



# Large Industries Key Growth Drivers

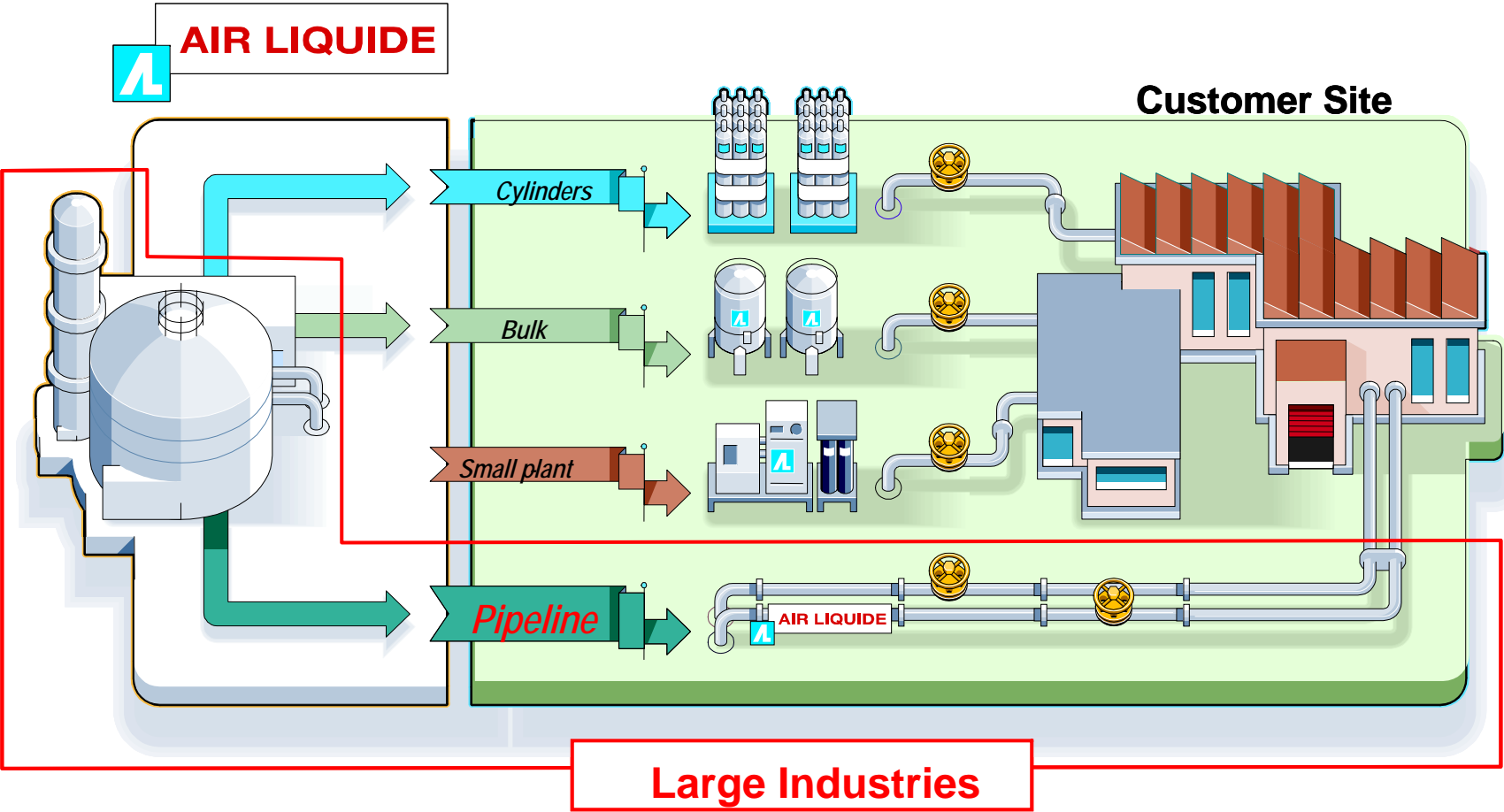
**Ron LaBarre**

Group Vice President

Large Industries Markets & International Customers

**UBS, Reverse Roadshow  
Paris, December 15<sup>th</sup>, 2006**

AL's *Large Industries* Business Line is dedicated to the supply of large volumes of industrial gases...



...by large **on-site** plants...



