

FINANCIAL TRANSMISSION, CONGESTION AND AUCTION REVENUE RIGHTS (FTRs/CRRs/TCRs/ARRs)





EUCI is authorized by IACET to offer 1.1 CEUs for the conference, 0.3 CEUs for the pre-conference workshop and 0.7 CEUs for the post-conference workshop.

SPONSORS





OVERVIEW

Financial transmission (FTR)/congestion revenue rights (CRRs and TCRs) and auction revenue rights (ARRs) facilitate mandatory, competitive, open transmission access. While the use of these measures is a customary practice among physical market participants, it's their use as financial instruments that seems to draw the most attention with regard to the efficient operation of the wholesale power marketplace.

Several market conditions are pushing FTR and ARR practices into more than just hedging tools. ISOs and RTOs, along with market participants, are constantly adjusting to ever-changing regulatory and oversight requirements associated with trading practices, credit and risk. In addition, competing perspectives are advocating adjustments to the ARR and FTR/CRR/TCR markets process, as weather, environmental regulations, accelerating renewable energy penetration and shifts in national energy policy influence how system operators deal with monetizing transmission congestion impacts.

This conference will discuss how these trends are affecting transmission congestion instruments operating in the wholesale electricity markets in 2020. It will also consider what system operators, market economists and design consultants — as well as market participants — are doing to adjust their practices accordingly. And it will examine what's under development now that could influence future market conditions and measures.

LEARNING OUTCOMES

- Review updates to processes and auctions in North American FTR/CRR/TCR markets
- Discuss FERC, CFTC and private compliance, surveillance agencies' enforcement of their market manipulation and disruptive trading practice rules over the past year
- Examine the impact of ISO model building and outage selection practices on market participant FTR bidding strategies and revenue
- Compare FTRs with non-FTR congestion management measures
- Assess whether FTR markets would significantly benefit from re-design and, if so, in what form(s)
- Identify credit policies that could reduce vulnerabilities and undue risk exposure as lessons learned from the "GreenHat" case
- Evaluate the accuracy of auction right allocations and market administration
- Examine if technical or system limitations are reducing the efficiency or performance of the FTR auction(s)
- · Assess if the day ahead market (DAM) products are functioning in a way so as to converge the DAM and RT markets

WHO SHOULD ATTEND

- FTR Market participants
 - o Energy traders
 - o Load
 - o Generators
- Transmission owners and operators
- Credit
- Finance
- Asset and portfolio management
- Energy clearing and settlements

- Back office
- Operations accounting
- RTO/ISO accounting
- Market management
- · Business controls
- Commercial operations
- Transaction accounting
- Power management and marketing
- Financial analysis



"I learned more about FTRs in 1 ½ days than I had in the past year or so."

Market Operations Manager, EDP Renewables North America, LLC

TESTIMONIALS FROM PAST ATTENDEES



Commission Advisor, WV Public Service Commission



Energy Analyst, Edison Mission Marketing & Trading



"EUCI did an amazing job and I wholeheartedly recommend them to all colleagues and associates as the 'full package deal' — a team who presented a conference full of cutting-edge talent, discussion and passion for FTRs and CRRs!"

Engineer, SPP

"Perfect avenue for nodal trading professionals for networking"

Senior Trader, EDF Trading

"A great way to stay up to date on the latest issues in FTR markets."

Project Manager, Southern Company

"Good content and diverse attendees make this a great opportunity to learn more about FTRs."

Director – Supply, Integrys Energy Services

"As an ISO representative, I enjoyed seeing the market updates and participating in the many networking opportunities."

Engineer II, Southwest Power Pool

"Great way to learn what is going on in the markets and also to network!"

Transmission Analyst, ACES

"Insightful presentations and provocative, productive discussions. Efficient deep-dive into the key issues confronting the FTR markets."

Chief Risk Officer, Nodal Exchange



AGENDA

WEDNESDAY, JANUARY 29, 2020

12:30 – 1:00 pm	Registration
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1:00 – 1:15 pm Welcome and Overview

1:15 – 3:00 pm Updates and Upcoming Plans/Proposals from North

American ISOs re: Their Transmission Congestion Auctions, Markets and Processes

North American transmission system operator staff and proxies will provide a synopsis of how their particular transmission congestion markets have adjusted operations and what impacts this has produced.

