

Development of the Framework to Support the Implementation and Regulation of a Full-Scale Competitive Wholesale Electricity Market

Final Workshop

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Agenda

- Introduction
- The WEM Concept
 - Overview
 - Benefits
- Key Proposals
 - Market design
 - Market structure
 - Regulation
 - Security of supply
- Comments and Discussion
- Next Steps
 - Transitional issues
 - Implementation timetable

The WEM Concept

- The WEM (Wholesale Electricity Market) will be a parallel market comprising:
 - A regulated sector
 - A bilateral contracts market
 - A balancing mechanism

The Two Markets Compared

| | Existing Power Pool | WEM Concept |
|-----------------------|--|---|
| Participants | <ul style="list-style-type: none"> • Generators • Single buyer | <ul style="list-style-type: none"> • Generators • Suppliers • Traders / intermediaries |
| Pre-day ahead markets | n/a | <ul style="list-style-type: none"> • Voluntary bilateral contracts Unregulated prices |
| Day ahead markets | <ul style="list-style-type: none"> • Generators submit regulated cost-based bids • Energomarket forecasts total demand • Market price set at SMP of thermal | <ul style="list-style-type: none"> • Voluntary bilateral contracts • Traded blocks on PXs • Unregulated prices |
| Within day balancing | <ul style="list-style-type: none"> • SO balances • Pays and is paid SMP | <ul style="list-style-type: none"> • SO balances • Generators/demand submit bids and offers to adjust energy |
| Settlement | <ul style="list-style-type: none"> • HPs / NPPs receive regulated bid • TPPs receive SMP • Energomarket pays average purchase price | <ul style="list-style-type: none"> • Charged for imbalances between actual and contracted output/demand |

Impacts of the WEM Concept (I)

- **Establishing direct contracting between generators and suppliers**
 - allows generators to enforce payments by stopping supplies
 - clarifies calculation of prices and quantities
 - credit cover provisions can be matched to risks of non-payment
 - customers can more easily bypass local suppliers, enhancing competition and reducing cross-subsidies

Impacts of the WEM Concept (II)

- Removing restrictions on bids and offers by generators
 - prices reflect costs of supply
 - investors can set prices to recover costs
- Allowing demand-side participation
 - allows identification of customers who are willing to limit their consumption
 - increases options to manage imbalances, reducing costs
- Introducing markets for balancing and ancillary services
 - allows purchases to be made at least-cost
 - increases incentives to provide these services

Benefits

- **Increased private investment**
 - much reduced risks of non-payment
 - direct access to creditworthy customers
 - freedom to set cost-reflective prices
- **Greater competition**
 - customers can choose who to buy from
 - generators can compete on price
 - pressures to reduce costs and improve creditworthiness
- **Integration into EU energy markets**
 - WEM Concept consistent with 'EU model' for electricity markets
 - opportunity to ensure compliance with EU legislation

Key Proposals:

Market Design

Market Structure

Regulation

Security of Supply

Next Steps

Key Proposals

Market Design: Commercial Arrangements

Key Issues

- Should a power exchange (PX) be established as part of the WEM Concept?
 - provides means to manage risks
 - needs to meet a need of participants if it is to succeed
- Who pays for losses?
- What credit cover provisions should be put in place?

WEM Price Volatility Compared

Коливання ціни електроенергії:

Франція

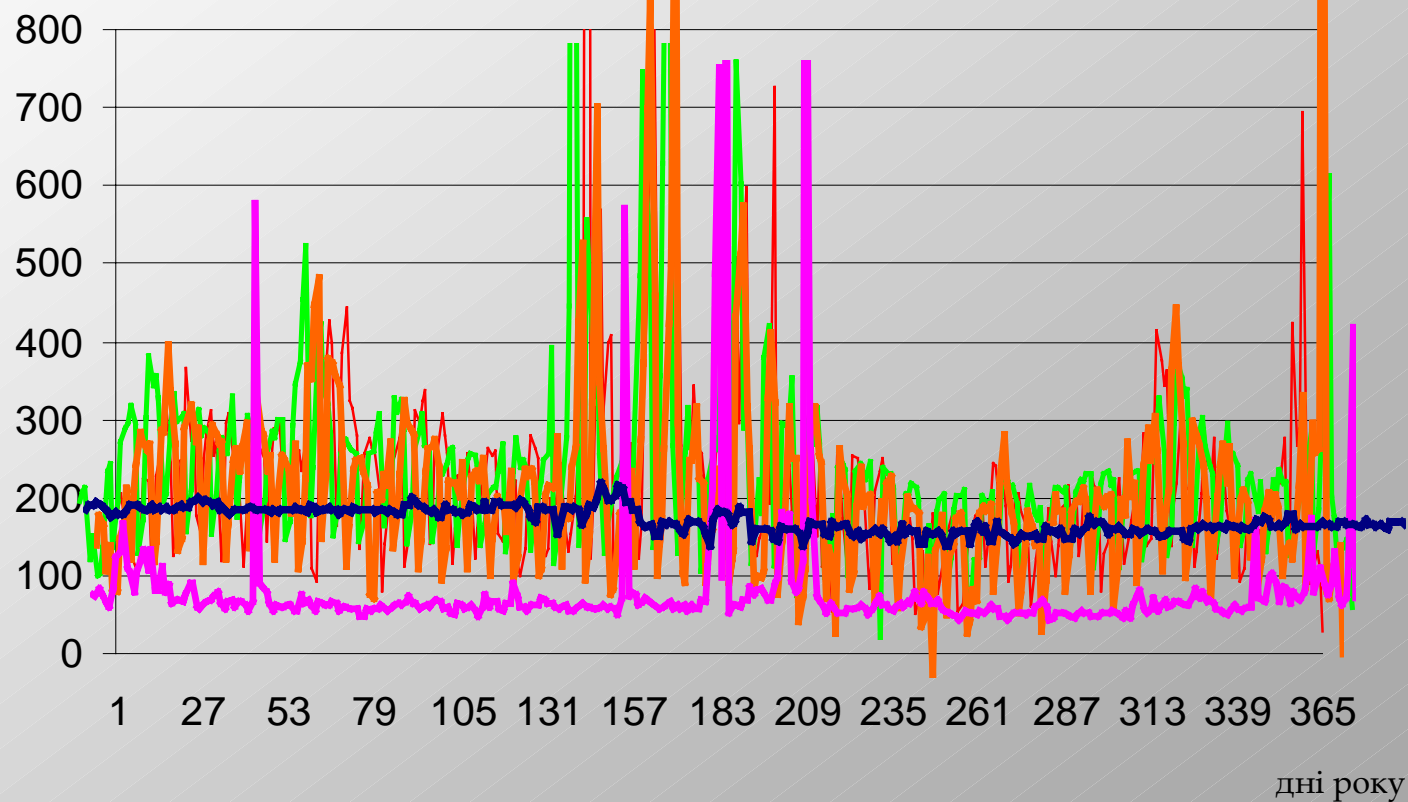
Австрія

Австралія

Німеччина

Україна

Ціна, грн./МВтг.



Sources: NERC

- # Credit Cover
- We have not made specific proposals
 - Bilateral contracts will contain their own provisions for credit cover
 - Need to ensure credit cover provisions in WEM are reasonable
 - significant cost to participants, and ultimately to customers
 - over-stringent requirements act as barrier to new entrants

Outstanding Decisions

- **Contract markets**
 - who drafts the model contracts?
 - should provision for an MO-established PX be made in legislation?
- **Paying for losses**
 - what incentives do the SO and transmission asset owner have to reduce losses?
- **Credit cover**
 - what forms and level of credit cover should WEM participants provide?

Key Proposals

Market Design: Scheduling and Dispatch

Key Issues

- **Should generators be allowed to 'self-schedule'?**
 - can reduce efficiency and raise costs
 - ensures generators are able to schedule output to match contracted sales
- **How are transmission constraints managed in scheduling?**
 - constrained scheduling with nodal or zonal prices differing
 - unconstrained scheduling with constraints managed in real-time through redispatching
 - constrained scheduling gives more efficient prices, but more complex to apply

Self-Scheduling

- WEM Concept envisages central scheduling during transition and self-scheduling once new WEM fully established
- We have proposed all generators are required to submit bids and offers to balancing mechanism
- Implies self-scheduling, but generators may be required to deviate where this manages imbalances at least-cost

Key Proposals

Market Design: Balancing Mechanism

Key Issues (I)