Steam  
&  
Electricity



**350** Air Separation Units  
**130,000 tonnes**  $O_2$  per day



**31** large  $H_2$  and Synthesis  
Gas Manufacturing Units

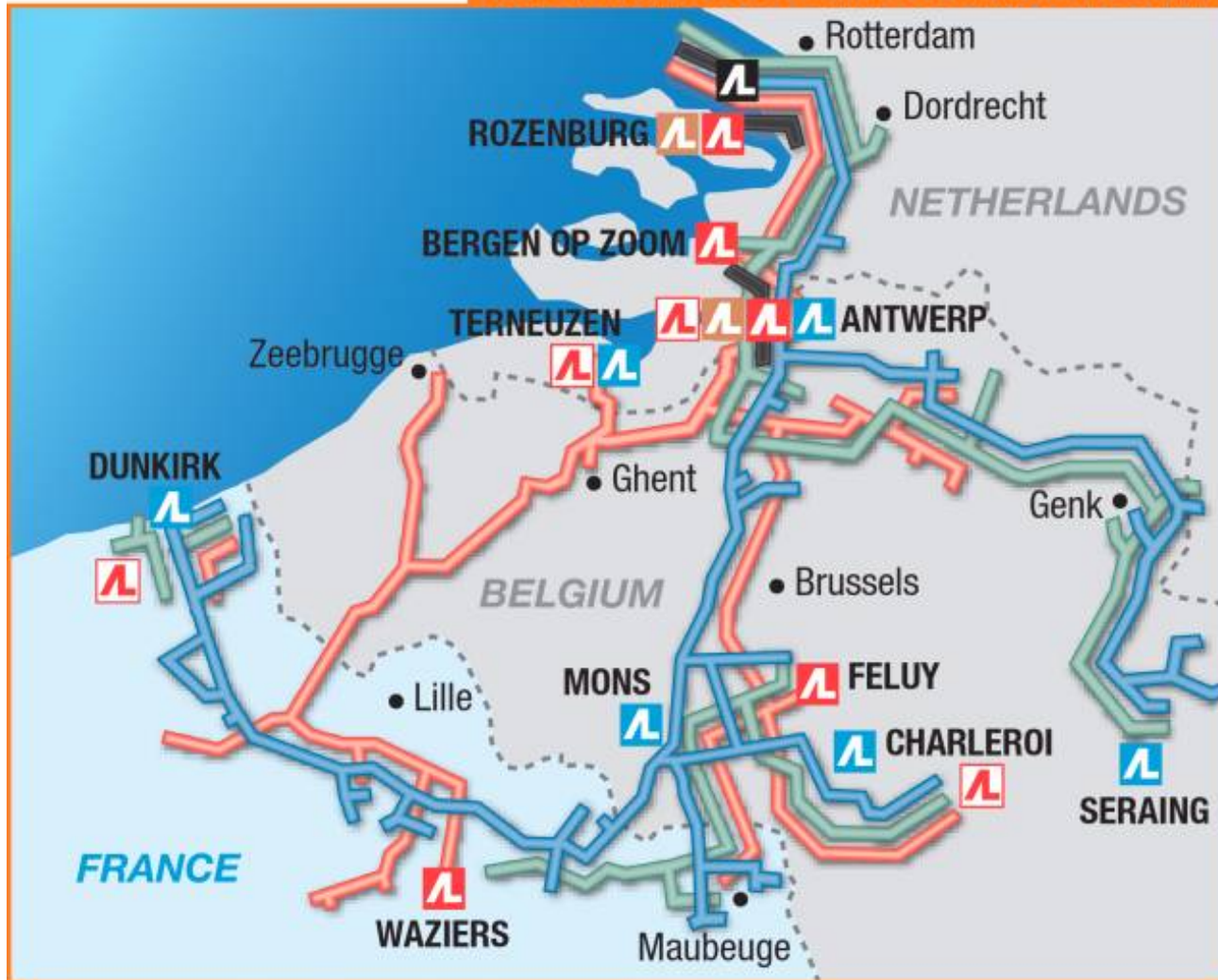


**19** Industrial Cogeneration  
Trains

**Air Liquide is the world's  
largest producer  
of Air Gases**

...and through 8 400 kilometers of pipelines...

