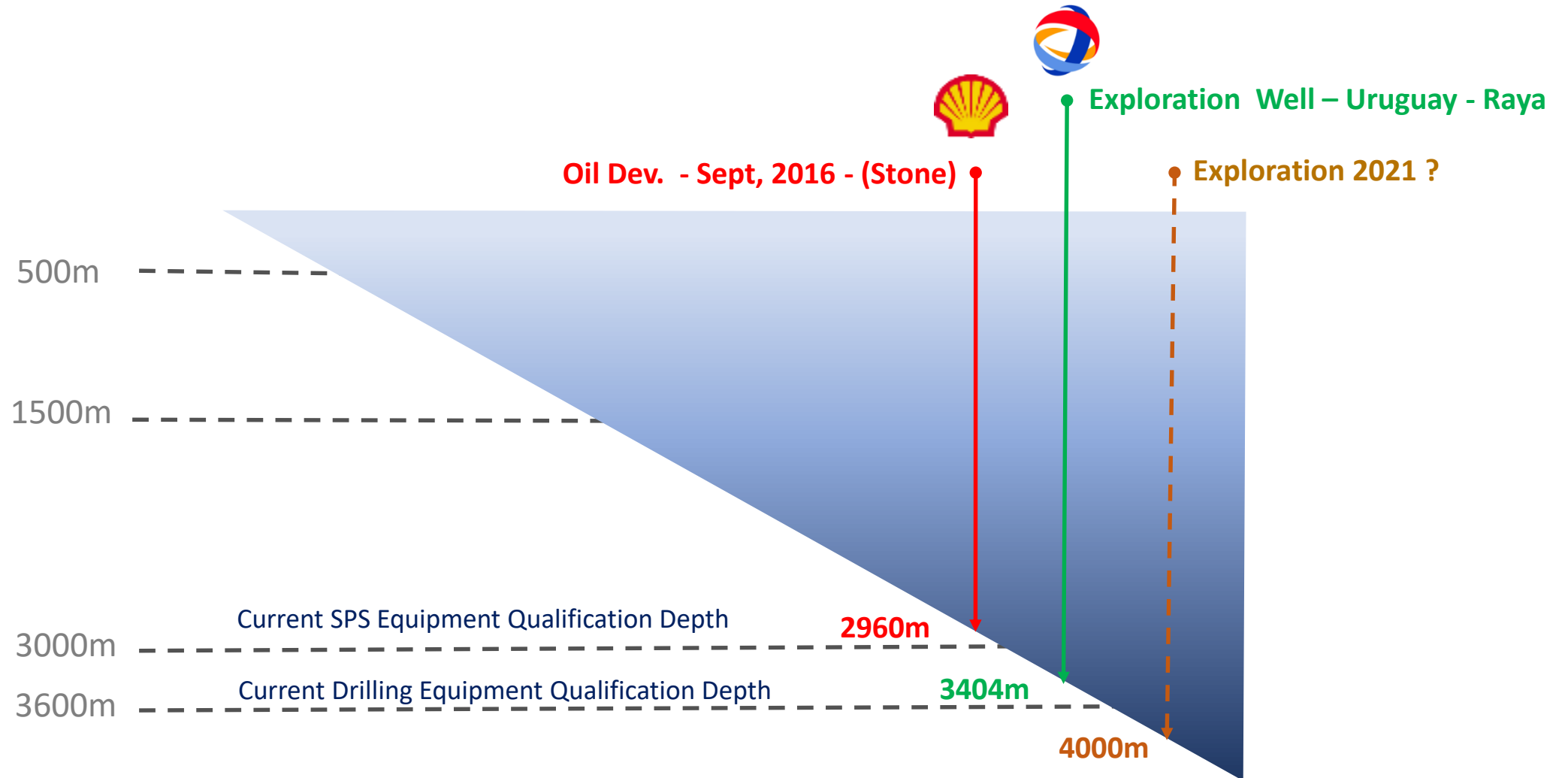


Pushing deep water frontier

Benoît Ludot

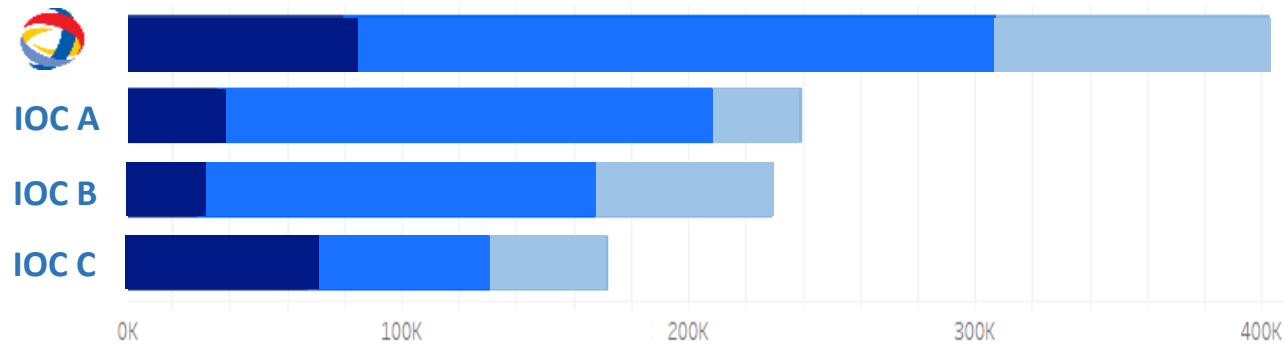


Water Depth Frontiers

