

Capital and operating cost assumptions

Table 20: Capital and operating cost assumptions for all technologies

Gas - CCGT					OCGT				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development	High	20	20	20	Pre-development	High	30	30	30
£/kW	Medium	10	10	10	£/kW	Medium	20	20	20
	Low	5	5	5		Low	20	20	20
Construction costs	High	700	700	700	Construction costs	High	300	300	300
£/kW	Medium	600	600	600	£/kW	Medium	300	300	300
	Low	500	500	500		Low	200	200	200
Fixed O+M					Fixed O+M				
£/MW/yr	Medium	22000	22000	22000	£/MW/yr	Medium	9900	9900	9900
Variable O+M					Variable O+M				
£/MWh	Medium	0.1	0.1	0.1	£/MWh	Medium	0.1	0.1	0.1
Insurance					Insurance				
£/MW/yr	Medium	1990	1990	1990	£/MW/yr	Medium	960	960	960
Connection and Use of System charges					Connection and Use of System charges				
£/MW/yr	Medium	6840	6840	6840	£/MW/yr	Medium	3440	3440	3440
Gas - CCGT with post combustion CCS (FOAK)					Coal - IGCC with CCS (FOAK)				
		Commissioning					Commissioning		
		2025					2025		
Pre-development	High	45			Pre-development	High	60		
£/kW	Medium	30			£/kW	Medium	50		
	Low	25				Low	45		
Construction costs	High	1500			Construction costs	High	3800		
£/kW	Medium	1300			£/kW	Medium	3300		
	Low	1100				Low	2700		
Fixed O+M					Fixed O+M				
£/MW/yr	Medium	25000			£/MW/yr	Medium	134800		
Variable O+M					Variable O+M				
£/MWh	Medium	2			£/MWh	Medium	2		
Insurance					Insurance				
£/MW/yr	Medium	4600			£/MW/yr	Medium	5100		
Connection and Use of System charges					Connection and Use of System charges				
£/MW/yr	Medium	6800			£/MW/yr	Medium	8800		

Coal - ASC with oxy combustion CCS - FOAK					Nuclear - FOAK				
Commissioning 2025					Commissioning 2020				
Pre-development £/kW	High	45			Pre-development £/kW	High	470		
	Medium	25				Medium	210		
	Low	20				Low	110		
Construction costs £/kW	High	2500			Construction costs £/kW	High	4600		
	Medium	2200				Medium	4100		
	Low	2000				Low	3700		
Fixed O+M £/MW/yr	Medium	56900			Fixed O+M £/MW/yr	Medium	72000		
Variable O+M £/MWh	Medium	2			Variable O+M £/MWh	Medium	3		
Insurance £/MW/yr	Medium	3400			Insurance £/MW/yr	Medium	10000		
Connection and Use of System charges £/MW/yr	Medium	8800			Connection and Use of System charges £/MW/yr	Medium	7400		
CCGT CHP					Co-firing Standard CHP				
Commissioning 2016 2017 2020					Commissioning 2016 2017 2020				
Pre-development £/kW	High	75	75	75	Pre-development £/kW	High			
	Medium	50	50	50		Medium	<i>Included in Construction costs</i>		
	Low	30	30	30		Low			
Construction costs £/kW	High	700	700	700	Construction costs £/kW	High			
	Medium	600	600	600		Medium	4300	4300	4300
	Low	500	500	500		Low			
Fixed O+M £/MW/yr	Medium	46300	46300	46300	Fixed O+M £/MW/yr	Medium	260000	260000	260000
Variable O+M £/MWh	Medium	0.1	0.1	0.1	Variable O+M £/MWh	Medium	2	2	2
Insurance £/MW/yr	Medium	2000	2000	2000	Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>		
Connection and Use of System charges £/MW/yr	Medium	6700	6700	6700	Connection and Use of System charges £/MW/yr	Medium	<i>Included in fixed O+M</i>		

