



PJM-MISO
Stakeholder
JCM Briefing
June 30, 2005



PJM and MISO FTRs

- **FTR Overview**
- **PJM FTR Processes**
 - **Overview of Financial Transmission Rights (FTRs)**
 - **Overview of Auction Revenue Rights (ARRs)**
 - **Overview of Simultaneous Feasibility Test (SFT)**
- **MISO FTR Processes**
- **Opportunities for Coordination**
 - **Identified FTR market differences**
 - **Cross-border FTRs**

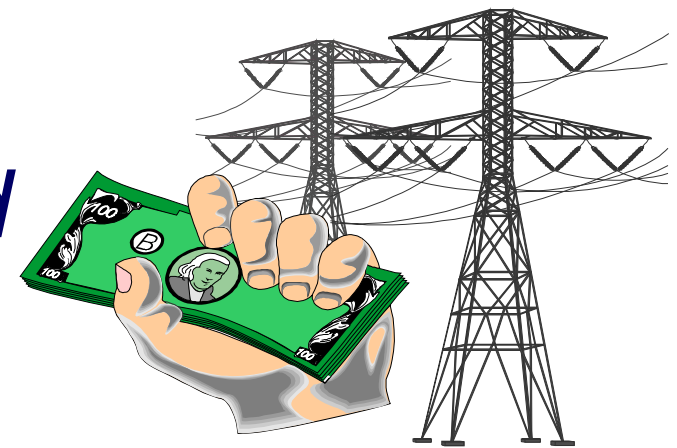
Financial Transmission Rights are ...

*financial instruments awarded
to bidders in the FTR*

*Auctions that entitle the
holder to a stream of*

*revenues (or charges) based
on the hourly Day Ahead
energy price differences*

across the path



FTRs can be acquired in two forms ...

FTR
Obligations

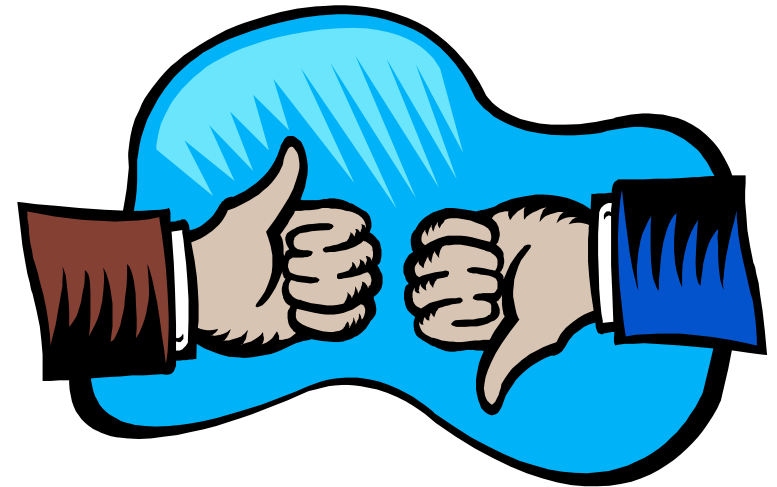
FTR
Options

Benefit

- the hourly economic value is positive
- FTR same direction as congested flow

Liability

- the hourly economic value is negative
- FTR opposite direction as congested flow



A Benefit

- the hourly economic value is positive
- FTR same direction as the congested flow.

Neither a Benefit or a Liability

- the hourly economic value is zero
- FTR opposite direction to the congested flow.

