



Fugitive Methane Emissions from Coal Mining and Handling Activities and Oil and Natural Gas Systems in India

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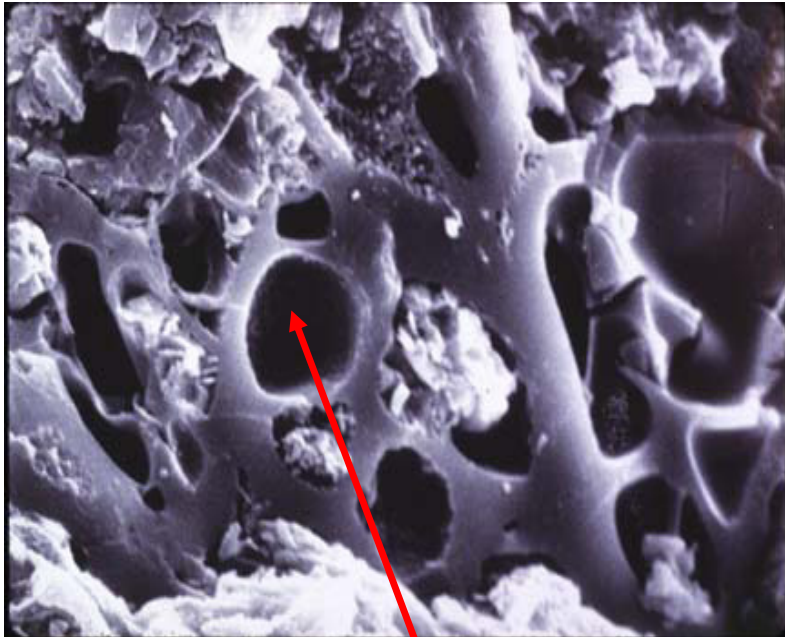
INCCA Workshop on GHG Emissions

New Delhi

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Coal



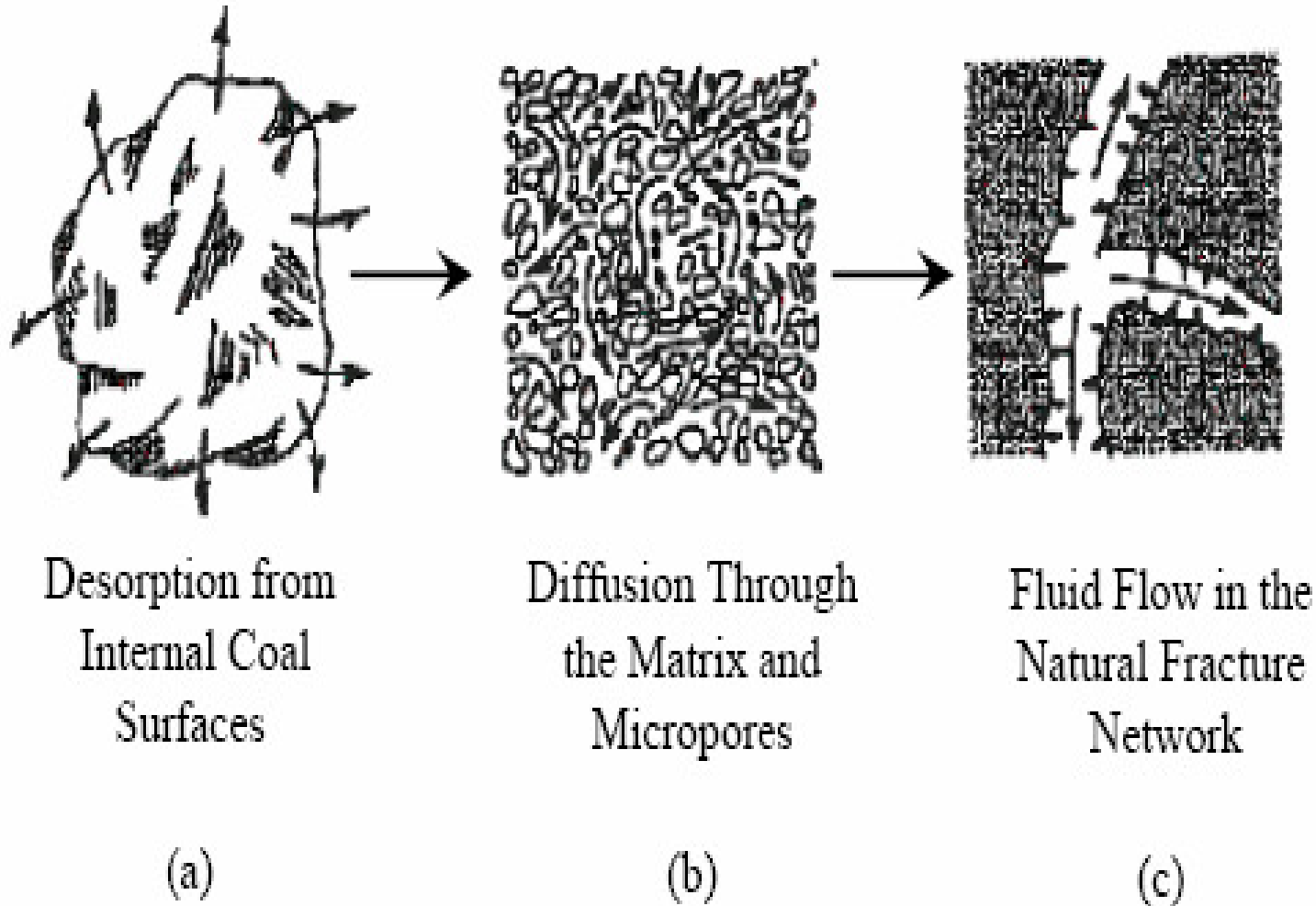
Microscopic view of the Micropores structure of coal