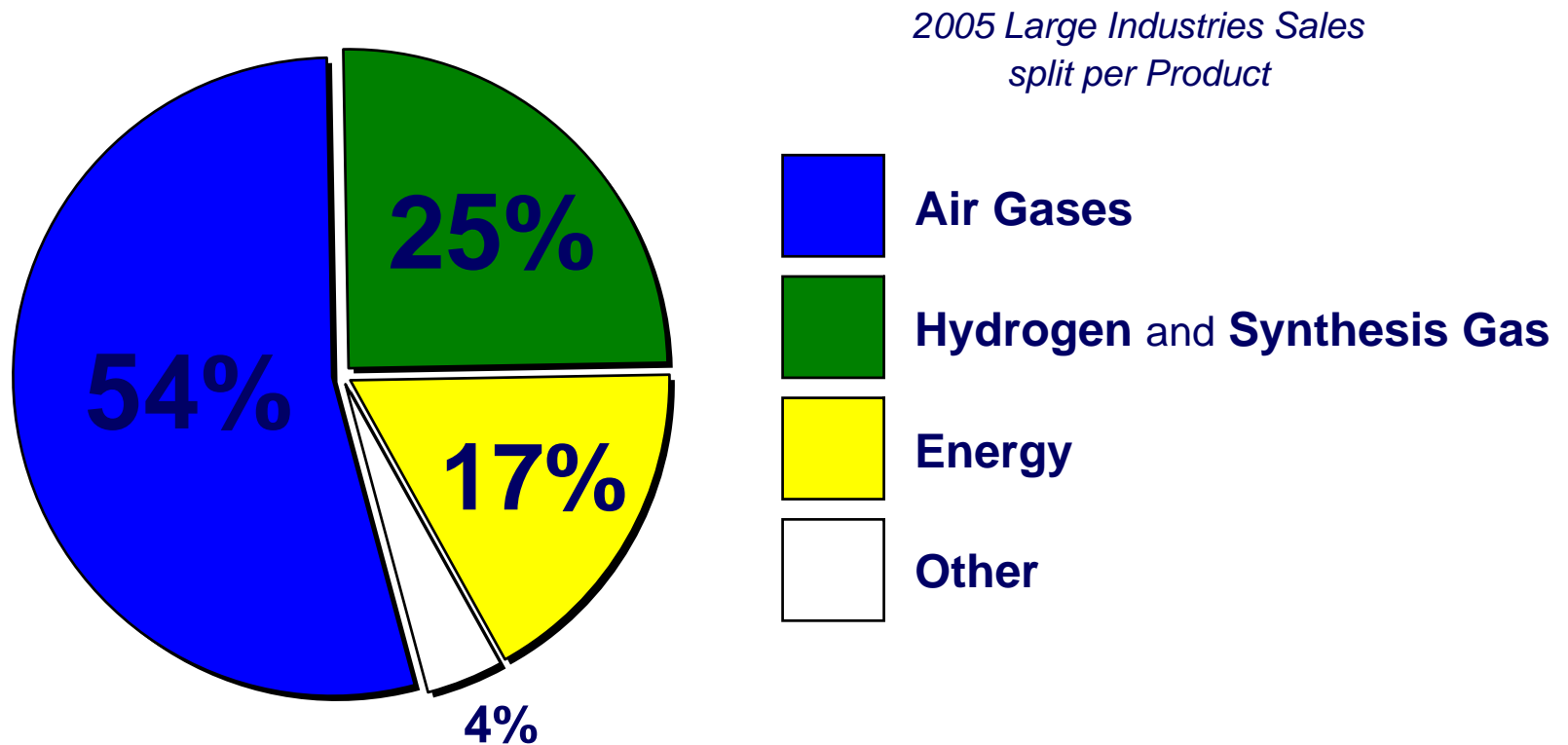
NORTHERN EUROPE NETWORKS: 2 700 km



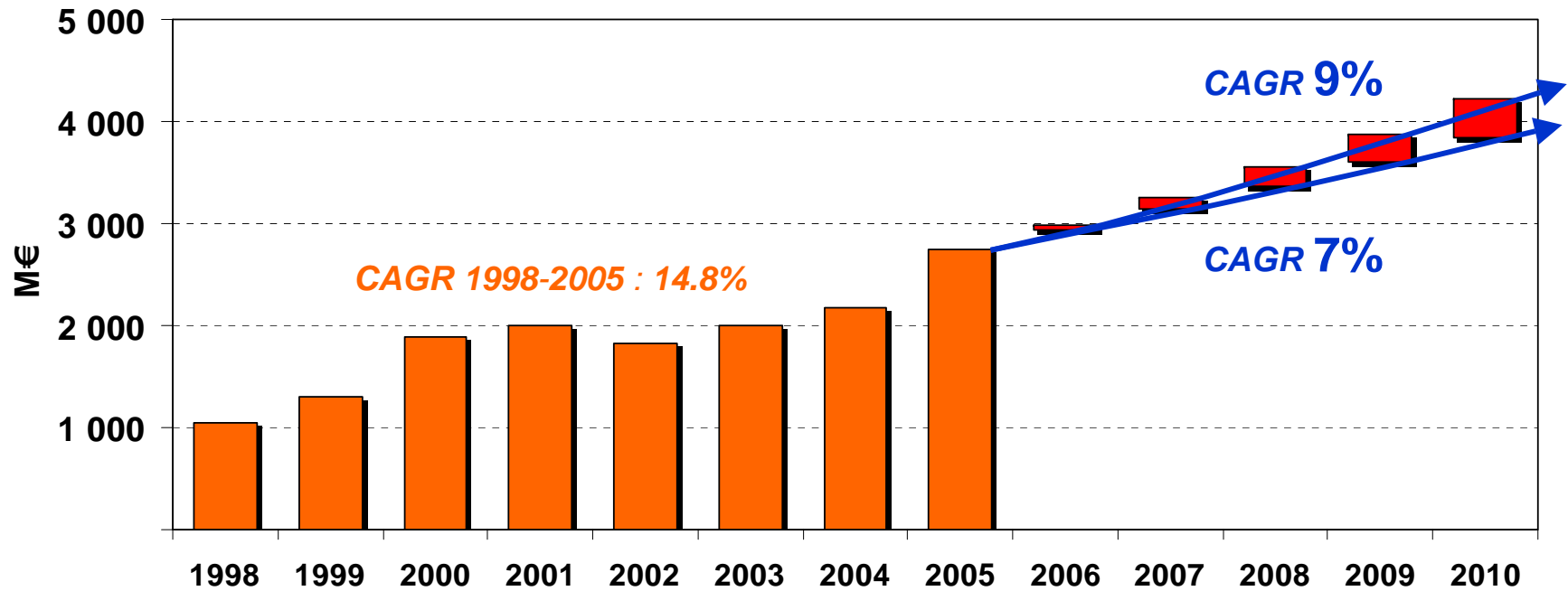
- Oxygen and nitrogen facility
- Oxygen
- Nitrogen
- Hydrogen and/or carbon monoxide facility
- Hydrogen
- Carbon monoxide
- Cogeneration facility