3:00 – 3:20 pm Afternoon Break

3:20 – 5:00 pm FTR Regulatory Update: The Compliance Implications of Past and Proposed Changes to the FTR Markets

Several RTOs are changing or have proposed changes related to FTRs, one proposing to do away with them except through bilateral contracts. This panel will discuss some of those changes and their potential implications on policy, hedging, compliance and enforcement. Topics will include:

- Summary of recent and recently proposed changes to the FTR programs in PJM and the CAISO
- A discussion of the efficiency ramifications of these changes and their policy implications
- Perspective on how these changes may affect hedging and speculative trading in the affected RTOs
- Input as to how these changes might affect FERC's surveillance/enforcement posture and industry compliance

Moderator: Shaun Ledgerwood, Principal, The Brattle Group

Sean Collins, Director - Division of Analytics and Surveillance, Federal Energy Regulatory

Commission (FERC)

Chloe Cromarty, Head – US Power & Gas Compliance, Mercuria Energy Trading

Howard Haas, Chief Economist, Monitoring Analytics

5:00 – 6:00 pm Networking Reception



"Realistic, frank update and dialogue on FTR/CRR/ TCR matters impacting market participants."

Lead – FTR & Pricing, Midcontinent ISO



"Great conference for both beginners and experts."

Market Analysis Engineer, E.ON Climate & Renewables



"Great mix of fundamentals and current market issues."

Manager – Energy Analytics, Covanta

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AGENDA

THURSDAY, JANUARY 30, 2020

7:45 - 8:15 am

Continental Breakfast

8:15 - 10:00 am

How Closely Linked Is/Should Be FTR Market Design to Energy and Capacity Market Design? Where is the Linkage/Leakage?

- The connection between PJM price formation reform and FTR market updates
- Considering the applicability of CAISO auction reforms to other congestion markets?
- Are there allocation/auction measures working well in certain ISOs that are transferable to other ISOs?
- As the level of intermittent resource output and storage deployment rises, are ISOs considering changes to congestion allocation/auction requirements to deal better with system volatility and transmission availability?
- How can market monitors, ISOs, and the FTR engender more confidence in prevailing FTR practices?
- The impact of FTR practices as perceived by consumers

Scott Harvey, Consultant, FTI Consulting

Guillermo Bautista Alderete, Director – Market Analysis & Forecasting, California Independent System Operator (CAISO)

Noha Sidhom, CEO, TPC Energy Fund

Devin Hartman President and CEO, Electricity Consumers Resource Council (ELCON)

10:00 - 10:20 am

Morning Break

10:20 am - 12:00 pm

Penetrating the ARR/FTR Data Black Box

A cornerstone principle of wholesale electricity markets is that the system design should allow for efficient, unbiased operation. Clear rules and unambiguous administration contribute to maximum transparency and optimum price formation. When it comes to the allocation and auction of congestion revenue rights, however, many of the systems operating in North American markets don't seem to measure up to other aspects of market design. Why is that? Is there a path forward that would improve this facet of market performance? Shouldn't market participants be able to re-create results of the market? This panel will examine whether changes can be implemented that do a better job of:

- Ensuring availability and quality of ISO data
- Accelerating the timing for receipt of data, so that it conveys sufficient value
- Improving data transparency, allowing for efficient re-formulation and analysis
- Disclosing the constraints being modeled in the market
- Specifying, from a user's (member's) standpoint, what data is required and in what format it is needed
- Availability and quality of DAM data for FTR valuation

Moderator: Narsi Vempati, Senior Vice President, Nexant Donald House, Supervisor – Congestion Revenue Rights, ERCOT Nicholas Shaffer, Chief Technology Officer, TPC Energy Ty Mitchell, Power Trader, Evergy



"Lively discussions about PJM underfunding from industry experts were very helpful and stimulating."

Analyst, Nodal Exchange



"It offered great insight into FTR markets and the electricity power market in general."

Transmission Assoc, EDP Renewables



AGENDA

THURSDAY, JANUARY 30, 2020 (CONTINUED)

12:00 - 1:00 pm

Group Luncheon

1:00 - 2:45 pm

FTR Credit Policies: What's the Best Path Forward?

- Lessons (still being) learned from "GreenHat" default and other zero-cost position policies
- Applicability of general commodity market credit rules
- Adjustments to ISO/RTO governance and credit policies
- Trading outside the electricity market construct on a separate exchange?
- The prospects for third-party clearinghouse(s) in multiple markets
- ISO customer due diligence and collateral requirements
- Who is qualified/allowed to purchase FTRs?
- Given renewed interest in revising RTO credit policies, is it time to revisit Order No. 741?

