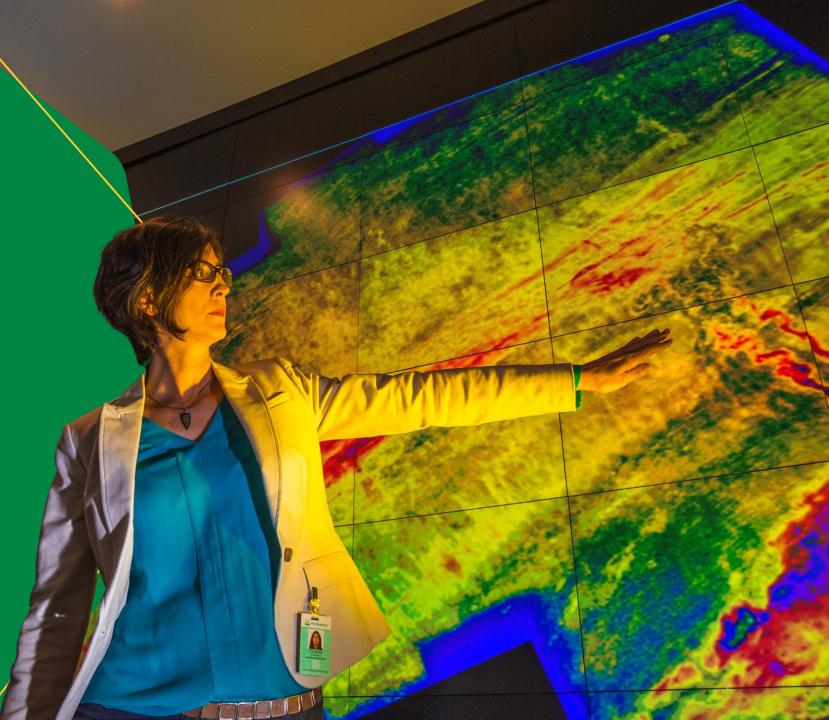
INVESTOR TOUR PETROBRAS 2024

BEHIND THE PRODUCTION FORECASTING FOR INVESTORS AND FINANCIAL ANALYSTS

May 27, 2024









Agenda

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9:40 AM







9:30 AM

Welcome

Petrobras Research Center (CENPES)

Behind the Production 10:00 AM Forecasting (3D visualization)

Paulo Johann

Carlos Alberto

Rechelo Neto

Maiza Pimenta

Goulart



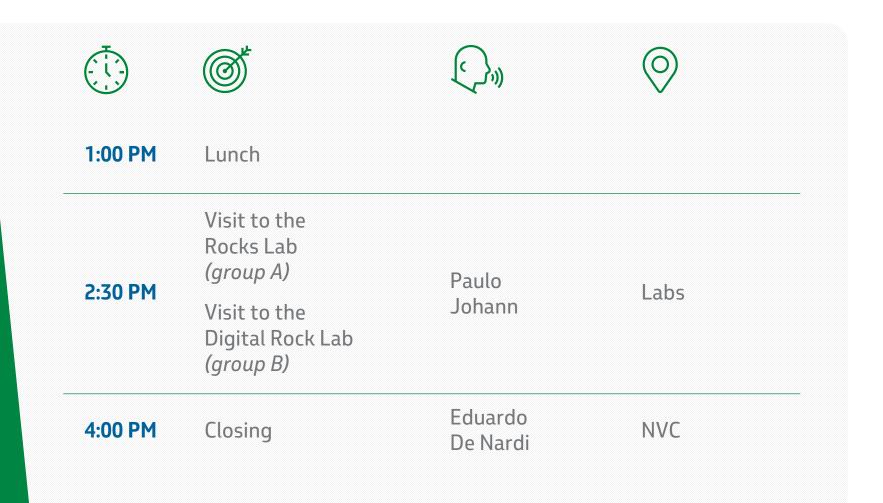
Center for Collaborative Visualization ("NVC")

Bruno Moczydlower Paulo Johann Rodrigo Schuenck Fabio Passarelli





Agenda



INVESTOR TOUR PETROBRAS 2024

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Welcome

CENPES Petrobras Research Center

The place to imagine create and make today Petrobras' future



Forward-looking Statements

The following presentations may contain forecasts about future events. Such forecasts merely reflect the expectations of the company's management about future economic conditions, as well as the sector and the company's performance and financial results, among other things. The terms "anticipate," "believe," "expect," "forecast," "intend," "plan," "project," "aim" and "should," as well as other similar terms, are aimed at identifying such forecasts, which evidently involve risks and uncertainties foreseen or otherwise by the company, and so they are not guarantees of the company's future results. Therefore, the future results of the company's operations may differ from present expectations, and readers should not exclusively rely on the information contained herein. The company is not obliged to update the presentations and forecasts in the light of new information or future developments. The figures specified for 2024 onward are estimates or targets.



NOTICE FOR U.S. INVESTORS

The SEC only permits oil and gas companies to include in their filed reports reserves that the company has proven through production or conclusive formation tests that are economically and legally viable in prevailing economic and operational conditions. We use some terms in this presentation, such as discoveries, which SEC guidelines prohibit us from using in our filed reports.

