

# ICE CLEAR CREDIT

CDS CLIENT CLEARING

2019

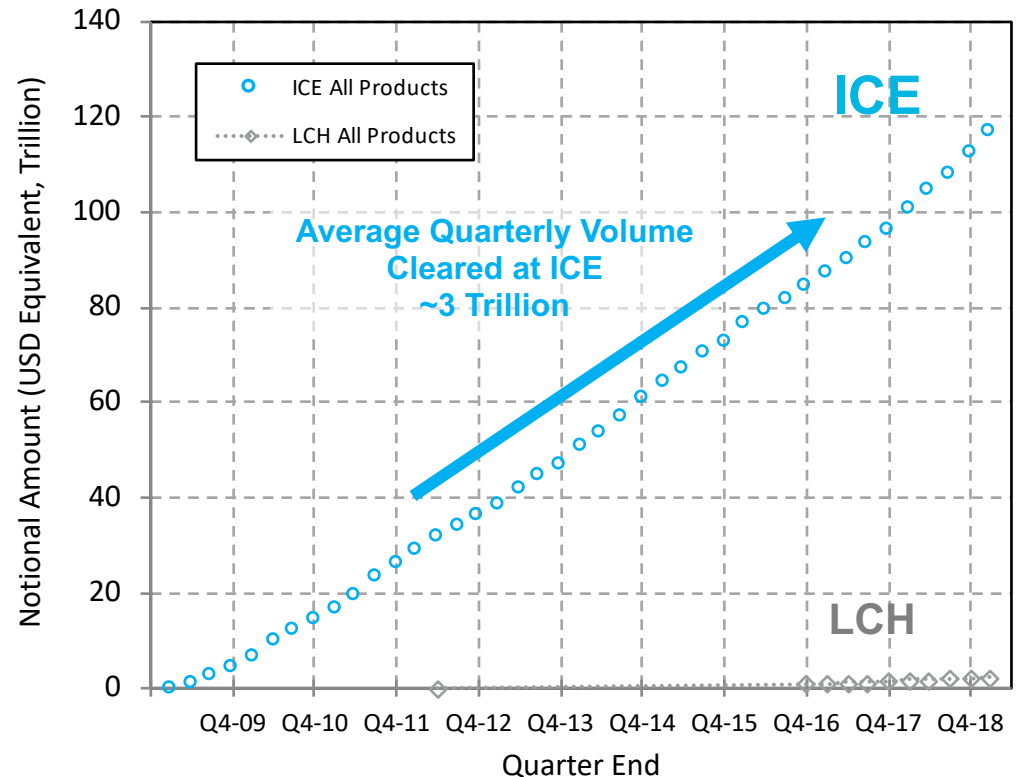


# ICE OTC Expertise

## Global Leader in Cleared Credit Derivative Markets

- Global leader in OTC credit as well as listed derivatives in credit indices, interest rates, equity, energy, agriculture and foreign exchange
- March 2009 - ICE is the first to clear index credit default swaps (CDS)
- July 2009 – ICE Clearing Europe launches CDS clearing
- December 2009 – ICE is the first to clear single name credit default swaps and client activity
- July 2012 – ICE Clear Credit designated a Systemically Important Financial Market Utility
- March 2016 – Global clearing volume surpasses \$75 trillion
- July 2017 – Global clearing volume surpasses \$90 trillion
- March 2018 – Global clearing volume surpasses \$100 trillion

