Updated Market Simulation Model Elasticities,
Updated September 2021

The Market Simulation Model (MarketSim) uses detailed elasticities in calculating both the consumer surplus and energy market production and consumption changes resulting from an OCS supply shock. Some of those elasticities have been updated since MarketSim's documentation (Industrial Economics, Inc. 2017) was published. Tables 1, 2, and 3 show the updated elasticities currently used in MarketSim.

Tables 1 and 2 below show the demand elasticities that are provided in Table 4 in Section 11.2.1 of the 2017 MarketSim documentation. None of the demand elasticities have been updated. Table 3 below provides updates to the supply elasticities of Table 5 in Section 11.2.2 the 2017 MarketSim documentation. Several of the supply elasticities were updated based on the 2020 Annual Energy Outlook (AEO) data available from the EIA. Three price cases (low, reference, and high) were used to derive the supply elasticities. The updated elasticity values are highlighted in green in Table 3.

BOEM continues to review available data and includes the best available elasticities when MarketSim is used in Bureau analyses. Additional updates will be available on BOEM's website.

Table 1:MarketSim Own-Price Demand Elasticities

DEFAULT OWN PRICE DEMAND ELASTICITIES			
Fuel	**Sector**	**Value**	**Source**
Oil	Residential	-1.002	Serletis et al 2010
Oil	Commercial	-0.939	Serletis et al 2010
Oil	Industrial	-0.264	Jones (2014)
Oil	Transportation	-0.3	Dahl (2012)
Oil	Rest of World (U.S. Crude Oil)	-0.45	Dahl (2010)
Oil	Rest of World (U.S. Refined Products)	-0.45	Dahl (2010)
Oil	Rest of World (non-U.S. Oil)	-0.45	Dahl (2010)
Gas	Residential	-0.313	Serletis et al 2010
Gas	Commercial	-0.296	Serletis et al 2010
Gas	Industrial	-0.468	Jones (2014)
Gas	Transportation	-1	Assumed value
Gas	Exports	-0.89	Dahl (2010)
Electricity	Residential	-0.287	Serletis et al 2010
Electricity	Commercial	-0.134	Serletis et al 2010
Electricity	Industrial	-0.125	Jones (2014)
Electricity	Transportation	-1	Assumed value
Electricity	Other	-0.18	Average of res., com., and ind.
Coal	Exports	-1	Assumed value
Coal	Other	-1.468	Jones (2014)
Coal	Industrial	-1.468	Jones (2014)

Table 2: MarketSim Cross-Price Demand Elasticities

DEFAULT CROSS PRICE DEMAND ELASTICITIES				
Elasticity of:	**With respect to:**	**Sector**	**Value**	**Source**
Oil	Gas	Residential	0.2	Newell and Pizer (2008)
Oil	Gas	Commercial	0.2	Newell and Pizer (2008)
Oil	Gas	Industrial	0.249	Jones (2014)
Oil	Gas	Transportation	-	
Oil	Electricity	Residential	1.151	Serletis et al. (2010)
Oil	Electricity	Commercial	1.08	Serletis et al. (2010)
Oil	Electricity	Industrial	0.01	Serletis et al. (2010)
Oil	Electricity	Transportation	-	
Oil	Coal	Industrial	0.09	Jones (2014)
Gas	Oil	Residential	0.07	Newell and Pizer (2008)
Gas	Oil	Commercial	0.07	Newell and Pizer (2008)
Gas	Oil	Industrial	0.172	Jones (2014)
Gas	Oil	Transportation	-	
Gas	Electricity	Residential	0.507	Serletis et al. (2010)
Gas	Electricity	Commercial	0.419	Serletis et al. (2010)
Gas	Electricity	Industrial	0.178	Jones (2014)
Gas	Electricity	Transportation	-	
Gas	Coal	Industrial	0.05	Jones (2014)
Electricity	Oil	Residential	0.214	Serletis et al. (2010)
Electricity	Oil	Commercial	0.092	Serletis et al. (2010)
Electricity	Oil	Industrial	0.009	Serletis et al. (2010)
Electricity	Oil	Transportation	-	
Electricity	Gas	Residential	0.072	Serletis et al. (2010)
Electricity	Gas	Commercial	0.041	Serletis et al. (2010)
Electricity	Gas	Industrial	0.118	Jones (2014)
Electricity	Gas	Transportation	-	
Electricity	Coal	Industrial	0.061	Jones (2014)
Electricity	Coal	Other	-	
Electricity	Oil	Other	-	
Electricity	Gas	Other	-	
Coal	Oil	Other	-	
Coal	Gas	Other	-	
Coal	Oil	Industrial	0.44	Jones (2014)
Coal	Gas	Industrial	0.351	Jones (2014)
Coal	Electricity	Industrial	0.652	Jones (2014)
Coal	Electricity	Other	-	

Table 3: MarketSim Own-Price Supply Elasticities

DEFAULT OWN PRICE SUPPLY ELASTICITIES			
Fuel	**Supply**	**Value**	**Source**
Oil	Imports from Canada	1.00	Assumed Value
Oil	Rest of World	0.40	Brown, Mason, Krupnick, and Mares (2014)
Oil	Biofuel	0.24	Luchansky and Monks (2009)
Oil	Alaska Onshore	0.42	Derived from AEO 2020
Oil	Alaska Offshore	0.58	Derived from AEO 2020
Oil	Lower 48 Onshore	0.51	Brown 1998
Oil	Lower 48 Offshore	0.51	Brown 1998
Oil	Other	0.51	Brown 1998
Gas	Imports pipeline	0.52	Derived from AEO 2015
Gas	Imports LNG	1.00	Assumed value
Gas	Alaska Onshore	1.29	Derived from AEO 2020
Gas	Alaska Offshore	1.29	Derived from AEO 2020
Gas	Lower 48 Conventional	0.29	Medlock (2012)
Gas	Lower 48 Offshore	0.29	Medlock (2012)
Gas	Other	0.51	Brown 1998
Gas	Lower 48 Unconventional	1.60	Medlock (2012) and EMF (2013)
Electricity	Coal	0.27	Derived from AEO 2018
Electricity	Gas	1.50	Derived from AEO 2020
Electricity	Hydro	0.05	Derived from AEO 2020
Electricity	Imports	0.36	Derived from AEO 2020
Electricity	Nuclear	0.53	Derived from AEO 2020
Electricity	Oil	0.22	Derived from AEO 2018
Electricity	Renewables non-hydro	0.68	Derived from AEO 2020
Electricity	Solar	2.03	Derived from AEO 2020
Electricity	Wind offshore	0.01	Derived from AEO 2020
Electricity	Wind onshore	0.65	Derived from AEO 2020
Coal	Domestic	1.86	Brown 1998
Coal	Imports	0.16	Derived from AEO 2020

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