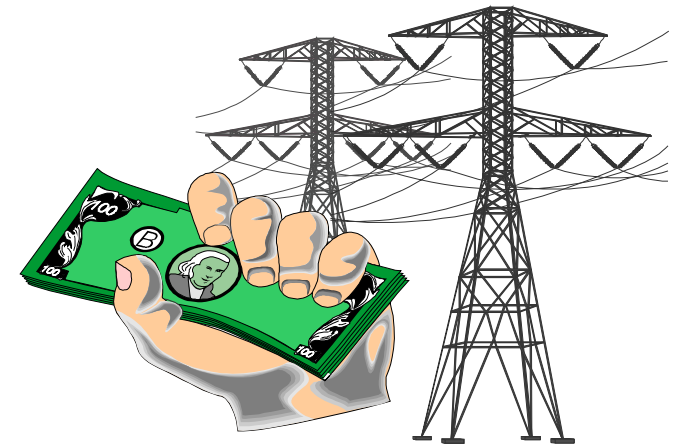


FTR Option cannot have negative value

PJM FTR Market Overview

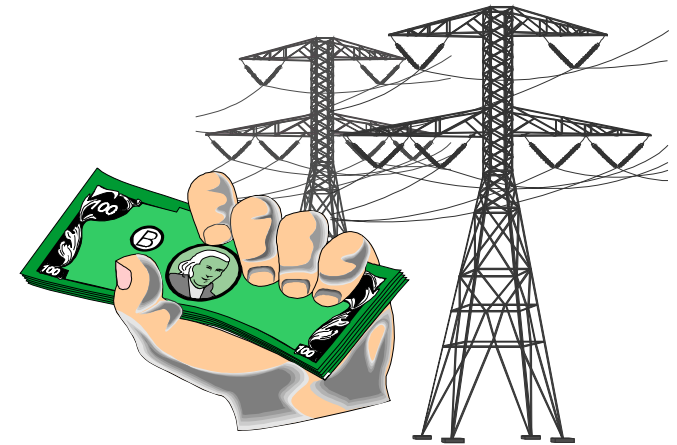
The PJM FTR Market consists of ...

- ✓ *Annual allocations of auction revenue rights*
- ✓ *With daily reassignment to reflect load shifts*
- ✓ *Annual FTR auctions*
- ✓ *Monthly FTR auctions*
- ✓ *FTR secondary market*