### Cumulative CDS Cleared Volume

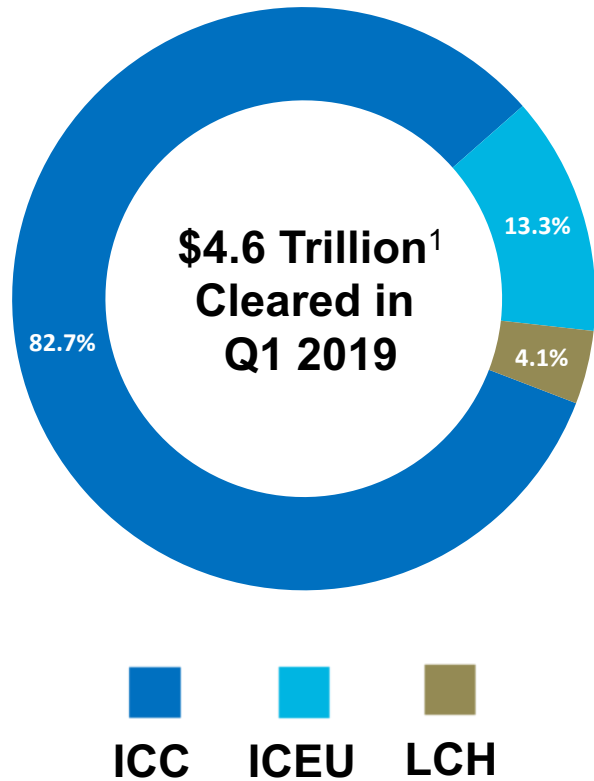


<sup>1</sup> Sum of daily USD Equivalent Cleared Notional

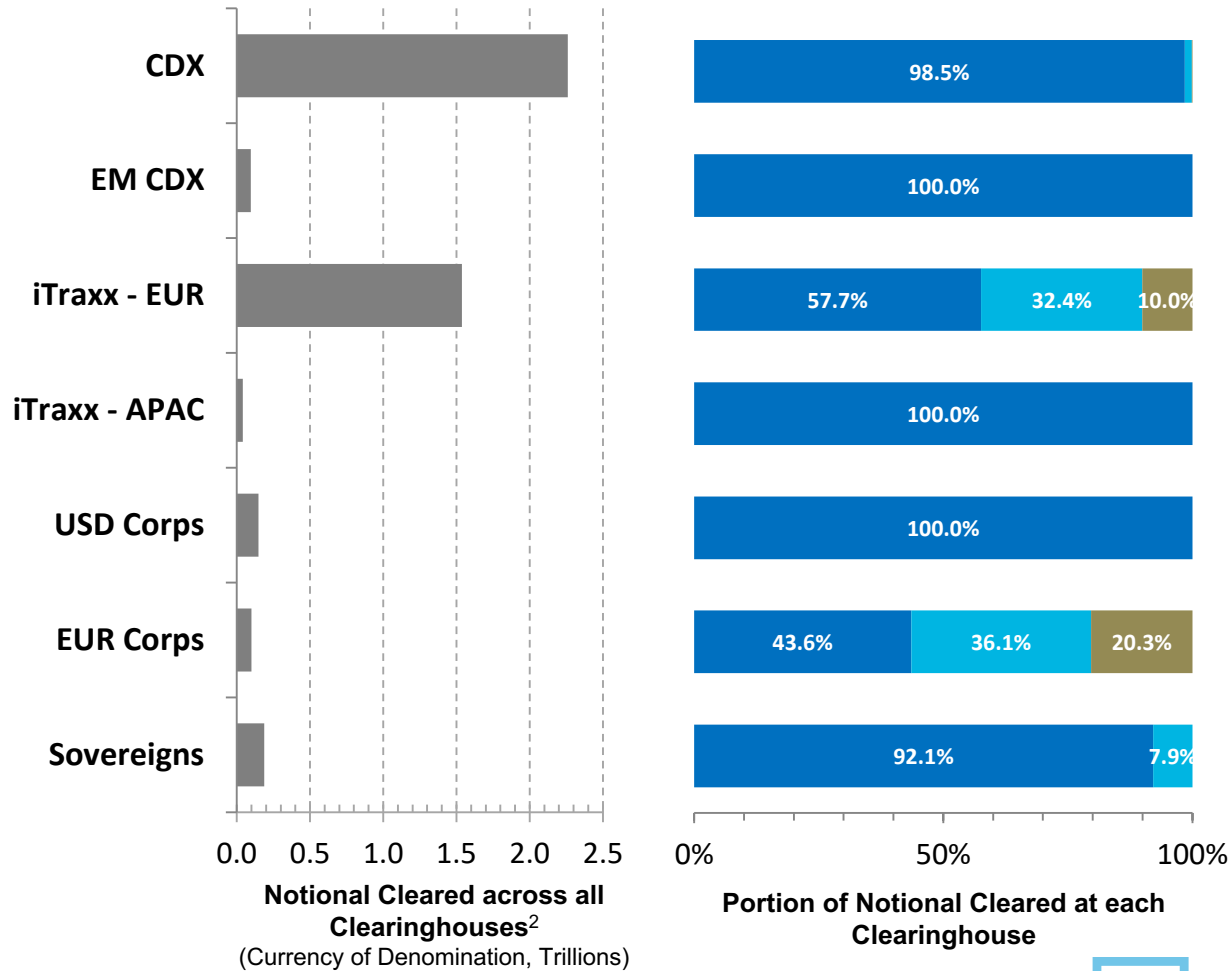
# Market Share

## CDS Volume Cleared During Q1 2019

### All Products



### By Product Category



<sup>1</sup> Sum of daily USD Equivalent Cleared Notional

<sup>2</sup> ICE Clear Credit (ICC), ICE Clear Europe (ICEU) and LCH

# ICE Global Instrument Coverage

- Over 550 different clearable instruments, broadest coverage amongst all Credit Clearinghouses
- Coverage in all three global markets; US, European & Asia-Pacific
- 100% coverage of IG index constituents and EM index constituents

## CDX

- IG – Series 12+
- HY – Series 22+
- EM – Series 21+

## iTraxx

- Main – Series 11+
- Xover – Series 21+
- Snr Fins – Series 21+
- Sub Fins – Series 22+
- Asia Ex-Japan – Series 24+
- Australia – Series 24+

## Corporates

- 254 North American
- 207 European
- 8 Australian
- 9 Asia & EM

## Sovereigns

- 36 Sovs

A full listing of clearing eligible products can be found at [theice.com/clear-credit](https://theice.com/clear-credit) (ICE Clear Credit) & [theice.com/clear-europe/cds](https://theice.com/clear-europe/cds) (ICE Clear Europe)

# ICE CDS Expertise

- Global leader in CDS with expertise in execution, post-trade processing, clearing and other operational and risk management processes
- Open platform architecture – each process is available individually and can connect to multiple alternative service providers
- Integrated ICE CDS solution offers an easier, more efficient execution and processing experience

## EXECUTION

- ICE's SEF, ICE Swap Trade, offers all-all anonymous execution leveraging its highly successful existing technology platform. Coupled with ICE's non-SEF execution, market participants are offered a singular view of the credit market
- Innovative CDS electronic services: credit event auctions, delta neutral auctions and portfolio compression

## PROCESSING

- ICE Link; the leading post trade affirmation service for CDS
- Connected to over 1200 CDS buy-side firms in addition to all major dealers, clearing brokers, IDBs, SEFs and SDRs
- Helps clients meet new regulatory requirements for automation and standardization

## CLEARING

- ICE Clear Credit (formerly ICE Trust) launched March 2009, the first clearing house to process CDS transactions
- ICE Clear Europe launched July 2009

# CDS Client Clearing Model Overview

## CDS Product

- Standard coupons, adherence to ISDA DC on credit and succession events
- Upfront fees netted with margin movements
- Ability to retain individual trades or benefit from operational netting

## Customer Protections

- Segregation of gross margin at the clearing house through Cleared OTC Derivatives Account Class (4d(f))
- Indices and single names held in the 4d(f) account to allow for portfolio margining
- Pre and Post default portability of positions and collateral supported
- “LSOC” customer segregation model

## Risk Management

- Specifically designed for CDS
- Guaranty Fund covers simultaneous default of 2 largest Clearing Participants
- EOD settlement process based on price submissions subject to execution ensuring fidelity of quotes

## Margin Methodology

- Dynamic Stress-Based Regime
- Margin Calculator provides transparency and detailed analysis of requirements
- Portfolio margining methodology (Index Decomposition) to provide capital efficiencies

