

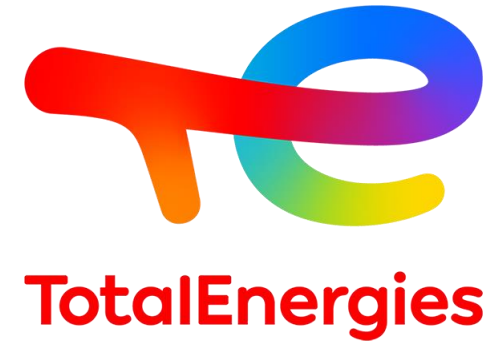
TotalEnergies, 50 years of Exploration in the Asia-Pacific Region

T. Thomas*, D. Roy, P. Dattilo, **D. Deveaux *** and P. Ravaut

7 March 2023

*** speakers**

Summary of Presentation

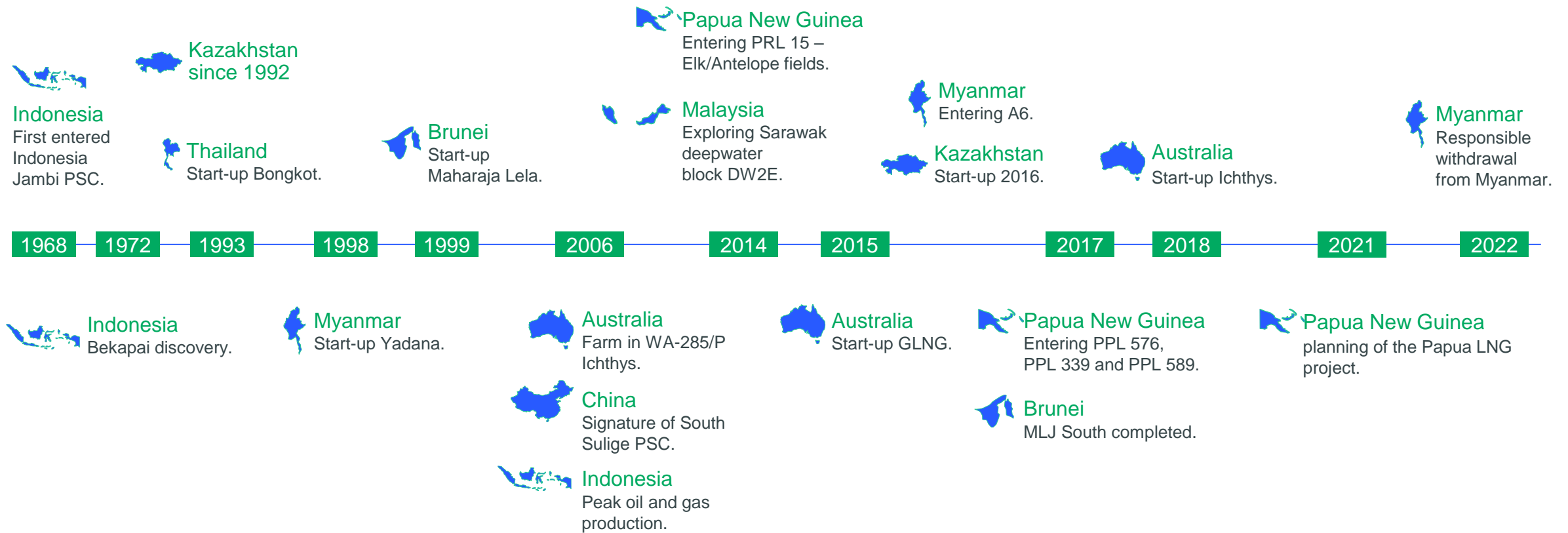


1. TotalEnergies – a short historical review, with **key milestones until today**
2. Explo story - **Mahakam Indonesia**, a hundred-year-old exploration history *
3. The exploration continues in **PNG, Elk/Antelope and Deep offshore**
4. Final message

* A short tribute to : **Ghislain Choppin de Janvry**, **Yves Grosjean**, **Bernard Loiret** and **Jean-Luc Piazza**
(The Mahakam "Musketeers")

Exploration & Production in Asia-Pacific

Key milestones





TotalEnergies E&P in Asia-Pacific



AUSTRALIA re-entered in 2005

Offshore / Unconventional (CBM to LNG)

Start-up GLNG Train 1 in 2015, Train 2 in 2016. Start-up Ichthys production and 2 LNG trains in 2018. 1 exploration permit (WA-285-P) and 1 block for CCS.

BRUNEI since 1986

Offshore / Deep Offshore

Existing gas production from the Maharaja Lela Jamalulalam offshore gas and condensate field on block B delivered to the BLNG plant.

CAMBODIA since 2009

Offshore

Exploration on OCA III, on hold pending agreement between Thailand and Cambodia.

CHINA since 2006

Unconventional / Deep offshore

Development of a tight gas field on South Sulige. Entry into Taiyang PSC (2017) for exploration, three 2D seismic surveying campaigns completed in 2018 and 2019.

INDONESIA since 1968

Production comes from the Ruby gas field on the Sebuku license.