Agenda

- Petrobras & Technology
- **2** Technological Capabilities
- **3** Connections for innovation

Agenda

1 Petrobras & Technology

- **2** Technological Capabilities
- **3** Connections for innovation



INNOVATION TO CREATE OPPORTUNITIES AND EVOLVE PRODUCTION



Technical achievements related to the development of deepwater production systems in Marlim field (Campos Basin)



Advances in technologies and cost effectiveness in deepwater development projects of Roncador field (Campos Basin)





Set of technologies developed for oil and gas production in the pre-salt layer

Set of innovations developed in the Libra Long Term Test (TLD), in the Santos Basin pre-salt



Set of innovations developed to enable production in the Búzios field, in the Santos Basin pre-salt



Unprecedented combination of BOP anchoring technology with real-time riser analysis - possibility of using dynamic positioning systems in shallow water depths



Deployment of a wide set of new technologies for the successful revitalization of the Marlim Field and the entire deepwater Campos Basin, unlocking new paths for mature deepwater asset redevelopment, with significant reduction in greenhouse gas emissions in pre-salt

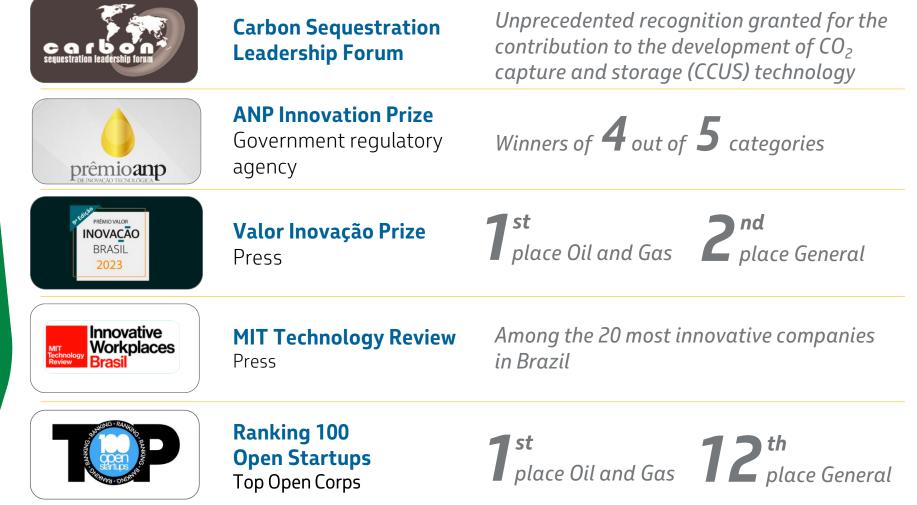
Awarded 7 TIMES by OTC

Highest award of the world's oil industry





RECOGNIZED INNOVATION BY RELEVANT AWARDS IN 2023



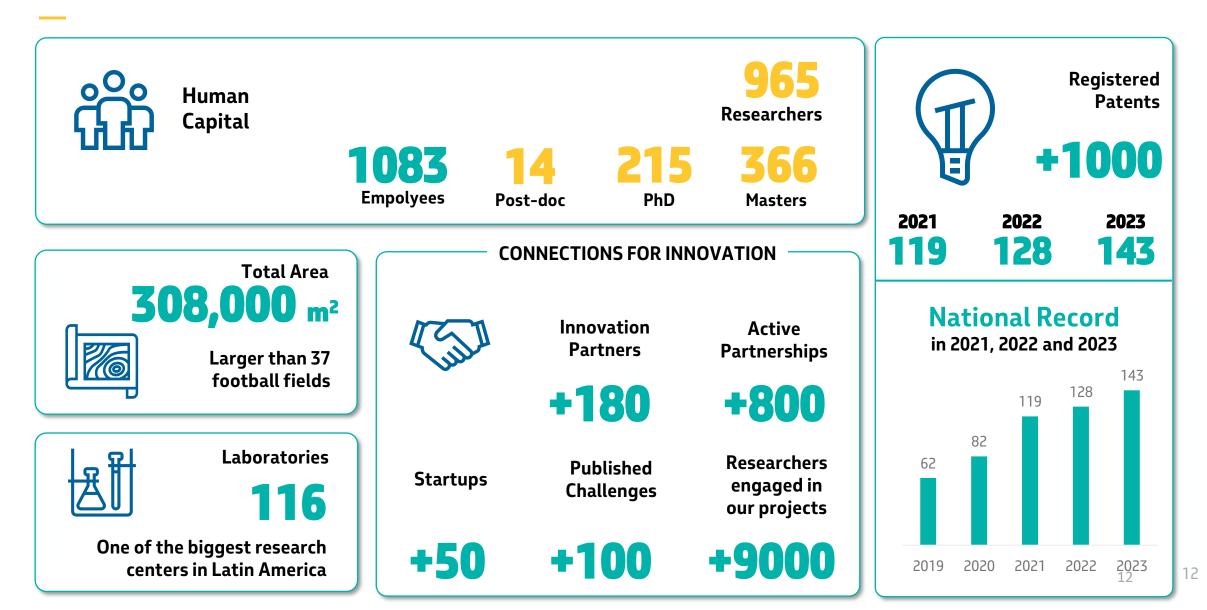
Agenda

Petrobras & Technology

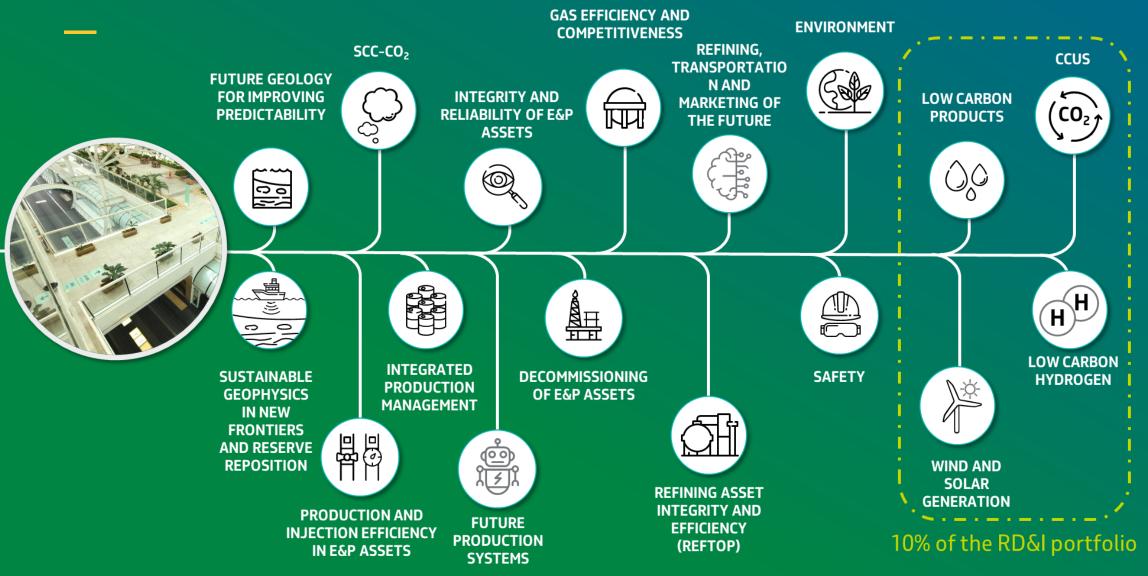
2 Technological Capabilities

3 Connections for innovation

RESEARCH, DEVELOPMENT & INNOVATION CENTER (RD&I) – CENPES (IN NUMBERS)



CENPES LINES OF RESEARCH



Agenda

Petrobras & Technology

2 Technological Capabilities

3 Connections for innovation

CONNECTIONS FOR INNOVATION

Open innovation hub based on technological challenges with several channels for the presentation of proposals



