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

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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	• Generators • Single buyer	• Generators • Suppliers • Traders / intermediaries
Pre-day ahead markets	n/a	• Voluntary bilateral contracts Unregulated prices
Day ahead markets	• Generators submit regulated cost-based bids • Energomarket forecasts total demand • Market price set at SMP of thermal	• Voluntary bilateral contracts • Traded blocks on PXs • Unregulated prices
Within day balancing	• SO balances • Pays and is paid SMP	• SO balances • Generators/demand submit bids and offers to adjust energy
Settlement	• HPs / NPPs receive regulated bid • TPPs receive SMP • Energomarket pays average purchase price	• 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

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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

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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

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Key Proposals:

Market Design
Market Structure
Regulation
Security of Supply
Next Steps

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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?

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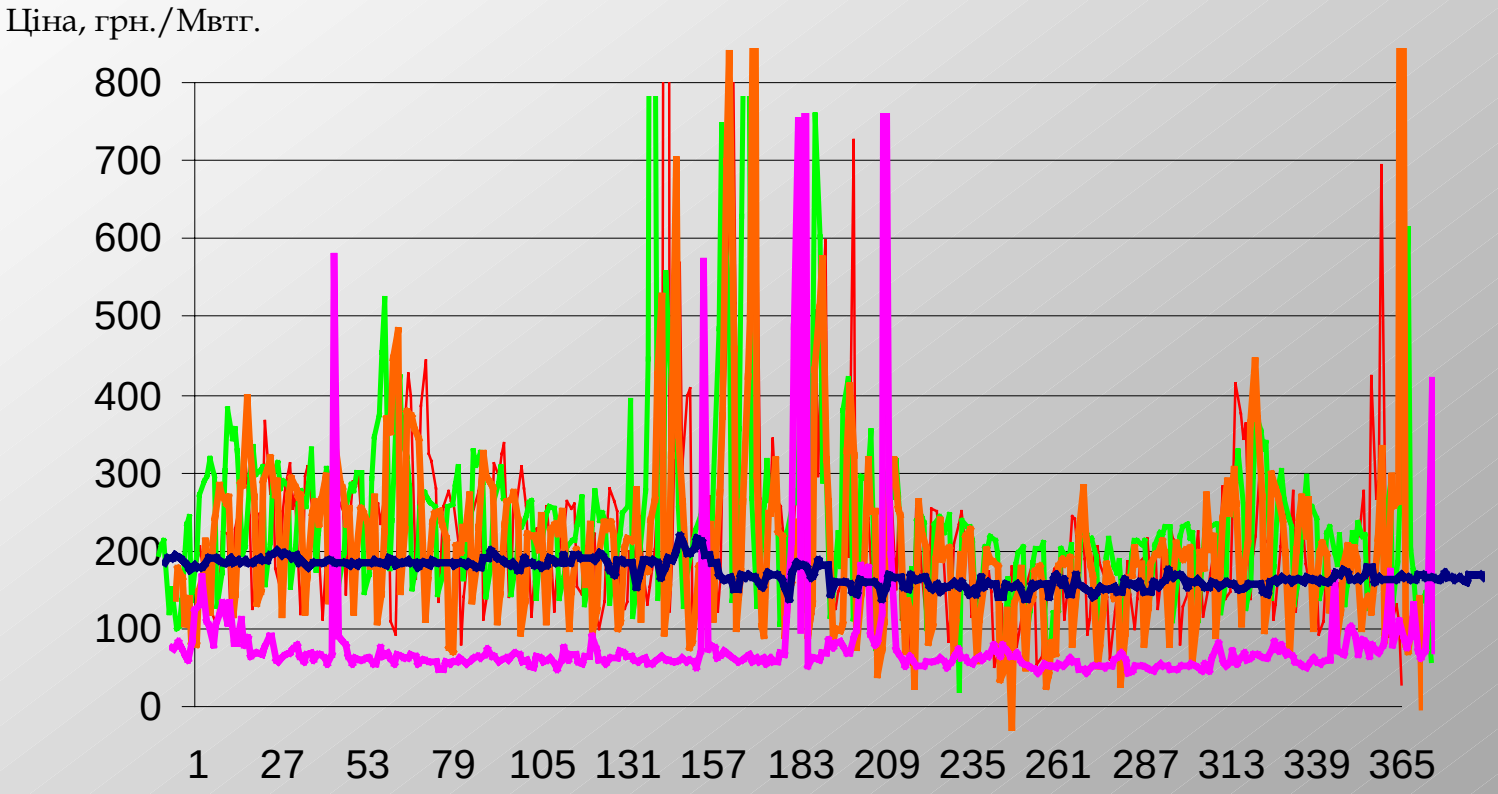
WEM Price Volatility Compared

