Electricity trading and risk management in liberalised market

February 2015

PricewaterhouseCoopers
## Agenda

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Current electricity trading in Japan
### JEPX
- Established in 2003, JEPX is the only electricity trading market in Japan
- Accounts for less than 1% of the total electricity sold

#### Spot trading
- Accounts for approx. 99% of JEPX trading
- 48 products in 30-min blocks
- Blind single-price auction
- Minimum volume: 1MW

#### Forward trading
- Accounts for about 1% of JEPX trading
- Both bilateral and spot-based
- 1 year ahead products by weekly or monthly blocks
- Continuous pricing
- Minimum volume: 500kW

#### Intraday trading
- Accounts for less than 1% of JEPX trading
- 4-hour ahead products for 8h or 32h supply
- Blind single-price auction
- Minimum volume: 1MW

### Trading volume breakdown*

<table>
<thead>
<tr>
<th></th>
<th>JEPX (0.5%)</th>
<th>Others (1.4%)</th>
<th>Intraday trade (20.1%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan Total</td>
<td>JEPX Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(kWh)</td>
<td>(kWh)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>874 B</td>
<td>4.7 B</td>
<td></td>
<td>60 M</td>
</tr>
<tr>
<td>(kWh)</td>
<td>(kWh)</td>
<td></td>
<td>(kWh)</td>
</tr>
<tr>
<td>As of FY2010</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* As of FY2010

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PwC
Changes anticipated in the trading market due to liberalisation

**Products**
- Plan to introduce 1-hour ahead trading with 24/7 transactions availability in 2016
- Plan to reduce the transaction fee to 1/3

**Liquidity**
Liquidity expected to increase as a result of liberalisation. Currently, IPP/wholesalers (8.2%*) are obliged to sell to EPCs. From 2016, they can choose to sell to other parties, including JEPX.

**Use of data**
- JEPX expected to facilitate wide-range merit order after National Transmission Operator (TSO) is established in 2015
- Price in JEPX expected to provide an indicator price

* As of FY2010
By contrast, trading in the UK electricity sector is much larger

**UK Market Overview**

- 317 TWh annual demand
- ~57.5 GW peak demand
- ~77.5 GW installed capacity (including wind)
- Capacity margin ~7%

<Overview of UK trading market>

<table>
<thead>
<tr>
<th>Overview</th>
<th>Day-ahead auction</th>
<th>Intraday*1</th>
</tr>
</thead>
<tbody>
<tr>
<td>APX</td>
<td>66 members</td>
<td>8.6 TWh</td>
</tr>
<tr>
<td></td>
<td>675,000 trades</td>
<td>Maximum monthly volume ~974 GWh</td>
</tr>
<tr>
<td>N2EX</td>
<td>42 members</td>
<td>139.4 TWh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum daily volume over 500 GWh</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>148 TWh (89.5%)</strong></td>
<td><strong>17.5 TWh (10.5%)</strong></td>
</tr>
</tbody>
</table>

*1 Spot market and prompt market combined

Note) The above figures are 2013 data
Evolution of trading in a deregulated market
What changes as an electricity market deregulates? (1/4)

Customers have choice

They choose different types of tariff

They choose a different retailer
Section 2 – Evolution of trading in a deregulated market

What changes as an electricity market deregulates? (2/4)

Customers have choice

Retailers no longer have a stable customer base

- They must forecast their customer demand: In-area and out-of-area
- They must develop tariffs to attract and keep customers
- They need access to data to manage price and volume risks
- They must manage their electricity purchase costs to support their tariffs
Section 2 – Evolution of trading in a deregulated market

What changes as an electricity market deregulates? (3/4)

Customers have choice

Retailers no longer have a stable customer base

Generators no longer have a guaranteed market for their production

- They must understand plant reliability and start to allocate the cost base across plant
- They must understand the cost base and reliability of competitors
- They must develop demand forecasts to determine how their generation plant will run
- They must manage their fuel purchase costs to support their operating plans
Section 2 – Evolution of trading in a deregulated market

What changes as an electricity market deregulates? (4/4)

- Customers have choice
- Retailers no longer have a stable customer base
- Generators no longer have a guaranteed market for their production
- All market participants become exposed to risk
- Trading becomes a fundamental part of operations for all market participants
Section 2 – Evolution of trading in a deregulated market

What does trading mean for market participants?

