

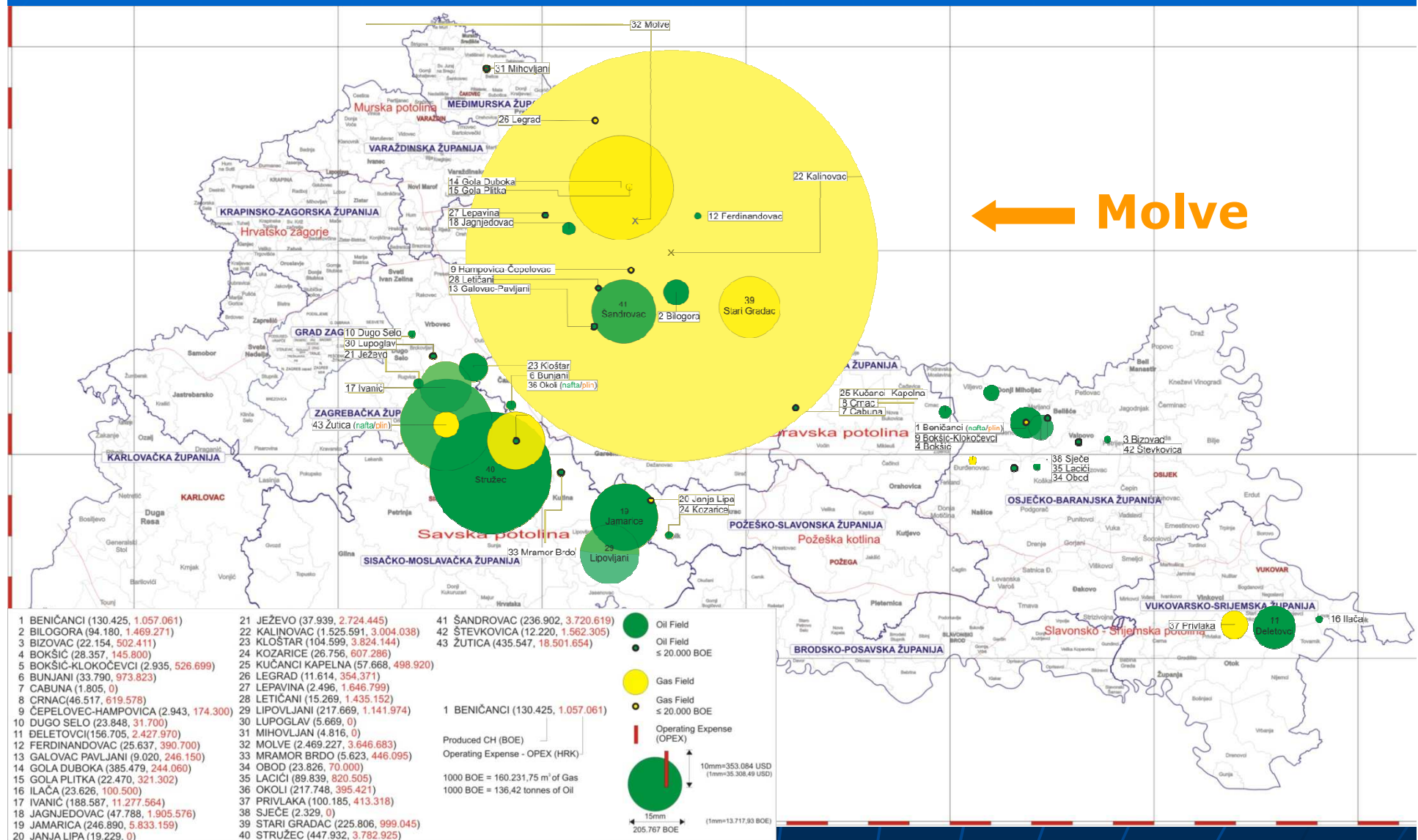


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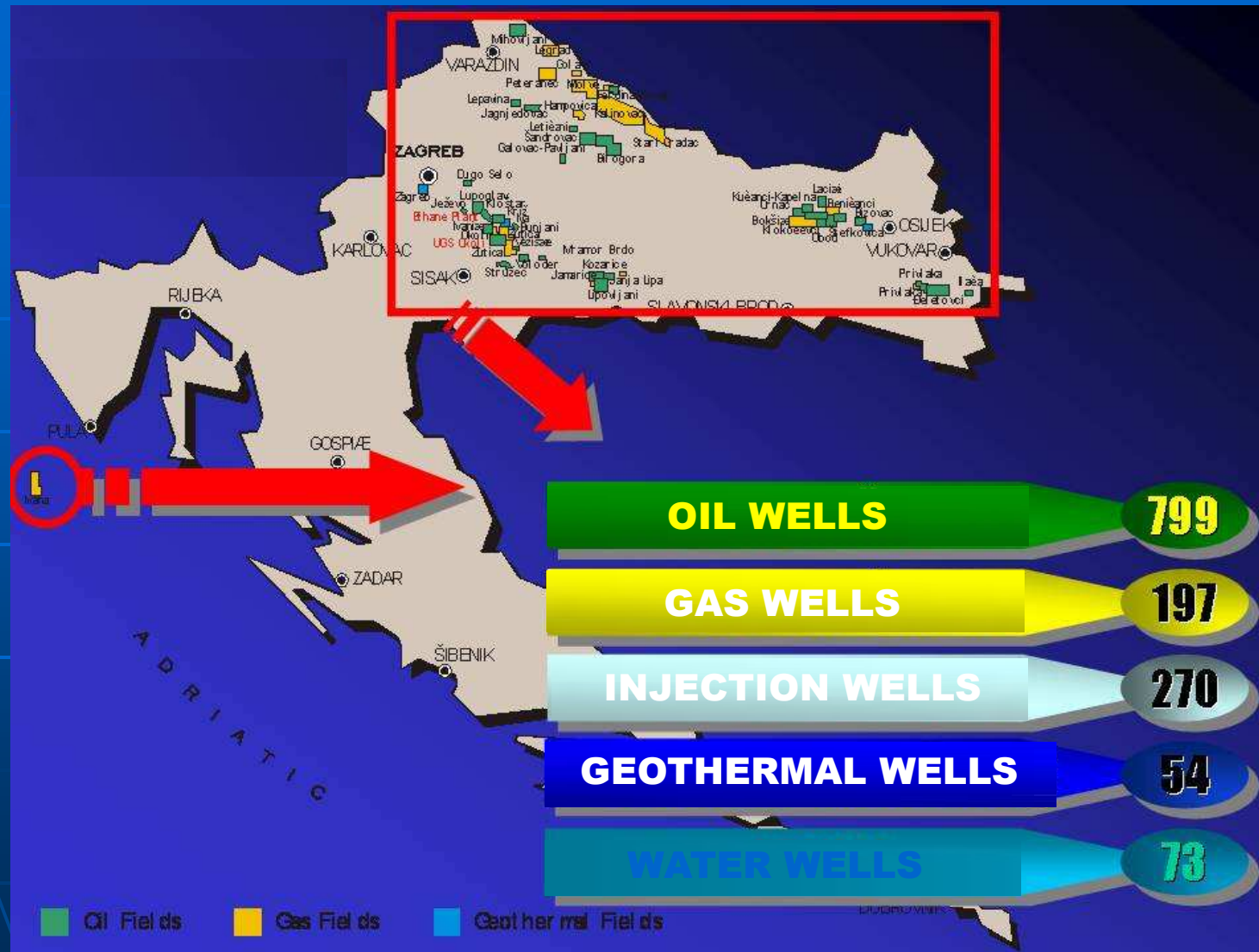
IMPORTANCE OF DOMESTIC PRODUCTION GAS FIELD MOLVE –THE CONTRIBUTION OF CROATIAN ENERGY SECTOR