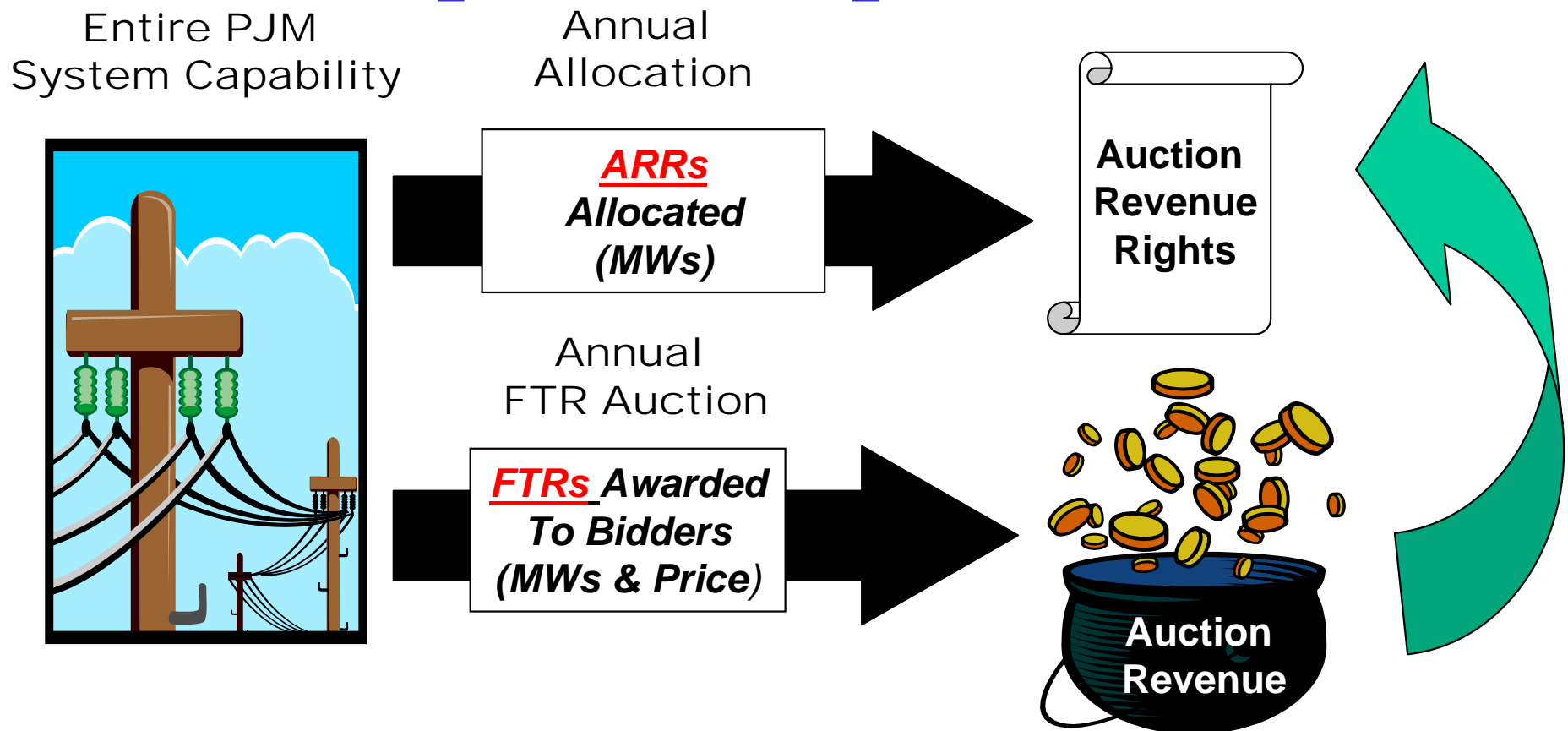


What are ARRAs?

*are entitlements allocated
annually to Firm
Transmission Service
Customers that entitle the
holder to receive an
allocation of the revenues
from the Annual FTR Auction*



ARRs provide revenue stream to the firm transmission customer to offset purchase price of FTRs



- *Allocated to Firm Transmission Service Customers annually in a two-stage allocation process*
 - *First stage protects native load utilization of the transmission system providing long-term certainty*
 - *Second stage provides flexibility to adjust hedging paths annually*
- *Property rights allocated to Firm Transmission Customers as Auction Revenue Rights*
- *Supports retail programs by reassigning ARRs/FTRs as load switches between LSEs within planning period*

- ✓ Economic value based on LMPs from the Annual FTR Auction
- ✓ Defined from source to sink
- ✓ Only available as an obligation
 - ✓ obligation can be benefit or liability
- ✓ Financial entitlement, *not* physical right
- ✓ Must be simultaneously feasible

$$\text{ARR Target Allocation} = \frac{(\text{ARR MW}) * (\text{LMP}_{\text{ARR Sink}} - \text{LMP}_{\text{ARR Source}})}{(\text{\# of rounds})}$$

- ARR Target Allocation is equal to the ARR MW amount (divided by the number of rounds) times the price difference from the ARR sink point to the ARR source point
- LMPs based on the nodal clearing prices for each round of the Annual FTR Auction
- ARRs can be a benefit or a liability

ARRs are acquired in the following mechanisms ...

1. Annual Allocation

Auction Revenue Rights (ARRs) requested by Firm Transmission Customers are allocated on an annual basis

2. Daily ARR Reassignment

ARRs allocated for the planning period will be reassigned on a proportional basis within a zone as load switches between LSEs within the planning period

- Convert ARR into FTR by “self-scheduling” FTR into Annual Auction on exact same path as ARR
- Reconfigure ARR by bidding into Annual Auction to acquire FTR on alternative path or for alternative product
- May retain allocated ARR and receive associated allocation of revenues from the auction

- ARR's entitle the holder to receive allocation of Annual FTR Auction revenues
- ARR's are allocated to firm Transmission Service Customers
- ARR's may be converted to an FTR by self-scheduling the ARR into the Annual FTR Auction
- ARR's are reassigned on a proportional basis within a zone as load switches between LSEs within the planning period
- ARR's are only available as an obligation
 - obligation can be benefit or liability
- ARR's must be simultaneously feasible