Trading helps generators and retailers manage risk

<table>
<thead>
<tr>
<th>Physical trading</th>
<th>Financial trading</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Delivers electricity to end consumers</td>
<td>• Manage exposure to wholesale prices</td>
</tr>
<tr>
<td>• Manage transmission constraints</td>
<td>• Protects margin within retail tariffs</td>
</tr>
<tr>
<td>• Manage outages</td>
<td>• Seeks to protect against uncertainty in wholesale and retail prices</td>
</tr>
<tr>
<td>• Manage short term changes in demand</td>
<td></td>
</tr>
</tbody>
</table>
Section 2 – Evolution of trading in a deregulated market

How do market participants trade physically?

1. Long term offtake agreements between an IPP and a retailer
   Examples
   500MW of power for every hour for 15 years, with the price indexed to the cost of LNG and inflation

2. Bilateral contracts between generators and retailers
   Examples
   1000MW of power for every hour in the year at the wholesale price in the market

3. Trading exchange
   Examples
   100MW of power for 1700–2100 on the next day

4. System support contracts with the System Operator
   Examples
   Fast reserve or load reduction
### How do market participants trade financially?

<table>
<thead>
<tr>
<th>1. Include price trigger within a contract (an embedded derivative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Via an exchange or financial counterparty using a financial derivative</td>
</tr>
<tr>
<td>3. Contract between 2 counterparties</td>
</tr>
</tbody>
</table>

#### Examples

- **Offer an industrial customer the option to fix its contract price for the month based on the average baseload price in the first week:**

- **See hedging example (Section 3):**

- **Contracts for Difference, which enable both generator and retailer to have price certainty for the contract duration and volume:**
What does this mean for a market participant?

**Traders focus on:**
- Acting as the interface between the company and the market
- Implementing company strategy in the light of market conditions

**Generators focus on:**
- Operation of power stations
- Managing cost base to maintain margins at contracted levels

**Retailers focus on:**
- Management of customers
- Tariff development based on contracted costs

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Section 2 – Evolution of trading in a deregulated market
Section 2 – Evolution of trading in a deregulated market

Example of a European EPC structure

Market

Generation business
Fuel business (eg gas, coal)

Trading Division

Dispatch

Transmission management

Retail business

T & D business (own)

T&D business (others)
Management of risk requires additional governance and oversight

<table>
<thead>
<tr>
<th>Data</th>
<th>Processes and controls</th>
<th>Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical and operating data for power plant</td>
<td>Manage exposure limits</td>
<td>Risk management</td>
</tr>
<tr>
<td>Demand data</td>
<td>Trade size</td>
<td>Performance management information</td>
</tr>
<tr>
<td>Existing contracts</td>
<td>Approval processes</td>
<td>Regulatory</td>
</tr>
<tr>
<td>Counterparty details</td>
<td>HR training</td>
<td>Market analysis</td>
</tr>
<tr>
<td></td>
<td>IT systems</td>
<td></td>
</tr>
</tbody>
</table>
Fundamentals of trading
A standard trading operating model includes a front, middle and back office.

Trading and marketing:
- 3rd party exchanges e.g. ICE
- Bloomberg
- Reuters

Risk management team:
- Trading decision support and analysis
- Deal capture and position management
- Financial execution and management
- Accounting/Reconciliation

Operations:
- Front office:
  - Market tracking and analysis
- Back office:
  - Physical trade management
- Middle office:
  - Paper trade and risk management
  - Logistics operations management

Finance:
- Governance and compliance:
  - Governments
  - Exchanges

Financial partners:
- Banks
- Exchanges (Monetary)
- Governments
- Joint ventures

Trading and marketing partners:
- Counter-parties:
  - Banks
  - Brokers
  - Suppliers
  - Customers

Risk management providers:
- Networks

Logistics providers:
- Logistics operations management
- Physical trade management