Society of Petroleum Engineers

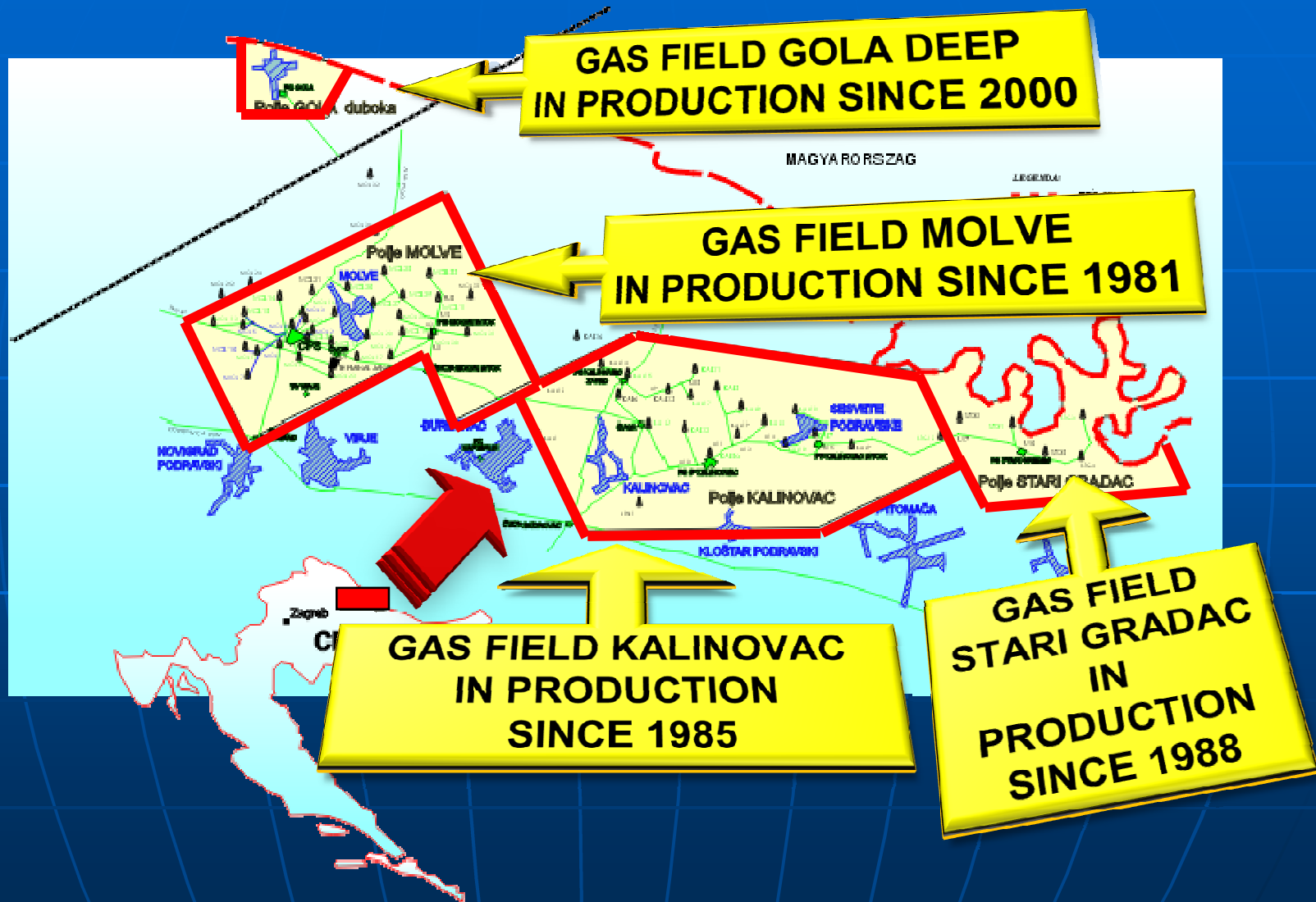
ROLE OF GAS FIELD MOLVE IN DOMESTIC ON-SHORE PRODUCTION



OIL AND GAS PRODUCTION IN CROATIA



GATHERING AND TRANSPORTATION SYSTEM REVIEW MAP



PRODUCED GAS COMPOSITION

FIELD	Molve	Kalinovac	Stari Gradac	Gola deep
Methane	69,22	69,97	66,50	41,04
Ethane	3,26	6,76	7,19	1,76
Propane	1,02	2,35	2,83	0,68
i-butane	0,10	0,12	0,12	0,17
n- butane	0,23	0,73	1,21	0,18
i-pentane	0,09	0,39	0,67	0,05
n- pentane	0,06	0,34	0,63	0,08
Hexane and higher hydrocarbons	0,53	5,25	9,09	0,02
Nitrogen	1,64	1,37	0,94	2,38
Carbon dioxide	23,75	12,17	9,02	53,64
Hydrogen sulfide	80 ppm	100 ppm	400 ppm	900 ppm
Mercury	1000 - 1500 $\mu\text{g} / \text{m}^3$			
Mercaptan sulfur	20 – 30 mg/m^3			

