

## **Futures Clearing 101**

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## **PJM Financial Risk Mitigation STF**

*Audubon, Pennsylvania*

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# About one year after the financial crisis storm, world leaders met to agree on a global solution...

The G-20 Leaders in  
Sep 2009 concurred that:



- *“All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest.”*
- *“OTC derivative contracts should be reported to trade repositories.”*
- *“Non-centrally cleared contracts should be subject to higher capital requirements.”*

# Risk management approaches to forward price, credit, and liquidity risk in energy markets

- **Bi-lateral/swaps trading**
  - *Typically low to zero margin requirements in energy markets where risk is managed by direct counterparty credit limits*
  - *Key Risk: Daisy chain of defaults*
- **Pooled Mutualized Risk**
  - *Solution for organized markets that addresses daisy chain risk*
  - *Key Risk: Once collateral is exhausted, default is mutualized among trading participants*
- **Exchange/futures Clearing**
  - *Approach recommended by G20 countries for risk management that relies on two-tiered credit infrastructure, variation margin and initial margin (regulated by the CFTC in the USA)*
  - *Multiple layers of protection before any possibility of mutualized risk*

# The regulatory landscape and its impact on power trading evolved

CFTC Jurisdiction **pre-Dodd Frank**

CFTC Jurisdiction **post-Dodd Frank**

**Designated  
Contract Market  
(DCM)  
Futures**

**Exempt  
Transactions**  
*(Exempt Commercial Markets  
were phased out  
under Dodd-Frank)*

**Swaps  
(Financially  
Settled)**

**Physically Settled  
“Forwards”  
(Not Futures)**

**NYMEX**

*Converted  
Oct 2012*

← **ICE**

*Applied Oct 2012;  
Registered Sep  
2013* ← **Nodal Exchange**

**NFX**

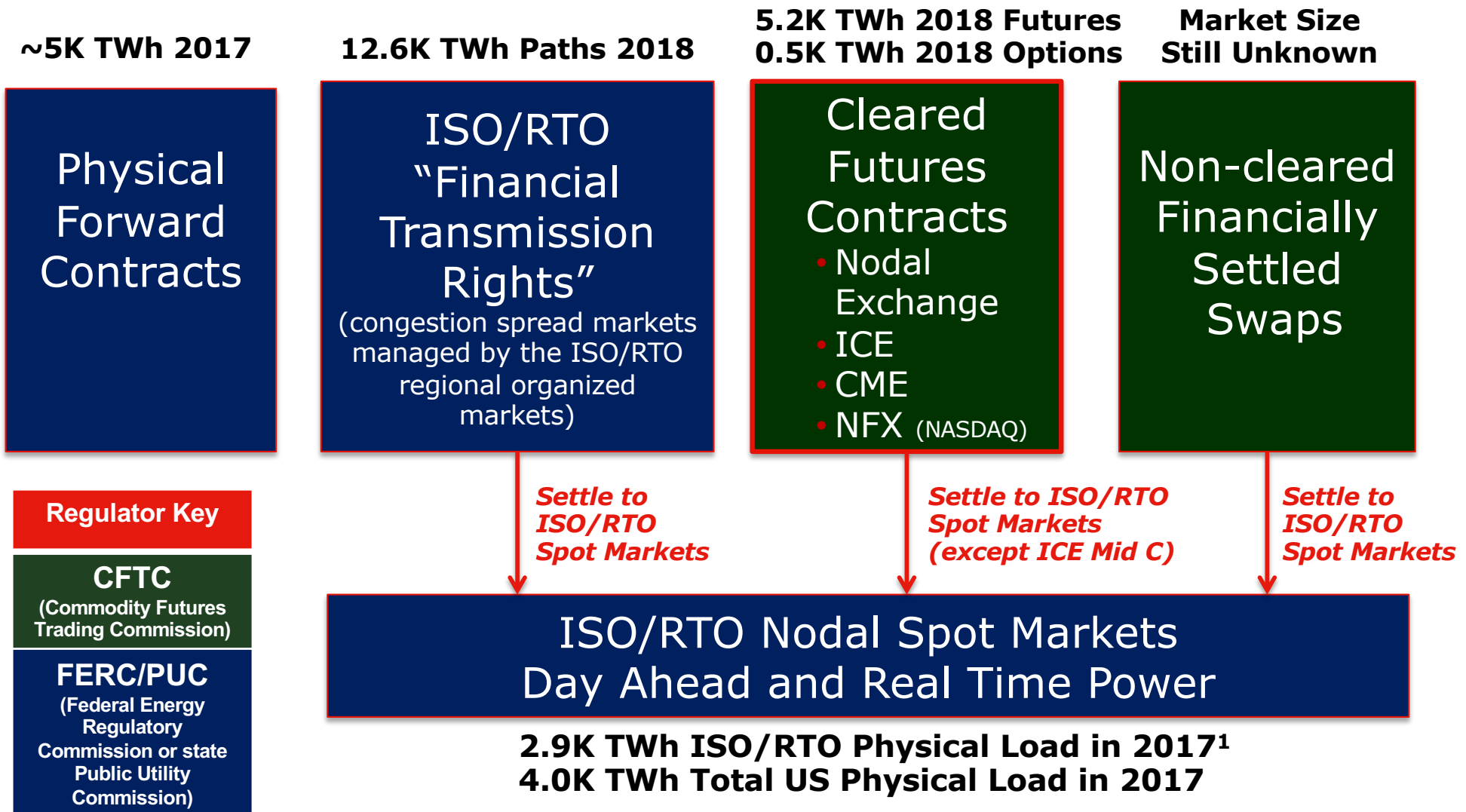
*(Jul 2015)*

Bilateral  
(or SEF/DCM)  
cleared swaps  
*(None to date)*

RTO/ISO FTRs  
*(Exempted with  
oversight by FERC or  
PUC Texas)*

Bilateral  
(or SEF)  
non-cleared  
swaps

# United States Power Markets



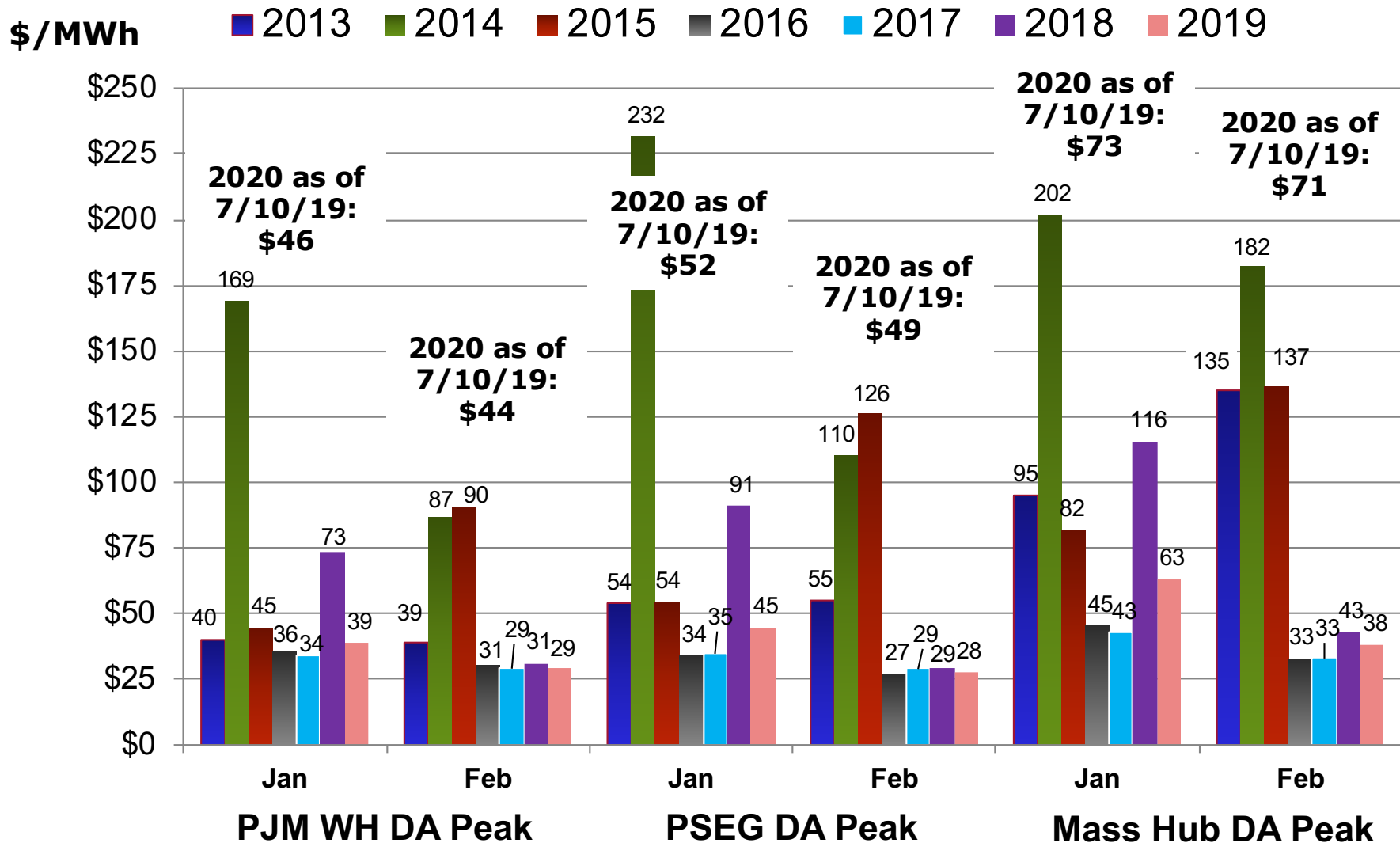
1. Approximation based on ISO/RTOs serve ~72% of U.S. population

