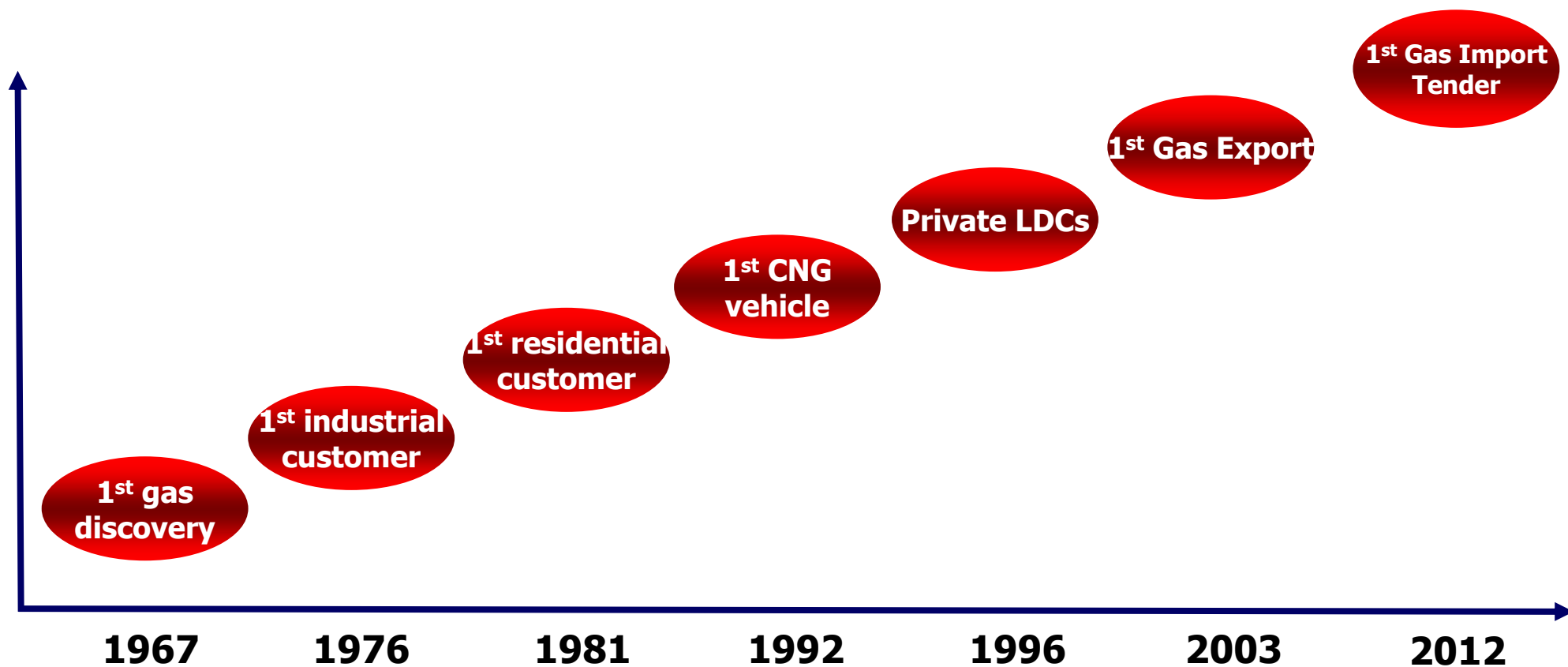


DEVELOPMENT OF NATURAL GAS IN EGYPT

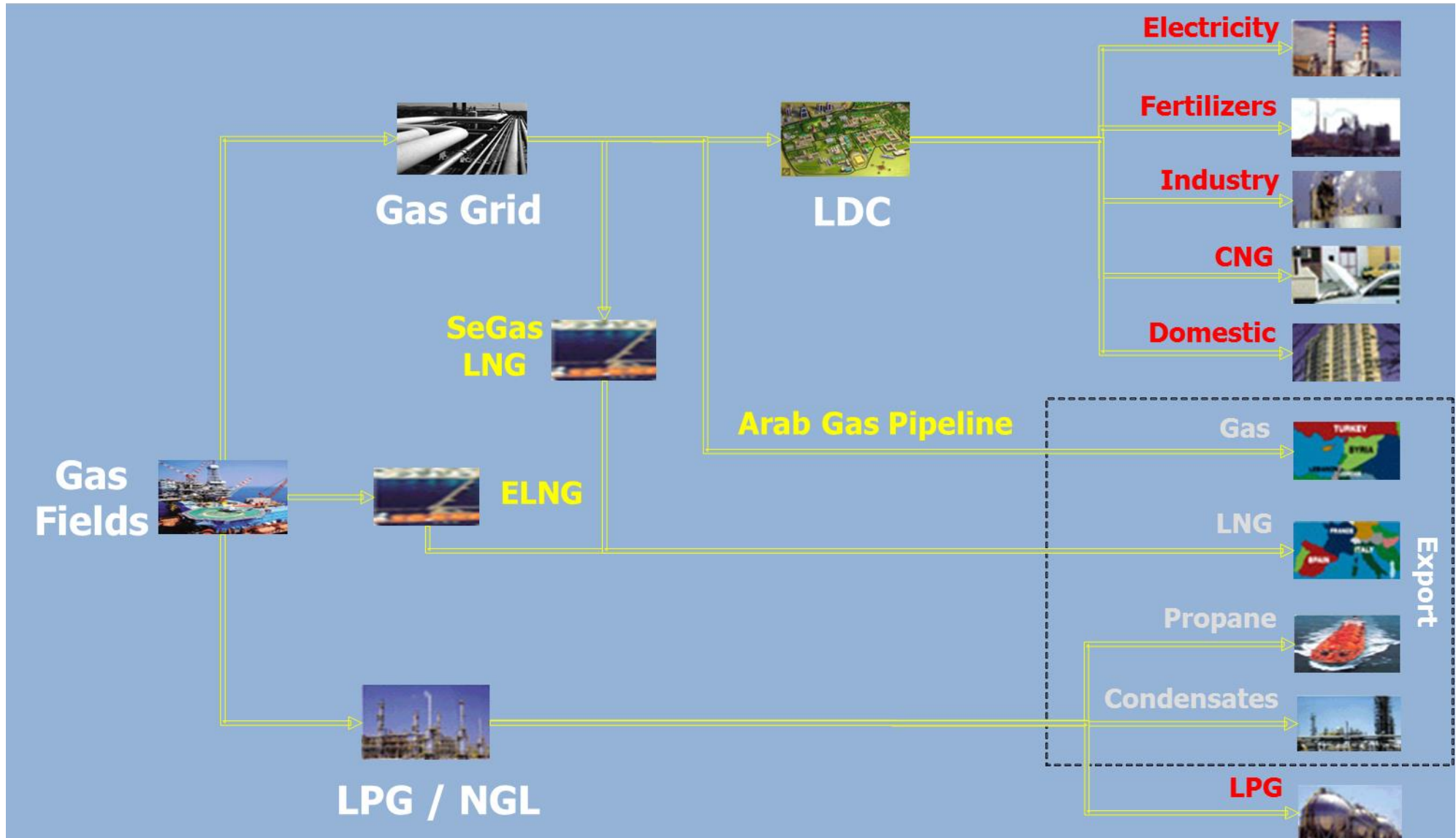


Egyptian Gas Sector – Key Milestones

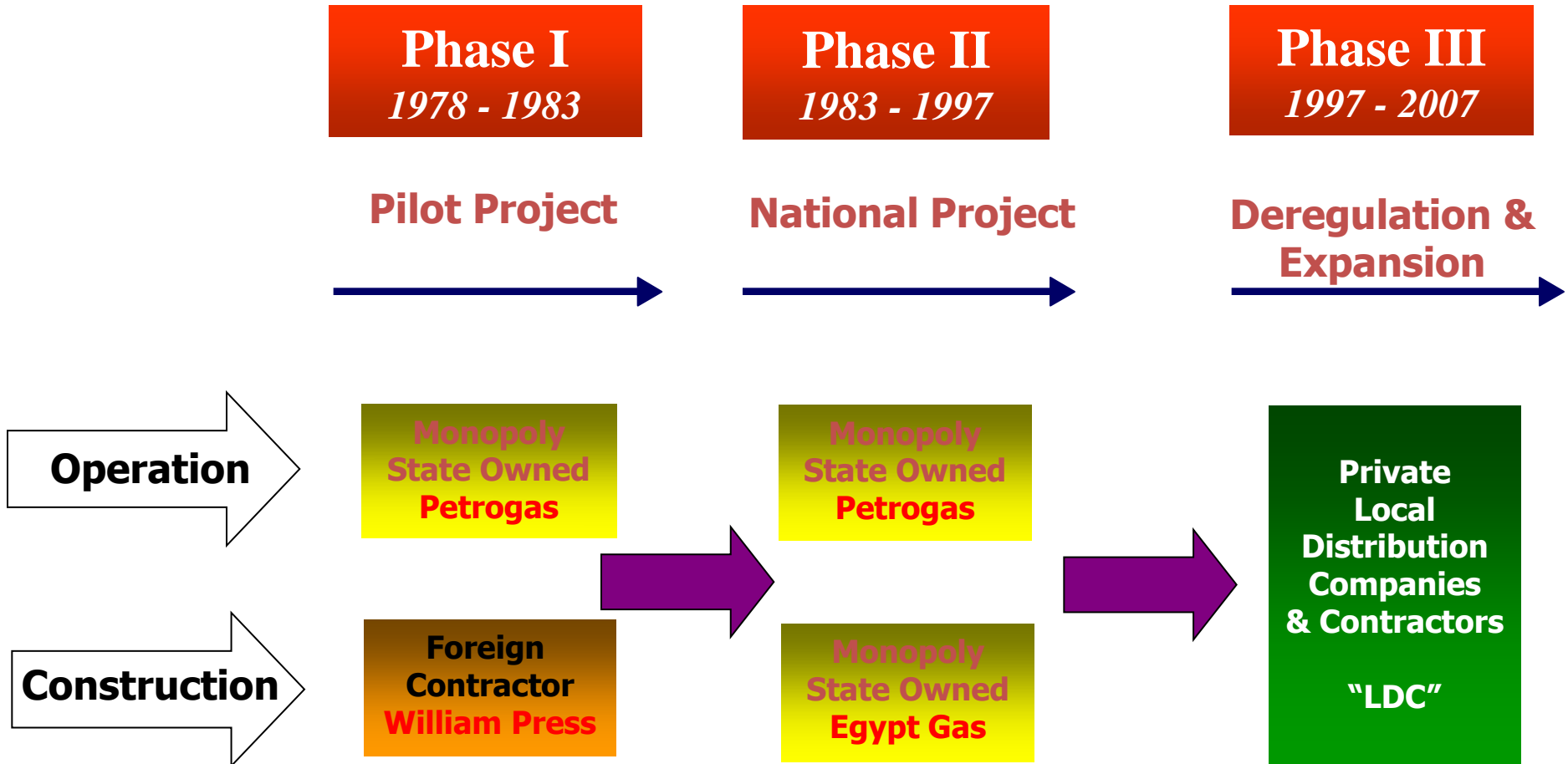


In 2012, natural gas share in Egypt total energy consumption: **55%**

Natural Gas Sector Egypt



I - Deregulation Development – Monopoly - LDC



Egypt's Strategic Investment/Development Rationale

Egypt's Economic Growth Vs. Energy Challenges

- Large increase in energy demand to 13 % annually
- Economy growing at 7.2% before 2008 Global crisis
- Energy subsidy increased from 30 B EGP in 2004 to 74 B in 2012.
- National plan to convert additional 4 million customers to natural gas, to the existing 3 million
- Government need to increase Power Generation capacity from 25 GW to 75 GW by 2030

Government Solutions Creating Market Opportunities

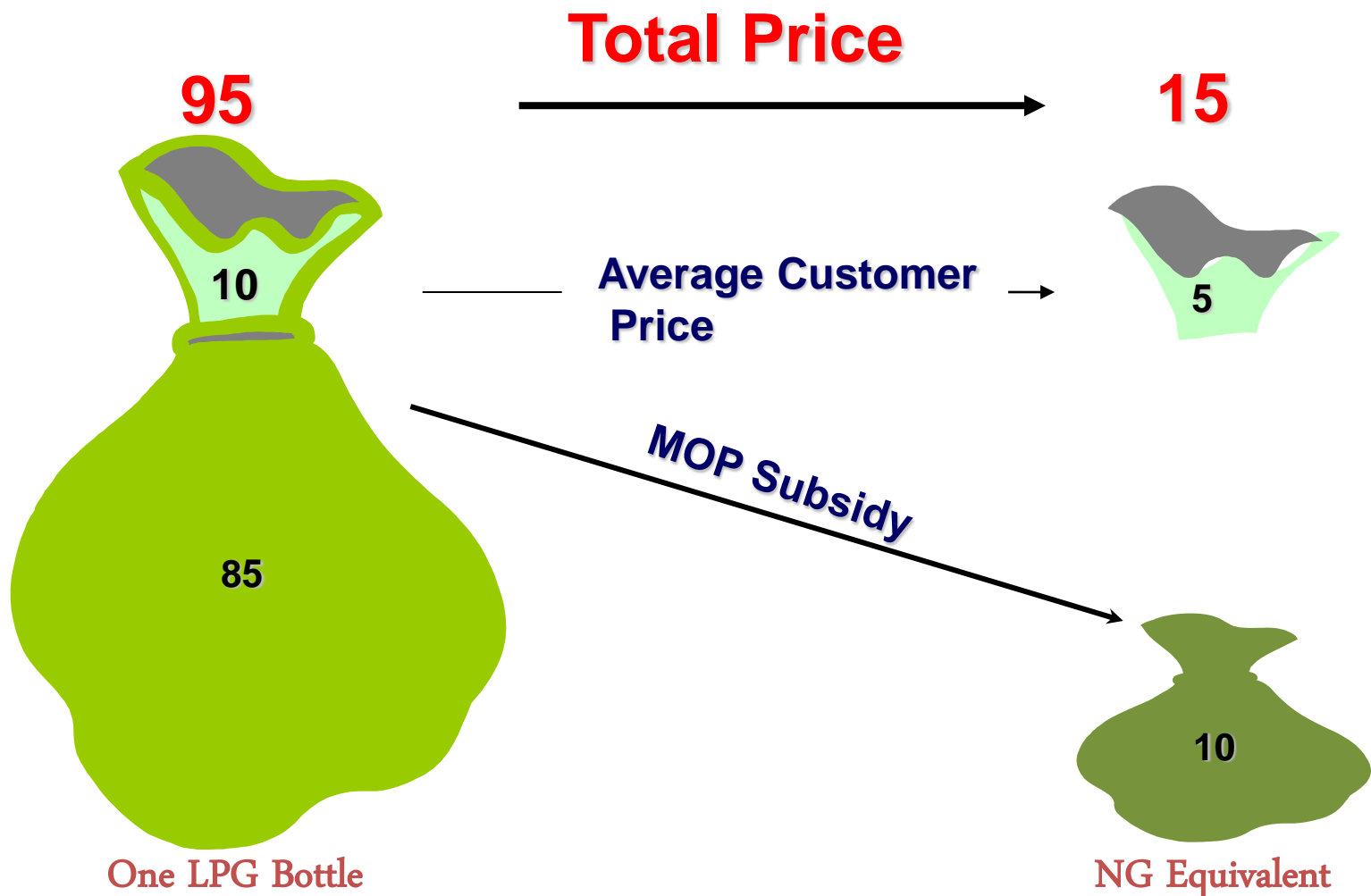
- Egypt's government is taking bold steps to liberalize the energy sector Gradual phasing out of subsidies (100% by 2015), currently a burden on the budget, gradual market deregulation
- Implement and activate strong regulatory bodies
- Encourage strong involvement of private sector investment and foreign direct investment

Growing Energy Demand

- Driven by rapidly rising domestic energy consumption on the back of population and demographic dynamics, rising per capita income levels and a heightened level of industrialization, urbanization, real estate and tourism related investments, Egypt's primary energy demand continues to outpace energy supply infrastructure;
- From 2002 to 2012, oil products and natural gas consumption levels increased by 37% while electricity consumption increased by 30%. According to the Government's guidance, the former is expected to increase by 30-35% by 2015 and the latter is forecasted to increase by 37-40% over the same period after incorporating the dragging effect of the current economic slowdown.

