RVHS 2014 Y6 H2 Prelim 2 Case Study 1
Answers:

(a)	With reference to the data in Table 1,	
	(i)	state how the own price elasticities of energy sources help to determine the nature of the good. [1]
	▪ |PED| < 1, necessity	
	(ii)	explain what determines the effectiveness of an increase in the price of oil in reducing total energy consumption in the UK. [4]
	▪ Effectiveness of an increase in the price of oil in reducing total energy consumption depends on the price elasiticities of demand. Since demand for oil in the UK is price inelastic (|PED|=0.04), an increase in price will cause a less than proportionate fall in quantity demanded. ▪ Effectiveness also depends on the value of cross elasticities of demand (XED) between oil and other sources of energy (e.g. gas, coal). E.g. if value of XED between oil and gas is high, an increase in the price of oil will lead to an increase in the demand for gas by a large extent which may offset the fall in qty demanded of oil to some extent. Hence the effect of an increase in the price of oil on the overall fall in the total consumption of energy in the UK may be small and ineffective.	
(b)	Explain how advances in technologies affect the level of subsidies given to encourage green energy projects. [3]	
	▪ Govt subsidies to producers of green energy projects lower COP, SS curve shift right, price falls and Qty dd increases ▪ Advances in technologies have the same effect on COP which makes production of green energy cheaper. This will further increase SS and shift the SS curve to the right ▪ Hence, with cost savings derived from advances in technologies, the level of government subsidy can be reduced to meet the current renewable energy output targets	
(c)	Explain how investing in renewable sources of energy can help to mitigate the rise in home energy bills. [2]	
	▪ Renewable sources of energy e.g. wind, solar, marine and fossil fuels are factor inputs in the generation of power supply to households ▪ Increase in the number of sources of factor inputs allows for more diversified and less volatile energy supply which can mitigate the rise in home energy bills (assuming demand constant)	
(d)	Using the concept of opportunity cost, explain whether there is justification for consumption subsidies to be high in nations that export a lot of fossil fuels. [2]	
	▪ Opportunity cost refers to the benefits of the next best alternative forgone ▪ In nations that export a lot of fossil fuels, if they choose to provide consumption subsidies on fossil fuel, opportunity cost is still incurred as expenditure in other areas such as education/ health care will be forgone. ▪ Hence concept of opportunity cost cannot be used to justify the high consumption subsidies given in these nations.	
(e)	With reference to the data where appropriate, discuss the view that fossil fuel subsidy to consumers are likely to bring about more costs than benefits. [8]	
	<u>Types of fossil fuel consumption subsidies:</u> ▪ Extract 1: Almost 90% of the fossil fuel subsidy in UK comes from the reduced rate of VAT paid by households. In the UK, VAT on gas and electricity is 5% rather than 20%	

charged on most other goods.

- Extract 3: subsidised low petrol prices to consumers, many countries in Middle East, South East Asia, South America and Africa heavily subsidise petrol.

Intent and objective:

- price cuts were intended to reduce energy and fuel costs for poorer households

Costs	Benefit
① disproportionately benefit the rich ▪ Figure 1: the lowest 20% income group receive disproportionately small amount of the benefits of the fossil fuel subsidies ▪ All households, both rich and poor, benefit from the consumption subsidies by paying lower prices for their energy and petrol uses. If the intent was to help the poorer household, this blanket approach is a blunt tool which will disproportionately benefit those who can afford to pay the market price for energy. ▪ The poorest in developing economies do not own cars or power-guzzling appliances and hence benefit little from cheap petrol and electricity. ② more costly in terms of government funding ▪ Subsidies make energy and petrol prices artificially cheap encourage excessive consumption which leads to unsustainable demand patterns. ▪ Expensive for governments, and therefore taxpayers, to finance and can hinder governments' efforts to reduce budget deficits. Significantly reduce tax revenue and drain govt coffers. Compete with other priority areas in public spending on roads, schools, and healthcare. Others ▪ Accelerates the depletion of natural resources. ▪ Reduce the incentive for investment in other forms of cleaner energy. ▪ The rich pay taxes and fuel consumption subsidies funded via taxation, increase in fossil fuel subsidies can hurt the rich	▪ Help to reduce the cost of basic essentials to lower income families e.g. electricity costs. Stabilise prices in view of rising commodities and energy prices worldwide, reduce the inequity issues to ensure the poor have access to basic necessity ▪

Conclusion:

- Whilst it may be justifiable in the short run, it will be unsustainable in the longer term even for fossil fuel exporting countries as supply of this non-renewable resources dwindle.
- Longer term measures to switch to renewable sources + reduce the demand for fossil (through "right" price signalling)

L3	Developed discussion of the both the costs and benefits of fossil fuel subsidies to consumers with good reference to case data. Comes to a reasoned conclusion on the cost benefit analysis.	7-8
L2	Developed explanation of either the costs or benefits of fossil fuel subsidies to consumers with good reference to case data. But no conclusion reached. Undeveloped explanation of either the costs or benefits of fossil fuel	4-6

	subsidies to consumers.	
L1	Smattering of valid points	1-3

(f) Extract 4 states that 'eliminating subsidies for coal, gas and oil could … provide half of the carbon savings needed to stop dangerous levels of climate change'. Using demand and supply analysis, discuss the policy options available to governments in the fossil fuels and related market to meet their carbon target. [10]

Intro

There is a need for the government to intervene in the market for industrial production due to the existence of negative externalities that cause the market to fail. These negative externalities arise because of the use of fossil fuel in industrial production. As such there is a need for the government to intervene in both the markets for fossil fuel and renewable energy.

