

Electricity Market Development in Northern Ireland

In the words of Rudyard Kipling (1865-1936), "I keep six honest serving men. (They taught me all I knew.) Their names are What and Why and When, And How and Where and Who." These lines have real relevance in the evolving electricity market.

This article describes the developments of the electricity market in Northern Ireland, with emphasis on the commitment to a workable but inexpensive system generating minimum overheads. Focus is on the simplicity of the trading arrangements, the minimal cost of introducing these arrangements, and the criteria to be satisfied in the development of systems to meet an evolving market culture.

Market Background

The EU Directive 96/92/EC came into force on 19 February 1999 in Northern Ireland and required that suppliers and eligible customers should be able to contract directly with independent power producers (IPP) for their electricity supply.

Prior to this date, all output from the province's four power stations was contracted to the Power Procurement business of Northern Ireland Electric plc (NIE). Some second tier suppliers came to Northern Ireland, but initially there was only competition at supply level, as none of the generating capacity that came out of contract was offered as independent plant. A proxy for competition at generation level was introduced in August 1999, when NIE's Power Procurement business auctioned 2 x 100 MW tranches of generation capacity to second tier suppliers, giving them capacity they could sell on to eligible customers based on the price they had bid for the capacity. This arrangement was known as virtual IPP (VIPP), as the capacity was not linked to specific generating units.

From 1 April 2000 for one generating unit and 1 May 2000 for two more generating units, contracts were bought out and the capacity offered to second tier suppliers, so from 1 April 2000 fully independent generation was running, and the market had really started.

Settlement System

The essence of the system is that bilateral trading volumes are nominated to the system operator on the previous day by both the IPPs and the suppliers. Essential features of the nomination process are as follows (Figure 1).

- Nominations are for energy for 48 half-hour settlement periods starting at 06:00 hours each day.
- Nominations must balance, i.e., suppliers and IPP nominations must be complementary. This is achieved by both parties making their nominations at what is described as the virtual-generation sent-out busbar.
- IPPs nominate units sent out from their station, and suppliers nominate their customer demand factored to compensate for system losses appropriate to their supply voltage (3.9% at 33 kV, 6.2% at 11 kV and 6.6 kV, and 11.4% at 400 V).
- Nominations for transfers over the interconnector with the Republic of Ireland will be equal at the interconnector commercial boundary. In Northern Ireland, the adjustment to the virtual-generation sent-out busbar will be 2% with IPP and supplier nominations then being made as for internal nominations.

These nominations are fed into the settlement system as are the ex-post actual deliveries to the network by IPPs and actual off-takes by suppliers.

Variations from nominations are calculated in settlement, a shortfall being charged at Bulk Supply Tariff (BST) and spill being paid for at a system avoidable price of 1.0 p/kWh in summer and 1.5 p/kWh in winter.

This article is based on a presentation made by Brian R. Lunn at the Plenary Session of the 2000 Universities Power Engineering Conference, titled "Development of the Northern Ireland Electricity Market". B.R. Lunn is with Northern Ireland Electricity plc. The views expressed in this article are those of the author and not necessarily those of his company.

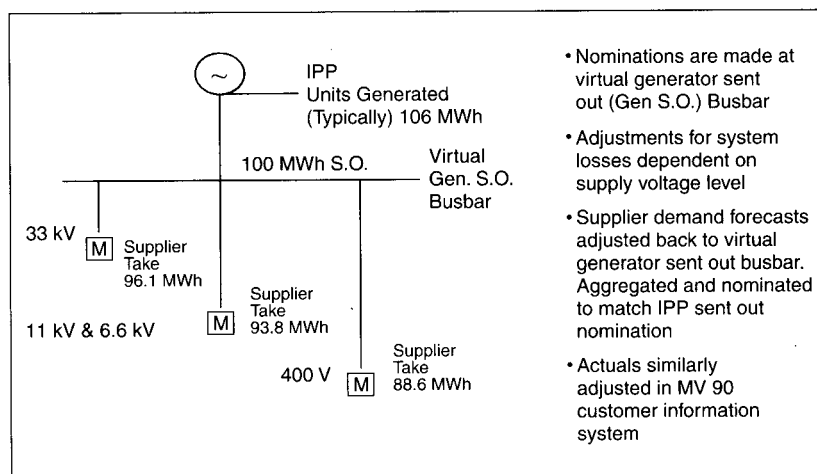


Figure 1. Energy nominations within Northern Ireland

Nominations are made by 11:00 hours on Day 1 for the 24-hour period commencing at 06:00 hours on Day 0 (i.e., the next day). The nominations represent the bilateral contracts between IPPs and suppliers. Settlement of variations from nominations is carried out separately for IPPs and suppliers.

