

## Question 1

### Present and Future Energy Sources in the Globalised World

#### Extract 1: Global energy demand seen up 44 percent by 2030

Most economists agree that globalization provides a net benefit to individual economies around the world, driving world economic growth, increasing competition, limiting military conflicts, and spreading wealth more equally around the world. However, according to Joseph Stiglitz, a former chief economist of World Bank, 'Globalisation today is not working for many world's poor. It is not working for much of the environment. It is not working for the stability of the global economy.' The general public tends to assume that the costs associated with globalization outweigh the benefits; one of its most imminent problems is the soaring energy demand, exhaustion in raw materials and its related pollution concerns.

Global energy demand is expected to soar 44 percent over the next two decades with most of the demand coming from developing countries such as China and Russia. Almost 75 percent of the rise in global energy demand through 2030 will occur in developing countries, particularly China, India, Russia and Brazil, the agency said. The Organization of Petroleum Exporting Countries will continue to provide 40 percent of the world's oil supplies during the period.

With the opening of borders to trade and foreign investment, globalization brings opportunities and pressures for domestic firms in emerging market economies to innovate and improve their competitive position. Many of these pressures and opportunities operate through increased competition from and linkages with foreign firms. This competition gave rise to economies and firms investing heavily in more efficient energy like renewable energy. The competition is certainly intensified when expertise, knowledge and advanced equipment could be easily acquired across borders in a globalized market.

Adapted Tom Doggett and Ayesha Rascoe, *Reuters*, 27 May 2009

#### Extract 2: Energy crisis? Fund the renewable solution

Despite energy being a basic requirement for economic growth and development, the International Energy Agency (IEA) says that 1.3 billion people do not have access to electricity. This mainly applies to people living in rural areas of Asia and sub-Saharan Africa.

Conventional generation of energy through the burning of fossil fuel has created many issues especially in these third world economies. Globalisation has fuelled the accelerating demand of energy, coupled with instability in the Middle Eastern countries, led to volatility in energy prices. Fortunately, renewable energies such as wind, solar or biomass come in small units – solar cells or wind turbines – making construction and maintenance fairly straightforward. Over time, the costs for solar, wind and efficient biomass have reduced significantly, now levelling at the same price, and in some cases cheaper, than fossil fuels.

Some countries have already made significant progress in distributing renewable energy technologies. In Bangladesh, over 80,000 solar home systems are being installed every month and there are already a total of over three million in use in rural, off-grid areas, benefiting over 20 million people. This has had a positive economic and social impact in the country. Since 1996, the renewable energy sector in Bangladesh has created jobs for over 150,000 people.

But elsewhere, despite renewable energy being a great opportunity to accelerate the economic development in the global south, progress has been slow. Creating a reliable environment for investments in renewable energy is one of the biggest challenges for the industry.

Source: Stefan and Dipal, *Guardian*, 5 Jun 2014

#### Extract 3: American solar industry in crisis

Despite the substantial investments in solar energy, the industry is in turmoil. A number of large American manufacturers such as Solyndra, Evergreen Solar, SpectraWatt, Solar Millennium and Solon fell victim to price pressure from Chinese rivals that helped to halve the cost of photovoltaic modules in 2011.

Not unexpectedly, the industry's poor fundamentals are provoking trade battles. In May, the U.S. Commerce Department found several Chinese solar-panel companies guilty of dumping and imposed 31 percent tariffs on their products. The action came as a result of a complaint filed by the American subsidiary of Germany's SolarWorld AG and a half-dozen other solar-energy companies that said that the Chinese manufacturers are selling solar panels at below-market prices. SolarWorld has now asked the European Union to investigate claims that Chinese rivals have been selling their products at below market value in Europe as well.

Source: Jack Perkowski, *Forbes*, 27 Dec 2012

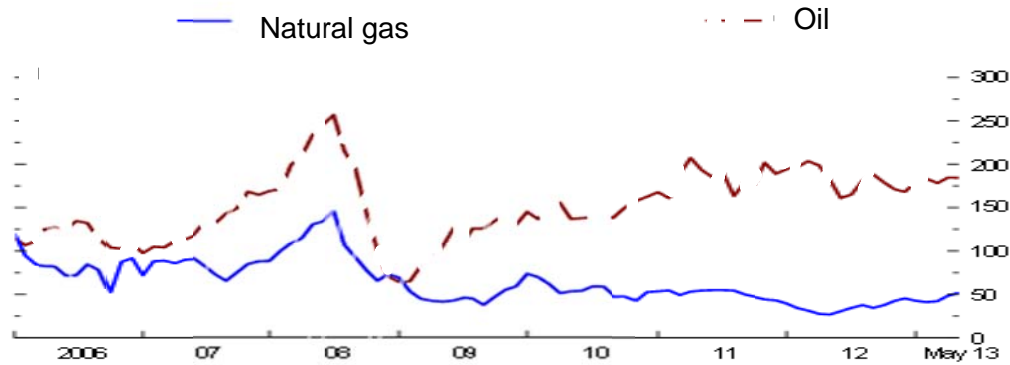
#### Extract 4: Natural gas price in Europe lowest since 2010

