Blockchain Technology

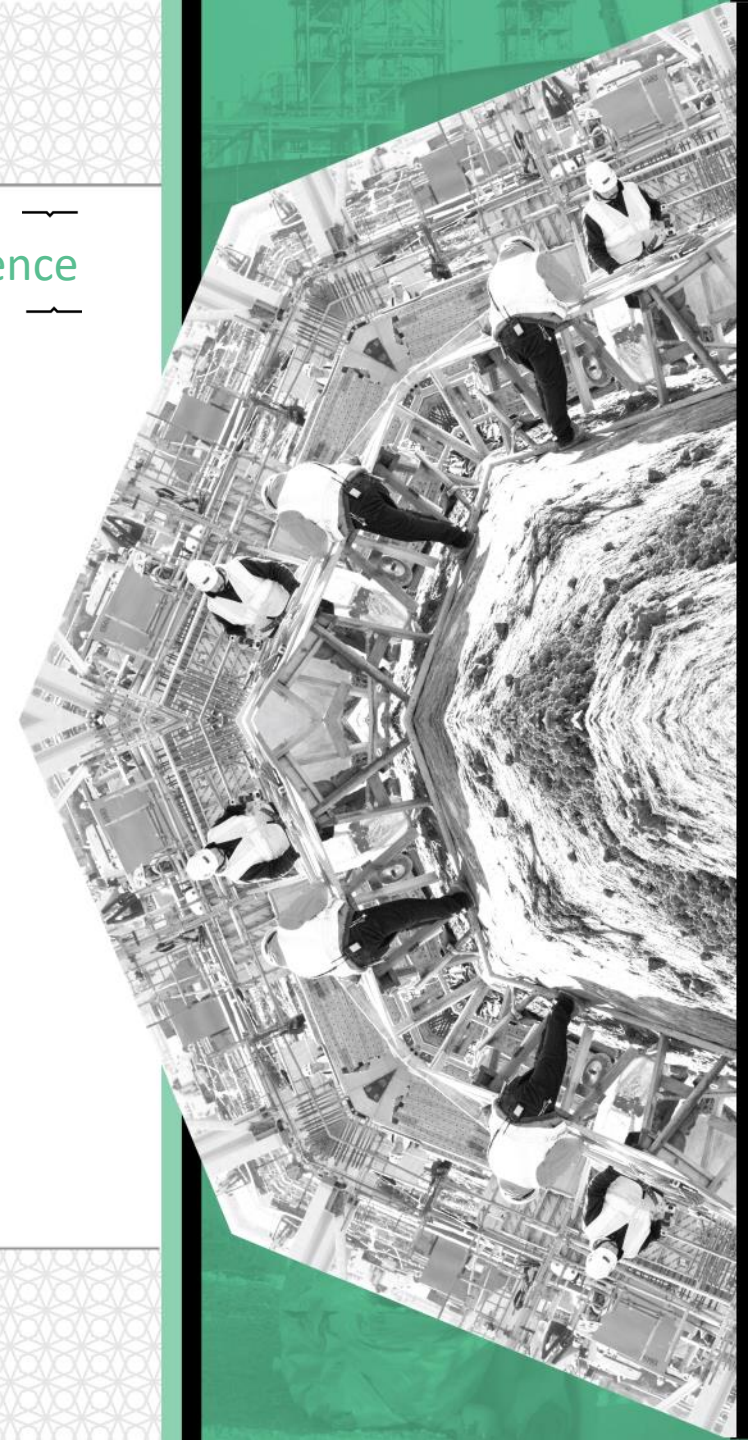An Enabler of Digital Transformation
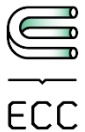
Team Members:

Pushkar Rao, Worley; Lynn Rouse, Chevron; Mark Foster, ExxonMobil
Moderated by
Rebecca Hofmann, Blockchain For Energy consortium

