Table S1. Average emission factors and standard deviation of $PM_{2.5}$ and gas-phase species (g kg^{-1} dry fuel carbon) for dung-*chulha*, brushwood-*chulha*, mixed-*chulha*, and dung-*angithi* cook fires. Sample size (n) was n=12 for dung-*chulha*, n=14 for brushwood-*chulha*, n=13 for mixed-*chulha*, n=10 for dung-*angithi*. SOAP values, k_{OH}, and MIR values used to calculate predicted SOAP-weighted potentials, OH reactivity, and ozone-forming potential are included for the quantified species. SOAP values were taken from Derwent et al. (2010), k_{OH} were found in the NIST Chemical Kinetics Database, and MIR values are found in Carter et al. 1994.

Compound	Dung-*chulha* Average (SD)	Brushwood-*chulha* Average (SD)	Mixed-*chulha* Average (SD)	Dung-*angithi* Average (SD)	SOAP	k_{OH} (x 10^{12}) (cm^3 molec $^{-1}$ s^{-1})	MIR (g O_3/ g VOC)
Carbon dioxide (CO_2)	3028 (80)	3365 (148)	3171 (83)	2745 (144)	0[a]	0	0
Carbon monoxide (CO)	301 (33)	143 (78)	243 (47)	385 (61)	0[a]	0.15	0.056
Methane (CH_4)	21.3 (4.0)	12.9 (5.4)	15.8 (2.7)	46.7 (8.2)	0[a]	0.006	0.0144
Sulfur-containing							
Carbonyl sulfide (OCS)	0.382 (0.135)	3.89 (1.36) x 10^{-2}	0.279 (0.083)	1.09 (0.67)	0[a]	0.002	0
DMS (C_2H_6S)	2.98 (1.55) x 10^{-2}	3.68 (3.36) x 10^{-3}	1.57 (0.74) x 10^{-2}	0.134 (0.096)	0[a]	5.4	0
Halogen-containing							
Dichloromethane (CH_2Cl_2)	1.37 (1.48) x10^{-3}	5.79 (8.21) x 10^{-4}	1.35 (2.20) x 10^{-3}	1.41 (0.85) x 10^{-3}	0[a]	0.123	0.041
Chloromethane (CH_3Cl)	5.48 (2.41)	0.751 (0.393)	3.34 (1.37)	14.2 (5.8)	0[a]	0.369	0.038
Bromomethane (CH_3Br)	2.02 (0.96) x 10^{-2}	2.14 (0.57) x 10^{-3}	1.42 (0.59) x 10^{-2}	4.42 (1.75) x 10^{-2}	0[a]	0.0288	0.0187
Iodomethane (CH_3I)	1.88 (0.40) x 10^{-3}	2.61 (0.61) x 10^{-4}	7.87 (2.08) x 10^{-4}	2.73 (0.51) x 10^{-3}	0[a]	0.0723	-0.56
Ethyl chloride (C_2H_5Cl)	7.83 (3.93) x 10^{-3}	1.13 (0.95) x 10^{-3}	5.23 (2.25) x 10^{-3}	2.82 (1.08) x 10^{-2}	0[a]	0.423	0.29
Dichloroethane ($C_2H_4Cl_2$)	2.71 (1.00) x 10^{-3}	6.86 (5.78) x 10^{-4}	4.04 (7.92) x 10^{-3}	4.55 (2.82) x 10^{-3}	0[a]	0.023	0.21
Nitrates							
Methyl nitrate (CH_3ONO_2)	5.62 (19.5) x 10^{-3}	1.47 (4.00) x 10^{-2}	2.19 (3.95) x 10^{-2}	0.527 (1.048)	0[a]	0.023	0
Ethyl nitrate (CH_3ONO_2)	7.27 (14.5) x 10^{-4}	1.50 (2.80) x 10^{-3}	7.63 (21.77) x 10^{-3}	0.140 (0.357)	0[a]	0.178	0
i-Propylnitrate ($C_3H_7ONO_2$)	5.85 (5.66) x 10^{-4}	6.57 (13.64) x 10^{-4}	1.37 (2.86) x 10^{-3}	1.83 (3.75) x 10^{-2}	0[a]	0.287	0
n-Propylnitrate ($C_3H_7ONO_2$)	1.94 (1.82) x 10^{-4}	2.43 (3.83) x 10^{-4}	4.81 (11.05) x 10^{-4}	5.63 (13.44) x 10^{-3}	0[a]	0.731	0
2-Butylnitrate ($C_4H_9ONO_2$)	8.27 (7.41) x 10^{-4}	2.82 (3.07) x 10^{-4}	2.39 (6.92) x 10^{-3}	7.57 (15.15) x 10^{-3}	0[a]	0.93	0
3-Pentylnitrate ($C_5H_{11}ONO_2$)	1.46 (0.49) x 10^{-4}	6.15 (5.54) x 10^{-5}	1.02 (0.62) x 10^{-4}	6.01 (12.55) x 10^{-4}	0[a]	1	0
2-Pentylnitrate ($C_5H_{11}ONO_2$)	7.27 (4.52) x 10^{-5}	4.41 (6.71) x 10^{-5}	4.05 (4.04) x 10^{-5}	5.61 (14.00) x 10^{-4}	0[a]	1	0
Alkanes							
Ethane (C_2H_6)	2.21 (0.60)	1.02 (0.64)	1.38 (0.30)	6.38 (2.14)	0.1	0.244	0.28