ACT Advanced					ACT standard				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development £/kW	High	1000	1000	1000	Pre-development £/kW	High	1005	1005	1005
	Medium	410	410	410		Medium	360	360	360
	Low	170	170	170		Low	165	165	165
Construction costs £/kW	High	6900	6800	6600	Construction costs £/kW	High	10100	10000	9800
	Medium	6800	6700	6500		Medium	5600	5500	5400
	Low	5100	5000	4900		Low	900	900	900
Fixed O+M £/MW/yr	Medium	414800	410900	399500	Fixed O+M £/MW/yr	Medium	426000	422000	410000
Variable O+M £/MWh	Medium	13	13	13	Variable O+M £/MWh	Medium	25	25	25
Insurance £/MW/yr	Medium	21900	21700	21050	Insurance £/MW/yr	Medium	21890	21680	21070
Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M			Connection and Use of System charges £/MW/yr	Medium	5570	5520	5360
Dedicated biomass >50MW					Dedicated biomass 5-50MW				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development £/kW	High	40	40	40	Pre-development £/kW	High	110	110	110
	Medium	30	30	30		Medium	95	95	95
	Low	15	15	15		Low	40	40	40
Construction costs £/kW	High	4600	4600	4500	Construction costs £/kW	High	5100	5000	4900
	Medium	2500	2500	2400		Medium	3600	3500	3500
	Low	2000	2100	2000		Low	2500	2500	2500
Fixed O+M £/MW/yr	Medium	96500	95900	94400	Fixed O+M £/MW/yr	Medium	112000	111000	109000
Variable O+M £/MWh	Medium	5	5	5	Variable O+M £/MWh	Medium	5	5	5
Insurance £/MW/yr	Medium	14320	14240	14020	Insurance £/MW/yr	Medium	16600	16500	16200
Connection and Use of System charges £/MW/yr	Medium	1380	1370	1350	Connection and Use of System charges £/MW/yr	Medium	1600	1600	1600

Onshore >5 MW					Offshore Round 2				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development £/kW	High	240	240	240	Pre-development £/kW	High	120	120	120
	Medium	100	100	100		Medium	70	70	70
	Low	30	30	30		Low	50	50	50
Construction costs £/kW	High	1800	1800	1700	Construction costs £/kW	High	2900	2700	2400
	Medium	1500	1500	1400		Medium	2500	2300	2000
	Low	1100	1100	1100		Low	2100	2000	1700
Fixed O+M £/MW/yr	Medium	37100	37100	37200	Fixed O+M £/MW/yr	Medium	62900	60500	54600
Variable O+M £/MWh	Medium	5	5	5	Variable O+M £/MWh	Medium	2	2	2
Insurance £/MW/yr	Medium	3000	3010	3010	Insurance £/MW/yr	Medium	11600	11100	10000
Connection and Use of System charges £/MW/yr	Medium	4510	4510	4510	Connection and Use of System charges £/MW/yr	Medium	45900	44200	39900
Offshore Round 3					Bioliquids				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development £/kW	High	150	150	150	Pre-development £/kW	High	1040	1040	1040
	Medium	105	105	105		Medium	180	180	180
	Low	50	50	50		Low	30	30	30
Construction costs £/kW	High	3100	3000	2600	Construction costs £/kW	High	1900	1900	1900
	Medium	2600	2400	2100		Medium	800	800	800
	Low	2200	2100	1800		Low	500	500	500
Fixed O+M £/MW/yr	Medium	70900	67000	57800	Fixed O+M £/MW/yr	Medium	121000	120700	120200
Variable O+M £/MWh	Medium	Included in fixed O+M			Variable O+M £/MWh	Medium	6	7	8
Insurance £/MW/yr	Medium	32800	31000	26700	Insurance £/MW/yr	Medium	4900	4900	4800
Connection and Use of System charges £/MW/yr	Medium	60600	57200	49400	Connection and Use of System charges £/MW/yr	Medium	12000	12000	11900

