



VÍTKOVICE

MACHINERY GROUP



VÍTKOVICE
VÍTKOVICE CYLINDERS a.s.

GREEN TECHNOLOGY IN VÍTKOVICE CYLINDERS a.s.



VÍTKOVICE

MACHINERY GROUP

GENERAL PARTNER

**EXPO
2010**

Shanghai, Czech Republic

VITKOVICE MACHINERY GROUP

- We are the most important Middle European engineering group with a strong position in selected segments of machinery production and in the area of supplies of large investment assemblies.
- Traditional manufacturing of products in series and engineering fields were complemented with two new areas:
 - Green Technology - CNG and Biogas,
 - Information Technologies.
- We incorporate approximately sixty companies.
- VITKOVICE trade mark celebrated its 180th anniversary.



LOCATION



VÍTKOVICE

MACHINERY GROUP

Ostrava, Czech Republic, Europe

vitkovice.com

HISTORY



1828

Foundation of Vítkovice steelworks by order of an enlightened Archbishop of Olomouc, Archduke Rudolf Jan.



1843

Arrival of a new majority owner, Viennese banker Salomon Mayer Rothschild.



1873

Creation of Mining and Metallurgical Group of Vítkovice, at which head was in 1876 appointed a timeless manager Paul Kupelwieser.

HISTORY



1946

A nationalized company Vítkovice Ironworks was established.



1992

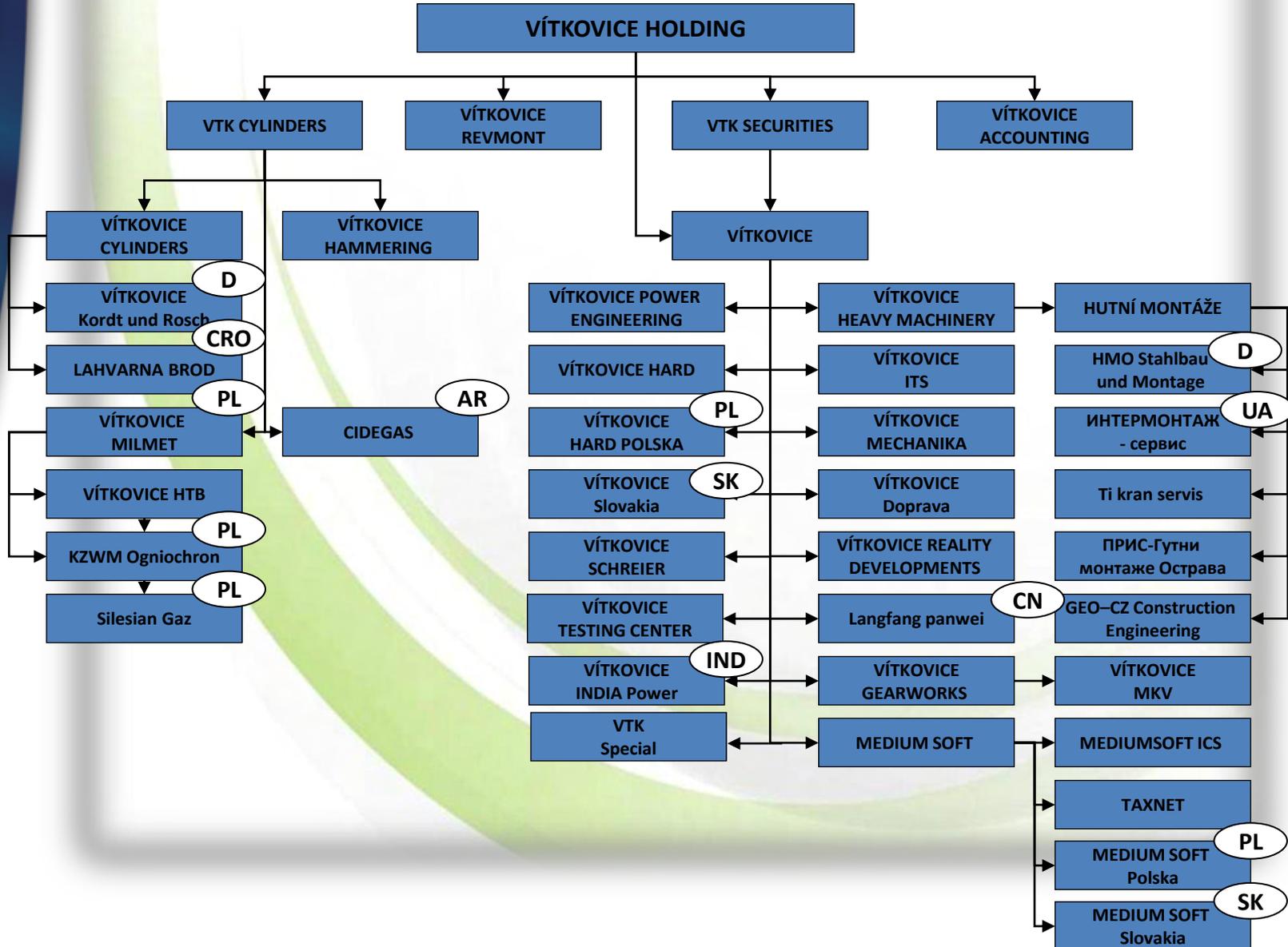
A joint-stock company VÍTKOVICE was established.