Egypt's Strategic Rationale – LPG Price vs NG

EGP

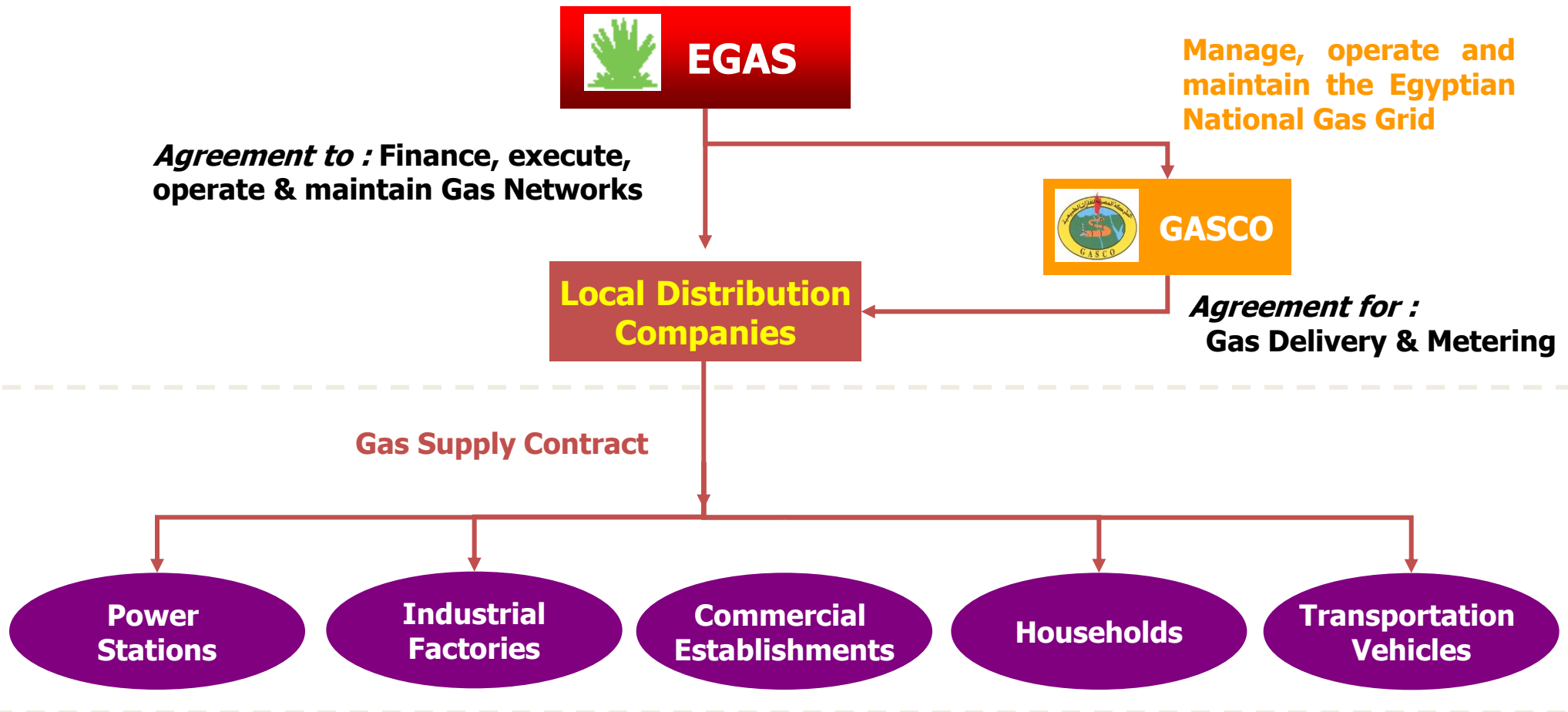


From the first slide showing the complete Gas sector in the Egyptian Gas market, The presentation concentrates on the development of the Downstream Gas Distribution sector

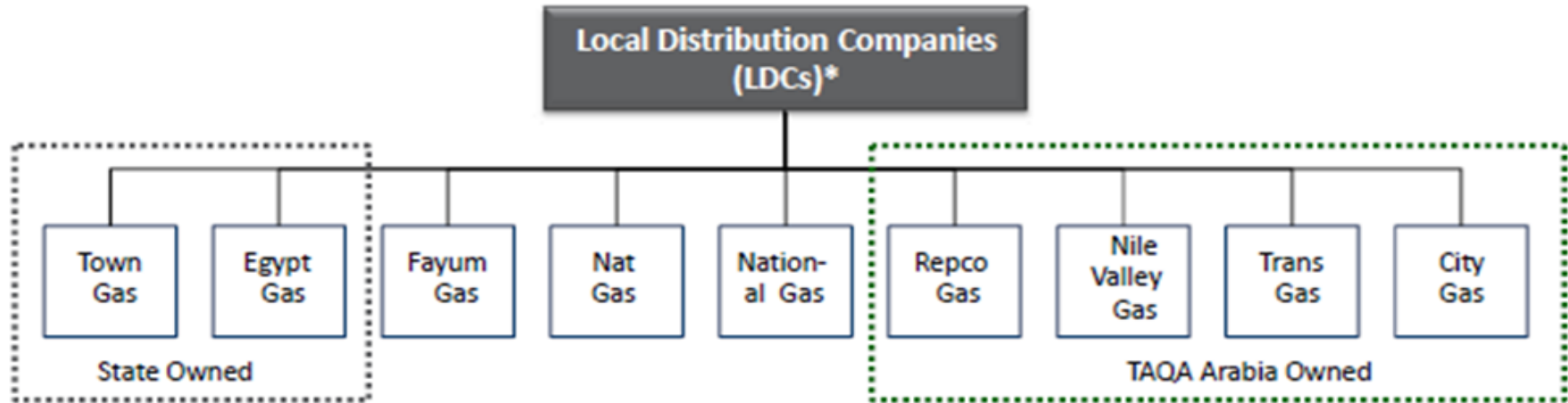
How it was established, is controlled and regulated, with proposals for continued development to meet the growing domestic gas demand



