



Physical and Financial Capacity Rights for Cross-Border Trade: **Interim Report Summary**

David Newbery and Goran Strbac

Florence Forum

23 May 2011

Key objectives of the study

- *Identify advantages and disadvantages of tradability of long-term TRs (**discussed in the interim report**)*
- *Should rights **be financial transmission rights (FTRs) or physical transmission rights (PTRs)**, (or variants/hybrids); (**discussed in the interim report**)*
- **Propose practical recommendations**, including the **preconditions necessary, for a facilitating a market in the rights** which will meet the needs of participants, and deliver efficient and reliable long-term price signals (**future work**)

Emerging Conclusions (1)

- **Firm** long-term contracts including TRs are desirable
 - reduce risk, and help to underwrite investment plans
 - TSOs need regulatory assurance to recoup losses
- **Anything PTRs can do FTRs can do better**
 - main advantage: standard two-sided FTR is a firm obligation and can be netted to release a potentially far larger market on either side of any IC
 - But no problem with options alongside obligations
- FTRs tend to mitigate market power
 - market power may be exacerbated with both FTRs and PTRs, but there are simple remedies: traders can outbid those with market power if markets liquid
- FTR duration to match power contract duration
 - Either encourage continuous trading or hold periodic auctions for re-trading
 - Advantages in issuing amounts of varying durations

Emerging Conclusions (2)

- Determining ATC requires TSOs to make assumptions years ahead about conditions expected to prevail in real time
 - Difficult, **ATC is market condition dependent**; forward FTRs likely to be inter-zonal so forward amounts based on inter-zonal ATCs
 - TSOs must provide sufficiently granular load flow data to the relevant SO day-ahead to maximize ATCs (flow-based calculation)
 - Effect of **netting** potentially very significant (requires TR **obligations**)
 - An alternative: **Simultaneous Feasibility Test: ATC is market condition independent**; SFT ensures revenue adequacy for European SO under all market conditions (given that network topology unchanged); should offer both obligation and options
- Regulators should agree to press for maximal transmission capacity

Key Objectives of Long-Term TR Trading

- Promotes **efficiency** in the use of cross-border transmission
- Promotes **competition** between generators across borders
- Tends to **mitigate market power** in generation, rather than reinforce it
- Facilitates required **investment** in cross-border transmission capacity
- Allocates **risk** efficiently to TSOs and rewards them appropriately
- Accommodates **intermittent** generation

Desirability of Contracting

- Long-term transmission rights enable competition to be extended across borders with scarce transmission capacity.

Objective	Advantages	Disadvantages
Promotes efficiency in use of cross-border transmission	can facilitate increased efficiency in the use of transfer capacity	
Promotes competition between generators across borders	Greater competition across borders, extent depends on arrangements.	Price convergence can harm some stakeholders but could be compensated. Insiders profit from poor transparency; will resist the increased competition.
Tends to mitigate market power in generation	increased competition should mitigate market power. Use-it-or sell-it (UIOSI) prevents harmful capacity withholding.	Large import shares enhance market power of dominant firms; address by import restrictions and liquid trading, with UIOSI.
Facilitates investment in interconnector capacity	Robust forward TR prices indicate value of more capacity	Private investment may require derogations, or supplementary revenue.
Efficiently allocates risk to TSOs, and rewards them appropriately	TSOs can bear the (modest) additional risks of more and longer-term TRs (compensation for unavailability for IC revenues) thus reducing risks to traders.	TSOs may resist bearing additional risks by alarming regulators.
Accommodates intermittent generation	Accurate ATCs ensure IC SO always financially hedged.	Requires providing more information; allocates more responsibility to supra-national dispatch.