The price of natural gas in Europe has dropped to its lowest level since 2010 as warm weather and high storage levels curb demand for the fuel. Fears of supply disruptions after Russia moved to take control of Crimea saw the price leap to 61.7 pounds a therm last month. Russia supplies about 30 per cent of Europe's natural gas, with almost half of it piped through Ukraine.

However, the price has been in retreat ever since. One factor weighing on prices has been Europe's mild winter. A key use of natural gas is as a heating source. "We have got to the end of the [winter] withdrawal season and stocks are still really high," said Trevor Sikorski, head of natural gas, coal and carbon at Energy Aspects, a consultant. "There's an awful lot of gas in storage."

Source: Neil Hume, *Financial Times*, 3 April 2014

Figure 1: Natural Gas and Oil Prices in United States (2005 =100) \*



Source: *WorldBank*, accessed June 2014

### Questions

- (a) Using Figure 1, summarise the variations in the natural gas and oil prices in US. [2]
- (b) Explain how 'firms investing heavily in more efficient energy like renewable energy' (Extract 1) affects the demand for oil. [2]
- (c) With reference to Extract 4, how far do demand factors explain the change in natural gas prices in UK? [4]
- (d) (i) With the help of examples, explain how negative externality in production arises in the conventional energy market. [3]
- (ii) Comment on how investment in renewable energy market affects market failure in the conventional energy market. [5]
- (e) Extract 3 indicates that 'U.S. Commerce Department found several Chinese solar-panel companies guilty of dumping and imposed 31 percent tariffs on their products.'

Evaluate the case for the imposition of tariffs by the US government.

- (f) Discuss the view that the costs associated with globalisation outweigh the benefits.

[Total: 30]

## Answers

(a) Using Figure 1, summarise the variations in the natural gas and oil prices in US. [2]  
From 2006 to May 2013, natural gas prices increased by 75% whereas oil prices fell by 50%. [1] Both natural gas and oil

(b) Explain how 'firms investing heavily in more efficient energy like renewable energy' (Extract 1) affects the demand of oil. [2]

With investment in renewable energy, supply of renewable energy increases, resulting in a surplus causing prices of renewable energy to fall and the quantity of renewable energy to rise.

The fall in price of renewable energy causes a decrease the demand for oil as people turn to renewable energy since the two goods are substitutes and are alternative sources of energy. [1]

(c) With reference to Extract 4, how far do demand factors explain the change in natural gas prices in UK. [4]

Explain the impact of Demand.

According to Extract 4, price of natural gas has fallen to its lowest. The mild weather in Europe has reduced the need to use natural gas as a heating source. Hence, demand for natural gas has fallen

Explain impact of Supply

The large stocks of natural gas made supply relatively price elastic because it is relatively easy for producers to run down its inventories to increase the quantity supplied of natural gas in response to any increase in prices. This will cause a smaller fall in price of natural gas for a given increase in demand

Conclusion : Addressing the direction word 'how far'

Given that the extract mentioned that Natural Gas has fallen to its lowest, this suggests that the fall in price is significant. [1]

OR any comments in regards to demand or supply not being the only factors that affect the prices OR any comments that suggest one factor affect more than the other.

(d) (i) With the help of example, explain how negative externality in production arises in the conventional energy market. [4]

Explain the private cost in production

Cost of fossil fuels, energy generators and wages to employ labour.

Explaining the negative externality in production in context.

The burning of fossil fuels to provide energy for production of goods and services has created negative externalities in production. It resulted in pollution due to the emission of carbon dioxide which causes health problems & hence medical expenses to third parties such as residents staying near energy generators, which they are not compensated by the producers or consumers.

The existence of negative externalities in production causes divergence between the costs curve, where  $MSC > MPC$ .