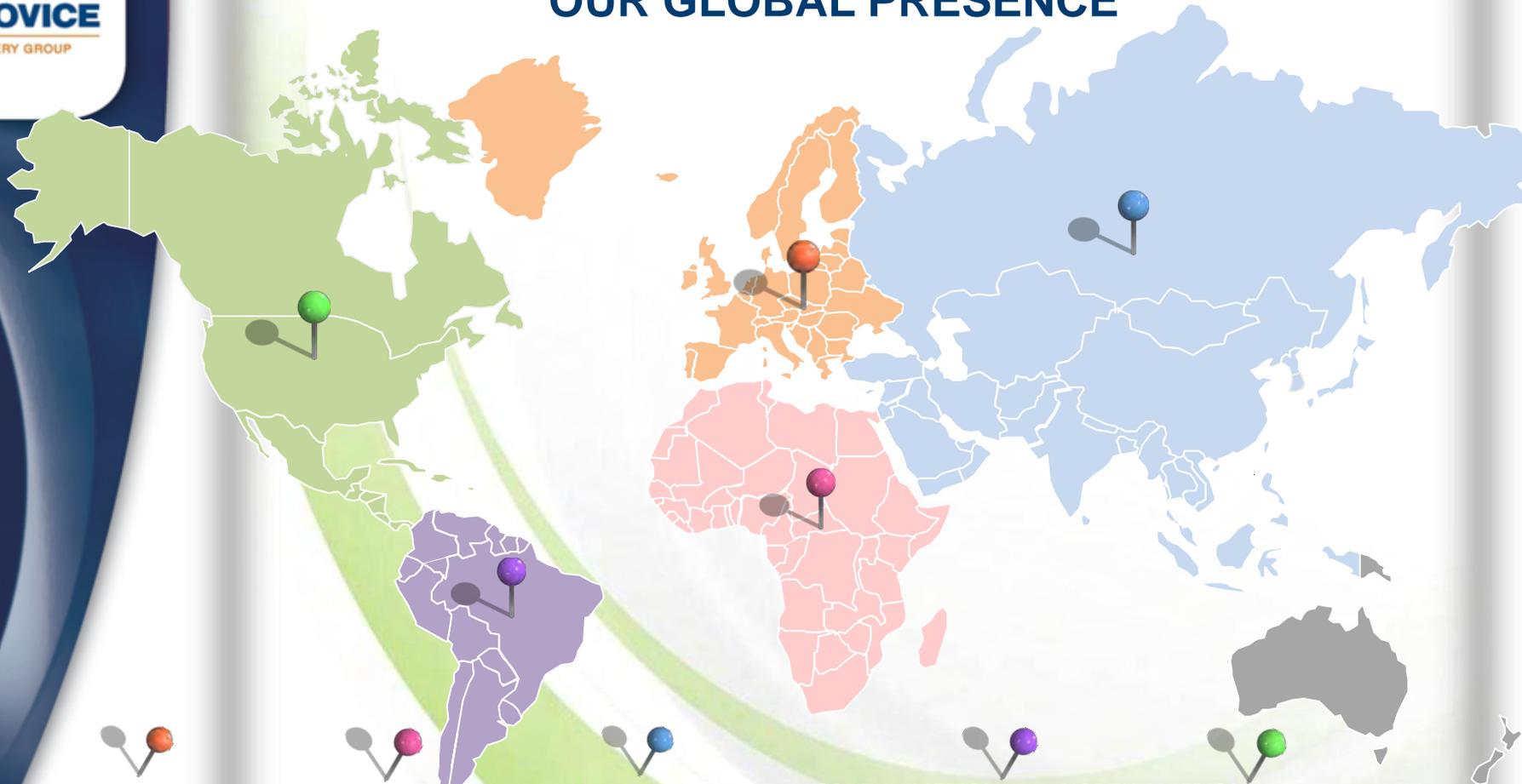
2003

VÍTKOVICE was transferred into hands of a private owner and the company set out on its way towards acquiring the leading market position.

STRUCTURE



OUR GLOBAL PRESENCE



EUROPE

- Portugal
- France
- Holland
- Germany
- Italy
- Norway
- Finland
- Etc...
- Spain
- Great Britain
- Belgium
- Austria
- Switzerland
- Sweden
- Greece

AFRICA

- Morocco
- Algeria
- Tunis
- Sudan
- Egypt
- South Africa
- Etc...

ASIA

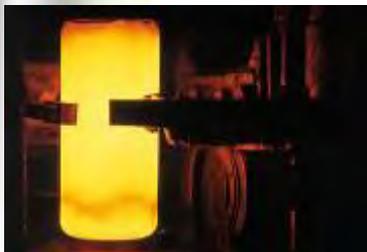
- China
- Korea
- Japan
- Russia
- India
- Saudi Arabia
- Etc...
- UAE
- Pakistan
- Israel
- Indonesia
- Vietnam

SOUTH AMERICA

- Brazil
- Argentina
- Venezuela
- Chile
- Columbia
- Ecuador
- Etc...

NORTH AMERICA

- USA
- Cuba



METALLURGY



**HEAVY
MACHINERY
& ENGINEERING**



**POWER
SYSTEMS
ENGINEERING**



**STEEL
STRUCTURES**

KEY AREAS OF OUR ACTIVITY

**STEEL
CYLINDERS
& VESSELS**



**TRANSPORT
ENGINEERING**



**EXTINGUISHING
TECHNOLOGY**



SERVICES



TECHNOLOGICAL APPROACH



OUR STRATEGY

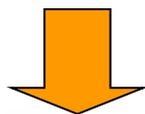


OUR CONCEPTION OF GREEN TECHNOLOGY



BIOGAS PURIFICATION

BIOGAS STATION



**BIOGAS
PURIFICATION**

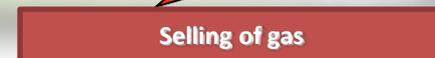


CLEANED BIOGAS = NATURAL GAS

FILLING STATION



Selling of gas



ADVANTAGES OF COMPRESSED NATURAL GAS (CNG)