Propane (C_3H_8)	0.650 (0.219)	0.253 (0.211)	0.378 (0.106)	2.53 (0.49)	0	1.1	0.49
i-Butane (C_4H_{10})	5.31 (2.14) x 10^{-2}	1.23 (1.22) x 10^{-2}	3.12 (0.92) x 10^{-2}	0.225 (0.048)	0	2.12	1.23
n-Butane (C_4H_{10})	0.145 (0.058)	4.20 (4.22) x 10^{-2}	8.83 (3.06) x 10^{-2}	0.665 (0.148)	0.3	2.4	1.15
n-Pentane (C_5H_{12})	6.18 (2.46) x 10^{-2}	1.19 (1.03) x 10^{-2}	2.99 (1.24) x 10^{-2}	0.210 (0.091)	0.3	3.8	1.31
n-Hexane (C_6H_{14})	3.16 (1.30) x 10^{-2}	5.25 (4.05) x 10^{-3}	1.74 (0.63) x 10^{-2}	0.153 (0.034)	0.1	5.2	1.24
n-Heptane (C_7H_{16})	2.22 (1.02) x 10^{-2}	2.49 (1.86) x 10^{-3}	1.29 (0.41) x 10^{-2}	9.79 (2.63) x 10^{-2}	0.1	6.8	1.07
2-Methylpentane (C_6H_{14})	1.91 (0.75) x 10^{-2}	3.28 (2.51) x 10^{-3}	8.44 (5.36) x 10^{-3}	7.07 (5.18) x 10^{-2}	0	5.2	1.5
3-Methylpentane (C_6H_{14})	1.14 (0.53) x 10^{-2}	3.23 (2.64) x 10^{-3}	5.12 (2.44) x 10^{-3}	2.33 (1.33) x 10^{-2}	0.2	5.2	1.8
Alkenes							
Ethene (C_2H_4)	5.73 (1.36)	1.68 (0.73)	3.68 (1.15)	5.47 (1.09)	1.3	8.51	9
Propene (C_3H_6)	2.48 (0.60)	0.765 (0.506)	1.36 (0.28)	4.98 (1.04)	1.6	30.1	11.66
1-Butene (C_4H_8)	0.488 (0.140)	0.169 (0.115)	0.274 (0.058)	1.13 (0.30)	1.2	31	9.73
i-Butene (C_4H_8)	0.411 (0.125)	9.25 (6.25) x 10^{-2}	0.209 (0.060)	1.09 (0.49)	0.6	51	1.23
trans-2-Butene (C_4H_8)	0.137 (0.047)	5.36 (3.30) x 10^{-2}	7.79 (2.22) x 10^{-2}	0.466 (0.170)	4.0	64	15.16
cis-2-Butene (C_4H_8)	0.104 (0.037)	4.04 (2.45) x 10^{-2}	5.88 (1.69) x 10^{-2}	0.331 (0.145)	3.6	56	14.24
3-Methyl-1-butene (C_5H_{10})	4.50 (1.44) x 10^{-2}	1.53 (1.13) x 10^{-2}	2.39 (0.62) x 10^{-2}	0.118 (0.027)	0.6	32	6.99
2-Methyl-1-butene (C_5H_{10})	8.33 (2.97) x 10^{-2}	2.65 (2.72) x 10^{-2}	3.92 (1.38) x 10^{-2}	0.238 (0.124)	0.9	61	6.4
2-Methyl-2-butene (C_5H_{10})	7.72 (3.14) x 10^{-2}	1.71 (1.24) x 10^{-2}	3.61 (1.53) x 10^{-2}	0.284 (0.146)	1.9	87	14.08
1-Pentene (C_5H_{10})	0.128 (0.048)	2.58 (1.64) x 10^{-2}	6.99 (1.98) x 10^{-2}	0.378 (0.102)	0	27.4	7.21
trans-2-Pentene (C_5H_{10})	5.34 (1.68) x 10^{-2}	2.38 (1.49) x 10^{-2}	7.79 (2.22) x 10^{-2}	0.159 (0.064)	3.1	67	10.56
cis-2-Pentene (C_5H_{10})	3.08 (0.90) x 10^{-2}	1.49 (0.94) x 10^{-2}	5.88 (1.69) x 10^{-2}	7.72 (3.98) x 10^{-2}	3.1	65	10.38
1-Hexene (C_6H_{12})	0.188 (0.072)	3.38 (1.83) x 10^{-2}	0.101 (0.030)	0.517 (0.157)	0	37	5.49
1,2-Propadiene (C_3H_4)	0.116 (0.033)	3.51 (1.57) x 10^{-2}	7.55 (2.72) x 10^{-2}	5.56 (2.84) x 10^{-2}	1.8[b]	0.45	8.45
1,2-Butadiene (C_4H_6)	1.70 (0.48) x 10^{-2}	7.54 (4.69) x 10^{-3}	1.01 (0.33) x 10^{-2}	1.34 (0.49) x 10^{-2}	1.8[b]	27	9.35
1,3-Butadiene (C_4H_6)	0.626 (0.221)	0.201 (0.105)	0.352 (0.195)	0.813 (0.254)	1.8	67	12.61
Isoprene (C_5H_8)	0.275 (0.151)	5.31 (3.88) x 10^{-2}	9.89 (7.79) x 10^{-2}	0.582 (0.444)	1.9	100	10.61
1,3-Pentadiene (C_5H_8)	6.02 (3.37) x 10^{-2}	2.47 (1.26) x 10^{-2}	3.08 (2.11) x 10^{-2}	0.175 (0.091)	1.8[c]	117	12.5
Alkynes							
Ethyne (C_2H_2)	3.46 (1.21)	1.25 (0.39)	2.89 (1.00)	1.01 (0.74)	0.1	0.9	0.95
1-Propyne (C_3H_4)	0.290 (0.084)	0.103 (0.045)	0.195 (0.070)	0.161 (0.087)	0[a]	3.1	6.72

