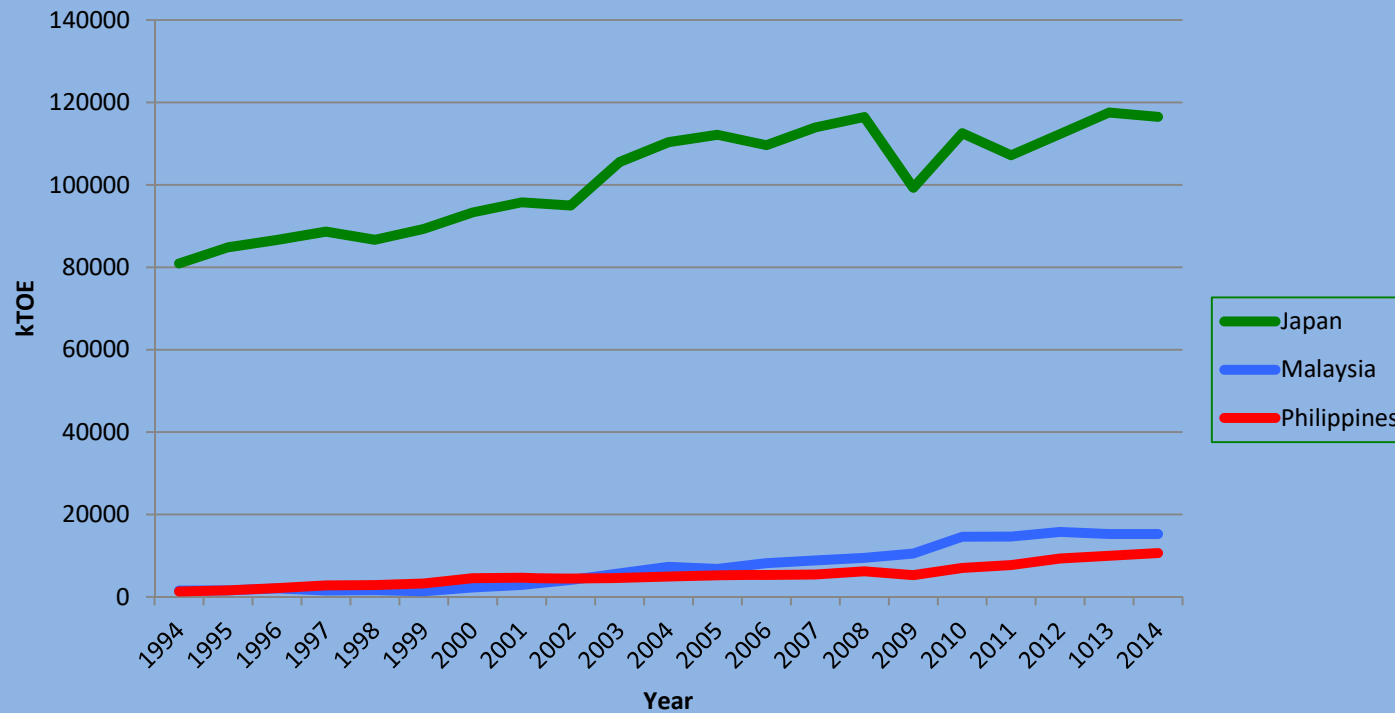
Graph

Primary Energy Supply from Coal (Sector: Indigenous Production)



Graph

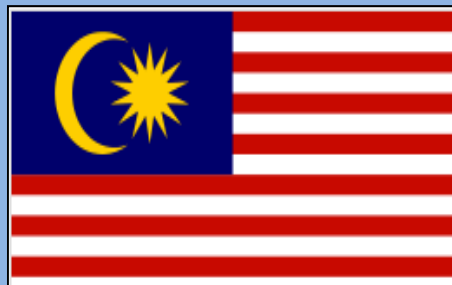
Primary Energy Supply from Coal Sector: Total Primary Energy Supply



Skills

- Gathering Data through the Internet
- Reading Tables
- Presenting Data in a Graph
- Reading and Interpreting Graphs
- Making Inferences
- Analyzing Relationships
- Making Connections
- Communicating Results

THANK YOU!!!



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