



Supplement of

Satellite quantification of methane emissions and oil–gas methane intensities from individual countries in the Middle East and North Africa: implications for climate action

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Table S1. Latest year of individual countries reporting to the UNFCCC.

Country	Algeria	Bahrain	Egypt	Iran	Iraq	Israel	Jordan	Kuwait	Lebanon	Libya ^a	Mauritania	Morocco
Last inventory year	2000	2000	2005	2000	1997	2019	2016	2016	2013	n/a	2000	2012
Country	Niger	Oman	Palestine	Qatar	Saudi Arabia	Syria	Tunisia	Turkey	Turkmenistan	UAE	Yemen	
Last inventory year	2008	1994	2011	2007	2012	2005	2000	2020	2010	2014	2012	

^aTo date, the government of Libya has not submitted its national inventory to the UNFCCC.

Table S2. Surface measurement sites.

Site code	Location	Longitude	Latitude	Elevation (masl.)	Number of observations in 2019	Measurement Type
ASK	Assekrem, Algeria	5.6	23.3	2710	44	Surface flasks
CIB	Centro de Investigacion de la Baja Atmosfera, Spain	-4.9	41.8	845	41	
IZO	Izana, Tenerife, Canary Islands, Spain	16.5	28.3	2373	52	
LMP	Lampedusa, Italy	12.6	35.5	45	47	
WIS	Weizmann Institute of Science at the Arava Institute, Ketura, Israel	35.1	30.0	151	45	

Table S3. Head counts of primary ruminant livestock for top-emitting countries in 2019. ^a

	Iran	Turkmenistan	Saudi Arabia	Algeria	Egypt	Turkey
Cattle	5,241,304	2,403,120	567,040	1,786,351	2,809,000	17,688,139
Buffalo	147,802	n/a ^b			142,700	184,192
Sheep	41,303,611	14,053,574	9,419,686	29,378,561	20,82,000	37,276,050
Goat	15,034,487	2,375,410	3,711,155	4,929,069	977,000	11,205,429

^aData is from the FAOSTAT (<https://www.fao.org/faostat/en/#data/QCL>).

^bNot available in the FAOSTAT.

Table S4. National gas emissions by subsector in 2019.

Country		Gas (Tg a ⁻¹)		
		Upstream	Midstream	Downstream
Algeria	Posterior	1.6	0.29	0.20
	Prior	0.77	0.17	0.14
Bahrain	Posterior	0.01	<0.01	0.12
	Prior	0.01	<0.01	0.04
Egypt	Posterior	0.02	0.02	0.11
	Prior	0.01	0.01	0.05
Iran	Posterior	0.18	0.15	0.68
	Prior	0.12	0.08	0.32
Iraq	Posterior	<0.01	0.01	0.03
	Prior	<0.01	<0.01	0.02
Israel	Posterior	0.01	<0.01	0.02
	Prior	<0.01	<0.01	0.01
Jordan	Posterior	<0.01	0.01	0.11
	Prior	<0.01	<0.01	0.05
Kuwait	Posterior	<0.01	<0.01	<0.01
	Prior	<0.01	<0.01	<0.01
Lebanon	Posterior	<0.01	0.01	0.01
	Prior	<0.01	<0.01	<0.01
Libya	Posterior	0.02	<0.01	0.01
	Prior	0.01	<0.01	0.01
Mauritania	Posterior	<0.01	<0.01	0.01
	Prior	<0.01	<0.01	0.01
Morocco	Posterior	<0.01	0.01	0.03
	Prior	<0.01	0.01	0.03
Niger	Posterior	<0.01	<0.01	<0.01
	Prior	<0.01	<0.01	<0.01
Oman	Posterior	0.04	0.02	0.04
	Prior	0.02	0.01	0.03
Palestine	Posterior	<0.01	<0.01	0.01
	Prior	<0.01	<0.01	<0.01
Qatar	Posterior	<0.01	<0.01	0.01
	Prior	<0.01	<0.01	<0.01
Saudi Arabia	Posterior	0.02	0.46	0.38
	Prior	0.01	0.17	0.18
Syria	Posterior	<0.01	<0.01	0.01
	Prior	<0.01	<0.01	<0.01
Tunisia	Posterior	<0.01	<0.01	0.01
	Prior	<0.01	<0.01	<0.01
Turkey	Posterior	<0.01	0.04	0.04
	Prior	<0.01	0.04	0.05
Turkmenistan	Posterior	0.67	0.23	0.64
	Prior	0.26	0.1	0.24
UAE	Posterior	0.01	0.01	0.05
	Prior	0.01	0.01	0.04
Yemen	Posterior	<0.01	<0.01	<0.01
	Prior	<0.01	<0.01	<0.01