

## A strategic fuel switch from NG to local lignite



### Development of the Komsomolsk Gasification Project - Ukraine

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# Ukrainian market situation

- Strong export of resources: metals, coal, power
- Energy prices in Ukraine are regulated
- Unique position at Black Sea and NG infrastructure
- 25 Million ton/a of iron export
- NG price ~ \$ 245/1000 m<sup>3</sup>
- Electricity price \$ 50/MWh
- Lignite price @ cost
- Fuel mix: Fossil 48%, Hydro 8%, Nuclear 44%
- Strong dependancy on Russian gas

FTD-Interview

25.08.2010, 04:00 

## Russen warnen vor Gaspreisschock

**Exklusiv** Schlechte Nachrichten für Gaskunden: Gazprom-Vizechef Alexander Medwedew prophezeit eine Verdoppelung der Preise bis 2012. Einzelne Anbieter verlangen bereits ab Herbst mehr. von *Michael Gassmann* — Düsseldorf und *Kathrin Werner*, Hamburg

Deutschlands wichtigster Gaslieferant Gazprom prophezeit einen drastischen Preisanstieg. "Bis 2012 ist unserer Meinung nach das Niveau der Vorkrisenzeit wieder erreicht", sagte der Gazprom-Vizechef Alexander Medwedew der FTD. Stimmt die Prognose des russischen Energiekonzerns, entspräche dies nahezu einer Verdopplung der gegenwärtigen Großhandelspreise.



Medwedews Worte haben enormes Gewicht in der Branche. Der russische Exportmonopolist Gazprom liefert gut ein Viertel des in Europa verbrauchten Gases, in Deutschland gar ein Drittel.

# Project Owner

## Key Facts

- KGP is a sister company of the Swiss headquartered resources company Ferrexpo with assets in Ukraine
- Ferrexpo first Ukrainian company to get enlisted on London Stock Exchange
- Main activity is production and export of iron ore pellets for over 30 years, uninterrupted
- Production capacity at the Ferrexpo Poltava Mining location is 12 mtpa of pellets
- Largest iron ore reserves in Europe : 6.6 billion tonnes

## Growth Strategy

- Committed to realizing the growth potential of the Poltava business
- Commercialize significant unexploited iron ore reserves and raise annual production to 35 mtpa
- Exploit local Lignite reserves
- Reduce exposure to energy market volatility and create sustainability and predictability of the iron ore production business model

Develop

KOMSOMOLSK GASIFICATION PROJECT  
KGP



# Location

## Map of Ukraine



- Ukraine, Komsomolsk - Kremenchuk: 350 km South-East of Kiev

## Site



- Located at iron ore production site
- Distance to coal mine is 50 km
- Industrial area & Qualified personnel available

# KGP-1 Overview

## Main Equipment (provisional)

- RWE Lignite Drying Technology (WTA)
- Siemens Gasification Technology
- Air Separation Unit 1500 t/d
- Gas Treatment
- Wet Sulfuric Acid unit
- Waste Water Treatment unit

