



NRG Energy, Inc

Renewable Energy Certificates and the Blockchain

2017





Overview

- REC Market Challenges
- Lifecycle of REC
- Current Status
- Key Components
- Market Growth Opportunities

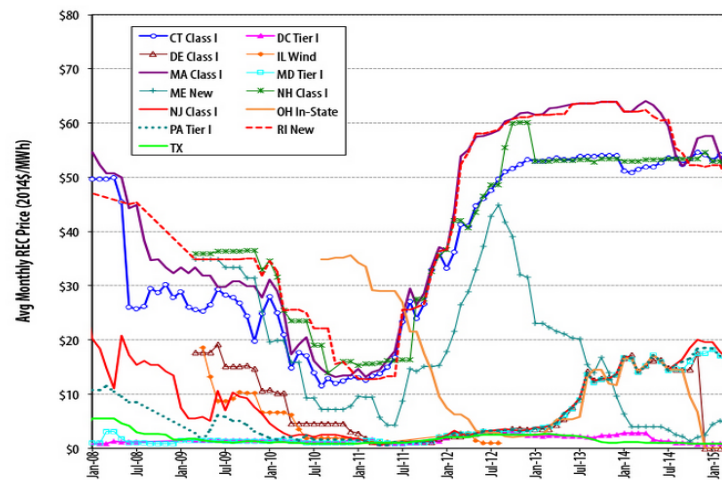
REC Market Challenges



National Market Snapshot

- + **Fragmented Marketplace:** Inconsistent regional and local market practices and regulations
- + **Large Units of Measurement:** 1 MWh units incongruent with mass market
- + **Opaque Tracking:** Costly certification and tracking measures
- + **Protracted Timing:** RECs transacted on a monthly cycle
- + **Disparate Market Systems:** Multiple IT platforms

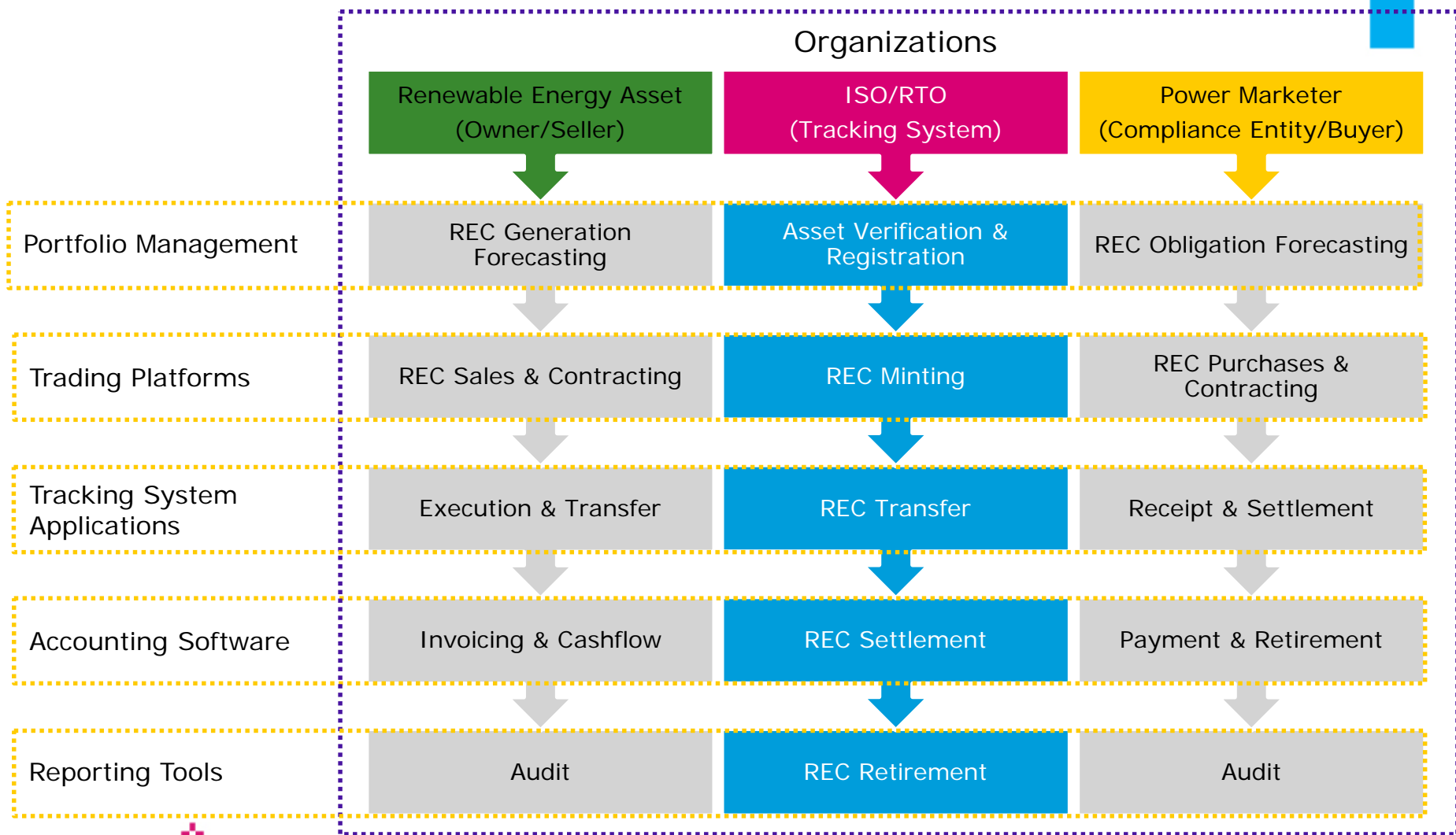
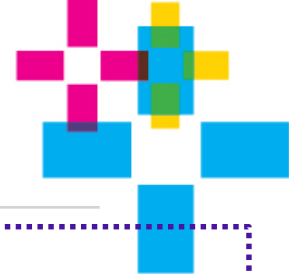
Illiquid, Volatile and Convoluted Market