PAPUA NEW GUINEA since 2012

Foothills and Ultra Deep Offshore

Preparing FID for Papua LNG project. Interests in the PRL15, PPL339, PPL589 and PPL576 exploration licenses.

MALAYSIA since 2008

Ultra deep offshore

Offshore exploration blocks DW-2E, SB-N and SB-2K

THAILAND since 1990

Offshore

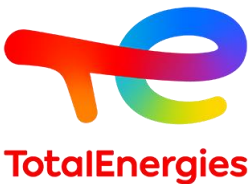
Existing offshore production from Bongkot. North and South fields. New wells drilled in 2020 to maintain the production plateau.

KAZAKHSTAN since 1992

Offshore & Onshore

Existing production from Kashagan field located in North Caspian Sea, start-up in 2016. Operating the Dunga onshore field.

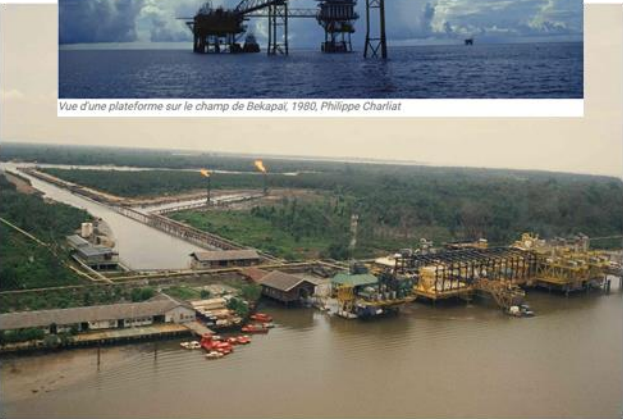
Mahakam, Indonesia - A hundred-year-Old Petroleum Exploration history



Mise en production de l'unité de Bontang : vue aérienne des installations, 1977, DR - Total