1-Buten-3-yne (C_4H_4)	0.155 (0.048)	5.01 (2.27) x 10^{-2}	0.113 (0.048)	5.37 (3.87) x 10^{-2}	0[a]	20	10.48
1-Butyne (C_4H_6)	2.37 (0.69) x 10^{-2}	1.09 (0.57) x 10^{-2}	1.46 (0.44) x 10^{-2}	1.85 (0.60) x 10^{-2}	0[a]	8	6.11
2-Butyne (C_4H_6)	1.33 (0.48) x 10^{-2}	6.84 (3.70) x 10^{-3}	8.06 (2.13) x 10^{-3}	1.40 (0.44) x 10^{-2}	0[a]	8	16.32
1,3-Butadyne (C_4H_2)	1.87 (0.75) x 10^{-2}	7.27 (3.00) x 10^{-3}	1.77 (0.62) x 10^{-2}	4.74 (4.07) x 10^{-3}	0[a]	16	5.76
Aromatics							
Benzene (C_6H_6)	3.18 (1.09)	1.00 (0.37)	2.36 (0.68)	2.38 (0.55)	92.9	1.2	0.72
Toluene (C_7H_8)	1.49 (1.03)	0.597 (0.218)	0.972 (0.250)	2.66 (0.52)	100.0	6.2	4
Ethylbenzene (C_8H_{10})	0.105 (0.027)	3.34 (3.03) x 10^{-2}	6.43 (1.20) x 10^{-2}	0.303 (0.052)	111.6	7.5	3.04
m/p-Xylene (C_8H_{10})	0.196 (0.044)	7.45 (3.89) x 10^{-2}	0.131 (0.030)	0.458 (0.093)	75.8	19	2.51
o-Xylene (C_8H_{10})	7.31 (2.44) x 10^{-2}	2.24 (1.46) x 10^{-2}	4.68 (1.21) x 10^{-2}	0.246 (0.060)	95.5	14	2.51
Styrene (C_8H_8)	5.88 (1.81) x 10^{-2}	2.28 (1.50) x 10^{-2}	3.40 (1.90) x 10^{-2}	8.64 (5.96) x 10^{-2}	212.3	43	1.53
i-Propylbenzene (C_9H_{12})	8.97 (2.73) x 10^{-3}	3.21 (2.78) x 10^{-3}	5.51 (1.31) x 10^{-3}	2.88 (1.51) x 10^{-2}	95.5	6.6	6.23
n-Propylbenzene (C_9H_{12})	2.00 (0.87) x 10^{-2}	4.90 (4.14) x 10^{-3}	1.30 (0.47) x 10^{-2}	0.122 (0.083)	109.7	5.7	6.23
3-Ethyltoluene (C_9H_{12})	4.44 (1.67) x 10^{-2}	1.46 (1.14) x 10^{-2}	2.79 (0.98) x 10^{-2}	0.221 (0.128)	94.8	22.4	7.39
4-Ethyltoluene (C_9H_{12})	1.96 (0.79) x 10^{-2}	6.78 (4.65) x 10^{-3}	1.35 (0.59) x 10^{-2}	0.115 (0.071)	69.7	13.6	4.44
2-Ethyltoluene (C_9H_{12})	2.12 (0.87) x 10^{-2}	7.22 (4.33) x 10^{-3}	1.50 (0.62) x 10^{-2}	0.116 (0.083)	94.8	13.2	5.59
1,3,5-Trimethylbenzene (C_9H_{12})	1.19 (0.55) x 10^{-2}	4.37 (3.18) x 10^{-3}	8.59 (4.28) x 10^{-3}	6.89 (4.93) x 10^{-2}	13.5	60	11.76
1,2,4-Trimethylbenzene (C_9H_{12})	3.22 (1.59) x 10^{-2}	1.14 (0.70) x 10^{-2}	2.43 (1.28) x 10^{-2}	0.193 (0.160)	20.6	32	8.87
1,2,3-Trimethylbenzene (C_9H_{12})	1.47 (0.78) x 10^{-2}	3.11 (2.08) x 10^{-3}	1.24 (0.82) x 10^{-2}	9.30 (9.75) x 10^{-2}	43.9	29	11.97
Terpenes							
alpha-Pinene ($C_{10}H_{16}$)	2.55 (1.92) x 10^{-3}	1.44 (1.81) x 10^{-3}	2.54 (2.08) x 10^{-3}	6.97 (7.78) x 10^{-3}	17.4	52	4.51
beta-Pinene ($C_{10}H_{16}$)	6.98 (5.20) x 10^{-3}	3.69 (2.46) x 10^{-3}	8.98 (10.14) x 10^{-3}	8.93 (10.96) x 10^{-3}	18.1	74	3.52
Oxygenates							
Acetaldehyde (C_2H_4O)	2.48 (0.92)	0.897 (0.520)	1.46 (0.38)	5.26 (2.34)	0.6	16	6.54
Butanal (C_4H_8O)	0.132 (0.047)	5.09 (3.32) x 10^{-2}	8.77 (3.50) x 10^{-2}	0.334 (0.145)	0	24	5.97
Acetone (C_3H_6O)	2.17 (0.69)	0.977 (0.584)	1.36 (0.35)	6.34 (1.63)	0.3	0.19	0.36
2-Butanone (C_4H_8O)	0.530 (0.183)	0.214 (0.161)	0.338 (0.130)	1.54 (0.47)	0.6	1.2	1.48
2-Propenal (C_3H_4O)	0.573 (0.202)	0.342 (0.177)	0.414 (0.192)	0.914 (0.761)	1.0[a]	20	7.45
MVK (C_4H_6O)	0.396 (0.121)	0.176 (0.117)	0.205 (0.087)	0.865 (0.458)	1.0[a]	19	9.65
Furan (C_4H_4O)	0.336 (0.141)	0.160 (0.086)	0.223 (0.072)	1.17 (0.29)	1.0[a]	40	9.15