This simple system fulfils the basic requirements of the Directive 96/92/EC and is regarded as interim, with an obligation on NIE and other industry players to review the interim arrangements by October 2000.

The existing system was developed in time for the 19 February 1999 market opening (although VIPP trading did not commence until 1 August 1999) and cost £10k in software development.

The interim solution achieves the following:

- Facilitates trading
- Delivered at minimal cost
- Can be extended to accommodate new players and new trading rules.

Interconnector Trading and Settlement

Since 19 February 1999, suppliers in Northern Ireland have traded with IPPs in the Republic of Ireland. ESB have secured customers in Northern Ireland and purchased capacity to meet at least part of their customer demand. On 19 February 2000, the Republic of Ireland market was opened up, and trading over the N-S interconnector in both directions became possible.

Energy trading and settlement over the interconnector mirrors the arrangements in place in Northern Ireland, i.e., suppliers and IPPs nominate their bilateral contracts to their system operator with appropriate adjustments for system losses.

To secure access to the interconnector a tranche of interconnector export capacity was auctioned. This tranche of capacity, for the first year, reflects the level of export capacity both NIE and ESB have judged to be deliverable without system driven constraints over the full year. The auction has resulted in interconnector capacity being secured by successful bidders from 1 April 2000 to 31 March 2001.

From 19 February 2000 to 1 April 2000 capacity was obtained on request up to the level to be auctioned with pro rata downward adjustment if requests for capacity exceed the tranche allocated for auction. This secured the minimum needs of the Directive 96/92/EC from the due date for Republic of Ireland.

The transmission system operators (TSO) jointly check that the nominations balance and produce an interconnector transfer schedule for each settlement period. Settlement is on the following basis.

- Nominated transfers will be deemed to have been delivered.
- Variations between supplier or IPP nominations and actual take or delivery are settled in the supplier's or IPP's jurisdiction.
- Variations between nominated interconnector transfers and actual transfer are settled between the TSOs.

Between now and October 2000, all aspects of trading, especially over the interconnector, will be revisited with the objective of releasing as much interconnector capacity into the market as possible

from April 2001. This review deals with variable available transfer capacity, firm and nonfirm capacity, liabilities, possible compensation, system security, and the need for market instruments such as counter-trading to solve interconnector capacity limitations.

The market process must be put in place quickly to secure all the potential benefits of the Scottish Interconnector due at the end of 2001. At this stage, no additional running costs (settlement) are envisaged to accommodate the changes to interconnector trading.

System Support Services

Northern Ireland has only 14 thermal generating units and 5 fast-start gas turbines totaling 1,641 MW of thermal capacity and 232 MW of gas turbine capacity to meet a peak demand that is currently 1,560 MW.

When considering operational security of supply, some additional features were added to the concept of ancillary services in devising the system support services (SSS) agreement. The main elements of the SSS agreement are:

- Commercial incentives driving annual overhaul programs to meet anticipated system demand throughout the year
- Mvar generation up to unit capability as system requirements dictate
- Commercial incentives on short-term outage planning
- Contracted operating characteristics for all generating units in Northern Ireland, with rebates for failure broadly reflecting additional system costs
- An overall payment of circa 50 p/MWh for all available centrally dispatched generating units (CDGUs) in Northern Ireland, which conform to the provisions of the SSS agreement.

The arrangements are very similar to the provisions in the power purchasing agreements (PPAs) put in place in 1992, which have been shown to be correctly structured to provide relevant incentives. This similarity allowed NIE to make relatively minor alterations to the contract management system (CMS) that calculates payments under the PPAs to accommodate payments (and rebates) under the SSS agreement.

Settlement of SSS payments is expected to total around £7 million/annum, which will provide sufficient incentive to all CDGUs to meet system requirements. Modifications to the existing contract management system (CMS) for SSS payments cost around £30k and the running costs will be minimal.

