Energy, commodities and blockchain

North American Power Credit Organization (NAPCO) conference

February 10, 2017

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Agenda

- Current state of energy trading and risk management
- Industry challenges
- Capabilities offered by blockchain technology
- Impact of blockchain on other market sectors
- What is blockchain?
- Blockchain illustrative example
- Industry use cases
- Blockchain technology capabilities
- Key issues and considerations
- The path forward for blockchain
Current state of energy trading and risk management activities today (illustrative example)

Firm A
- Trading compliance
- Risk
- Back office
- Trade entry
- Confirmation
- Margin/collateral
- Invoicing
- Delivery
- Settlement
- Reporting

Firm B
- Trading compliance
- Risk
- Back office
- Trade entry
- Confirmation
- Margin/collateral
- Invoicing
- Delivery
- Settlement
- Reporting

Exchanges, brokers, logistics

Regulators

Fax, IM, email, phone

Banks

Reference pricing

ETRM and CTRM
ERP, TMS, accounting

ETRM and CTRM
ERP, TMS, accounting
Industry challenges

Challenges with current processes

- Siloed systems
- Disorganized regulatory data
- Legacy systems
- Lack of transparency
- Manual processes
What capabilities does blockchain offer?

**Blockchain technology** has the potential to transform today’s inefficient, time-consuming processes into a more **efficient, transparent framework**, while also offering the ability to **reduce costs**.

- Access to untapped segments
- New products
- Increased speed and efficiency
- Data reliability and availability
How is blockchain impacting other industry sectors?

Blockchain investments exceeded $1b per year since 2014.

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<th>Financial services</th>
<th>Retail</th>
<th>Commodities</th>
<th>Government</th>
<th>Technology</th>
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<td>Inventory management</td>
<td>Commodities and futures exchanges</td>
<td>Land ownership records</td>
<td>Internet of Things database</td>
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<td>Cross-border payment</td>
<td>Supply chain custody</td>
<td>Precious material tracking</td>
<td>Tamper-proof voting</td>
<td>Mobile network infrastructure</td>
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<td>Certificate of authenticity</td>
<td>Commodity-backed digital currencies</td>
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- **Health and sciences**
  - Patient records database
  - Prescription management

- **Transportation**
  - Automotive property ownership
  - Self-driving cars

- **Utilities**
  - Energy exchange
  - Smart utility metering systems

- **Media**
  - Digital rights management
  - Micropayments

- **Education**
  - Student transcript management
  - Certificate management
What is blockchain?

Blockchain is a distributed ledger that is:

- **A database and network**
  Distributed ledgers are a database and a network, which means they can store and transmit data.

- **Synchronized**
  All activity on a distributed ledger automatically is reflected across the network.

- **Secure**
  Data cannot be changed once it is committed to the system.

- **Smart**
  Code can be added to transactions that allows autonomous execution of functions once predefined conditions have been met. These are known as “smart contracts.”
Blockchain benefits can include:

- Trade details confirmed and reconciled upon execution and kept in sync through trade life-span
- Scheduling information updated and transparent for all parties involved
- Streamlined and more timely invoicing and settlement process

Trading group executes smart contract with counterparty, which is recorded on blockchain platform.

Transaction details automatically confirmed between counterparties and kept in sync.

Pricing for transaction posted on blockchain platform.

Payment made upon invoice submission on blockchain.

Scheduling groups able to set delivery schedule with carrier and counterparty and details recorded on blockchain.

Deliveries automatically tracked, with updated volume information recorded on blockchain for immediate company and counterparty access.
Energy industry blockchain application

Use cases

1. Reconciliation
2. Settlements and invoicing
3. Contracts and agreements
4. Scheduling
5. Data privacy and security
6. Identity management
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ey.com/StartupChallenge

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Blockchain technology industry overview

- **Industry consortia:**
  - R3CEV, Hyperledger, PTDL, ISITIC

- **Vendors:**
  - Platforms and infrastructure: Ethereum, Kynetix, Axoni, itBit, Eris, BTL, Chain.com
  - Invoicing: Tallysticks
  - Data management: Factom
  - Smart contracts: Symbiont, Adjoint
  - Payment: Ripple, DASH, Abra
  - Supply chain: Wave, Block Verify, Everledger
  - Other: Digital Asset Holdings, IBM, Bitfury
Key challenges with blockchain

1. Unclear legal and regulatory framework
2. Immature technology and frameworks
3. Lack of formal digital identity and verification
4. Investment and collaboration
5. Legacy integration
Way forward for blockchain in the energy trading and marketing industry

“The advent of blockchain technology, combined with the current state of industry processes, offers a great opportunity to effect major transformation in how the industry conducts business.

To move forward, companies may need to undertake several actions, including joining together to form a consortia, engage in focused pilot programs and create internal organizational innovation initiatives.

“A journey of a thousand miles begins with a single step.”

– Lao Tzu
Questions?
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