

advanced Expro methane hydrate production process

Oilgas/Mining expro
practices,new extraction
process offshore

=Yellow extraction
process



Gas/mining Market Overview

Large reserves Uranium, Gold, Silver, Thorium, Chromium...
Busd resources, Australia, Canada

huge amount of RD works. Bench marking, Process, drilling,
explor tech

Advanced geophysics and geochem technologies implemented:
ex: seismics special high resolutions, MMI, RMN, EM
Special Built in methods for geo data interpretation

DNI spec knowhow on expro low opex and capex;
Unconventional gas field dev successfull

Business Model/Added value

-RD on MH

Based on our new patented MH process of drilling and extraction of MH on the sea bottom, cooperation with ifp, Ifremer, CGG, Universities

-DNI group currently experience of, field explor services operations, engineering construction of field installations on gas fields, mines

--Expro know how ok= means huge gas assets (vs low tenaments costs)=

Gulf Cadiz, Indonesia and canada pacific



Introduction

Knowledge base1: Mh or shale Gas expro,(explor, drilling practices) high experience on deals, finance of mining

Expro Knowledge base is built in ot BU:

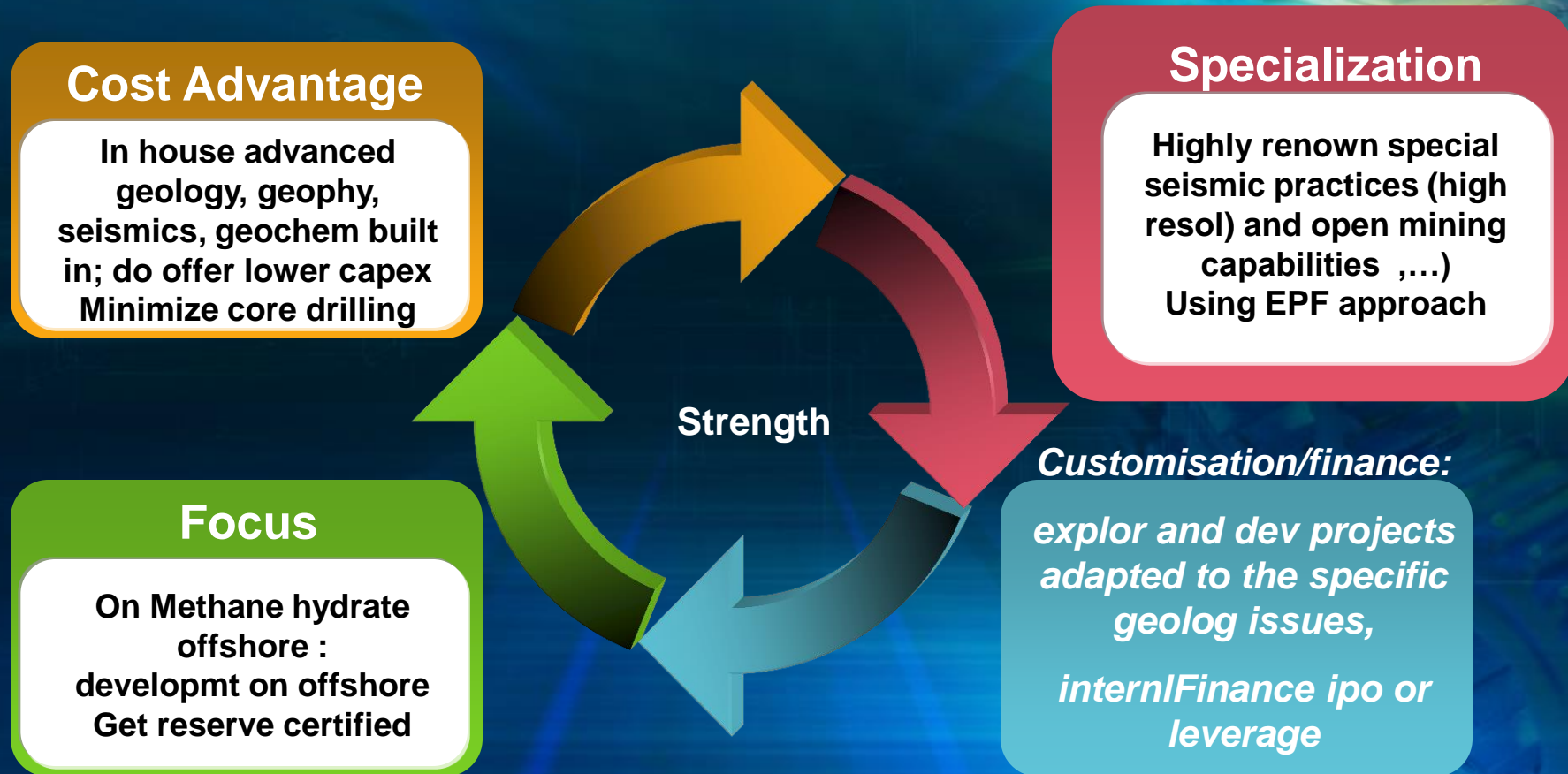
gas/mining field dev

BU1=Oil/gas co

BU2=.Mines



Business Strategic planning basis



Core knowhow/practices

Our Core Business is geoscience and MH extraction Solution Implementation.