## Infrastructure

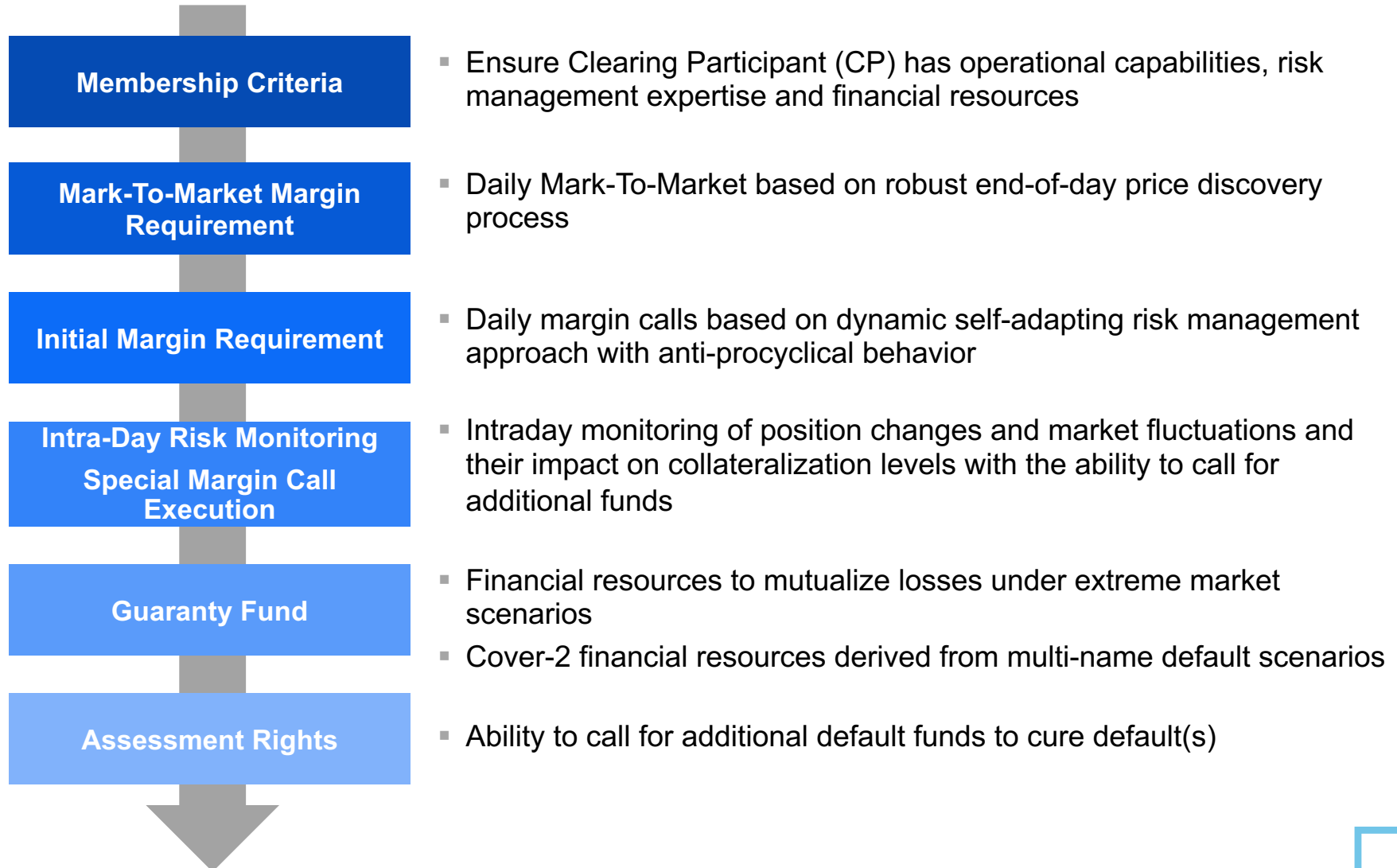
- Open Access: supporting multiple SEF execution and middleware providers
- Trades cleared intra-day, on a near real-time basis
- Allows users to leverage existing infrastructure – no costly technology build
- Supports all trade life cycle events: backloading, netting, portability, credit events

## Customer Documentation

- Client relationship to FCM/BD governed by a bilateral futures/securities agreement
- No additional ICE Clear Credit documentation for Client and FCM/BD to bilaterally execute
- ICE Clear Credit rules govern CDS clearing

# CDS Risk Management approach

## WaterFall for Managing Systemic Risk



# CDS Risk Management Approach

## Initial Margin Components

		Related Exposure	Modelling Approach
Market Dynamics	Credit Spread Level Changes Recovery Rate Changes	<ul style="list-style-type: none"> <li>Credit spread term structure changes</li> <li>Recovery Rate changes</li> </ul>	<b>Integrated Spread Response Risk Measures</b> <ul style="list-style-type: none"> <li>Statistical modeling of credit spread fluctuations and recovery rate fluctuations via Monte Carlo Framework</li> <li>Full portfolio valuation at every simulated scenario</li> </ul>
	Interest Rate Sensitivity	<ul style="list-style-type: none"> <li>Interest rate term structure changes</li> </ul>	<ul style="list-style-type: none"> <li>Stress loss in response to different discount curve scenarios</li> </ul>
	Basis Risk	<ul style="list-style-type: none"> <li>Trading behavior differences between Indices and constituents</li> </ul>	<ul style="list-style-type: none"> <li>Statistical modeling of index-Single-Name basis fluctuations</li> </ul>
Default Risk	Jump to Default	<ul style="list-style-type: none"> <li>Losses due to potential credit events</li> </ul>	<ul style="list-style-type: none"> <li>Stress Loss-Given-Default in response to credit events related to Single Names with common majority ownership</li> </ul>
	Wrong Way Risk	<ul style="list-style-type: none"> <li>Losses due to highly (and positively) correlated potential credit events</li> </ul>	<ul style="list-style-type: none"> <li>Stress Loss-Given-Default in response to credit events related to Single Names highly and positively correlated to CP</li> </ul>
Liquidation Risk	Bid / Offer Charge	<ul style="list-style-type: none"> <li>Transaction costs associated with liquidation of positions/portfolios</li> </ul>	<ul style="list-style-type: none"> <li>Instrument liquidation cost estimated at specific bid-offer widths</li> <li>Portfolio level costs estimated for hedged and directional positions</li> </ul>
	Concentration Charge	<ul style="list-style-type: none"> <li>Transaction costs associated with liquidation of large positions</li> </ul>	<ul style="list-style-type: none"> <li>Exponentially increasing liquidation cost with increasing position size and directionality</li> </ul>