- **'Hard' or 'soft' regime?**
 - hard regime penalises imbalances to encourage participants to trade ahead to manage imbalances
 - soft regime applies smaller penalties for imbalances

- **Gross or net balance calculation?**
 - gross calculates imbalances separately for generation and demand
 - net offsets 'long' generation against 'short' demand and *vice-versa*
 - net calculation reduces exposure to balancing mechanism and favours vertically-integrated participants

Key Issues (II)

- **Single or two price regime?**
 - single price regime applies same price for selling and buying energy
 - two price regime charges different prices, depending on system balance
 - single price regime is more efficient, but less incentive to avoid imbalances
- **Marginal, average or administered imbalance charges?**
 - marginal prices are more efficient
 - more volatile and may be more exposed to market manipulation
 - administered prices are most predictable but least efficient

Aims for the Balancing Mechanism

- WEM Concept does not describe envisaged balancing mechanism
- Our proposals assume that objectives for mechanism are to
 - minimise price shocks
 - avoid price volatility
 - promote entry by new generators and suppliers, who may not be vertically integrated
- Argues for favouring 'soft' pricing rather than economic efficiency

Our Proposals

- Calculate gross imbalances
- Calculate separate imbalances for each trading period
- Set imbalance charges using one price regime
- Calculate imbalance charges on basis of average price
- Allow *ex-post* trading of imbalances (although activity will be limited under soft regime)
- Use administered imbalance price in Stage 1 of transition to new WEM (involves CHPs only)

Key Proposals

Market Design: Ancillary Services

Key Issues

- What definitions of ancillary services are used?
- How are ancillary services purchased?

Our Proposals

- **WEM Concept identifies need for market in ancillary services**
- **We propose that**
 - frequency-keeping reserves are procured as part of the scheduling and dispatch process
 - spinning or standing reserve may be purchased through additional reserve requirements
 - provision of AGC becomes a mandatory and uncompensated requirement on all generators
 - black start and reactive power services are procured under contract through a competitive tendering process

UCTE Reserves Hierarchy

| | |
|--|------------------|
| Primary Control Reserves (<30 seconds) | |
| Secondary Control Reserves (30 seconds+) | |
| Tertiary Control Reserves (<15 minutes) | Balancing Energy |

- Primary control reserves respond to frequency deviation
- Secondary control reserves are used to release primary reserve capacity
- Tertiary control reserves are used to release secondary reserve capacity
- Balancing energy dispatched in parallel with tertiary control reserves

Outstanding Decisions

- Are other ancillary services required?
- When should the mandatory requirement to provide AGC be introduced?
- How are reserves procured during the transition from the existing WEM?

Key Proposals

Market Structure: Definition of Eligible Customers

Key Issues

- How is consumption for purposes of determining eligibility calculated?
 - single or multi-site?
 - include or exclude self-supplied demand?
 - can eligibility be lost if consumption falls below threshold?
- Can eligible customers opt to remain in the existing WEM?

Eligible Customers in the Existing WEM

- During the transition, regulated prices in the existing WEM may be held below competitive prices in the new WEM
- If so, then, for the competitive WEM to succeed, eligible customers must not be able to purchase from the existing WEM at lower prices
- This will be very politically controversial, and is a key issue for the transition to the new WEM

Key Proposals

Market Structure: Participation by NPPs (Nuclear Power Plants)