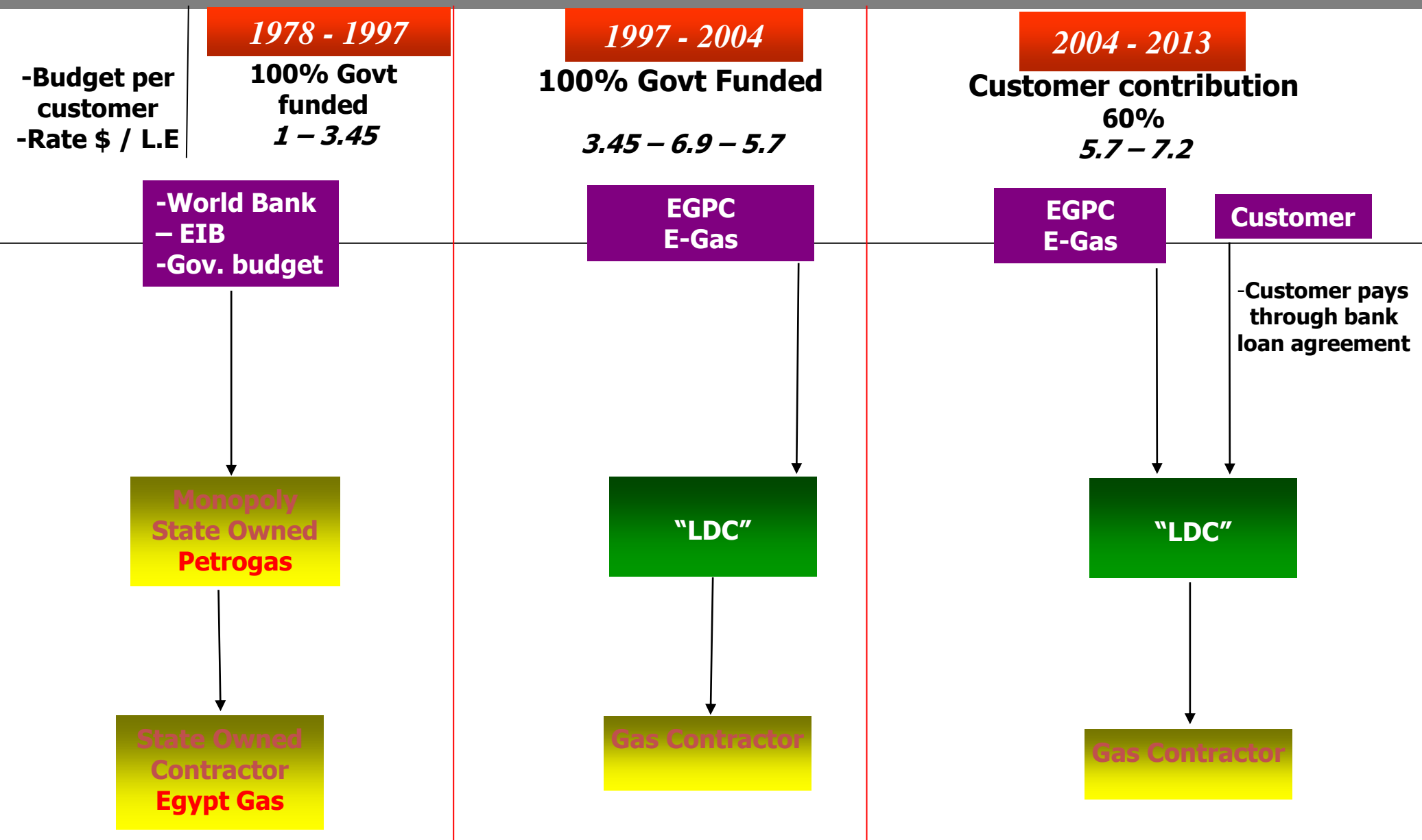
I – What happened? Market Structure



I – What happened? Local Distribution Companies



I – What happened? Egypt Strategic Development



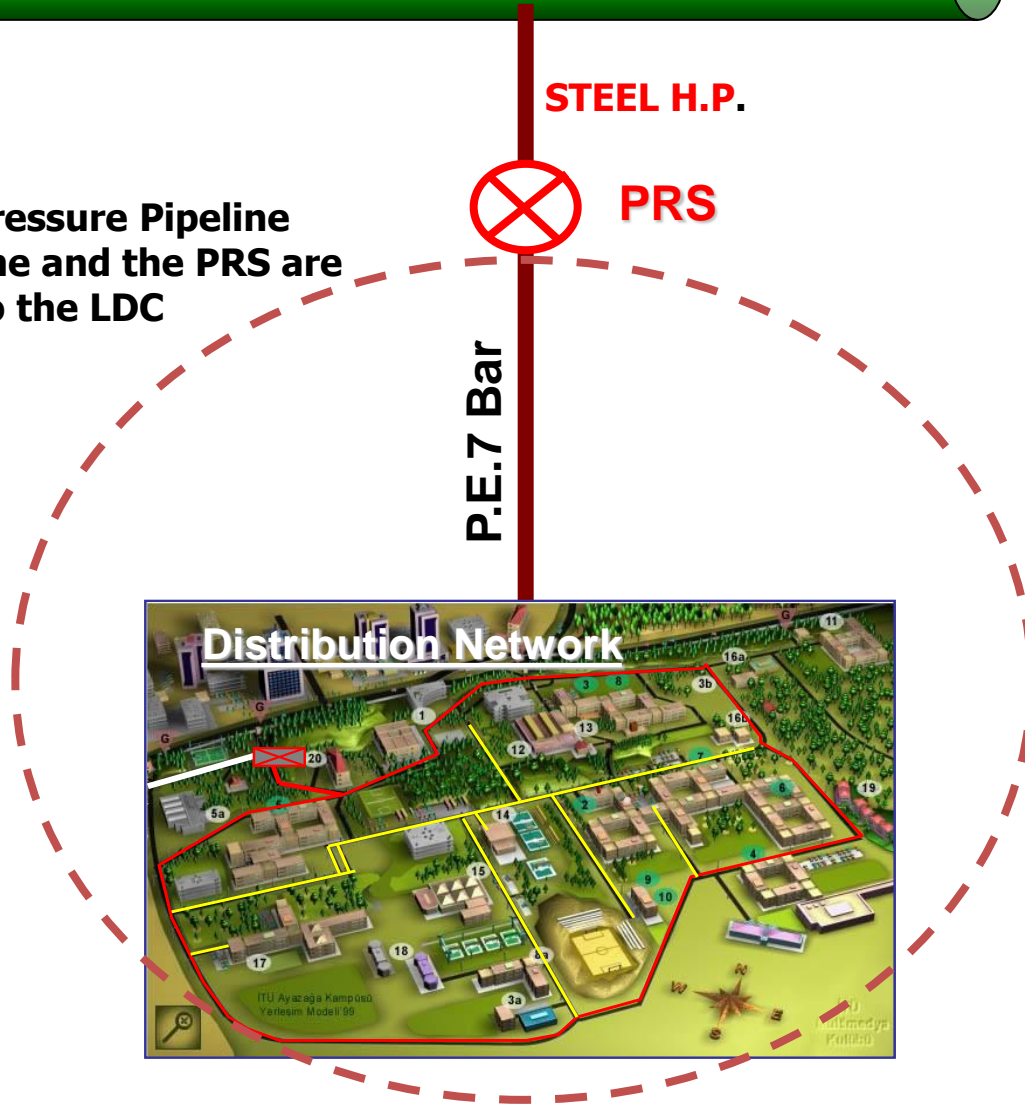
I – What happened? EGAS terms for Development

Trunk Line – HP – 70 Bar

The Main National Grid / Trunk line is constructed & Operated by GASCO (on behalf of EGAS)

The Steel High Pressure Pipeline from the Trunk line and the PRS are paid separately to the LDC

Everything down stream of the Pressure Reduction Station is within the cost of the LDC connection rate. Payments made “per converted customer”

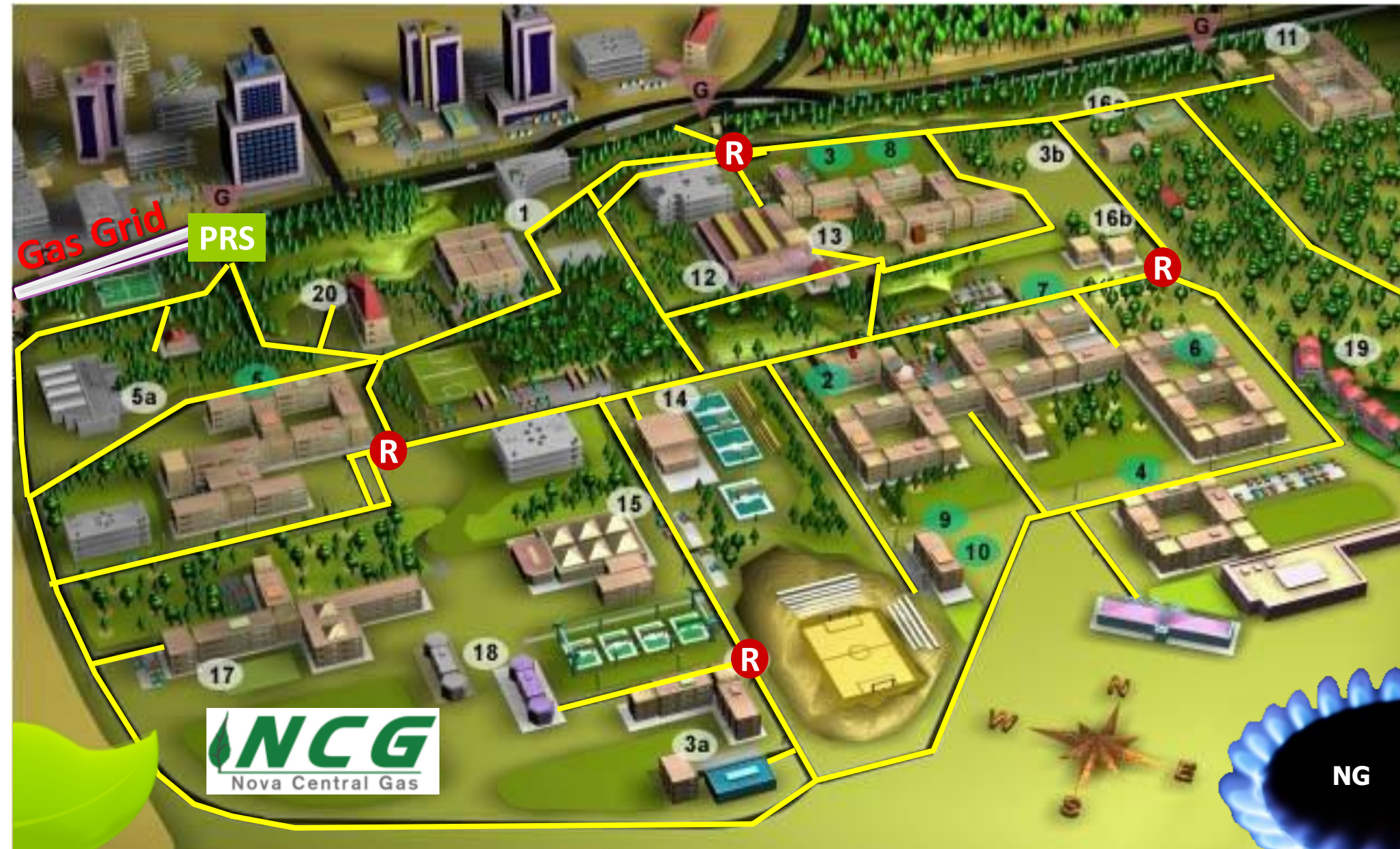


THE LDC & IT'S ROLE

TAQA



Natural Gas Distribution Network



Residential

- Apartments
- Houses
- Villas

Commercial

- Hospitals
- Schools and Universities
- Offices
- Restaurants
- Bakeries etc.

Industrial

- **Factories**

Medium

- Chemical
- Paint
- Textile
- Food

Heavy

- Steel
- Cement
- Fertilizer

Fuels substitution & conversion

Water heating

Cooking

Furnaces

Refrigeration

Space heating

Steam Generation

Manufacturing Process Heat

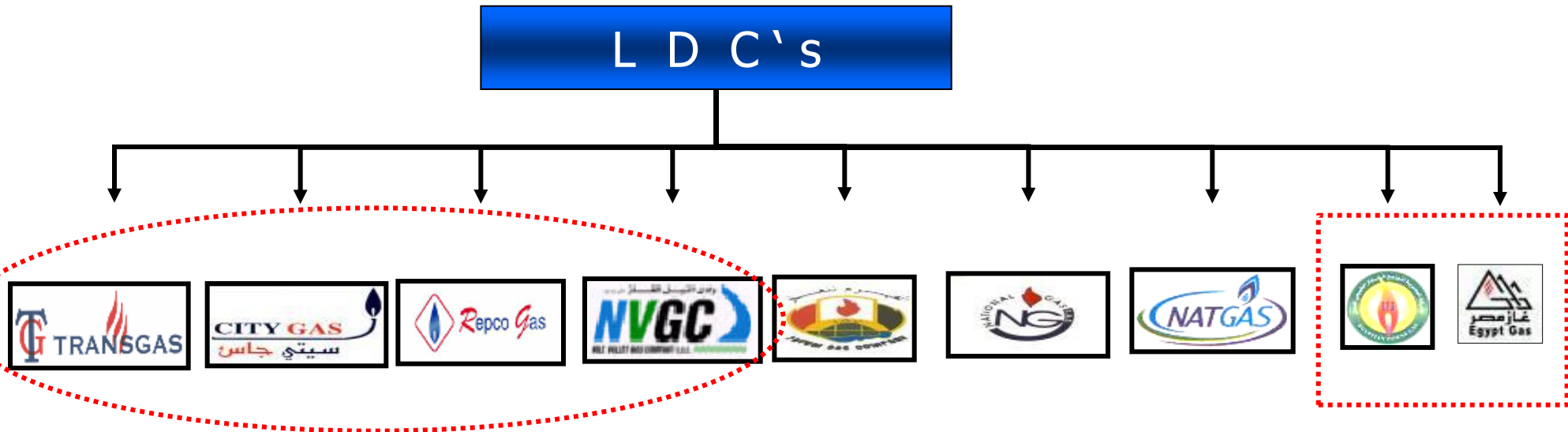
Gas-fired Air-conditioning



Natural gas will replace:

- **Diesel** for water and central heating
- **LPG** for heating and cooking
- **Fuel oil** and **diesel** for industrial applications
- **Gasoline** in cars

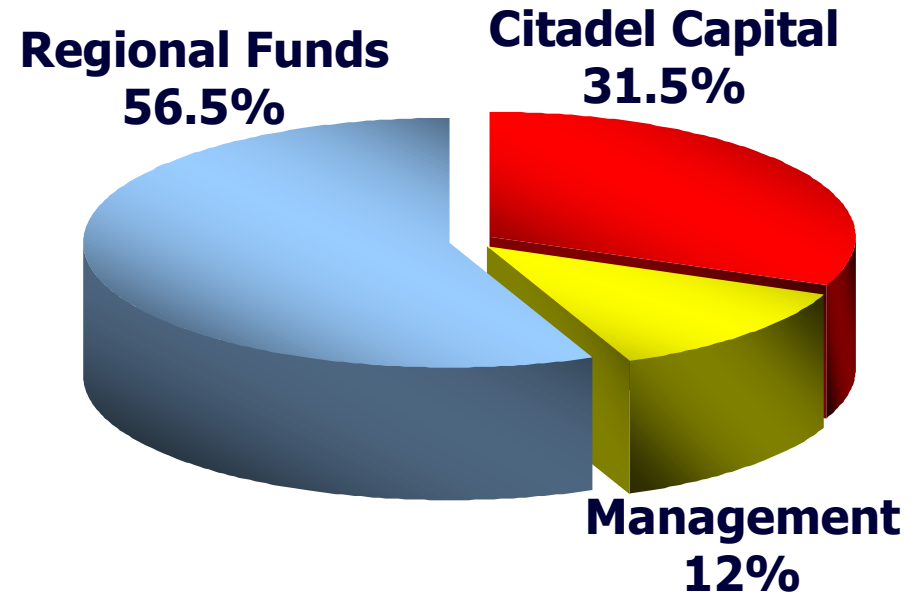
- The Local Distribution Company (LDC) concept was first established in 1996/7
- This moved Gas Infrastructure development from the Public sector to Private Investment
- A number of large Oil majors originally participated to integrate across the value chain
- This brought over 1bn \$ of foreign investment
- Introduced new technologies & improved HSE standards



Overview

- TAQA Arabia was established in March 2006 as an Egyptian shareholding company with an authorized capital of LE 10 billion and paid-in capital of LE 884 million (US\$ 155 million)
- TAQA was established to serve as the parent company for a full service energy distribution group (primarily natural gas and electricity).
- Through its establishment, TAQA acquired several companies operating in the natural gas downstream sector (Gas Distribution, Construction, CNG and Engineering). These include 4 Operating LDC's, a Design & Consultancy Group, a Construction company & a CNG for vehicles business
- TAQA has invested further (through acquisitions and greenfield projects) in order to improve its market share not only in Egypt, but in the wider MENA region.

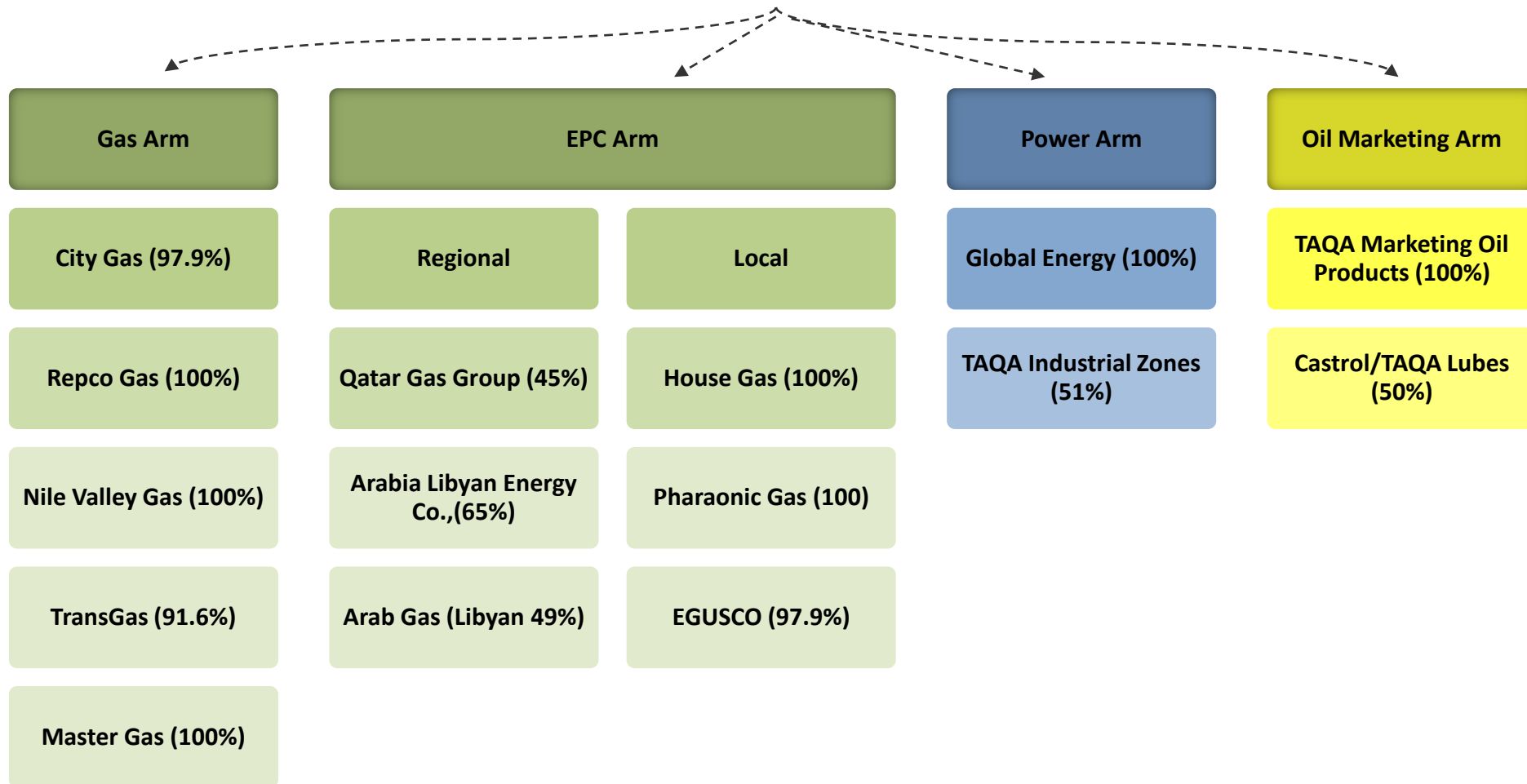
Shareholding Structure



TAQA – GAS Division – Gas Distribution Division – An Overview



- TAQA Arabia owns 4 licenses for natural gas distribution in different LDC concessions representing 11 Egyptian Governorates.
 - All LDC concessions were established with the objective of acting as both a developer and operator of natural gas distribution networks.
 - The four LDC concessions currently distribute approximately 6.0 Billion Cubic Meter per Year (BCM/Y), expected to reach 9.0 (BCM/Y) in 2015.
 - The additional 3.0 BCM/Y are expected from 2 sources:
 - Existing factories in Upper Egypt using fuel oil products
 - Natural Gas to Power
- The LDC's Currently supply & Operate for Power Plants, residential, Commercial & industrial customers.



Two Gas Divisions

EPC

Engineering
Design

Procurement

Construction



Integrated Group

OPERATING UNITS

Operation

Maintenance

Gas Distribution

TAQA LDC Development

- No. of Operating Licenses: 4
- Concession License Duration: Up to 20 years
- Concessions LDC Areas:
- Suez & Red Sea resorts, Damietta,
- Kafr El-Sheikh & Upper Egypt
- Residential Areas: 15
- Industrial Zones: 8 (heavy, med & Light)
- Power Generation Plants: 3
- converted Clients (Res. & Com.) over 700,00 converted, 1.2m potential
Gas Sales: 6.0 BCM / Year

- Construction Management & Control
- Financing and Investment
- Operation & Maintenance:
 - *HP Transmission Pipelines*
 - *MP/LP Distribution Networks*
 - *Tank System*
- LPG Bulk delivery
- 24 h Emergency
- Customers Invoices & Billing System
- Customer Service
- Gas Marketing
- Technical Assistance for Industry



Operation & Maintenance

The 4 TAQA Arabia Operating LDC's have dedicated, trained & Skilled resources to ensure the smooth running of all facilities, whether Domestic, Commercial or Industrial:

- **Pressure reduction Station P.R.S**

The 4 TAQA LDC's have installed and operate approx. 10 Major City gate pressure reduction stations, as well as over 100 industrial PRS equipment.