Vue d'une plateforme sur le champ de Bekapai, 1980, Philippe Chariat



Vue aérienne des installations d'Handil, 1974, DR - Total

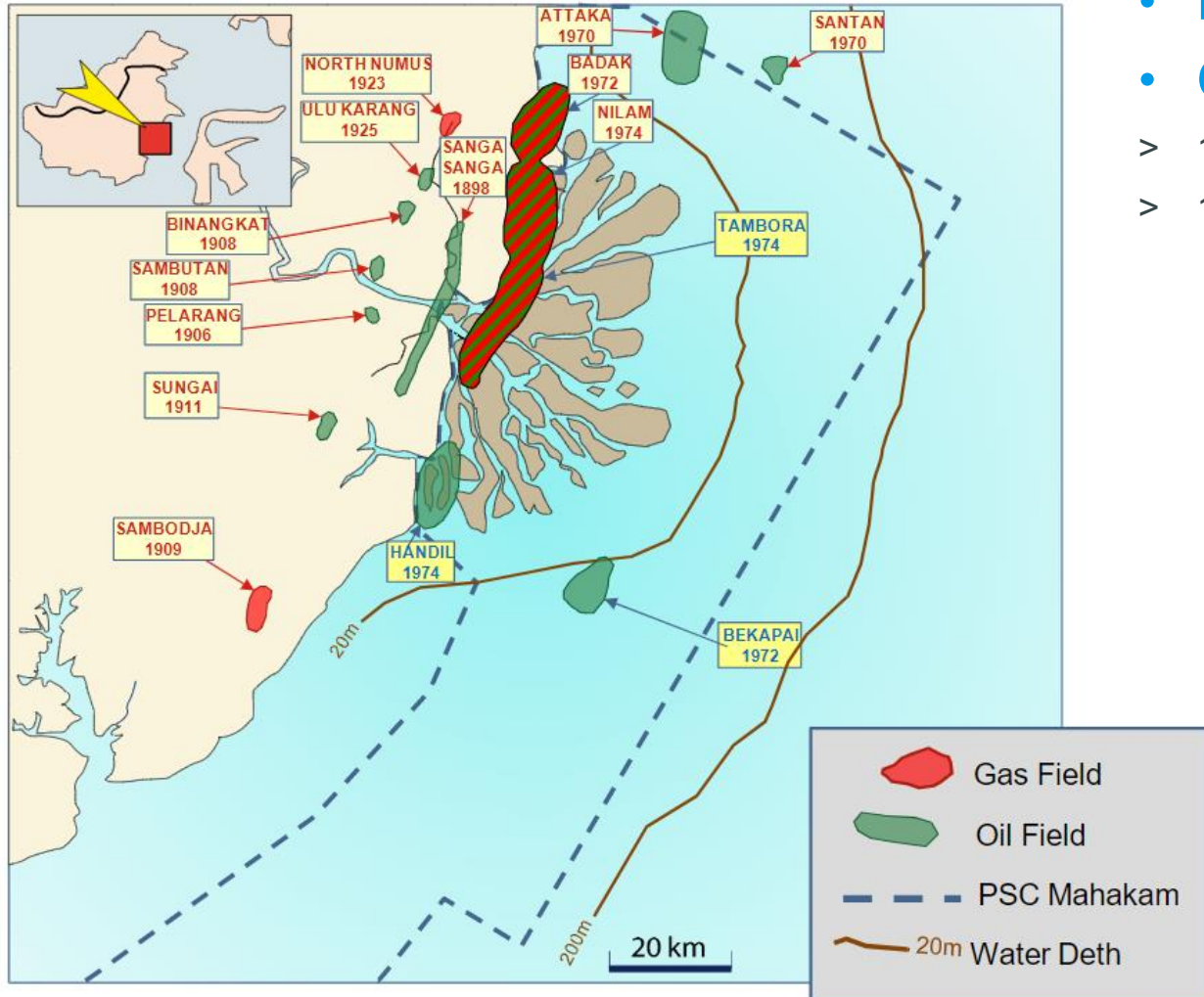


Mise en production du gisement gazier de Tambora : installations, 1989, DR - TOTAL

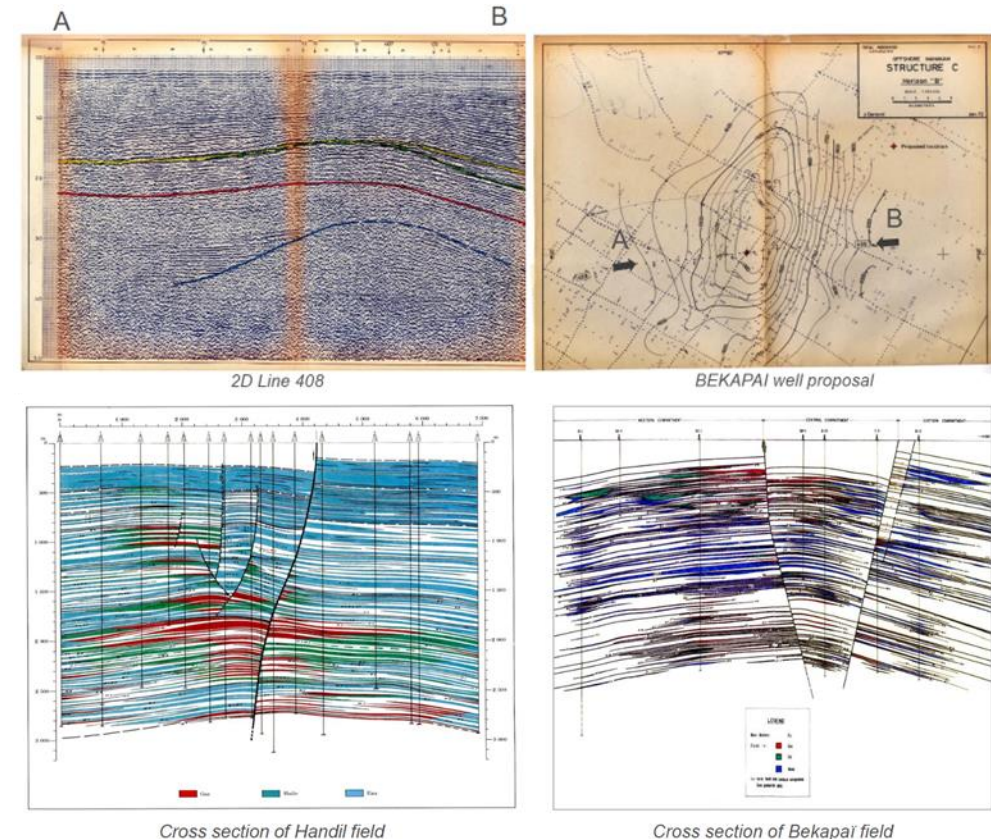


Rig Soehanah opérant sur plateforme SWPS sur Sisi field, vu de la mer, 2014, Thierry Gonzalez