OUR OPEN INNOVATION PROGRAM HAS AN EXTENSIVE NETWORK OF PARTNERS, LEVERAGING THE CAPACITY OF CENPES

120 universities and research institutes in Brazil (80 - current) 85 universities and research institutes abroad (27 - current) UNIVERSITY OF BRITISH COLUMBIA UNIVERSITY OF CALGARY THE UNIVERSITY OF QUEENSLAND Stanford UFPE HERIOT WATT NG E. 2 UFC SENAI UFERSA -Berretschd de Hoeba UNIVERSIDAD NACIONAL DE LA PLATA UFRN UFPA 5%3 DPI NTNU UFBA Newcastle University UFAL PUCRS Putche Universided Catality in Ele Canadr do Sal 東京大学 請 IF₂ ~ MARINTEK UFES UFRJ (9 SINTEP The University of Shefficial UNIVERSITY OF ABERDEEN \sim νff Molde University College UFRRJ Universitat d'Alacant 3 UFMG UnB Universided a FGV **T**UDelft UNIVERSITÀ DEGLI STUDI DI TORINO University of BRISTOL PUC Energies nouvelles MARIN IRIS Southampton Non-exhaustive Non-exhaustive 37 companies and 64 technological cooperation agreements in progress Engagement program with 70 startups (53 - current) USSV WIK HUEZ TELECOM C VR (MONKEY Ø. 0 iter **TechnipFMC** Schlumberger Microsoft LTrace Geophysical Solutions RZX VERTESIS seven SELLETIVA[®] PROMEC science system OCEANEERING Integral IMI WIK **ESSS** LTrace Geophysic ▲ Albemarle PIX ALIGER sical Solutions sense BRASI Minerva Bonpet GoLedger RN Tecnologia RHEOLOGY RESEARCH MURABE GA Drilling Ketjen (\bigcirc) DNV kognitus linstor INVISION MOGAI TRISOLUTIONS Non-exhaustive Non-exhaustive

THANK YOU!

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INVESTOR TOUR PETROBRAS 2024

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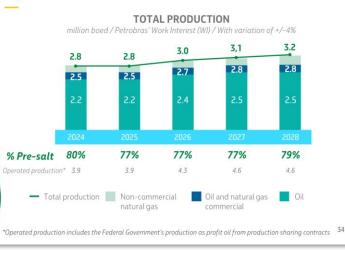
Behind the Production Forecasting



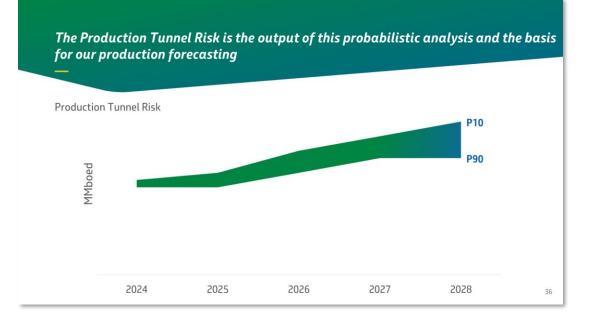
Our production forecast does not follow a deterministic approach. It is based on an accurate probabilistic model

2024-28+ Strategic Plan [Nov23]