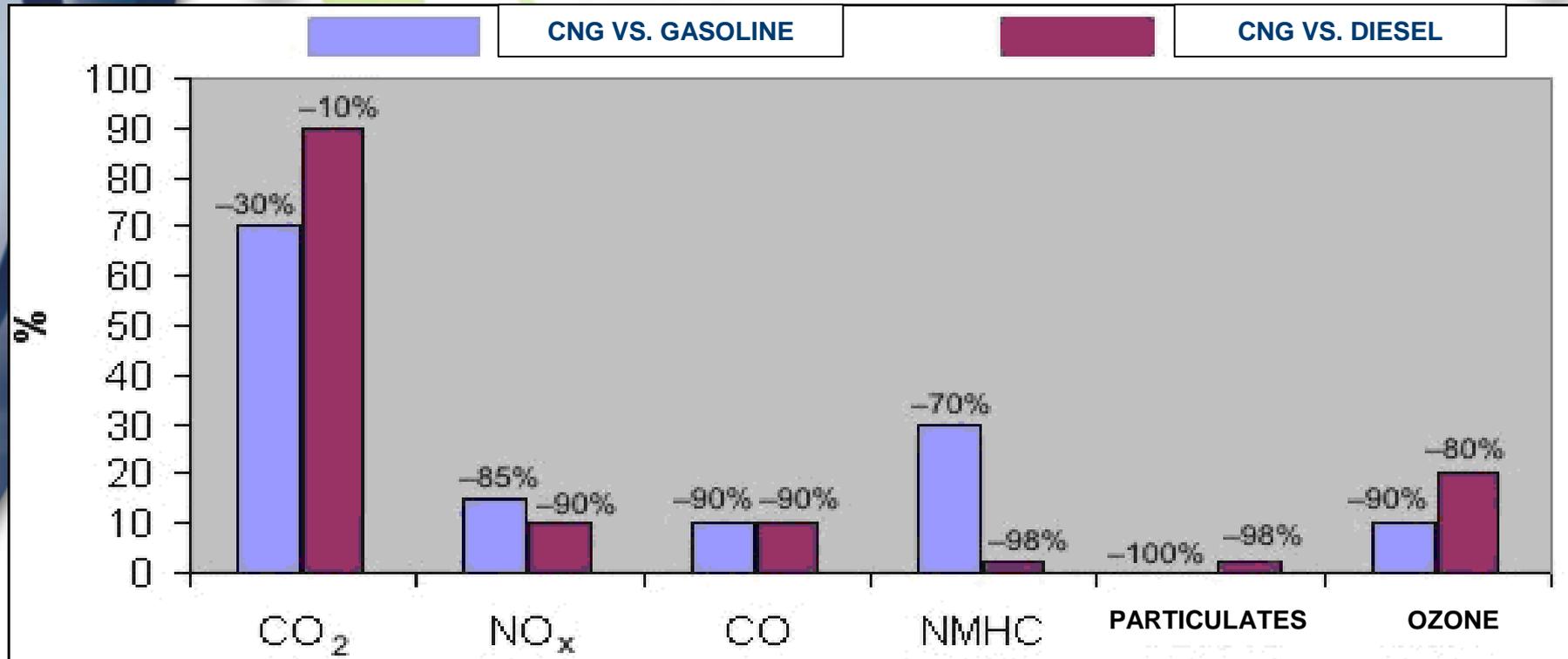
- ecology
- the cheapest fuel
- big reserves of natural worldwide = alternative fuel of the future (estimated reserves for 150 years)
- high technologies for use of CNG