Mahakam, Indonesia – First period. Looking for structures and discoveries

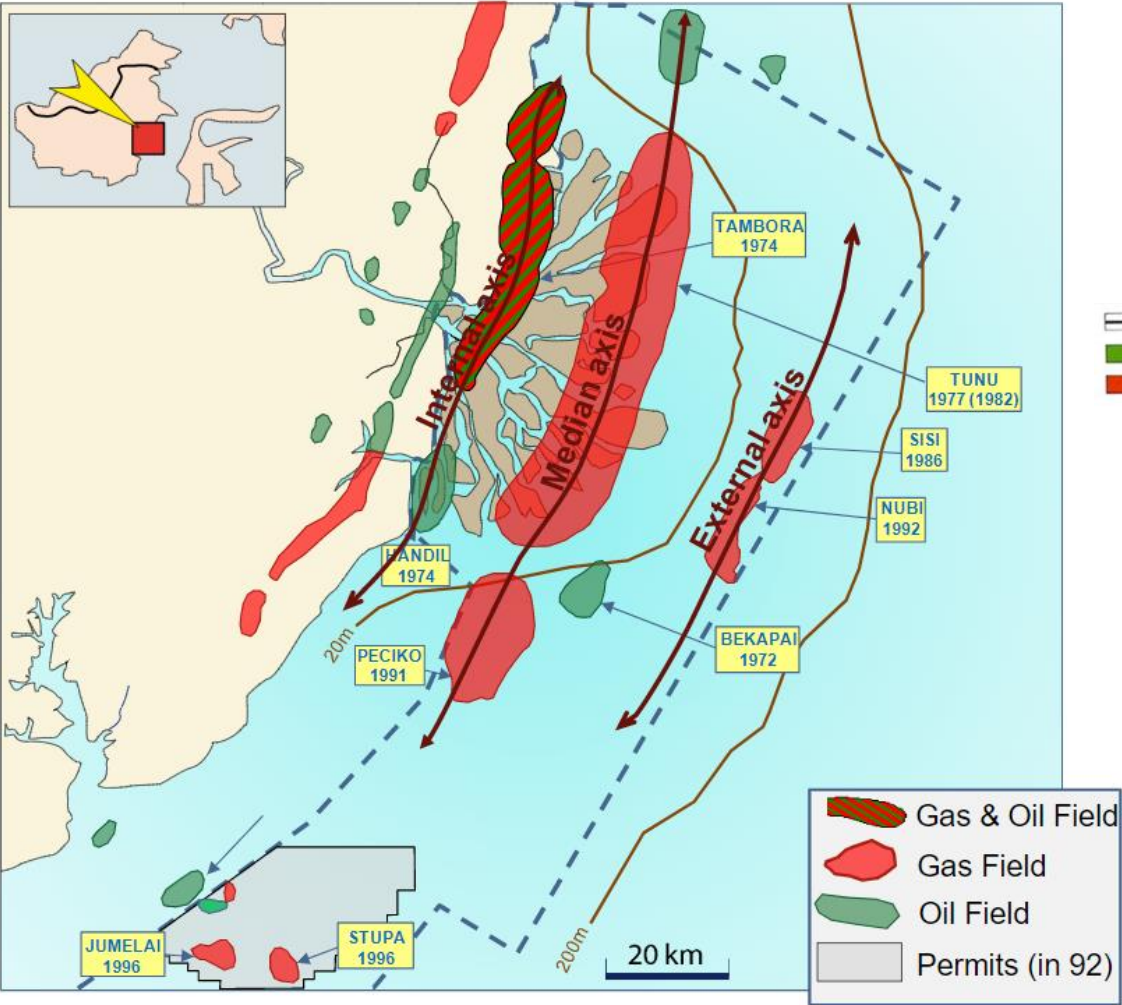
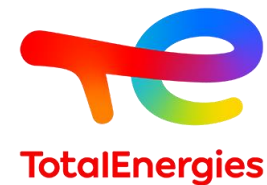


- Disappointing early wells as no gas market.
- Challenging 2D seismic grid acquisition
- > 1972 - **BEKAPAI**, a major discovery on revisited structure.
- > 1974 - **HANDIL** discovery on large anticline.



After Bernard Duval

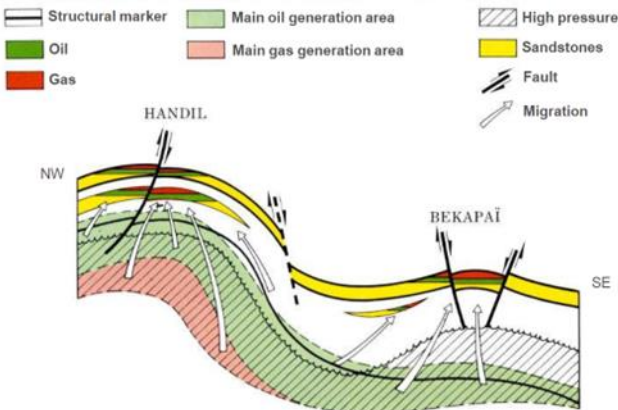
Mahakam, Indonesia – Second period. Rethinking the Petroleum System & New Strategy



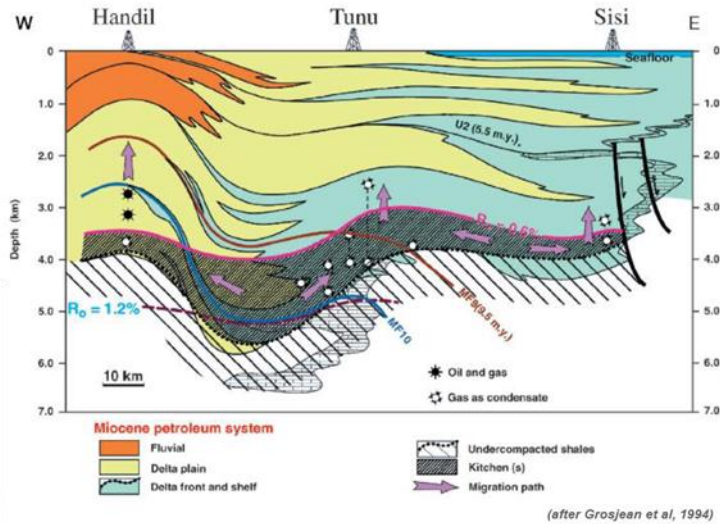
After Bernard Duval

- Opening gas market end 70's and LNG plant.
- New petroleum system concept

(Detailed stratigraphic analysis, Geochemical re-interpretation and new migration model)