Intro: Panel Introduction

Rebecca
Hofmann

Blockchain For Energy
Consortium

Pushkar
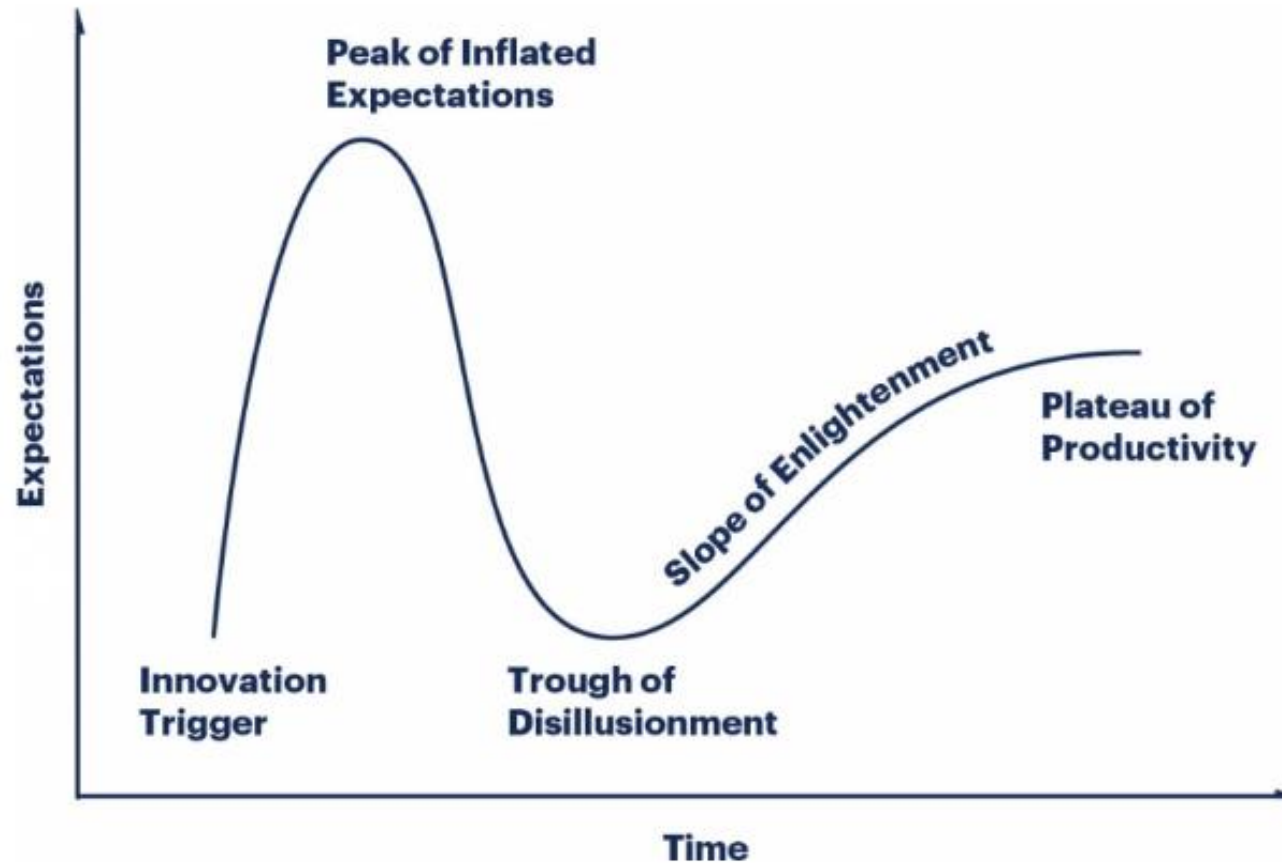Rao

Worley

Lynn
Rouse

Chevron

Mark
Foster

ExxonMobil

Is Blockchain Real...Hype V Reality

Technology Overview: Blockchain Value Proposition

Blockchain is a transparency & visibility engine….

Immutable
Permanent

Distributed
Needs Consensus

Security & Trust
Zero Trust Architecture

Combining technologies
Blockchain + IoT/AI/RPA

Worley Smart Contract Program

CHALLENGE

- Manual process for weekly timesheet approval by Project Manager (2.5 hours)
- Project metrics and burn rate have limited visibility and not available real time
- Audits are time consuming in case of disputes

IMPACT

- 60% reduction in processing time for timesheet approval (hrs)
- Turnaround time reduced from days to hours   (> 80% reduction)
- Transparent tracking and tracing of all timesheet related actions and approvals

Automated extraction of timesheet from finance system → Hours, total value, approval request recorded on chain → Notification and approval/denial action performed on Teams → Approval status recorded on chain → Power BI dashboard updated