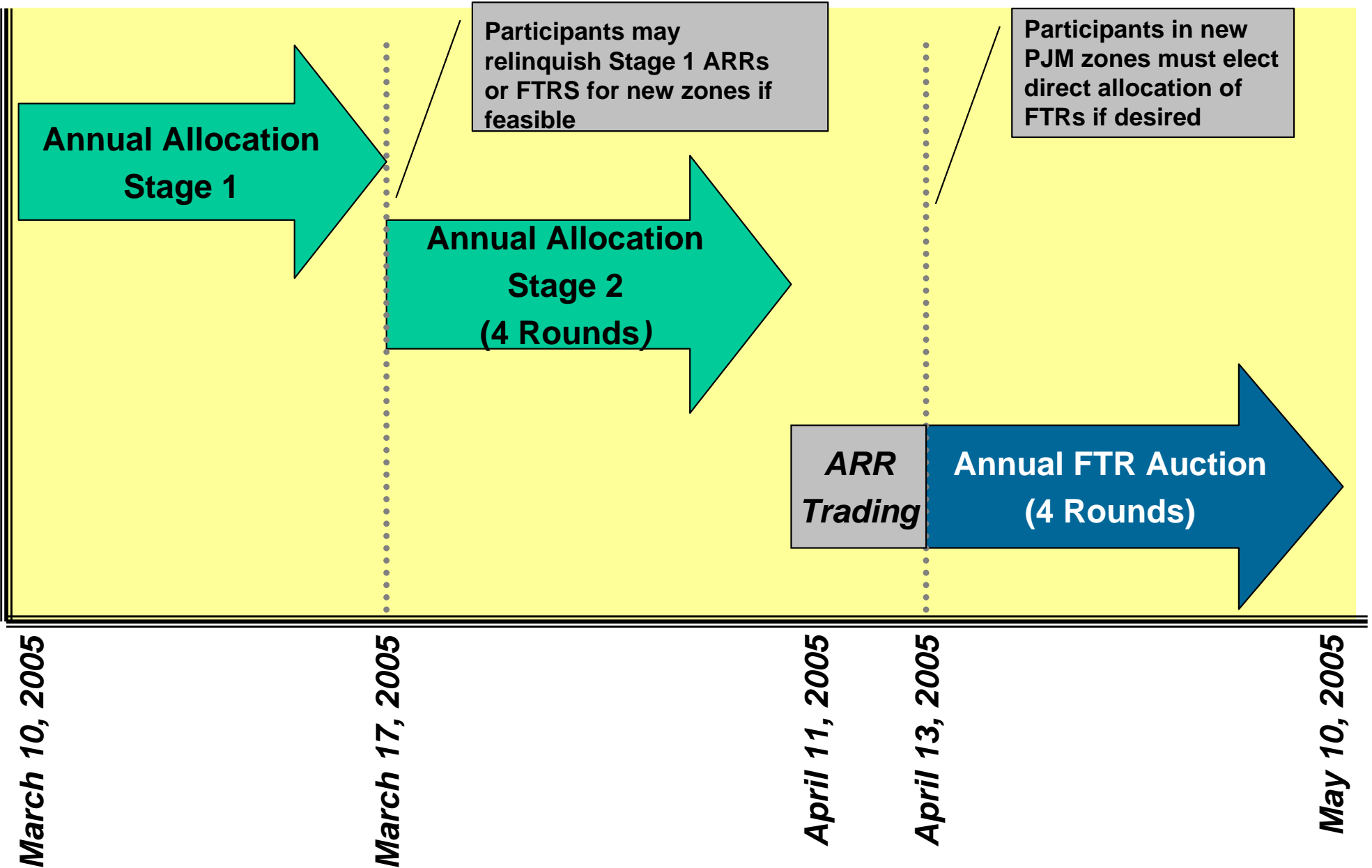
FTRs are acquired in three market mechanisms

- ...
1. Annual FTR Auction
 - multi - round
 - entire system capability
 2. Monthly FTR Auction
 - single - round
 - purchase “left over” capability
 3. FTR Secondary Market
 - bilateral trading