Коливання ціни електроенергії:

Франція Австрія Австралія Німеччина Україна



Sources: NERC

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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

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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?

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Key Proposals

Market Design:
Scheduling and Dispatch

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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

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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

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Key Proposals

Market Design:
Balancing Mechanism

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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

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Key Issues (II)

- Single or two price regime?
  - single price regime applies same price for spilling 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

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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

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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

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Key Issues

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

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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

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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?

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Key Proposals

Market Structure: Definition of Eligible Customers

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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)

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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

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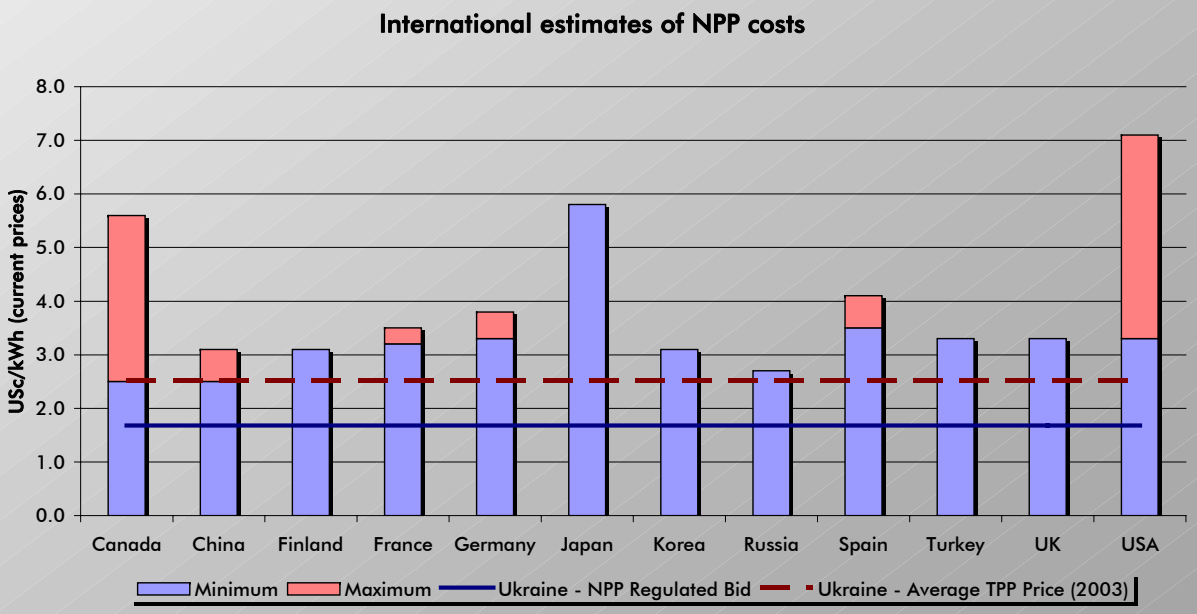
Removing Regulated Caps on NPPs

- 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

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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

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Key Proposals

Regulation:
Market Monitoring

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Institution-al 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)

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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

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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

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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

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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

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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

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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

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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

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Key Proposals

Security of Supply:
Supplier of Last Resort

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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?