# Integrated Spread Response I

## Capital Efficient Portfolio Approach to Market Dynamics

- Integrated Spread Response
  - Capital efficient portfolio approach to market dynamics via Copula-based Monte Carlo simulations<sup>1,2</sup>
  - 99.5% VaR measures<sup>3</sup>
  - Margin Period of Risk (MPOR): at least 5 days
    - increased MPOR (up to 6 days) is applied to instruments/sub-portfolios that trade during market hours different from the clearinghouse's hours of operations
- Integrated Spread Response (iSR) measures:
  - $iSR^{(RF)}$ : Associated with positions in instruments related to the same Risk Factor
  - $iSR_{SP}$ : Associated with positions in instruments related to Risk Factors with common risk characteristics
    - NA Corporate sub-portfolio, European Corporate sub-portfolio, Western-European Sovereign sub-portfolio, Asia-Pacific sub-portfolio, etc.
    - Multi-currency benefits between NA and European corporate sub-portfolios are recognized
  - $iSR_P$ : Associated with all portfolio positions introducing limits on portfolio benefits<sup>4</sup>
  - $iSR_{IM}$ : Associated with all portfolio positions introducing anti-procyclical Initial Margin (IM) features<sup>5</sup>

# Integrated Spread Response II

## Capital Efficient Portfolio Approach to Market Dynamics

- Portfolio level  $iSR_p$  measure is computed as

$$iSR_p = 80\% \times \sum_{sPEP} iSR_{sP} + 20\% \times \sum_{RFEP} iSR^{(RF)}$$

Full Cross-RF portfolio benefits are provided

No Cross-RF portfolio benefits are provided

- Final Initial Margin  $iSR_{IM}$  measure is computed as

$$iSR_{IM} = 0.75 \times iSR_p + 0.25 \times \min(iSR_p, SRP_{\text{Stress Events}})$$

Portfolio responses to stress market events, e.g. LB default period

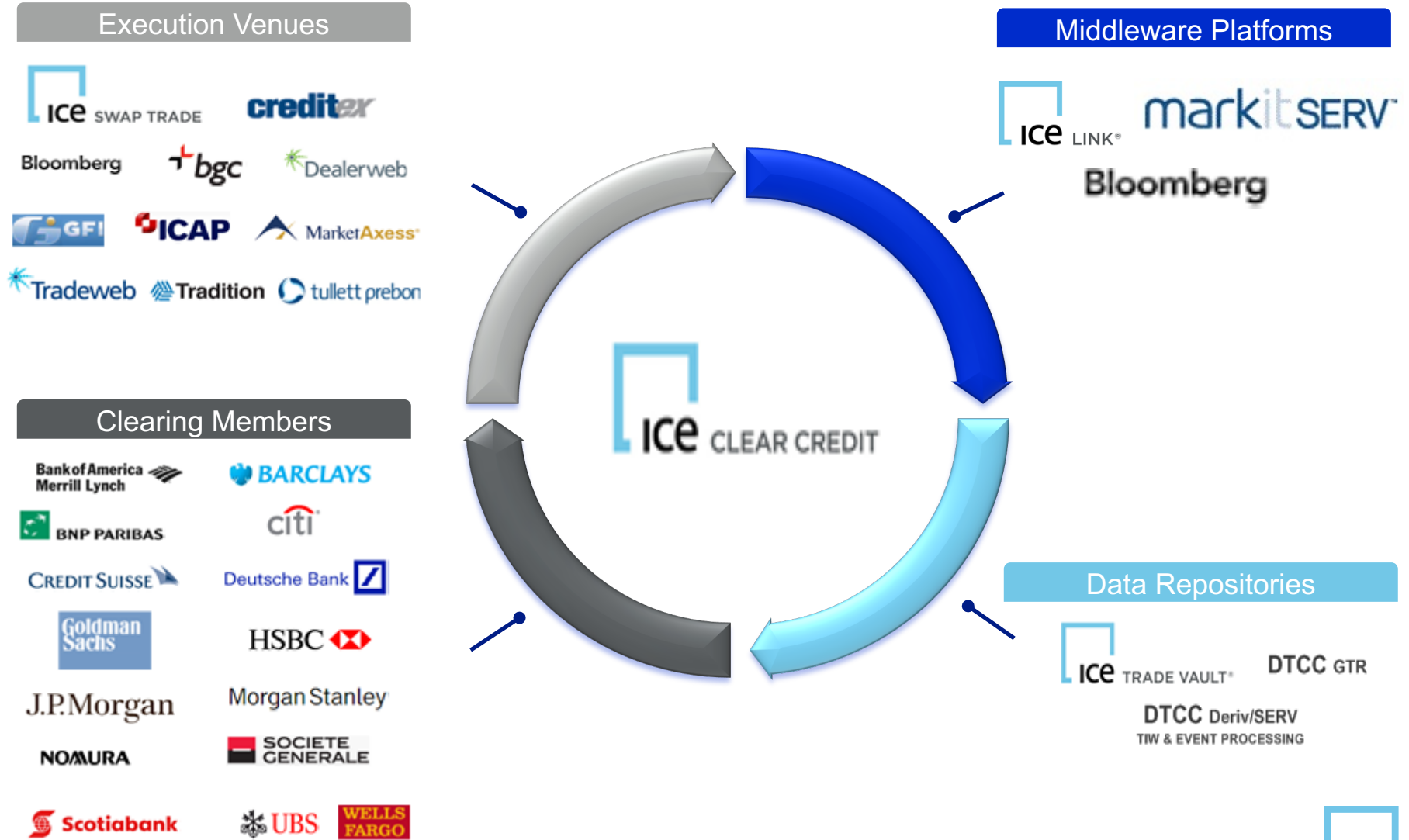
# CDS Guaranty Fund Approach

## Cover-2 Financial Resources

- **Guaranty Fund is designed to provide financial resources to cover the greatest hypothetical losses associated with extreme market scenarios that feature:**
  - Simultaneous defaults of two CPs and their affiliates, i.e. two affiliate groups
  - Simultaneous defaults of three non-CP Single Name (SN) Risk Factor Groups
    - Each SN Risk Factor Group may contain multiple reference entities
    - Stress level Recovery Rates are assumed for Loss-Given Default estimations
  - Adverse spread widening and tightening scenarios are applied to non-defaulting SN Risk Factor Groups and index instruments
  - Adverse widening of the Index-SN basis
  - Adverse changes in the default-free discount interest rate term structures
- **The greatest two-affiliate-group cumulative uncollateralized loss under extreme scenarios determines the Guaranty Fund size**
- **Guaranty Fund size is monitored everyday based on all cleared portfolios**
- **Robust reverse stress testing is used to assess the levels of protection achieved by the available financial resources**