- Synthetic gas facility
- Hydrogen source

...generating **30%** of the AL Group's Gas and Services Sales

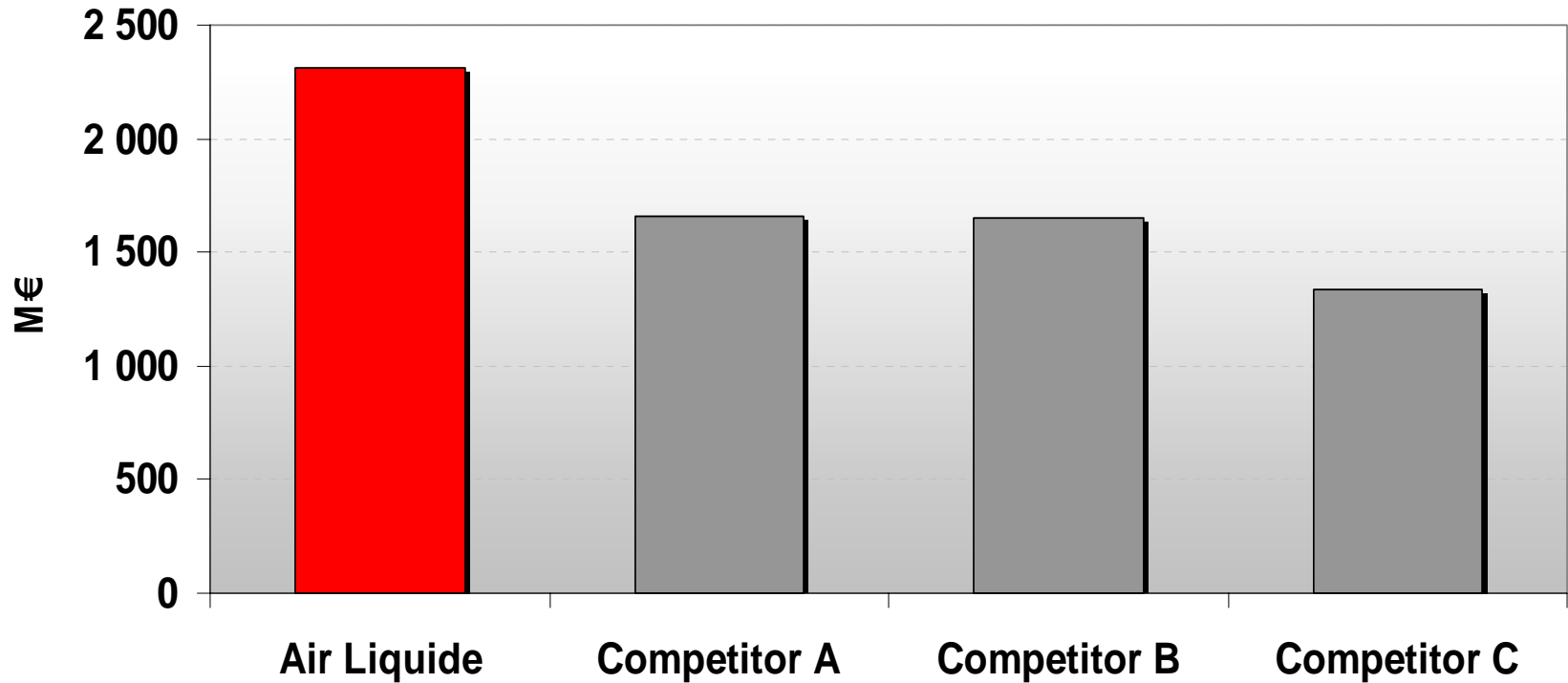
**2005 Air Liquide Sales :** 10.4 billion Euro, 88% Gas and Services  
**Large Industries Sales :** 2.7 billion Euro