Blockchain

Worley

Chevron
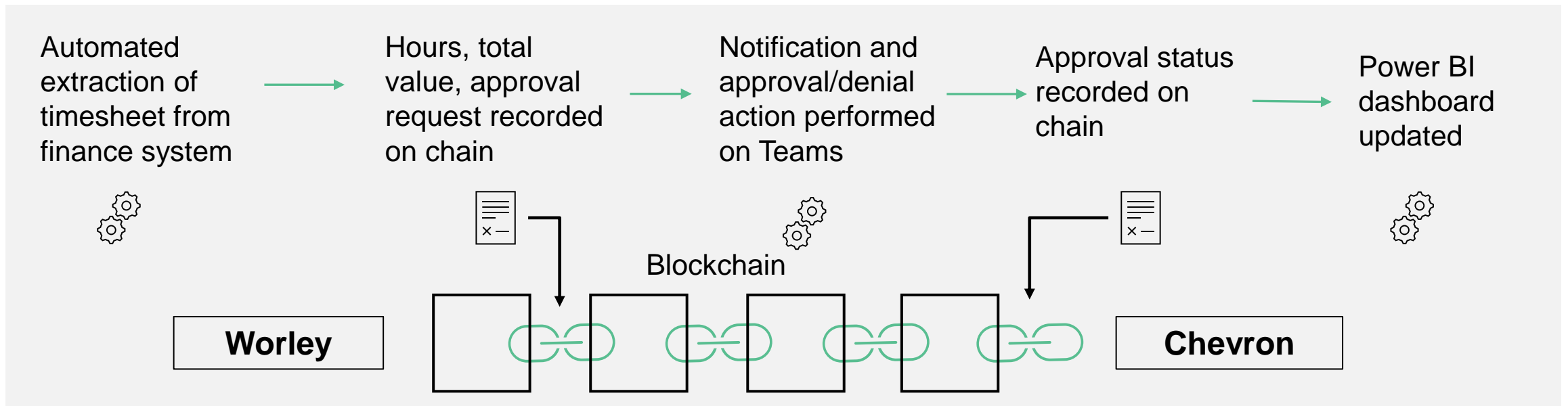
Pilot: Digital Passport (Valve)

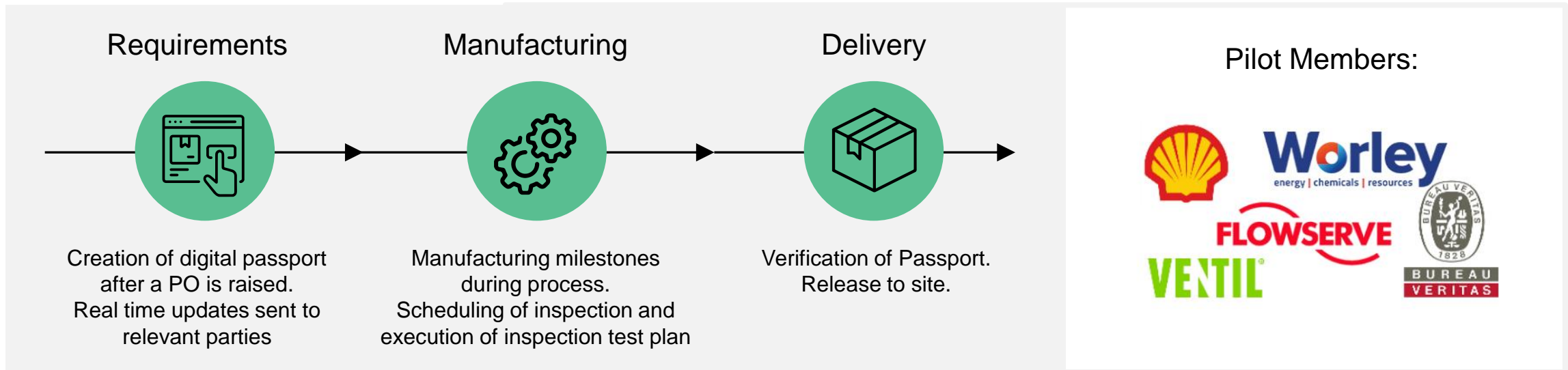|	
CHALLENGE	• Process heavily dependent on paper and manual transactions • High cost, errors, long delivery times for equipment • 20 weeks lead time for 1 control valve

IMPACT	• Real time visibility and transparency into supply chain • Less complexity and fewer errors by eliminating paper from process • 50% Reduction in time from design to operations handover for valve

Requirements

Creation of digital passport after a PO is raised. Real time updates sent to relevant parties

Manufacturing

Manufacturing milestones during process. Scheduling of inspection and execution of inspection test plan

Delivery

Verification of Passport. Release to site.