Current construct restricts market participants, increases transaction costs, and impacts working capital.

Blockchain can alleviate market constraints and add value to commercial operations

Lifecycle of a Renewable Energy Credit (REC Process Chain)





NRG Blockchain RECs Current Status

Proof of Concept:

- Simple Minimum Viable Product complete
- Issuance-Transfer-Retirement of RECs
- Blockchain technology focused

Collaborations:

- Voluntary Markets – current use case discussions with:
 - Nasdaq Market Technology (Technology Partner)
 - Center for Resource Solutions (Green-e certification)
- Compliance Markets
 - Regulatory Partnerships



NRG Blockchain RECs Key Components

Key Components:

- Proof of Concept
- Bottom Up Approach to Solve Market Issues
- Technology focus on efficiency improvements and cost savings
- Regulators remain component of governance
- Consensus mechanism reflecting market governance requirements

What our project is not:

- Not a commercial product
- Not a new cryptocurrency
- Not an Initial Coin Offering (ICO)
- Not avoiding regulations – developing blockchain to improve functioning of regulatory processes



NRG Blockchain RECs Market Growth

Voluntary market use case presents an opportunity as the market is primed for growth through increased corporate demand.

Key areas discussed:

1. Limitations of Scalability
 1. Current chain-of-custody audit is not scalable
 2. Blockchain REC platform is scalable

2. Corporate US demand is growing
 1. Current volume is ~50m RECs per year
 2. Increasing in near-term by 50% to 100%
 - see the following slide



NRG Blockchain RECs Market Growth

CORPORATE RENEWABLE ENERGY BUYERS' PRINCIPLES: INCREASING ACCESS TO RENEWABLE ENERGY

65 COMPANIES

48 MILLION MWH
OF DEMAND FOR
RENEWABLE ENERGY

\$5 TRILLION IN
MARKET CAP



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