

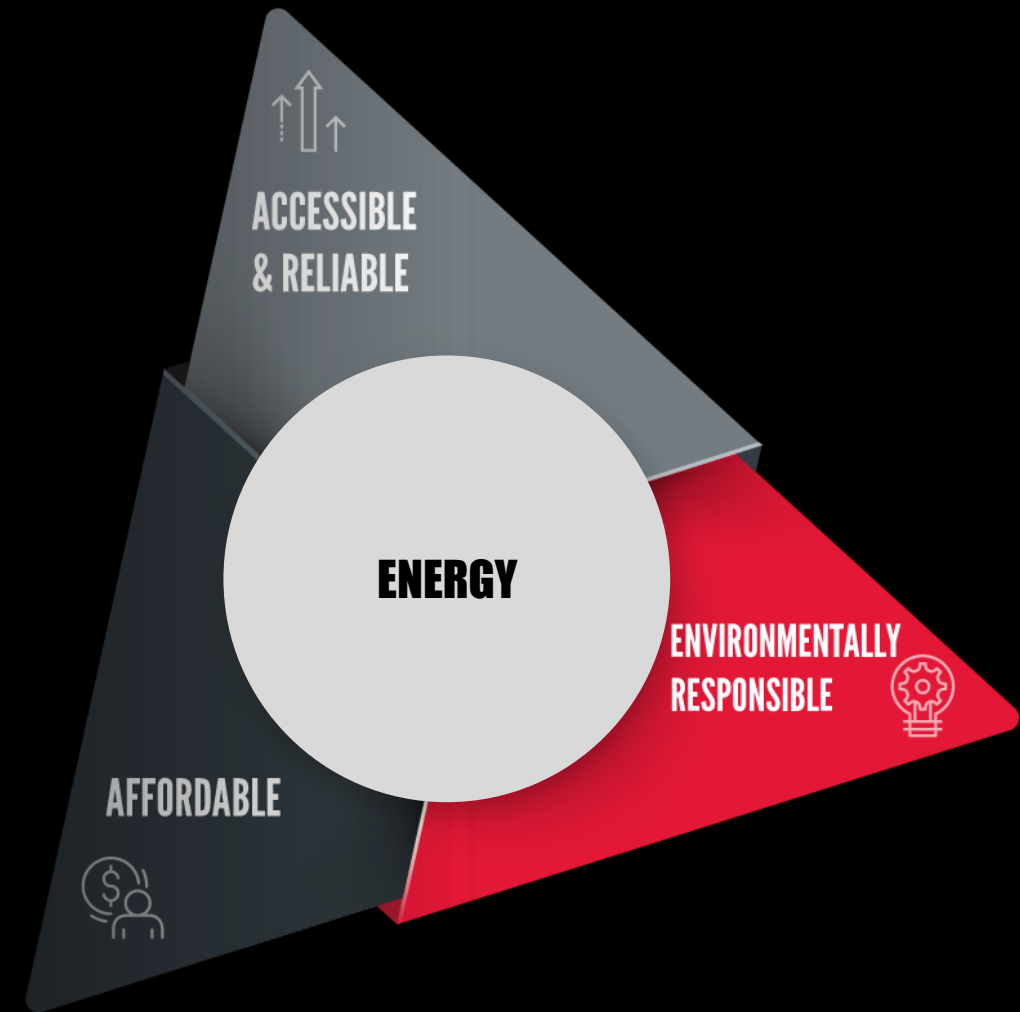


**Integrating supply chains in  
the power and energy sector**



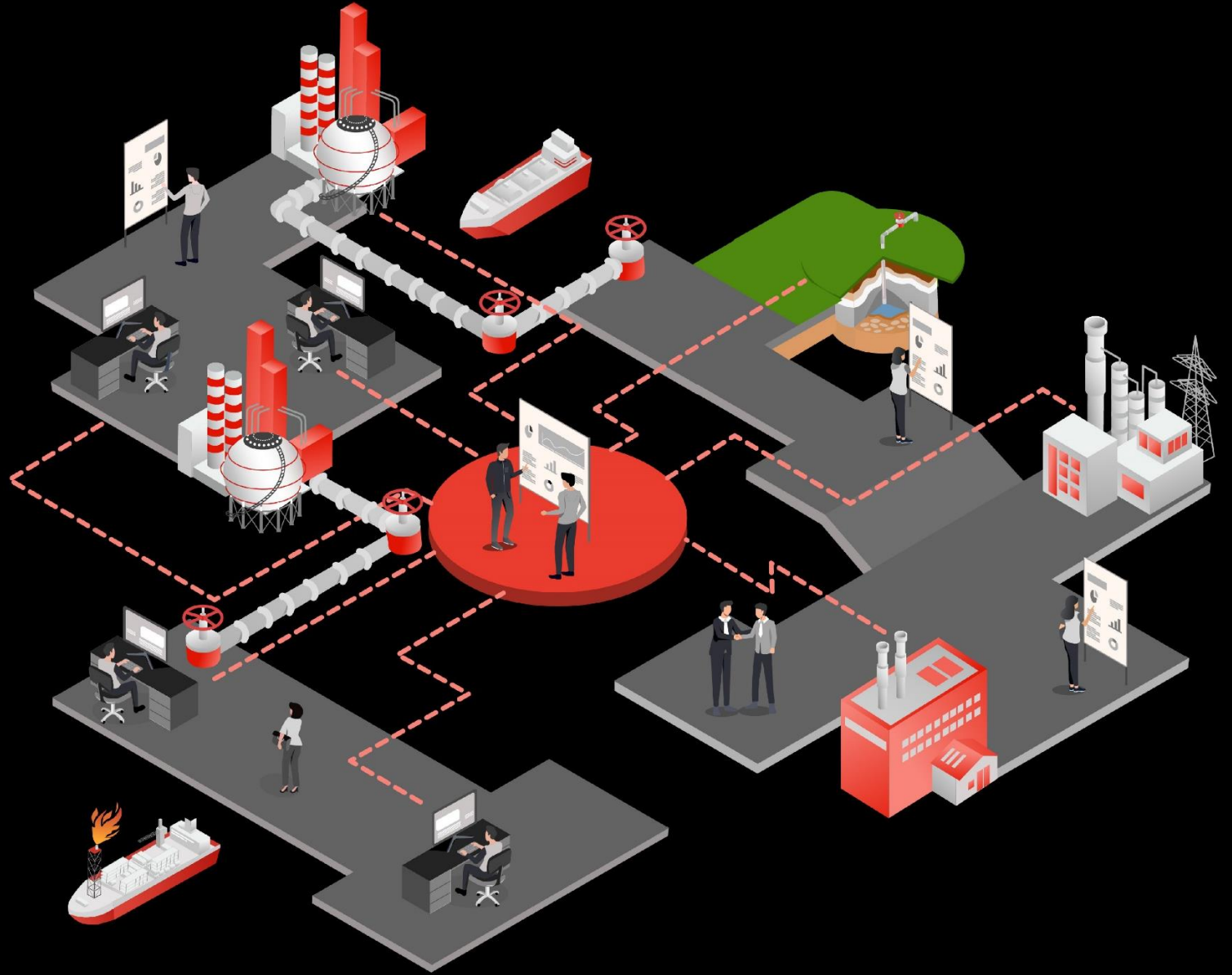
# Our Purpose

**We solve for energy justice with technology and collaboration.**



# Context

- Natural gas market in Brazil is deregulating and state-owned company is divesting its midstream assets
- The wholesale natural gas market is composed of multiple physical infrastructures along with numerous changes of ownerships along the supply chain.
- Under the Agreement with CADE, Petrobras refrain from purchasing new gas volumes from partners [...] at the wellhead.
- Petrobras signed another agreement with 3 partners for sharing natural gas gathering and processing infrastructures.