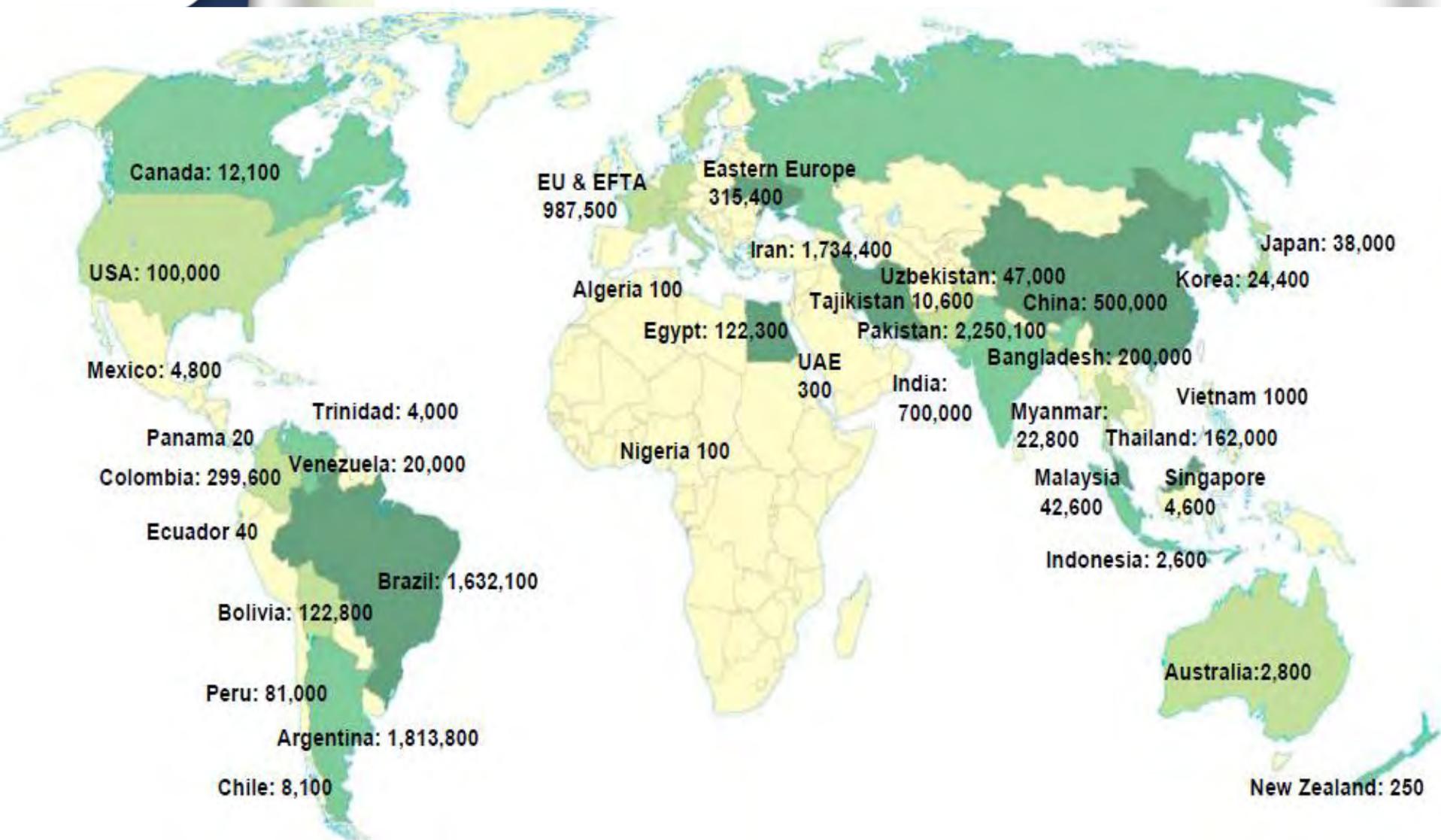
Air pollution caused by automobiles and buses is a major problem in many countries

NATURAL GAS – THE CLEANEST FUEL

Many countries are using NGVs to solve their air pollution problems (NO_x, SO_x, CO, Particulates, Aromatics, etc.)



NATURAL GAS WORLDWIDE



VITKOVICE MACHINERY GROUP AND CNG

CNG in transport = CORE BUSINESS of VMG

Contains:

- ❑ **Production of high-pressure seamless steel cylinders in the Czech rep., Poland and Argentina (production capacity approx. 1 million of steel cylinders / year)**
- ❑ **Delivery of turn-key projects related to the CNG business – Filling stations, storage systems, trailers, virtual pipeline systems, conversion of cars**



HIGH PRESSURE SEAMLESS STEEL CYLINDERS

STEEL CYLINDER = BASE UNIT FOR ALL CNG APPLICATIONS

- ❑ World leader in manufacturing of steel cylinders – production by reverse extrusion
- ❑ weight ratio 1l / 0,9kg
- ❑ Tradition of production of high pressure steel cylinders of more than 100 years
- ❑ Production of CNG cylinders up to 406 mm of external diameter
- ❑ Standards and norms for natural gas(CNG), ECE R110, ISO 11 439, NZS 5454, COVENIN 3226



History

- 1906 - The beginning of the steel cylinders production
- 1938 - World exhibition in Paris
- 1945 - 50 – Renewal of the production of steel cylinders
- 1961 - The beginning of the production of grinding balls
- 1991 - The billet production by reverse extrusion started
- 1997 - The production of quenched grinding balls initiated
- 8/2007 - Production of 10-millionth cylinder
- 2008 - The production of big-sized pressure vessels started



HIGH PRESSURE SEAMLESS STEEL CYLINDERS

Production plants of cylinders in VMG

1) Czech Rep.(EU): VÍTKOVICE CYLINDERS a.s.