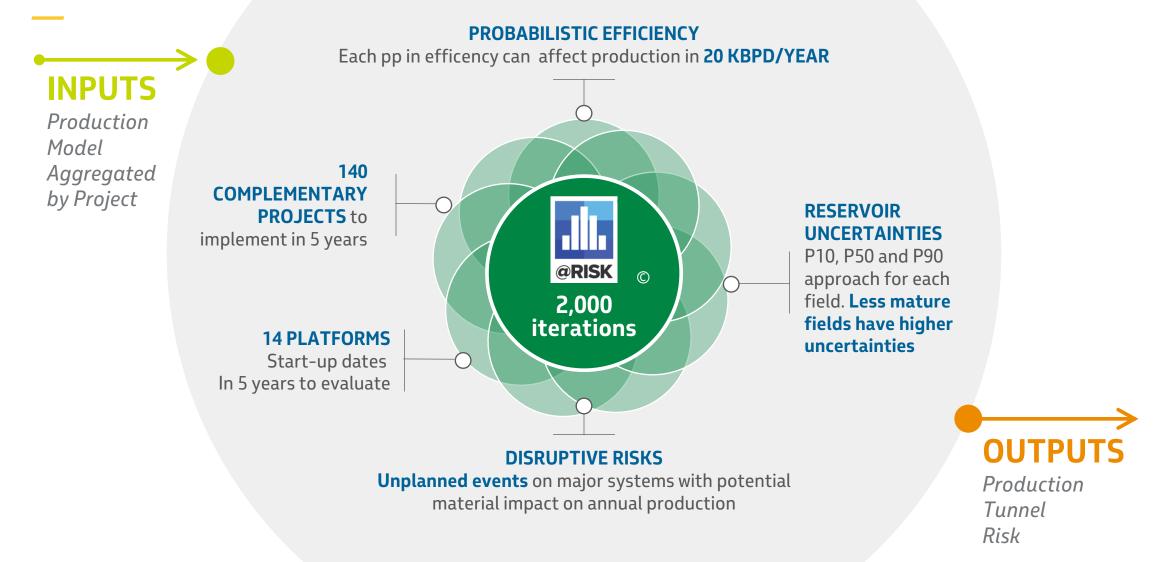
Delivering increasing production and generating higher economic value



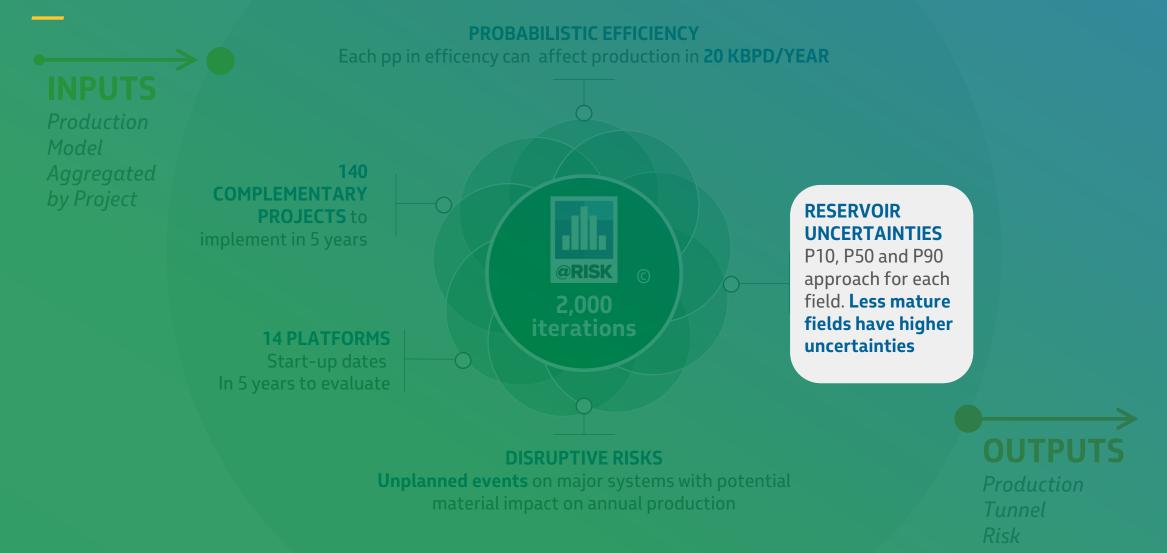
Deep Dive Petrobras 2024 [Jan24]



Due to the complexity of the business, we adopted this probabilistic approach to incorporate uncertainties and unplanned events...

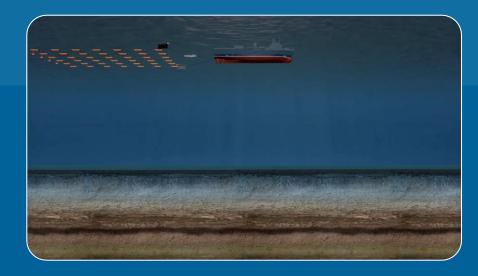


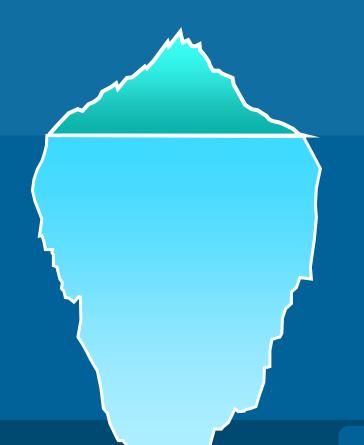
... and production forecasting is actually the final step of a sophisticated modelling process



Probabilistic production forecasting

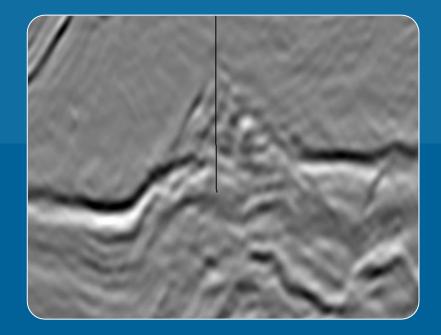
Reservoir modelling and characterization effort





