sections, 7.6 to 7.9. Table 7.1 summarises how the economic costs and benefits of a project are measured in the presence of taxes and subsidies using the Harberger approach.

Exercises

1. A state owned electricity corporation is considering establishing a new coal fired electricity generation project. It will increase the domestic supply of electricity by 600 000 megawatt hours per annum (MWh p.a.). Currently, 3 million MWh of electricity are supplied and purchased in the country each year.

    The average sales price of electricity prior to the new project was 10 cents per kilowatt hour (kWh). In order to clear the market after the new project comes on stream, it is calculated that electricity prices will need to fall to 9 cents per kWh. At this lower price, some small oil fired generators will become uneconomic. The electricity generating authority is expected to decommission some of these units, reducing supply by 100 000 MWh per annum.

    Calculate the total economic benefits and benefits per unit of output of the new coal fired electricity generation station. Use a diagram and/or the Harberger equation to assist you in these calculations.

    What is the value of the uncompensated gain in consumer surplus as a result of the decline in electricity prices (that is, the gain in consumer surplus that is not offset by the loss in producer surplus)? Show this diagrammatically and calculate the total $ value.

2. The operation of the coal fired electricity generation station will require 100 skilled technicians, a skill category that is in short supply in the country concerned. There are currently only 700 such technicians employed in the country, at an average wage of $500 per month. The additional demands for this type of technician created by the project are expected to result in their wages rising 10 per cent. At this higher wage, it is calculated, from past experience, that approximately 70 workers with these skills, currently working in other occupations, will be induced to return to this employment. In addition, some employers currently employing such workers will no longer be able to afford to employ them at the higher wage rate. It is expected that the additional 30 workers required will be released from employment by such enterprises.

    Calculate the total economic costs and costs per unit of labour employed of the project's requirements for skilled technicians. Use a diagram and/or the Harberger equation to assist you in these calculations.

3. In the same project as described in exercise 1, calculate the total benefits and benefits per unit of the project if electricity consumers were paying a sales tax of 10 per cent on top of the 10 cents per kWh tariff, and will continue to pay sales tax at this rate on the new lower tariff of 9 cents per kWh, after the project begins production. Use a diagram and/or the Harberger equation to assist you in these calculations.