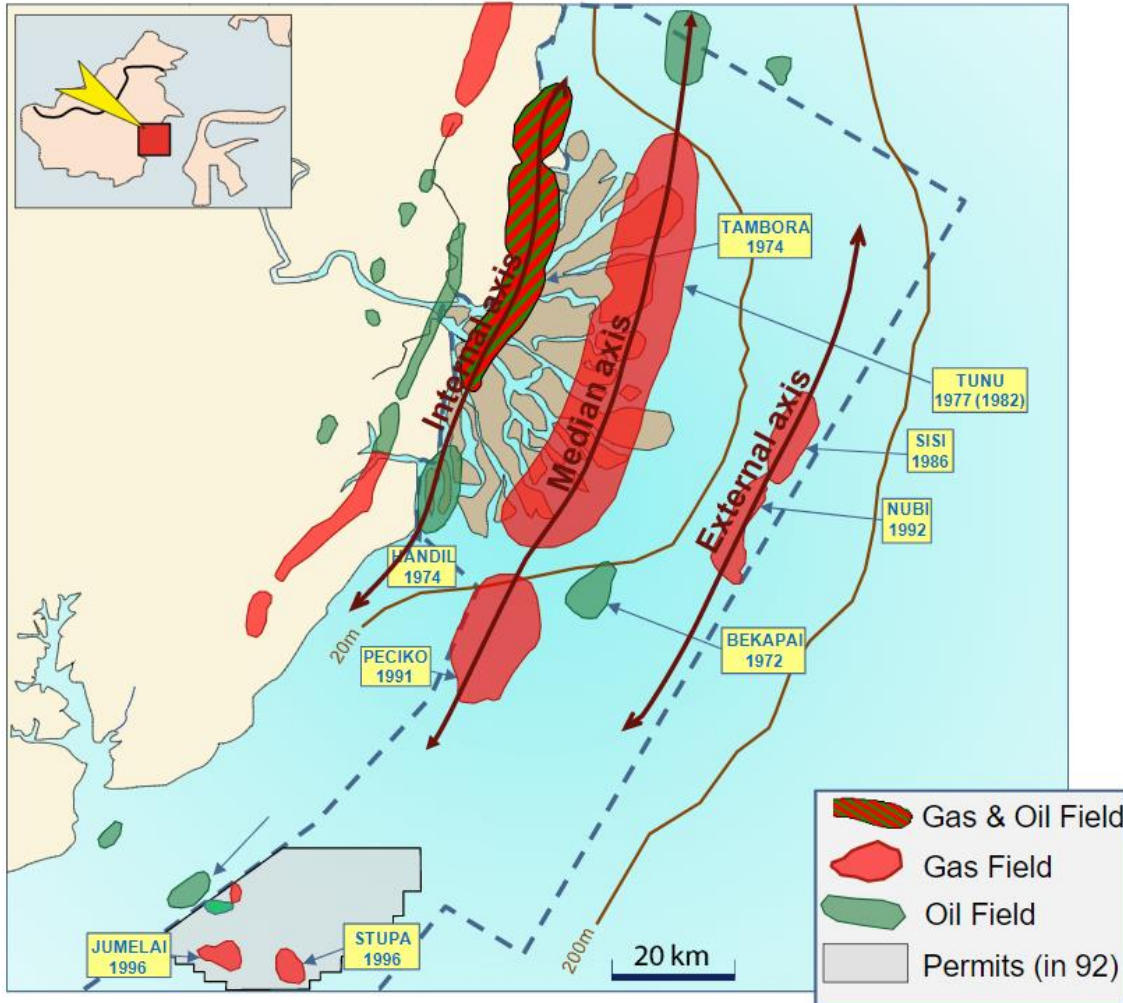
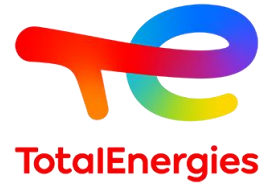


The initial model of the petroleum system



The Mahakam delta oil machine

Mahakam, Indonesia – Second period. Rethinking the Petroleum System & New Strategy



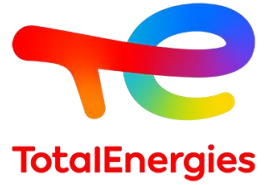
- Opening gas market end 70's and LNG plant.
- New petroleum system concept
(Detailed stratigraphic analysis, Geochemical re-interpretation and new migration model)