Key Issues

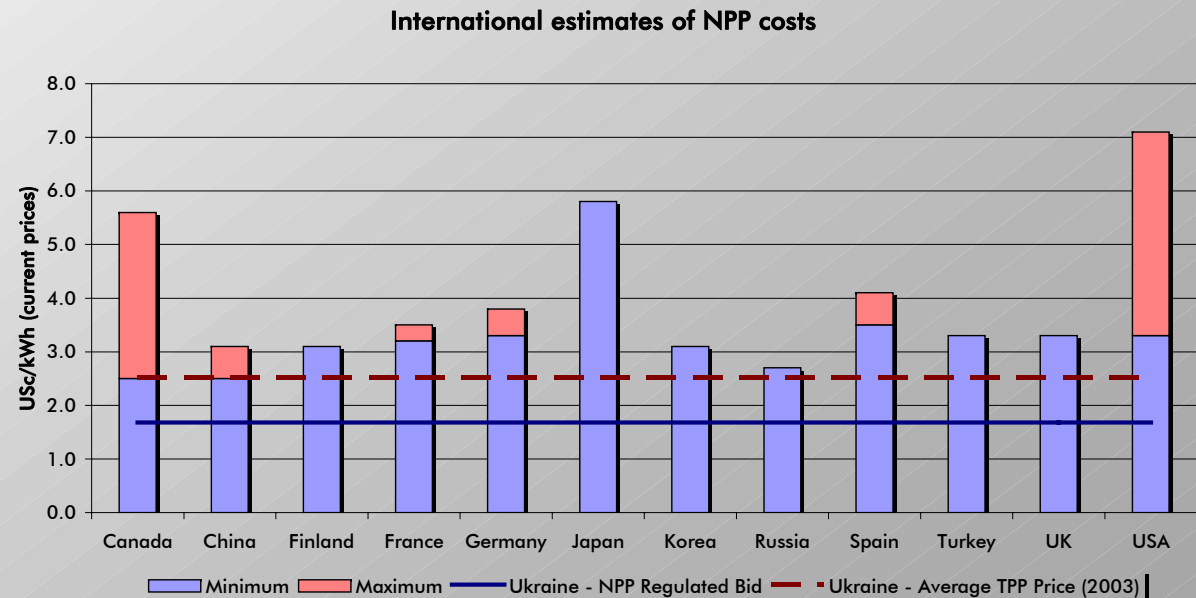
- How do NPPs manage revenue risks in a competitive market?
 - NPP output is inflexible
 - leaves NPPs very exposed to imbalance charges
- How can recovery of decommissioning and waste liability management costs be assured?

Our Proposals

- WEM Concept contains statement of intent that NPPs should bid competitively
- We understand that a separate fund for decommissioning and waste management liabilities is being established
- We propose that imbalance risks are managed by permitting
 - vertical integration – NPPs can buy supply businesses
 - horizontal integration – NPPs can buy more flexible TPPs

Removing Regulated Caps on NPPs

- Decisions on the speed of removal of existing regulatory controls on NPP bids need to consider impact on WEM prices
- Must rely on country-specific data – no international consensus on NPP costs



Key Proposals

Market Structure: Allocation of Capacity

Key Issues

- Existing capacity comprises
 - HPs – 9%
 - NPPs – 23%
 - TPPs – 68%
- How should this be allocated between existing and new WEM during the transition?
- The approach taken affects
 - price levels in the two markets
 - price volatility in the two markets
 - the ability of market participants to contract flexible capacity which can match their load shape

Our Proposals

- The WEM Concept envisages that HPs will be restricted to selling through the power pool and balancing mechanism
- We have proposed that CHP, NPP and TPP capacity is allocated
 - in proportion to the share of demand met from each market
 - to achieve a balanced mix of plant types and costs in each market
- Most equitable approach
- HPP capacity should be made available for balancing purposes, and required to submit bids and offers to the balancing mechanism

Key Proposals

Regulation: Market Monitoring

Institutional Framework

- WEM Concept allocates responsibility for market monitoring to NERC
- We propose that NERC is responsible for collecting and publishing indicators of WEM competitiveness annually
- The published report should include recommendations on how to address identified market power

Approach and Remedies

- A range of indicators should be monitored – no single indicator is sufficient
- Both conduct (e.g. price caps) and structural (e.g. forced divestment of capacity) remedies should be permitted
- The use of conduct-based remedies should be time-limited and subject to regular review

Key Proposals

Regulation: Treatment of NJSC (National Joint Stock Company)

Key Issues

- The National Joint Stock Company (NJSC) will own
 - majority stakes in generators representing 45% of capacity
 - majority stakes in 12 oblenergos, representing 70% of wholesale electricity purchases
 - minority stakes in 8 oblenergos, representing 18% of wholesale electricity purchases
- The size of NJSC's market share and its vertically integrated nature raise major competition concerns

Our Proposals

- We recommend that NJSC be subject to additional monitoring of its bidding and sales activities
- Where there is evidence of abuse of its dominant position, NJSC should 'lease' capacity as virtual IPPs (VIPPs)
- A VIPP is a contract giving a third party rights to sell energy and determine bidding strategies for NJSC-owned generators

Outstanding Decisions

- Should there be any requirement for NJSC to separate its individual businesses?
- How should any VIPP contracts be structured?
- Should any restrictions be placed on power purchases by NJSC-owned oblenergos?
- What mechanisms exist to ensure fair access for third parties to distribution networks belonging to NJSC-owned oblenergos?