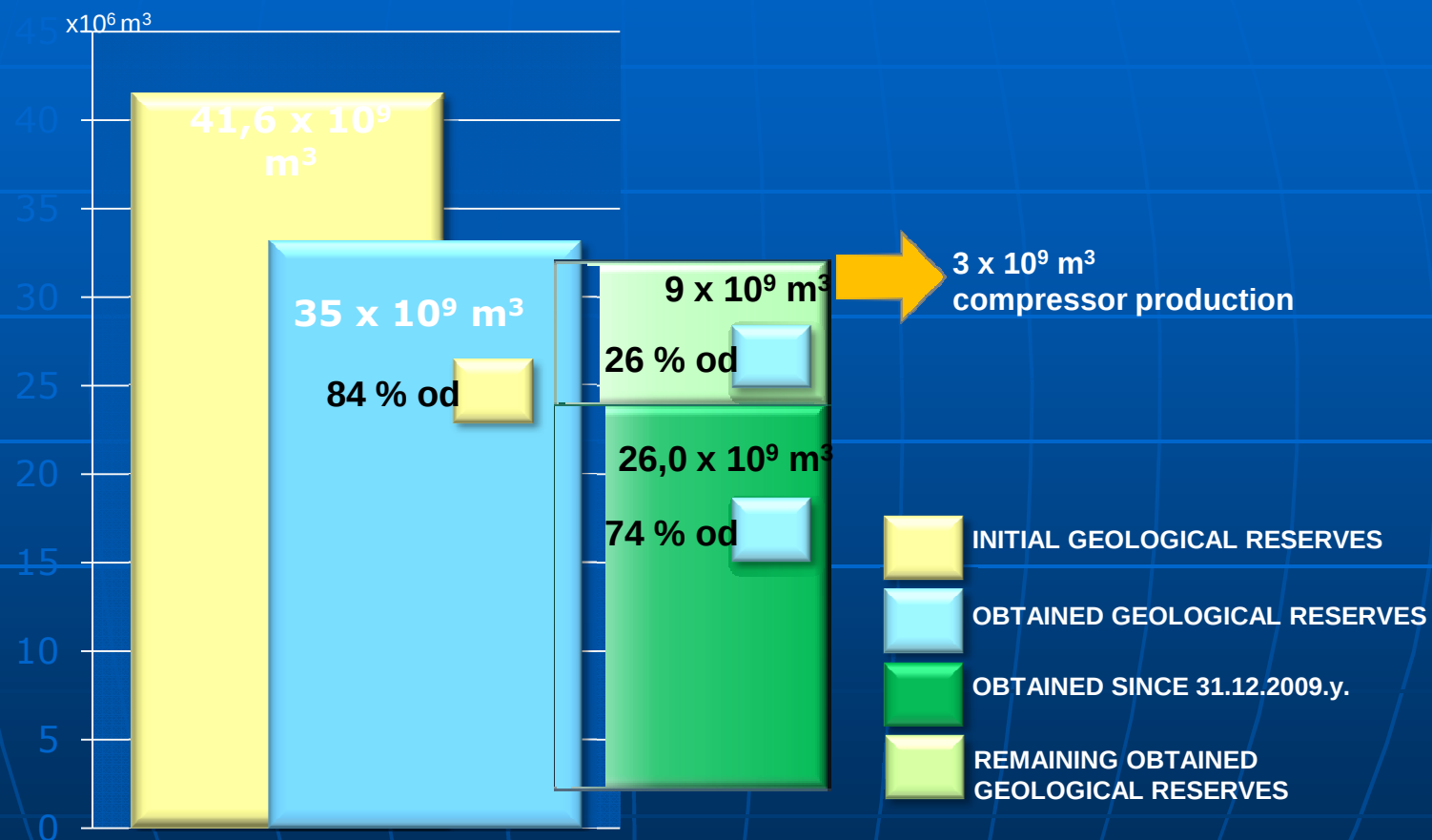
$P_i \approx 400 - 500 \text{ bar}$

$T \approx 180 - 200 ^\circ\text{C}$

PRODUCED GAS COMPOSITION WELL STREAM ANALISYS

% mol	Molve	Kalinovac	Stari Gradac	Gola deep
CO ₂	21,647	11,244	10,386	51,666
N ₂	1,640	1,114	0,815	1,909
Methane	71,177	69,657	66,857	41,286
Ethane	3,359	7,671	7,361	1,828
Propane	1,017	2,621	2,641	0,704
i-butane	0,254	0,699	0,849	0,153
n- butane	0,227	0,788	1,014	0,276
i-pentane	0,088	0,443	0,601	0,116
n- pentane	0,057	0,359	0,513	0,125
hexane	0,109	0,668	1,030	0,537
heptane	0,061	0,942	1,140	0,153
octane	0,041	0,792	1,002	0,184
nonane	0,044	0,617	0,847	0,158
C ₁₀ +	0,279	2,386	4,944	0,904
CGR (cm ³ /m ³)	66	650	1220	185
GCR (m ³ /m ³)	15000	1600	820	5400

FRAMEWORK REVIEW OF GEOLOGICAL RESERVES MOLVE (31.12.2009.)



PROJECT MOLVE I 1978. – 1980.

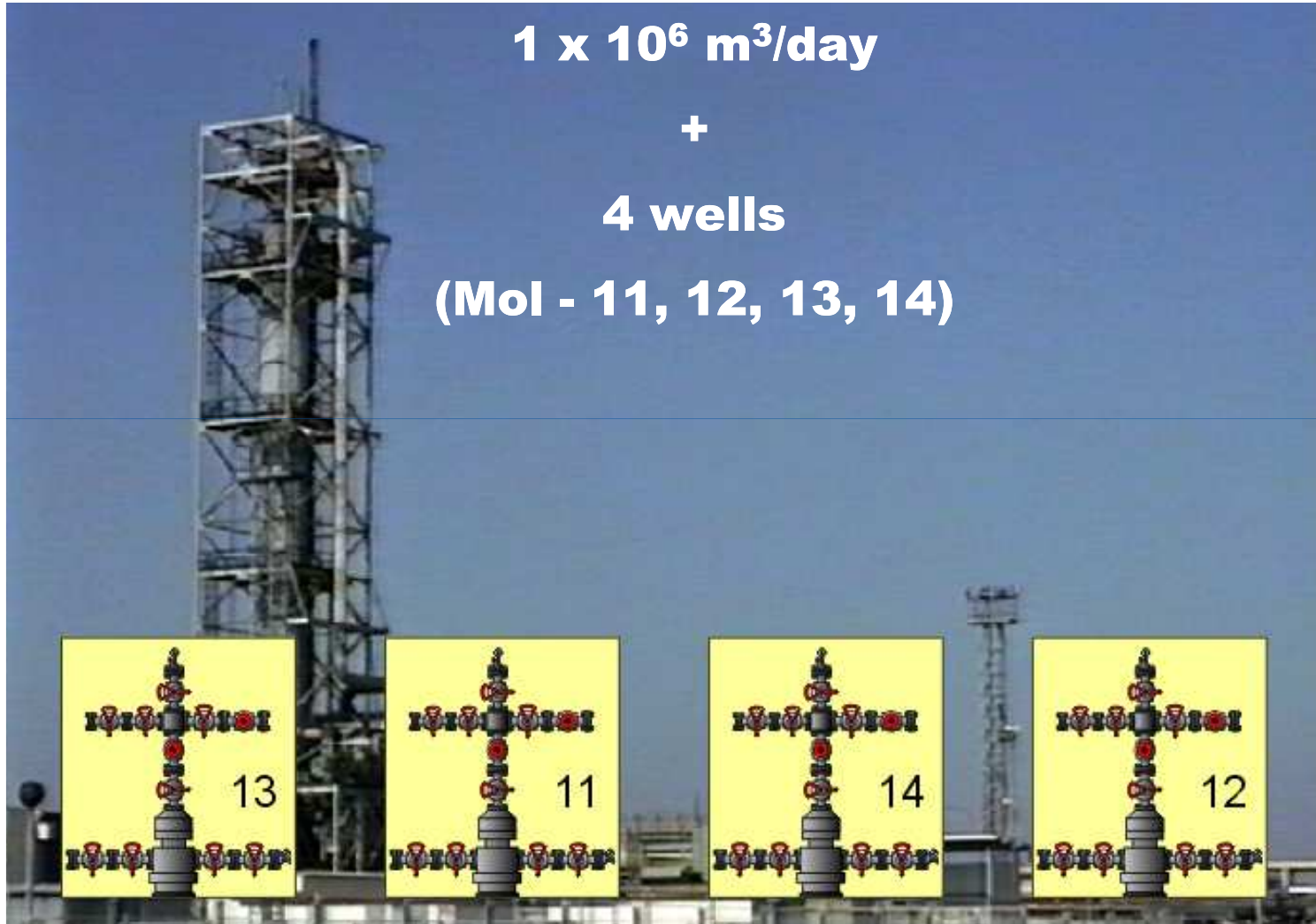
GTP MOLVE I

$1 \times 10^6 \text{ m}^3/\text{day}$

+

4 wells

(Mol - 11, 12, 13, 14)



PROJECT MOLVE II 1981. – 1984.