2-Methylfuran (C_5H_6O)	0.360 (0.177)	0.158 (0.123)	0.226 (0.093)	1.51 (0.70)	1.0[a]	62	8.3
Furfural ($C_5H_4O_2$)	0.263 (0.218)	0.113 (0.143)	0.265 (0.161)	0.981 (0.414)	1.0[a]	35	10
Methanol (CH_3OH)	6.43 (3.77)	5.38 (5.20)	3.84 (1.26)	13.1 (10.6)	0.3	0.9	0.67
Ethanol (CH_5OH)	0.126 (0.220)	5.80 (5.19) x 10^{-2}	0.184 (0.220)	0.236 (0.281)	0.6	3.4	1.53

[a]given values of either 0 or 1, SOAP values not reported

[b]values based on 1,3-butadiene

[c]value based on *(E)*-1,3-Pentadiene

Table S2. Summary of aromatic compounds, oxygenates, halogen- and sulfur- containing compounds that do not have higher emissions when using *angithi* stove and/or dung fuel. Significant relationships between emissions and either stove or fuel are indicated by marking the type that gives the larger emissions. N/A indicates no relationship was found. P values are listed in addition to the fuel or stove type if the relationship is not clear.

Compound	Stove	Fuel
Benzene	*Chulha*	Dung
Styrene	*Angithi* (p=0.0723)	Dung
Acrolein	*Angithi* (p=0.0787)	Dung
Methanol	*Angithi*	N/A
Ethanol	N/A	N/A
Furfural	*Angithi*	Dung (p= 0.03)
Dichloromethane	N/A	N/A
1,2-dichloroethane	*Angithi*	N/A
Iodomethane	*Angithi* (p=0.0891)	Dung

Figure S1. Emission factors (g VOC/ kg fuel C) versus moisture content of the fuel. Red markers indicate dung fuel was used, while blue markers indicate brushwood fuel. Filled square markers indicate *chulha* stoves, while open circles indicate *angithi* stoves were used. If a significant correlation was observed (r^2> 0.70) for a particular fuel-stove combination, the linear regression trendline is shown.