Demetri Karousos, COO and Chief Risk Officer, Nodal Exchange Sharon Midgley, Director – Wholesale Market Development, Exelon Abram Klein, Managing Partner, Appian Way Partners Howard Haas, Chief Economist, Monitoring Analytics

2:45 - 3:00 pm

Afternoon Break

3:00 - 4:45 pm

Properly Correlating FTR Outcomes with Costs Related to Supplemental Transmission Projects and Other Transmission Congestion Reduction Measures

- How frequently should (historical) resources be re-mapped to ensure appropriate auction revenue rights allocations?
- How significant a role in congestion pricing is the lack of transparency regarding the scheduling of outages?
- Should other ISOs follow ERCOT's practice that allows for the purchase of an FTR options contract at every path that is available for a traditional FTR contract?
- Transmission modeling as it relates to FTR model
- Re: transmission development to reduce congestion, was FERC 1000 the fix or the fault?
- New equipment into service
- Project slippage and scheduling uncertainty
- Over-estimating congestion when it does come online
- Criteria for outage selection in building the monthly model file (e.g., picking one set of outages to apply to whole)

Mike Borgatti, Vice President – RTO Services & Regulatory Affairs, Gabel Associates Steve Lieberman, Director – PJM Regulatory Affairs, American Municipal Power Andrew Stevens, Managing Director, Direct Energy

4:45 pm

Conference Adjourns



"A unique and informative event for transmission traders, and a great way to stay current on topics important for transmission trading!"

FTR Trader, BioUrja



Analyst, Portland General Electric





PRE-CONFERENCE WORKSHOP

FTR Trading Fundamentals & Tools

WEDNESDAY, JANUARY 29, 2020

OVERVIEW

This workshop will explain the key concepts of nodal markets as they relate to FTRs, as well as provide a base of knowledge to make the ensuing FTR conference more understandable. The topic of FTRs will be introduced with a brief discussion of the motivation for nodal electricity markets and centralized dispatch. The purpose of FTRs within nodal markets and their financial form will be examined.

The auction process for buying and selling FTRs will be presented with an overview of how each of the different ISOs has a slightly different implementation (and a slightly different name) for FTRs and auctions. These fundamental FTR concepts will be reinforced by the presentation of historical scenarios from the perspective of both hedging and speculative market participants. The workshop will also consider numerical illustrations of an FTR in the money and out of the money with an explanation of drivers behind each, and consideration of the objectives of these different market participants: financial traders, generators, and load serving entities.

LEARNING OUTCOMES

- Identify and review the price formation mechanisms in nodal markets
- · Review the purpose of financial transmission rights (FTRs) within nodal markets and their financial form
- Examine the causes of transmission congestion and the relationship to FTRs
- Assess FTRs in the money and out of the money, and an explanation of drivers behind each

WORKSHOP INSTRUCTOR



Venki Venkateshwara Managing Director, FTI Consulting

Venki Venkateshwara is a Managing Director at FTI Consulting, working in the Network Industry Strategies practice of the Economic Consulting segment. He has led electric and gas market studies on several markets including PJM, MISO, NYISO, NE-ISO, the Southeast, and California. He has supported major utilities on matters dealing with fuels markets, integrated resource planning, and environmental regulation. He has also provided analyses and expert testimony on avoided costs in several states as well as at the federal level. Mr. Venkateshwara has also led strategy and market studies of the opportunities created by electric industry deregulation for utilities, independent power producers, equipment sellers and service providers, including studies of assets or company acquisitions, new technologies, energy trading, the global outlook for energy storage, solid fuel boilers, and environmental control equipment. In the area of business transactions, he has considerable experience in providing independent market assessments (e.g., studies to support project finance transactions) or in conducting due diligence on behalf of asset acquirers. Mr. Venkateshwara's experience prior to joining FTI Consulting includes work with other consultancies including McKinsey & Company, Charles River Associates and Siemens Energy Business Advisory. He has also served as a Director of Strategy at Consolidated Edison in New York and the global nuclear and renewables company, AREVA.