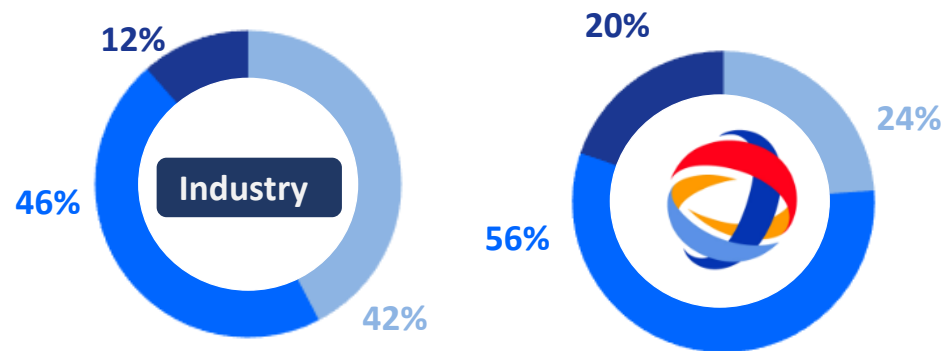


Exploring deeper waters

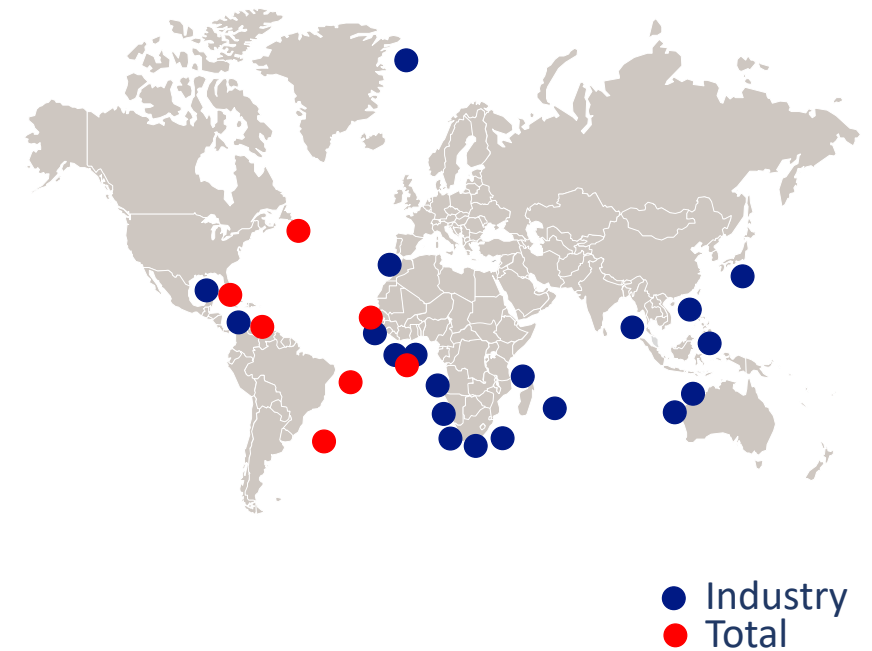
Net Acreage(sqm)



Net Acreage(%)