- The FTR Auctions maximize the quote based bid value of a set of simultaneous feasible FTRs awarded in each auction
- Annual FTR Auction revenues are distributed to ARR Holders in proportion to the economic value of the ARRs
- The Annual FTR Auction offers for sale the entire FTR capability of the transmission system for the term of one year
- The Annual FTR Auction multi-product, multi-period, and multi-round auction

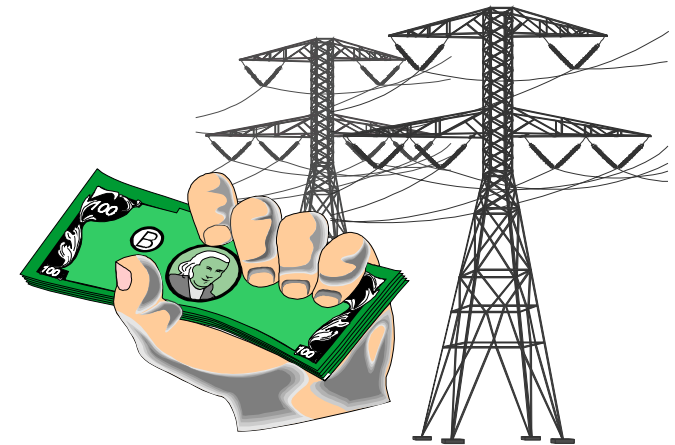
- In the Annual FTR Auction, ARR holders have the option to convert their ARRs into FTRs by “Self-Scheduling” FTRs
 - this option must be selected in Round 1
- The Monthly FTR Auctions offers for sale or purchase the residual FTR capability of the transmission system for the term of one month
- The Monthly FTR Auctions are multi-product, multi-period, single round auctions



Midwest ISO FTR Market Overview

The Midwest ISO FTR Market consists of ...

- ✓ *Annual and monthly FTR allocations*
- ✓ *Annual and monthly FTR auctions*
- ✓ *Daily reassignment of FTR auction-determined value to reflect load shifts*
- ✓ *FTR secondary market*



- *FTRs are allocated to Firm Transmission Service Customers annually in a four tier allocation process*
 - *Consists of eight independent allocations*
 - *Four seasons, peak and off-peak*
 - *Includes a “restoration” process for a transition period based on highly utilized Network Resources and Point-to-Point transmission service*
- *Allocated FTRs are Obligations*

- *FTRs allocated to Firm Transmission Service Customers in each month*
 - *Participant's may nominate from eligible FTRs that were not allocated during the annual allocation*
 - *Subject to simultaneous feasibility, but with transmission model reflecting current conditions*
- *Allocated FTRs are Obligations*

- The FTR Auctions maximize the bid value of a set of simultaneous feasible FTRs awarded in each auction
 - The annual auction consists of independent seasonal, peak and off-peak auctions
- Annual and Monthly FTR Auction revenues are distributed to:
 - Participants with cleared sell offers
 - Firm transmission customers
- The Annual FTR and Monthly Auctions offer for sale the previously awarded and residual FTR capability of the transmission system

