

JOGMEC Techno Forum 2015



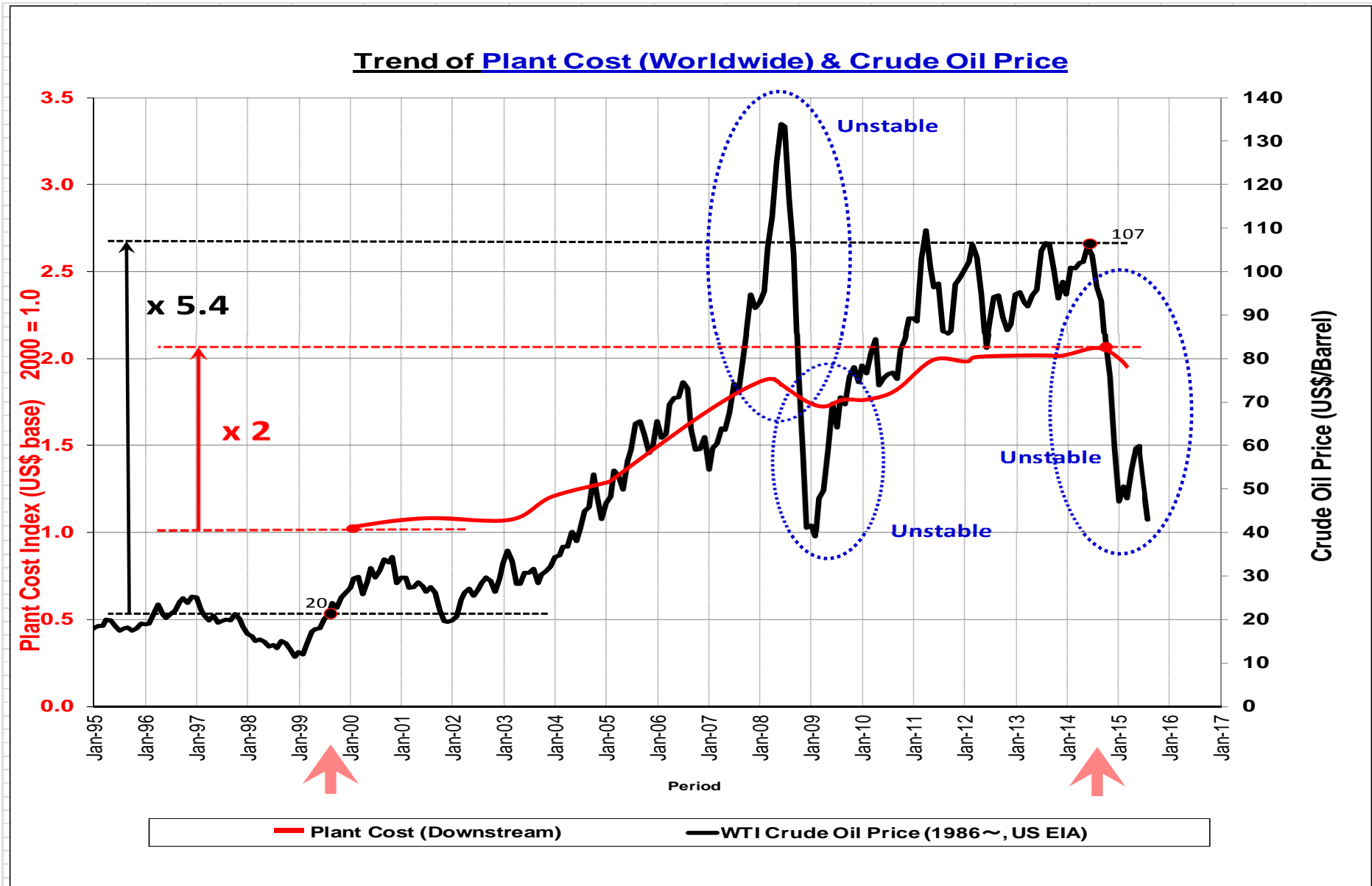
The "New Normal"

Koichi Kawana
President and Representative Director

28th October 2015

JGC JGC CORPORATION

1. WTI Price Index vs. Plant Cost Index



Source of Plant Cost : IHS CERA

2. Challenges of "3D" in Situation of High Oil Prices

- **Difficulty**

- **Depth**

(Only on the screen)