### Large Industries Consolidated Sales



## 2004 Sales in the Large Industries Business (in Million Euro)



*Air Liquide internal estimation based upon public information*

# Large Industries Customers use our gases in a **wide range** of processes and applications

		Air Separation Units		Hydrogen/CO/Syngas Manufacturing Units			Cogeneration	
		O <sub>2</sub>	N <sub>2</sub>	H <sub>2</sub>	CO	Syngas	e <sup>-</sup>	Steam
<b>Chemicals</b>	Basic chemicals and petrochemicals	✓	✓	✓	✓	✓	✓	✓
<b>Metals</b>	Iron and steel Non-ferrous	✓	✓					
<b>Oil &amp; Gas</b>	Refining industry IGCC	✓	✓	✓		✓ <sup>2</sup>	✓	✓
<b>Energy Conversion</b>	GTL, CTL, Methanol Oxycombustion, IGCC	✓	✓			✓ <sup>2</sup>		

<sup>2</sup> Intermediate products

# Macro trends drive new technologies all requiring enormous quantities of Oxygen and Hydrogen



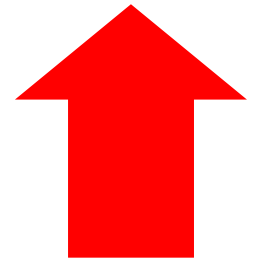
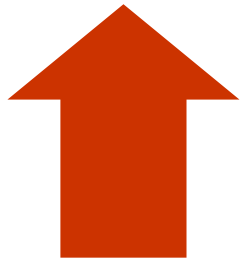
*South America,  
Russia, Middle-  
East*

*Coal gasification,  
Oil Sands,  
Refineries  
expansion*

*GTL, CTL, CTC*

*H2 in refineries, IGCC,  
Oxy-combustion,  
Fuel Cells*

*India, China*



*Producers move  
towards the  
feedstock  
sources*

*Security of  
energy supply*

*Valorization of  
stranded  
resources*

*CO<sub>2</sub> capture & storage,  
Clean Fuel,  
Hydrogen economy*

*Producers move towards  
their end markets*

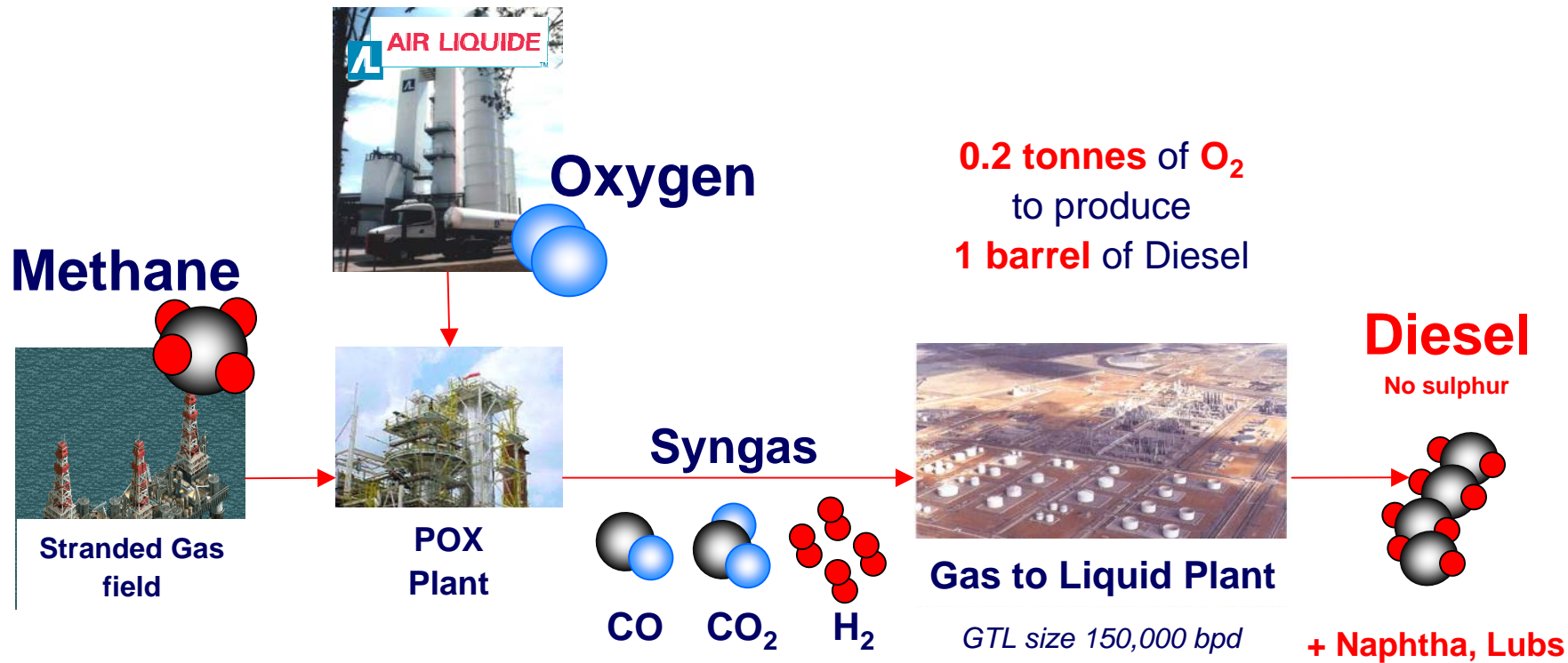
**Availability of energy  
feedstock and prime materials**