→ Key messages

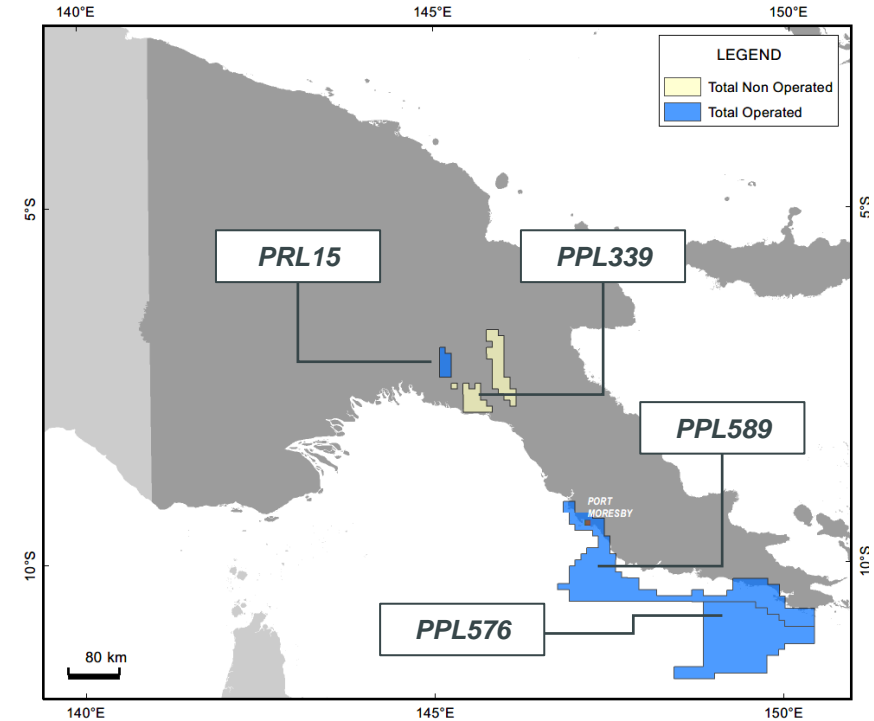
- Regional perspective, (re)questioning of the Petroleum system & field model.
- Out-of-the-box thinking with relativistic view of past “dry” wells.
- Focused application of technological advances.
- Strong team spirit.
- Fundamental optimistic attitude.
- Tenacity & power of conviction.

After Bernard Duval

TotalEnergies presence in PNG, since 2012



- **Committed to long term sustainable E&P presence and optimal future development** of resources in PNG's unique environment
- **Strong presence in PNG onshore and offshore full E&P cycle** 31,200 km² (Op.) and 4,165 km² (Non-Op.)
- **PRL 15 Operatorship** since August 2015
 - TotalEnergies 40% - ExxonMobil 37% - Santos 23%
- From **Appraisal to Development** with **Papua LNG project**
- **Leveraging global experience, onshore to ultra deep offshore:**
 - Technological innovation and expertise
 - Development and project execution capability



PRL15 – Classic Foothills History

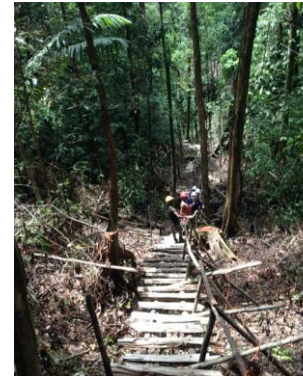
Leveraging Our Foothills experience from discovery to development



- PRL15 Operator since 2015, **building on successful exploration**, initially largely driven by surface geology
- **Significant appraisal acceleration** with 4 wells proving attractive connected volumes
- Leveraging **TotalEnergies global experience**
 - Significant Fold and Thrust Belt, and Onshore Experience
 - > Bolivia, Columbia, Argentina, France-Aquitaine, etc.
 - Optimizing technological experience and expertise
 - Development and project execution capability
 - Forging committed Joint Ventures and Collaboration with all stake holders
- Ensuring **optimal and responsible future development** of resources in the unique environment of PNG **with minimal footprint, respecting all stakeholders**



