

Petrobras
connections
for innovation

Powering Innovation

with Petrobras



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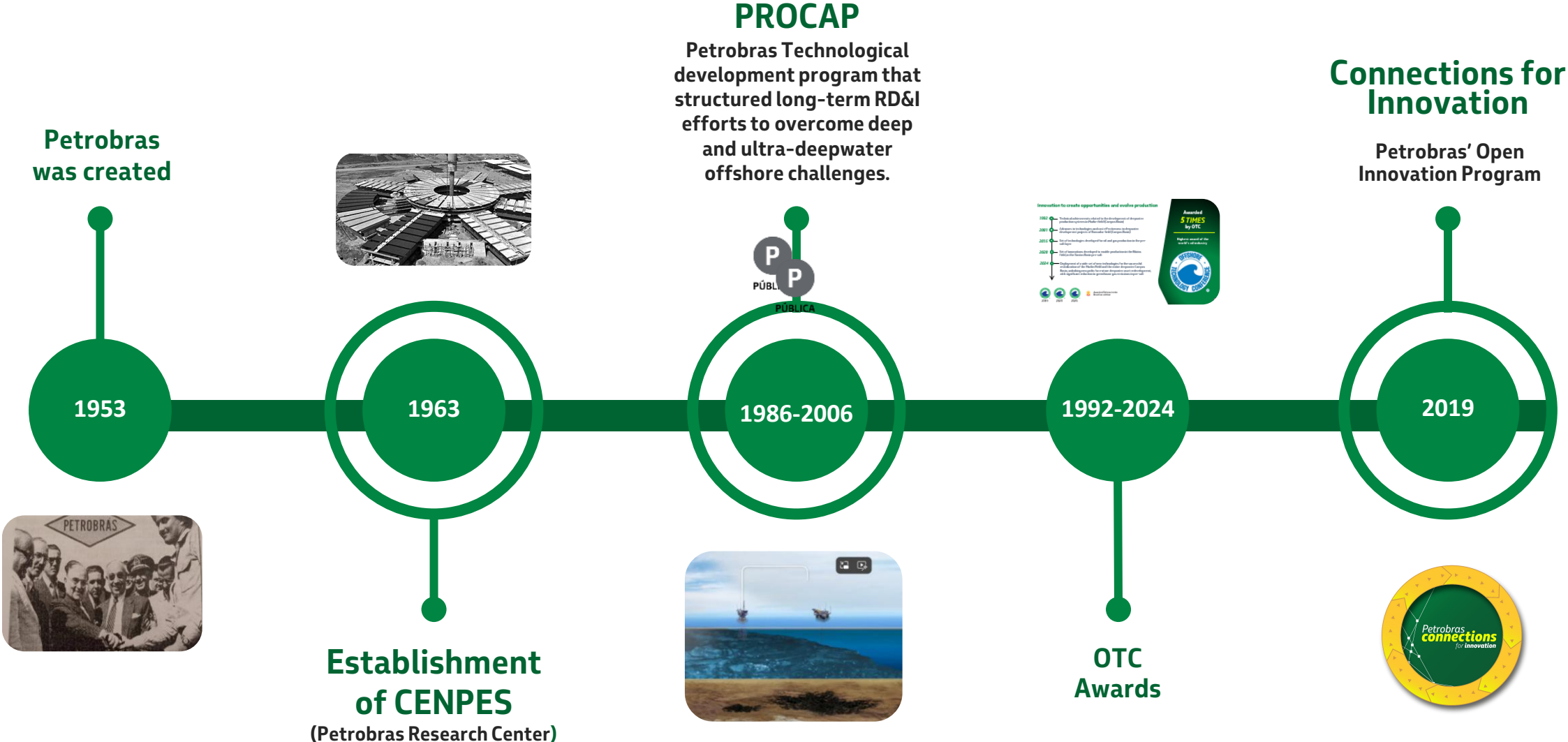
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Open Innovation has always been at the core of our evolution

Through collaboration and sustained technological development, Petrobras advanced the frontier of offshore production, enabling **operations in ultra-deep waters**.



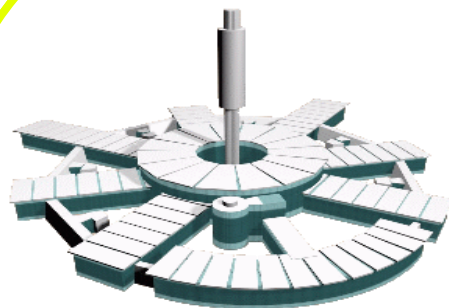


CENPES: High Innovation Capacity



Registered Patents

+1440



Total area

308,000 m²

Human Capital



1234

Empolyees

1070

Researchers

220

PhD

Laboratories



116

Labs

4,600

Equipments



ELETRÔNICA

FISCALIZAÇÃO

Innovation to create opportunities and evolve production

- 1992** ○ Technical achievements related to the development of deepwater production systems in Marlim field (Campos Basin)
- 2001** ○ Advances in technologies and cost effectiveness in deepwater development projects of Roncador field (Campos Basin)
- 2015** ○ Set of technologies developed for oil and gas production in the pre-salt layer
- 2020** ○ Set of innovations developed to enable production in the Búzios field, in the Santos Basin pre-salt
- 2024** ○ 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