Carry out high special geophys (seismic explor

reserv simulation, extract RD

engineering design of installations

Process installations construction

Base geosciences and engineering

Conduct of expro opérations

Explore implement large tenements with advanced drilling/well operation mines/(shale gas) performed with high HSE standards So high Yellow potential reserves

MH Process Competitive Edge: 1

Component Details

Competitive edge details of the process =

Most of the work undertaken on this subject (R&D, tests, ...) shows that many difficulties to overcome:

HSE wise: risk of leakage or slippage or the collapse of the seabed sludge, conventional drilling may in fact create the sea floor collapse, no umbrella is provided to date to capture leakage or mitigate risk;

-Well oper on shale gas dev (expro knowhow) ...

-Sea floor slippage risk is mitigated by abandoned well cementing

MH Process Competitive Edge: 2

- The economic difficulties: that are inherent in conventional technologies drilling submarine and underwater completion, appear very expensive (opex, capex), as these operations will be extremely multiplied, and very slow compared to interventions on the well of classical fields, eg a subsea drilling can cost more than 290000usd/jr, the drilling time can be increased more than 10, given the fragmentation of blocks of hydrate; which destroy economics of these oil expro tech;

MH Process Competitive Edge: 3

- The idea of DNI process patented is a strategy of open pit mining under water, under an umbrella by deploying an innovative excavation system on the seabed and the extraction of active MH, and preventing cave-ins and mudslides, the-DNI process does not use polluting products, and guarantees the non leakage of gas and hydrates;
The unit is supported by a moving ballast, and obviously has an adaptability and flexibility against the unpredictable basement of the seabed, including geotechnical characteristics of sea floor that vary randomly, with blocks of atomised MH; the special seismic and geophysics technologies involved allows precise targeting of the area with acceptable feasibility;
- rapid well drilling, well cemented after suction completion, special drilling extraction based on drilling string/tubing driven by a ballast, advanced BHA, suction system under the bell

MH Process Competative Edge: 4

Furthermore, the simulations of the process will be based on numerous studies and research throughout the world (areas of physio-chemical, thermodynamic and engineering ...), the control and command of the installation will be carried out from a classic boat + a simple surface FPSO, industry ROV, underwater robotics is very mature and the knowledge and the operation attached to them;

This technology implements the optimum efficiency by recovering energy from CH₄ in a turbo-expander at the surface, which then feeds a gas turbine driving an alternator. (Equipment located on the boat); This process offers a capex and opex at a much lower costing, to that of a traditional subsea rig and conventional oil production, drilling and production facilities for capex may represent respectively the sums of 370 MUSD and 400 MUSD average (capex + subsea system, + FPSO surface vessel) this approach offers cost savings of about 16 times lower than a traditional capex;

Practices and Capital

Labour:

Two types of specialized staff:

1. Geoscience team for exploration of gas shale or MH
2. Experts on gas engineering

Capital:

Phase I: Seed Funding

Competitive Advantage

**Deep knowledge & experience
on business and engineering processes, in oil & gas up to the MH**

Sourcing Ability

Setting up JV with local
oil companies;
Strong MH exploration
practices

Sourcing Ability and Low Cost Operations
Strong DNI mining knowledge base. Long
track of DNI OM experience

Experience of
oil/gas
operations

Long track of Steriwave-DNI experience

Geoscience
exploration
shale/ MH

Leader

Engineering /
extraction
experts

Strong Knowledge Base

Competitive Advantage

Path of Growth

Not only do we offer good advantages on exploring MH basins within any country, but we also select them. Moreover, our existing partner contacts with oil companies will be a starting strength.

Jv offshore = Spain or Portugal or Marmara sea.....

JV,
India
USA



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graph LR; A(( )) --> B(( )); B --> C((JV, India USA)); C --> D((Jv offshore = Spain or Portugal or Marmara sea.....));
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Go to the Market

Phase **operations trough JV with local oil co**

Phase I RD

Identify the needs of each site
MH gas and powergen

Set up mini pilot prototype,
engineering

Start jv =Internl sourcing base
and partnership agreement with

- RD simulations with IFP, Ifremer, Universities

- Pilot plant implementation

Our resources

- Engineering design, RD deep practices
- Seek opportunity to get MH permits, in Portugal, in India, Russia & USA, **first target=certify a first block**
- Focused exploration activities plan dev with India, Portugal, Iran...

Our JV Partners

- Take advantage of the existing contact to get jv partners
- Boost international business by cooperating with the energy companies
- le high potential asset value:multibillion

Yellow MH Advanced MH mining process

Totally highly safe, flexible MH process providing actual risk management, risk mitigation

Perfect environmental loss prevention

On the top of this: high return, quick high reserve value

far lower opex and capex versus oil oiltech such as horizontal well

L/O/G/O