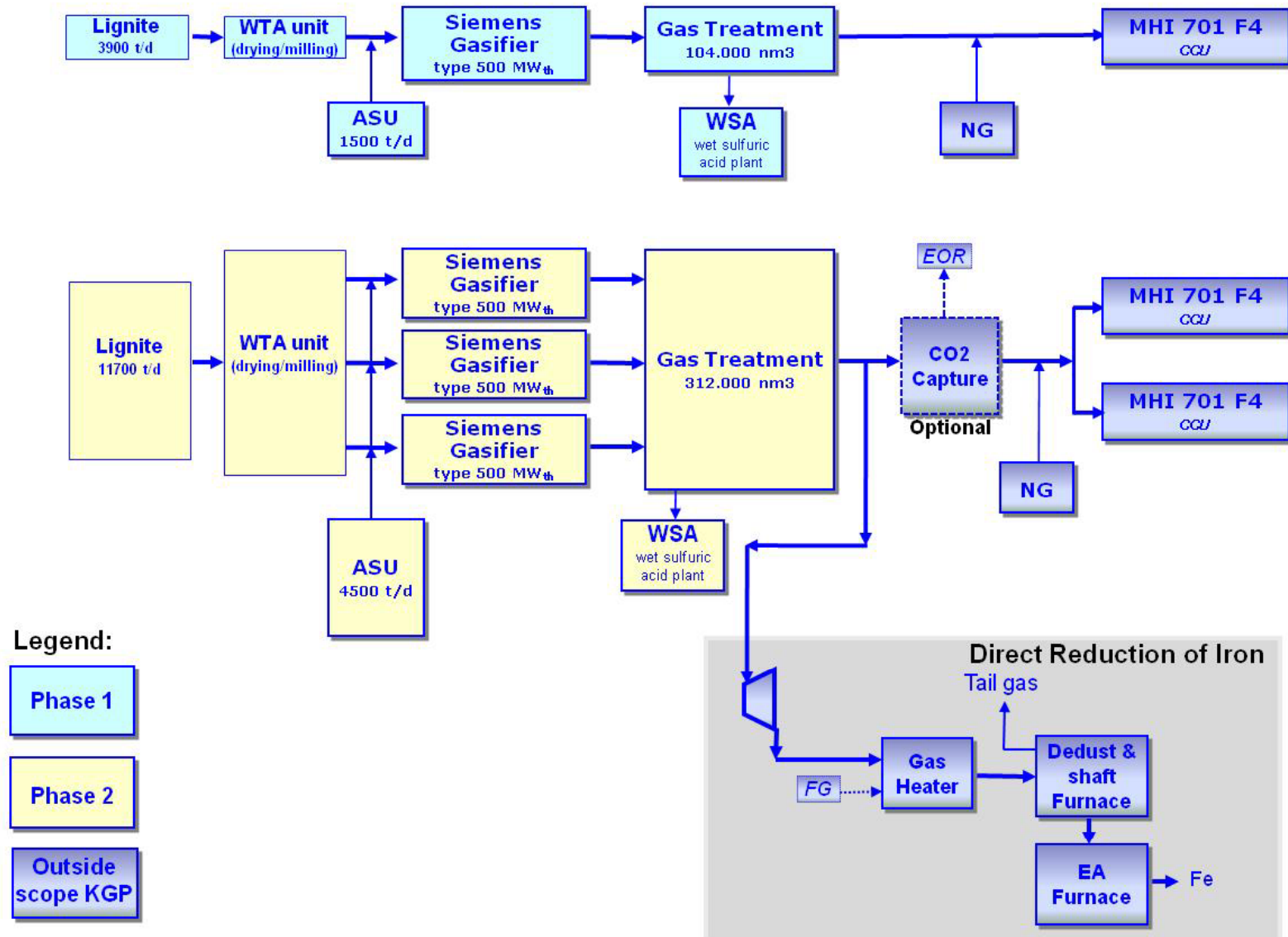
## Feed stock

- 3900 t/d of Lignite (brown coal),
- Raw coal LHV 9.3 MJ/kg
- Moisture content 42% - 54%

## Product

- 104.000 nm<sup>3</sup>/h Syngas (CO + H<sub>2</sub>) as feedstock for MHI M701F Gas Turbine and the future Direct Reduction of Iron Ore