**Environment  
protection**

**Emerging  
economies**

# Up to 30,000 tonnes per day of Oxygen are required for each Gas to Liquids facility

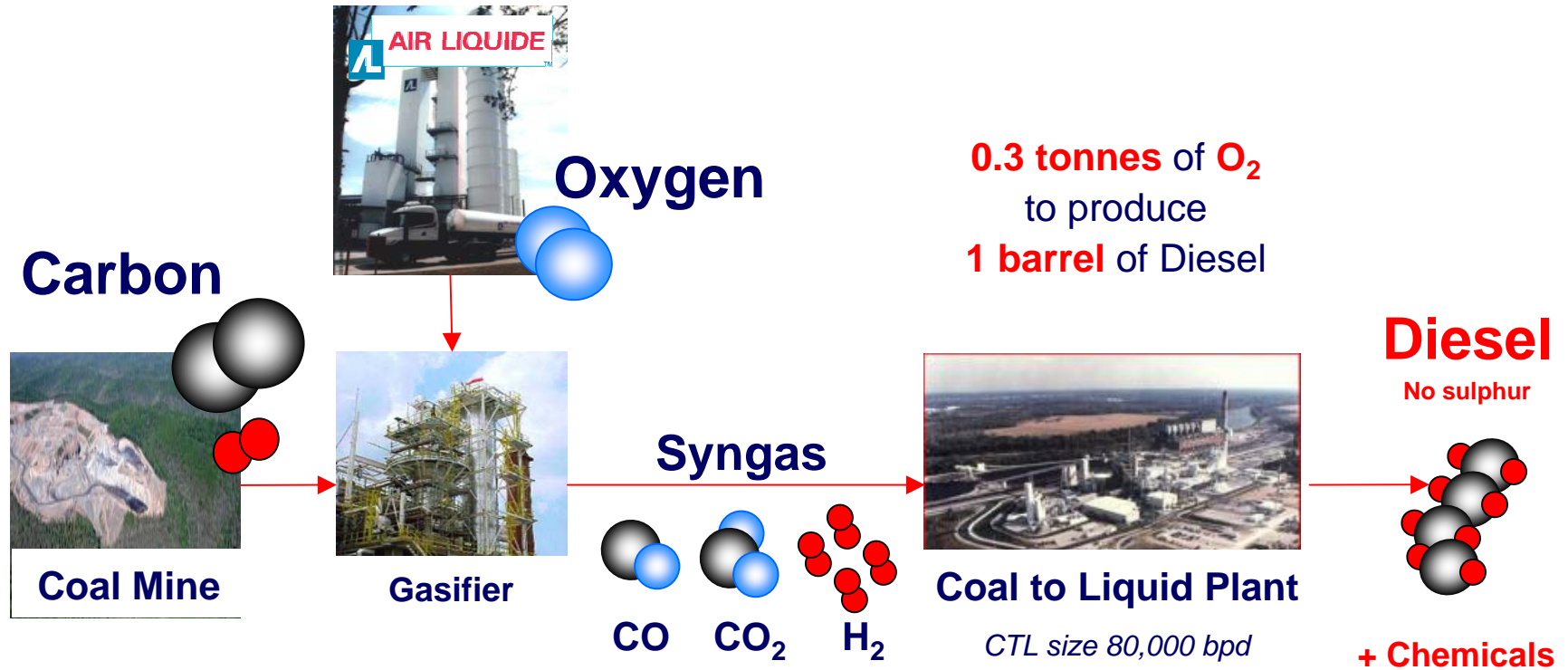
Availability of energy



Gas to Liquids (**GTL**) projects are viable when Oil price is above **30 \$/bbl**  