External partners:
- 3rd party exchanges e.g. ICE
- Bloomberg
- Reuters
Each function has specific business processes that support trading operations

- **Front Office**
  - Trading
  - Trade Analysis
  - Position Management

- **Middle Office**
  - Risk Management
  - Mark to market & Position Reporting
  - Governance & Compliance

- **Back Office**
  - Settlement & Invoicing
  - Contract & Cash Management
  - Financial Reporting & Control
Section 3 – Fundamentals of trading

3 Trading Models

1. SPOT
   - Fuel Procurement
   - Generate Power
   - Sell Physical

2. HEDGE
   - Fuel Procurement
   - Generate Power
   - Sell Physical
   - Buy Financial Derivative (hedge)

3. ARBITRAGE
   - Sell Physical
   - Buy Financial Derivative
   - Buy Physical
   - Sell Financial Derivative

Lower Risk – Managing physical flow
Higher Risk – Trading for profit

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Section 3 – Fundamentals of trading

**Spot**

Spot = Forward sale of power for specified period of time usually 1 month to 5 years

**Time**

- **3 months**
- **6 months**
- **1 year**

**Generation profile**

- Generation
- Planned Outage
- Ramp Up
- Generation

**Power sale profile**

- Long term sale @ floating price
- Short term sale @ fixed price

- 1 year sale – Purchase Price Agreement (PPA) @ Floating price – Power index

- 1 month @ Fixed Price
- 1 month @ Fixed Price
- 1 month @ Fixed Price

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Section 3 – Fundamentals of trading

**Hedge**

Illustrative example

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Section 3 – Fundamentals of trading

Hedge

Financial Hedge – Future Power Sales (Exposure)

Fuel Procurement ➔ Generate Power ➔ Sell Physical ➔ Buy Financial Derivative (hedge)

Purchase a financial hedge to guarantee a margin

Generator ➔ Bank ➔ Retailer

$25/MWh ➔ $45/MWh ➔ $25/MWh

$25/MWh Physical power

Guarantee Margin of $15

Market Price at date of settlement (sales price)

$70 ➔ $45 ➔ $25 ➔ $0

$20

Financial Contract Gain
$25 – Pay to Bank
$45 – Bank pays Generator

Physical Contract Loss
$25 – sales price
$30 – cost to generate

$5

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Section 3 – Fundamentals of trading

Arbitrage

Buying a forward financial contract on a speculative basis

UK energy prices: Jan 2006 – Feb 2015

Current price $45/MWh

Own view of forward market prices

Outturn market price of $51/MWh: profit of $6/MWh

Outturn market price of $43/MWh: loss of $2/MWh

Source: http://energyserve.co.uk/daily-update
Operating model considerations for a trading function
Case for change: What drives organisations to transform their operating model?

Change catalysts

- Increased trading volumes
- More complex trading strategies
- Market volatility
- Internal/external reporting requirements
Effective trading operations depends on many factors
### Impact on trading function based on complexity of trading strategy

<table>
<thead>
<tr>
<th>Trading Strategy</th>
<th>Spot</th>
<th>Hedging</th>
<th>Arbitrage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>People &amp; capability</strong></td>
<td>• One Trading Desk</td>
<td>• Additional personnel to risk manage hedging activities</td>
<td>• Split trading desk between hedging and arbitrage</td>
</tr>
<tr>
<td></td>
<td>• Small Operations Team</td>
<td>• + 1 Risk personnel</td>
<td>• +1 Trader – Arbitrage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• +1 Risk personnel (depending on volume)</td>
</tr>
<tr>
<td><strong>Governance &amp; control</strong></td>
<td>• Policies and controls to manage physical trading</td>
<td>• Additional policies and controls for hedging (financial derivatives)</td>
<td>• Increased oversight to manage financial risk e.g. trade strategy approval process</td>
</tr>
<tr>
<td><strong>Service delivery &amp; process</strong></td>
<td>• Simple trading book structure</td>
<td>• Trading book structure increases to manage hedging strategies</td>
<td>• Trading book structure grows larger to manage both hedging and arbitrage strategies</td>
</tr>
<tr>
<td></td>
<td>• P/L and position exposure reporting</td>
<td>• What- if scenario and hedging analysis</td>
<td>• Enhanced risk reporting to manage trading strategies</td>
</tr>
<tr>
<td><strong>Implementation &amp; change</strong></td>
<td>• Specialist system</td>
<td>• Specialist system</td>
<td>• Enhanced risk analytics</td>
</tr>
</tbody>
</table>