# ICE Clear Credit – CDS Connectivity

## Multiple Trade Ecosystem Touch Points



# Overview of ICE CDS EOD Settlement Process

## Establish Reliable End-of-Day Valuations for Margin/Risk Calculations

### Quote Submission

- ICE requires CPs to submit quotes for 9 benchmark tenors and all standard coupons cleared by ICE for any Single Name in which the CP has a cleared interest
- ICE requires CPs to submit quotes for each Index instrument for which the CP has cleared interest

### End Of Day Valuation

- Using the submitted quotes, ICE performs an end-of-day valuation for every cleared instrument using a multi-stage crossing/matching algorithm
- EOD prices for non-benchmark tenors interpolated from calculated Settlement Prices for benchmark tenors

### Firm Trade Obligation

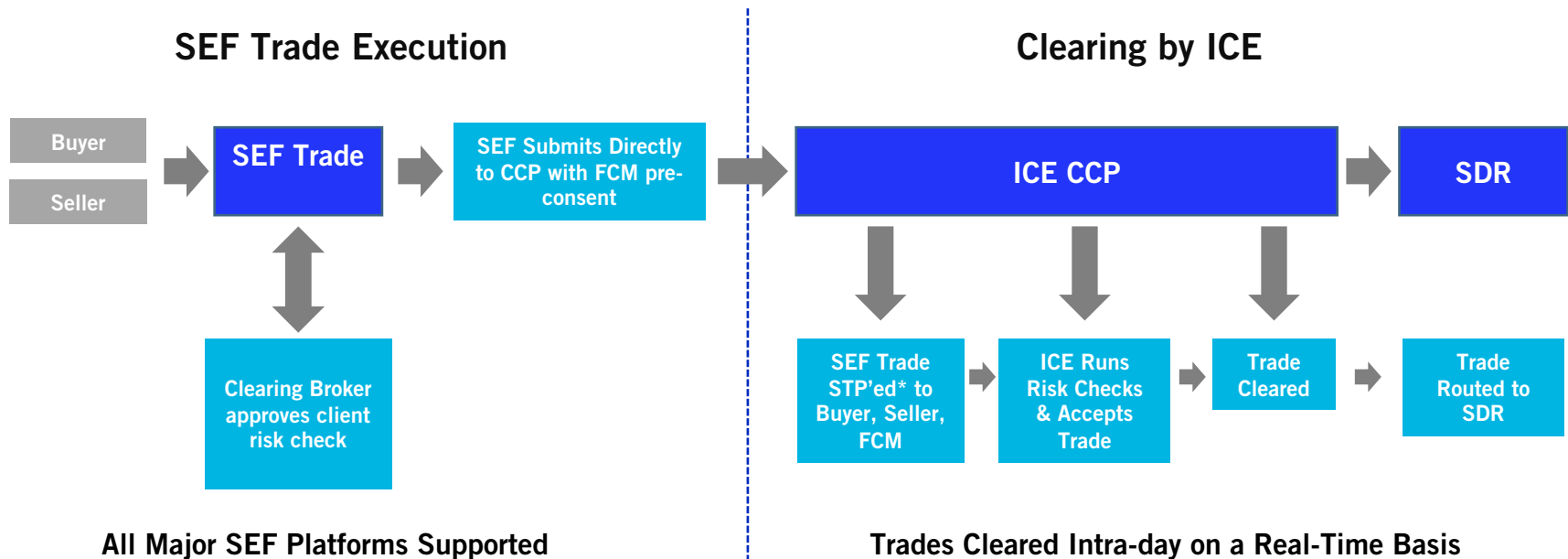
- To encourage the best possible submissions, ICE requires Clearing Participants to enter into real trades if submitted quotes are crossed/locked

### Controls to Limit Impact on Risk

- Controls ensure that Firm Trades do not have adverse market impact
- “Default” bid offer width (default spread width)
- Fixed notional size

# CDS SEF Trade Workflow

ICE Supports all Major SEF Platforms via the SEF Direct Workflow



\* ICE Link optionally STP's SEF Trade submission and optionally SDR reports the RT/PET message for SEF

# Client Clearing Tools

## CDS Margin Calculator

- Available to all clients through the ICE Link GUI
- Provides full transparency into our CDS initial margin methodology with results broken down by component
- Run what-if scenarios on existing positions or custom portfolios

**Select existing positions in the ICE Link Positions Blotter and click on "Margin"**

**Ability to upload custom portfolios directly into Calculator**

**Review Margin Results / Export in CSV format**

Description	Trade Date	Notional(MM)	BPS	Term
CDX-NAIGS16V1-5Y	01-Nov-2011	125 USD	100	Jun 16
CDX-NAIGS15V1-5Y	12-Jun-2011	125 USD	100	Dec 15
CDX-NAIGHVOL14V1-...	12-Jun-2011	1 USD	100	Jun 15

Portfolio		Initial Margin		Initial Margin Requirement Components									
My Acct Name	Cpty Acct Name	Net Notional	Gross Notional	Total Requirement	% of Gross	Spread Response (SR)			Basis Risk	Portfolio Jump to Default	Liquidity	Concentration	Interest Rate Sensitivity
						SR With Decomp Benefits	SR with Decomp and Hedge Benefits	Final SR					
Product Management Buyside Fund1	Product Mgt FCM	(489,500,000)	539,500,000	8,244,324 USD	1.53%	(7,040,248)	(7,054,688)	(7,054,688)	0	(542,891)	(617,947)	0	(28,798)