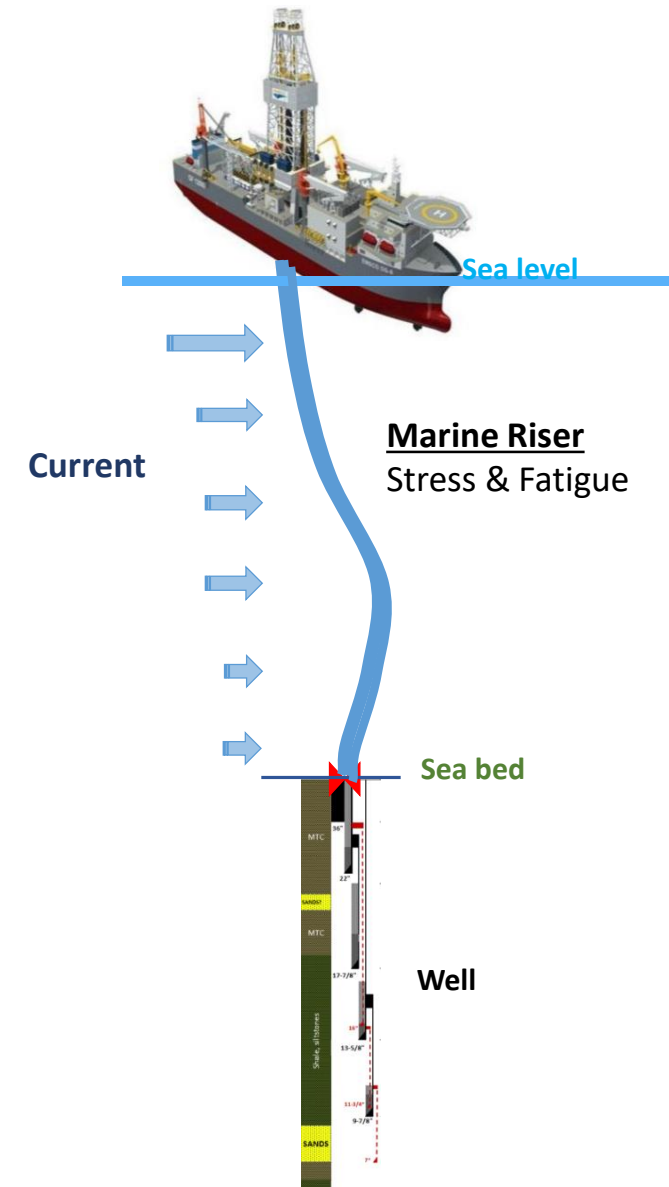


Acreage localization (WD > 3000m)



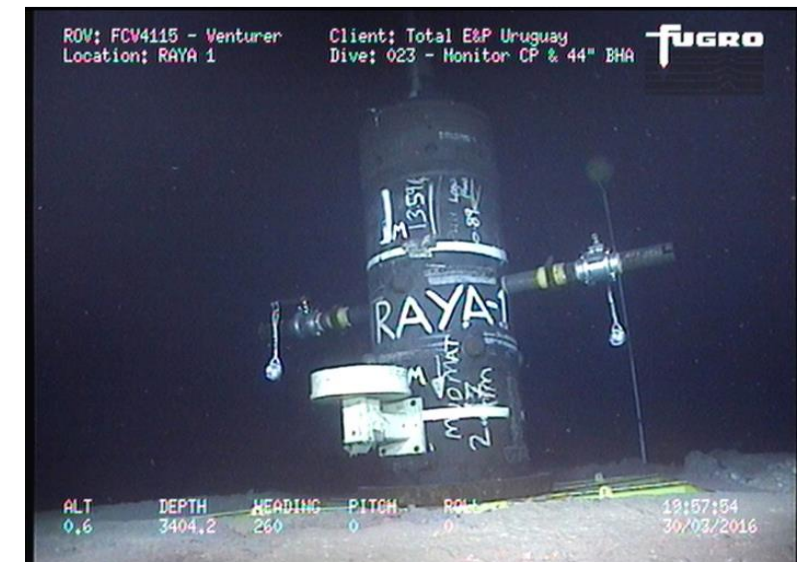
Pushing the drilling limit

- Drilling equipment
 - True qualification for 12000ft/3600m WD
 - Rig upgrading / New unit required for 3600 m + WD
- Drilling operations
 - Drilling mud cooling
 - Gas kick detection & management
 - Narrow frac windows
- Rig operability envelop
 - Marine riser integrity
 - Rig station keeping capability
 - Rig operability in harsh conditions and/or strong currents
 - Risk of high Wait on Weather (WOW)



The Raya Well – 3404 m WD – water depth world record

- Successful execution
 - HSE incident free
 - Well drilled in 99 days (106 planned)
 - WoW 12 %
- The keys for success
 - Metocean data availability
 - Metocean environment and rig motion modeling capability
 - Extensive upfront engineering
 - Robust operating procedures
 - Operator deep water marine and operation know how
 - Strong collaboration with the drilling contractor



Mobilizing the O&G industry

- Equipment to be qualified for 3000m WD in 2021
- 4000 m WD qualification technically feasible in 2025 ?