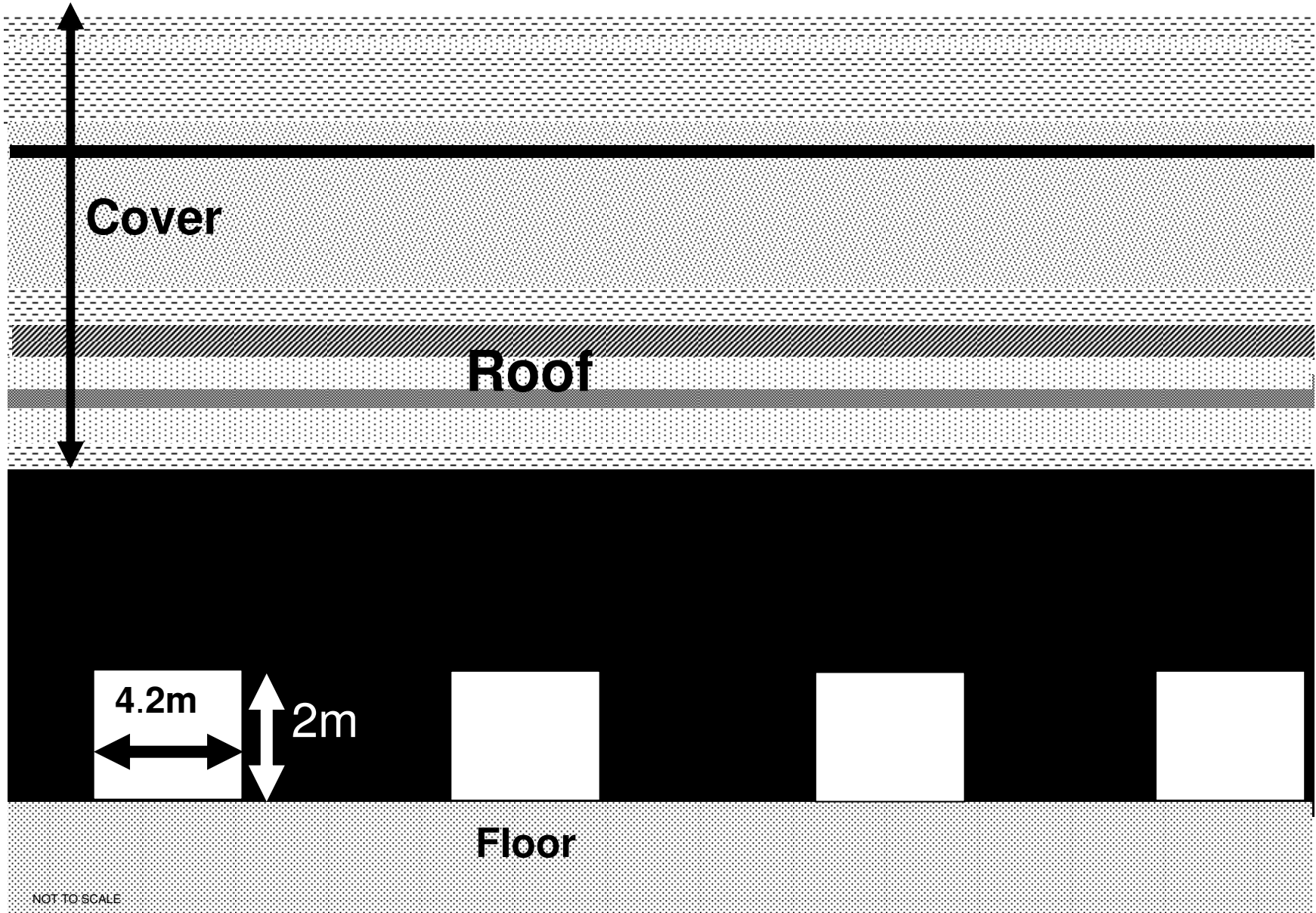
Fracture system, cleats in coal



Transport of Gas in Coal



Increasing Size →



Cover

Roof

4.2m

2m

Floor

NOT TO SCALE



What about surface mines???