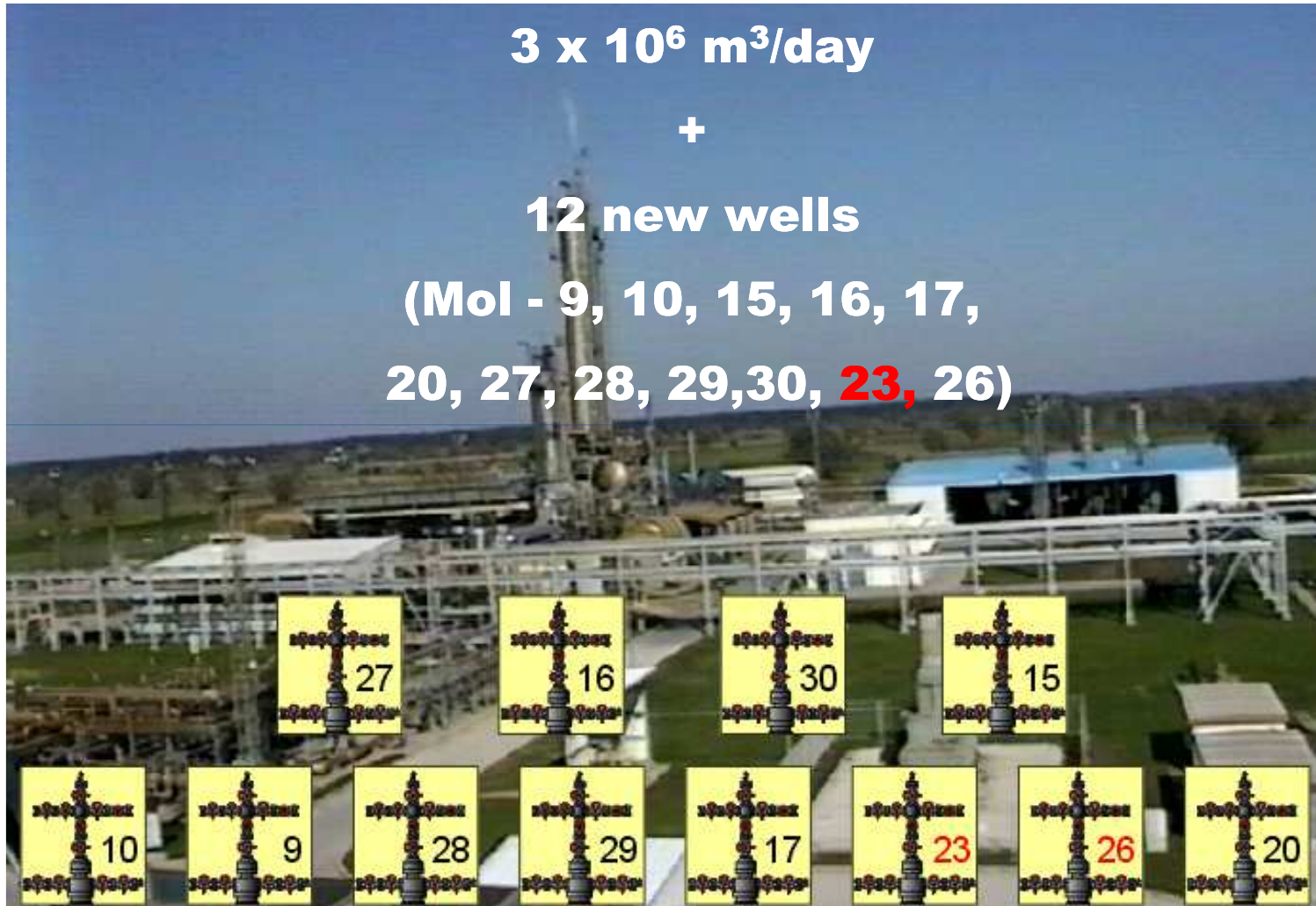
GTP MOLVE II

$3 \times 10^6 \text{ m}^3/\text{day}$

+

12 new wells

(Mol - 9, 10, 15, 16, 17,
20, 27, 28, 29, 30, **23**, 26)



PROJECT PODRAVINA 1987. – 1993.

GTP MOLVE III

$5 \times 10^6 \text{ m}^3/\text{day}$

+

SGS Stari Gradac (4 wells)

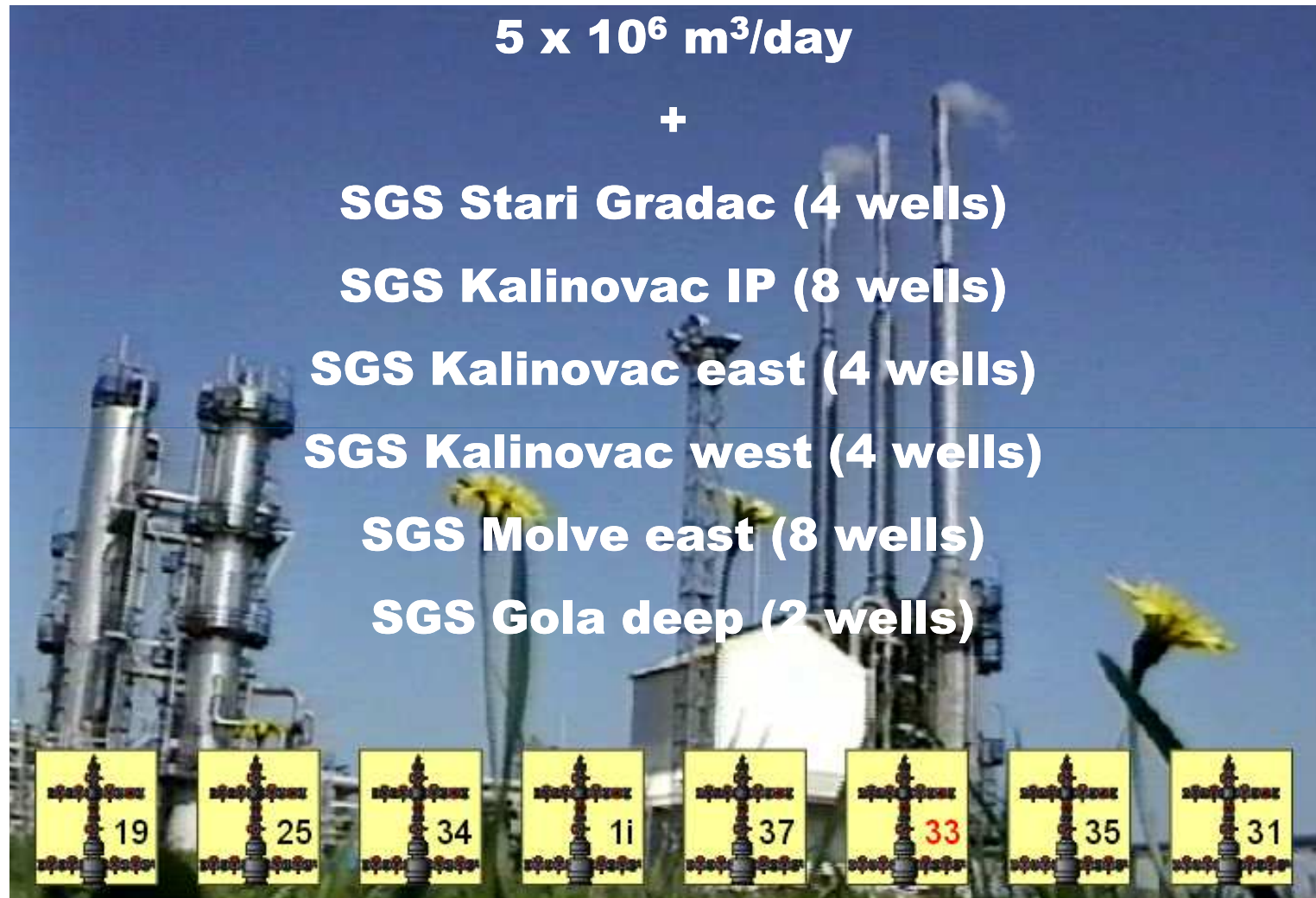
SGS Kalinovac IP (8 wells)

SGS Kalinovac east (4 wells)