# Overall Plant Concept

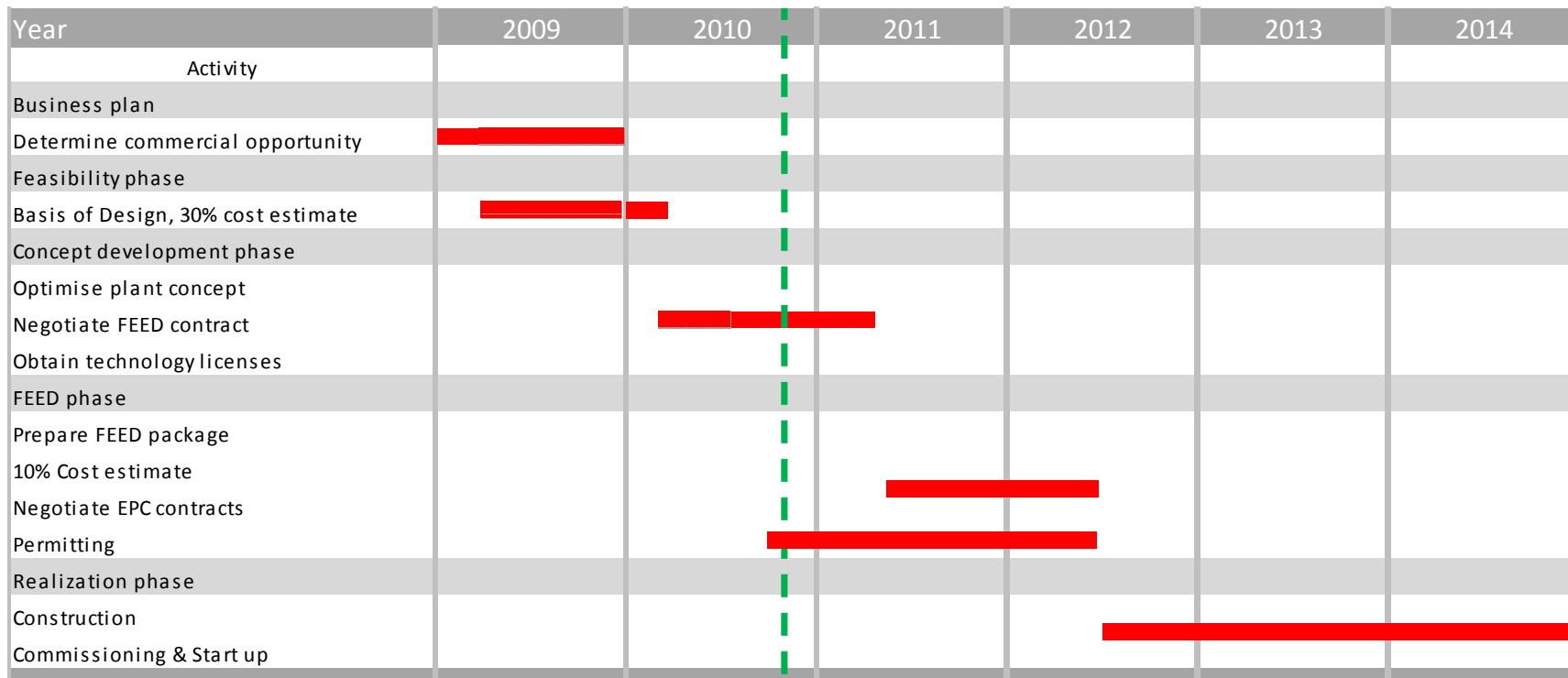


# Gasification Technology Selection

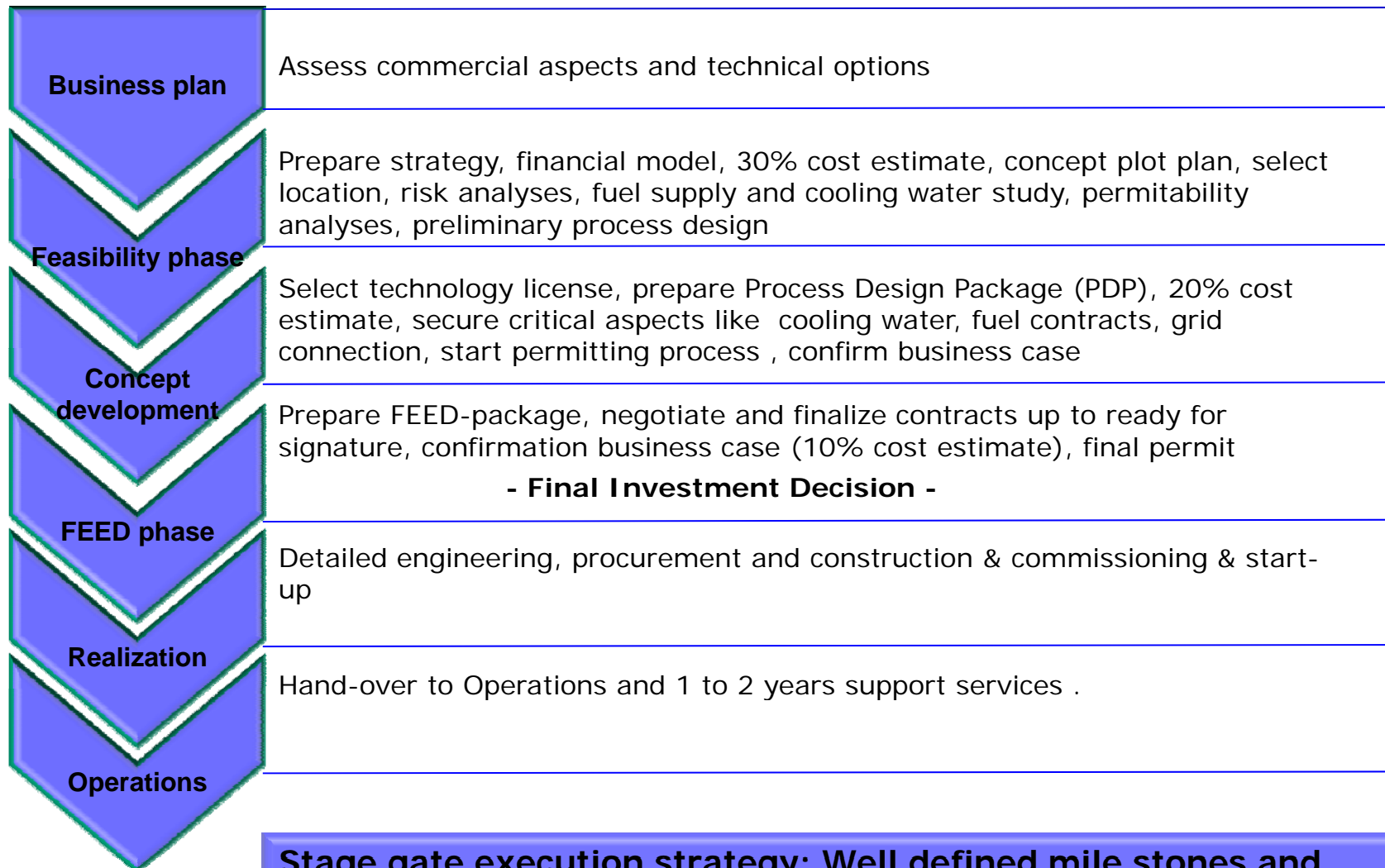
Criterion	Siemens Score 1-5	Weighing Factor 1-5	Total Score
NPV/IRR	3	5	15
Maturity	2	3	6
Availability	3	3	9
Planning	4	2	8
Construction	4	1	4
Efficiency	4	3	12
Environmental Impact	2	3	6
Fuel Flexibility	4	2	8
Complexity	4	3	12
<b>GRAND TOTAL</b>			<b>80</b>