Starting **now**, peak in 5 to 10 years

# Up to 28,000 tonnes per day of Oxygen are required for each Coal to Liquids facility

Availability of energy

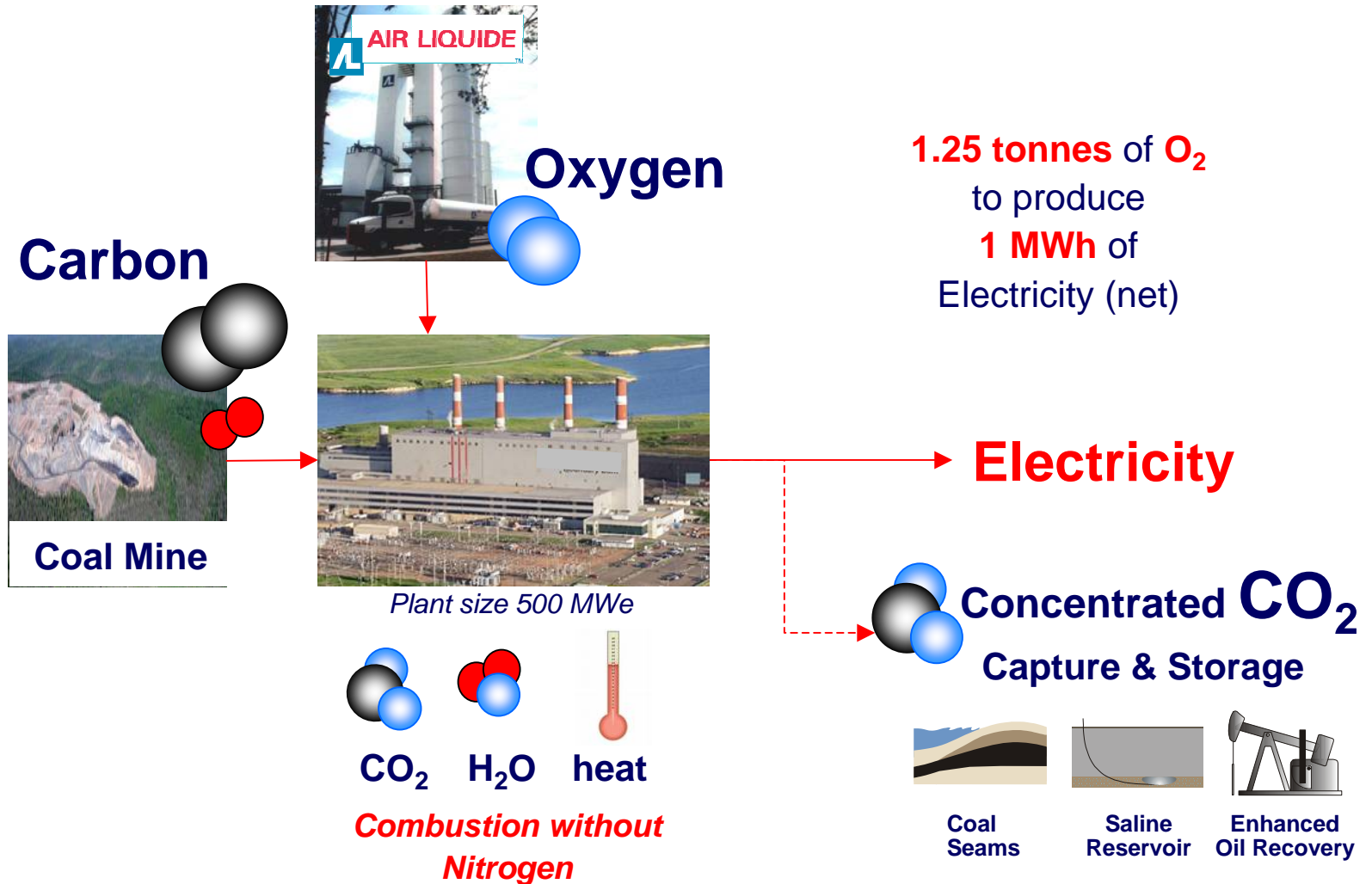


Coal to Liquids (CTL) projects are viable when Oil price is above **40 \$/bbl**  
Starting in 5 to 10 years