2019



2023



2025



Awarded 3 times in the Brazilian edition

Awarded

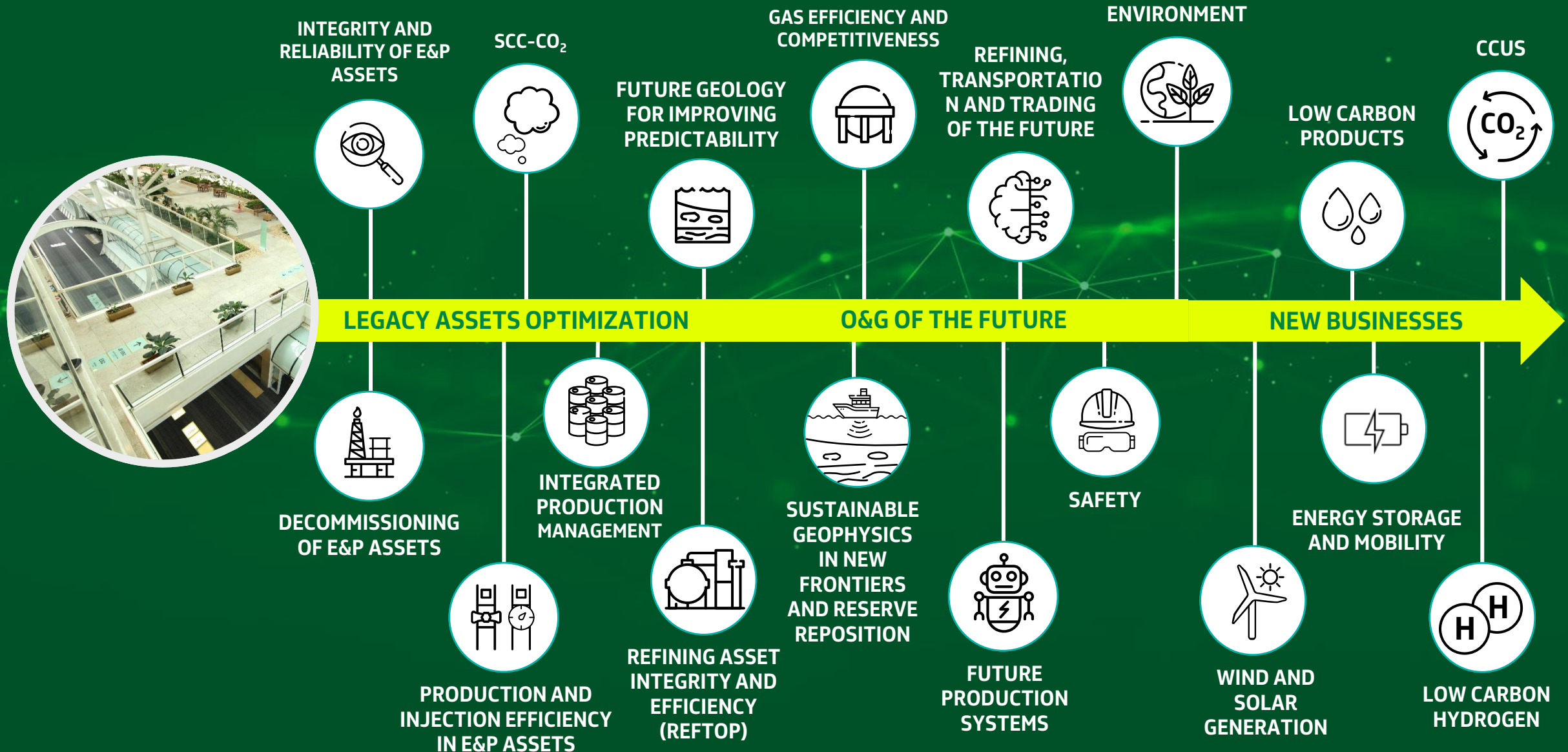
5 TIMES

by OTC

Highest award of the world's oil industry

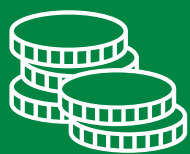


An ambitious *RD&I portfolio* that supports the company's long-term strategy.



Investing today to shape tomorrow

Petrobras' Strategic Plan 2026-2030



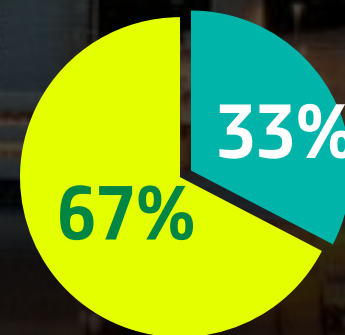
USD 4 billion will be invested in **Research and Development** between 2026 and 2030.



Increase participation in decarbonization and new energy to 40% by 2030

Brazilian RD&I regulatory framework in the oil and gas sector

Operators must dedicate part of production revenues to research and innovation, ensuring predictable funding.



- Low Carbon
- O&G, Safety and Sustainability

Petrobras' open innovation hub publishes hundreds of opportunities since 2019

From **Lower**
to **Higher**
maturity levels



To find the best
Universities,
Science Institutes
Startups
and Companies

And create win-win partnerships **to develop**
and test technologies with Petrobras





Petrobras
connections
for *innovation*

Petrobras' Open Innovation Program aims to...