- (d) (ii) Comment on how investment in renewable energy market addresses market failure in the conventional energy market. [4]

#### Explain Market Failure

The market equilibrium output,  $Q_e$  determined when  $MPC=MPB$  where producer surplus and consumer surplus are maximised. The socially optimal level of output,  $Q_{se}$  is determined when  $MSC=MSB$  where societal welfare is maximised.

These bring about an overproduction and overconsumption by  $Q_{se}Q_m$ . The total social cost of producing  $Q_{se}Q_m$ ,  $Q_{se}BAQ_e$  outweighs the total social benefit,  $Q_{se}BCQ_e$  resulting to the deadweight loss of ABC. Hence, there is a need to lower the quantity of energy produced through conventional resources

#### Explain how investment can resolve the market failure [1m]

With investment in renewable energy, demand for conventional energy falls since they are they are substitutes as explained in b). The new market equilibrium output will coincide with the socially optimal level of output.

#### Address the direction word 'comment'

#### Comment on impact of the policy.

E.g. The amount of investment (affecting the extent of the fall in demand)

The larger the investment poured into renewable energy in the form of research and development, the larger the increase in supply of energy from renewable, the lower the price of renewable energy. The lower the price in renewable energy, the larger would the fall be in the demand of conventional energy. As supported by Extract 3, some countries have made significant progress in distributing renewable energy, hence the smaller the market failure it results.

Level	Level Marking Scheme	Marks
L2	Candidate demonstrates their ability to analyze and evaluate the effects of investment in renewable energy market on market failure in the conventional energy market in context of case materials.	3-4
L1	Candidates analyze the effects of investment in renewable energy market on market failure in the conventional energy market with the use of economic tools. However, no evaluative comments are demonstrated.	1-2

- (e) Extract 3 indicates that 'U.S. Commerce Department found several Chinese solar-panel companies guilty of dumping and imposed 31 percent tariffs on their products.' [6]

Evaluate the case for the imposition of tariffs by the US government.

Thesis: Case for tariffs

#### Counter Predatory Dumping

Problem due to Predatory Dumping: Structural Unemployment

Dumping is the practice of selling goods in an overseas market below its marginal costs or below the price charged in home country. If China practices predatory dumping and charges price,  $P_1$ , there will be significant fall in production of solar panels by domestic producers in US which enable China to gain monopoly power in US as shown in Figure 4. The US solar panel industry will not be able to sell its product and shut down. This creates structural unemployment as these labour might not have the necessary skills to find a job in other industries.

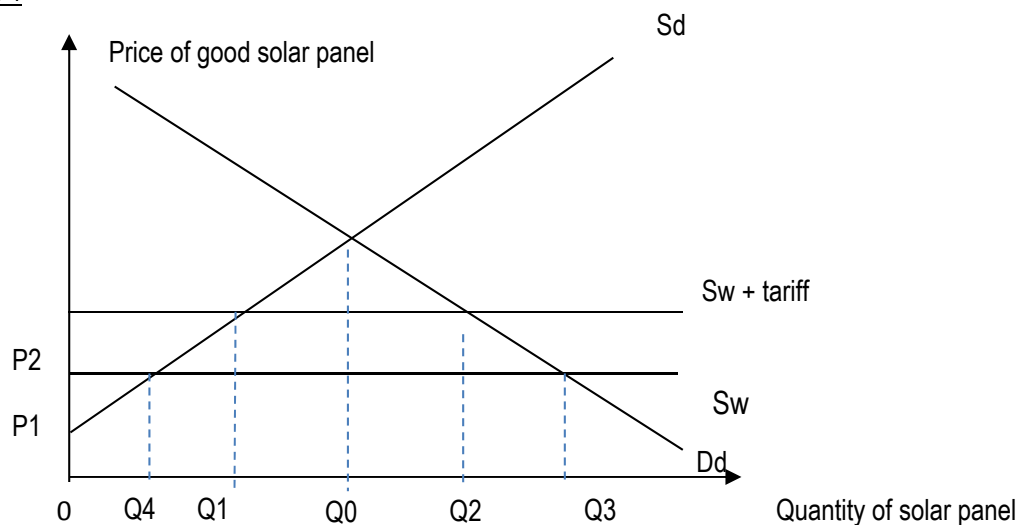
This is supported by Extract 3 where large number of American manufacturers falling victim to price pressures from Chinese rivals.

Moreover, there is a possibility that the Chinese solar panel companies will charge high prices once they established monopoly power, reducing consumer welfare.