Pilot Members:

Shell · Worley energy | chemicals | resources · FLOWSERVE · VENTIL · BUREAU VERITAS 1828

Phase 2: Digital Passport - Chevron

CHALLENGE	IMPACT
• Process heavily dependent on paper and manual transactions • High cost, errors, minimal logistics transparency • Increased handover times due to approvals and review requirements • Inability to track carbon intensity for equipment	• Real time visibility and transparency into supply chain • Less complexity and fewer errors by eliminating paper from process • Reduction in time from design to operations handover for valve • Ability to incorporate carbon footprint into assets and products

IOGP Sub-Committee

- Develop technical specifications for blockchain solution that provide industry with standard guidelines

- Develop architecture minimal requirements and interoperability needs

- Leverage learnings from proof of concept or pilots deployed by Member Companies

Chemical Transport – B4E/Chevron, Quality Traceability

CHALLENGE		IMPACT	
CHALLENGE	• Process heavily dependent on manual transactions • Manual reconciliation and low visibility of invoicing errors • Long approval times and delays in invoicing and payments	**IMPACT**	• Real time visibility and transparency into chemicals value chain • Less complexity and fewer errors by eliminating manual process • Reduction in time for ticket approval and less errors • Data can be utilized for ESG assessment and chemical optimization

PHASE 1: QUALITY TRACEABILITY – CHEVRON

CHALLENGE		IMPACT	
CHALLENGE	• Material test data is captured in pdf files and manually submitted • Data not easily searchable and is decentralized across assets and projects • Data analytics or troubleshooting is difficult	**IMPACT**	• Structured, real-time and consistent data in centralized platform • Authentication linking traceability • Smart contracts that automatically review against industry standards, internal standards or project specific requirements • Enables KPI and supplier performance analysis

Water & Chemical Trials

Concept

Sensor data is used to initiate and approve business transactions

Service Provider

Operator Data

Blockchain ensures visibility and trust

Validation via smart contracts approves business transactions
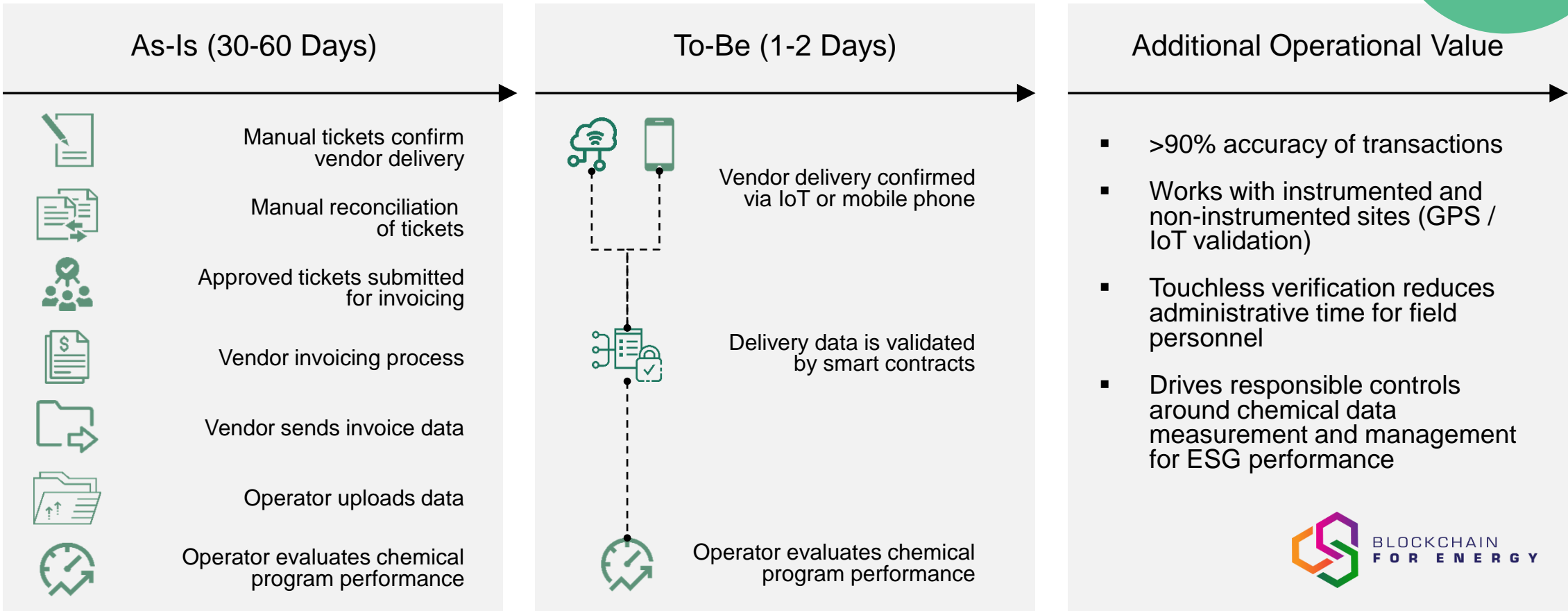
Saltwater Disposal