Enhance integration across the innovation ecosystem



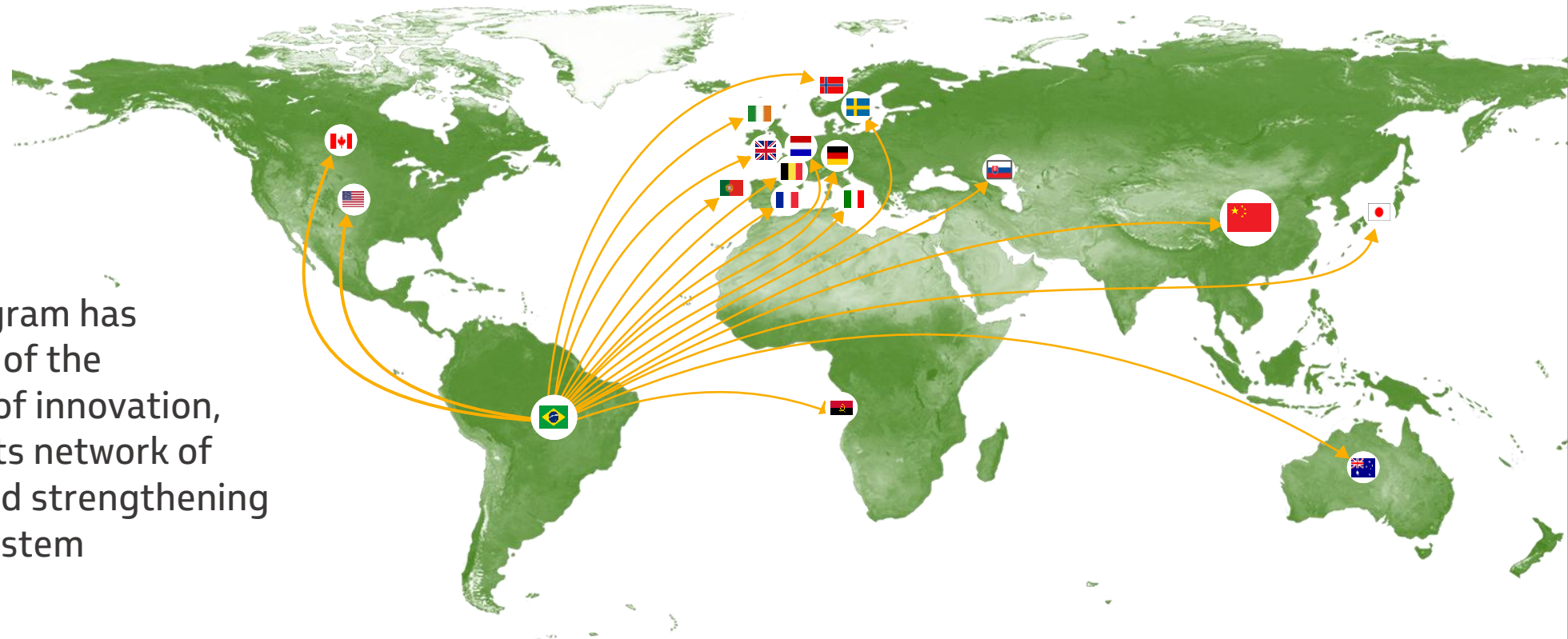
Drive strategic innovation partnerships



Speed-up Innovation

+ 450 Innovation Partners in Brazil and Around the World

In just six years, the Program has established itself as one of the company's main drivers of innovation, systematically growing its network of strategic connections and strengthening Brazil's innovation ecosystem



Open innovation hub

Published challenges per year

+300

Active Projects

+1000

Engaged researchers

+11000

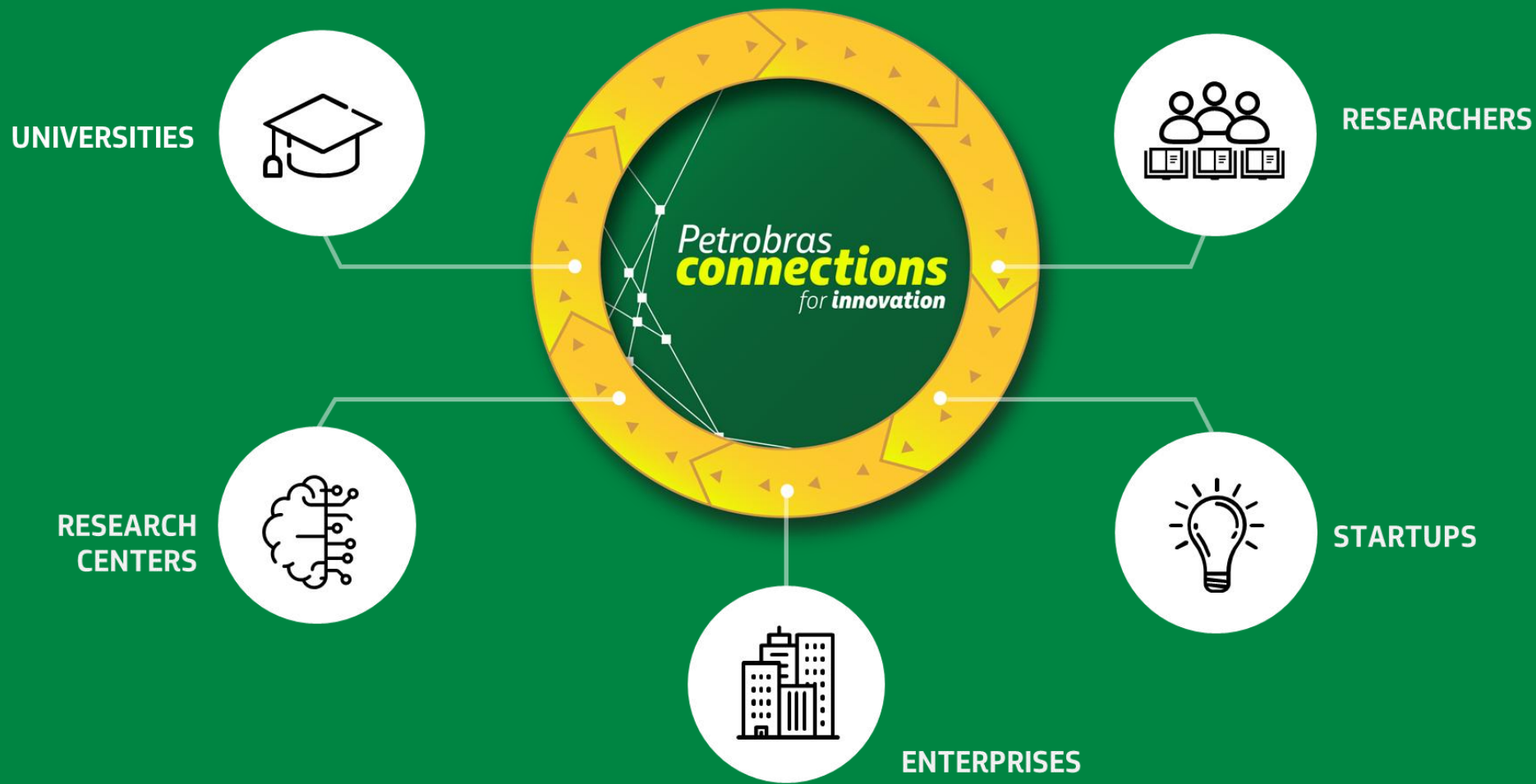


Business with Petrobras is facilitated when companies have a local presence in Brazil

Some of our international partners with local presence:



Through our open innovation program, we have mechanisms that enable collaboration with a wide range of partners...



...through 8 different partnership pathways...