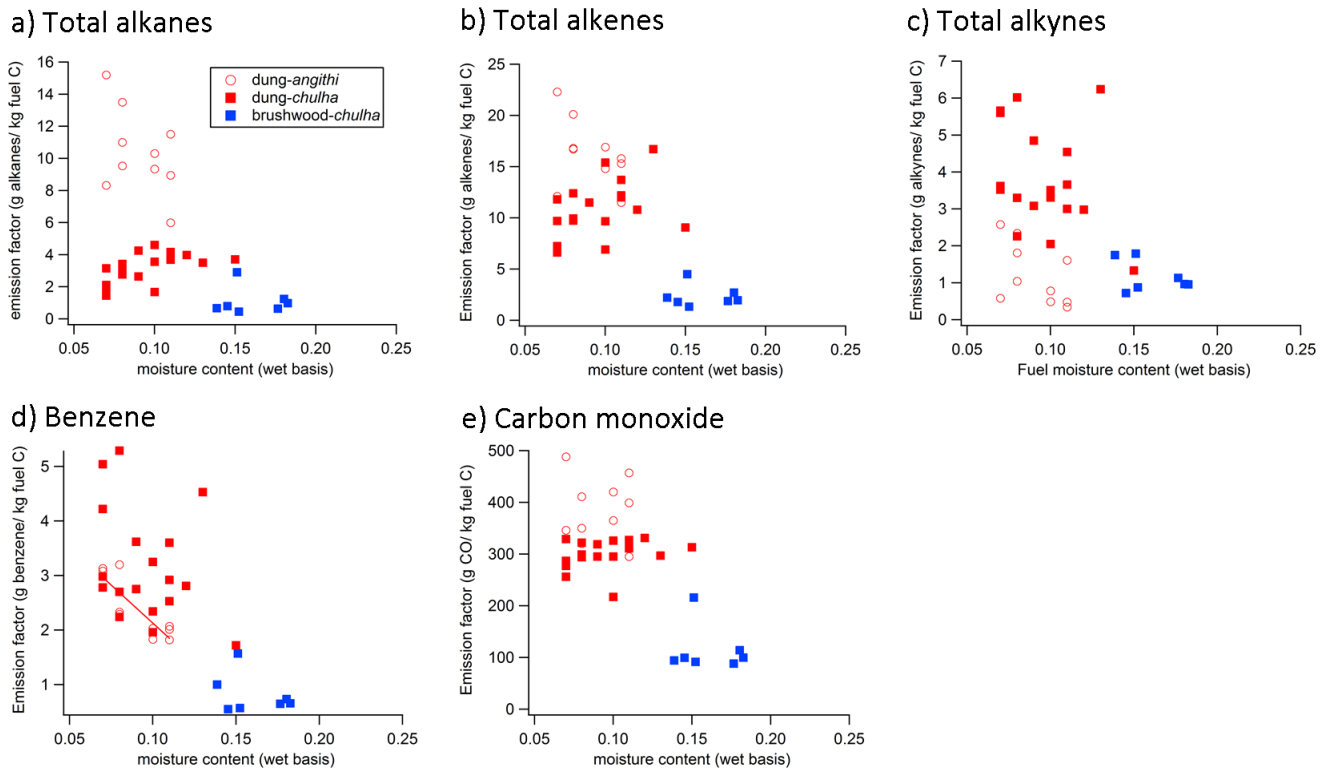

Figure S2.1 Comparison of EFs (g/ kg dry fuel) in the present study to those of Stockwell et al., 2016 (adjusted). The blue line indicates 1:1 agreement of the emission factors, with points above the blue line indicating higher EFs reported in Stockwell et al., 2016. Likewise, points below represent compounds that have a higher EF in the present study.