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WORKSHOP AGENDA

WEDNESDAY, JANUARY 29, 2020

7:45 – 8:15 am Registration and Continental Breakfast

8:15 – 8:30 am Overview and Introductions

8:30 – 10:00 am Program Content

- Transmission and Congestion
 - o Kirchhoff's Laws
 - o Shift factors
- Fundamentals of Nodal Pricing
 - o Basic LMP constructs and relationship to congestion
- Why FTRs?
- Elements of FTR Markets
 - o Auctions
 - o Period
 - o Settlement
 - o Overview of processes in different ISOs

10:00 – 10: 15 am Morning Break

10: 15 - 11:45 am Program Content

- Congestion Funding
 - o Flow of congestion funding
 - Where does the congestion money come from?
 - How it gets paid out
 - o Revenue adequacy
- Impact on Congestion Pricing of Expected Market Changes
 - o New generation
 - o Retirements
 - o New transmission
 - o Changes in the fuel prices markets
 - o Etc
- Numerical Illustrations of an FTR in the Money and Out of the Money, Explanation of Drivers Behind Each, and Consideration of Different Market Participant Objectives
 - o Financial traders
 - o Generators
 - o Load serving entities

11:45 am Workshop Adjournment



"EUCI conferences not only provide excellent speakers and content, but also attract a wide range of very interesting attendees, resulting in lively and informative discussions."

Commodity Manager, Innogy SE

POST-CONFERENCE WORKSHOP

Benefitting from the use of an FTR Market Simulator

FRIDAY, JANUARY 31, 2020

OVERVIEW

Each ISO provides data to allow market participants to gain insight into its FTR market and to simulate historical auctions as well as to assess upcoming auctions. Certain data such as prior bids and offers are provided following sufficient time lag. Of course, proprietary data are blocked and upcoming bids and offers are unknown.

This workshop will explain the complete data needed for market participants to obtain insights into the FTR markets, framed within what ISOs provide. Strategies to provide remedies for missing data will be presented and discussed. The key concepts of FTR markets will be explained and a base of knowledge will be provided regarding how to utilize data provided by the ISOs to simulate historical auctions and allocations as well as how to better prepare for an upcoming auction as either a speculator or hedger.

LEARNING OUTCOMES

- Review the types and forms of data used by North American FTR/TCR/TCC/CRR markets
- · Discuss the interaction of these data types (e.g. phase-shifting transformers) and their impacts upon market clearing
- Assess the sensitivity of allocation and auction results to less-than-complete data sets
- Examine the differences in data set-up between single-period monthly auctions and multi-period (co-optimized) seasonal auctions
- Evaluate differences between Auction Revenue Rights (ARR) allocation and Financial Transmission Rights (FTR) auction problem definitions and solution methodology
- Explore the outcomes of allocations and auctions and determine causes of significant impacts upon clearing
- Examine the impacts of scheduling ARRs into the FTR auction
- Identify impacts of outages and other network model changes upon allocation and auction clearing as well as upon expected settlement return from the Day-Ahead market
- Consider the impacts of potential market rule changes
- Assess increase in network capacity for incremental upgrades

WORKSHOP INSTRUCTOR



Joseph Bright
Vice President – Grid Management, Nexant Inc.

Mr. Joseph Bright has been heavily involved for over 20 years in the development of Nexant's iHedge software including analysis and development of the solution engine, training and client support. Since 2002, he had an integral role in the on-site deployment of Independent System Operator FTR markets as well as in the ongoing maintenance and support due to changes in market rules and increases in software capability. Mr. Bright trains and supports all ISOs as well as numerous market participants in the use of Nexant's iHedge FTR Market Simulator. Prior to deregulation, he developed electric power grid solution and optimization software for Power Computer Applications Corporation (PCA) before its acquisition by Nexant in 2000. This software is being used by hundreds of grid energy controls centers throughout the world. He earned his BSEE and MSEE degrees from Purdue University.