Challenge-based routes

Capability-based routes

Technological Cooperation

Partnerships with universities, companies and science and technology institutions

Pre-Commercial Procurement

Technology development with pre-established conditions for a large scale supply contract

Solution Acquisition

Search for startups and other innovative companies that validated or soon-to-be-validated tech solutions

Technological Ecosystems

Biorefining Pilot

A relationship model to address a specific challenge through integrated collaboration



Technology Transfer

Licensing Technologies for use by third parties in their businesses

Petrobras Innovation Ventures

Equity investments in startups through funds, holding minority positions aimed at long term relationship

Open Lab

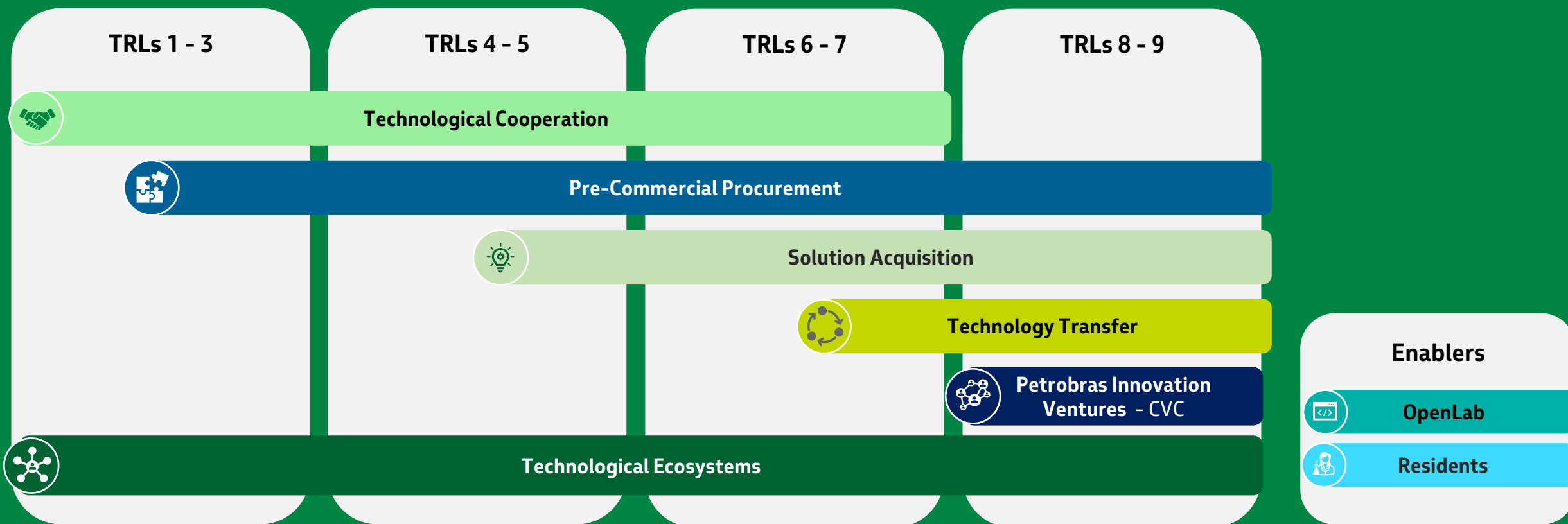
Open-source software development

Residents

Attract professionals and accelerate the learning curve



Designed to address and accommodate different technological maturity levels



For Companies and Startups:

Challenge-based routes

Capability-based routes

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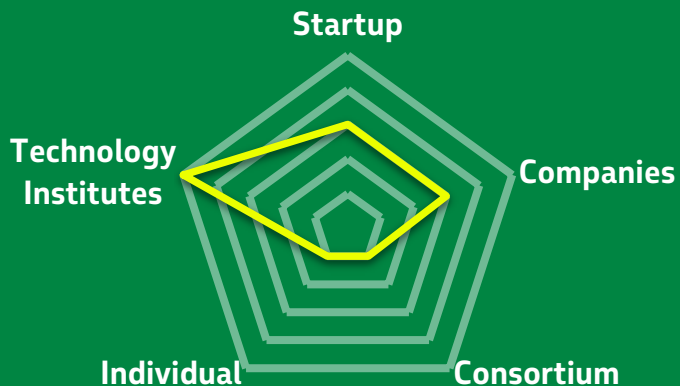
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Technological Cooperation

We partner with universities, science and technology institutions, and companies to develop technology from **basic research to prototyping**.

- **+ 1100** ongoing **cooperation terms**
- **+100 new patents** per year



Financial support for RD&I project development



Systematized and continuous selection process for the selection of technological partners



Cooperation with Petrobras technical staff for project development



Possibility of investment in infrastructure and wide scope diversity.

Cooperation with Startups

<p>Startups call for proposal</p>	<p>+140 Published challenges</p> <p>+1000 Submitted proposals</p>	<p>74 Contracted projects</p> <p>59 Startups with ongoing contracts</p> <p>3 Technologies supplied</p>
<p>ANP Startup program (NAVE)</p>	<p>21 Contracted projects</p>	<p>Projects NAVE with Petrobras</p> <p>4</p> <ul style="list-style-type: none"> • ACTA Robotics • Monitorai • UNAX Insight • Next Devices



"Startups bring an outside perspective and challenge traditional paradigms."



Successful Partnerships

Techinological Cooperation

OD OBN (On-demand Ocean Bottom Nodes)



4D seabed seismic system with long-life nodes that enables continuous reservoir monitoring and on-demand data retrieval via autonomous and remotely operated systems.

Partners:



Firefighting Robot



A high-temperature-resistant robot, remotely operated from distances of up to 300 meters, enhances safety by accessing hazardous areas and reducing firefighters' exposure, while also featuring thermal camera monitoring and 360-degree vision.

Partners:



Detalhamento

Case 2

Cooperações Tecnológicas

Descrição do projeto

Desenvolvimento de sensor sísmico de longo período de residência no assoalho oceânico (5 anos) com capacidade de comunicação óptica e acústica com o meio externo através de veículos remotos (ROV), autônomos (AUV) e infraestrutura topside (embarcações).

