

IED BACKGROUND PAPER: PRICE ELASTICITY OF DEMAND FOR ELECTRICITY

This paper provides information on the price elasticity of demand for electricity contained in Treasury's Climate Change Mitigation Modelling.

The MMRF economy wide computable general equilibrium (CGE) model of Australia is being used by Treasury to model the economic cost of climate change mitigation. The MMRF model is iteratively linked with bottom-up electricity generation sector modelling provided by SKM – MMA and ROAM Consulting to ensure a consistent set of projections.

The MMRF model allows for substitution between production and consumption inputs at the firm and household levels. The aggregate response of electricity demand to carbon prices will depend on the assumed constant partial elasticities and the induced changes in the industrial and consumption structure of the economy.

Section 22

- The firm's constant partial price elasticity of demand for intermediate input use of electricity is assumed to be -0.25.
 - : If the retail electricity price rises by 10 per cent relative to other inputs used in a firm's production, *all else unchanged*, the firm will use 2.5 per cent less electricity and supplement this with more capital, labour or other intermediate goods.
- In MMRF, three household consumption industries account for household consumption of energy sources and the underlying capital equipment for each service: private transport services; private heating services; and private electricity services.

Table 1: Model assumptions of own price elasticity of demand and expenditure elasticity for each household consumption sector.

Sector	Expenditure elasticity	Implied own price elasticity
Private Transport Services	0.4	-0.2
Private Electricity Services	1.0	-0.5
Private Heating Services	0.5	-0.3

Note: The constant own price and expenditure elasticities are based on the initial MMRF database for 2005-06.

Source: MMRF

- The constant partial equilibrium expenditure and implied own price elasticity, taking private electricity services as an example, are interpreted as follows:
 - : A 10 per cent increase in the price of private electricity services faced by households, *all else unchanged*, decreases the demand of private electrical services by 5 per cent.
 - : A 10 per cent increase in total household expenditure, *all else unchanged*, increases private electrical services expenditure by 10 per cent.