Data acquisition through seismic and wells

Identification of a prospective asset and initial characterization of a reservoir

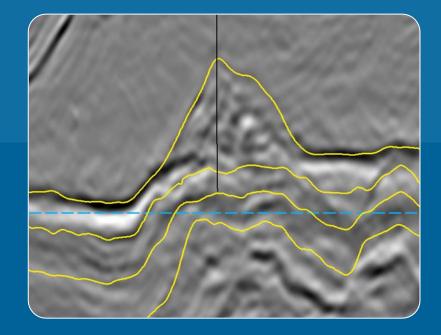


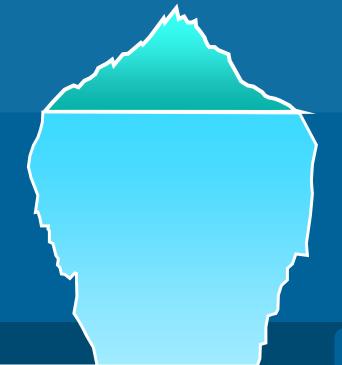


Definition of subsurface structure and indirect estimation of reservoir properties

Seismic interpretation and geophysical modelling

Data acquisition through seismic and wells

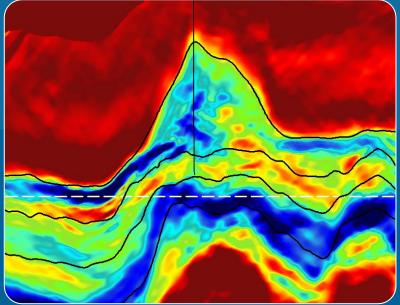




Definition of subsurface structure and indirect estimation of reservoir properties

Seismic interpretation and geophysical modelling

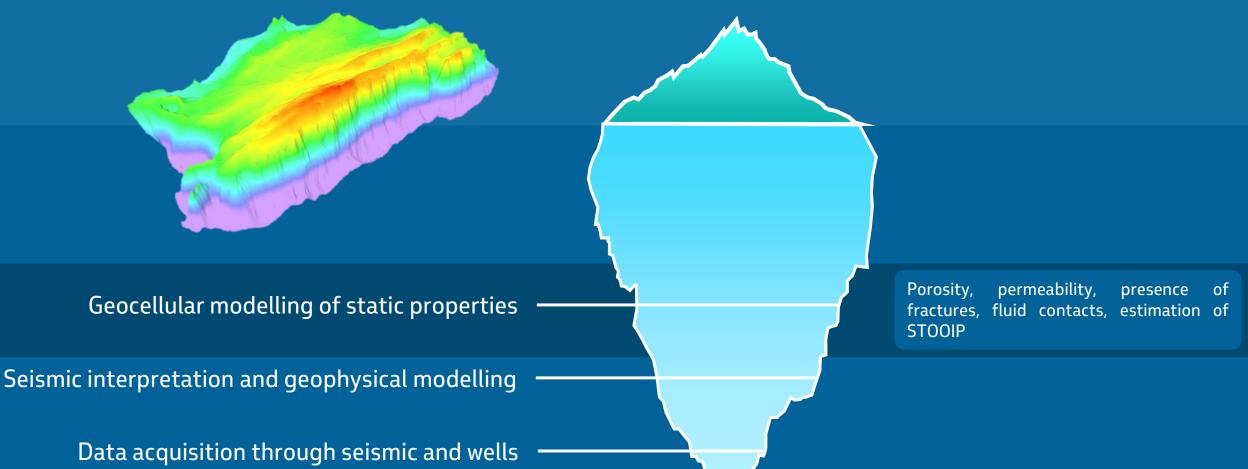
Data acquisition through seismic and wells