Parceiros envolvidos

Petrobras, Shell, SENAI CIMATEC e Sonardyne

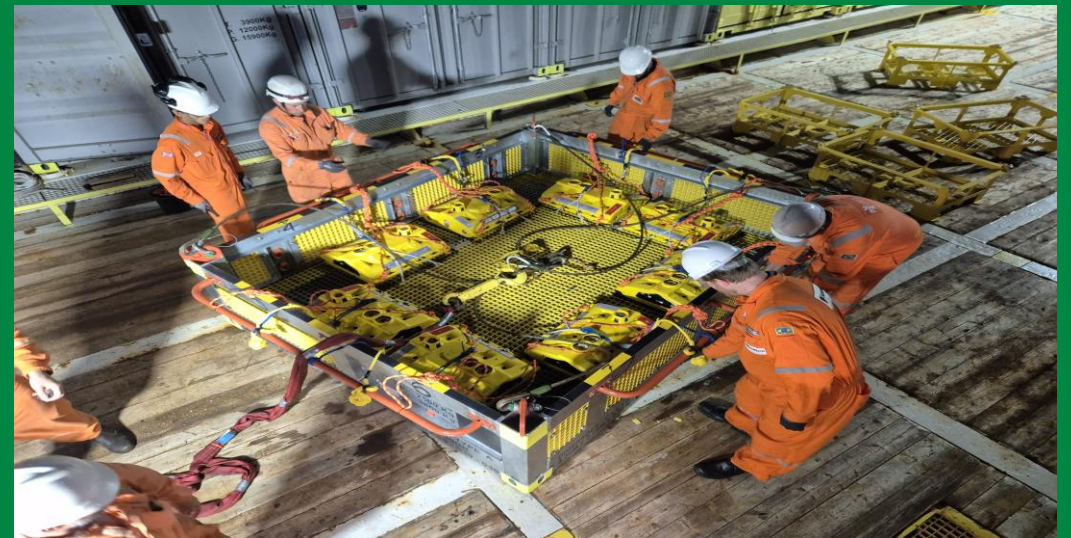
Como o projeto se desenvolveu?

Por meio de Termos de Cooperação, com uso de verba ANP, e escopo dividido entre operadoras e parceiros tecnológicos.

Qual o status do projeto hoje?

Em andamento. Processo de qualificação da tecnologia no Campo de Mero, Módulo 4, com previsão de conclusão da aquisição de dados sísmicos em agosto/26. Previamente, foi construído uma planta-piloto no CIMATEC Park (Camaçari/BA) onde o sistema OD OBN, 660 sensores, foi manufaturado.

Temos mais imagens? Se sim, cole aqui



Challenge-based routes

Capability-based routes

Technological Cooperation

Partnerships with universities, companies and science and technology institutions

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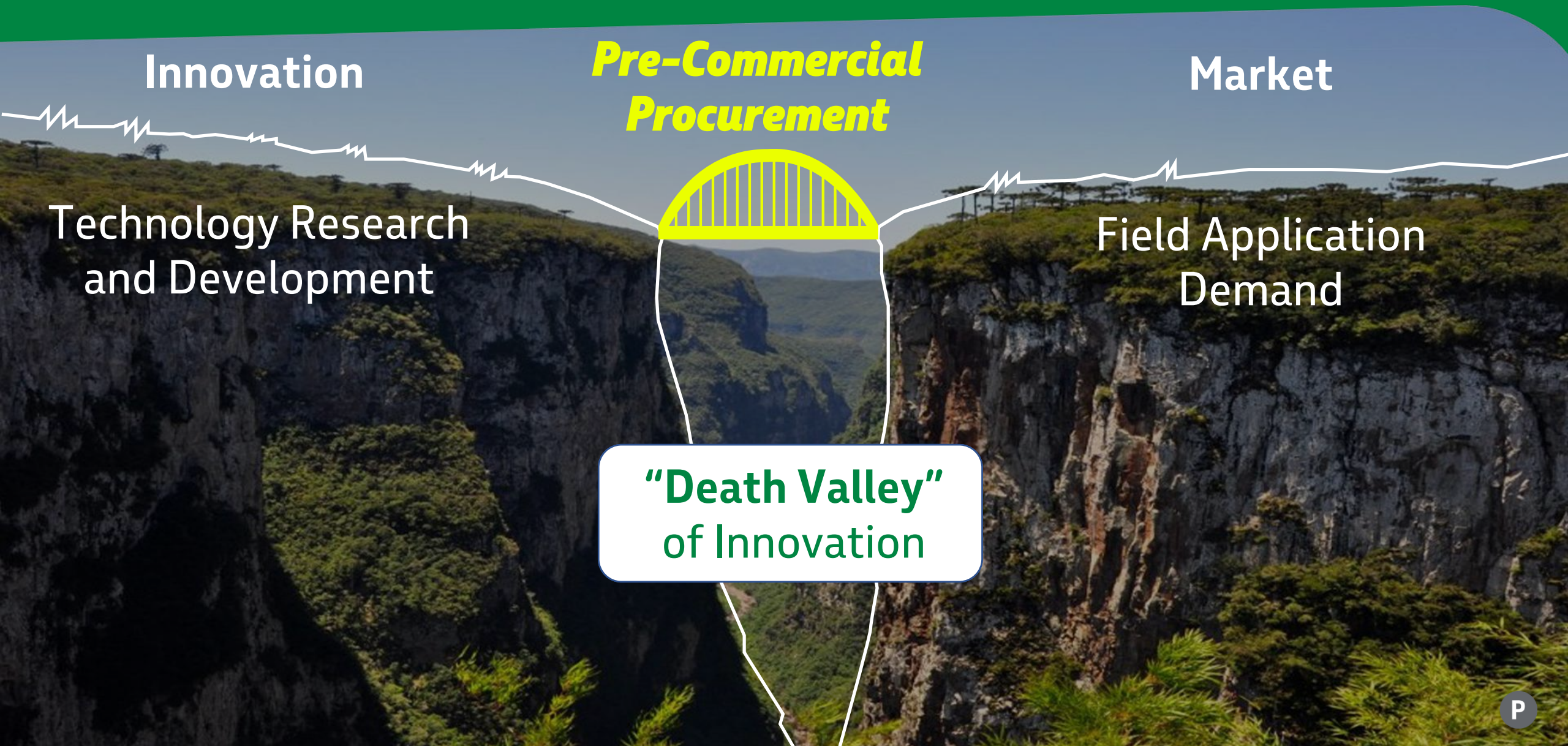
Open-source software development

