Appendix

TABLE I

THE PRICE ELASTICITY MATRIX OF LCDR FOR ELECTRIC POWER SUBSYSTEM

Parameter		Value
Installed capacity	CHP(kW)	300
	GT(kW)	400
	GB(kW)	400
	P2G(kW)	100
	WT(kW)	500
	PV(kW)	400
	EES(kW·h)	200
	GST(m^3)	500
	Heat-Electricity ratio of CHP	0.9
	Carbon emission coefficient of gas-fired units	a=1,b=0.04,c=0.001
	Calorific value of natural gas (MJ/kg)	36
	Power curtailment price of PV and WT (￥/kWh)	0.2
	Basic price of carbon trading (￥/kg)	0.3
	Carbon trading price growth rate	0.5
	Ladder-type carbon trading step size (kg)	1500
	Initial carbon credits (kg)	20000
	Electricity-to-gas ratio of P2G	0.5
	Carbon absorption coefficient of P2G (kg/kWh)	0.35
	The operational cost (without fuel cost) of CHP (￥/kW)	0.08
	The operational cost (without fuel cost) of GT (￥/kW)	0.05
	The operational cost (without fuel cost) of GB (￥/kW)	0.05
	The operational cost of EES (￥/kW)	0.2
	The operational cost of EES (￥/ m^3)	0.05

TABLE II

THE PRICE ELASTICITY MATRIX OF LCDR FOR ELECTRIC POWER SUBSYSTEM

Electricity price period	Peak	Flat	Valley	Price (￥/ KW·h)
Peak	-0.15	0.04	0.08	0.92
Flat	0.04	-0.15	0.1	0.65
Valley	0.08	0.1	-0.15	0.35

TABLE III

THE PRICE ELASTICITY MATRIX OF LCDR FOR NATURAL GAS SUBSYSTEM

Gas price period	Peak	Flat	Valley	Price (￥/m³)
Peak	-0.25	0.08	0.1	3.05
Flat	0.08	-0.25	0.2	2.42
Valley	0.1	0.2	-0.25	2.04

TABLE IV

THE PRICE-BASED DEMAND RESPONSE PERIOD

	Electric power subsystem	Natural gas subsystem
Valley	23:00-07:00	23:00-24:00
Flat	11:00-19:00	05:00-11:00
Peak	07:00-11:00	12:00-19:00

TABLE V

THE PROPORTION OF EACH UNIT IN ELECTRIC POWER SUBSYSTEM

	Thermal power units	Renewable energy generation
Low carbon emission periods	0.3	0.7
Medium carbon emission periods	0.5	0.5
High carbon emission periods	0.8	0.2

TABLE VI

THE PROPORTION OF EACH GAS LOAD IN NATURAL GAS SUBSYSTEM

	Industrial gas	Residential gas
Low carbon emission periods	0.6	0.4
High carbon emission periods	0.7	0.3