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February 2015
### Section 4 – Operating model considerations for a trading function

**How can a trading system support managing operations and trade activity?**

<table>
<thead>
<tr>
<th><strong>1 Business benefits</strong></th>
<th><strong>2 Trading activity benefits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Standardise business processes</td>
<td>• Load forecasting tools enabling scenario and historical analysis</td>
</tr>
<tr>
<td>• Single system to manage transaction life cycle</td>
<td>• Better visibility of trading position (trade, forecast, plan, loss, schedule, actual)</td>
</tr>
<tr>
<td>• Greater position and P/L visibility across multiple business units</td>
<td>• Ability to capture financial trade instruments, including futures, swaps and options</td>
</tr>
<tr>
<td>• Streamlined forecasting, scheduling, settlement and operations activities</td>
<td>• Real-time analytics and what-if analysis</td>
</tr>
<tr>
<td>• Data Security</td>
<td>• Real-time P&amp;Ls, volumes, value at risk (VaR) and other portfolio metrics</td>
</tr>
</tbody>
</table>
### Section 4 – Operating model considerations for a trading function

**Why invest in a new IT system to support trading?**

<table>
<thead>
<tr>
<th>Business case</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project objectives</td>
<td>Benefits to the business</td>
</tr>
<tr>
<td>Business requirements for front, middle and back office</td>
<td>Costs</td>
</tr>
<tr>
<td>IT infrastructure and interfaces</td>
<td>Resource requirements</td>
</tr>
<tr>
<td>Data management strategy</td>
<td>Project timeline and plan</td>
</tr>
<tr>
<td>Project risks</td>
<td>Procurement requirements</td>
</tr>
</tbody>
</table>
Section 4 – Operating model considerations for a trading function

Trading systems are at the centre of your IT architecture

ETRM systems link external data feeds and Enterprise Resource Planning (ERP) systems

- Market sources
- Exchanges
- Brokers

Market data repository
Exchange integration platform
Broker platform

Customer relationship management
Contract management

Energy Trading & Risk Management (ETRM)

ERP (Finance & Back Office)

Performance reporting
Planning and consolidation
Comparison of trading systems
Energy Trading and Risk Management (ETRM) systems

Used to trade physical and financial energy commodities

<table>
<thead>
<tr>
<th>Front office</th>
<th>Middle office</th>
<th>Back office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deal capture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Trader’s tools</td>
<td>• Credit risk analytics</td>
<td>• Balancing</td>
</tr>
<tr>
<td>• Simulations</td>
<td>• Market risk analytics</td>
<td>• Settlement</td>
</tr>
<tr>
<td>• Scheduling</td>
<td>• Price forecasting</td>
<td>• Invoicing</td>
</tr>
<tr>
<td>• Nominations to system operator</td>
<td>• Simulations</td>
<td>• Contract management</td>
</tr>
<tr>
<td></td>
<td>• Stress testing</td>
<td>• Hedge accounting</td>
</tr>
</tbody>
</table>

Reporting

Source: IDC Energy Insights
### Major ETRM vendors in the Power & Gas Trading market

**ETRM Software Landscape**

<table>
<thead>
<tr>
<th>Best of Breed</th>
<th>Category Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>TriplePoint</td>
<td>OpenLink</td>
</tr>
<tr>
<td>Brady</td>
<td>SunGard</td>
</tr>
<tr>
<td>Murex</td>
<td>Allegro</td>
</tr>
</tbody>
</table>

**Market Potential**

**Completeness of Offering**

Source: Chartis RiskTech Quadrant for Energy Trading Risk Management Systems 2013
### Comparison of ETRM Software Vendors