Residents

Attract professionals and accelerate the learning curve



Pre-Commercial Procurement



Innovation

**Pre-Commercial
Procurement**

Market

Technology Research
and Development

Field Application
Demand

**“Death Valley”
of Innovation**

Pre-Commercial Procurement



Solution to a real problem (firm demand)



There is technological risk (TRL 2 to TRL 7)



Possibility to contract one or more technological routes with national or foreign companies



Compensation for effort



Possible to purchase solution in large scale (waiver of bidding)



Flexibility to negotiate IP rights

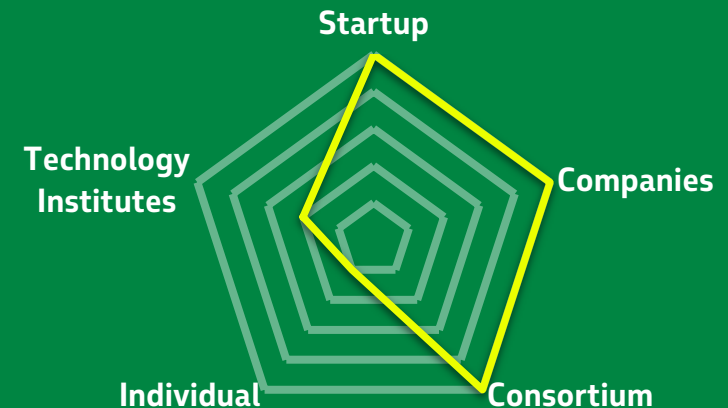


Market Engagement!

*Companies or Technology Institutes with **recognized technical capacity** and **RD&I tradition***

→ **+ 21 signed contracts**

→ **+ USD 300 million** investment



Pre-Commercial Procurement

Some of the companies that have already signed PCPs with Petrobras:



Successful Partnerships

Pre-Commercial Procurement

Autonomous Underwater Vehicles (AUVs)



Development of an autonomous solution for conducting deepwater subsea inspections without the need for support from specialized vessels.

Partners:



Vibratory Seismic Source



Development of a marine seismic source with control over amplitude, frequency, and phase of the emitted signal, enabling simultaneous source separation techniques and wavefield reconstruction, thereby reducing operational effort and significantly minimizing environmental impact in offshore seismic acquisition.

Partners:



Detalhamento

AUV

Encomendas Tecnológicas

Descrição do projeto

Desenvolvimento de Solução Autônoma para realização de inspeção submarina em água profundas, sem a necessidade de suporte por embarcações especializadas

Parceiros envolvidos

Saipem

Como o projeto se desenvolveu?

Através da contratação de uma Encomenda Tecnológica junto ao mercado desenvolvedor potencial, além de outras iniciativas de desenvolvimento em paralelo.

Qual o status do projeto hoje?

O Projeto está na Fase 4 ,Testes de Qualificação em Campo.

Temos mais imagens? Se sim, cole aqui



Detalhamento

Fonte Sísmica Vibratória Encomendas Tecnológicas

Descrição do projeto

Desenvolvimento de fonte sísmica marinha com controle de amplitude, frequência e fase do sinal sísmico emitido, permitindo técnicas de separação de fontes simultâneas e reconstrução do campo de onda, diminuindo o esforço operacional e reduzindo grandemente o impacto ambiental em processos de aquisição sísmica offshore

Parceiros envolvidos

SHEARWATER GEOSERVICES DO BRASIL

Como o projeto se desenvolveu?

Parceria formalizada através de uma Encomenda Tecnológica junto ao mercado desenvolvedor potencial.

Qual o status do projeto hoje?

O projeto está na fase de teste de campo, que dará subsídio para o planejamento da qualificação.

Temos mais imagens? Se sim, cole aqui



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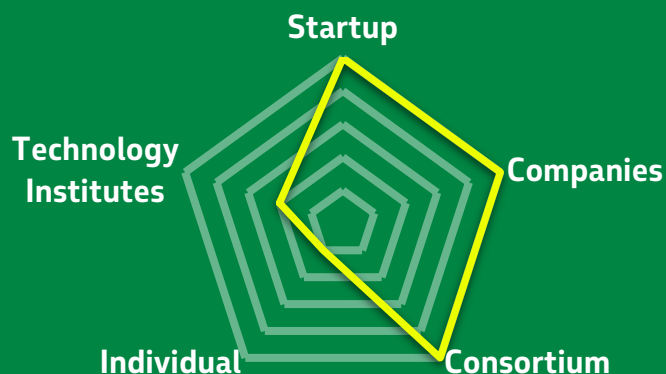
Attract professionals and accelerate the learning curve



Solution Acquisition

Startups and companies with mature technologies to run tests in production environments and get ready to deployment.

→ **+ 70 solutions** in the pipeline



Agile route to testing and validating solutions



Petrobras technical monitoring



Possibility of direct contracting of supply after validation



Support from the Petrobras team in the continuity and implementation of projects

Successful Partnerships

Solution Acquisition

Remote Inspection of Equipment and Structures



Evaluate the use of robotic solutions with integrated sensors to measure thickness on metallic surfaces of equipment and pipelines located in open areas of offshore and onshore facilities, as well as enable the acquisition of images and videos for visual inspection.