Key Proposals

Regulation: Regulation of Bids and Offers

Key Issues

- Generators in the existing WEM may continue to have their bids regulated for a period
- This creates an incentive to sell at unregulated prices in the new WEM during the transition period
- Generators will seek to reduce capacity offered to the existing WEM and increase that sold through the balancing mechanism

Our Proposals

- We propose that, for generators allocated to the existing WEM
 - the MO is responsible for submitting bids and offers to the balancing mechanism
 - the prices paid from the balancing mechanism to these generators are the same as the SMP set in the power pool
- This removes the incentive and option to sell in the balancing mechanism, rather than the existing WEM

Outstanding Decisions

- When is regulation of generators in the existing WEM removed?
- How does the MO submit bids and offers to the balancing mechanism?
- How are differences between payments made and received through the balancing mechanism managed?
- What controls are in place to prevent conflicts of interest between the MO as a participant in and the operator of the WEM?

Key Proposals

Security of Supply: Capacity Payments

Key Issues

- If peaking generators are reliant on energy market revenues alone, then prices in some hours must spike to very high levels
- The resulting price levels and volatility may be unacceptable
- Capacity payments are a way to reduce reliance on energy market revenues
- Generators are paid for making capacity available, even if it is not dispatched

Our Proposals

- The WEM Concept refers to unregulated generators earning a capacity fee in order to promote new investment
- Capacity payments reduce the efficiency of energy prices, and can be complex to implement
- We have proposed that the SO can, instead, contract with individual generators to provide standing reserve

Outstanding Decisions

- Who determines the required capacity margin?
- Which generators are eligible for standing reserve contracts?
- How are standing reserve contracts awarded?
- How are generators with standing reserve contracts paid?
- How are generators with standing reserve contracts scheduled and dispatched?

Key Proposals

Security of Supply: Buyer of Last Resort

Key Issues

- The 2003 EU Directive provides for a tendering process for new generation, where capacity build under the authorisation process is insufficient
- This creates a need to allocate responsibility for
 - identifying the need to commence the tendering process
 - administering the tender
 - signing contracts awarded through the tendering process

Our Proposals

- The WEM Concept allocates responsibility for planning and tendering to a 'state agency'
- The long-term plan is approved by the Cabinet of Ministers
- We have proposed the SO becomes the responsible agency
 - independent of other market participants
 - best placed to access the necessary information and data

Key Proposals

Security of Supply: Supplier of Last Resort

Key Issues

- In any competitive WEM, a supplier runs the risk of bankruptcy
- In such circumstances, what measures are in place to protect customers from interruptions to supply?

Our Proposals

- NERC should have powers to appoint a supplier of last resort (SLOR), where a supplier fails to provide service
- The SLOR serves customers of the failed supplier until these can be voluntarily transferred to another supplier
- Additional costs incurred by the SLOR are recovered by a levy on customers