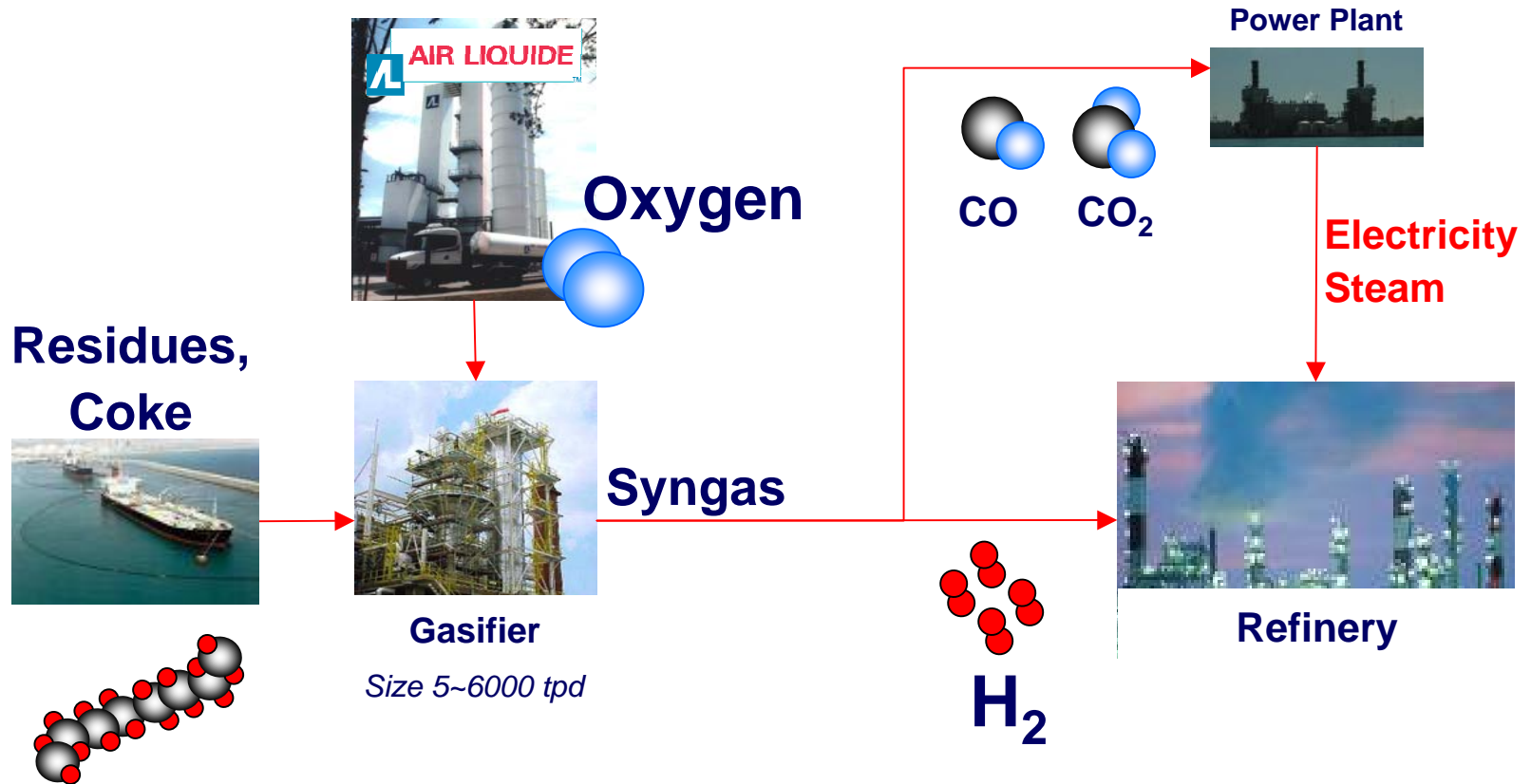
# Up to 15,000 tonnes per day of Oxygen are required for each Oxycombustion power plant

Environment protection

Starting in 5 to 10 years



# Up to 5,000 tonnes per day of Oxygen are required for each Gasification facility



**Gasification** is used to **optimize refineries** throughput and to produce **Clean Fuels**

We master all the **key success factors** to benefit from these trends

**Worldwide Presence**

**People & Skills**

**Technology**

**Availability of  
energy  
feedstock and prime  
materials**

**Environment  
protection**

**Emerging  
economies**