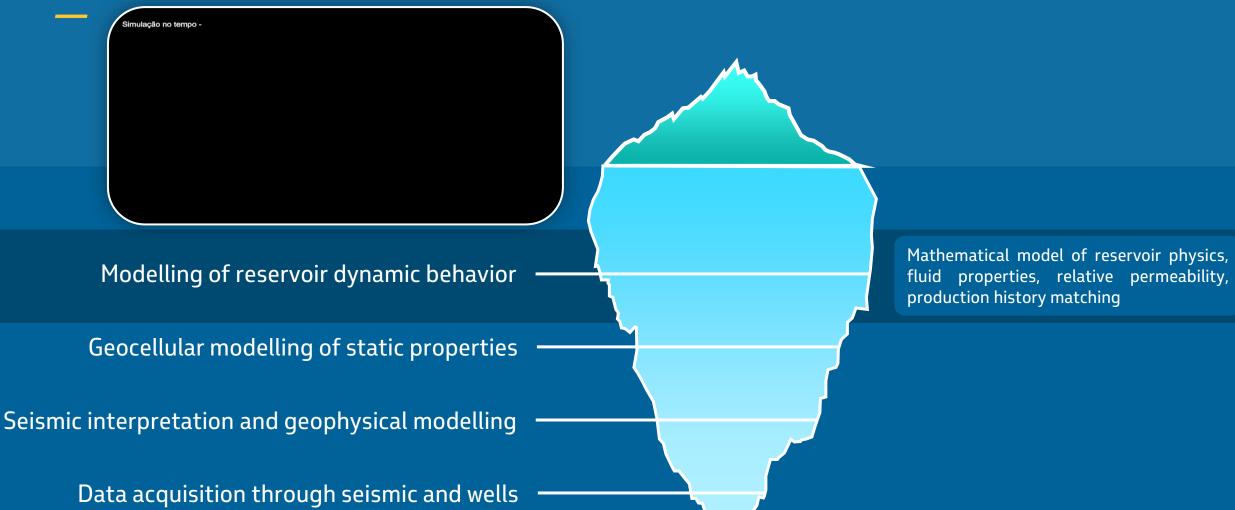


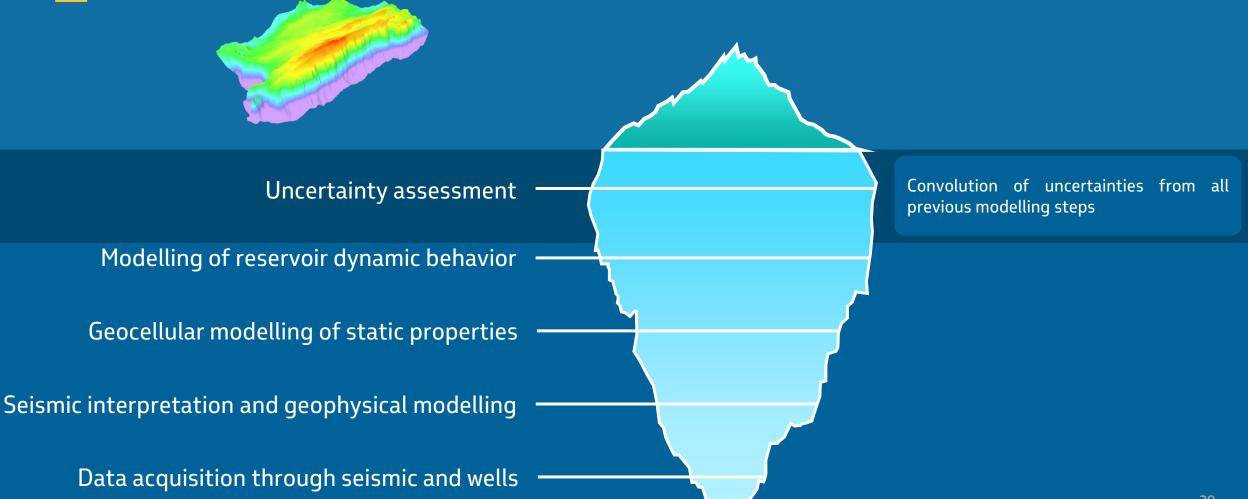
Definition of subsurface structure and indirect estimation of reservoir properties