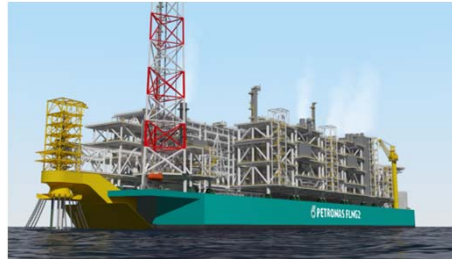
- **Distance**

3. Technical Challenges

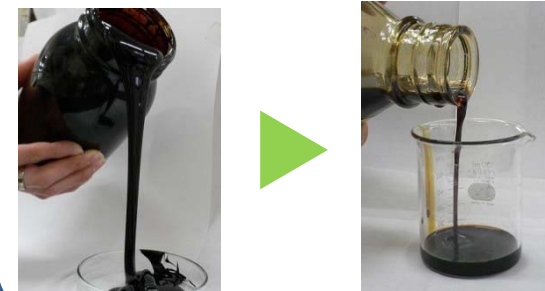
1) Shale Gas/Oil



2) Onshore, Offshore, Deep Sea Development



3) Extra Heavy Oil Upgrading



4) Clean Coal



5) CO₂•N₂ Removal

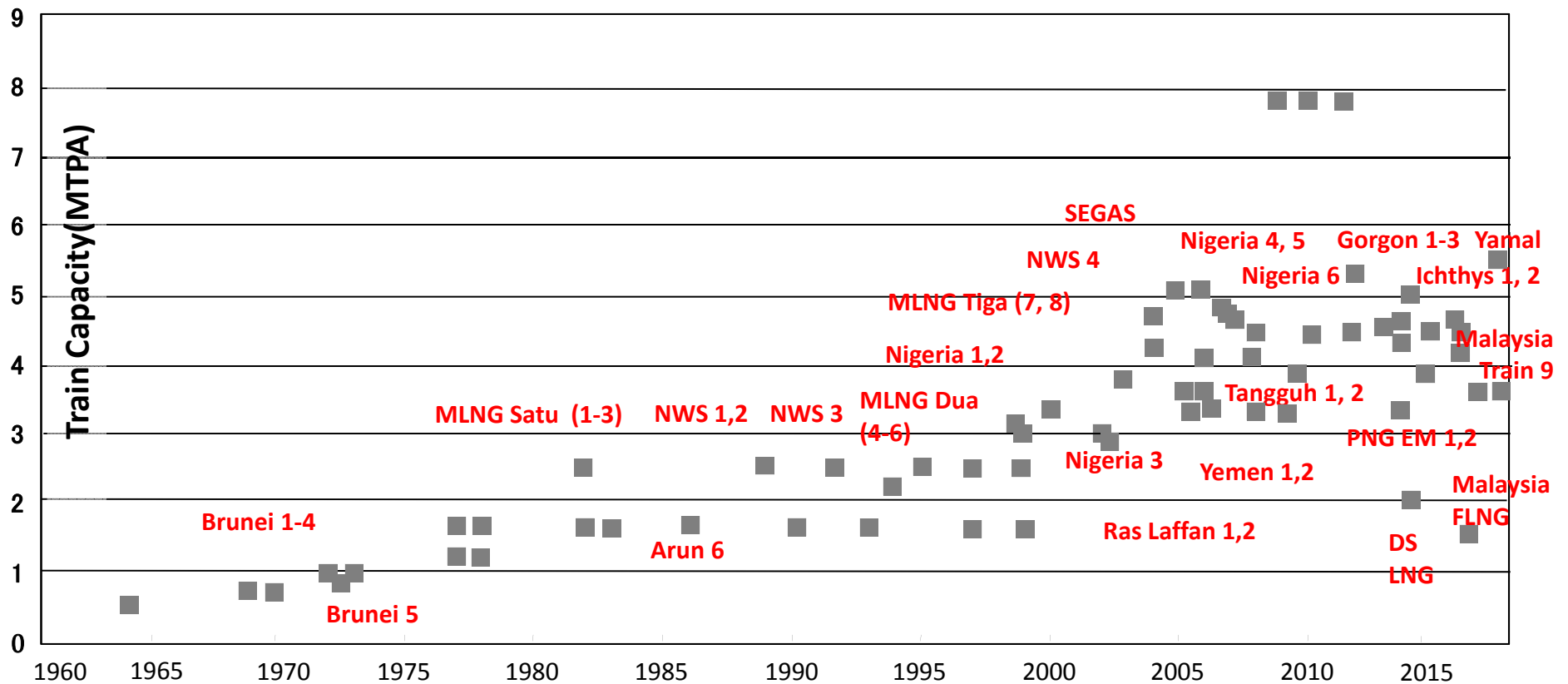
- CCS
- Ceramic Membrane
- Solvent Extraction

6) Renewable Energy

- Solar Energy
- Wind Power
- Geothermal Power
- Bio Ethanol

4. LNG Plant

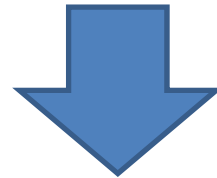
JGC's track record of LNG projects already covers 39 LNG trains. JGC has participated at various stages of project development. Also, JGC is extensively experienced with ECA structured finance.