**6 technologies high level screening, 2 in depth evaluated**

# Project schedule phase 1

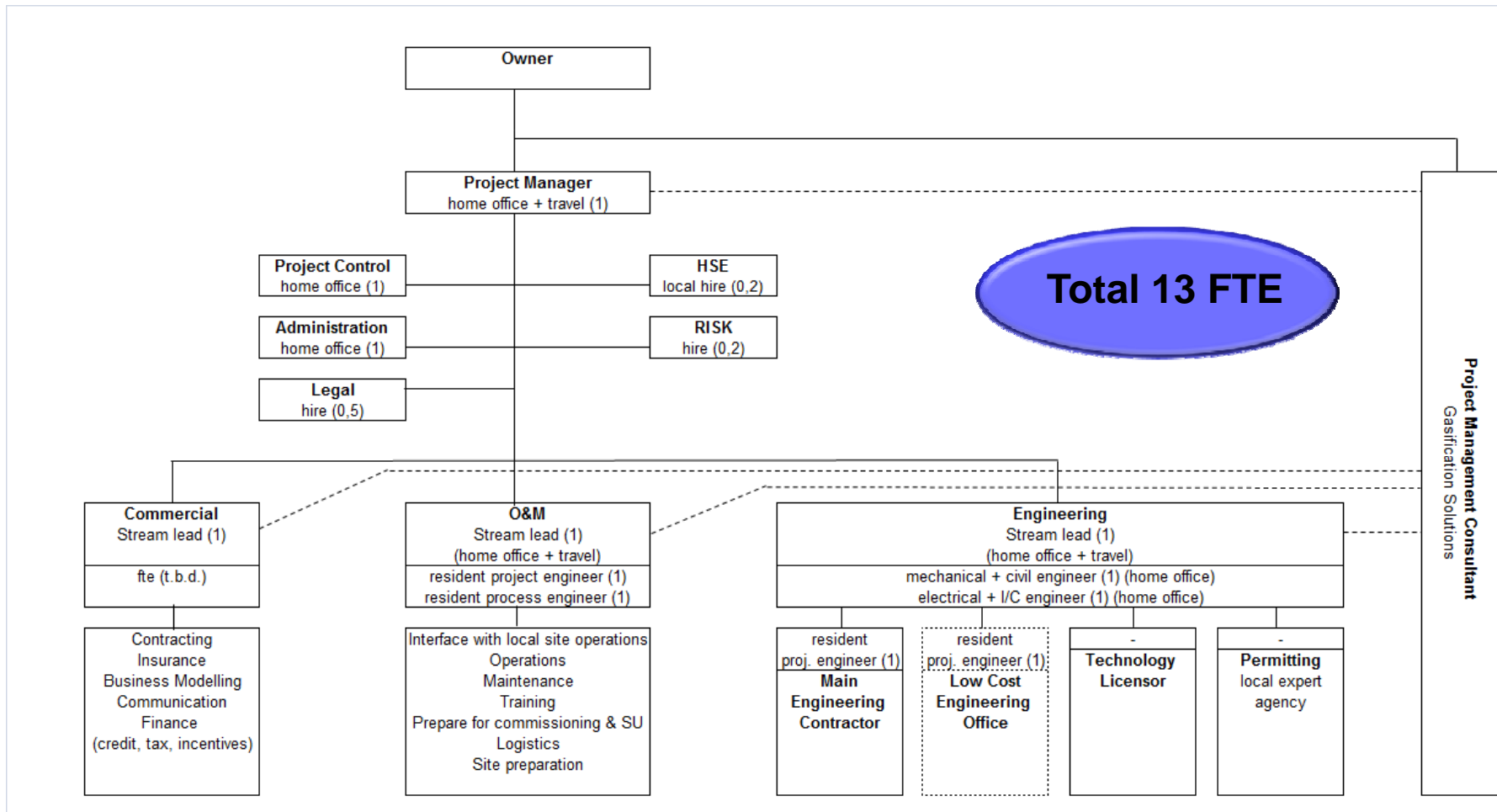