#### Explain how tariff works

With tariffs, the unit cost of exporting solar panels increases, this causes a fall in profits of exporters and hence world supply falls from  $SW$  to  $SW + \text{tariff}$ . Quantity of imports falls from  $Q_4Q_3$  to  $Q_1Q_2$ . This cushioned the fall in domestic production from  $Q_0Q_4$  to  $Q_0Q_1$  of solar panels in US, this would mean that the fall in demand of labour in the solar industry would be less, leading to a managed increased in structural unemployment in US and prevent Chinese solar panel companies from charging high prices.

Figure 4



## Anti Thesis: Case against Tariffs [2m]

Invite retaliation:

However, the imposition of tariffs may be 'provoking trade battles' as stated in Extract 3. It will invite retaliation from China which will impose tariffs on US's exports, hence reducing the export revenue of US's export oriented industries and hence reducing actual growth in US.

Dumping is difficult to ascertain:

Moreover, China may not be selling solar panels at below market price. China's factor endowment may allow her to possess comparative advantage in producing solar panels and hence producing solar panels at lower prices. The imposition of tariffs will cause prices of solar panel to be higher which reduces consumer surplus. Local consumers are made to pay higher price to protect the local manufacturers who may in the long run become inefficient and complacent.

## Conclusion

The imposition of tariffs is justified if it is a case of dumping. However, it is difficult to determine firms' cost of production and hence ascertain if firms are dumping. If foreign firms are able to sustain their lower prices for a long period of time, government should not be protecting its industry so that consumers will enjoy higher consumer surplus and it prevents export-oriented firms from suffering from fall in export revenue due to retaliation. However a temporary protectionist measure is still acceptable if the US government is buying time to retrain workers in these industries which lack comparative advantage so that they can cross over to aid in the production of goods and services which US has a comparative advantage in.

Level	Knowledge, Application, Understanding & Analysis	Marks
L3	For an answer that analyses pros & cons of tariff in the context of the US solar panel industry	6-8
L2	For an answer that analyses pros <u>OR</u> cons of tariff in the context of the US solar panel industry <u>OR</u> For an answer that describes pros & cons of tariffs in the context of the US solar panel industry	3-5
L1	For a description of tariff	1-2

(f) Discuss the view that the costs associated with globalisation outweigh the benefits. [8]

Costs that globalisation bring about.

### 1. Environmental Concerns affecting SOL and inefficiency issues

As mentioned in Extract 1, one problem of globalisation is the soaring energy demand, exhaustion in raw materials and its related pollution concerns. The increased trade due to globalisation has enabled the developing countries to grow as they produce not only for themselves but also for the world. Hence, non-renewable resources such as primary fuels are heavily used, causing greater carbon emissions and the contribution towards global warming. This lowers SOL as non-material well-being is compromised due to greater pollution, poorer air quality and deterioration of health and hence lower quality of life.  
EV: In LDCs have the lower production costs as they have little pollution taxes or regulations.

### 2. Structural Unemployment leading to income disparity

Extract 1 'increased competition from and linkages with foreign firms.' causes more structural unemployment.

Explain how globalisation results in refocusing of an economy towards the production of goods which the country has a relative cost advantage leads to both structural unemployment and income disparity.

EV: With more rapid decline of the traditional industries and more rapid expansion of new product industries, the extent of fall in demand for unskilled labour will be greater causing larger structural unemployment as well as income inequality.

Benefits associated with globalisation.

### Economic Growth

From Extract 1, globalisation opens borders to trade and foreign investment causing economic growth which brings about net benefits to individual economies around the world.

Explain the impact on Actual & Potential economic growth

Globalisation → enlarge the markets for the exports of the world economy causing an increase in net export (X-M) → increase in output.

‘globalization brings opportunities and pressures for domestic firms in emerging market economies to innovate and improve their competitive position’.

‘when expertise, knowledge and advanced equipment could be easily acquired across borders in a globalized market.’

The transfer of skills and technology improves the productivity of labour → lower unit COP → increase supply of these goods and services → increase AS → potential growth.

Both actual and potential growth **serve** to increase in real output and hence material well-being of residents increases, improving standard of living.

**EV: AD needs to be high enough for economy to actualise potential growth.**

Conclusion:

Judge if the costs outweigh the benefits.

Level	Knowledge, Application, Understanding & Analysis	Marks
L3	Analysis & evaluation of both cost and benefit arguments of globalisation	6-8
L2	Description of both cost and benefit arguments of globalisation Analysis of either cost OR benefit arguments of globalisation	3-5
L1	Mere identification of some cost and benefits of globalisation	1-2