Section A
Answer **all** questions

Question 1 Solar Energy

Extract 1: Global solar energy surging

Solar electric energy demand has grown by an average of 30 percent per annum over the past 20 years against a backdrop of rapidly declining costs and prices. This decline in costs has been driven by economies of scale, manufacturing technology improvements and the increasing efficiency of solar cells.

In developing countries, markets have benefited from the steady decline in solar photovoltaic (PV)* prices. India, for example, still significantly lags behind European countries in the use of solar energy. However being behind has enabled it to spend far less to set up solar farms than countries that pioneered the technology. In the past two years, the price of solar power has fallen sharply, thanks to a glut of solar panels in the market and falling silicon prices.

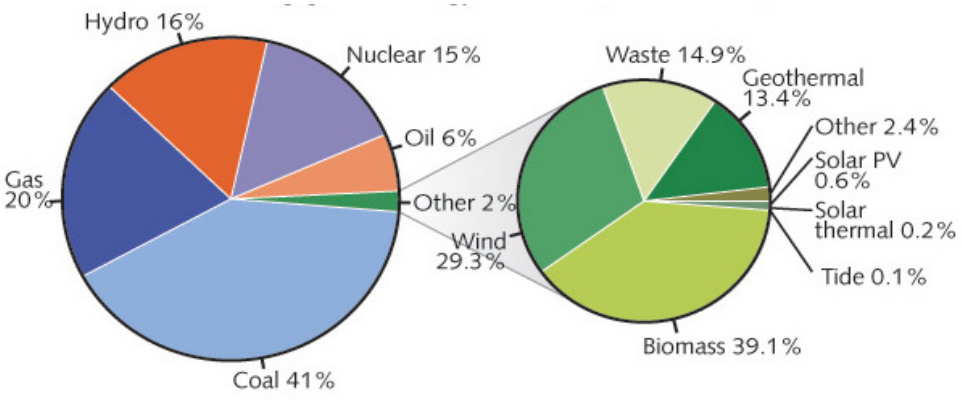
Several other factors make solar boom possible in developing countries like India: polluting diesel is unreliable and costly and coal is dirty.

Global investment in renewable energy reached a record of US$257 billion last year, with solar energy attracting more than half of the total spending, according to a United Nations report. Investment in solar energy surged to US$147 billion in 2011, a year-on-year increase of 52 percent thanks to strong demand for rooftop photovoltaic installations in Germany, Italy, China and Britain.

Source: *Associated Press*, 11 June 2012

**Solar PV (photovoltaic) are panels used to convert sunlight directly into electricity.*

Figure 1: Global energy usage 2010



Source: *Energy Information Administration (EIA)*

Table 1: Installed photovoltaic (PV) power in Germany and India

PV Power (in Megawatts)	2008	2009	2010
Germany	6120	9914	17320
India	90	230	189

Sources: *IEA Photovoltaic Power Systems Programme, EPIA, EurObserver* and *SolarBuzz*

Extract 2: Solar energy in Germany

Among industrialized countries, the German government has led the way in legislating high incentives to stimulate the development of its domestic solar markets. The German Feed-in-tariffs (FITs) are a cash-back scheme which offers financial rewards to individuals who generate their own electricity.

This government policy is designed to reduce CO_2 emissions via solar deployment and to create high-tech jobs through the development of a strong national solar industry. The FITs has caused an explosive growth in demand for solar panel installations on homes, schools, offices and fields throughout the country. This leads to the expansion of the solar PV panels industry with its own distributor and dealer networks, equipped with well-trained installers and good customer support capabilities.

The German government has made large investments in restructuring the nation's energy infrastructure and weaning it off atomic energy. It has as much solar power generation capacity that is able to produce electricity equal to twenty nuclear power stations at full capacity. This shows that Germany can do with fewer coal-burning power plants, gas-burning plants and nuclear plants. Currently, it gets about four percent of its overall annual electricity needs from the sun alone.

However, the German government had to cut subsidies of up to 30 percent for solar panels in February because demand was so high it could no longer afford to support the green technology. The growth of solar energy was one of Germany's success stories but it had been allowed to grow too fast and had been too heavily subsidised.

Source: *Various*

Extract 3: To FIT or not to FIT?