Results proved value and inspired further investment

100%	elimination of rounding practice
86%	of all transactions fully automated
36%	of personnel hours recovered
10x	multiple on investment

Chemicals Delivery

Results proved operational value and versatility of product

24HR	Visibility via dashboard to monitor chemical spend
98.5%	of all transactions fully automated
12k	personnel hours recovered
10x	multiple on investment
👍	Enablement of consignment model

Industry Adoption

Enhance product to drive member value

Multiple companies are preparing for implementation across several basins

B4E Product Council will facilitate this adoption and the future scaling beyond

- Assist in developing and deploying change management tools
- Assist in developing / testing enterprise Integrations
- Test interoperability and portability to manage future risk

Rapid Availability of Chemicals Data Empowers Field Operations

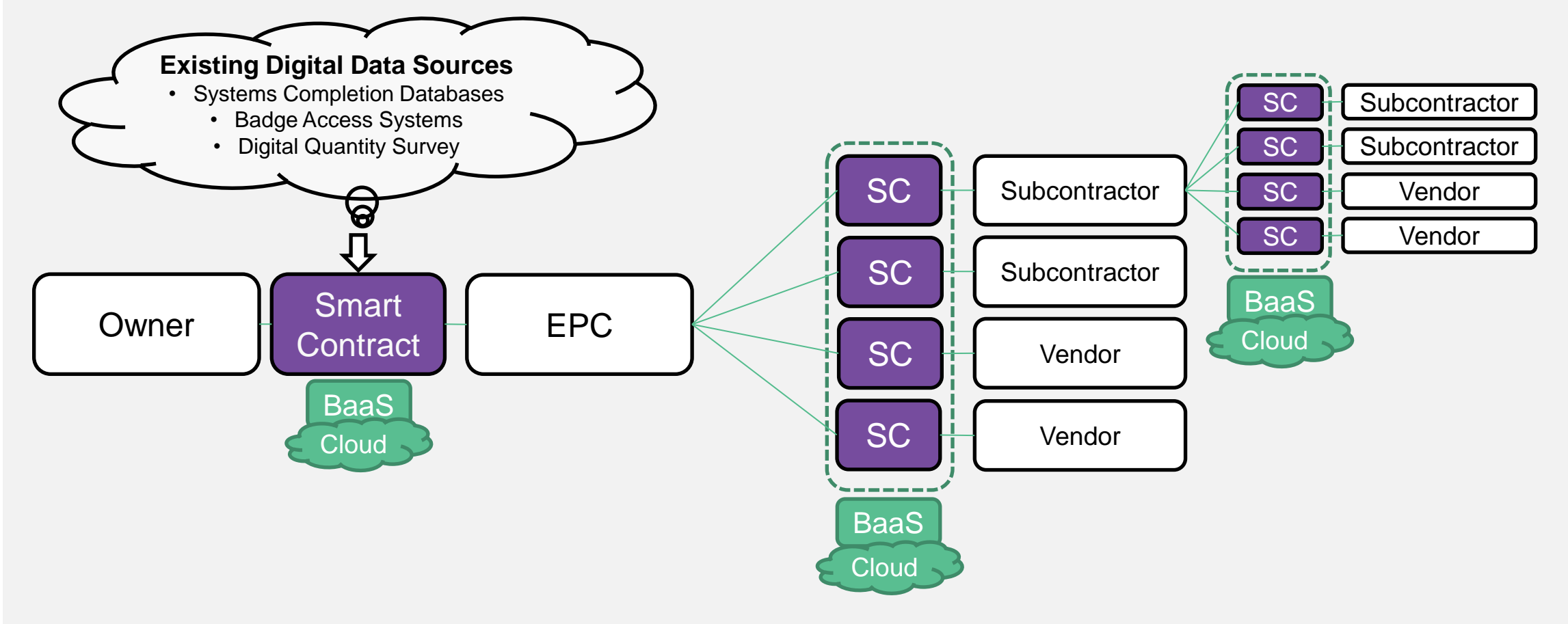**TRIALS REVEALED MILLIONS OF DOLLARS IN SAVINGS ACROSS ALL FUNCTIONAL AREAS**

As-Is (30-60 Days)

- Manual tickets confirm vendor delivery
- Manual reconciliation of tickets
- Approved tickets submitted for invoicing
- Vendor invoicing process
- Vendor sends invoice data
- Operator uploads data
- Operator evaluates chemical program performance

To-Be (1-2 Days)

- Vendor delivery confirmed via IoT or mobile phone
- Delivery data is validated by smart contracts
- Operator evaluates chemical program performance

Additional Operational Value

- >90% accuracy of transactions
- Works with instrumented and non-instrumented sites (GPS / IoT validation)