# Risk management differences between cleared futures and non-cleared swaps

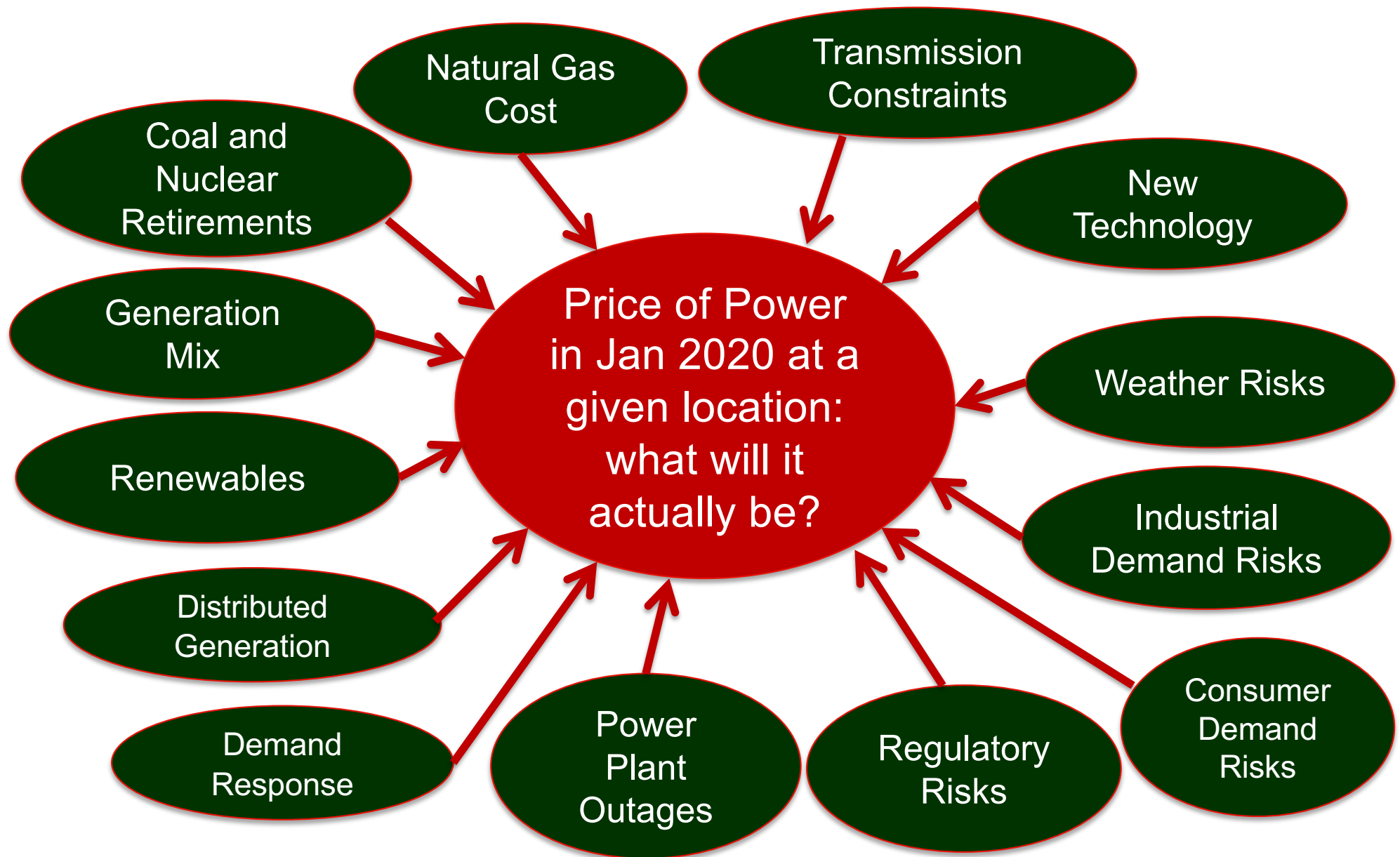
- **Price Risk Management**
  - *Both futures and swaps provide a solution by allowing forward prices to be hedged*
- **Credit Risk Management**
  - *Cleared futures provide a more robust solution than non-cleared swaps*
- **Liquidity Risk Management**
  - *Cleared futures provide a more robust solution than non-cleared swaps*