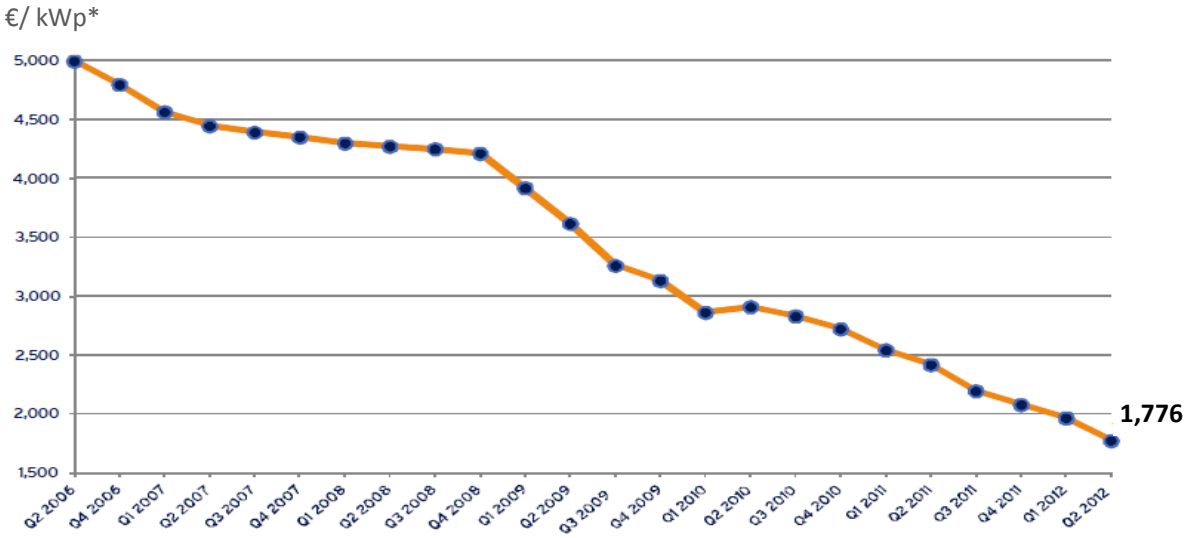
The Singapore Government currently is not keen on the Feed-in-tariffs (FIT) in encouraging renewable energy sources. Second Minister for Trade and Industry S. Iswaran said that Singapore supports research and development (R&D) to help bring down the costs of alternative energies. He said that "if we choose the path of subsidising consumption of these alternative energy sources, then we are subsidising a more costly alternative".

The argument against FIT is basically to avoid distorting a free market with subsidies. Tax exemptions or R&D grants may be given to prospective investors but there is no guarantee this will result in clean electricity.

FIT makes it attractive for investors, entrepreneurs, engineers and scientists to devote their time and effort seriously to renewables. According to a Malaysian Minister, if governments do not "create favourable conditions, then the future of renewable energy is doomed".

Source*: Today,* November 2011

Figure 2: Average end-customer prices in Germany for PV

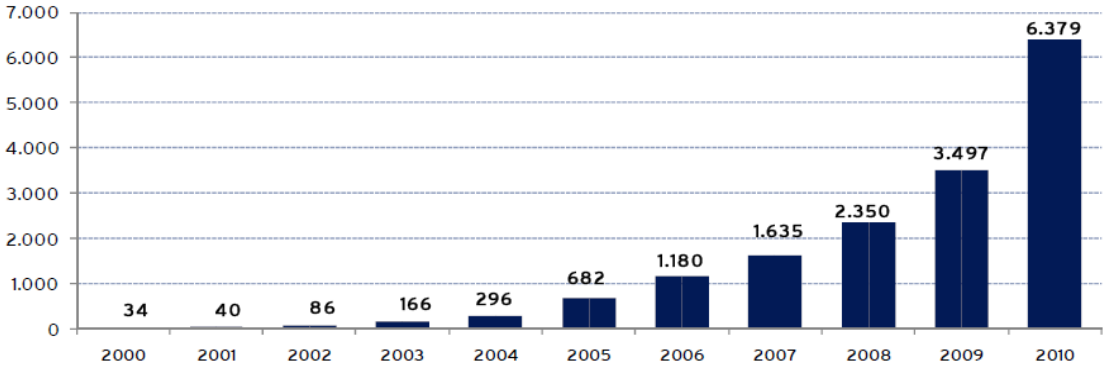


**kWp: The highest possible output from a PV solar panel*

Source: *BSW-Solar*, May 2012

Figure 3: CO_2 Savings through PV systems in Germany

Thousand CO_2 units



Sources: *BMU, BSW-Solar*, April 2011

Questions

(a) **(i)** Compare the trends in installed photovoltaic (PV) power in Germany and India between 2008 and 2010. [2]