Partners:



Digital Twin of Tanks

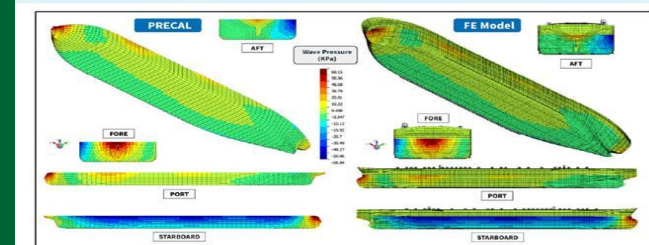


Figure 145. Wave Pressure Transfer PRECAL to FE model-LC80p, Freq. 0.8 rad/s, WH. 90°, (beam sea, port side), in-phase

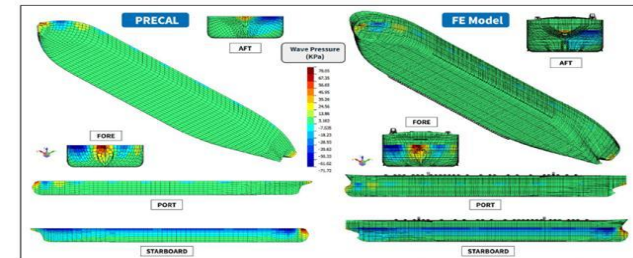


Figure 146. Wave Pressure Transfer PRECAL to FE model-LC80p, Freq. 1.2 rad/s, WH. 90°, (beam sea, port side), in-phase

Develop an innovative Digital Twin solution applied to tanks of FPSOs (Floating Production Storage and Offloading units).

Partners:



Detalhamento

Case 1

Aquisição de Soluções

Descrição do projeto

Inspeção remota de equipamentos e estruturas em áreas abertas de difícil acesso

Parceiros envolvidos

3 contratos: Bently; Consórcio Best-Orion; DR-1
Imagens

Como o projeto se desenvolveu?

O escopo dos testes contemplou a condução das avaliações em escala crescente de complexidade, iniciando em ambiente controlado, posteriormente avançando para o refino e finalmente os testes em instalações offshore. De forma geral, o CPSI avaliou a aplicação de plataformas robóticas com sensores ultrassônicos e câmeras RGB integrados para medição de espessura e inspeção visual em superfícies metálicas de plantas de O&G tanto terrestres como marítimas, tais como: costados de embarcação, equipamentos e tubulações em áreas abertas de difícil acesso.

Qual o status do projeto hoje?

CPSI encerrado com identificação da melhor solução robótica. Fase 2 do CPSI em contratação com a empresa vencedora para prestação do serviço

Temos mais imagens? Se sim, cole aqui



[Bike-costadoP48.mp4](#)

Detalhamento

Case 2

Aquisição de Soluções

Descrição do projeto

Digital Twin de Tanque de UEP's

Parceiros envolvidos

American Bureau Of Shipping (ABS)

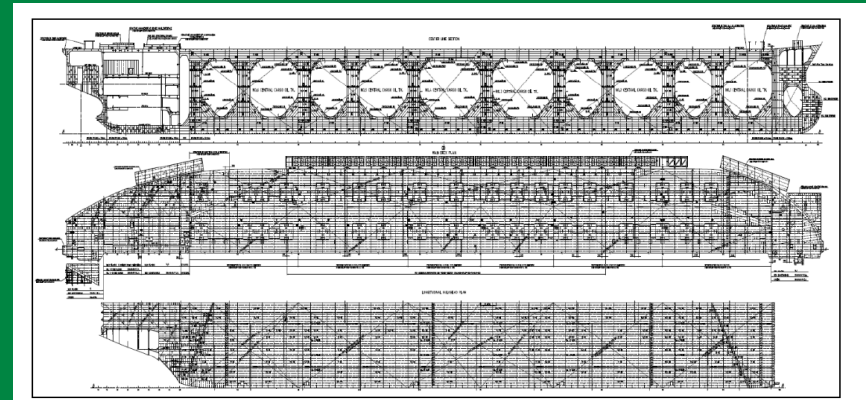
Como o projeto se desenvolveu?

O sistema e as ferramentas desenvolvidas foram submetidos a diversos testes práticos em ambiente do CENPES, validando todas as funcionalidades previstas: upload de dados, ingestão, análise, apresentação dos resultados e interface dashboards. Os relatórios finais demonstraram o cumprimento de todos os requisitos técnicos e operacionais, confirmando a robustez, confiabilidade e potencial de expansão da solução DigitalTtwin entregue. O projeto alcançou todos os marcos previstos, consolidando uma base tecnológica apta a suportar o uso corporativo da Petrobras no monitoramento, gestão proativa da integridade e extensão de vida útil de ativos offshore.

Qual o status do projeto hoje?

CPSI concluído. Oportunidade de realizar o Contrato de Fornecimento pós CPSI em análise.

Temos mais imagens? Se sim, cole aqui



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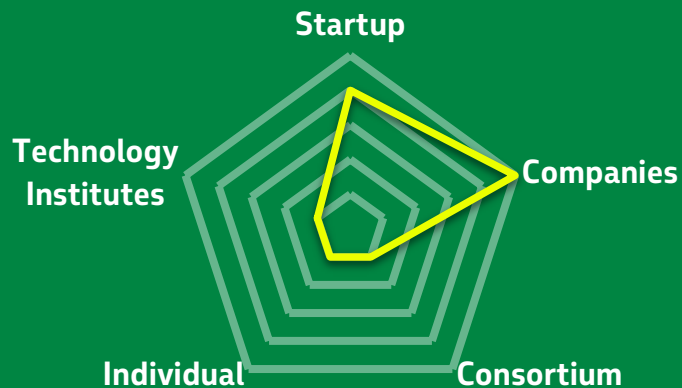


Technology Transfer

Companies seeking to incorporate **new technologies** to its portfolio

→ **+30 Current** contracts

→ **+200** Patents disclosed to the market



Access to cutting-edge technology, know-how and knowledge for innovation



Companies can commercially explore technologies developed by Petrobras



Possibility of internal use to optimize operations



Training and technical assistance

Successful Partnerships

Technology Transfer

M.O.D.A



A safe and reliable monitoring system for detecting wire rupture in flexible pipelines. Originally developed through a cooperation agreement with a Brazilian university, the technology was later licensed to a spin-off and is currently deployed in more than 450 units across the pre-salt cluster.