Seismic Bridging

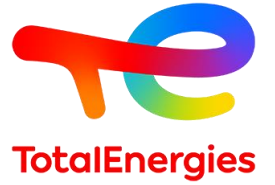


HA Rig 115 on Antelope-6



PRL15 – Technology Implication

Leveraging TotalEnergies technology for optimal and cost-effective exploration



- **Intensive operations and data acquisition**

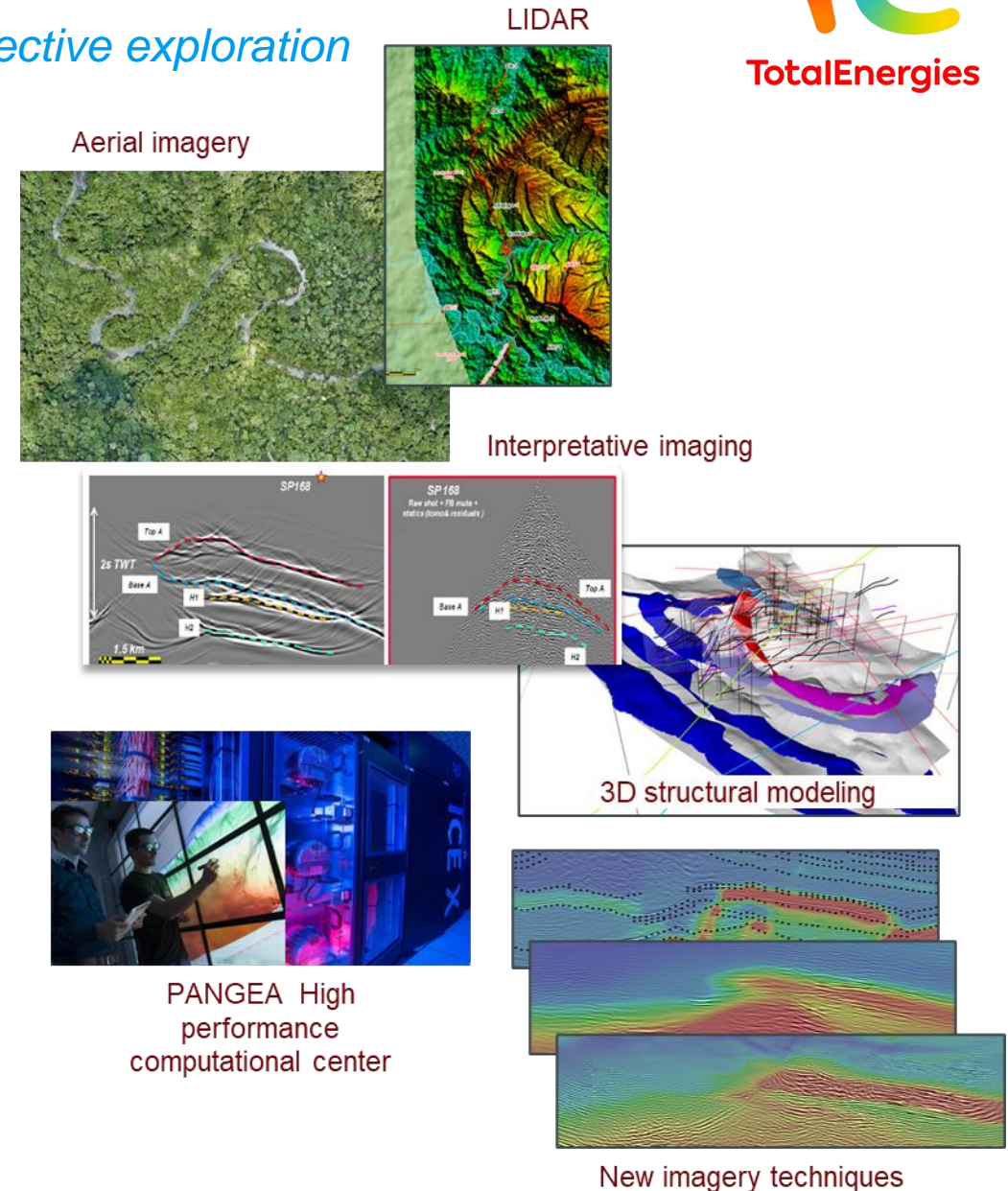
- Regional AGG and LIDAR survey
- 2D seismic and MT acquisition

- **Constant integration using advanced technics**

- Field work and surface geology, radar and satellite analysis
- From Seismic-to-Shot based Interpretative imaging
- 3D restoration and Structural modeling (Move3D) for paleo-bathymetry and displacement estimates
- Developing and testing new imagery technology (e.g. FWI)

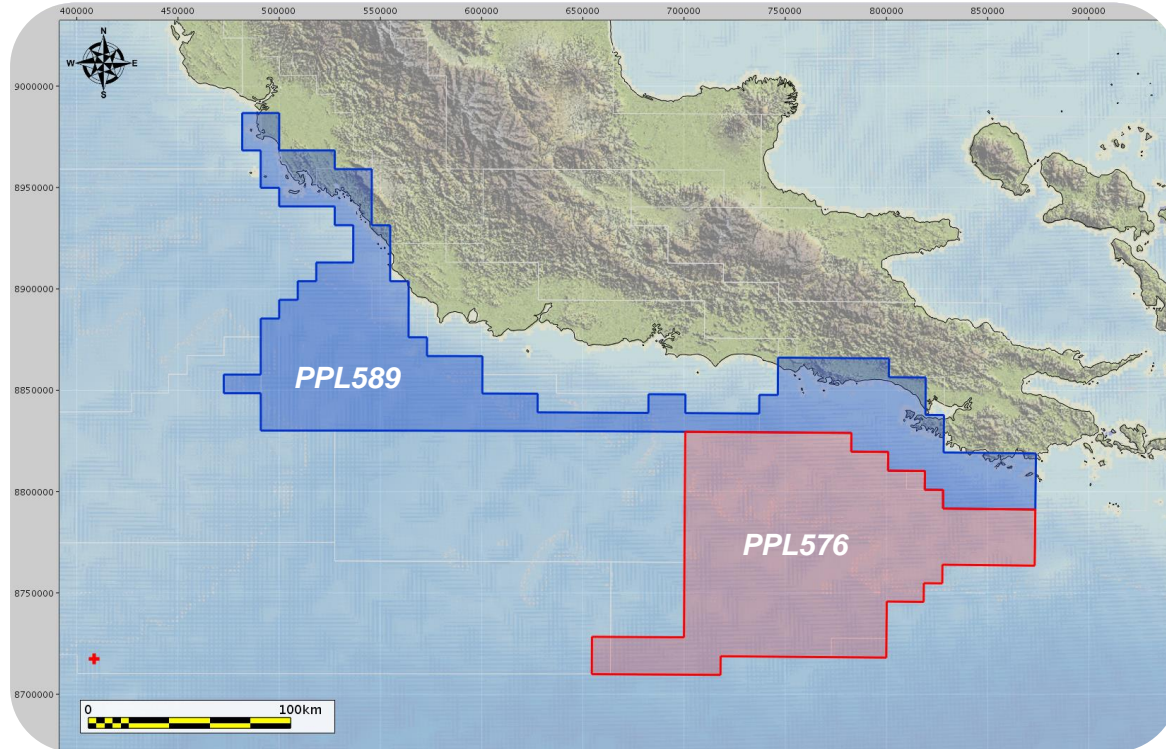
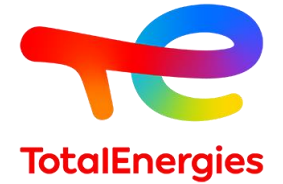
- **Dedicated facilities and in-house expertise**