(ii) Using the data provided, explain one reason for the difference in the trends in installed photovoltaic (PV) power between Germany and India. [2]

(b) Using a demand and supply diagram, account for the change in PV average end-customer prices in Germany over the years. [3]

(c) Explain how subsidies can distort the allocation of resources in the free market. [4]

(d) **(i)** Using an example from the extracts, differentiate between private cost and external cost. [3]

(ii) Comment on the large investments in solar energy, despite solar energy taking up a small percentage of the global energy demand shown in Figure 1. [8]

(e) Discuss how investments in solar energy may affect future use of coal as a main source of energy. [8]

[Total: 30 Marks]

Question 2 The Brazilian Economy

Extract 4: Brazil's government acts to boost struggling economy

The Brazilian government cut its benchmark interest rate by 0.5 percentage points, the eighth consecutive time since August 2011. It has also extended its tax on foreign exchange transactions as policymakers scramble to revive an economy that has failed for nearly a year to respond to a barrage of stimulus measures. Both measures are aimed at protecting the domestic industry from a flood of cheap imports.

Although Brazilian consumers continue to spend, industrial output remains weak as consumers are consuming more and more imports. Brazilian businesses suffer from rising costs because of high taxes, expensive credit, shortage of skilled labour and infrastructure bottlenecks. Despite rising prices, Brazilians are among the world's "happiest" people and jobless rates are at record lows.

For the year 2012, inflation control is uncertain. Market forecasts show inflation around 5.5%, but the level of economic activity is very low and interest rates are still on the decline.

Source*: Financial Times,* March 2012 and *Reuters,* July 2012.

Extract 5: Brazil's trade relations with China

China became Brazil's largest trading partner in 2009, overtaking the United States which had held the position since the 1930s. Last year, the flow of trade between Brazil and China reached US$56 billion, a growth of 52% from 2009.

However, despite a US$5 billion surplus, not all Brazilians are totally happy with this commercial relationship. Brazilian industrialists complained that competition against China's undervalued currency and low costs is next to impossible to deal with, and is seriously harming the local industry. Earlier this year, the government released a research saying that the increase in the imports of consumer goods prevented the creation of 46,000 jobs in Brazil last year. Economic data shows that the share of the manufacturing sector in Brazil's GDP fell from a peak of 27% in the late 1980's to 15% now.

The Brazilian government has shown that it is worried about this matter. It issued anti-dumping measures against China last week. Brazil imposed a new tariff of US$4 per kilo on Chinese synthetic fibres, which already has a 26% import tax. However, the government has been very careful in addressing these issues. Even though some industries complained about China, many also feel that Brazilians are partially to blame for the country's inability to compete with deficient infrastructure, an inefficient tax system and high labour costs.

Source: *BBC,* April 2011

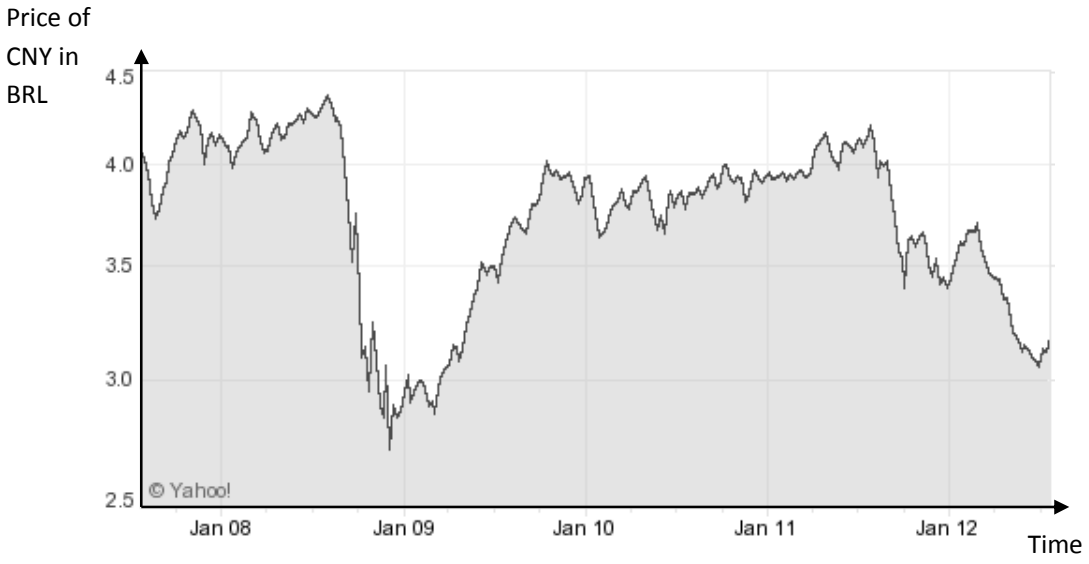
Extract 6: FTA – the way forward?