# Predicting power prices is not easy...trading futures contracts can provide a hedge for price risk

Wholesale Power Settlement Price by Contract Expiry by Year



**Forward price risks will continue to be significant for market participants (e.g., generators, load serving entities, consumers)**

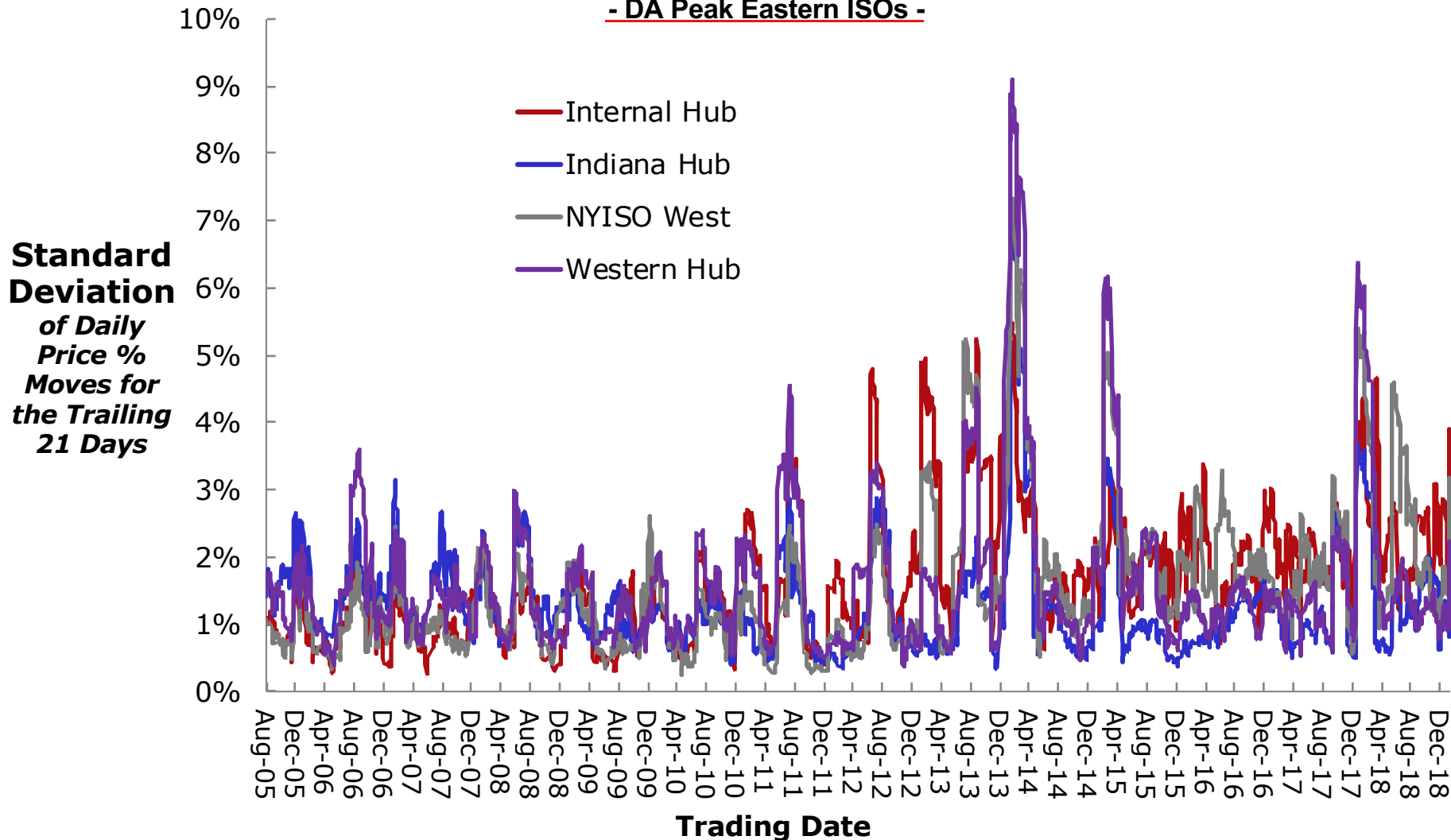




# Price volatility appears to be increasing making hedging even more important

## Historical Volatility by Month

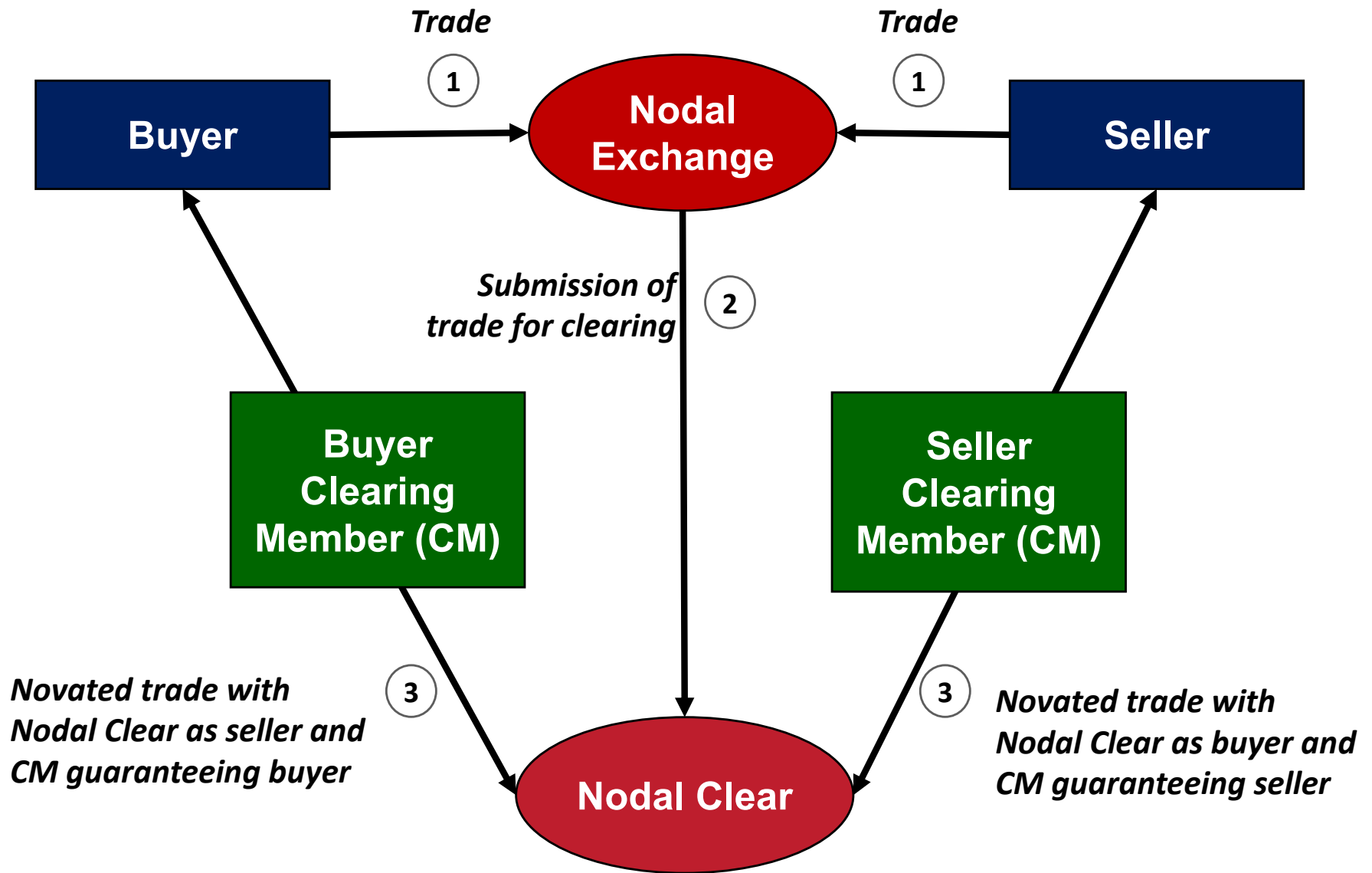
- DA Peak Eastern ISOs -



# Central counterparty clearing is used to manage the credit risk related to futures contracts

- When contracts are to be settled in the future there is risk regarding the counterparty being able to meet payment obligations at that future time