Available

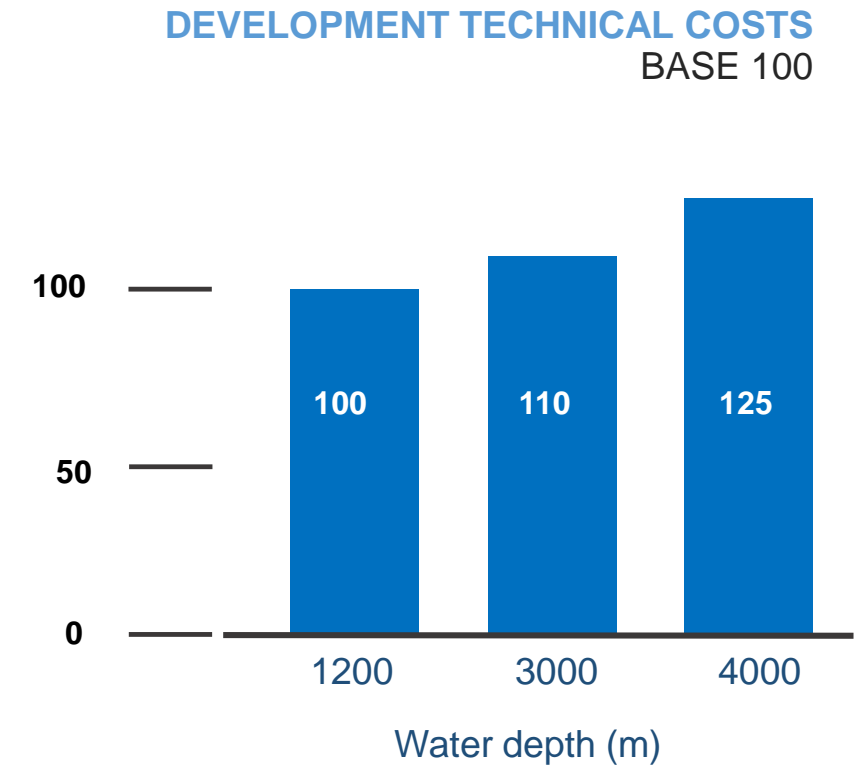
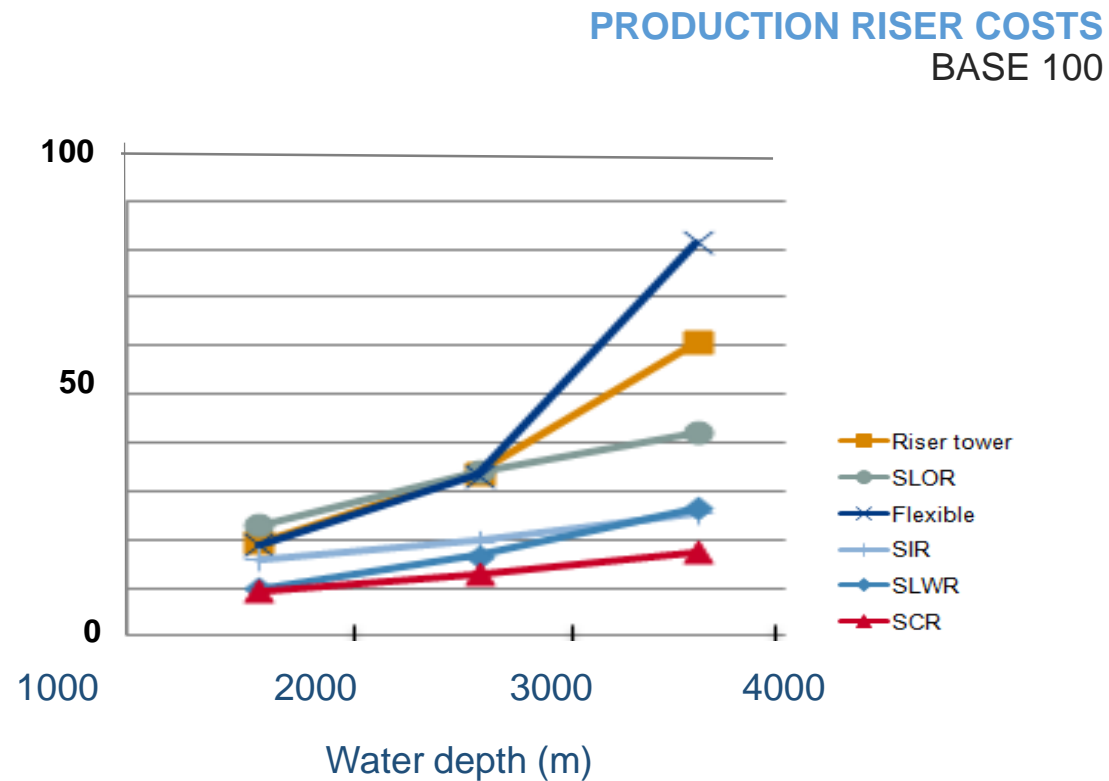
Qualif on going

To be qualified

R&D

Reducing impact on development cost

- Technology & concept choices are key



In deeper water together

- Extending Exploration drilling capability
- Production equipment qualification
- Development cost reduction
- Disruptive technologies