Training materials available on ICE Link Web GUI (Help Documents) or at [www.theice.com/clearcredit](http://www.theice.com/clearcredit)  
Contact ICE for a demonstration: [icelinkhelp@theice.com](mailto:icelinkhelp@theice.com) or call +1 770 738 2101 / +44 (0)20 7488 5100

# Client Clearing Tools

## Reports

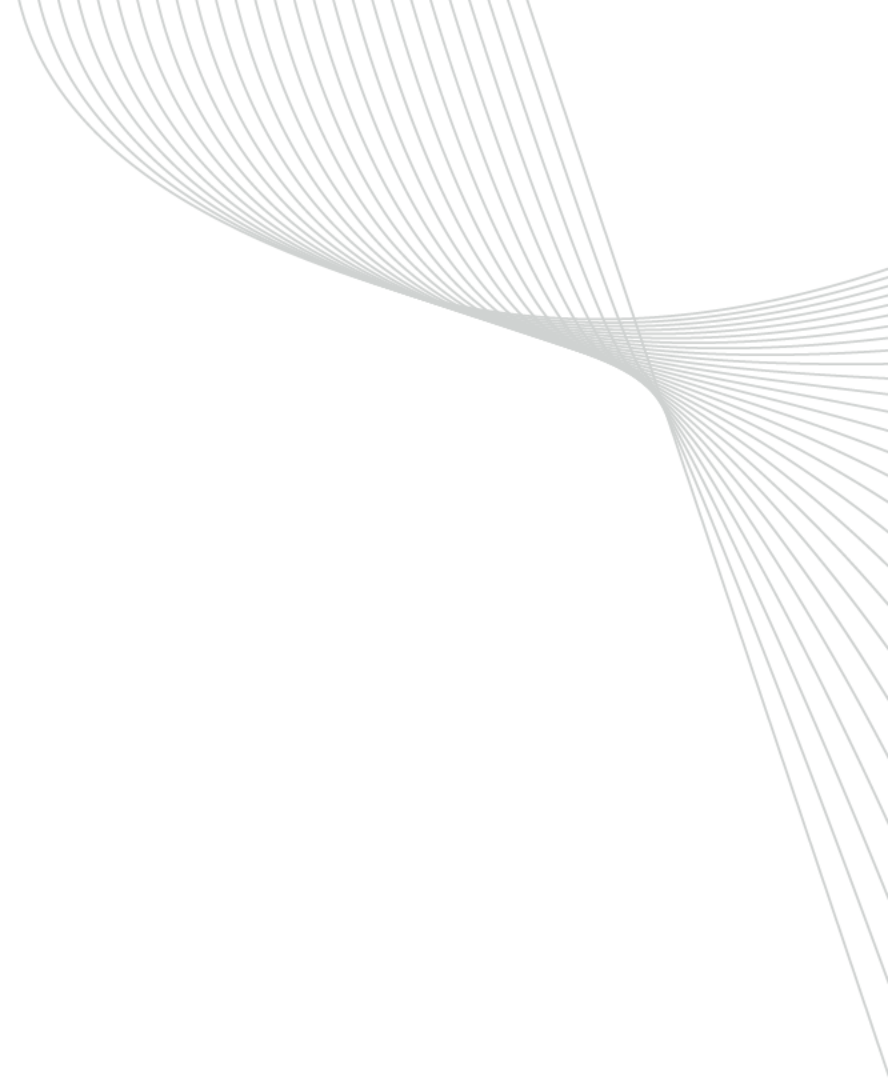
REPORT	DESCRIPTION	FORMAT	AVAILABILITY*
Clearing Eligible Instruments	A full list of indices and single names eligible for clearing; includes ICE Clear Credit and ICE Clear Europe eligible instruments	CSV	Daily
Clearing Activity	Provided at allocated trade level; includes new trades cleared on a specific day	CSV and PDF	Daily
Cleared Positions	Provided at allocated trade level; includes all open cleared positions from current day in a per trade format	CSV and PDF	Daily
Gross Margin	Provides the portfolio level margin requirements (initial margin and mark-to-market)	CSV and PDF	Daily
Early EOD Pricing file	Provides end-of-day closing clearing house prices. Available at 5 pm local time.	CSV	Daily
Mark-to-Market Margin Interest Report	Provides the daily interest earned on margin collateral using the MTM balances	CSV and PDF	Daily
Netting	Provides netting results for accounts set to net; includes terminations and new net trades	CSV	Daily / Ad hoc / Selective

- All reports available in production and test environments for ICE Clear Credit and ICE Clear Europe.
- Available at 9 pm local time (except for the EOD pricing file which is available at 5pm and 8 pm local); NY for ICE Clear Credit and LDN for ICE Clear Europe
- Access through the ICE Link web interface or electronically via secure MFT

# Next Steps

- To begin clearing CDS, Clients need to:
  - Establish relationships with one or more ICE CDS Clearing Participants and execute legal documentation
  - Establish connectivity
  - Test clearing workflows and review clearing reports
- For more information, please contact us:
  - Corry Bazley (212) 323-6021 [corry.bazley@theice.com](mailto:corry.bazley@theice.com)
  - Laura Edelman (212) 323-6005 [laura.edelman@theice.com](mailto:laura.edelman@theice.com)
  - Joseph Miller (212) 323-6023 [joseph.miller@theice.com](mailto:joseph.miller@theice.com)
- Visit [theice.com /clear-credit](https://theice.com/clear-credit) for further information on clearing eligible products, EOD prices, eligible collateral, margin methodology and clearing workflows

# Appendix



# References

## Integrated Spread Response

- [1] Stanislav Ivanov, “Initial Margin Estimations for Credit Default Swap Portfolios”, Journal of Financial Market Infrastructures, Volume 5, Number 4, June 2017
- [2] Andrew Patton, “A Review of Copula Model for Economic Time Series”, Journal of Multivariate Analysis, Volume 110, April 2012
- [3] In accordance with the Article 24 of the Commission Delegated Regulation (EU) No. 153/2013 of European Market Infrastructure Regulation (EMIR) Regulatory Technical Standards (RTS).
- [4] In accordance with the Article 27 of the Commission Delegated Regulation (EU) No. 153/2013 of EMIR RTS.
- [5] In accordance with the Article 28 of the Commission Delegated Regulation (EU) No. 153/2013 of EMIR RTS.