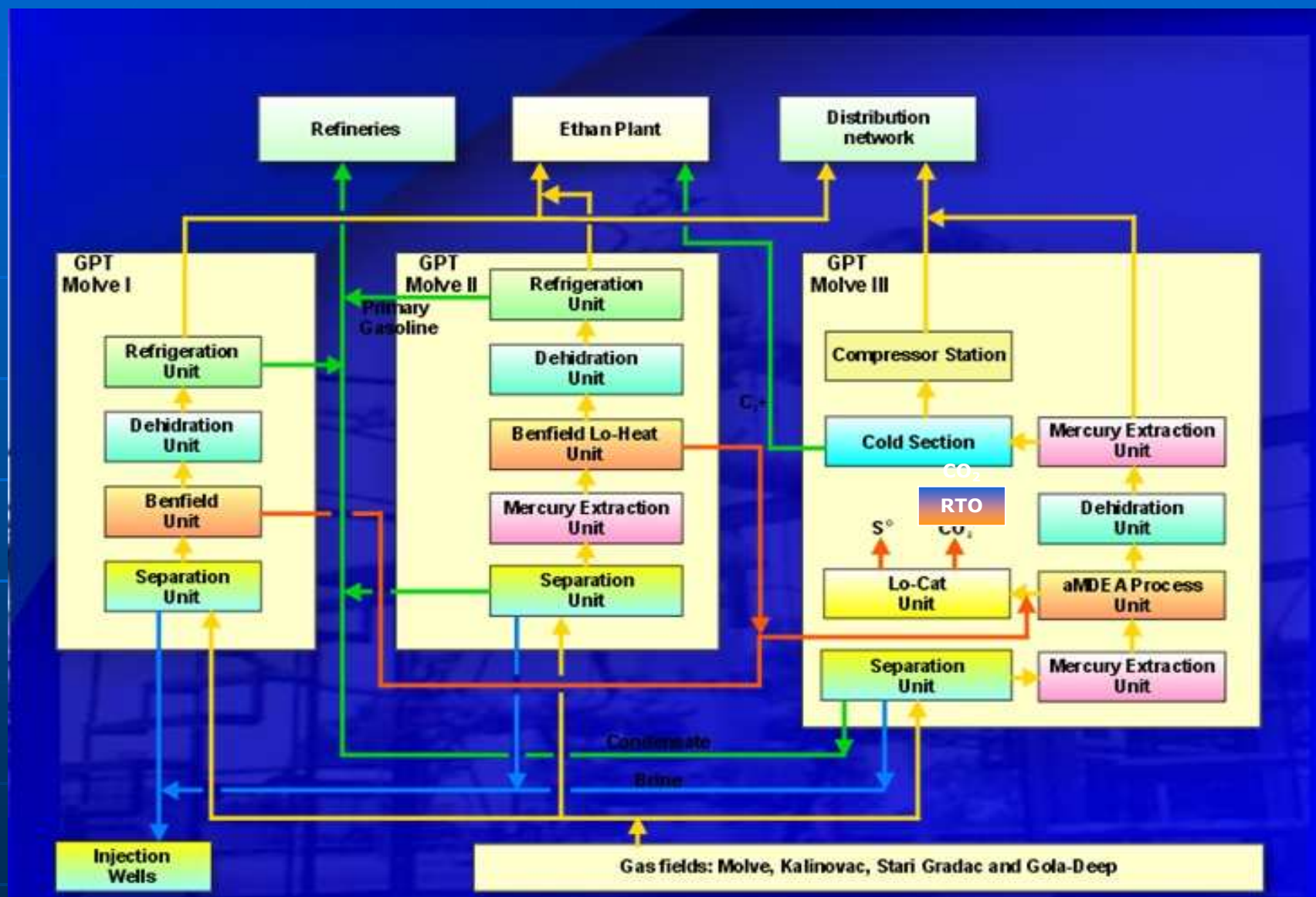
SGS Kalinovac west (4 wells)

SGS Molve east (8 wells)

SGS Gola deep (2 wells)



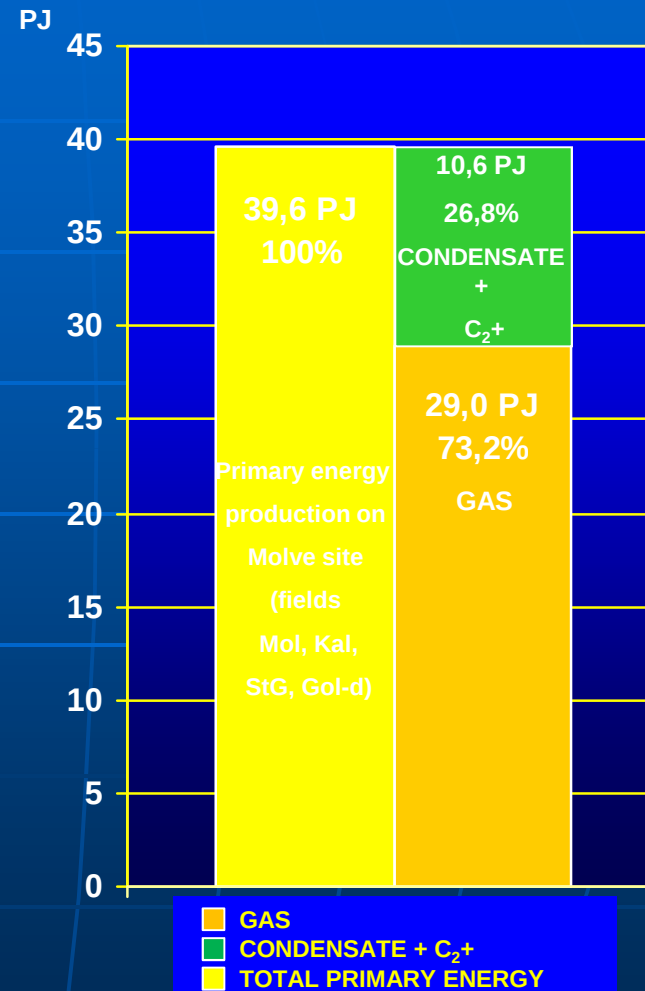
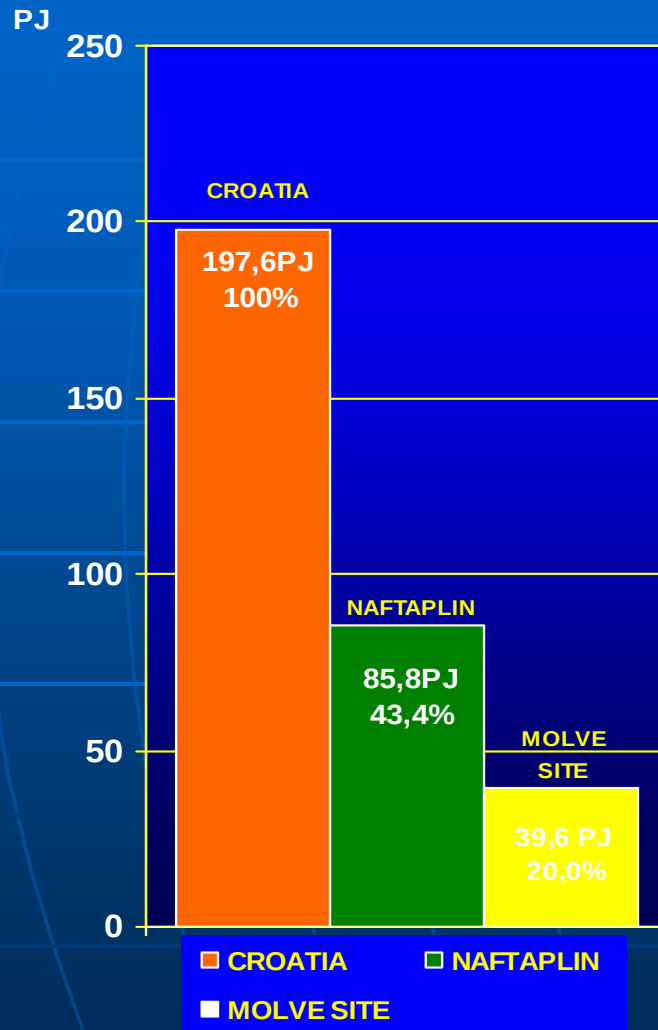
PROCESS FLOW DIAGRAM ON GTP MOLVE I, II i III