Bioliqids CHP					Cofiring Conventional				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development	High	1000	1000	1000	Pre-development	High	7	7	7
£/kW	Medium	180	180	180	£/kW	Medium	5	5	5
	Low	30	30	30		Low	2	2	2
Construction costs	High	2000	2000	2000	Construction costs	High	170	170	160
£/kW	Medium	800	800	800	£/kW	Medium	120	120	120
	Low	500	500	500		Low	40	40	40
Fixed O+M					Fixed O+M				
£/MW/yr	Medium	121000	120700	120200	£/MW/yr	Medium	10100	10100	10200
Variable O+M					Variable O+M				
£/MWh	Medium	6	7	8	£/MWh	Medium	1	2	3
Insurance					Insurance				
£/MW/yr	Medium	4900	4900	4800	£/MW/yr	Medium	900	900	900
Connection and Use of System charges					Connection and Use of System charges				
£/MW/yr	Medium	12000	12000	11900	£/MW/yr	Medium	9200	9200	9200
Cofiring Enhanced					Biomass conversion				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development	High	60	60	60	Pre-development	High	60	60	60
£/kW	Medium	60	60	60	£/kW	Medium	60	60	60
	Low	60	60	60		Low	60	60	60
Construction costs	High	700	700	700	Construction costs	High	700	700	700
£/kW	Medium	400	400	400	£/kW	Medium	400	400	400
	Low	300	300	300		Low	300	300	300
Fixed O+M					Fixed O+M				
£/MW/yr	Medium	40900	41000	41000	£/MW/yr	Medium	40900	41000	41000
Variable O+M					Variable O+M				
£/MWh	Medium	1	2	3	£/MWh	Medium	1	2	3
Insurance					Insurance				
£/MW/yr	Medium	1300	1300	1300	£/MW/yr	Medium	1300	1300	1300
Connection and Use of System charges					Connection and Use of System charges				
£/MW/yr	Medium	17500	17500	17500	£/MW/yr	Medium	17500	17500	17500

Wave			Tidal stream shallow		
Commissioning 2025			Commissioning 2025		
Pre-development £/kW	High	130	Pre-development £/kW	High	
	Medium	110		Medium	<i>Included in construction costs</i>
	Low	100		Low	
Construction costs £/kW	High	4700	Construction costs £/kW	High	3100
	Medium	4500		Medium	2700
	Low	3800		Low	2000
Fixed O+M £/MW/yr	Medium	97800	Fixed O+M £/MW/yr	Medium	143300
Variable O+M £/MWh	Medium	<i>Included in fixed O+M</i>	Variable O+M £/MWh	Medium	1
Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>	Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>
Connection and Use of System charges £/MW/yr	Medium	<i>Included in fixed O+M</i>	Connection and Use of System charges £/MW/yr	Medium	<i>Included in fixed O+M</i>
Tidal stream deep			Tidal range		
Commissioning 2025			Commissioning 2025		
Pre-development £/kW	High		Pre-development £/kW	High	
	Medium	<i>Included in construction costs</i>		Medium	<i>Included in construction costs</i>
	Low			Low	
Construction costs £/kW	High	3600	Construction costs £/kW	High	3800
	Medium	3200		Medium	3000
	Low	2700		Low	2200
Fixed O+M £/MW/yr	Medium	114000	Fixed O+M £/MW/yr	Medium	38000
Variable O+M £/MWh	Medium	1	Variable O+M £/MWh	Medium	<i>Included in fixed O+M</i>
Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>	Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>
Connection and Use of System charges £/MW/yr	Medium	<i>Included in fixed O+M</i>	Connection and Use of System charges £/MW/yr	Medium	<i>Included in fixed O+M</i>

Hydropower 5-16MW					Hydro Large Storage				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development £/kW	High				Pre-development £/kW	High			
	Medium	50	50	50		Medium	55	55	55
	Low					Low			
Construction costs £/kW	High				Construction costs £/kW	High			
	Medium	3100	3100	3300		Medium	3400	3400	3600
	Low					Low			
Fixed O+M £/MW/yr	Medium	43500	43600	43700	Fixed O+M £/MW/yr	Medium	24800	24800	24900
Variable O+M £/MWh	Medium	10	11	12	Variable O+M £/MWh	Medium	6	7	8
Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>			Insurance £/MW/yr	Medium	900	900	900
Connection and Use of System charges £/MW/yr	Medium	<i>Included in fixed O+M</i>			Connection and Use of System charges £/MW/yr	Medium	7300	7300	7400
Sewage Gas					Landfill				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development £/kW	High				Pre-development £/kW	High	210	210	210
	Medium	<i>Included in construction costs</i>				Medium	130	130	130
	Low					Low	30	30	30
Construction costs £/kW	High	5900	5900	5800	Construction costs £/kW	High	3400	3400	3300
	Medium	3600	3600	3500		Medium	2000	2000	2000
	Low	2300	2300	2200		Low	1000	1000	1000
Fixed O+M £/MW/yr	Medium	101000	101000	101000	Fixed O+M £/MW/yr	Medium	59600	59600	59700
Variable O+M £/MWh	Medium	<i>Included in fixed O+M</i>			Variable O+M £/MWh	Medium	10	11	12
Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>			Insurance £/MW/yr	Medium	1300	1300	1300
Connection and Use of System charges £/MW/yr	Medium	8700	8700	8700	Connection and Use of System charges £/MW/yr	Medium	5100	5100	5100