# Regulatory Reporting to SDR/TR

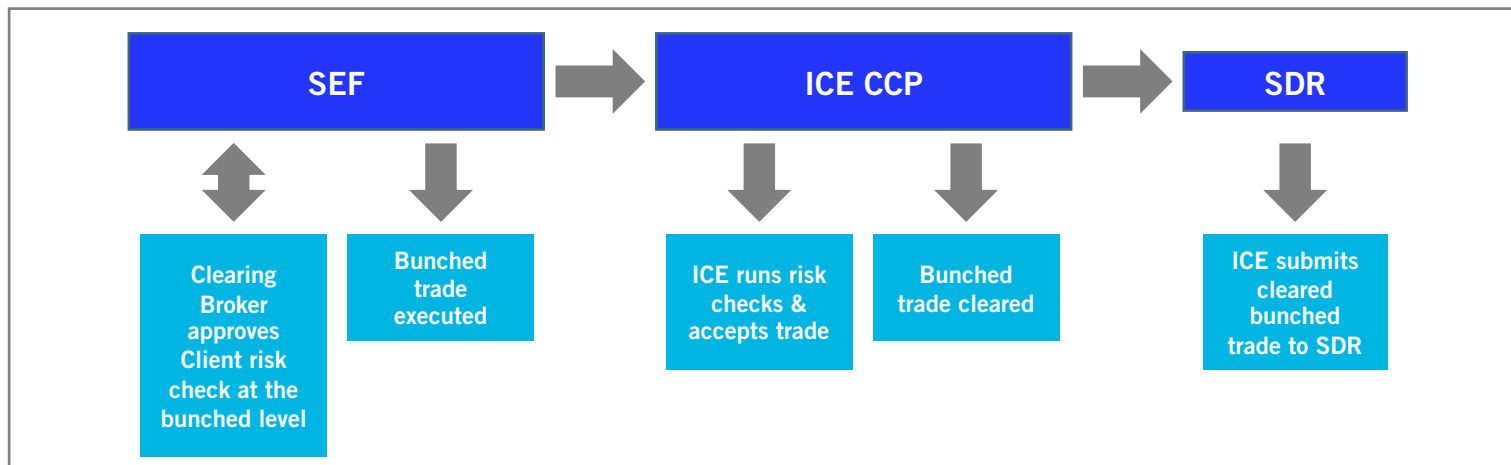
- ICE Link offers market participants a regulatory reporting compliance solution
  - Satisfies ESMA/CFTC requirements for Trade Reporting to a Swap Data/Trade Repository (SDR/TR)
  - Determines which workflows and events are reportable
  - Stores all required static data relevant to regulatory reporting
  - Leverages existing ICE Link affirmation workflow for reporting to SDR/TR
  - Communicates and generates Unique Swap/Trade Identifier (UTI/UTI) per ISDA guidelines
  - API and web GUI regulatory reporting functionality
  - Supported for all CDS products and workflows in ICE Link
    - Cleared Trades: Self Clearing and Clearing Brokered
    - Non-Cleared, Bilateral and PB: New Trades, Novations, and Terminations
    - SEF and Off-facility Trade reporting
  - Minimal effort to adopt, no change to existing ICE Link workflows

Cleared or Bilateral*	Reportable Events	Event Initiator	Event Available in ICE Link	Event Available in Confirm System	UTI Generation	UTI Communication	ICE Link TR Submission	Supported TR
Bilateral	<b>NEW TRADE-UNALLOCATED BLOCK</b>	Dealer	Y	N	Dealer/ICE Link	ICE Link	Y	DTCC Europe
	<b>NEW TRADE-ALLOCATION</b>	Client	Y	Y	ICE Link	ICE Link	Y	DTCC Europe
	<b>NOVATION</b>	Client	Y	Y	ICE Link	ICE Link	Y	DTCC Europe
	<b>TERMINATION</b>	Client	Y	Y	Dealer/ICE Link	ICE Link	Y	DTCC Europe
	<b>SEF</b>	SEF	Y	Y	SEF	ICE Link	Y	DTCC Europe
	<b>AMENDMENT</b>	Dealer	Y	Y	Dealer/ICE Link	ICE Link	Y	DTCC Europe
	<b>CREDIT &amp; SUCCESSION EVENT</b>	TIW	Y	Y	N/A	ICE Link	Y	DTCC Europe
ICE Cleared	<b>NEW TRADE-UNALLOCATED BLOCK</b>	Dealer	Y	N	Dealer/ICE Link	ICE Link	Y	TV Europe
	<b>CLEARED TRADE (BETA/GAMMA)</b>	CCP	Y	N	CCP	ICE Link	Y	TV Europe
	<b>SEF</b>	SEF	Y	N	SEF	ICE Link	Y	TV Europe
	<b>DAILY MTM &amp; COLLATERAL VALUATION**</b>	CCP	Y	N	CCP	ICE Link	Y	TV Europe
	<b>NETTING</b>	CCP	Y	N	CCP	ICE Link	Y	TV Europe
	<b>TRANSFER</b>	CCP	Y	N	CCP	ICE Link	Y	TV Europe
	<b>CREDIT &amp; SUCCESSION EVENT</b>	CCP	Y	N	CCP	ICE Link	Y	TV Europe