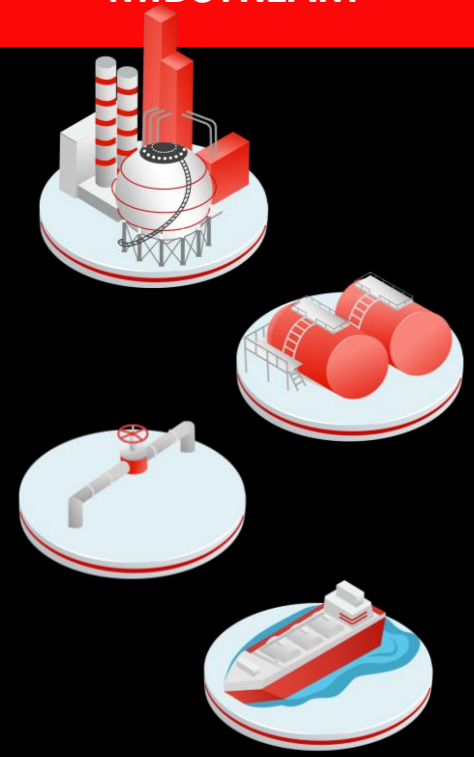




**UPSTREAM**



**MIDSTREAM**



**DOWNSTREAM**

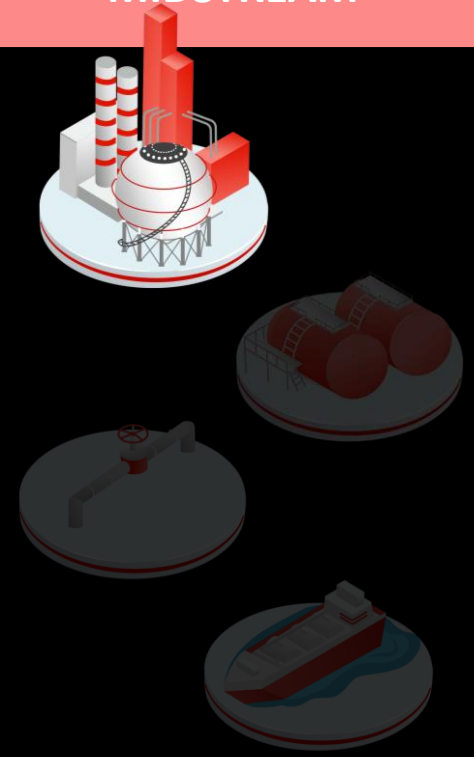


**Segmentation**

**UPSTREAM**



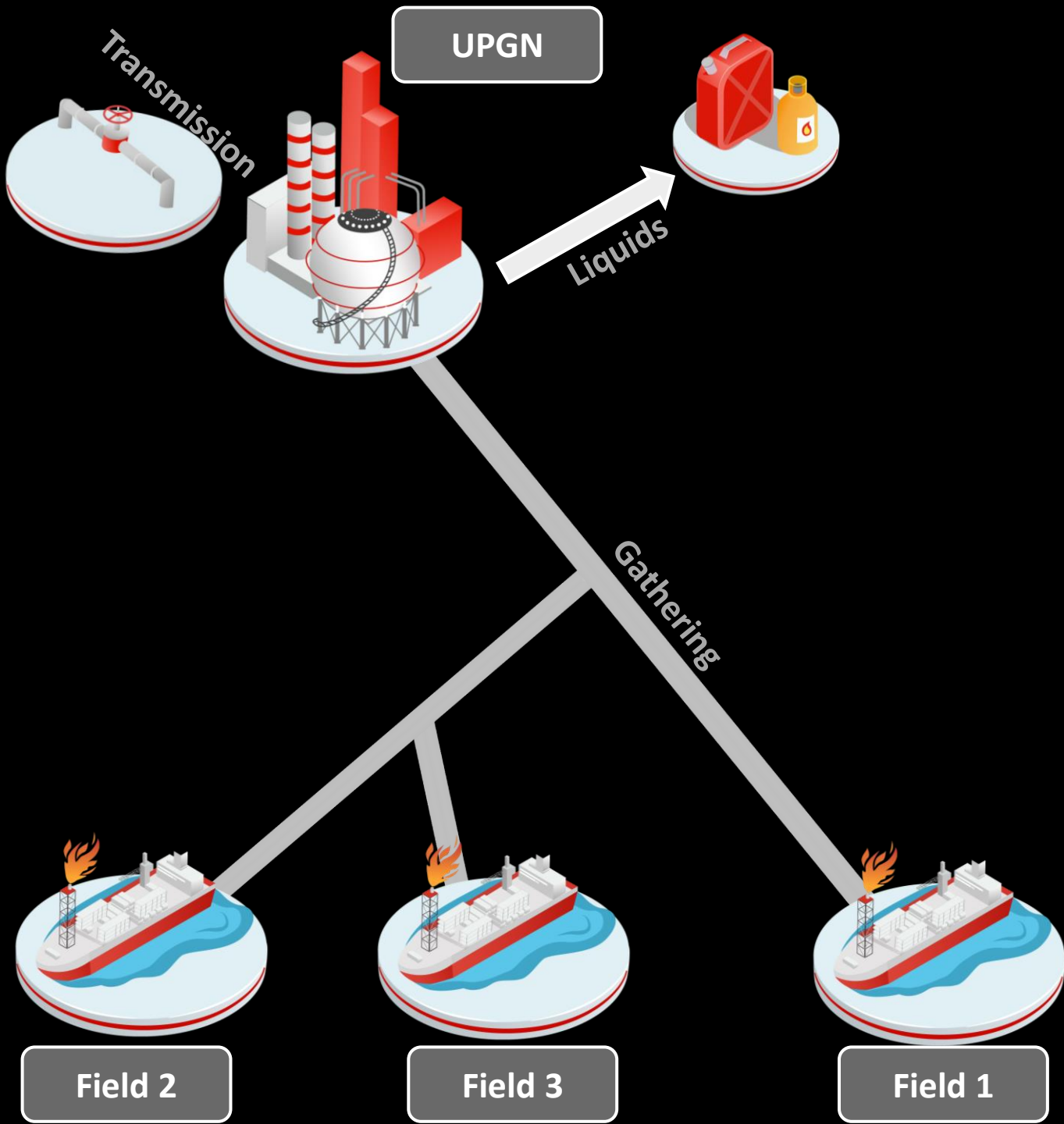
**MIDSTREAM**



**DOWNSTREAM**



**Segmentation**



## Description

Location	Ownership	C <sub>3+</sub>	Contaminant	Tax Regime
Field 1	A, B, C	6%	5%	α
Field 2	X, Y, Z	10%	7%	β
Field 3	A, C, X	3%	2%	γ
Pipeline / UPGN	A, B, C, X, Y, Z	Blend	Blend	

## Challenges

- Ownership
- Joint Billing
- Regulatory, Contractual and Tax regime
- Time conflicts, and delay in processing
  - Oil production delay
  - FPSO Charter & spread costs
  - Fines
- Timely Information availability**



 **Shared assets and infrastructure**

Reliability of measurement equipment and proof of calibration

 **Lack of clarity, visibility and efficiency**





No interoperability and common standards, manual entries

 **Disputes, audits and prior period adjustments**

- Volume and quality discrepancies reconciliation



- Joint-interest billing  
- Financial balance reconciliation

 <b>Delay in asset Monetization</b>	<b>Working capital requirements</b> 
 <b>Marketing exposure or flex options</b>	<b>Regulatory &amp; Compliance costs</b> 