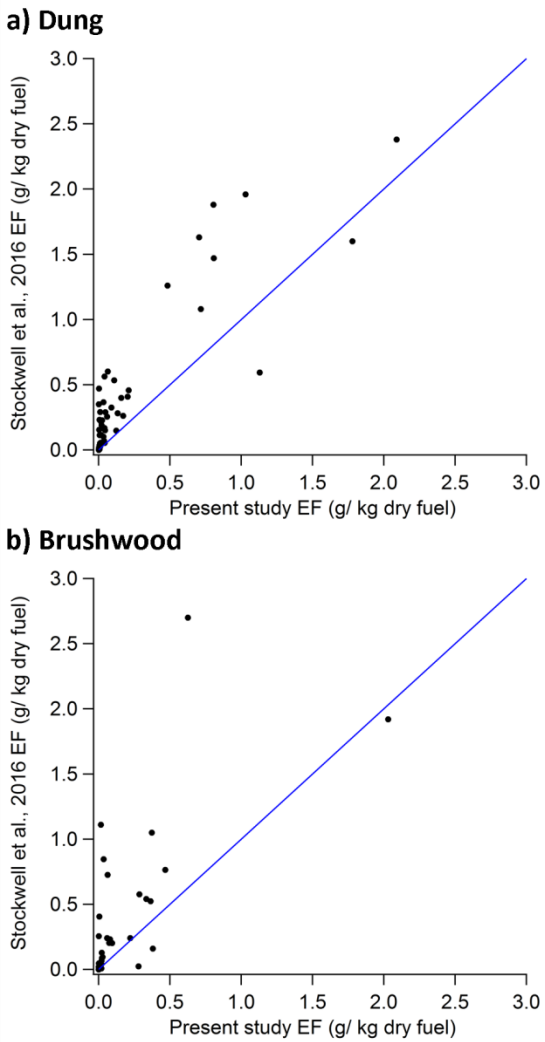

Figure S2.2 Emission factors (g/ kg fuel C) plotted as a function of modified combustion efficiency for select species. Open circles indicate cooking events conducted with *angithi* stoves, whereas filled squares indicate *chulha* stoves. Color indicates fuel, either brushwood (blue), dung (red), or mixed (purple). Crosses indicate measurements from Stockwell et al. 2016.