How market failure results from industrial production

- MEC > 0 → Divergence btwn MPC & MSC as MSC = MPC + MEC
- Market output is at Qm, socially optimal output is at Qs
- Qm > Qs ➔ overproduction

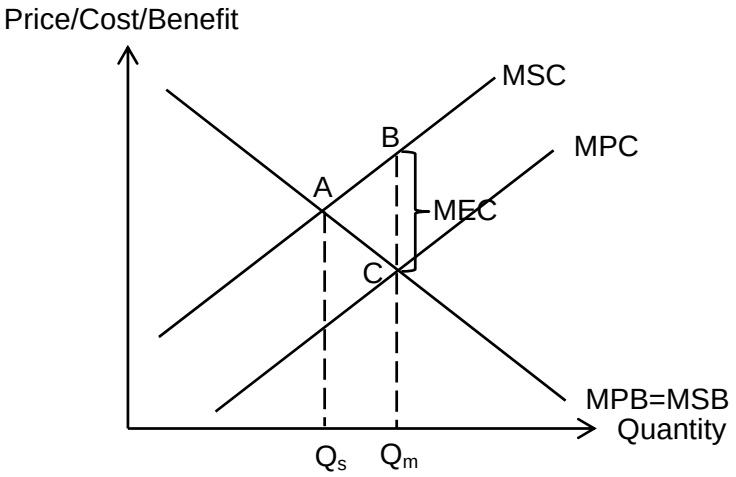

Figure 3: Negative externalities arising from industrial production

The following measures will reduce the divergence between MPC and MSC → industrial production will switch to using more renewable energy

Market for fossil fuel	
• consumers of fossil fuel → firms that use fossil fuel as a factor input in the production of goods and services • producers of fossil fuel → firms that extract fossil fuel	
Decreasing the supply for fossil fuel	**Decreasing the demand for fossil fuel**
(1) Removal of measures that have been propping up the industry (e.g. tax breaks, favourable access to land & infrastructure)	**(3) Carbon tax** ☹: • Not a sustainable solution in the long

☹: o Extract 4: *"nations continue to prop up the oil, gas and coal industries in less obvious ways, such as providing tax breaks or favourable access to land and infrastructure … trying to ensure that changes to their coal-mining industries happen gradually rather than overnight."* → protectionism for fossil fuel industry (declining industry) **(2) Removal of fossil fuel consumption subsidies** • Fossil fuel consumption subsidies are given to consumers → Extract 2: *"Almost 90% of the fossil fuel subsidy in UK comes from the reduced rate of VAT paid by households."* ☹: *Students should not be awarded for this as points are already mentioned in part (e)*	run • some firms may even find it more cost efficient to relocate their manufacturing processes to other countries with lax environmental regulations. **(4) Tradeable permits** ☹: • It is difficult to accurately estimate the number of tradeable permits • It is also difficult to estimate the level of pollution that is optimal for society. • Furthermore, fluctuations in tradeable permit prices may result in firms being reluctant to invest in green energy projects

Market for renewable energy	
Increasing the supply for renewable energy	**Increasing the demand for renewable energy**
(5) More subsidies for the production of renewable energy ☹ Subsidies → Difficult to remove in the long run → should be targeted at domestic green energy firms rather than foreign firms Extract 1 → *"Out of the top 10, only two of the companies are British-owned. The remaining energy companies that make money out of British wind farms and British consumers are based in Germany, Norway, Spain and Italy."* **(6) Government-funded / led R&D into renewable energy technology** ☹ May not be cost effective to invest resources into R&D	Governments shouldn't just focus on increasing the SS of renewable energy, they have to adopt demand-side measures too. **(7) Tax breaks given to factories that use renewable energy** ☹ The effectiveness of such a measure depends on the amount of tax breaks give .

<u>Conclusion</u>

- There's a need to tackle both the fossil fuel and renewable energy market.
- However, measures must also be adopted to encourage the research and

development in the area of renewable energy

	LORMS	
L3	Developed discussion of measures in both the markets for fossil fuel and renewable energy. Full credit will only be awarded for answers that include at least one evaluative comment on the relative effectiveness of the selected policies.	8-10
L2	Developed explanation of measures in either the market for fossil fuel or renewable energy.	4-7
L1	Smattering of valid points	1-3