Key Proposals

Security of Supply: Reciprocity in Cross-Border Trade

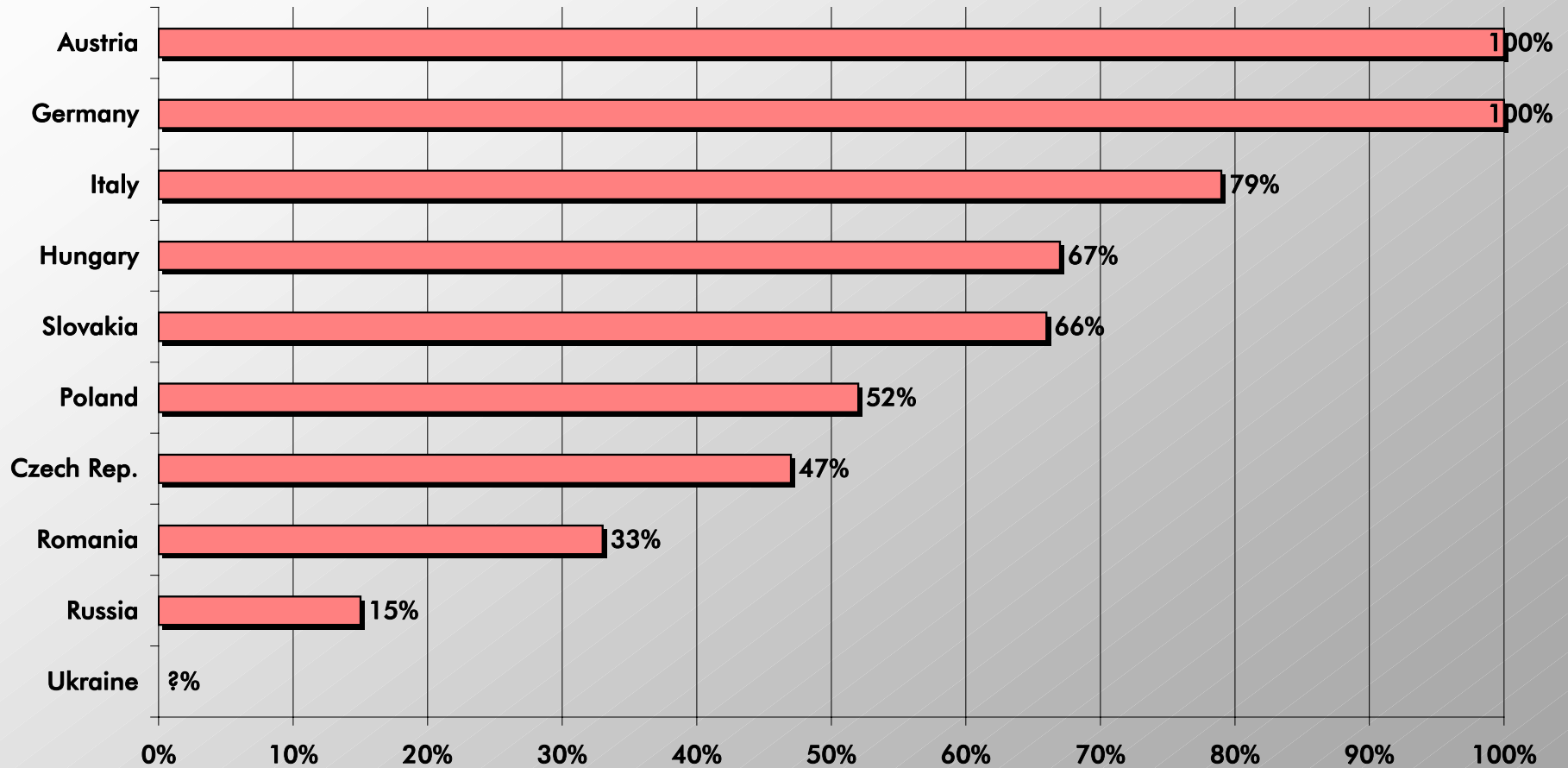
Key Issues

- Allowing large-scale imports of energy runs the risks of
 - dumping by foreign generators
 - reduced security of supply
- These risks need to be balanced against the benefits of lower prices for customers
- It is important to understand when imports can be limited under EU and international trade law

Conclusions

- **EU law appears to mean that**
 - **Ukraine cannot limit imports on reciprocity grounds, if the eligible share of the electricity market in the Ukraine is less than in the exporting country**
 - **Ukraine may be subject to restrictions on exports to EU, if market opening less than Member States**
 - **achieving Ukraine's goals for trade requires greater market opening**
- **International treaties may allow use of non-discriminatory import restrictions**

Market opening compared



EC, January 2005, *Annual Report on the Implementation of the Gas and Electricity Internal Market*, Brussels
(Selected countries only)