- Touchless verification reduces administrative time for field personnel
- Drives responsible controls around chemical data measurement and management for ESG performance

BLOCKCHAIN FOR ENERGY

Manual Process   Automated Process

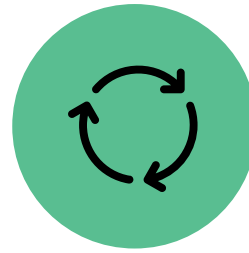# Envisioning future smart contract ecosystems

Getting Started: Valuation Approaches

Embedded financing costs

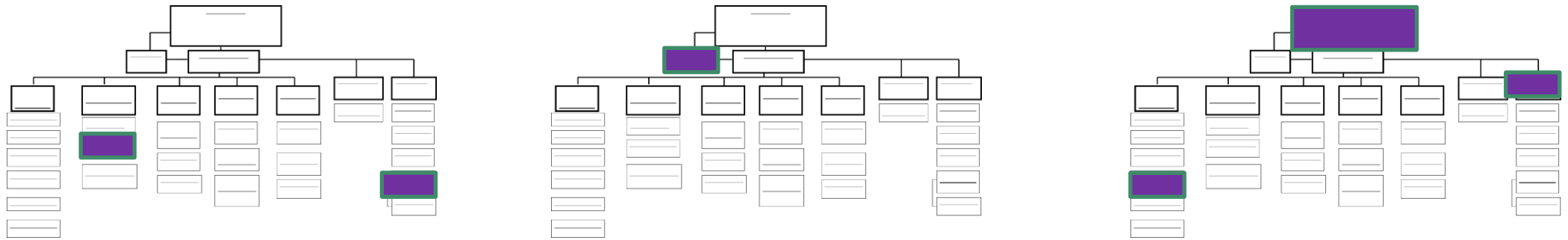*Increase velocity of payments*

Reduce overhead costs

Automate, eliminate workflow steps, audit efficiency

Reduce contract leakage

Smart Contract pro-actively aligns, minimizes disputes

Getting Started: Forming teams, MVP approach

The Energy Business Blockchain Ecosystem...it starts here

Blockchain For Energy is a non-profit organization made up of industry experts from major energy companies who choose to shape technology for their benefit.

Chevron · ConocoPhillips · ExxonMobil · PIONEER NATURAL RESOURCES · devon · REPSOL · Schlumberger · API American Petroleum Institute · Worley energy | chemicals | resources

Blockchain for Energy's mission is driven by their collaborative creation of shared single-source-of-truth solutions _for_ the benefit of the entire energy industry.

The effect of this will be to:

- Develop and deploy innovative, value-added solutions,
- Future proof the way we do business
- Optimize costs and increase efficiencies
- Create transformational change for the energy industry, by the energy industry

Thank you for your interest.

For more information on any of the subjects in this presentation please contact:

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