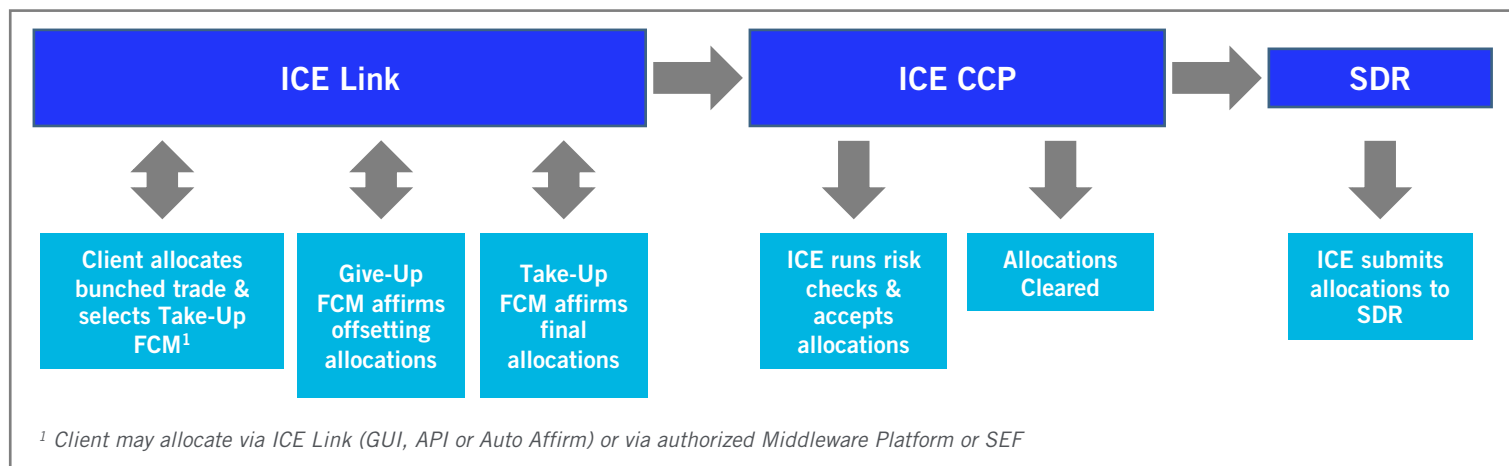
# CDS SEF Bunched Trade Workflow

## Clients can Execute at the Bunched Level and Allocate Post Clearing

### Step 1. Bunched trade SEF executed & cleared by ICE via the SEF Direct workflow



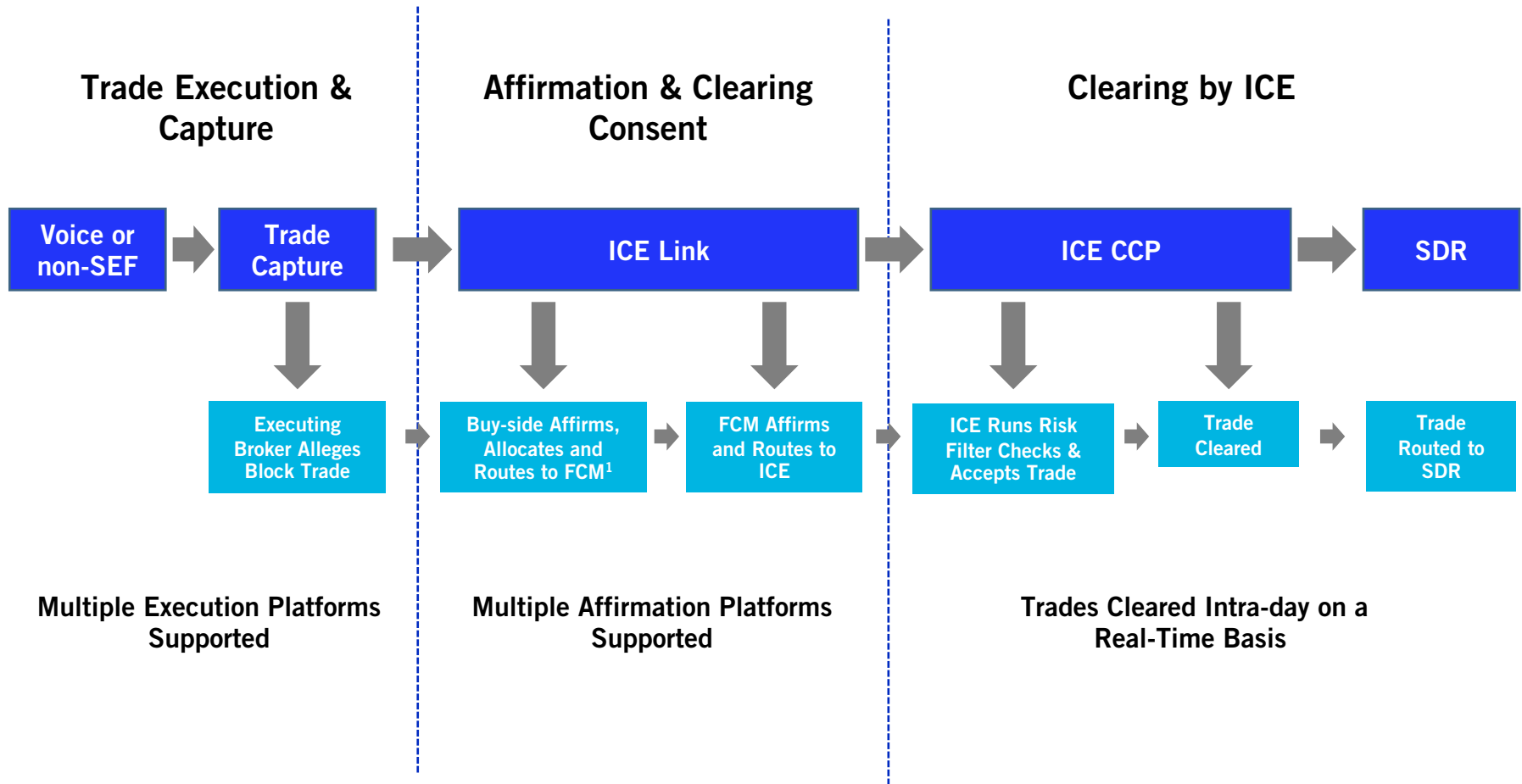
### Step 2. Allocations provided by client & cleared by ICE



<sup>1</sup> Client may allocate via ICE Link (GUI, API or Auto Affirm) or via authorized Middleware Platform or SEF

# CDS Off-Facility Trade Workflow

## ICE Supports the Existing OTC Model and Multiple Execution and Affirmation Platforms



<sup>1</sup> Client may allocate via ICE Link (GUI, API or Auto Affirm) or via authorized Middleware Platform or SEF