Brazil and China have had their differences, but the two emerging market leaders are putting those qualms aside for the betterment of both their growth. The latest China-Brazil trade deal, worth up to US$1.5 billion, is the latest proof of that. In fact, as the two countries entered into their third annual BRIC summit with their Indian and Russian counterparts, Brazil made it clear that it sees China as a model for its own industrial development.

Brazil and China have entered into an increasing number of trade agreements as the Red Dragon has sought to shore up supplies of raw materials to fuel its growth. Brazil, among other things, is the world's largest producer of iron ore. This fact is often used as a bargaining tool by China in its trade negotiations with Australia, the latter being keen on exporting its own iron ore to China.

Source: *mondaymorning.com,* April 2011

Figure 4: Brazilian Real (BRL) per Chinese Yuan (CNY)



Source*: Yahoo.com* 2012

Table 2: Brazil-China Trade Balance (USD Millions)

Year	Exports to China(A)	Share relative to total exports (%)	Imports from China (B)	Share relative to total imports (%)	Bilateral Trade Flow (A+B)	Net Exports (A-B)
2008	16523	8.3	20044	11.6	36567	-3522
2009	21004	13.7	15911	12.5	36915	5093
2010	30786	15.2	25593	14.1	56379	5193
2011	28160	15.6	23420	14.1	51580	4740

Source: *Brazilian Ministry of Development, Industry and Foreign Trade,* 2012

Table 3: Economic indicators of Brazil

Indicator	2009	2010	2011
GDP (USD Billion)	1620.2	2143.1	2475.1
Inflation (%)	4.9	5.0	6.6
Budget balance in % of GDP	-3.3	-2.5	-2.6
Unemployment (%)	8.1	7.0	4.7
Current Account Balance (USD Billion)	-24.3	-47.3	-52.5
Foreign Reserves (USD Billion)	237.4	287.1	350.4

Source: *Banco Central do Brasil*, 2012

Questions

(a) With reference to Figure 4 and Table 2,

(i) State the trend of the Brazilian Real against the Chinese Yuan between January 2009 and January 2011. [1]

(ii) Describe the trend of Brazil's trade balance with China from 2009 to 2011. [2]

(iii) In the light of the above trends, explain how the change in exchange rate has affected Brazil's trade balance with China. [2]

(b) How far does the data in Table 3 support the claim that Brazilians are "among the world's happiest people"? [4]

(c) With reference to the data, explain why the level of economic activity has continued to be low in Brazil, despite the cut in interest rates. [3]

(d) Discuss the policy measures that the Brazilian government can adopt to solve its current account deficit. [8]

(e) To what extent would Brazil's decision to pursue free trade agreements with China and other countries help it achieve its macroeconomic goals? [10]

[Total: 30 Marks]

Section B

Answer **one** question from this section

3 Spanning 101 hectares, Gardens by the Bay is an integral part of a strategy by the Singapore government to transform Singapore from a 'Garden City' to a 'City in a Garden'.

www.gardensbythebay.org.sg

(a) Explain the difference between merit goods and public goods, and consider under which of these classifications 'Gardens by the Bay' should be placed. [10]

(b) Discuss the view that providing goods with positive externalities free of charge to the users will lead to an efficient allocation of resources. [15]

4 (a) Explain the methods that a government might use to protect its domestic industries from imports. [10]

(b) Discuss whether protectionism offers any advantages to an economy. [15]