FTR Options and Obligations Experience

- All US nodal markets offer FTR obligations: market participants satisfied
- Only PJM and CAISO offer FTR options (only for Merchant Transmission projects)
- Market participants' demand for FTR options has been limited
- Many ISOs (MISO, NYISO and New England ISO) issue FTR obligations in annual and monthly FTR auctions; exploring possibility of issuing FTR options for a few years
 - Reluctant to issue/administer FTR options market because of challenge in designing a set of options while ensuring TSO revenue adequacy (but nothing stops traders issuing them)
 - Lack of adequate models or methods to price FTR options raises serious concerns about the liquidity of secondary markets
- In Summary, both FTR options and obligations are offered and it is left to market participants to decide which rights are desirable

Long term TR: From PTR options, at present, to FTR, in future: obligations & options (issued by TSOs) and CfDs (issued by traders)

Simultaneous Feasibility Test

- The Simultaneous Feasibility Test (SFT) is:
 - Important, because it tests that the FTRs required and issued are within network capacity when allocated
 - Achieved by representing all FTRs simultaneously in network model, with all loop flows from the external network
 - Solved for network flows in both the pre- and post-contingency states and checked for limit violations
- The SFT guarantees that **if all outstanding FTRs are exercised simultaneously to support physical transfers then no transmission constraint or ATC violated**
- When the topology assumed for SFT is the same as used in the real time dispatch, TSO congestion **revenues will be “adequate”** to cover financial settlement of all outstanding FTR obligations and options

FTR / PTR: Firmness

- Firmness facilitates liquid forward and secondary markets and efficient pricing. If the network structure is maintained, SFT would ensure revenue adequacy.
- Fully firm FTRs: shortfall socialized
 - Inter-temporal smoothing of congestion revenue - surpluses cover shortfalls
- Not fully firm: prorate pay to FTRs to cover shortfall (“haircut” approach): IFA example
 - SO can curtail interconnector capacity if necessary
 - Pro-rate capacity curtailment in the following order: Intraday, DA, Long term nominations
 - Curtailed PTR holders compensated on the basis of the initial purchase price.
 - Participants take account of non-firmness when bidding (overall, IFA 93% available last 5 years).

We will consider a shared management of the shortfall between TSOs, FTR holders and all market participants but prefer TSO averaging (better incentives, lower risks)

Emerging Conclusions

- Long term TRs are desirable - reduce risk, help to underwrite investment plans
- FTRs have several advantages PTRs and no obvious disadvantages; notably a standard two-sided FTR is a firm obligation that can be netted to release a far larger market
- FTRs tend to mitigate market power as do PTRs+UIOSI provided trading is liquid (and dominant importers cannot monopolise imports)
- Duration of FTRs should match power contracts and should be firm
- Determining ATCs requires TSOs about future conditions (months and years ahead) (potentially a significant problem). Effect of netting potentially very significant (can be supported by FTR obligations)

Regulators should agree to press for maximal transmission capacity

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Firmness in practice

- Nord Pool CfDs are 100% firm as cleared through the derivatives exchange
- CAISO, PJM, ISO-NE: reduce FTR payout pro rata => revenue recovery
- NYISO: shortfall recovered by TO's
- Texas: shortfall socialised to load
- In ISO-NE and PJM revenue adequacy excellent: 100% in 2008, 2009 & 97.7% in 2010 (PJM)
- Revenue **inadequacy**: MISO 2006-2008 over 10%; NYISO 2005-2008 7%
 - NYISO and MISO reacted by making available a smaller number of FTRs

Secondary Trading

- In PJM:
 - Market participants can buy and sell existing FTRs through the PJM-administered, bilateral market or market participants can trade FTRs among themselves without PJM involvement
 - Duration can be altered as long as the new start and end times are within the original FTR duration
- In the US LMP pools, participants can nominate self-scheduled trades automatically accepted by the pool clearing algorithm. In PJM around 30% of total trades
- Self-scheduled participants pay access charge equal to the LMP differential between their nominated sinks and sources, claimed back if they hold the equivalent FTRs
 - Consequently, these participants bear no liquidity risks or PX fees

Common misconception: a move towards FTRs might impede OTC or bilateral energy trading