



Example of a Novel Gas to Liquids Offshore Recovery Solution for a New Market



“Market Opportunities & Positive Environmental Recognition”

Example Displaying Novel Gas to Liquids Offshore Recovery for a New Market!



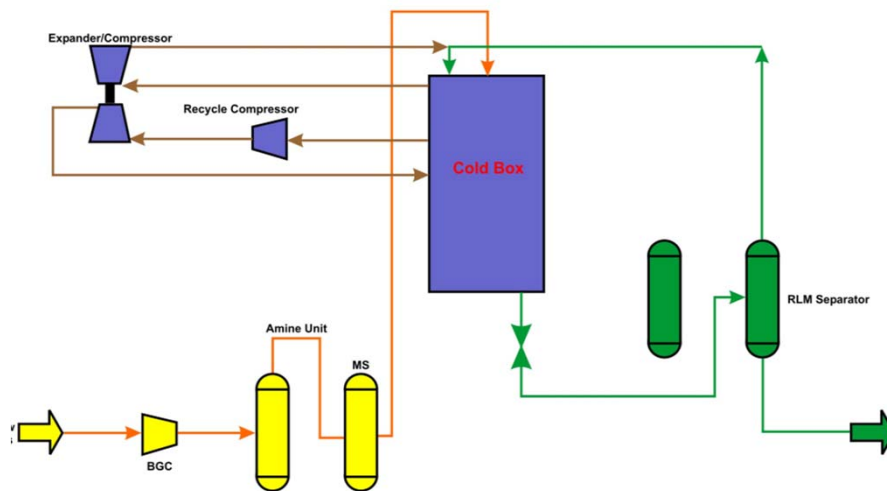
- Client seeking New Novel Environmentally sound Market Niche for Gas to Liquids offshore recovery
- Irvine investigate market for new end users
- Pure Liquefied Methane (PLM) used is duel fuel for Diesel engines marine and motor vehicle
- PLM similar properties to LNG including handling etc
- Duel fuel PLM 80% Diesel 20% substantially cutting diesel emissions, PLM greatly reduced price
- Use of PLM will also extend Diesel fuel shelf life well into the future

***Floating / Mobile Concept Currently
Under Review by Client***

What is Pure Liquefied Methane (PLM)?

Simply put:

PLM is natural gas cooled down to a temperature where it becomes a liquid, it is a very close sister to LNG. At ambient pressure the temperature is approximately -161°C (-258°F). PLM is primarily methane with low concentrations of other hydrocarbon and non-hydrocarbon components.



Simple PLM Schematic



Onshore PLM Facility example
(established technology)

***Economic & Environmentally
Driven Product***

Example Gas Recovery Solution - West Patricia Reservoir, Malaysia

Original Options Evaluated Included:

- Continued flaring**
Not an option
- Gas Re-injection**
\$28.6m USD and “dead money”
- Micro Liquefied Natural Gas (LNG)**
Viable small \$ return allowing some OPEX relief
- Compressed Natural Gas (CNG)**
Viable small \$ return allowing some OPEX relief
- Gas to Liquids (GTL)**
Viable small \$ return allowing some OPEX relief

The Challenge:

- Get an alternative solution to flaring
- Not to spend \$28.6m in “dead re-injection money”
- Maximise revenue potential
- Look at what’s best for Malaysia
- Attract new business to Malaysia
- Pinpoint technology transfer potential
- Benefit local infrastructure & supports local employment
- Advance Malaysia’s current LNG relationship

Our Vision for West Patricia & Malaysia Involves:

- The best solution for WP and for reducing flaring on future developments!
- Not spending \$28.6m in “dead re-injection money”
- Finding a viable marketable solution that maximises revenues with follow up benefits
- Malaysian driven and environmentally friendly recognised solution.



The Solution - Big Picture:



What is Pure Liquefied Methane?

PLM is a Gas Derivative (Gas to Liquid), basically a Bi Fuel. ‘The simultaneous combustion of 2 fuels’, e.g. PLM combines with Diesel (a fuel enhance additive) to make clean Diesel



The Solution:



- Define process design for offshore use**
The present onshore design needs physically reducing
- Establish pilot plant on fixed structure**
Optimise process, implement planned use for PLM to part fuel support vessels/FSO etc, in-line with reducing WP’s OPEX.
- Establish production on floating structure (barge)**
Optimise process for floating production & exploit the design

The Solution for West Patricia:

Strategy- Phase 1:

- Define pilot design for offshore use, 3.5 to 5MMscf/d
- Lease known reliable platform for operations (SERF)
- Adapt support vessels & FSO engines to DDF (diesel & gas)
- Establish offshore ISO container distribution
- Establish onshore distribution excess PLM



Strategy- Phase 2:

- Adapt pilot design for floating production applications
- Lease or purchase barge from known reliable source (T.B.A.)
- Produce & Implement planned PLM offtake & shuttle to shore
- Implement planned PLM distribution network
- Distributors supply growing Asian market
- Project duration is 2 years



Mani Benefits:

- WP OPEX greatly reduced, higher reservoir revenues
- PLM process established offshore, greatly reducing flaring
- Existing LNG transportation facilities adapted for PLM
- Job creation for Malaysia offshore & onshore
- Malaysia has opportunity for positive environmental recognition



Petronas Malaysia
Opportunities for New Investment Returns & Positive Environmental Recognition

Concept Status



- Studies conducted include:
 - Identification of floater, i.e sizing / mobile platform identification (covers floating & fixed platform options)
 - Identification of PLM process equipment P&ID's
 - Identification of low cost Sour Gas treatment facility
 - Identification of project planning
 - Identification of project deliverables
 - Identification of suppliers
- Project awaiting developers interest

Example of Early Consultancy & Project Business Development !



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Thank You



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Contacts



**For further information on our designs and services
please contact:**

Singapore Office:

39, Pandan Road,
Singapore. 609281
Tel.: +65 91093201
+65 68539106

Malaysia Office:

11, Jalan 14/2, Taman Tar,
Ampang, Salangor, Kuala Lumpur
68000
Tel.: +60 342665601
Mob.: +60 123210824
+60 178810807

Irvine Engineering Pte Ltd - Registered Address:

60 Paya Lebar Road,
#08-43 Paya Lebar Square,
Singapore. 409051
Tel.: +65 68539106

Dubai Office:

Jumeirah Lake Towers,
P.O. Box: 643593,
Cluster C, Goldcrest
Executive Tower Office
706,
Dubai. UAE.
Tel.: + 971 4 447 0897
Fax: + 971 4 447 0896
Mob.: + 971 567451923
(Main Company Contact)



enquiries@irvineeng.com