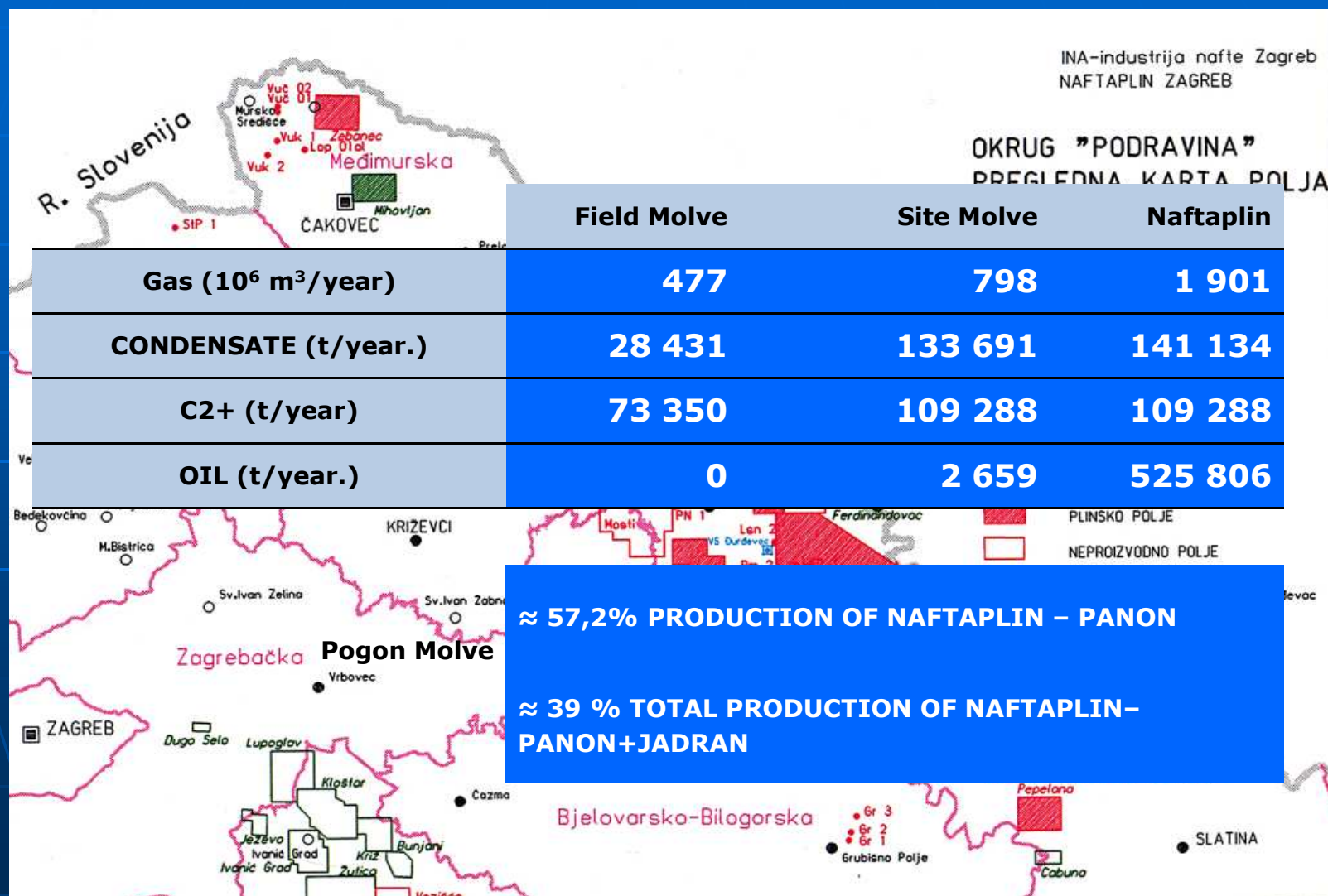
GAS AND CONDENSATE OBTAINED IN MOLVE FIELD SINCE 1981. UNTIL 31.12.2009.



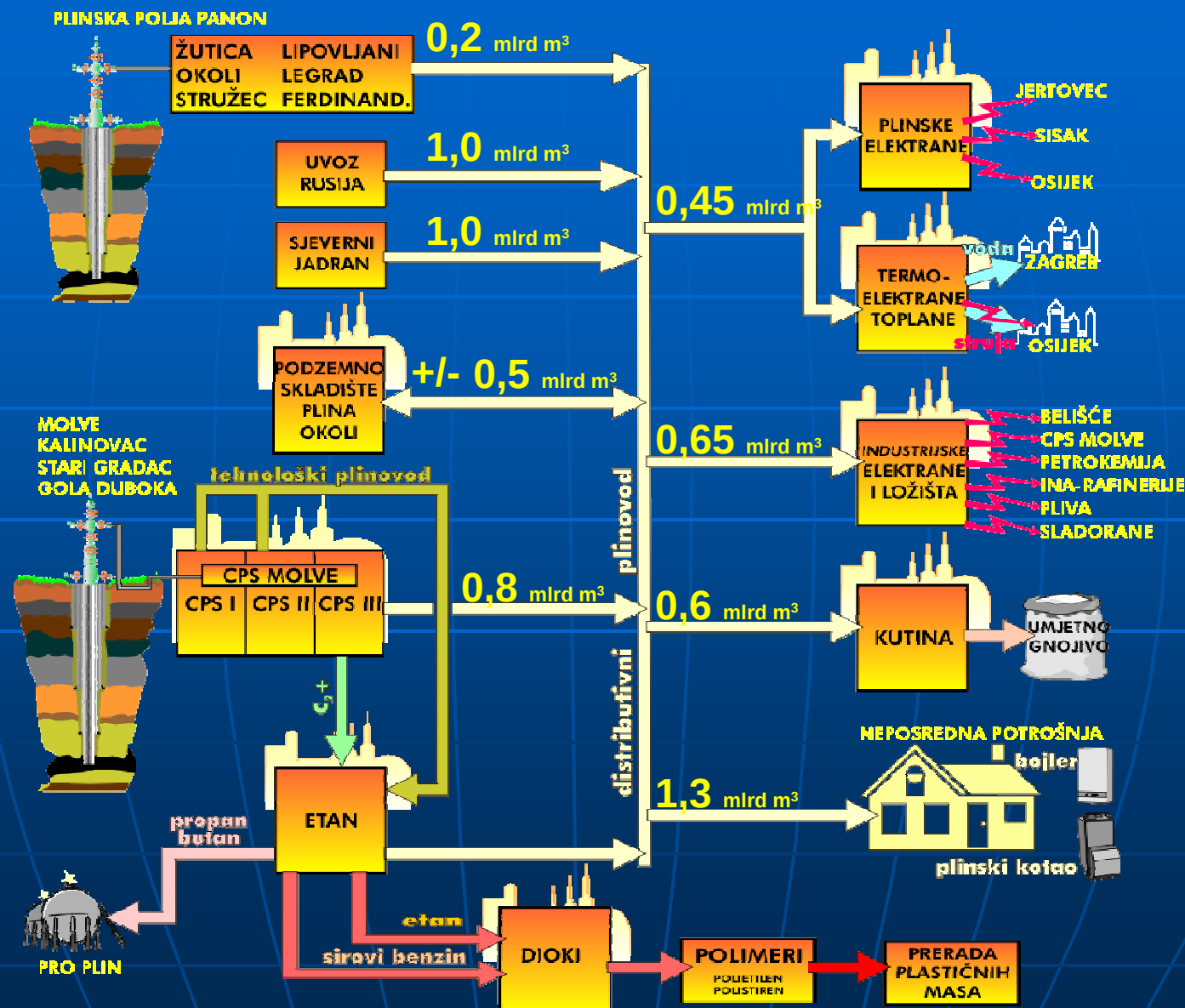
PRIMARY ENERGY PRODUCTION IN CROATIA IN 2009. (hydro power, coal, fuel wood, crude oil, natural gas)