Market Development Achievements

The achievements in developing the electricity market in Northern Ireland can be summarized as follows:

- Requirements of EU Directive 96/92/EC have been met by 26% market opening in Northern Ireland
- Interconnector trading arrangements in place coincident with the Rol market opening
- System for provision and payment of system support services in place
- All the above achieved at minimal cost
- VIPP auctions effected as a proxy for IPPs
- Real price reductions for eligible customers
- Every prospect of market liquidity improving with enhanced interconnection and IPPs appearing
- A developing market culture among market players. Although the existing market facilities are simple, they were inexpensive to develop and cost little to operate. By avoiding the huge expenditure that has occurred in Great Britain, market facilities can be developed further as the need arises, without incurring any unnecessary expenditure and market overhead cost. This should ensure that the best market structure for Northern Ireland emerges to facilitate the maximum reduction in electricity prices from their current high level.

The Future

Where do we go from here? There is no universal solution in the search for the right trading system. The answers are different for each system, and we should return to Kipling's six honest serving men for some appropriate questions and answers.

What

- What is wrong with our existing system? Whereas the adage "if it works, don't fix it" is not the most positive approach for implementing change, we do need reasons to change a working model.

- What changes are being requested by market players? The view of market players needs to be incorporated into the change process. They will experience any real problems.
- What changes are necessary? Is beneficial market development being hindered if we maintain the status quo?
- Why are particular changes being requested? Care should be taken that the request for change is based on a requirement to improve the trading system and is not a mechanism by which an individual market player can strengthen his position to the disadvantage of others.
- Who do you ask if an existing system works well? There is a danger that advice can be available from people with experience of designing or implementing trading systems that will not fit one's requirements. It is important that, whereas a system can be configured to meet one's requirement, an appropriate solution should not be "shoe-horned" as a bad fit for local issues. The customer and operator of an existing system will be in a position to offer good advice.
- Who will benefit? For a number of reasons, it is important to evaluate in advance who will benefit, among them being the answer to the next question.
- Who will pay for it? Whoever benefits should pay for, or at least contribute to, the cost of developing and running the system. This imposes a discipline on the complexity of the system being proposed and any requests for changes. Our experience in Northern Ireland was that the demands of the market players in terms of the complexity of the system were considerably reduced when it became apparent that they would be expected to pay for the development.
- Who should design and evaluate the proposed changes? The industry's input should not be undervalued, although outside experience/consultancy can add to the breadth of expertise going into the design process. People who will benefit from the changes should be consulted rather than be part of the decision-making process. People with no commercial interest should be at the heart of the process.
- How much will it cost to implement and run? Some form of cost-benefit analysis must be carried out. It is not sufficient to argue for a sophisticated trading system without any attempt to justify it.
- How much will it bring prices down? Since the objective in the final analysis is to bring electricity prices down, any proposal that does not hold out reasonable expectation of this happening should be scrapped.

When

- When can this be implemented? The process of major change can lead to timetables that are optimistic. Strong project management will prevent unwilling parties dragging their feet while accepting that some program slippage is inevitable.
- When should there be a review? Any new system being installed should have a review timetable up front. Without this, a market player can be faced with an unexpected review and possibly genuine cause for complaint. Additionally, reviews are required because the financial, commercial, or operational outcomes are not as anticipated. The Northern Ireland experience from 1992 was that having no price review for generation was a mistake from which all should learn.

All the questions and possible combinations have not been dealt with here. Simplistically, a balance is required between development plus running costs and benefits derived. The evaluation of *these* benefits must be made beforehand. There is no point in having a complex and expensive (some may say sophisticated) system that costs more than it delivers.

About the Author

Brian R. Linn has worked in *the* ESI for 35 years. His early career was in distribution and transmission as a technical engineer. After an 18-month secondment to ESB working in Saudi Arabia, he moved to system operations with operational control for Northern Ireland generation and transmission and, since 1992, managed and settled the power purchase contracts with the newly divested power stations. He is currently System Operations manager for Northern Ireland Electricity plc. He has played a leading role in the development and operation of the evolving market for electricity in Northern Ireland, including settlements. The expectation is that his department will become a separate independent company as the TSO for Northern Ireland, as promoted in the EC Directive 96/92/EC.