Key Proposals

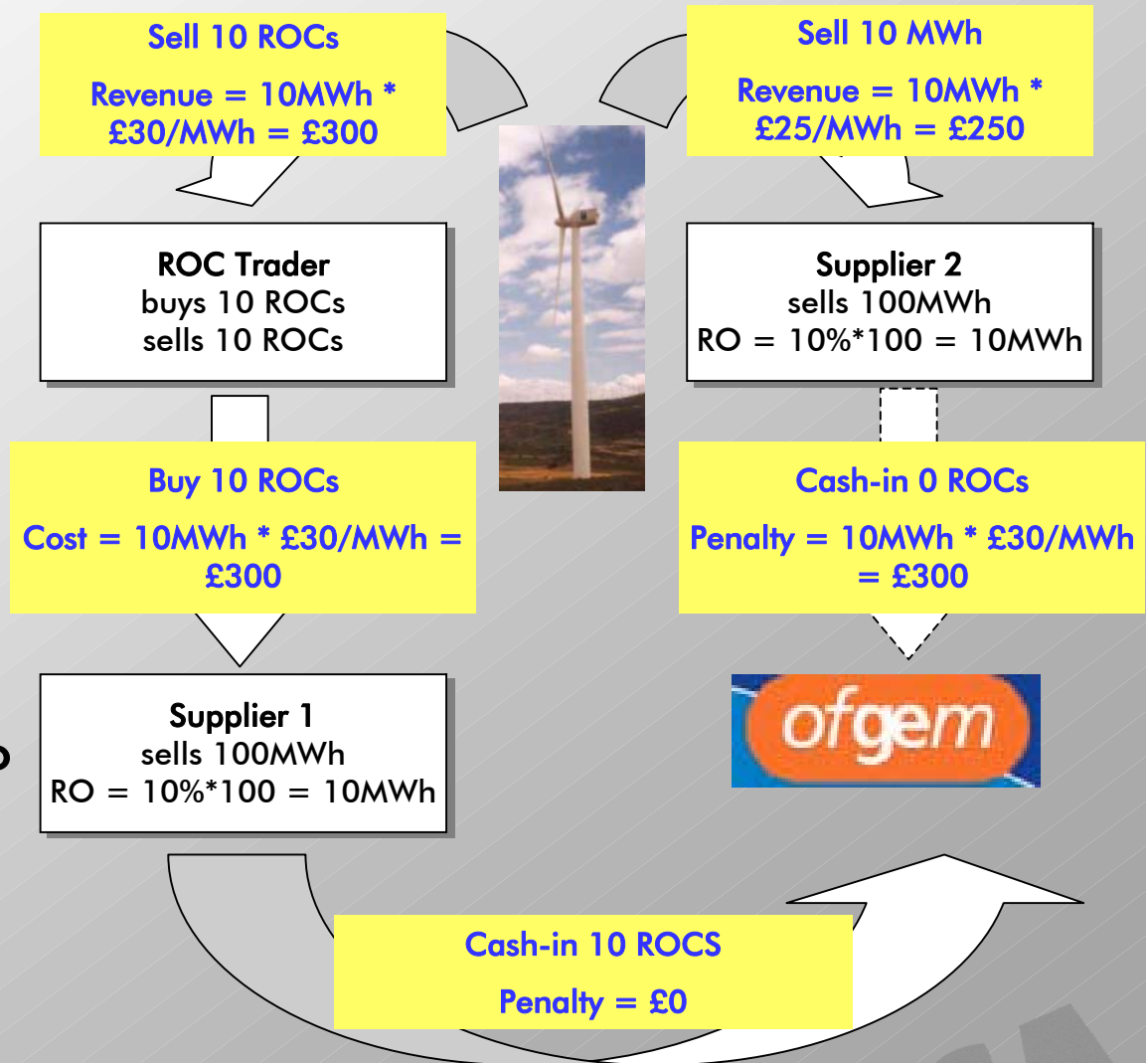
Security of Supply: Promotion of Renewables

Key Issues

- Renewables are uncompetitive relative to conventional technologies, if environmental costs are not recognised
- Providing initial price support allows renewables to become competitive
 - economies of scale
 - learning by doing
- Two main mechanisms in the EU
 - feed-in tariffs (guaranteed purchase prices)
 - renewable portfolio standards (RPSs)

The UK Renewables Obligation

- Set obligation of 10% and penalty of £30/MWh
- Renewables generator produces and sells
 - 10 MWh to Supplier 2 @£25/MWh
 - 10 ROCs to ROC Trader @£30/MWh
 - earns £55/MWh in total
- Supplier 1 buys 10 ROCs from ROC Trader
- Supplier 1 cashes-in ROCs to meet 10MWh obligation
- Supplier 2 has no ROCs and is charged penalty for 10MWh obligation



Our Proposals

- **Replace existing mechanisms with guaranteed purchase price with auctions to selected qualifying generators**
 - simple to introduce and administer
 - low level of regulatory risk
 - creates competition between renewables projects
 - allows SO to manage quantities of renewables on system
- **Transitional measure while WEM Concept implemented**