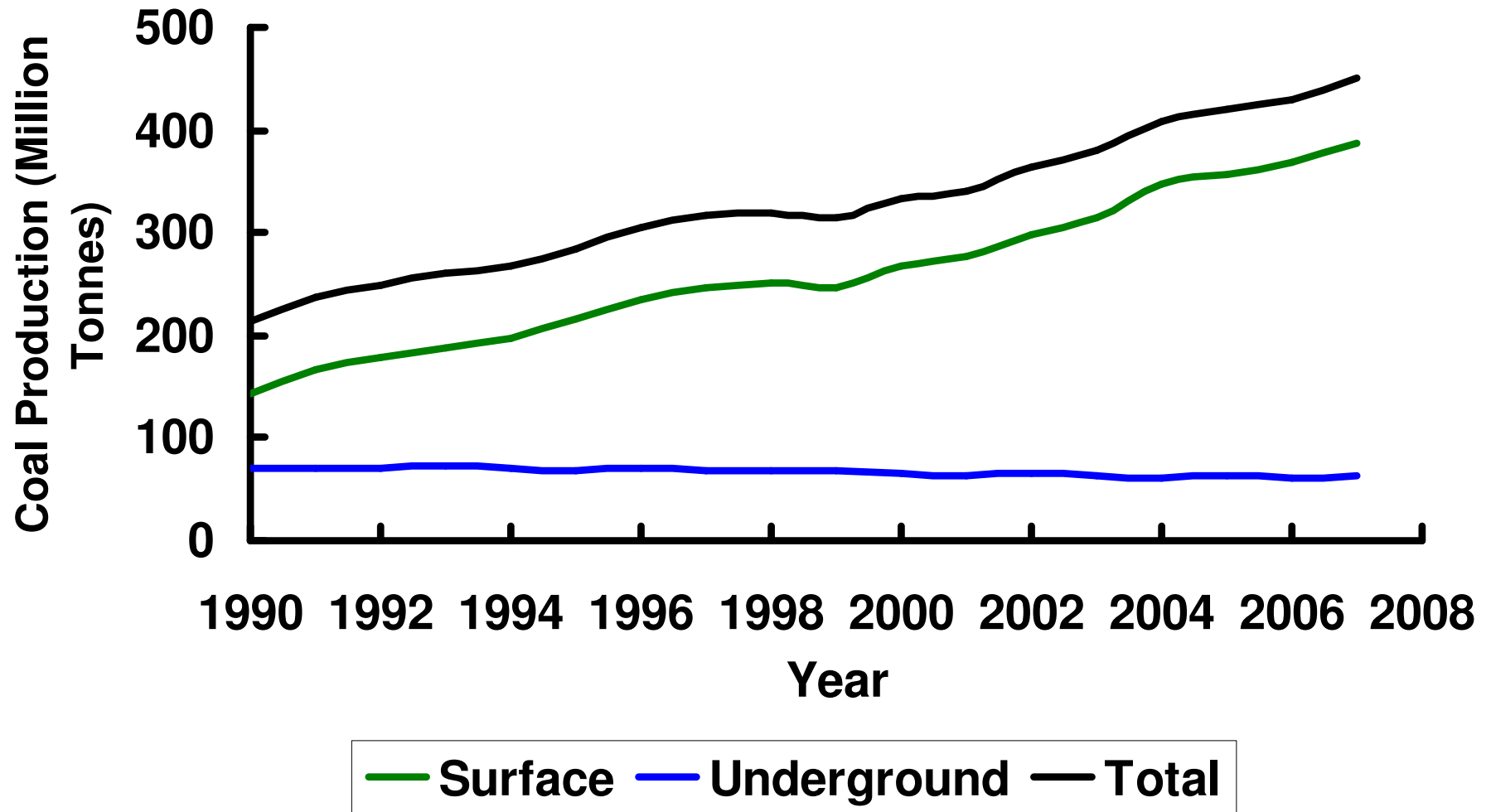




Fugitive Emission from Coal Mining and Handling Activities



Activity data



Coal Production

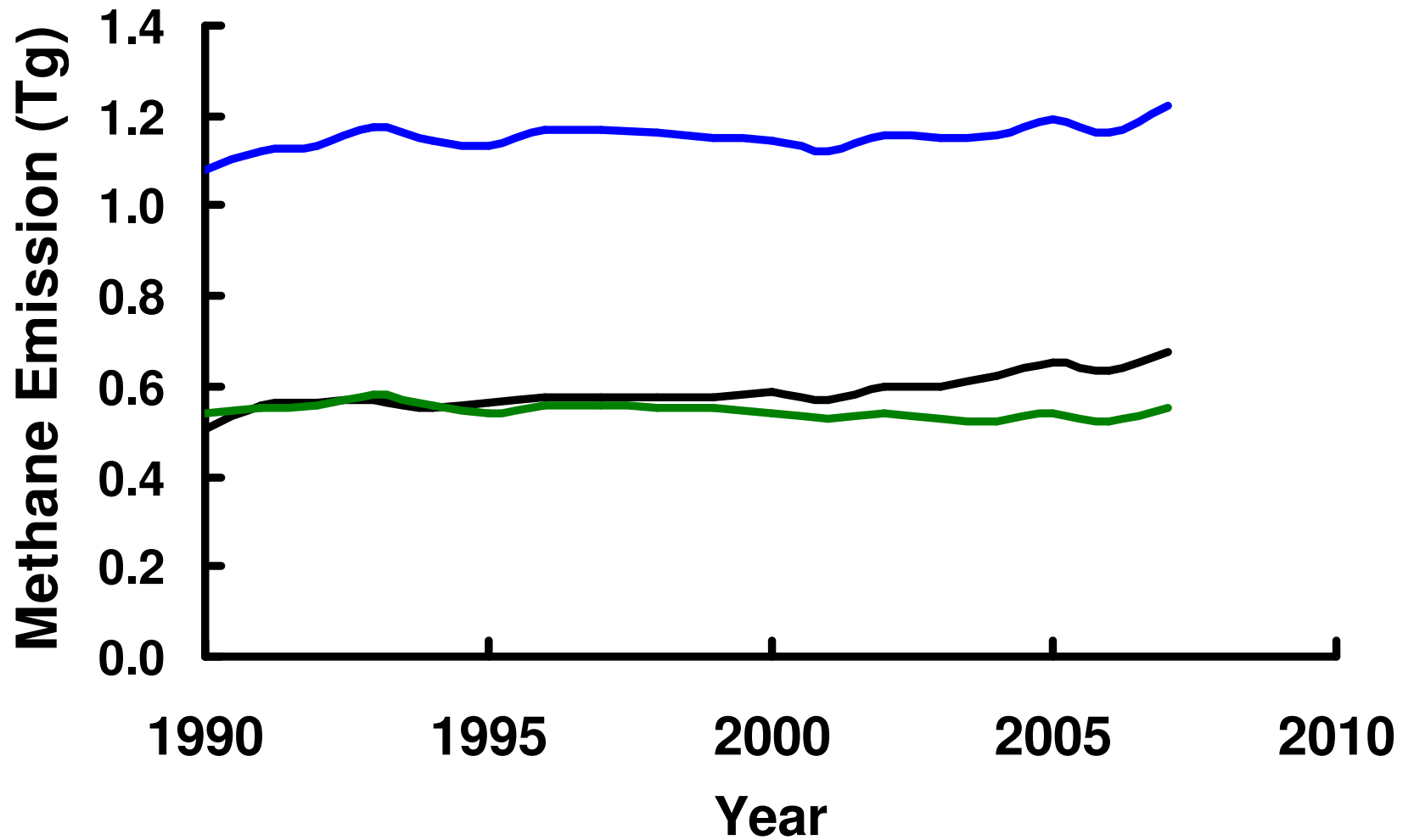


New Emission factors

Operation	Methane Emission factor (m ³ /tonne)			
	Surface Mining	Underground Mining		
		Degree-I	Degree-II	Degree-III
Mining	1.18	2.91	13.08	23.68
Post Mining (Handling)	0.15	0.98	2.15	3.12



Emission Estimates



Estimates

— CIMFR — IPCC Low — IPCC Av..



