

DSM Programmes: Cost-benefit analysis for illustration purpose

	Participant	Non-Participant
Potential Benefits under the 3 year programme		
Rebate * (note I.A)	Max. \$740	-
Estimated annual savings in electricity charges* (note I.B)	2 CFL : around \$160/year 1 Refrigerator : around \$240/year 2 Room-Coolers : around \$300/year	-
Costs under the 3 year programme		
Estimated average annual DSM charge for a typical household mention in Note I.B* (note II.A & II.B)	around \$35 to around \$80	
Estimated participant cost/(savings) per measure* (note II.C)	CFL :\$6 to \$25 Refrigerator (\$120) to \$300 Room-Coolers \$0 to (\$50)	-
Long Term Benefits		
Estimated notional savings in capital investment (note I.C)	around \$360M	
Estimated notional savings in operating costs (note I.D)	around \$240M	
Estimated environmental benefits (note I.E)	Around 4% reduction in emissions of CO ₂ , SO ₂ , Nox & particulates	

* The benefits and costs relate only to residential programmes.

Explanatory Notes

I. Benefits

A. Rebate (on energy efficient appliances and equipment)

- (i) Maximum amount of rebates to a residential consumer is \$740 over the first 3-year DSM Programmes Period.
- (ii) The amount of rebates to the non-residential consumers will depend on the agreed project.

B. Savings in electricity charges

Indicative reductions in electricity charges achievable by using energy efficient appliances for a typical domestic household with average monthly energy consumption of 301-700 kWh and tariff charge of \$250-\$630 is as follows:-

		2 CFL (11 Watt)	1 Refrigerator (220 litres, Grade 1)	2 Room Cooler (0.75 hp, Grade 1)
1	Average demand saving (Watt)	49× 2 =98	30	140× 2=280
2	Operating hours	5/day	24/day	1200/year
3	Annual energy saving per measure (kWh/year)	89× 2	263	167× 2 =344
4	Annual saving in electricity bill per measure (\$/year)	160	236	300
5	Monthly saving in electricity bill per measure (\$/month)	13	20	60 (during the 5 summer months)

(Note: All figures in the table are estimation only.)

C. Savings in capital investment

Energy and capacity savings from the DSM programmes can avoid capital investment in new generating plant and transmission and distribution facilities in the long term, and thereby the permitted return thereon that can be earned by the power companies under the Scheme of Control Agreements. The estimated total nominal value capital investment to be avoided by the implementation of the power companies' current DSM Resource Plans is around \$360M.

D. Savings in operating costs

Implementation of DSM programmes also saves the operating costs (i.e. fuel cost and operation and maintenance cost) associated with the avoided generating plant and transmission and distribution facilities. The estimated total nominal value of operating cost to be avoided by the implementation of the power companies' current DSM Resource Plans is around 240M.

E. Environmental benefits

The savings in electricity will reduce the amount of fuel used for power generation, thereby reducing gaseous and particulate emissions from local power stations. This will contribute to efforts to limit production of greenhouse gases and improve air quality. Over the 3-year DSM period, it is estimated by the Environmental Protection Department that there would be a total reduction of about 4% in emissions as follows:

Reduction in emissions (tonnes)

	<u>Total</u>
CO ₂	813,000
SO ₂	2,300
Nox	2,410
Particulates	194

II. Costs to Consumers

A. DSM programme costs

The programme costs for implementing the power companies' DSM programmes include rebate, advertising cost, administrative cost, measurement and verification (M&V) costs and other expenses. The total estimated programme costs of the two power companies are summarized as follows:

Rebate (\$M)	Admin. and Advert. (\$M)	M&V and Others (\$M)	<u>Total Programme Costs</u>
			Nominal value (\$M)
158	123	20	301

B. DSM incentive earnings

The estimated DSM incentive earnings, inclusive of tax, based on the avoided capital investment arising from all installed energy efficient lighting and appliances over their lifetime is \$76M.

C. Participant Cost

Participants in the DSM programmes would need to bear the difference in cost between the purchase price of the energy efficient and the non-energy efficient lighting or appliance concerned and the relevant rebate. This difference is referred to as participant cost. It may be a saving or a cost to the residential participants depending on the measure concerned. The total nominal participation costs estimated by the power companies' DSM Resource Plans are around \$54M.