Energy from Waste					Energy from Waste CHP				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development £/kW	High Medium Low	<i>Included in construction costs</i>			Pre-development £/kW	High Medium Low	<i>Included in construction costs</i>		
Construction costs £/kW	High Medium Low	5200 4900 4500	5200 4900 4500	5100 4800 4500	Construction costs £/kW	High Medium Low	6900 6200 5500	6900 6200 5500	6800 6100 5400
Fixed O+M £/MW/yr	Medium	222000	222000	222000	Fixed O+M £/MW/yr	Medium	269000	269200	269600
Variable O+M £/MWh	Medium	25	25	25	Variable O+M £/MWh	Medium	30	30	30
Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>			Insurance £/MW/yr	Medium	<i>Included in fixed O+M</i>		
Connection and Use of System charges £/MW/yr	Medium	<i>Included in fixed O+M</i>			Connection and Use of System charges £/MW/yr	Medium	<i>Included in fixed O+M</i>		
Geothermal					Geothermal CHP				
		Commissioning					Commissioning		
		2016	2017	2020			2016	2017	2020
Pre-development £/kW	High Medium Low	300 140 50	300 140 50	300 140 50	Pre-development £/kW	High Medium Low	240 140 50	240 140 50	240 140 50
Construction costs £/kW	High Medium Low	6700 4600 2300	6300 4400 2200	5900 4100 2000	Construction costs £/kW	High Medium Low	7300 5100 2600	6800 4800 2500	6400 4500 2300
Fixed O+M £/MW/yr	Medium	35800	35800	35800	Fixed O+M £/MW/yr	Medium	34200	34200	34200
Variable O+M £/MWh	Medium	10	10	10	Variable O+M £/MWh	Medium	10	11	12
Insurance £/MW/yr	Medium	71500	71500	71700	Insurance £/MW/yr	Medium	77100	77100	77200
Connection and Use of System charges £/MW/yr	Medium	2000	2000	2000	Connection and Use of System charges £/MW/yr	Medium	1900	1900	1900

Biomass CHP					AD					
		Commissioning					Commissioning			
		2016	2017	2020			2016	2017	2020	
Pre-development £/kW	High				Pre-development £/kW	High	580	580	580	
	Medium	Included in construction costs				Medium	180	180	180	
	Low					Low	50	50	50	
Construction costs £/kW	High	5000	5000	4900	Construction costs £/kW	High	7200	7200	7000	
	Medium	3900	3800	3800		Medium	4000	3900	3900	
	Low	2700	2700	2700		Low	1700	1700	1700	
Fixed O+M £/MW/yr	Medium	149900	149100	146700	Fixed O+M £/MW/yr	Medium	301000	301000	301000	
Variable O+M £/MWh	Medium	10	11	12	Variable O+M £/MWh	Medium	30	30	30	
Insurance £/MW/yr	Medium	25400	25300	24900	Insurance £/MW/yr	Medium	58000	58100	58200	
Connection and Use of System charges £/MW/yr	Medium	1400	1400	1400	Connection and Use of System charges £/MW/yr	Medium	8700	8700	8700	
AD CHP					ACT CHP					
		Commissioning					Commissioning			
		2016	2017	2020			2016	2017	2020	
Pre-development £/kW	High				Pre-development £/kW	High	90	90	90	
	Medium	Included in construction costs				Medium	90	90	90	
	Low					Low	90	90	90	
Construction costs £/kW	High	7200	7200	7000	Construction costs £/kW	High	10600	10500	10300	
	Medium	4200	4200	4100		Medium	5900	5800	5700	
	Low	1800	1800	1800		Low	1000	1000	900	
Fixed O+M £/MW/yr	Medium	364000	364000	365000	Fixed O+M £/MW/yr	Medium	425800	421800	410000	
Variable O+M £/MWh	Medium	20	20	20	Variable O+M £/MWh	Medium	10	11	12	
Insurance £/MW/yr	Medium	58000	58100	58200	Insurance £/MW/yr	Medium	21900	21700	21100	
Connection and Use of System charges £/MW/yr	Medium	8700	8700	8700	Connection and Use of System charges £/MW/yr	Medium	5600	5500	5400	