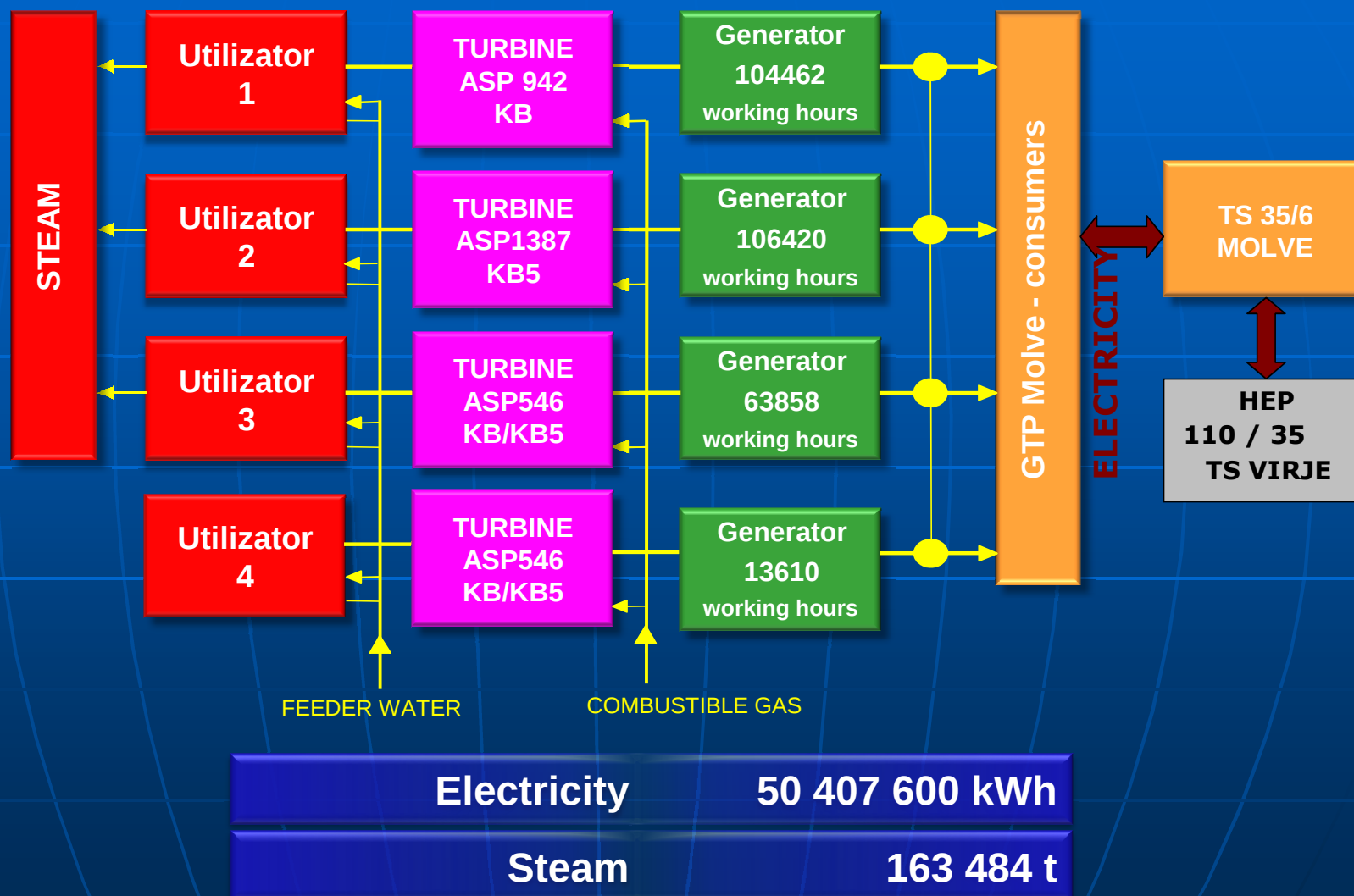
CONTRIBUTION OF PRODUCTION MOLVE PLANT FOR HYDROCARBON PRODUCTION IN 2009. g.



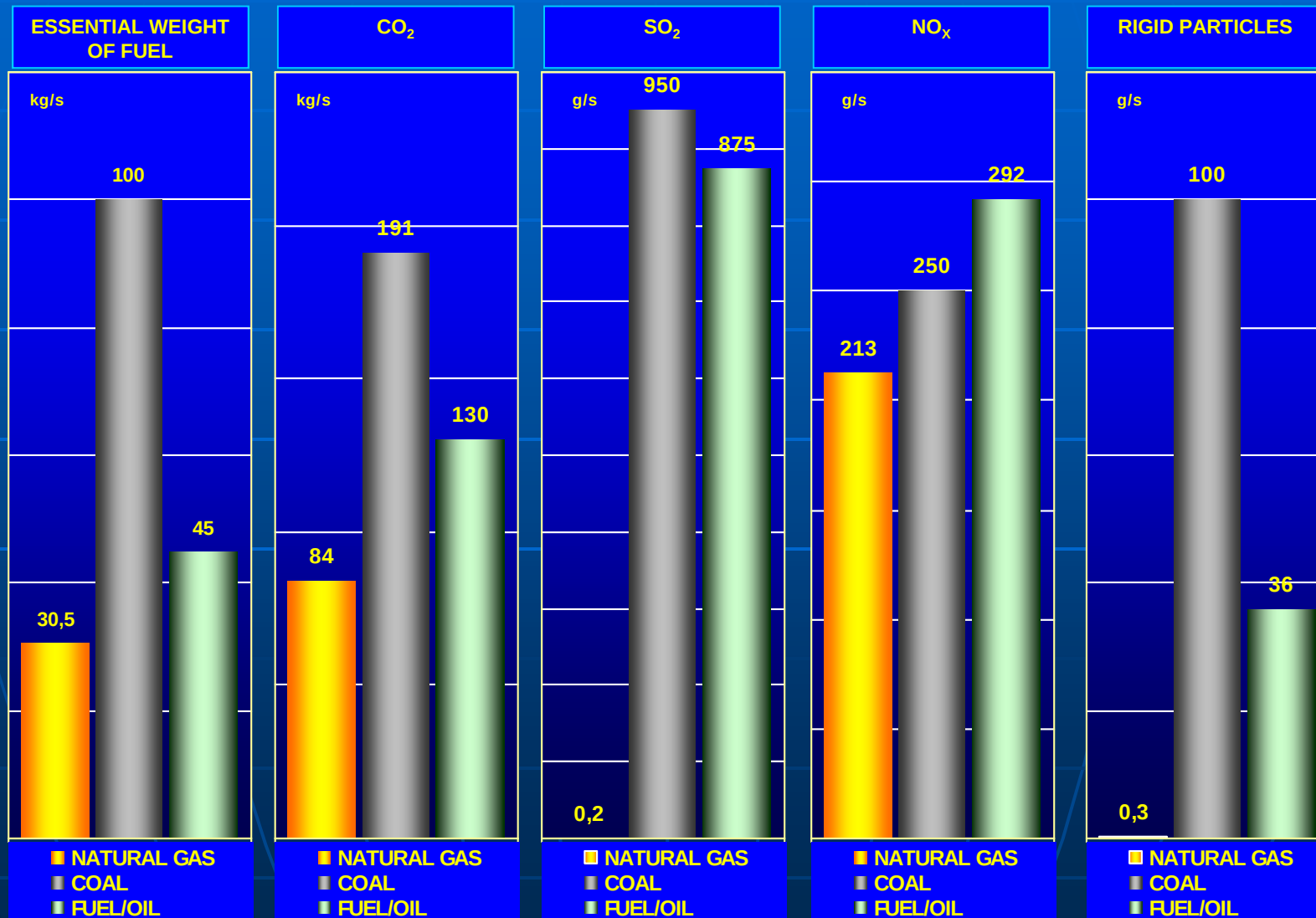
DISTRIBUTION OF NATURAL GAS PRODUCTION AND CONSUMPTION