2) Poland (EU):
VÍTKOVICE MILMET S.A.



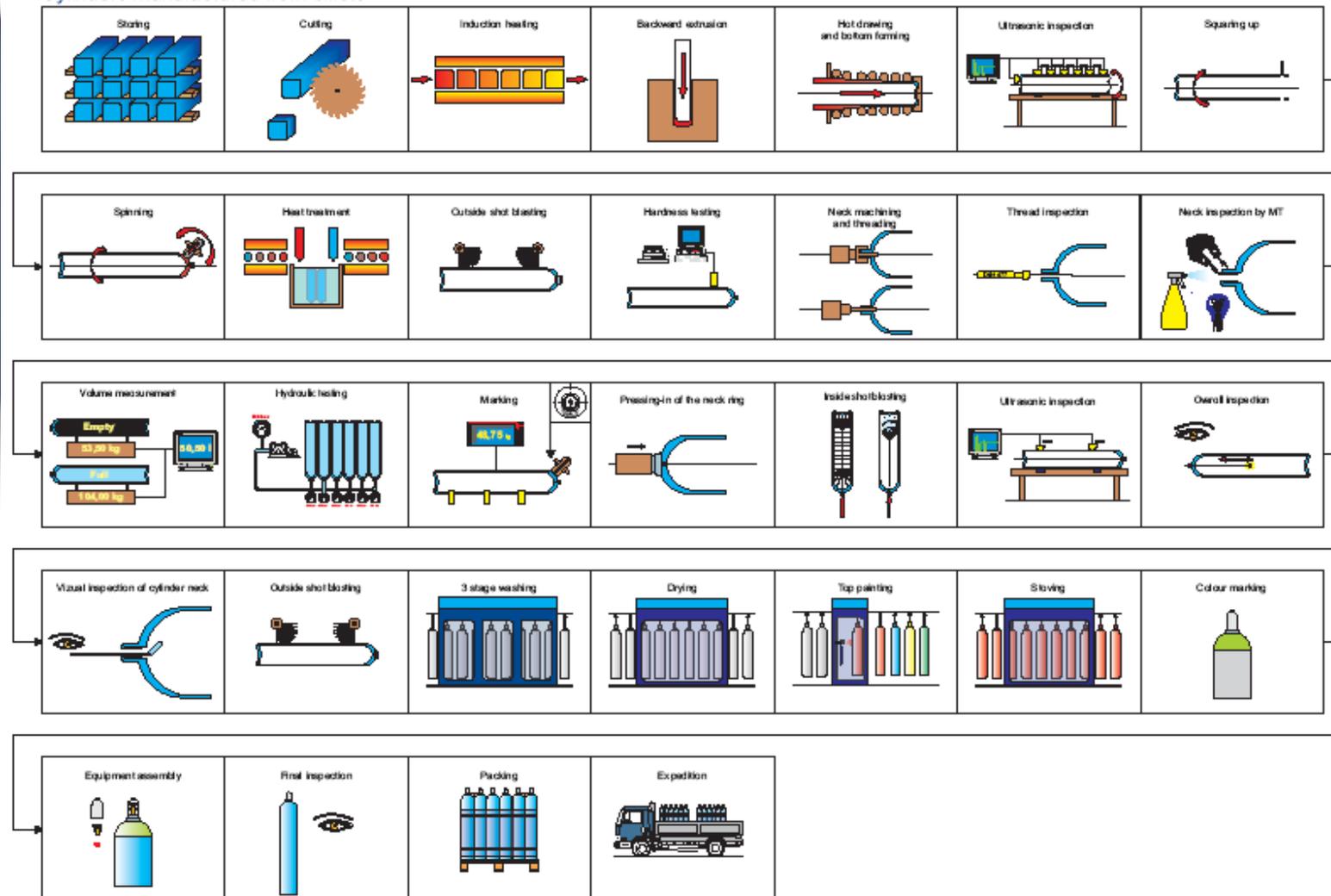
3) Argentina (South America):
CIDEGAS S.A.