- **HP Transmission Pipelines**

- TAQA LDC's are responsible for delivering Gas through Transmission off-takes from The national Grid to both residential areas and Industrial customers including Cathodic Protection maintenance and monitoring

- **MP/LP Distribution Networks**

TAQA LDC's are responsible for the ongoing monitoring & maintenance to the thousands of km of IP/MP & LP Gas networks

- **Customer Service**

- All ongoing customer service work, alterations, one – off connections etc are provided by the LDC

- **Customer Invoices and Billing System**

- The LDC's have a dedicated customer billing system with hand held terminals to allow meter reading, invoicing and money collection

- **24 h Emergency Provision**

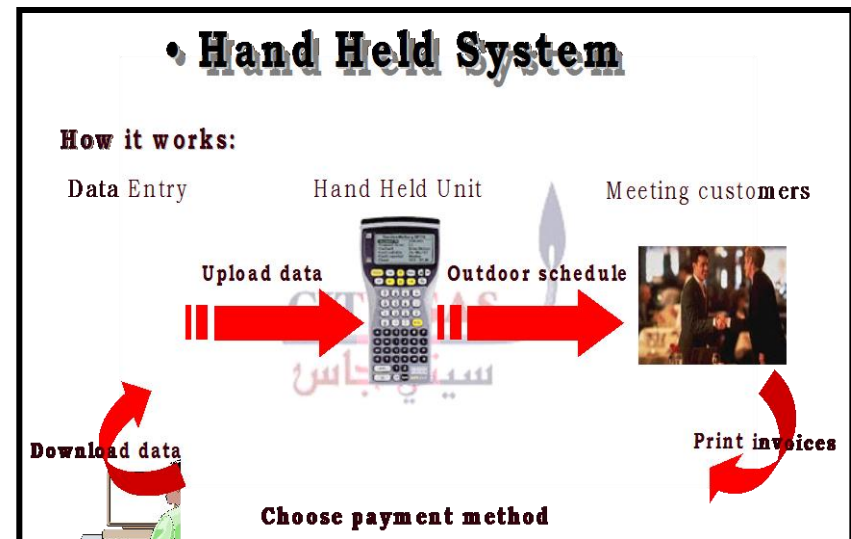
- The 4 TAQA LDC's Provide a complete Emergency Service provision across all of its activities with 8 dedicated call centres operating 24/7 – 365 days to deal with public reported Gas Escapes. The current response time averages 30mins (compared with up to 1hr in Europe)

- **Technical Assistance for Industry**

- The LDC's have a wealth of operating experience and provide support to the wider industry in learning and development.

Customer's Billing System Database:

- Contractual Information
- Previous Bills
- Meter Information
- Monthly average Consumption
- Number of appliances



- **New customers**
- **Modifications of existing appliances**
- **Repair works in Emergency cases**
- **Periodic Maintenance**



- Emergency Centre operating 24h / 365d
- Quick response is the goal
- Solving emergency cases (gas leakage, fire, ...)



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TAQA EPC Division

- **Survey Engineering / Design & Consultancy**
 - Land & property / Appliance Survey
 - Detailed Engineering Design
 - Gas Master Planning, Studies etc
- **Procurement**
 - Integrated procurement strategies
- **Construction**
 - Hi-Pressure Transmission Pipelines construction
 - Intermediate / Medium Pressure & LP Pipeline Network construction
 - External & Internal Installations
 - Conversion of residential / industrial appliances

Track Record

- TAQA EPC connected over 1.0 million Residential customers in 12 governorates
- Over 300,000 Commercial & industrial connections
- These include:
 - Heavy/Medium Industrial Factories
 - Electricity Power Plants
 - Cement / steel Industries
 - Brick Factories
 - Residential compounds & resorts
 - 5* Hotels Schools/Colleges, Sporting clubs
 - CNG vehicle filling stations

Engineering, Design & Consultancy

- TAQA EPC Engineering & Design Group, EGUSCO, provides – Gas Master planning, Feasibility studies, gas pipeline Design engineering, route selection, optimization of pipeline systems, coating & protection, standards, Plant process design, contracting philosophy, execution planning, Project scheduling, Draft preparation of tenders packages. and consultation for all Gas & associated activities
- The TAQA Engineering & Design Group are main Agents for Akfel Engineering (Turkey) and provide a one – stop shop for design, sales & installation of Pressure Reduction equipment & associated facilities in Egypt & the wider MENA region

Additional regional achievements:

- Gas master plan , on behalf Libyan government (JV with Tractabel Engineering - Belgium).
- Technical Supervisor for Arab Gas Pipeline, Syria Gov. (Phase I & II)
- Technical Advisor for Arab Gas Pipeline, Jordan Gov. (Phase I & II)
- Pressure Reduction & Metering Stations sales / supply
- Fabrication Assembly and Installation
- Civil & Mechanical works design



EPC Procurement

- The Group procurement division as part of the EPC Group provides a complete procurement service across the TAQA Gas Group under a Service level Agreement (SLA).
- TAQA LDC's and TAQA EPC Group take the advantage of leveraging off volumes.
- The Procurement division, through strong supplier relationships, has the leverage to enter into longer term framework and consignment stocking agreements with suppliers. Which significantly improve cash-flow



Construction Division - Overview

Synopsis

- TAQA Group EPC operates the largest private gas construction company in Egypt; “House Gas”, Which is an integral part of the EPC group.
- House Gas is ISO 9001:2008 and OHSAS 18001:2007 and ISO 14001. certified;
- “House Gas” was the first private sector company to operate in the contracting segment of the natural gas industry in Egypt.
- The EPC now performs construction activities as a full “multi-utility” service provider .
- The Groups construction division also serves as a sub-contractor for the Group’s Qatari, Kurdistan, Libya and UAE operations.
- The construction arm's main clients are the LDCs, including the four TAQA Gas companies as well as third party LDCs. However, internal multi-utility installations at resorts, hotels and factories have been considerable growth activities.



The TAQA EPC Construction division is able to provide a “one-stop” shop solution as a “multi-utility” service provider

Scope of Activities

- The construction arm undertakes all construction work from the point of connection with the national grid to final connection / conversion at the end user point.
- High, Medium & low pressure pipelines (inc. Distribution Networks).
- External & internal residential, commercial and industrial installations Specialist Pipework installations.
- Connecting central and commercial air conditioning systems.
- EPC contracts for PRS (Fabrication & installation)
- Civil construction and maintenance works
- Electromechanical works (PRS erection, regulators assembling, fuel steel tanks, CNG stations, fire fighting systems etc.)
- Multi-Utility installation & Project Management



Automotive Fuels: CNG

- CNG : Compressed Natural Gas
 - Gas stored in vehicle at high pressure (200 bar)
- LNG : Liquefied Natural Gas
 - Gas stored in liquefied form at atmospheric pressure (requires cryogenic tank and regasification equipment)
 - Best in heavy vehicles and ships

Alternatives :

- Gasoline, diesel, LPG

Position gas :

- Clean, low on emissions
- Feasibility depends on fiscal regime
- Best in vehicles with limited travel radius and many stop-starts



Reduces dependence on/import of oil

CNG Business

Egypt CNG Market

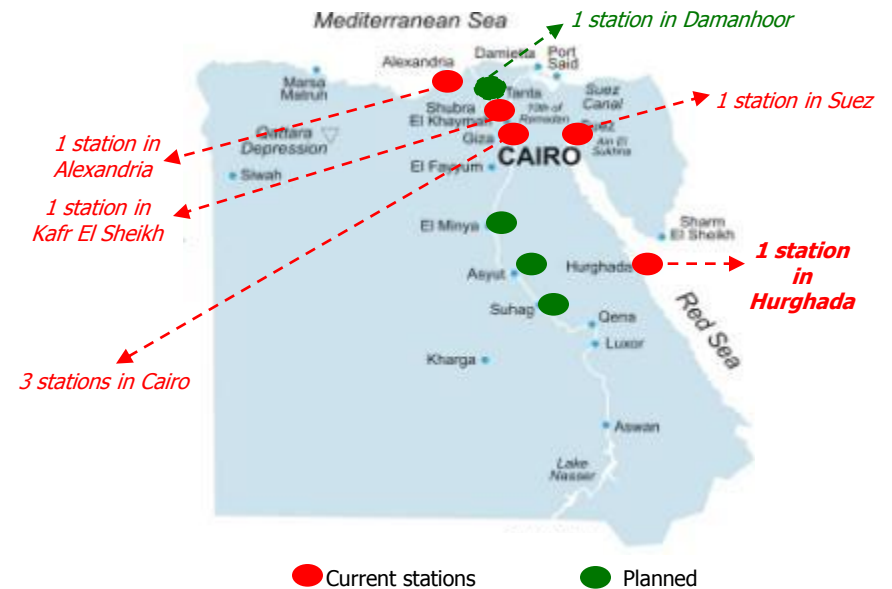
- The CNG business in Egypt was established in 1996
- Two players in 1996, currently reached six companies
- 120,000 vehicles, mainly taxis, converted to CNG and expected to reach 300,000 conversions
- The end consumer price and margin are regulated



Master Gas

- Operating 7 stations and conversion centers in prime locations
- Distributing around 25 million cubic meters and converting around 3,000 vehicles per annum