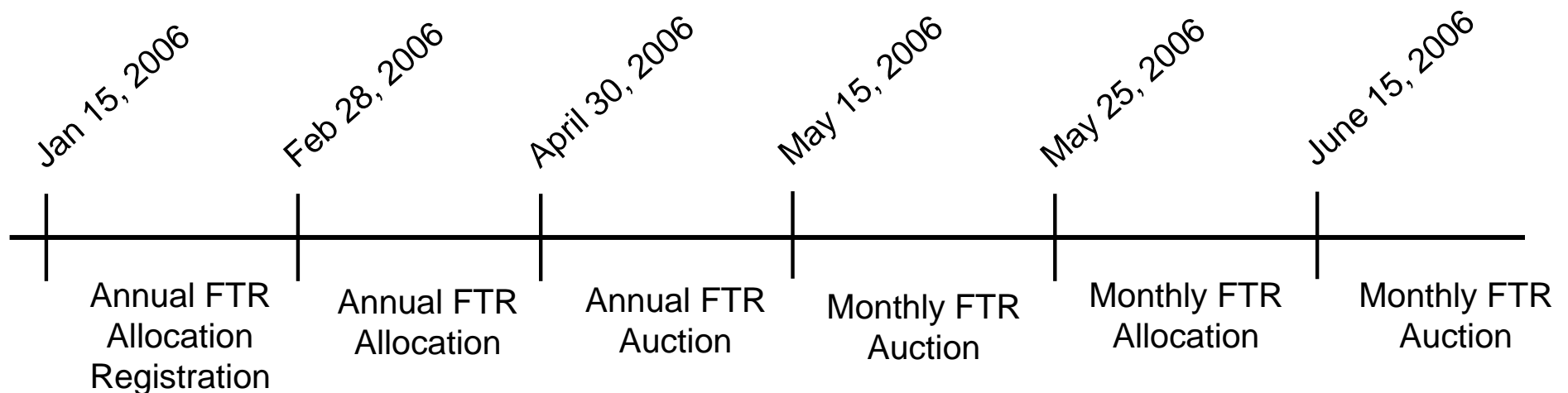
- FTRs can be requested together with new Transmission Service Requests (TSRs)
 - Requests made on OASIS when TSR submitted
 - FTR requests are studied in queue order and granted if residual FTR capacity is available
 - FTRs for new Transmission Service have the same source, sink and duration as the TSR

- Auction Revenue Rights (ARRs) are used to reassign FTR value as load switches between LSEs within an allocation period
 - Reflects daily load shifts as reported by Market Participant
 - Based on assignment of ARRs matching FTRs awarded during the annual allocation
 - Value based on monthly FTR auction clearing prices

- Midwest ISO administers a secondary market bulletin board
 - Offers to sell FTRs may be posted daily
 - Bids to buy FTRs may be posted daily
 - Participants may facilitate bilateral FTR transactions
- The bulletin board is cleaned/erased each midnight EST by MISO
- Transfers of ownership occur after all applicable credit requirements have been satisfied

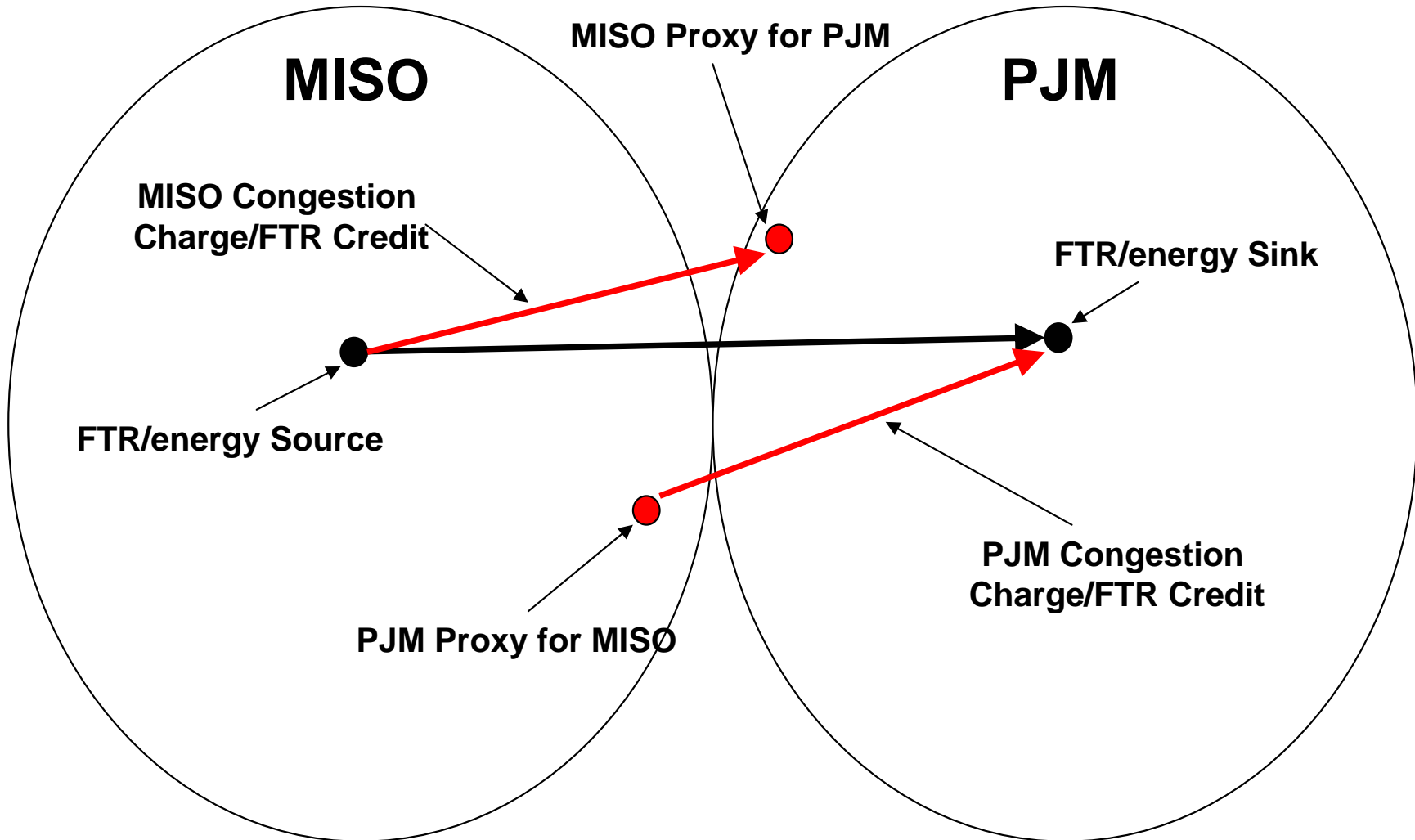
- The Midwest ISO is currently allocating FTRs for the September 1, 2005 to May 31, 2006 period, at which time the Midwest ISO and PJM annual allocation periods will be aligned.