# Project Approach



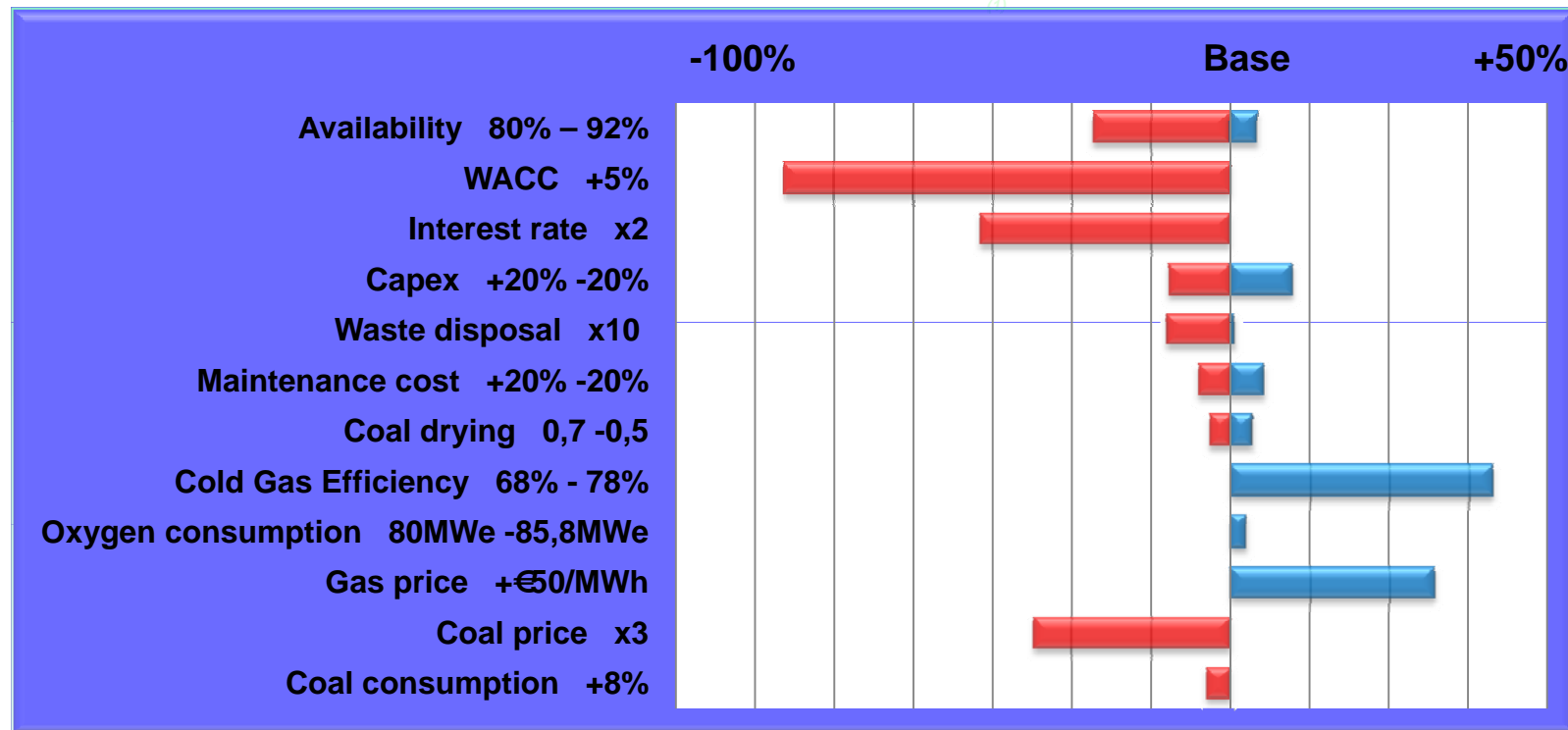
**Stage gate execution strategy: Well defined mile stones and deliverables per phase**