**\$**

# The Problem

# Traceability

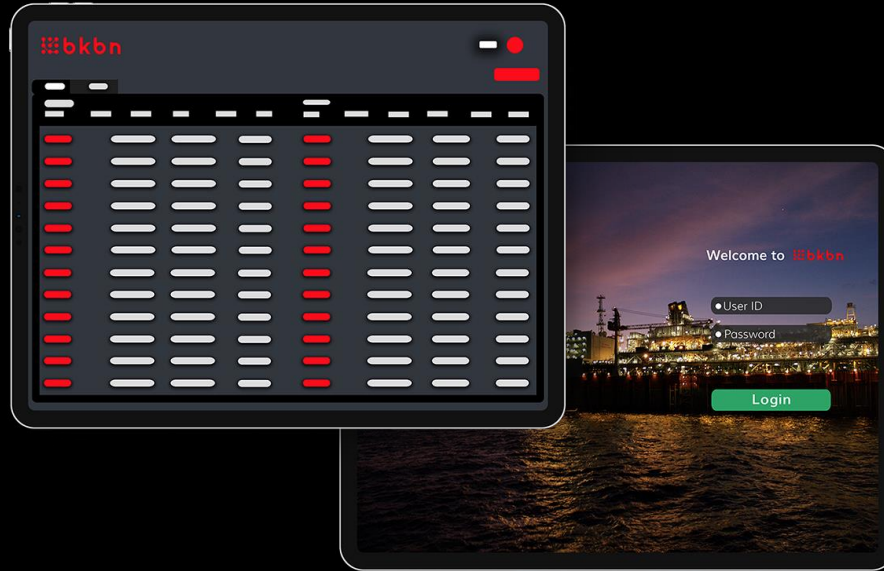


## Solution

# The Digital Backbone

digitally represents  
the physical world.

A digital infrastructure for the power and energy industry's supply chain to facilitate the sharing of trusted end-to-end information.





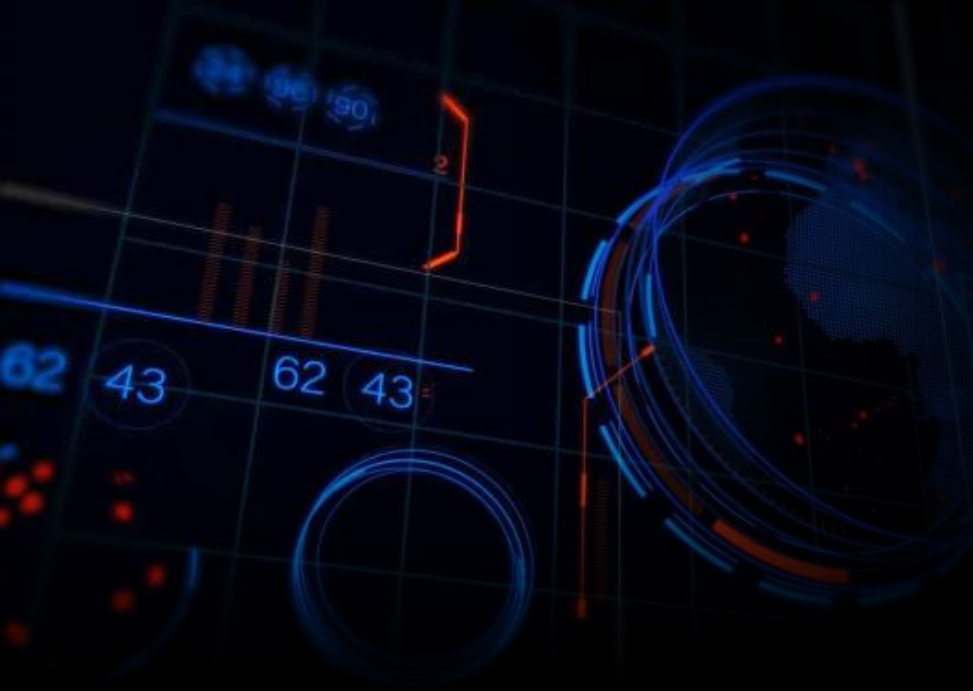
**In construction**



## **Why now?**

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- Deregulation and market in the making – new gas law approved in April 2021
- Developing a Proof of Concept and prototype at MIT
- Privatization of SIE/SIP