Fugitive Emission from Oil and Natural Gas Systems



Sources

Petroleum Products	Process	Sources of Methane Emission
Oil	Exploration (for both oil & gas)	Production testing - Gas Flared
	Crude oil Production	- Internal Floating tank - Fixed Roof Tank - Floating Tank
Natural Gas	Production and processing	Fugitive Emission
Venting and Flaring	Venting	Gas Venting
	Flaring	Flares

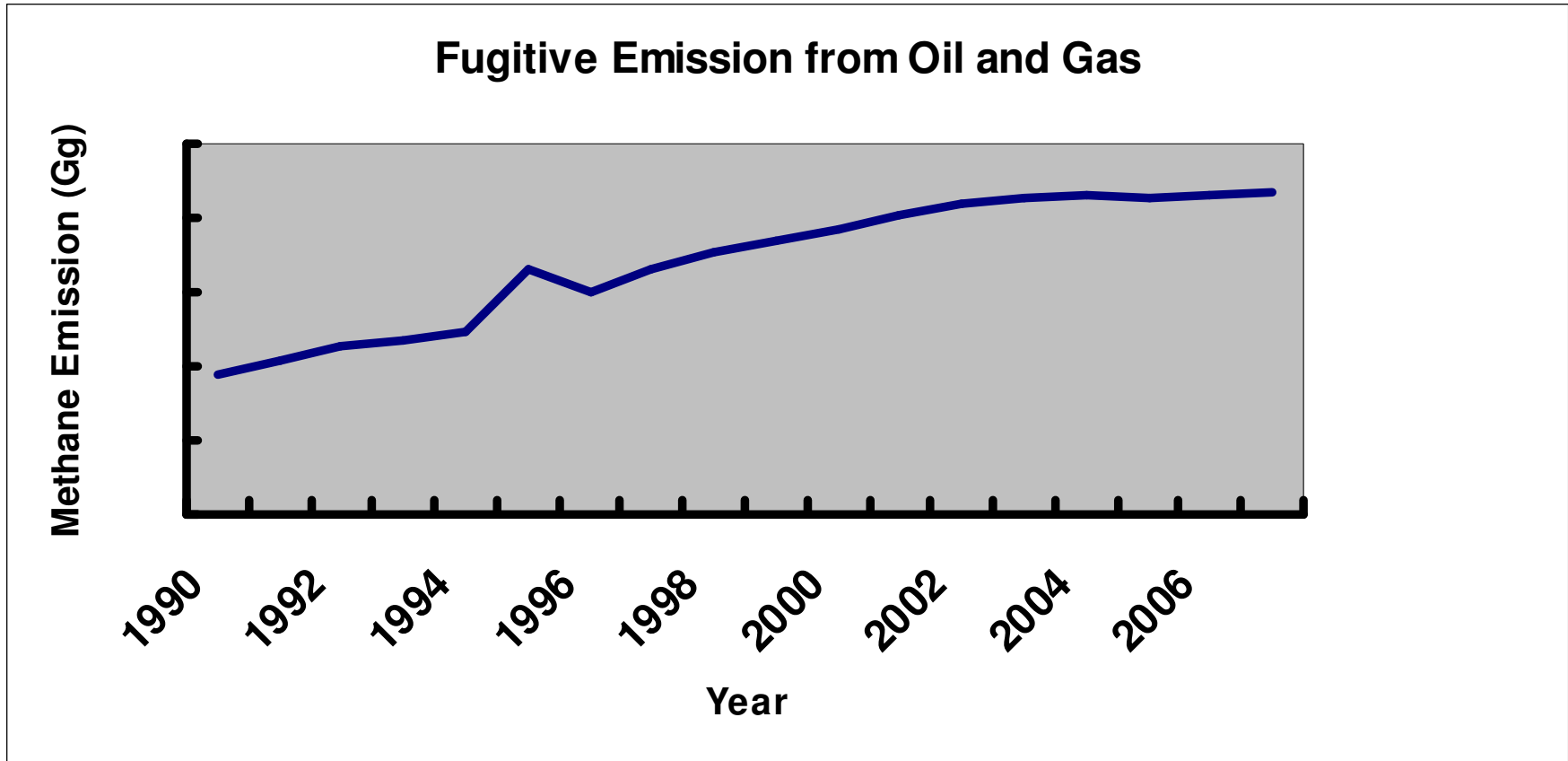


Emission Factor

No. of Wells	0.003 (Gg/well)
Oil Production	0.000334242(Gg/1000 tonnes)
Refinery Throughput	6.75904×10^{-05} (Gg/MT)
Gas Production	0.003555802 (Gg/MMCM)
Gas Processing	0.010667405 (Gg/MMCM)
Gas distribution	0.010667405 (Gg/MMCM)
Leakage	0.00648193 (Gg/MMCM)
Flaring	0.000640877 (Gg/MMCM)



Methane Emission Estimates



Emission



Thanks