Large scale solar PV					Solar <4kW				
<div>Commissioning</div> <div>201620172020</div>					<div>Commissioning</div> <div>201620172020</div>				
Pre-development £/kW	High				Pre-development £/kW	High			
	Medium	Included in construction costs				Medium	Included in construction costs		
	Low					Low			
Construction costs £/kW	High	1100	1100	900	Construction costs £/kW	High	2500	2400	2100
	Medium	1000	1000	900		Medium	1900	1800	1600
	Low	900	900	800		Low	1500	1400	1300
Fixed O+M £/MW/yr	Medium	22600	22400	21900	Fixed O+M £/MW/yr	Medium	23700	23600	23500
Variable O+M £/MWh	Medium	Included in fixed O+M			Variable O+M £/MWh	Medium	Included in fixed O+M		
Insurance £/MW/yr	Medium	Included in fixed O+M			Insurance £/MW/yr	Medium	Included in fixed O+M		
Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M			Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M		
Onshore 1MW<5MW					Onshore <15kW				
<div>Commissioning</div> <div>201620172020</div>					<div>Commissioning</div> <div>201620172020</div>				
Pre-development £/kW	High				Pre-development £/kW	High			
	Medium	Included in construction costs				Medium	Included in construction costs		
	Low					Low			
Construction costs £/kW	High	2300	2300	2300	Construction costs £/kW	High	6100	6100	6100
	Medium	2000	2000	2000		Medium	5500	5500	5500
	Low	1600	1600	1600		Low	5000	5000	5000
Fixed O+M £/MW/yr	Medium	29600	29400	29000	Fixed O+M £/MW/yr	Medium	73000	73000	73000
Variable O+M £/MWh	Medium	Included in fixed O+M			Variable O+M £/MWh	Medium	Included in fixed O+M		
Insurance £/MW/yr	Medium	Included in fixed O+M			Insurance £/MW/yr	Medium	Included in fixed O+M		
Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M			Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M		

AD < 250kW					AD > 500kW				
Pre-development £/kW	Commissioning				Pre-development £/kW	Commissioning			
		2016	2017	2020			2016	2017	2020
	High					High			
	Medium	Included in construction costs				Medium	Included in construction costs		
	Low					Low			
Construction costs £/kW	High	8000	8000	8000	Construction costs £/kW	High	6000	6000	6000
	Medium	6000	6000	6000		Medium	4500	4500	4500
	Low	4000	4000	4000		Low	3000	3000	3000
Fixed O+M £/MW/yr	Medium	924000	924000	924000	Fixed O+M £/MW/yr	Medium	714800	714800	714800
Variable O+M £/MWh	Medium	Included in fixed O+M			Variable O+M £/MWh	Medium	Included in fixed O+M		
Insurance £/MW/yr	Medium	Included in fixed O+M			Insurance £/MW/yr	Medium	Included in fixed O+M		
Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M			Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M		
Hydropower 100kW-1000kW					Hydropower <15kW				
Pre-development £/kW	Commissioning				Pre-development £/kW	Commissioning			
		2016	2017	2020			2016	2017	2020
	High					High			
	Medium	Included in construction costs				Medium	Included in construction costs		
	Low					Low			
Construction costs £/kW	High	10000	10000	10000	Construction costs £/kW	High	21400	21400	21400
	Medium	4500	4500	4500		Medium	9500	9500	9500
	Low	2000	2000	2000		Low	4200	4200	4200
Fixed O+M £/MW/yr	Medium	104000	104000	104000	Fixed O+M £/MW/yr	Medium	110000	110000	110000
Variable O+M £/MWh	Medium	Included in fixed O+M			Variable O+M £/MWh	Medium	Included in fixed O+M		
Insurance £/MW/yr	Medium	Included in fixed O+M			Insurance £/MW/yr	Medium	Included in fixed O+M		
Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M			Connection and Use of System charges £/MW/yr	Medium	Included in fixed O+M		