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Crude &amp; Refined Oil</th>
<th>Natural Gas &amp; Liquids</th>
<th>LNG</th>
<th>Coal &amp; Freight</th>
<th>Power &amp; Carbon</th>
<th>Metals, Chemicals, and Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>OpenLink</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>TriplePoint</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Allegro</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>SunGard</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Brady</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓ (no freight)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Murex</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Source: Chartis RiskTech Quadrant for Energy Trading Risk Management Systems 2013*
## Comparison of ETRM Software Vendors

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Main Energy Customers</th>
</tr>
</thead>
</table>
| **OpenLink** | • GMR Energy (Singapore)  
|            | • Hess (US)  
|            | • Scottish Power (UK)  
|            | • Dong (Denmark)  
|            | • Petronas (Malaysia)  |
| **TriplePoint** | • Iberdrola (Spain)  
|            | • ConocoPhillips (US)  
|            | • SK Energy (Korea)  |
| **Allegro** | • National Grid (UK)  
|            | • Saudi Aramco (Saudi Arabia)  
|            | • DTEK (Ukraine)  
|            | • BKW (Germany)  |
| **SunGard** | • Iberdrola renewables (Spain)  
|            | • San Miguel Power (Asia)  
|            | • CFE (Mexico)  
|            | • Fortum (Finland)  |

Source: Chartis RiskTech Quadrant for Energy Trading Risk Management Systems 2013
## OpenLink

### Overview
- Front to Back Office solution for Power, Generation, Transmission, and Distribution
- Focus on risk management and optimisation
- ‘Cube Logic’ to support data management
- Treasury & Commodity Management

### Software Platform
- Endur – Power & Gas Trading
- Findur – Treasury & Cash Management
- Cube – Data Management

### Strength
- Comprehensive risk analytics framework
- Sophisticated analytical & reporting capabilities
- Strong capability for financial & reporting modelling
- Standard valuation models & simulation capability
- Scheduling capabilities to handle daily and hourly nominations
Section 5 – Comparison of trading systems

**Overview**

- Multi commodity platform
- Focus on enterprise risk management (market, operational, counterparty credit, regulatory)
- Integrates seamlessly with personal productivity tools (e.g. Excel), enterprise systems, and market feeds

**Software Platform**

- Commodity XL – Commodity Risk Management
- Softmar – Chartering & Vessel operations

**Strength**

- Supports full transaction lifecycle including procurement (Commodity XL)
- Strong logistics and shipping capability (Softmar)
- Business Intelligence to model load and generation availability
- Hedge accounting capability to support hedge trading
- Regulatory functionality to support external reporting
Section 5 – Comparison of trading systems

**SunGard**

**Overview**

- Cross Platform Technology with software solutions across multiple asset classes
- Aligne platform focuses on energy and risk management
- Large professional services team

**Software Platform**

- Aligne – Energy Trading & Risk management
- Avantgard – Treasury & Cash management
- MarketMap – Data management

**Strength**

- Focus on commodity and asset management in power and gas trading including procurement (Aligne)
- Offers supporting solutions across regulation / compliance and market data (Aligne/MarketMap)
- Strong Treasury functionality (Avantgard)
Section 5 – Comparison of trading systems

**Allegro**

**Overview**
- Focus on Power, Generation, Transmission, Capacity, and Distribution and Ancillary services
- Strong power and gas trading functionality
- Hosting & managed service offerings

**Software Platform**
- Allegro v 8.0

**Strength**
- Component approach offers flexible architecture & features
- Intuitive user interface
- Ease of rollout and integration
- Real time scenario analysis functionality
- Integration with ISO’s to streamline scheduling
Case studies: Approach to trading
Section 6 – Case studies: Approach to trading

Agenda

1. Background
2. Client need
3. How did PwC help?
4. IT system benefits
5. Overall client benefits
**Background**

**Market change**

- Deregulation led to increased competition
- Pricing changed from regulated pricing to market-based pricing
- Independent System Operator (ISO) and trading exchanges established
- Regulatory changes to wholesale and retail energy sector

**Impact on our client**

- **Registration with ISO**: Additional operational procedures required
- **New trading exchanges**: Increase in risk management and need for new trading strategies
- **Regulatory reporting**: Increased information reporting requirements
**Client Need**

_To adapt its regulated business model to successfully operate in a liberalised trading market_

**Objective**

Perform a strategic and operational assessment of its front, middle, and back office for its marketing and trading functions

**Areas of focus**

1. Governance & oversight
2. Organisation & staffing
3. Information systems
4. Front/middle/back office processes
5. Risk and performance reporting
How did PwC help?