# Owners organisation FEED phase



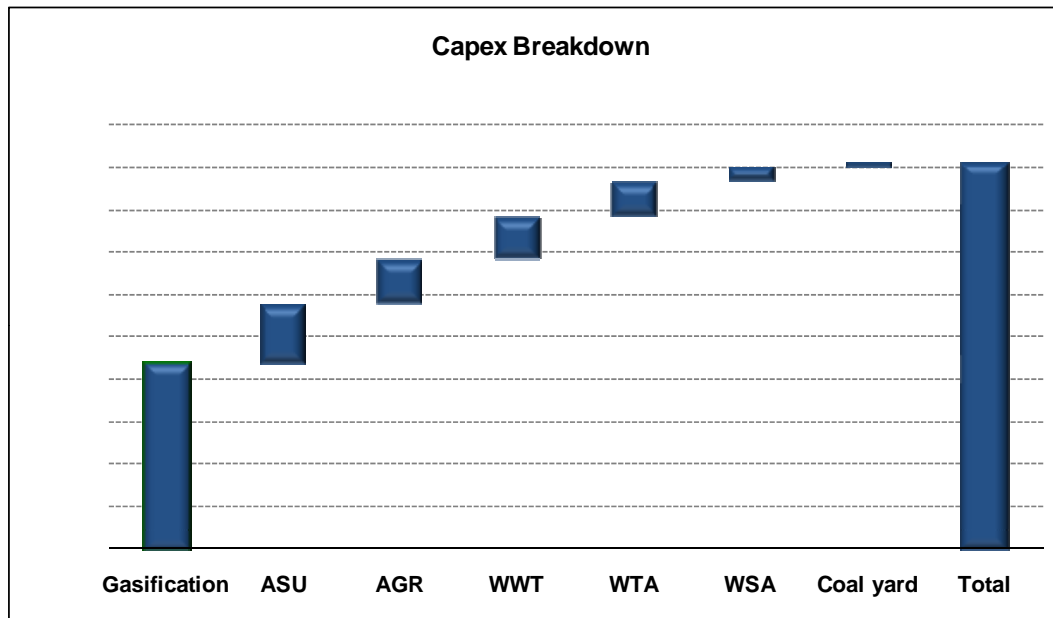
# Valuation

## NPV sensitivities



**Financial assumptions significantly influence the profitability**

# CAPEX

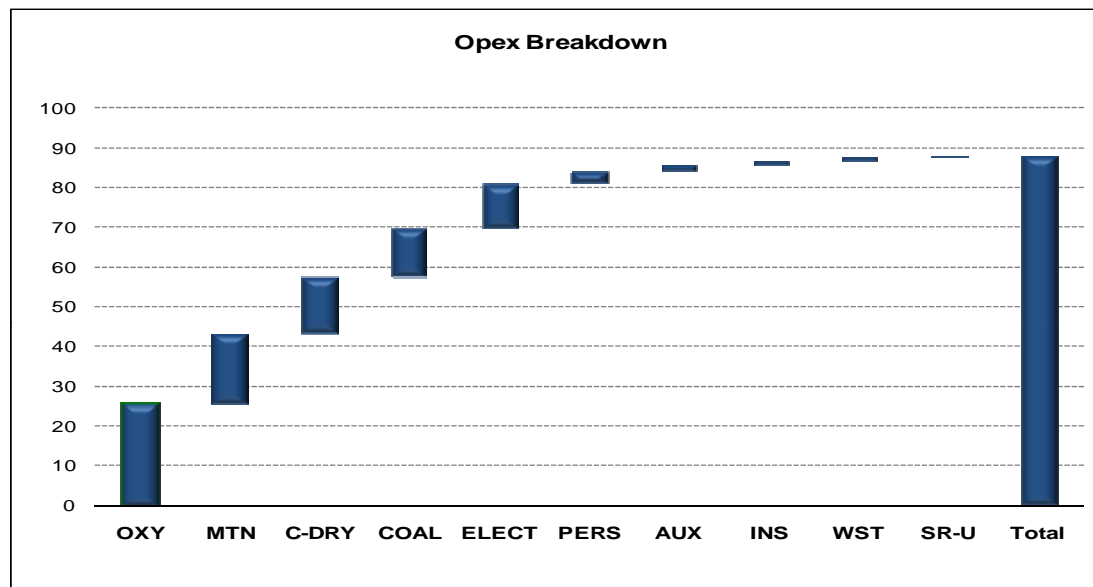


Abbr.	Unit
GAS	Gasification
ASU	Air Separation
AGR	Acid Gas Removal
WWT	Waste Water Treatment
WTA	Coal Drying & Milling
WSA	Wet Sulphuric Acid
Coal yard	Coal Yard

**Capex are predominately determined by investment in:**

- **Gasification**
- **ASU**

# OPEX



Abbr.	Full Description
OXY	Oxygen consumption
MTN	Maintenance
C-DRY	Coal Drying
COAL	Coal consumption
ELECT	Electrical consumption
PERS	Personnel
AUX	Auxiliaries
INS	Insurance
WST	Waste disposal
ST-U	Start up cost

**Cost are predominately dependent on energy cost :**


- **Oxygen**
- **Coal Drying**
- **Electricity consumption**

# Contracting Strategy

**Contracting strategy will be based on following principles:**

- Contract form LS(TK), EPCm or BOOT will be finally determined after market dialogue
- Maximize Ukraine content , subject to thorough qualification process
- High focus on favourable repetitive orders (in relation to phase 2)
- Only reputable technology licensors and FEED contractor

## High quality manufacturers are available in Ukraine



Berdichev Machine-Building Plant  
"Progress":  
Process (Static) Equipment



Shipyard:  
Piping pre-fab  
shop




Токмакський  
кузнечно-штамповочний  
завод

Tokmak Forging  
plant: Flanges &  
fittings



Stakhanov  
Wagon Works  
Coal yard/  
Logistics



Uzhgorod  
Turbogaz  
Rotating  
Equipment

# The Komsomolsk Gasification Project