- A central counterparty clearing house acts for a specified market as the **buyer to every seller and the seller to every buyer**, taking no market position risks only default risk
- These clearing organizations for commodities such as energy are regulated by the Commodity Futures Trading Commission (CFTC) and referred to as **derivatives clearing organizations (DCOs)**
- To protect themselves in the case of a default, DCOs hold margin which is called at least daily
  - **Variation margin:** covers actual movements in the expected settlement price of the contract (mark to market)
  - **Initial margin:** covers the potential price movements that could occur after a potential default and are determined to cover a set number of days to liquidate with a certain degree of confidence

**“Novation” in cleared market trading leaves the clearinghouse as the central counterparty; clearing members provide an extra layer of protection**



# Nodal Clear clearing members



- ADM Investor Services Inc. (FCM)



- BofA Securities, Inc. (FCM)



- BNP Paribas Securities Corp. (FCM)



- Citigroup Global Markets, Inc. (FCM)



- ED&F Man Capital Markets Inc. (FCM)



- Goldman Sachs & Co. (FCM)



- Macquarie Futures USA LLC (FCM)



- Mizuho Securities USA Inc. (FCM)



- Morgan Stanley & Co. LLC (FCM)



- RBC Capital Markets LLC (FCM)



- Royal Bank of Canada



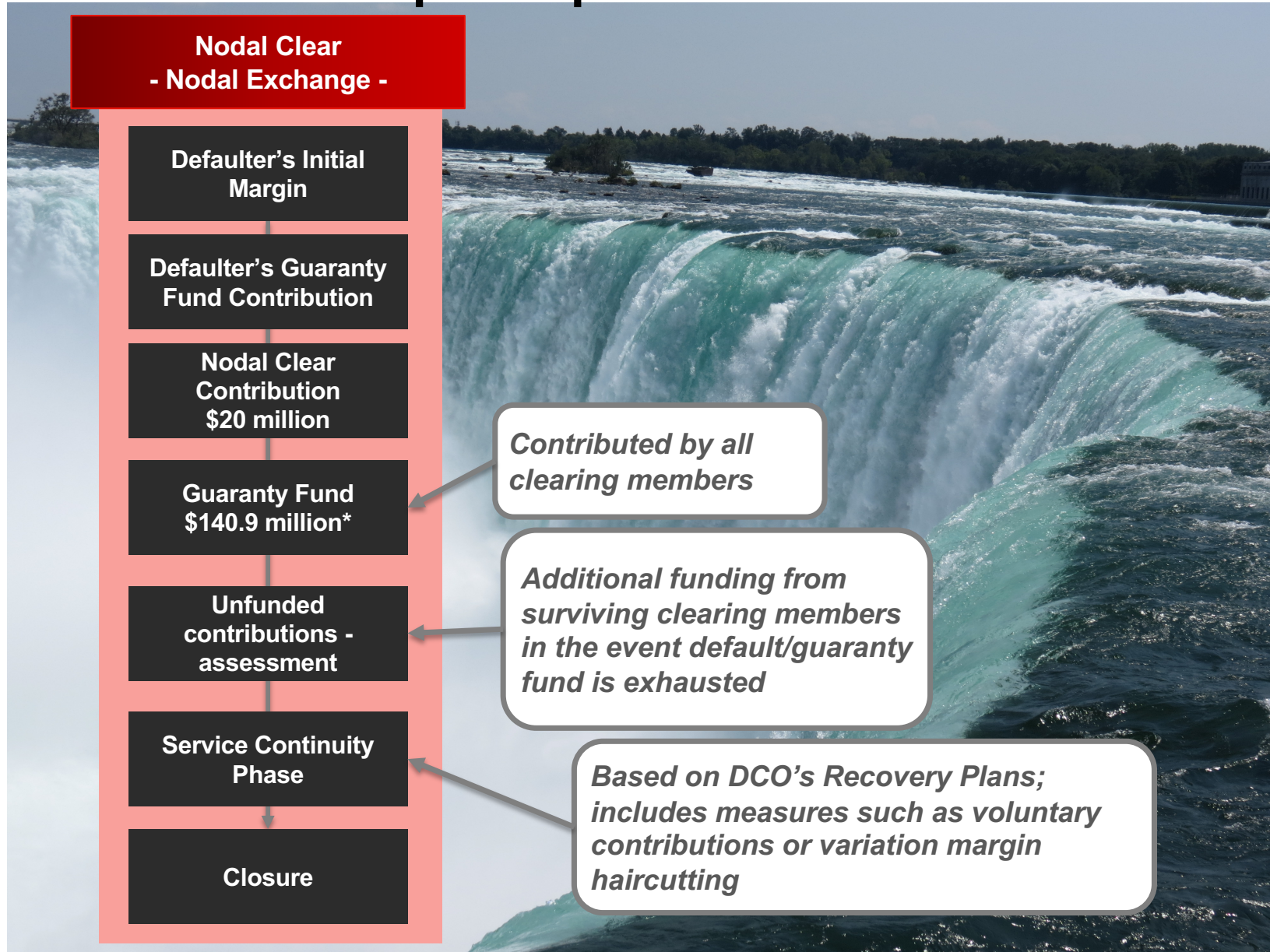
- SG Americas Securities LLC (FCM)