WORKSHOP AGENDA

FRIDAY, JANUARY 31, 2020

7:45 – 8:15 am Registration and Continental Breakfast

8:15 – 8:30 am Overview and Introductions

The simulation of FTR markets

· Obtaining data

10:00 – 10:20 am Morning Break

10:20 – 11:45 am Program Content

• Differences in the ISOs from the perspective of the simulation

o TOUs

o Coupled (co-optimized multi-period) versus uncoupled optimization

o PTP options and obligations

o Multi-round auctions and multi-stages of allocations

o Linear versus non-linear network models

Accommodation of phase-shifting transformers and DC lines

o Modeling uncompensated loop flow

o ARR results

Existing positions (MW rights held from prior auctions)

Bid and offer curves versus price/quantity bids

o Data not provided by the ISO

11:45 am – 1:00 pm Group Luncheon

1:00 – 2:40 pm Program Content

Benefits of running a simulator

o Assess the remaining capacity before the auction or allocation

o Obtaining all shift factors

o Determining interactions of supplied portfolios

o Other strategizing

Basic data requirements for a transmission rights auction or allocation

o Network model, contingency cases, monitoring, outages

o Pricing node definitions and participation factors

o Uncompensated loop flow definitions

2:40 – 3:00 pm Afternoon Break

3:00 – 4:45 pm Program Content

• Preparation for an auction

Reproducing posted auction results

Interpreting results

4:45 pm Workshop Adjournment



January 29 - 30, 2020 | Washington, DC

INSTRUCTIONAL METHODS

PowerPoint presentations and case studies will be used for this conference.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for the entirety of the conference to be eligible for continuing education credit.

IACET CREDITS



AUTHORIZED EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.1 CEUs for the conference, 0.3 CEUs for the pre-conference workshop and 0.7 CEUs for the post-conference workshop.

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to this event may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

EVENT LOCATION

A room block has been reserved at the Omni Shoreham, 2500 Calvert St NW, Washington, DC 20008 for the nights of January 28 - 30, 2020. Room rate is \$169 plus applicable tax. Call 1-800-THE-OMNI (843-6664) or visit the website for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is January 27, 2020 but as there are a limited number of rooms available at this rate, the room block may close sooner. Please make your reservations early.

SPONSORSHIP OPPORTUNITIES

Do you want to drive new business through this event's powerful audience? Becoming a sponsor or exhibitor is an excellent opportunity to raise your profile before a manageably sized group of executives who make the key purchasing decisions for their businesses. There is a wide range of sponsorship opportunities available that can be customized to fit your budget and marketing objectives, including: Platinum, gold, or VIP sponsor, Reception host, Networking break host, Tabletop exhibit, Workshop sponsor, Lanyard sponsor, Luncheon host and Breakfast host.

Please contact Stephen Coury at scoury@euci.com or 720-988-1228 for more information.

PLEASE SELECT

BUNDLE PRICE: FINANCIAL TRANSMISSION, CONGESTION AND AUCTION REVENUE RIGHTS CONFERENCE AND BOTH WORKSHOPS JANUARY 29 – 31, 2020: US \$2695 EARLY BIRD ON OR BEFORE JANUARY 10, 2020: US \$2495				Mail Directly To: EUCI 6400 S Fiddlers Green Cir., Sui Greenwood Village, CO 80111 OR, scan and email to: confer	CO 80111	
CONFERENCE AND ON (MAKE SELECTION BELIA SELECTION	WORKSHOP: WEDNESDAY, JANUAR RD ON OR BEFORE JANUARY 10, 2020 E WORKSHOP: FRIDAY, JANUARY 31 RD ON OR BEFORE JANUARY 10, 2020 SSION, CONGESTION AND AUCTIO ANUARY 29 – 30, 2020: US \$1495 ORE JANUARY 10, 2020: US \$1295 ORKSHOP ONLY: FTR TRADING FUN	RY 29, 2020 0: US \$169 1, 2020 0: US \$209 DN REVEN	5 UE RIGHTS ALS & TOOLS	WWW.EUCI.COM p: 303-770-8800 f: 303-741-0849 EVENT LOC A room block has been reserve 2500 Calvert St NW, Washingto of January 28 - 30, 2020. Room tax. Call 1-800-THE-OMNI (843 website for reservations and m get the group rate. The cutoff of rate is January 27, 2020 but as to frooms available at this rate, t sooner. Please make your reservations.	d at the Omni Shoreham , n, DC 20008 for the nights rate is \$169 plus applicable (-6664) or visit the ention the EUCI event to ate to receive the group here are a limited number he room block may close	
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Substitutions & Cancellations

OR Enclosed is a check for \$

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before December 27, 2019 in order to be refunded and will be subject to a US \$195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 303-770-8800. EUCI reserves the right to alter this program without prior notice.



Visa and MC or 4 digits on front of AmEx)

REGISTRATION INFO