Long-Term Proposals

- **Guaranteed purchase price not consistent with WEM Concept**
 - suppliers buying renewables disadvantaged in retail competition
 - renewables face higher balancing risks
- **Introduce RPS once new WEM established**
 - renewables earn revenues from RECs, and are therefore less exposed to energy market risks
 - all suppliers face same obligations and compete on equal terms

Next steps

Transition to the New WEM

Prices in the New WEM

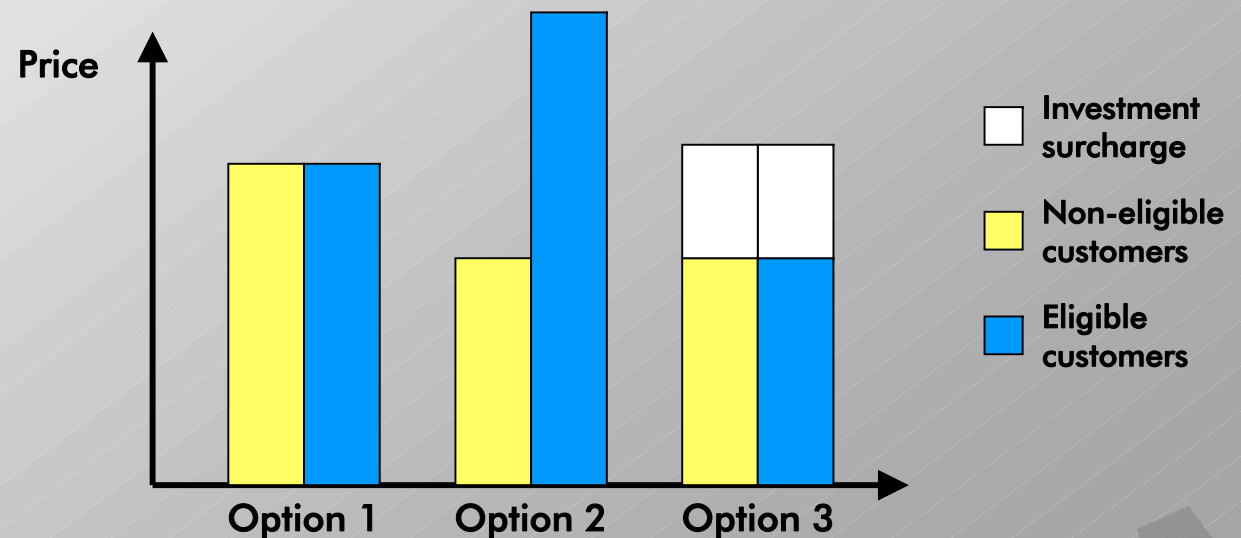
- Regulated prices in the existing WEM are below those likely to exist in a competitive WEM
- The increase is an efficient outcome - prices respond to the need for investment
- The impacts on individual customers will depend on
 - the extent to which efficiency gains from competitive pressures in the new WEM reduce costs
 - the ability of customers to negotiate lower prices (e.g. by offering larger volumes or flatter load profiles)

Transition Options

- **Option 1 - Remove all price regulation**
 - prices rise to finance new investment
 - price shocks for smaller customers
- **Option 2 - Continue to regulate prices in the existing WEM**
 - new investments financed from higher prices in new WEM
 - discriminates against eligible customers supplied from new WEM
- **Option 3 - Regulate prices in both WEM**
 - does not allow prices to rise to fund new investments
 - does not comply with objectives set for the WEM Concept

Funding Investment

- If prices in both markets are regulated, then an investment surcharge will be required
- Otherwise, investments are funded either from the new WEM alone, or from both markets



Next steps

Timetable and Support Requirements

Implementation Phases

- **Three main phases**
 - resolving outstanding questions of market design
 - setting out the final WEM design in a suite of codes and rules, as well as implementing any changes in primary legislation
 - establishing the necessary supporting hardware and software
- **Also need to remove obstacles to viable industry**
 - resolve existing debt 'overhang'
 - ensure this does not recur

Overall Timetable

- Each implementation phase might last for up to a year
- The WEM Concept estimates that implementation of the new WEM in full, might take up to five years
- Four stages of market opening, each lasting for approximately one year