Information availability

**3**  
days



**1**  
hour



Reconciliation\*

- Quality Bank
- Joint billing
- Regulatory

**90**  
days



**1**  
hour



Dispute resolution

**1000+**  
manhours



**0\***  
hour



Confidentiality

**Silo**



selective  
**Transparency**

# Value Proposition

# Manage complex multi-party transactions with transparent, accurate end-to-end tracking of your assets

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## Transparency

Real-time access to information to minimize marketing exposure; strong signal to potential investors (IPO)

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Averted delay in asset monetization (oil or natural gas)

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## Efficiency

Automatic reconciliation: quality bank and joint-billing

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Automatic calculation of regulatory and fiscal obligations

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## Auditability

Quick resolution of disputes or prior-period adjustment

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Track-record of activities for unplanned costs due to capacity misuse

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## Benefits

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# Technology

# Blockchain

## Distributed Ledger Technology

- Algorithmic guarantees of immutability and tamper resistance by design
- Cannot be controlled by a single entity and has no single point of failure

## Private, permissioned, distributed

- Identity and security are federated: access to sensitive data is only available in the customer cloud infrastructure
- **bkbn** has no default access to sensitive customer data, which is fully encrypted

## Governance

- Governance model is designed by its founding members, smart contracts automatically enforce the procedures without external intervention
- Legal and regulatory requirements are hard-coded in the smart contracts, ensuring 100% compliance.



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# Team

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**Maria Gabriela Gallinal**

+20 years of experience of credit risk management in the financial market. Prior to MIT, Gabriela led the credit risk department of the largest Brazilian bank in New York.

MSc in Banking Management and Finance from Universidad Católica del Uruguay 'Dámaso Antonio Larranaga '



**Ali Adoudou**

+15 years of international experience in the Oil & Gas industry leading large teams in project management and field development. Ali spent 8 years in Brazil, implementing strategies to align offshore operations with regulatory requirements.

MSc in Engineering and MBA from Georgetown University.



**Etienne Cartolano**

+12 years of experience leading high-performance teams in the creation of data products in the financial sector. He is one of the leaders of the USP Data Science Center.

PhD in eng. of Computing, coordinator of the Blockchain developers course at University of São Paulo and collaborating researcher.

# References



mit  
media  
lab



MIT  
CRYPTOECONOMICS  
LAB



# Mavennet

Technology – blockchain traceability

# PROSM

Design – Governance and Economics

Funded and Supported by



# Canada-US Cross-Border Gas Import Tracking Using Blockchain Technology

Proven technology



The screenshot displays the NEOFLOW dashboard interface. On the left is a dark purple sidebar with navigation options: Dashboard (selected), Analytics, Products, Contracts, Actions, and Shared Products. The main content area is titled "Dashboard" and includes a user profile for "Marathon Petroleum" with a notification badge for 46. The dashboard features several data visualization components:

- Produced:** A line chart showing gas production over the last 24 hours. The current value is 390 BBLs as of Nov 25, 2020, at 03:41 PM. The chart shows a peak around 7 AM and a secondary rise towards 5 PM.
- Transferred, Revenue, Delivered:** These metrics are listed at the top but do not have associated data visualizations in this view.
- Summary Cards:** Three cards on the right provide key statistics: "Products: 30 Active / 60 Consumed", "Actions: 3 Transfers / 4 Contracts", and "Contracts: 4 Contracts".
- Bitumen & crude oil quality:** A horizontal bar chart showing Gravity at 63% and Sulfur at 47%.
- Export vs. domestic:** A bar chart showing 70% for Export and 30% for Domestic.