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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

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Key Proposals

Security of Supply: Reciprocity in Cross-Border Trade

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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

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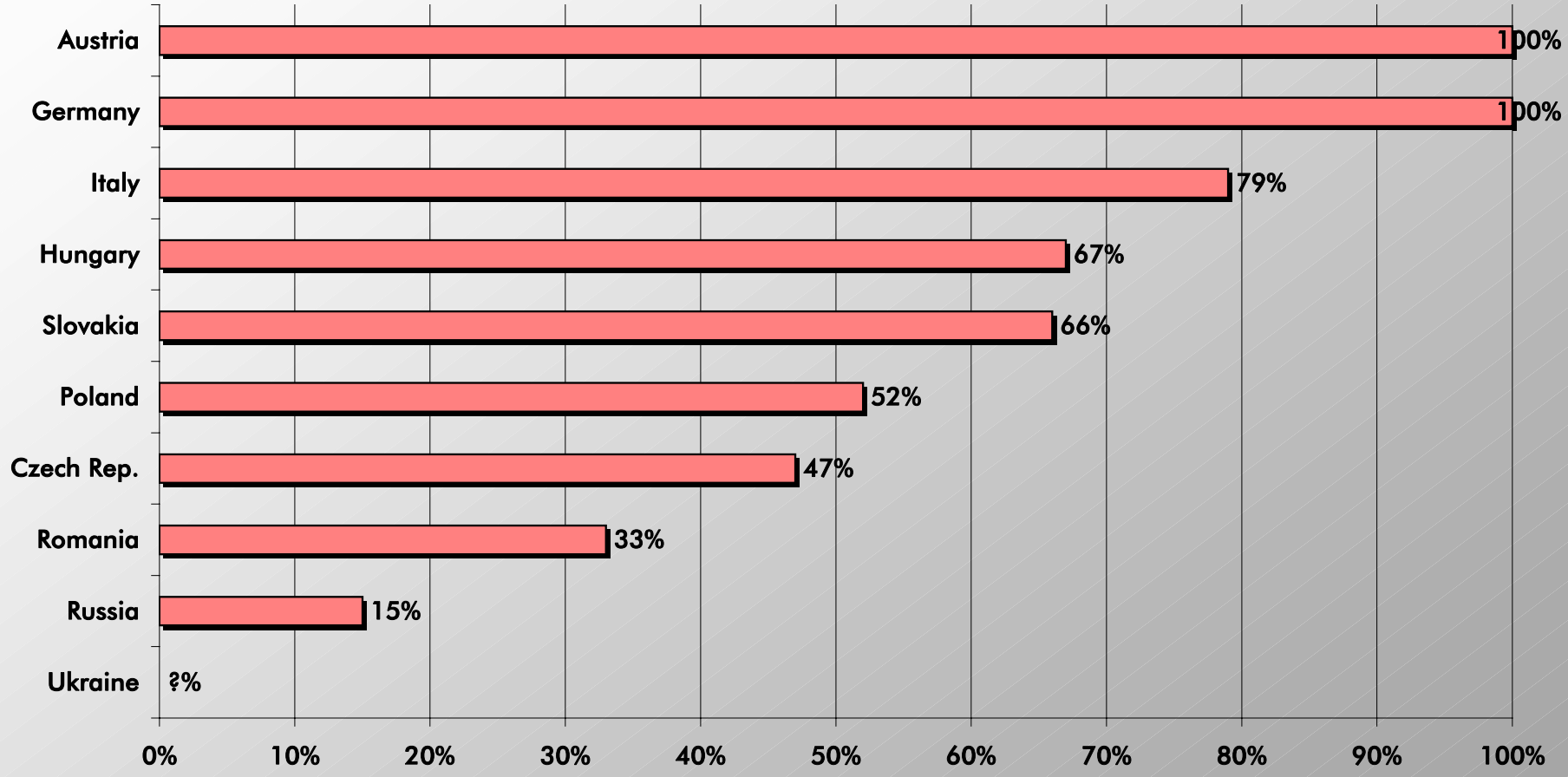
Market opening compared



