

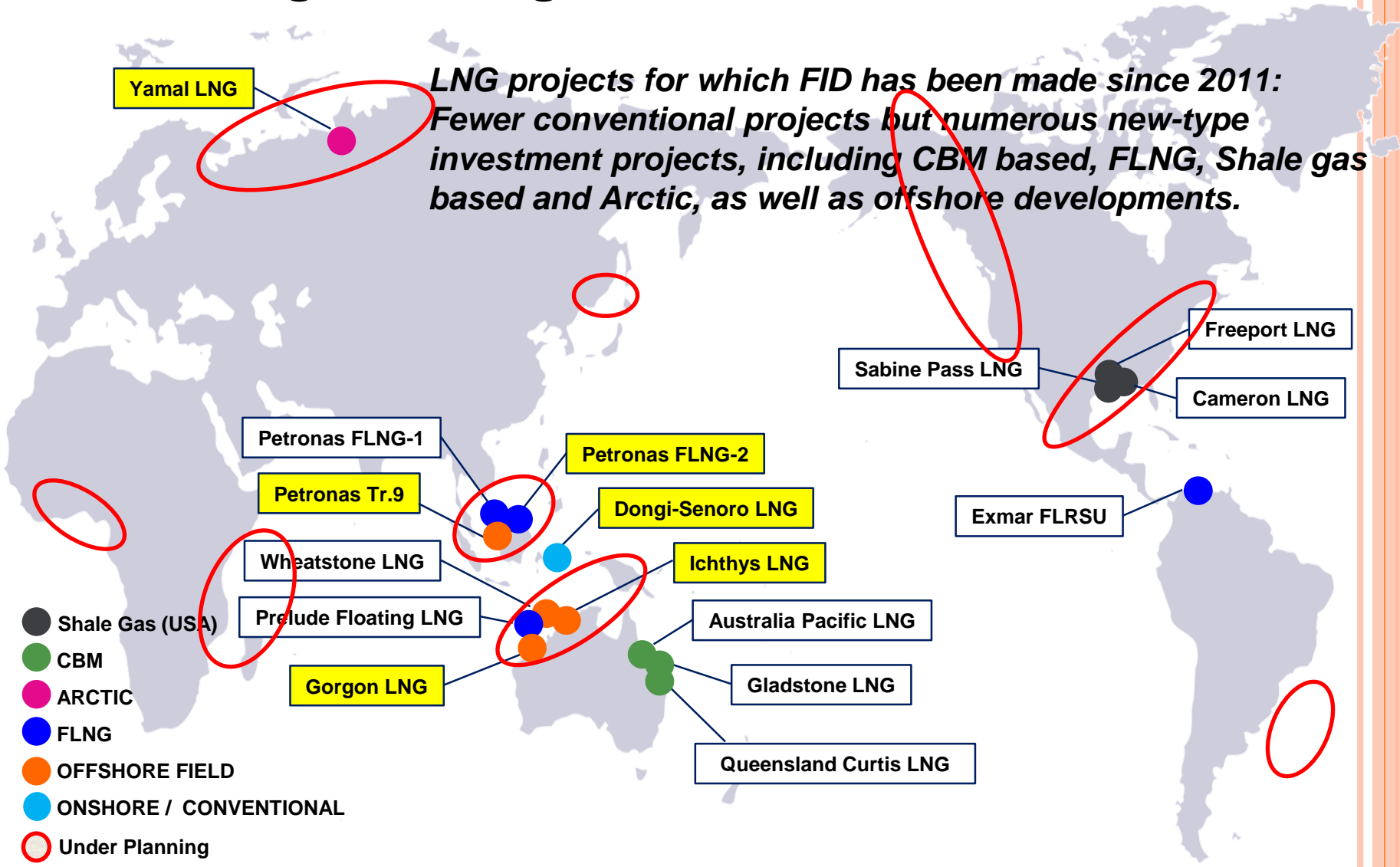
Floating LNG as a Solution



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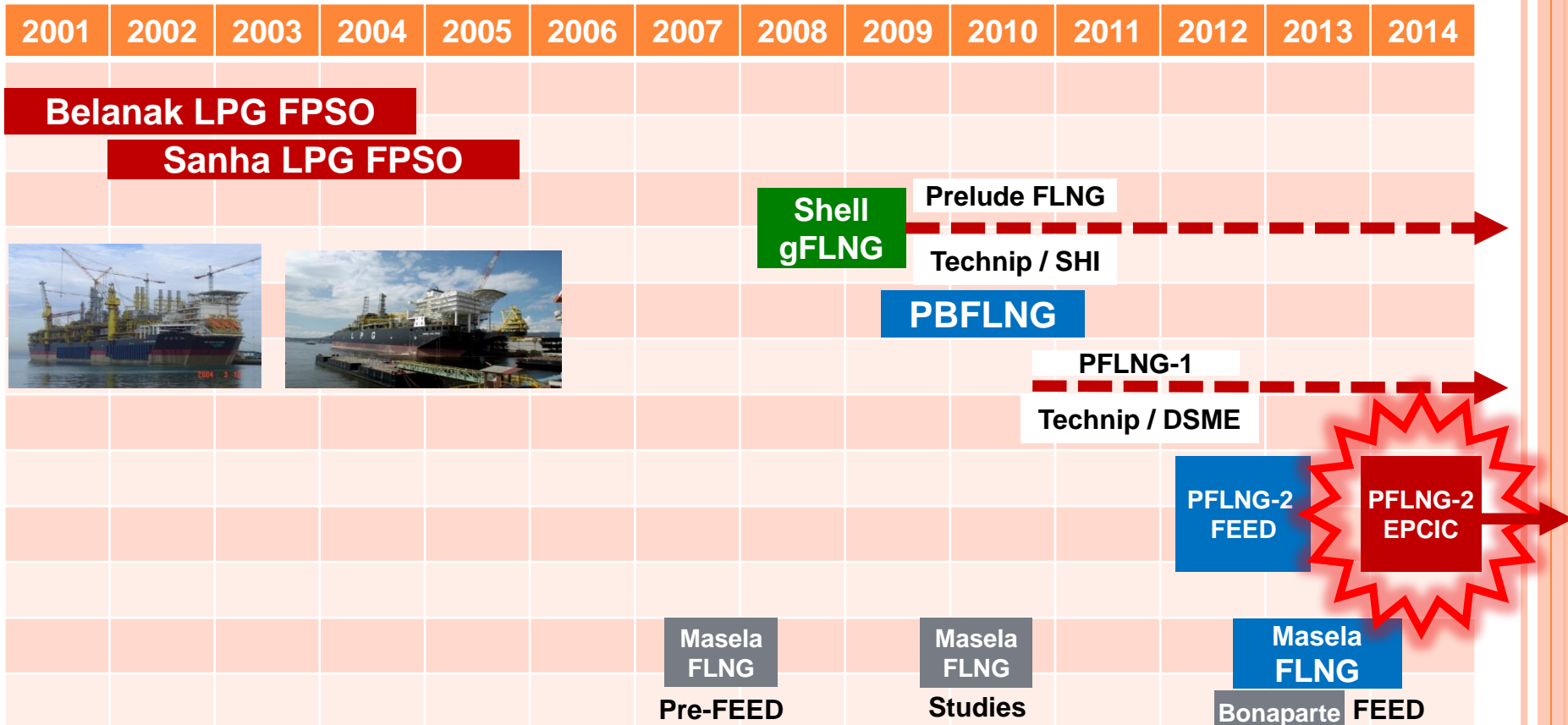
A Paradigm Change in LNG Business

LNG projects for which FID has been made since 2011: Fewer conventional projects but numerous new-type investment projects, including CBM based, FLNG, Shale gas based and Arctic, as well as offshore developments.



JGC FPSO / FLNG Development

JGC started FLNG preliminary studies in the 90's. In early 2000, two (2) EPCICs of LPG FPSO were completed in which operation of distillation columns was confirmed. Since 2007, FLNG has been accelerated.



Belanak LPG FPSO

Sanha LPG FPSO

Shell gFLNG

Prelude FLNG

Technip / SHI

PBFLNG

PFLNG-1

Technip / DSME

PFLNG-2 FEED

PFLNG-2 EPCIC

Masela FLNG

Pre-FEED

Masela FLNG

Studies

Masela FLNG

Bonaparte FLNG

Pre-FEED

Operability of Distillation Column confirmed for FPSO

FLNG adopted

FLNG – Key Attractions

- **Potential cost-effective solution for deep water gas extraction**
- **Potential alternative for onshore plant, to overcome labor issues, land limitation or geopolitical risks**
- **An effective approach for stranded offshore gas field development**

3D Model of FLNG2 shown only on screen (not in handouts) due to confidentiality reasons.

FLNG: Increasing opportunities for gas monetization

FLNG - Challenges

1. Safety considerations

2. Pursuit of Cost Competitiveness

- **Optimum Scale and Layout**
- **Standardization of Vessel and Equipment**
- **Involvement of wider range manufacturers**
- **Flexibility of Ship and Module yards**
- **Accumulation of knowledge from Lessons Learned**

3. Project finance / Marine insurance

FLNG: Offers opportunity for higher commercial benefit to owners

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