- Technological center and laboratories
- PANGEA High performance computation center



TotalEnergies PNG Deep Offshore Exploration

A leading acreage position



- TotalEnergies operates **two high-grade exploration licenses in offshore PNG**
 - Multi-play prospectivity
 - High potential for fluid HC
 - Ready-to-drill high impact prospects with material resources
 - Optimal location to inferred mature kitchen

**PPL
576**

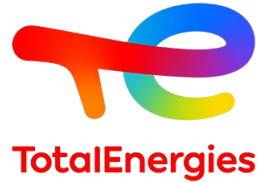
- ✓ Effective since Nov 30, 2016
- ✓ **Giant carbonates prospects with liquid potential**
- ✓ 14,784 km²; WD up to 2,500m
- ✓ Targeting 1st exploration well in PNG UDW

**PPL
589**

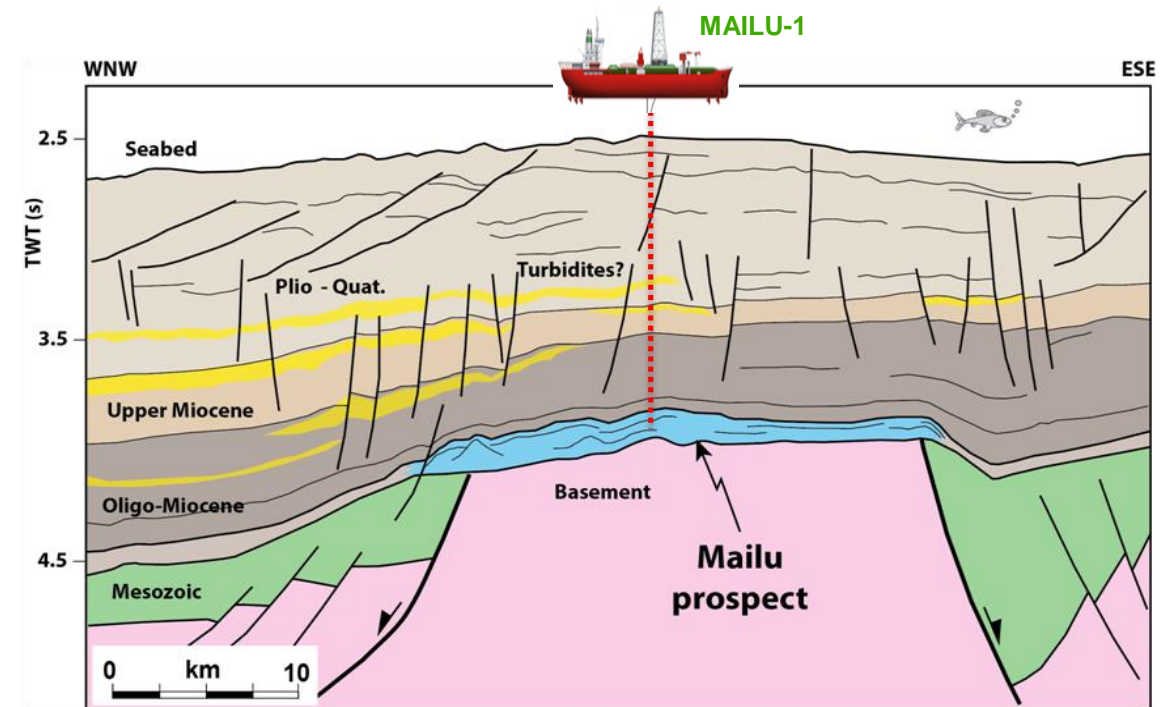
- ✓ Effective since Oct 31, 2017
- ✓ **Significant data acquisition and prospect maturation effort**
- ✓ 15,650 km²; WD up to 2,500m
- ✓ Potential de-risking program with 3D survey

TotalEnergies PNG Deep Offshore Exploration

Unique position in a Frontier domain, to unlock next development area



- Targeting **Giant Tertiary carbonate structures**, Eocene isolated carbonate reservoir deposited on pre-existing highs.
- **Multi Gbbl liquid potential** in a significantly de-risked basin, with major follow-up exploration potential
- Targeting **drilling of 1st exploration well**, Play Opener in the offshore Papuan Plateau
- **Leveraging TotalEnergies global experience in carbonates and ultra deep offshore** :
 - Exploration Drilling
 - Development and project execution capability



Mailu-1 well site: 2,000m water depth; 60 km from coast

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