Seismic interpretation and geophysical modelling

Data acquisition through seismic and wells







Uncertainty assessment

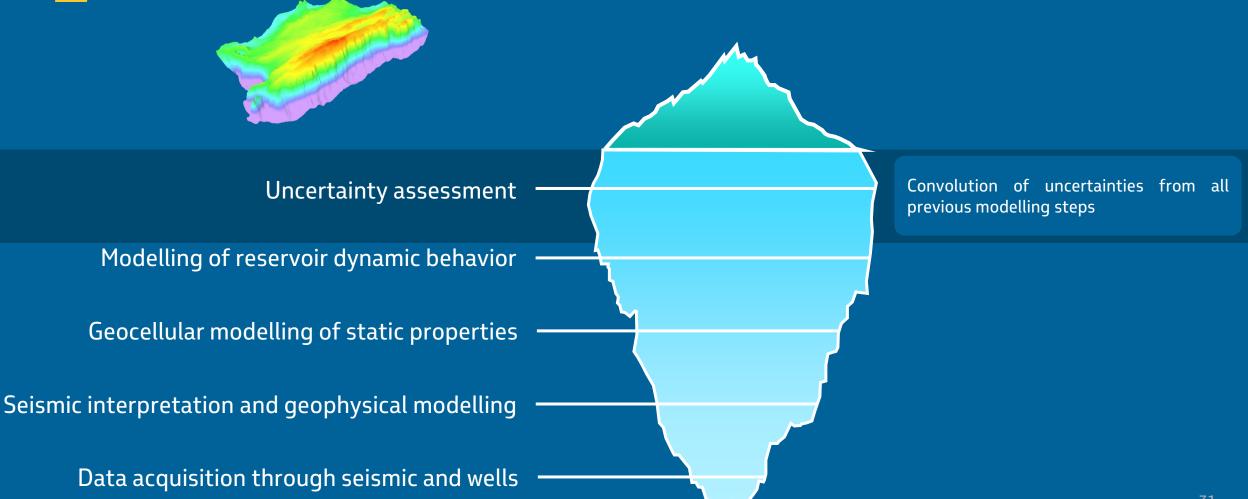
Modelling of reservoir dynamic behavior

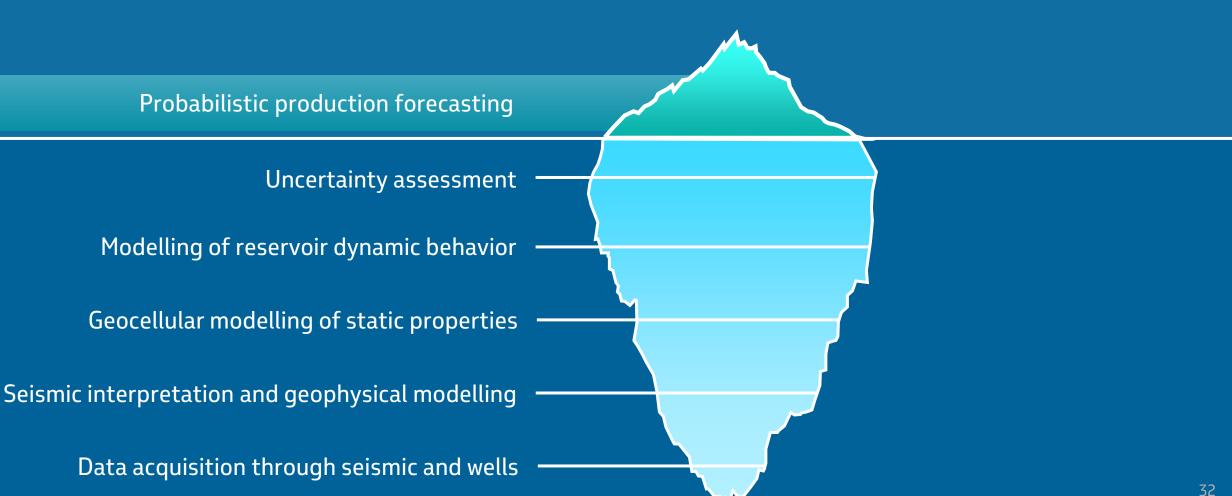
Geocellular modelling of static properties

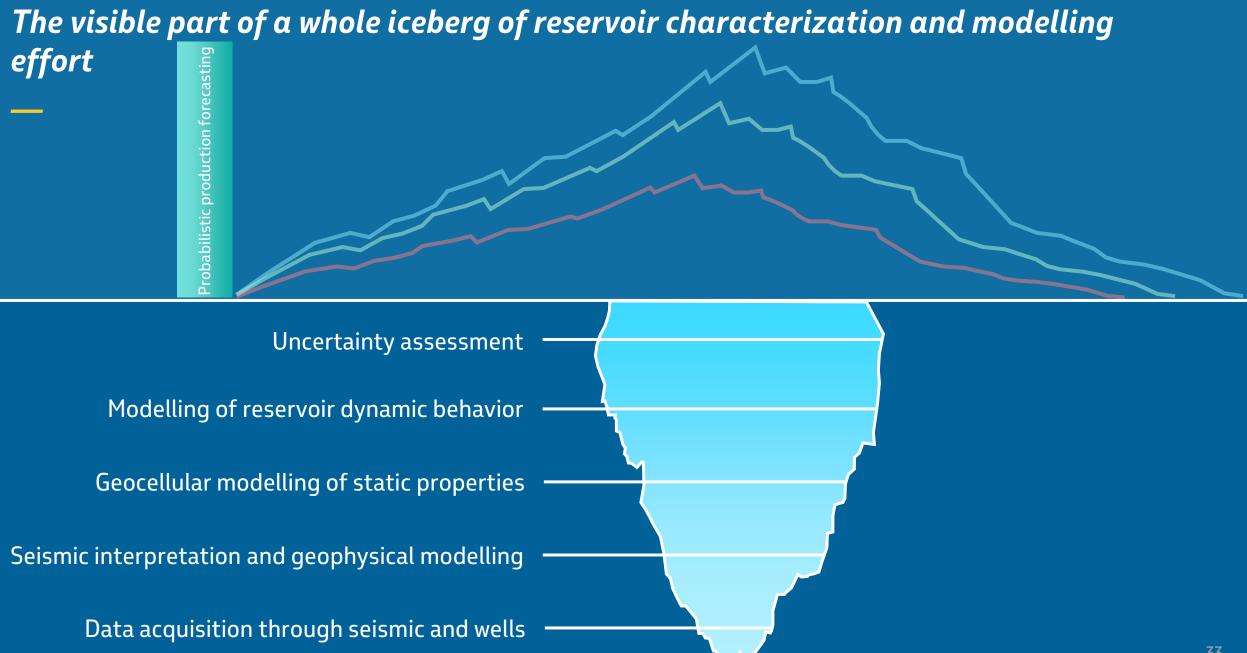
Seismic interpretation and geophysical modelling

Data acquisition through seismic and wells

Convolution of uncertainties from all previous modelling steps







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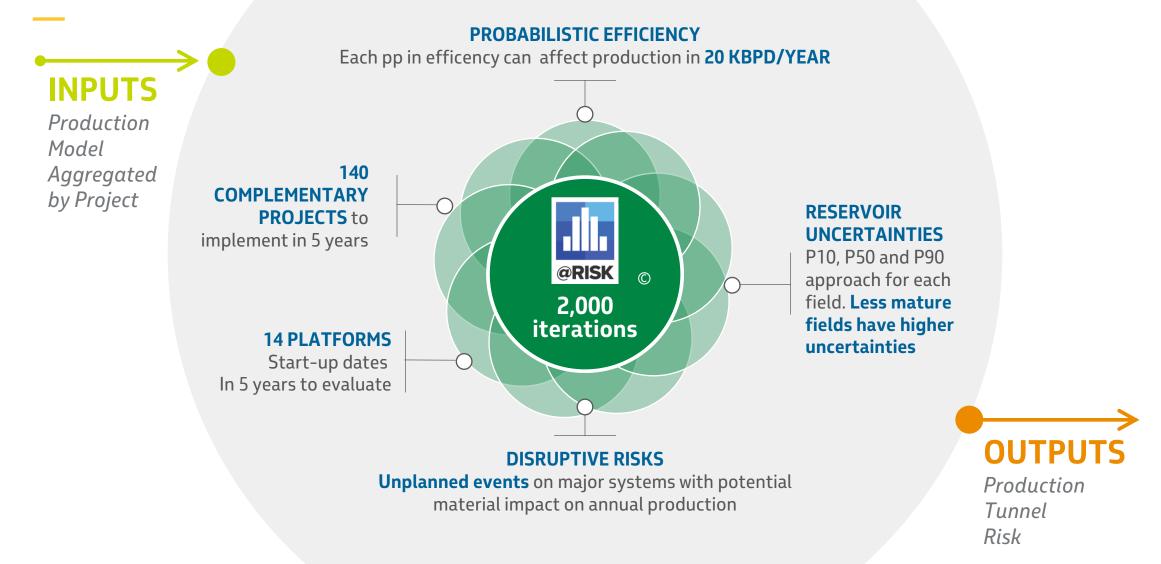
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3D VISUALIZATION