CNG Network



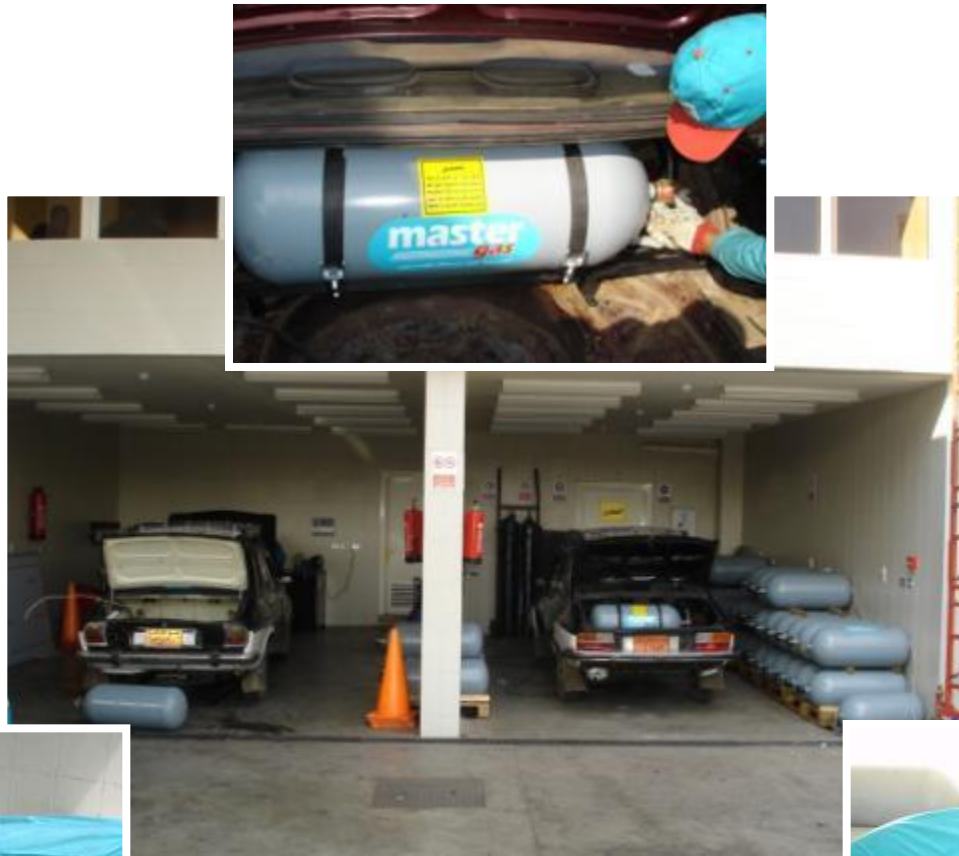
Fuelling Service Stations Gallery



Vehicles Conversion Centers Gallery



Vehicles Conversion Centers Gallery



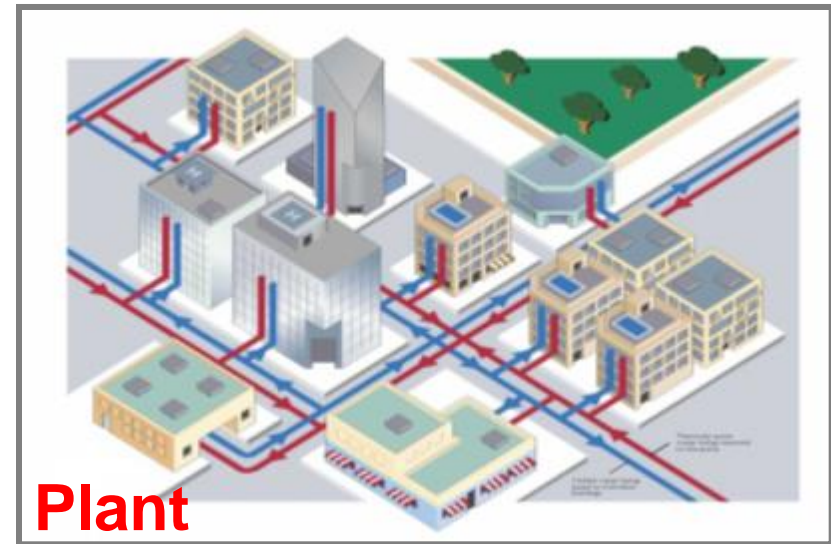
Gas District Cooling

Scope:

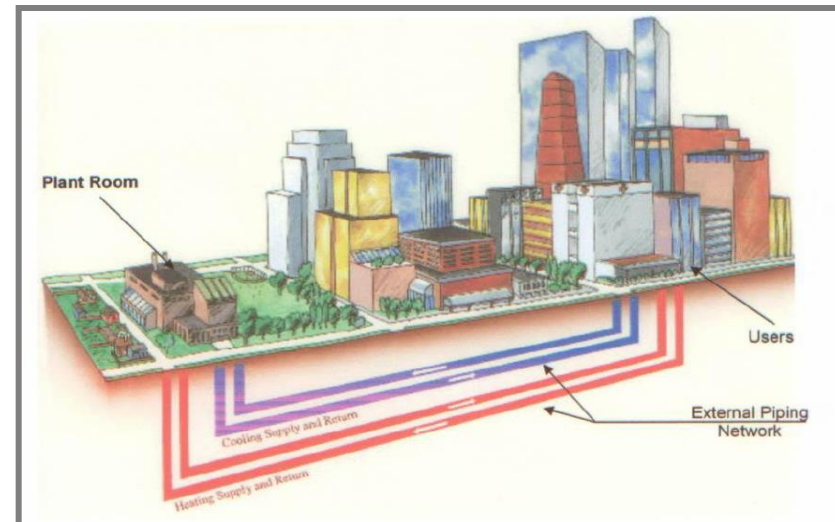
- Using absorption chillers / heater units
- BOO District cooling projects
- 250 000 Ton

Clients Benefits:

- Saving of 30-40% of operating cost compared to electricity driven chillers
- Less building Capex & Opex
- Less Power
- Less maintenance & staffing
- Economical operating costs
- No chillers noise & vibration
- Space saving in the buildings



District cooling consists of 3 main parts:



Synthetic Natural Gas (LPG+Air) Distribution Network

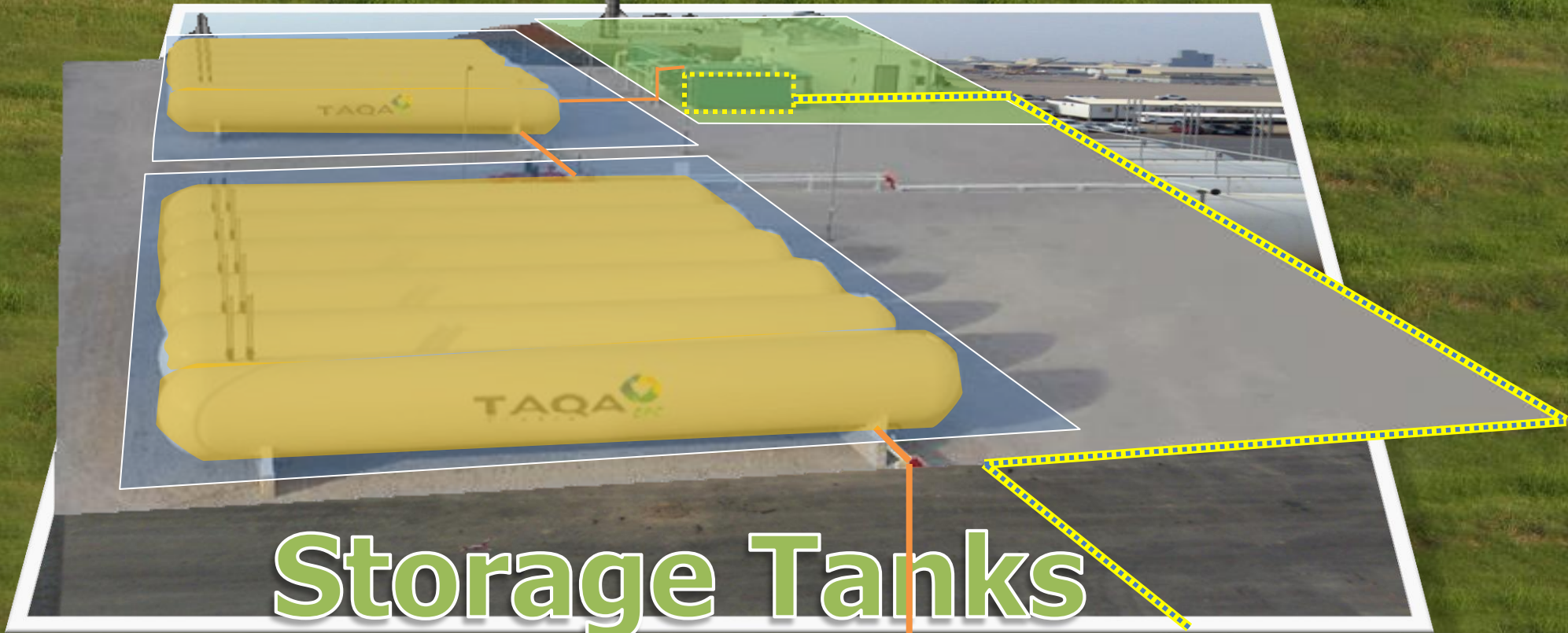


SNG
=
LPG + Air

40 % Air



- Air Compressor
- Blender LPG - Air

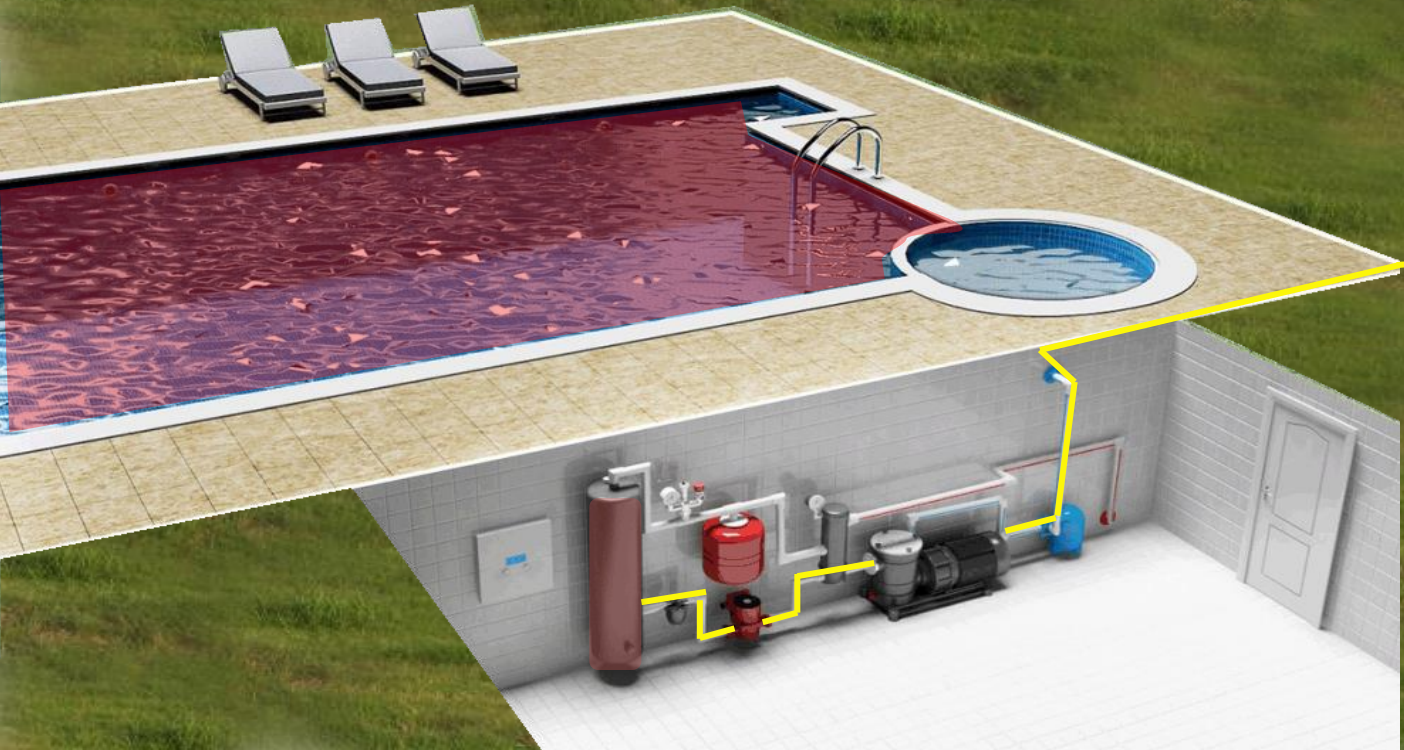
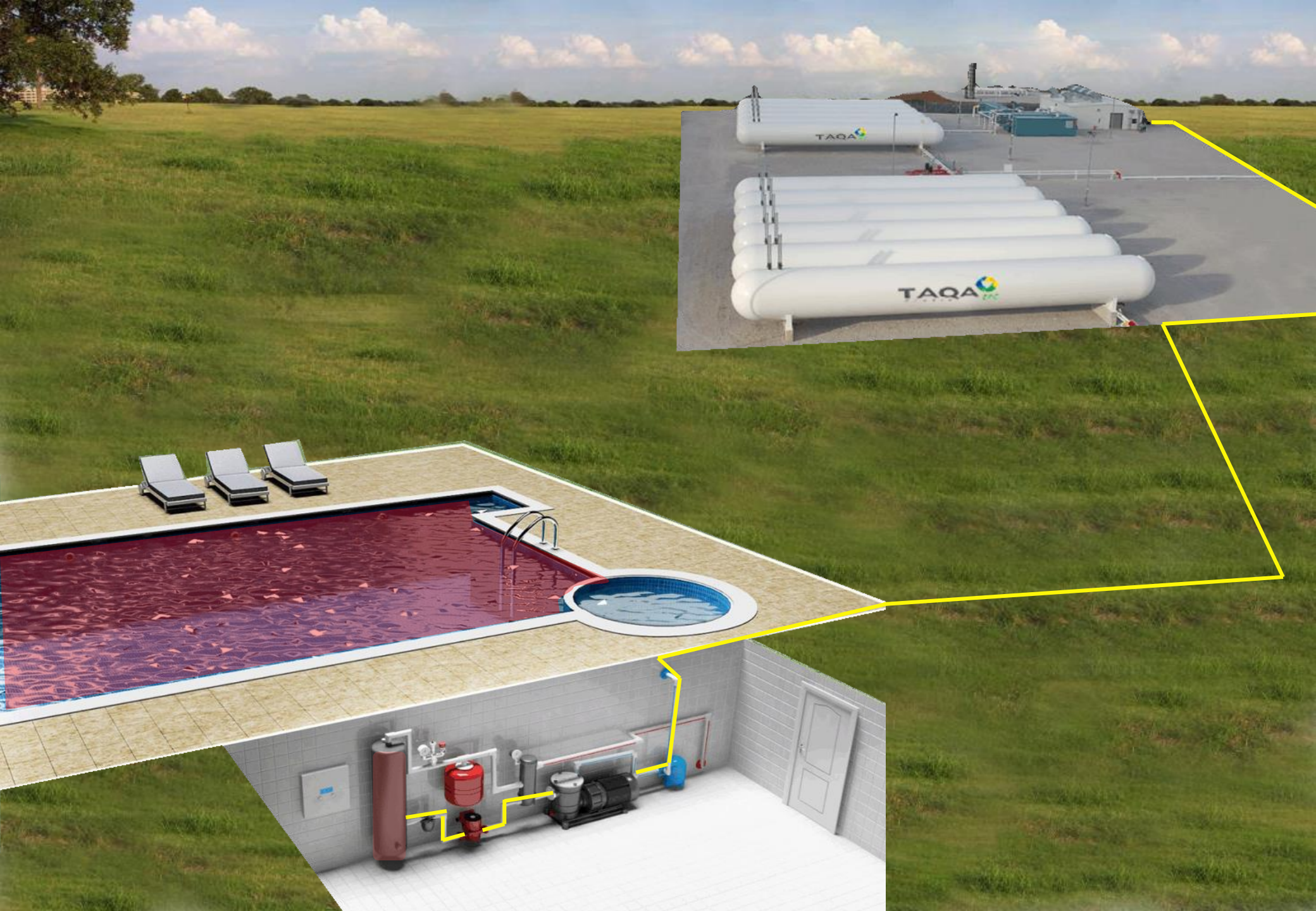


Storage Tanks

Close – Up of SNG site ***SNG***
Ready to use







Re-capping the Development of the Egyptian Domestic sector

From ONE state monopoly to 7 private sectors & 2 state LDC's

- Approx. 3.5 Million customers connected
- Over 1 bn \$ of Foreign & Local investment
- 16 Egyptian Governorates covered by Gas networks
- 600 MM \$ /Year Saved in subsidies
- Enhanced HSE Standards
- Introducing new technologies
- Attracting the Multi-Nationals
- Social Investment – Jobs/Employment - Environmental
- Provide a better quality of life for Egypt's citizens

The case for more Liberalisation

- The current LDC agreements with EGAS does not support 100% penetration of existing facilities and therefore does not support maximum expansion to reach 6 million customers (Government target).
- Areas for connection are based on
 - EGAS ability to fund connections (annual budget)
 - Short term agreements with LDC's
 - Fixed Price – regardless of work quantity
 - Skills & capacity to deliver

The Potential Way forward

- TAQA – have the largest Private LDC licensed companies with approximately 1.2million initial potential customers that could be converted to natural gas over the next 5 years.
- TAQA's proposal to the Egyptian Gas holding Company is that they will invest 100% of the capex currently paid by EGAS to connect this 1.2m customers.
- To do this TAQA would be repaid over a 20 year period from an added tariff (based on IRR) from Gas volumes sold to Industrial users.
- This proposal allows maximum penetration to the Domestic sector (significantly reducing govt. subsidies annually) – by adding a small tariff charge to the Industrial sector (which already receives subsidised gas)
- After completion of the works, TAQA will alleviate the government of EGP 2 bn subsidies per annum.
- TAQA will be allowed the option to feed imported natural gas through the national grid.

- Whilst the development of the Domestic Gas Infrastructure in Egypt has been through the Investment & control firstly of the Egyptian Gas & Petroleum Corporation (EGPC) and subsequently the Egyptian Gas Holding company (EGAS), The Liberalisation of the Domestic Market has still to come.
- The way forward is for Customer connections to be based on the ability to pay, Investment rationale from the LDC and its rate of return from Gas sales, with Gas prices set against a basket of alternative fuels – regulated by such bodies as EGAS
- Here the regulating body (EGAS) would be concerned with setting policy, establishing Price formulas/ mechanisms that encourage Private companies to invest, as well as controlling standards, procedures and competency levels.

THANK YOU



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