Inspections in technological route

Technological route of cylinder production - plant 3

Cylinders manufactured from billets



CNG FILLING STATIONS



Big - sized filling stations
„Flash Filling Station“

- Flow rate 250 – 3000 Nm³ / h
- In-house or commercial use
- Perfect choice for company fleets – buses,...



Middle – sized filling stations
„Fast filling“

- Flow rate 20 – 250 Nm³ / h
- In-house or commercial use
- Best choice for company fleets– taxis, bakeries, delivery services, forklifts, municipalities, etc.



Small – sized filling stations
„Domestic“

- Slow filling technology
- Best choice for 1-2 vehicles

CNG FILLING STATIONS

1) Small – sized filling stations

Technical parameters

- Output at 15 C and 200 bar max. 5 m³/h
- 3 stage compressor oil lubricated
- Motor 2 kW / 3 x 400 V / 1410 ot./min. / 10 A
- Gas meter integrated, Automatic filling process control
- Max. filling pressure 235 bar
- Inlet gas pressure Min.- Max. 0,02 – 0,2 bar
- Ambient temperature 5-45 C (option-15 – 50 C)
- Dimensions 600 x 1050 x 780 mm
- Weight 120 kg
- Noise level at 5 m 49 dB

Slow filling within several hours



CNG FILLING STATIONS

2) Middle – sized filling stations

- ✓ Flow rate 20 – 250 Nm³/h
- ✓ modular solution of compressor's and storage units – any unit can be added
- ✓ More compressors securing continual filling process in case of any fall - out
- ✓ Perfect choice for company fleets – taxicabs, bakeries, fleets for delivery services, forklifts, municipalities, etc.
- ✓ Cost price of natural gas without any mark - up



CNG FILLING STATIONS



- **3) Big– sized filling stations**
- **FLASH Filling Station** under the brand **CNGvital**
- Flow rate 250 – 3000 Nm³/h
- Technology according to the client´s need
- wide range of CNG filling stations of high quality (200, 250, 300, 330 bar) including financing, turn-key deliveries and on-line service



STORAGE SYSTEMS

- Cylinder's applications for storing and transport of CNG, CBG, alternatively technical gases
- Working pressures
200, 250, 300, 330 bar
- Modular systems
to increase total volume



CONTAINERIZED STORAGE SYSTEMS AND TRAILERS

Purpose of use:

- a) As a **VIRTUAL PIPELINE SYSTEM**, i.e. supply of natural gas to the areas with no gas pipeline system:
- Daughter's stations
 - Households
 - Industrial areas
- b) Reserve solution of supply of natural gas in case of any fall-out



CONTAINERIZED STORAGE SYSTEMS

- Transport of containerized storage systems by hook trucks
- Up to 10 000 Nm³ of gas to be transported
- Possible modification of technical solution according to the client's needs



TRAILERS

- Transport on trailers
- Up to 10 000 Nm³ of gas to be transported
- Possible modification of technical solution according to the client's needs





VITKOVICE

MACHINERY GROUP

VITKOVICE CYLINDERS a.s.

Ruská 24/83, 70600 Ostrava – Vítkovice
Czech Republic

T+420 596 664 622 F +420 596 664 730

www.vitkovicencylinders.cz

VITKOVECE-MILMET s.a.

Member of VITKOVICE Group

41-200 Sosnowiec

Poland

T+4832 291 8595 F+4832 291 4477

www.milmet.eu

Sales Representative

Valery Gavrilov

Towit Machinery Trading AG

8590 Romanshorn, Switzerland

T+41 71 466 4700 F+41 71 466 4719

valery.gavrilov@towit.ch



PRODUCT OF VITKOVICE



CNGvitall
COMPRESSED NATURAL GAS



VITKOVICE

MACHINERY GROUP

GENERAL PARTNER

**EXPO
2010**

Shanghai, Czech Republic