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

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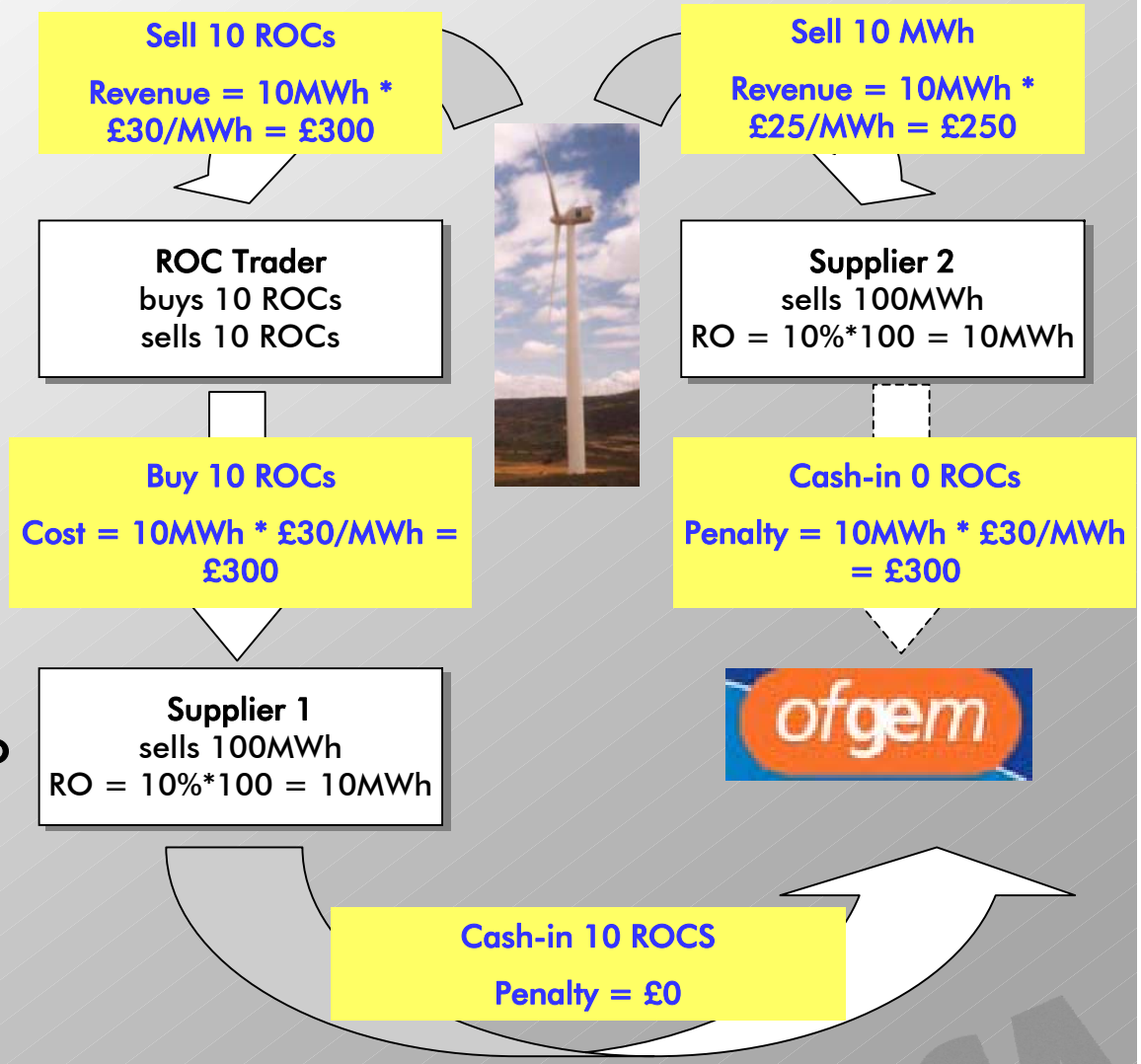
Key Issues

- 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



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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

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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

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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)