Reviewed current business model and developed a road map to implement recommendations across each area

<table>
<thead>
<tr>
<th>Areas of focus</th>
<th>PwC Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Governance &amp; oversight</td>
<td>Revised governance and controls framework</td>
</tr>
<tr>
<td>2 Organisation &amp; staffing</td>
<td>Modified business model for the marketing and trading functions</td>
</tr>
<tr>
<td>3 Information systems</td>
<td>Selected and implemented new IT system</td>
</tr>
<tr>
<td>4 Front/middle/back office processes</td>
<td>Updated business processes including defined roles and responsibilities</td>
</tr>
<tr>
<td>5 Risk and performance reporting</td>
<td>Enhanced risk and management reporting</td>
</tr>
</tbody>
</table>
IT System Benefits (1/5)

Facilitated management of business activities across scheduling, trading, risk management and trade processing in one system

**Issues & business needs**

- Our client used different systems to manage activities across the power and gas transaction lifecycle
- Its systems were not well integrated and different sources of information required manual consolidation
- High risk of errors occurring when data was transferred between systems

**Trading system solution**

- Integrated solution with one source of the truth
- Real time information across the business to support more informed decision making (procurement and trading)
IT System Benefits (2/5)

Enhanced the portfolio management capability to manage physical load, generation and trading activities

Issues & business needs

Our client sought improved:
- Understanding of its generation position (forecast & management)
- Communication of data to comply with ISO requirements

Trading system solution

Enabled our client to:
- Model demand load and generation and simulate its underlying power position
- Automate communications with ISO via the new IT system thus reducing resource effort and eliminating manual processes
Supported facilitation of new trading strategies to optimise financial hedging of generation and arbitrage

**Issues & business needs**

Our client wished to develop its financial trading capabilities:
- Position (volume)
- Risk exposure to that position (market value)
- Trading or hedging strategy (trade strategy)

**Trading system solution**

Our client was able to:
- Capture physical and financial positions in one system
- Support consolidated risk management activities
- Model trade simulations
IT System Benefits (4/5)

Provided simplified compliance with external ISO scheduling requirements for power nominations

Issues & business needs

- Our client needed to generate day-ahead nominations to send to each ISO
- The ISO interfaces varied by location requiring different nomination reports to be generated
- Our client wanted to minimise the risks of potential error using manual systems to manage data across different ISO platforms

Trading system solution

- Resulted in a simplified scheduling process using a single system to manage nominations across multiple ISOs
**IT System Benefits (5/5)**

Enabled our client to manage its regulatory reporting on imbalances across multiple control areas

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**Issues & business needs**

- Our client was responsible for its balance position within each control area.
- It needed to keep track of its balance position in each control area in real time.
- Its existing capabilities were time consuming and used multiple systems.

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**Trading system solution**

- Our solution enabled our client to monitor imbalances in each ISO area on a single screen.
- The new system enabled our client to see both balanced and unbalanced positions at any time.
## Overall Client Benefits

The new trading system enabled our client to reduce operational and market risk through creating a new business model to compete effectively.

<table>
<thead>
<tr>
<th>Enhanced data flow for decision making</th>
<th>Information flow from long term trade desks to day-ahead trade desks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimised operational processes</td>
<td>Improved organisational and task alignment</td>
</tr>
<tr>
<td>Reduced manual effort</td>
<td>Higher efficiency achieved across business processes (front, middle, and back)</td>
</tr>
<tr>
<td>Improved IT system</td>
<td>Automation of ISO operational requirements and ease of compliance with regulatory reporting requirements</td>
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</table>