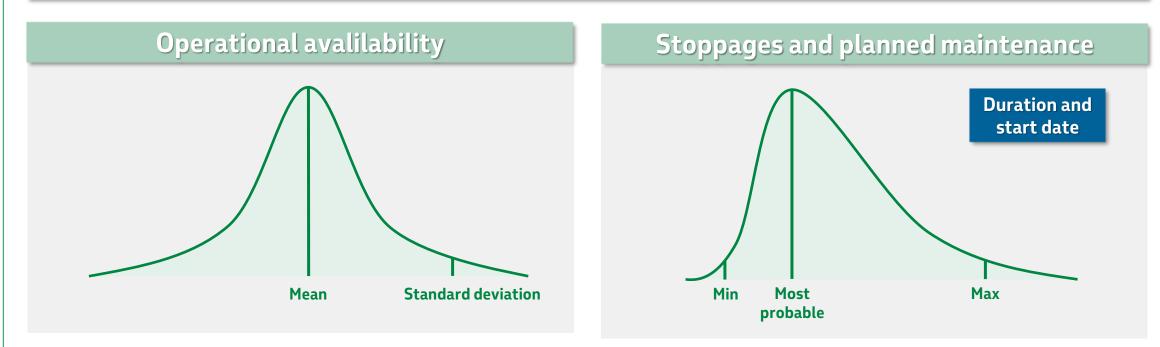
part 1 building the reservoir model

part 2 flowing through the reservoir

The reservoir is just one aspect of the probabilistic analysis... we have to consider several other risks in the model

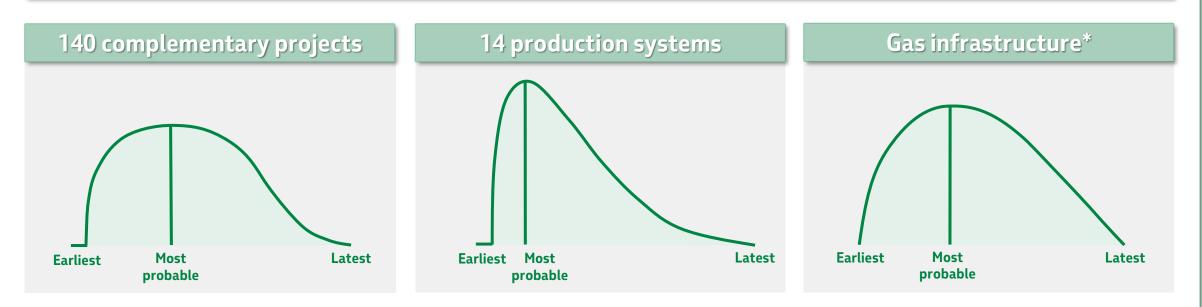


Operational Efficiency



- Efficiency projection is based on recent performance of each platform
- Intercurrences observed during maintenance tend to increase the duration of scheduled stops

New Projects



- Project management challenges
- Implementation risks
- Integrated quantitative risk analysis: FPSO, wells, subsea systems and regulatory authorizations

* when applicable

Disruptive Risks*



Adverse environmental conditions during offloading operations



Production impact due to unexpected requirements from regulatory bodies



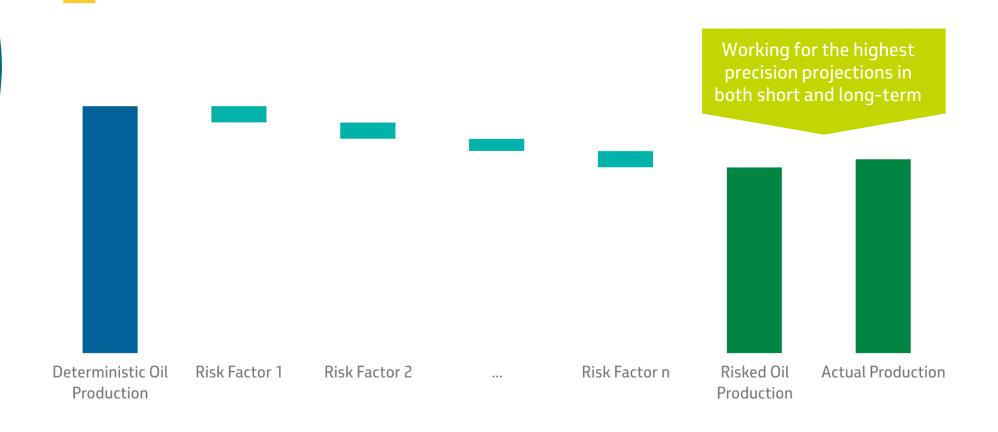
Subsea or well equipment major failures



Topside equipment major failures

* applied at portfolio level

The accuracy of our forecast was possible due to technical improvements incorporated in the probabilistic production projection model



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