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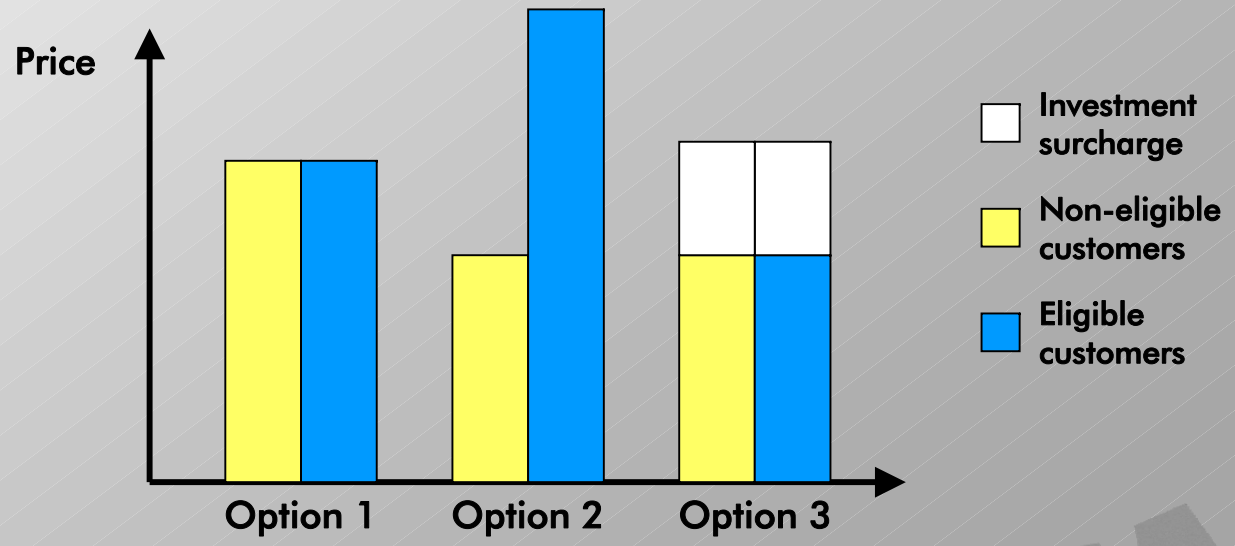
Transition Options

- *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

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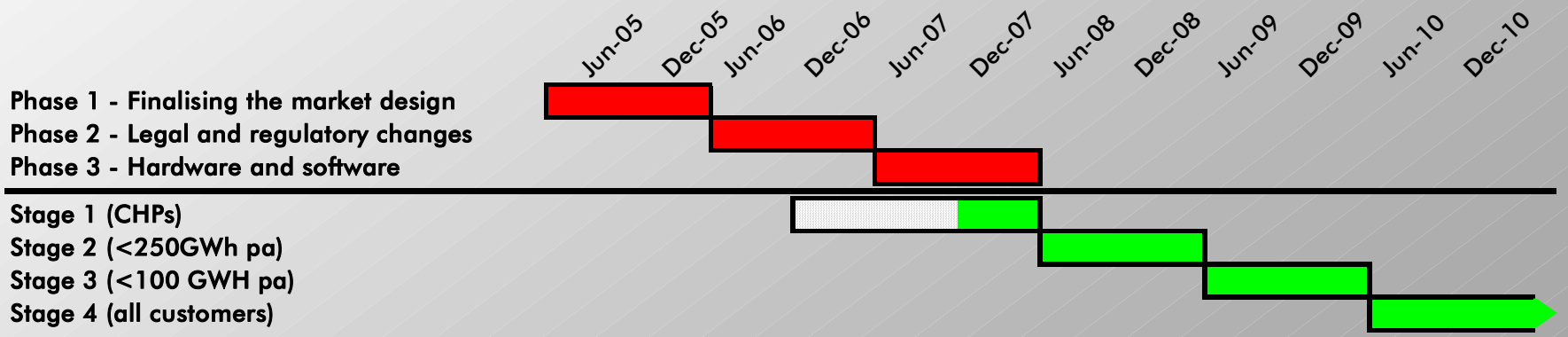
Implement-ation Phases

- 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



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