Partners:

ouronova
inovações tecnológicas



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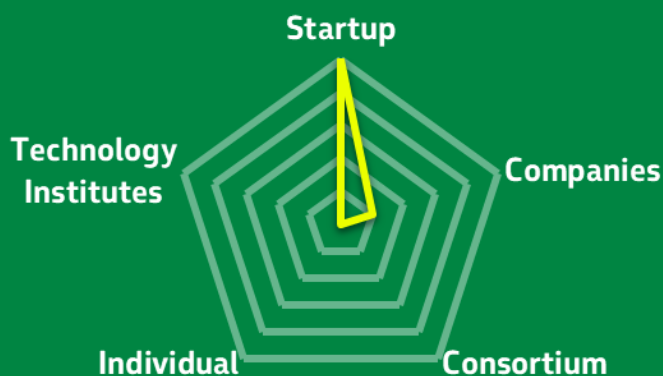
Investing in national and international startups and scale-ups with proven technologies to transform the energy sector, accelerate a fair energy transition, and decarbonize operations.

Climate Investments Fund

Multicorporate fund with US\$ 1,1 bi of capital
40+ investments

New Energy Transition Fund [Brazil]

With BNDES and FINEP
R\$ 500 mi of capital
Open call for fund and manager selection



Petrobras Empowers Our Partners Beyond Financial Investment...



Technical validation



Demand to scale



International visibility

Smart Money

Petrobras Empowers Our Partners Beyond Financial Investment...



Business Guidance



Technical Expertise



Branding Support



*Diversification
of Solutions*



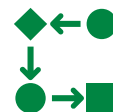
Media Exposure



RD&I Support



*Advanced RD&I
Infrastructure*



IT Infrastructure



Data Access

Other technological pathways:

Challenge-based routes

Capability-based routes

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Examples of **oppen** challenges



Technological Cooperation

Unified Anchoring Data System with Integrated Artificial Intelligence

Domain: Surface / Topside Technology

Proposal submission deadline:
28/05/2026



Pre-Commercial Procurement

Development and application of a mudlogging data acquisition system – the exact cabin of the future

Domain: Geology for Exploration and Reservoirs

Proposal submission deadline:
29/05/2026



Pre-Commercial Procurement

Development and installation of a low-enthalpy energy recovery system for steam generation

Domain: Refining Technology

Proposal submission deadline:
29/05/2026



Technological Cooperation

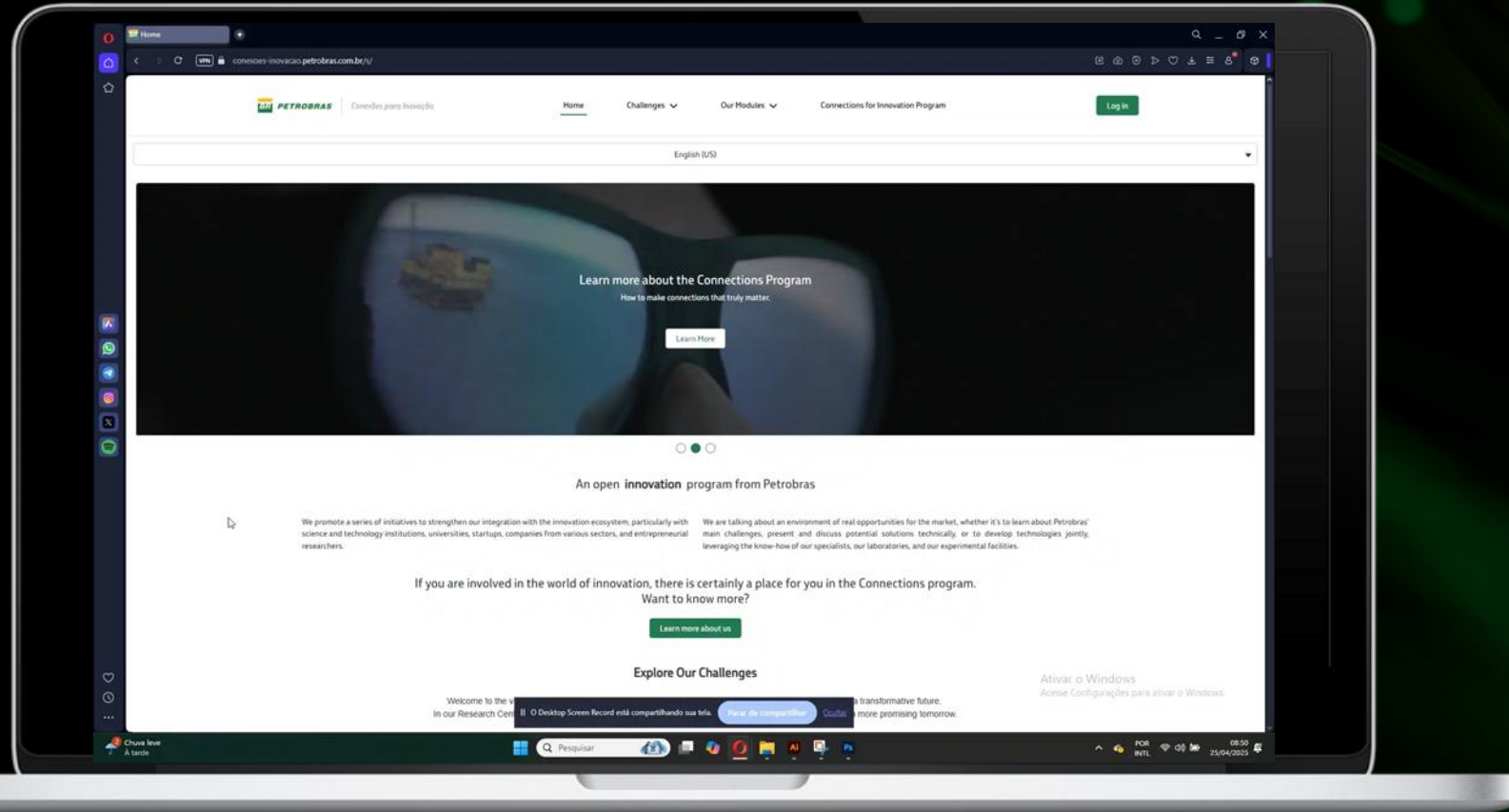
Development of a RAM (Reliability, Availability and Maintainability) analysis methodology applied to the lifecycle of FPSOs

Domain: Surface / Topside Technology

Proposal submission deadline
16/05/2026



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