J2 June Intensive Revision

**CSQ – Lesson 2 – Market Failures Q2**

**Electricity markets in Europe**

**Table 1: Electricity consumption in the UK by sector (in Terawatt-hours)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sector** | **2010** | **2011** | **2012** | **2013** | **2014** |
| Domestic | 118.8 | 111.6 | 114.7 | 113.5 | 108.3 |
| Industry | 104.5 | 102.4 | 98.2 | 96.9 | 92.8 |
| Others | 105.5 | 103.9 | 105.1 | 105.9 | 101.8 |
| Total | 328.8 | 317.8 | 318.0 | 316.2 | 302.9 |

Source: *Digest of UK Energy Statistics (DUKES)*

**Table 2: Average annual household expenditure on electricity (in £)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | **2010** | **2011** | **2012** | **2013** | **2014** |
| Expenditure  | 474 | 502 | 522 | 546 | 549 |

Source: *Department of Energy & Climate Change* *(DECC) UK*

**Extract 1 Britain’s shift to renewable energy**

Britain generated more of its electricity from renewable sources than from burning coal for the first time in the second quarter of 2015, as more wind and solar farms were built.

The Government has encouraged the shift to green energy through subsidies for renewable generation and punitive measures on coal plants as it seeks to meet climate change targets. The drop in coal power also reflected the closure or temporary shutdown of other coal power stations and an increase in the UK’s carbon tax which made coal plants less profitable to run.

A DECC spokesman said: “Government support has driven down the cost of renewable energy significantly and these statistics show that has successfully enabled renewables to compete with other technologies.”

Source: *The Telegraph*, September 2015

**Extract 2 Obstacles to renewable energy use**

It seems to be that Britain’s aged electricity grid is stopping renewable energy projects connecting to the system, threatening the country’s prospects for a low-carbon consumption future. Ashley Seager, a director at solar energy firm Sun4net, said the lack of capacity was exacerbated by prohibitively high connection charges of £40m annual fee it has to pay to be connected to the National Grid especially for businesses wanting to produce their own energy. He said: “For about 80% of those projects, grid connection was too expensive to make them viable.” In another claim, the cost of connecting offshore wind to UK’s grid was estimated at £17bn, leading to a possible black hole in UK’s budget in the near future, given the deficit it already faces and such cost is inevitably going to be added to everyone's electricity bills.

Source: Adapted from *The Telegraph*, March 2014

**Extract 3 Expansion of solar power**

Six years ago, the Intergovernmental Panel on Climate Change identified solar power as the most expensive of all renewable energy technologies, estimating it cost twice as much to generate a unit of electricity from a solar panel as from a wind turbine.

But the cost of solar panels and batteries has plunged by more than half in the last five years. Financial services company UBS says in Germany, Italy and Spain, solar power soon won’t need government subsidies to be economically viable.

One decision had a significant part to play in the drop in solar costs: a few years ago, China’s government opted to subsidise its manufacturing sector to produce cheap solar panels. The aftermath has been mixed for the European solar industry. On one hand, cheap panels made expansion of solar power easier. But the imported panels also undercut Europe’s manufacturing sector. In Germany, for example, this led to companies going out of business and significant job cuts.

Source: *Carbon Brief*, September 2013

**Extract 4 Europe’s tariffs on solar panels**

The European commission is imposing anti-dumping tariffs on Chinese solar panels, in a move that could spark tit-for-tat retaliation from the world's second largest economy. The commission, the EU's executive arm, accused China of undercutting European rivals by selling panels below-cost and threatening 25,000 jobs in the European solar industry. "Our action today is an emergency measure to give life-saving oxygen to a business sector in Europe that is suffering badly from this dumping," said the European commissioner for trade, Karel De Gucht.

Hosuk Lee-Makiyama, the director of the European Centre for International Political Economy, said tit-for-tat tariffs could be imposed on those EU member states known to have supported the anti-dumping duties. "China is likely to retaliate and they know who their friends are," he said.

Source: *The Guardian*, June 2013

**Extract 5 Power generation in the European Union**

The European Commission has released an interim report providing the first full data set on energy costs and subsidies for power generation technologies across the 28 European Union countries.

Examining energy subsidies in 2012, the *Subsidies and Costs of EU Energy* report shows that the EU spent between €120 and €140 billion on power sector support. The largest amount -- €40 billion – went to renewables, reflecting EU efforts to expand the share of renewable energy in its overall energy consumption.

The report also presents estimates on external costs across power generation technologies that are not reflected in market prices, such as costs of environmental and health impacts and the impact of climate change. The external costs of the EU’s energy mix in 2012 are estimated at between €150 and €310 billion.

Source: *PV Magazine*, October 2014

**Questions**

1. Compare the trends in domestic and industrial electricity consumption in
the UK from 2010 to 2014. [2]
2. **(i)** Using Tables 1 and 2, what can you infer about UK households’ price

 elasticity of demand for electricity? [4]

**(ii)** Comment on the likely price elasticity of supply of electricity. [2]

1. Explain **one** supply-side reason that accounts for the rise in the use of renewable energy sources for electricity production in the UK. [3]
2. Extract 4 highlights protectionist measures that the European Commission adopted in the solar panel industry. Comment on the arguments for and against such protectionism. [6]
3. According to Extract 5, power generation creates “external costs that are not reflected in market prices”.
4. Explain how these ‘external costs’ may lead to market failure. [5]

**(ii)** Discuss the relative effectiveness in addressing this market failure problem by using renewable energy subsidies as opposed to taxation. [8]

[Total: 30]