Source: Published data consolidated by JGC

5. Reversion to "3C"?

- **C**onventional
- **C**heap & cost-cutting
- **C**onservative



Value Creation & Innovation
(by Big Data, IoT, Standardization, etc.)

6. Past Boom in Middle East



Now in Middle East!



Labor Cost in High Range!

- National Employment Policies
- Demand for Infrastructure
- Increase of Price Index
- Increase of Price Index in home countries of migrant workers



Risk to plan implementation from cost & time standpoints!



Investment Planning from Long-term View

7. Education

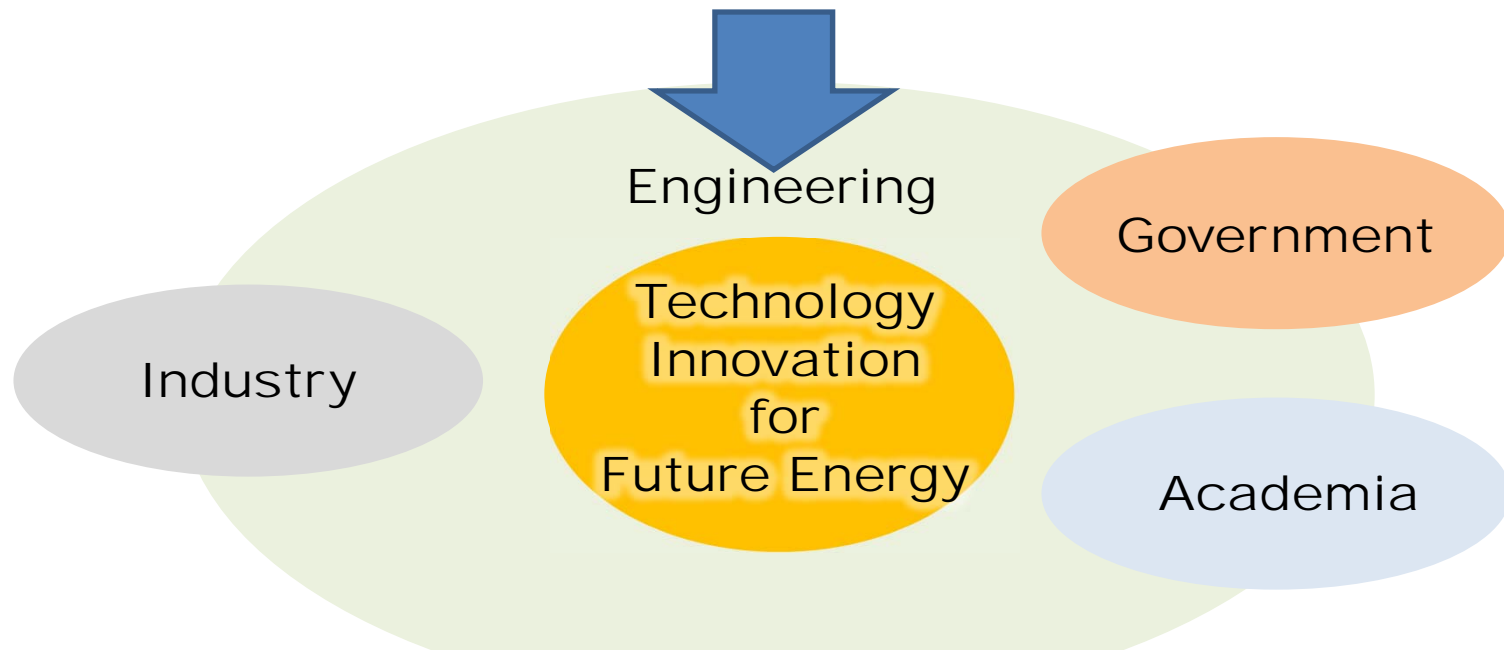


8. Challenges for the Future

- Increased world population and economic growth of emerging countries
- Greater urbanization
- Globalized environment and biodiversity



- Heightened demand
- Improved Efficiency
- Proactive measures for environmental protection



Long-term view unrelated to oil price

Engineering the Future !

- Economy
 - Efficiency
 - Environment
 - Employment
 - Education
- 
- Engineering

