

Q14. What is the composition of liquefied natural gas (LNG) and by how much does it vary?

Some typical reported LNG compositions from liquefaction plants in exporting countries are listed below:

Table 7 – LNG compositions

Plant	Location	C1 Methane	C2 Ethane	C3 Propane	C4 Butane	N2 Nitrogen	Wobbe (MJ/m ³)
GL4Z	Algeria	87.16	8.78	2.1	0.7	1.26	52.26
GL1Z	Algeria	87.4	8.2	1.9	0.7	1.8	51.76
GL2Z	Algeria	91	7.63	0.52	0.03	0.82	51.57
GL1K	Algeria	91	6.7	0.6	0.2	1.5	51.07
Marsa El Braga	Libya	83.68	11.73	3.51	0.28	0.8	53.26
Nigeria LNG	Nigeria	87.9	5.5	4	2.5	0.1	53.88
NW Shelf	Australia	89	7.3	2.5	1	0.2	52.98
Brunei LNG	Brunei	89.4	6.3	2.8	1.3	0.2	53.05
PT Badak LNG	Indonesia	91.18	5.51	2.41	0.88	0.02	52.73
Arun LNG	Indonesia	88.48	8.36	1.56	1.56	0.04	53.21
MLNG	Malaysia	91.35	4.3	2.95	1.4	0	52.96
Atlantic LNG	Trinidad	95	4.6	0.38	0	0.02	51.57
Oman LNG	Oman	90	6.35	0.15	2.5	1	52.26
Qatar LNG	Qatar	No composition data provided					
RASGAS	Qatar	89.6	6.25	2.19	1.11	Not known	52.34 - 52.92
ADGAS	U.A.E	84	14	1	0.9	0.1	53.48
Kenai LNG	Alaska	99.8	0.1	0	0	0.1	51.7

Source: Importing Gas into the UK – Gas Quality Issues; ILEX Energy; Nov. 2003

The following range of LNG compositions (at the ship manifold) was used as typical LNG compositions for the design of the Shannon LNG facility:

Component	Unit	Rich	Lean	Alternate
Nitrogen	mole%	0.32†	0.26†	0.6†
Methane	mole%	89.57†	96.47†	95.54†
Ethane	mole%	8.61†	2.17†	3.40†
Propane	mole%	1.18†	0.77†	0.39†
i-Butane	mole%	0.13†	0.13†	0.04†
n-Butane	mole%	0.18†	0.20†	0.03†
i-Pentane	mole%	0.01†	0.00†	0.00†
Total	mole%	100	100	100
HHV	MJ / Sm ³	41.07	39.02	38.81
Wobbe Number	MJ / Sm ³	52.39	51.29	51.01
Density @ bubble point, 1.136 bara	kg/m ³	455.39	435.93	437.87
Molecular Weight		17.76	16.73	16.73

Natural gas delivered into the BGE system will comply with BGE requirements. The pipeline entry specifications are as follows:

Property		Value	Units
Higher Heating Value (real gross dry)	Min	36.9	MJ/Sm ³
	Max	42.3	MJ/Sm ³
Wobbe Index	Min	47.20	MJ/Sm ³
	Max	51.41	MJ/Sm ³
Relative Density	Min	0.55	relative to air
	Max	0.70	

LNG's which do not meet gas quality specifications will be ballasted with nitrogen (adding nitrogen into the gas stream up to 4% nitrogen) to lower heating value and/or Wobbe Index value to meet BGE specification.