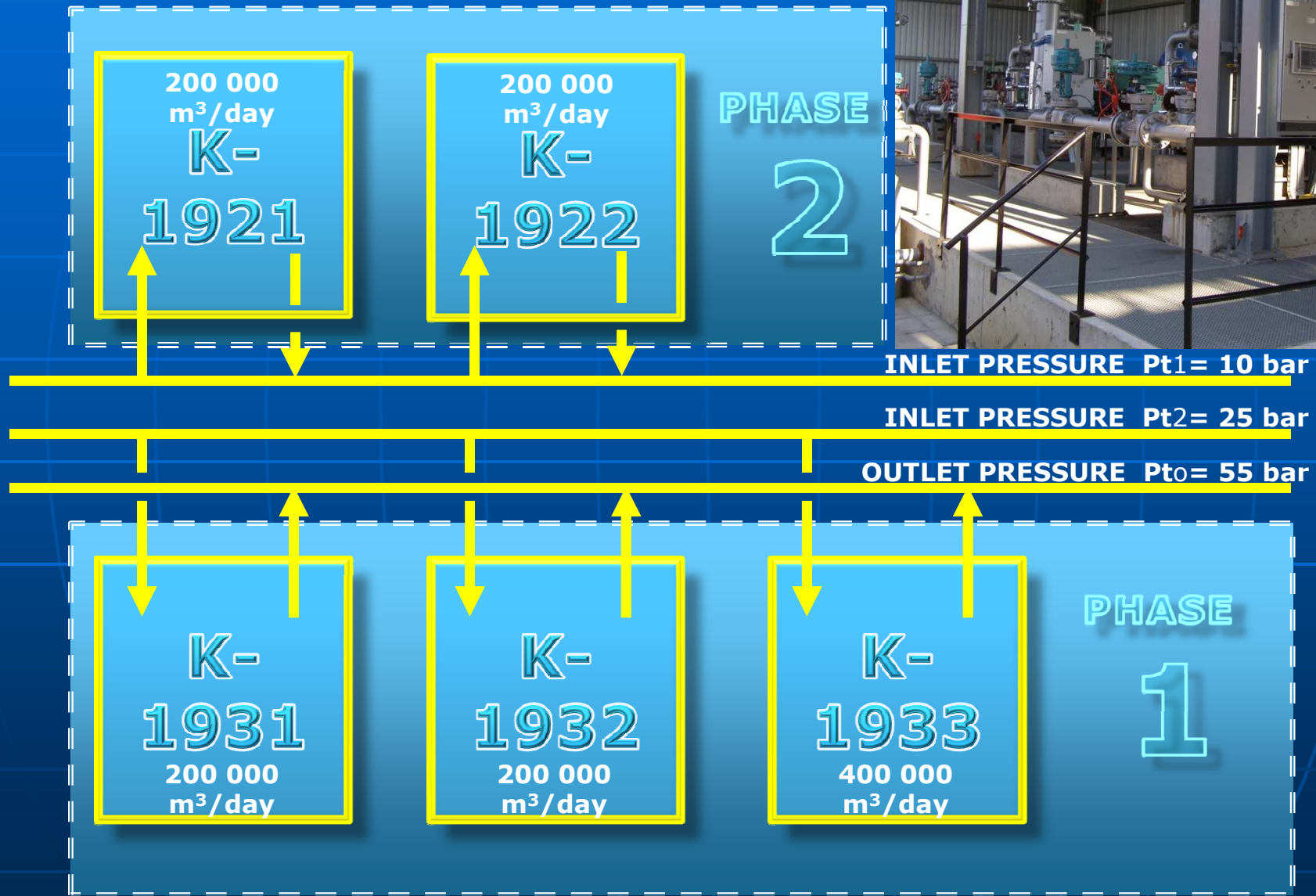
PRODUCTION OF ELECTRICITY AND STEAM IN POWER ENERGY BLOCK IN GTP MOLVE FOR 2009.



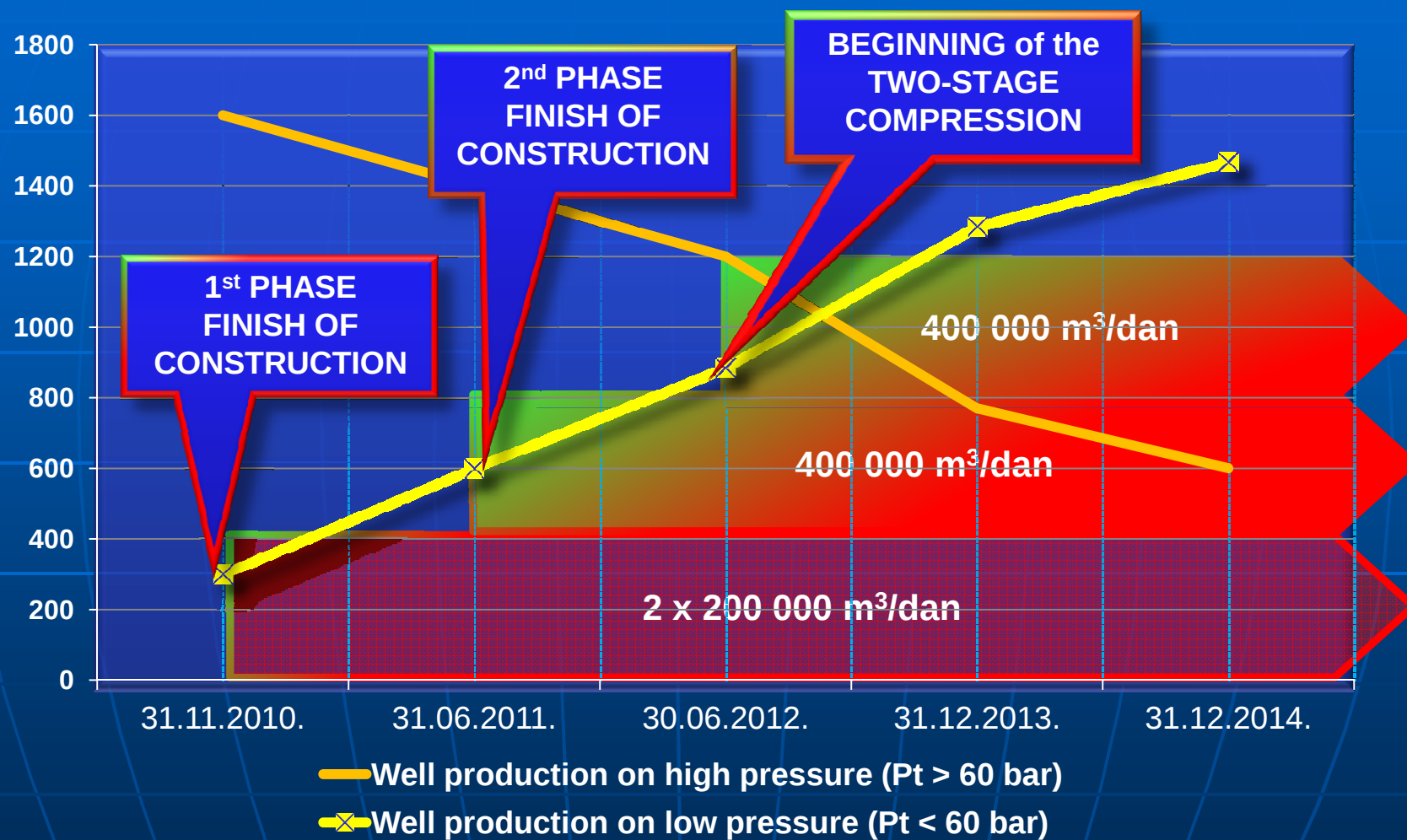
COMPARISON OF EMISSIONS OF POLLUTANTS DURING ENERGY PRODUCTION FROM FOSSIL FUELS (energy equivalent 1000 MJ)



BEGINING OF THE LAST PHASE OF PRODUCTION: COMPRESSOR STATION MOLVE



COMPRESSOR STATION MOLVE



PROJECTS IN PROGRESS





Ines Hemetek - Potroško

Thank you!

Society of Petroleum Engineers