Illustrative Midwest ISO FTR Market Calendar FTR Allocation Period 6/1/06 – 5/31/07



FTR Market Coordination

- PJM FTR market has Options, MISO expects to introduce options in early 2006
- MISO allocates/auctions FTRs for four seasons, PJM auctions annually and monthly (with pending balance of planning period auction.)
- PJM FTR auctions runs multiple periods simultaneously, MISO FTR market runs them independently
- MISO market allocates FTRs and auctions residuals. PJM market allocates ARR and auctions FTRs, but allows for ARR self-scheduling. Is this equivalent?



- The first step will be to synchronize the timeframes of the two FTR processes.
 - Identify the required Tariff and business rule changes.
 - Develop a transition plan for the RTO(s) for which timeframe needs to change.
 - Implement the transition such that the processes are aligned prior to implementing an FTR product that spans the markets.
- Any other prerequisite conditions for cross-border FTRs will also need to be determined.

- Once the timeframes for the FTR processes are synchronized, remaining characteristics of the allocations/auctions will need to be examined.
- Rules for requesting/auctioning rights will need to be analyzed to ensure their compatibility
 - Number of stages in the allocations
 - Number of rounds in the auctions
 - Etc.
 - Rules for pro-rating/clearing individual RTO FTR allocations/auctions considering cross-border requests/bids will need to be determined.
 - Could rules for cross-border rights be different from the rules for rights that are wholly in one RTO or the other?
 - Do the same products need to be offered for cross-border FTRs as are offered for FTRs wholly within one RTO or the other (obligations, options)?

- Determine technical SFT/auction clearing mechanism to be used in each RTO that will correctly consider cross-border FTRs.
 - The appropriate interaction between the technical software of the two RTOs will need to be determined.
 - Will the two RTO's technical software need to iterate? Can one technical software package be utilized that clears just the cross-border FTRs?
 - A specification for the required technical software interaction will need to be developed.
 - Consistency between the nodal clearing prices that result from each RTO's FTR auction and the bid prices for FTRs that span the RTOs will need to be maintained.
- Determine correct settlement mechanism in each RTO for cross-border FTRs.
 - How should the cross-border FTRs be modeled to properly reflect any difference in the energy price between the two RTO markets?
 - Does anything specific need to be done in settlements in order to account for any energy price difference?