Newedge



- Wells Fargo Securities LLC (FCM)

# Default Waterfall – the clearinghouse has several layers of protection to insulate participants from defaults



\* As of June 14, 2019

# Initial margining methodologies differ among clearing houses

- CFTC directs clearing houses (DCOs) to have initial margin requirements that produce >99% coverage over an acceptable historical time period, and assume an appropriate liquidation period for the product (at least 1 day for energy)
  - 99% coverage equates to ~2 days per year when the amount of initial margin held would not have covered a default
- Most commodity exchanges have historically used SPAN (Standardized Portfolio Analysis of Risk) to calculate initial margins
  - SPAN uses “scanning arrays” to calculate initial margins for a given commodity, and then employs offsets to try to accommodate spread and other more complicated positions
- For the Nodal Exchange market, portfolio margining (e.g., Value-at-Risk) is utilized, creating significant capital efficiencies for complex portfolios
  - Nodal Clear employs an expected shortfall methodology to address the “fat tail”; the calculation is calibrated to handle a one or two-day price movement to a 99.7% confidence level
  - Initial margins calculated using portfolio margining can be significantly lower than the amount produced by SPAN for portfolios with diverse positions, owing to the offsetting efficiencies

# Non-cleared swaps do not provide the same degree of credit protection

- Credit exposure directly with each counterparty
- Can hold increased margin levels with counterparty (e.g., 10 day hold), but not as strong credit risk protection as provided by the collective strength of the clearing house and its clearing members
- Limited, if any, netting of positions among counterparties to reduce risk exposure
- Significant effort to manage and monitor credit risk exposure
  - “With defaults in the energy industry at their highest level in 15 years, firms are increasingly nervous about the credit standing of their peers. That has put pressure on credit teams to improve their counterparty assessments.”<sup>1</sup>
  - “The default rate for high-yield debt issued by US energy firms over the past 12 months hit 5.3% in October 2015, the highest level since 1999 and significantly above the broader US corporate default rate of 2.9%, rating agency Fitch Ratings said in a November 13, 2015 report.”<sup>1</sup>

1. *Energy Risk* article entitled “Oil rout sharpens energy companies’ focus on credit risk” by Stella Farrington, 12/1/2015

# Futures contracts provide liquidity risk management

- Able to trade with many buyers and sellers in the futures market on an anonymous basis without worry of credit risk – greatly expanding the universe of counterparties to achieve the best price
- Ability to net positions from trades done with multiple participants providing capital efficiency
- Standardized contracts attractive to many buyers and sellers
- Price transparency – participants able to see the prices of all trades
- Trading screen platform (central limit order book) to place orders as well as block trades that can also be facilitated by voice brokers – enabling liquidity on demand



# Lessons learned from global industry defaults in 2018 – key factors to continue to manage:

- Clearing Member admission policies
- Credit and compliance monitoring of Clearing Members
- Position monitoring
- Variation margin importance
- Initial margin design
- “Skin in the Game”
- Guaranty Fund importance
- Default management process