

Harmonised Ancillary Services Workshop

SONI/EirGrid

29th April & 1st May 2008

Workshop Objective

To initiate a consultative process with all interested parties on the detailed design and implementation of the RAs' policy principles for future harmonised ancillary services, as stated in their Decision Paper of February 2008

Workshop Opportunities

- To re-state the RAs policy decisions regarding future Harmonised Ancillary Services.
- To identify and discuss possible options for how the regulatory policy decisions could be implemented.
- For Market Participants and other stakeholders to contribute to the eventual design of the solutions to be implemented.
- To introduce to Market Participants and other stakeholders the TSOs' Harmonised Ancillary Services Project.
- For the TSOs to listen to and understand the views of stakeholders.
- To invite further contributions from stakeholders after the workshops.
- To set out and inform all of the next steps.

Agenda

- 1. TSOs Introduction**
- 2. RAs Introduction**
- 3. Discussion of Services – how to procure and pay**
 - i. Black Start
 - ii. Reactive Power
 - iii. Operating Reserve
 - iv. Other Services (e.g. Fast response, Frequency regulation)
- 4. Generator Performance**
 - Penalties
 - Treatment of derogations
- 5. Additional potential payments and charges**
 - a) Trips & Fast wind downs
 - b) Short Notice Re-declarations
 - c) Dual Fuel/Multi-mode/Environmental
- 6. TSO Summary**
- 7. RA Summary**
- 8. Next Steps**

Agenda

In Scope:

- **Procurement & Payment**
- **Flexible Solutions**
- **Identify Risks & Issues**

Out of Scope:

- **Challenging RA Decisions**
- **Designing IT Solutions**

EirGrid / SONI Ancillary Services Workshop

Andrew Ebrill [Sarah Friedel],
Manager, CER [NIAUR]

Dundalk, 29th April [1st May] 2008

Background

- **Ancillary Services are not paid for in energy market but are needed for secure operation of the system. E.g. reserve, reactive power**
- **Currently treated separately and differently in RoI & NI**
- **Similarities: paid through TUoS charges by demand customers with cost of c. 0.14 c/kWh in RoI & 0.13 c/kWh in NI**

Northern Ireland	Republic of Ireland
System Support Services (SSS)	Ancillary Services (AS) Generator Short Notice Redeclaration Charges Generator Trip/Fast Wind-down Charges

Background (II)

- **Sept. '06: Following consultation, due to similar costs, RAs decided that separate regimes for AS could continue for SEM go-live without major market distortion**
- **Paper also agreed to review future treatment of AS on island for longer-run**
- **Aug.'07: SOs published Consultation Paper, with RA approval, on various policy options for long-run AS harmonisation across island**

Consultation Paper Proposals

- **AS Unbundling**
- **Regulated approach to Operating Reserve & Reactive Power rather than annual tender/market. Socialisation of costs is easiest**
- **For Black Start, tendered approach for existing gens & negotiated contracts for new generators. Costs should be socialised**

Consultation Paper Proposals (II)

- **Move to incentivise compliance with Grid Code by generators**
- **Proposal to levy charges on a tripping generator, which are a function of its size & rate of change**
- **TSO incentivisation of AS procurement is appropriate**

Consultation Responses

- **Generally supportive of the TSOs' proposals**
- **Majority in favour unbundled arrangements & “regulated rates” over tendering etc.**
- **Clear view emerged for transparent procurement /payment arrangements & supportive of TSO incentivisation**
- **Most responses indicated a preference for socialisation of AS costs**

Decision Paper

- **Published by RAs in February 2008**
- **Sets High Level Principles for AS harmonisation**
- **AS to be unbundled**

Decision Paper (II)

- **Operational Reserve & Reactive Power to be regulated with fixed & variable elements**
- **Penalties for underperformance will be applied**
- **Costs to be socialised**
- **Clarification regarding potential reserve causation for new generators**

Decision Paper (III)

- Black Start will be procured under negotiated long-term contracts via tender or direct award. Penalties for underperformance will be applied & costs to be socialised
- Grid Code incentive methods, Trips/Red-D & Other Issues to be proposed in next Consultation and decided in Q4 Decision

Next Steps

- **This is a key opportunity to input into detailed AS design...**
- **Will feed into Consultation Paper on AS detail**
- **RA Decision Paper on AS due in December**

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Black Start

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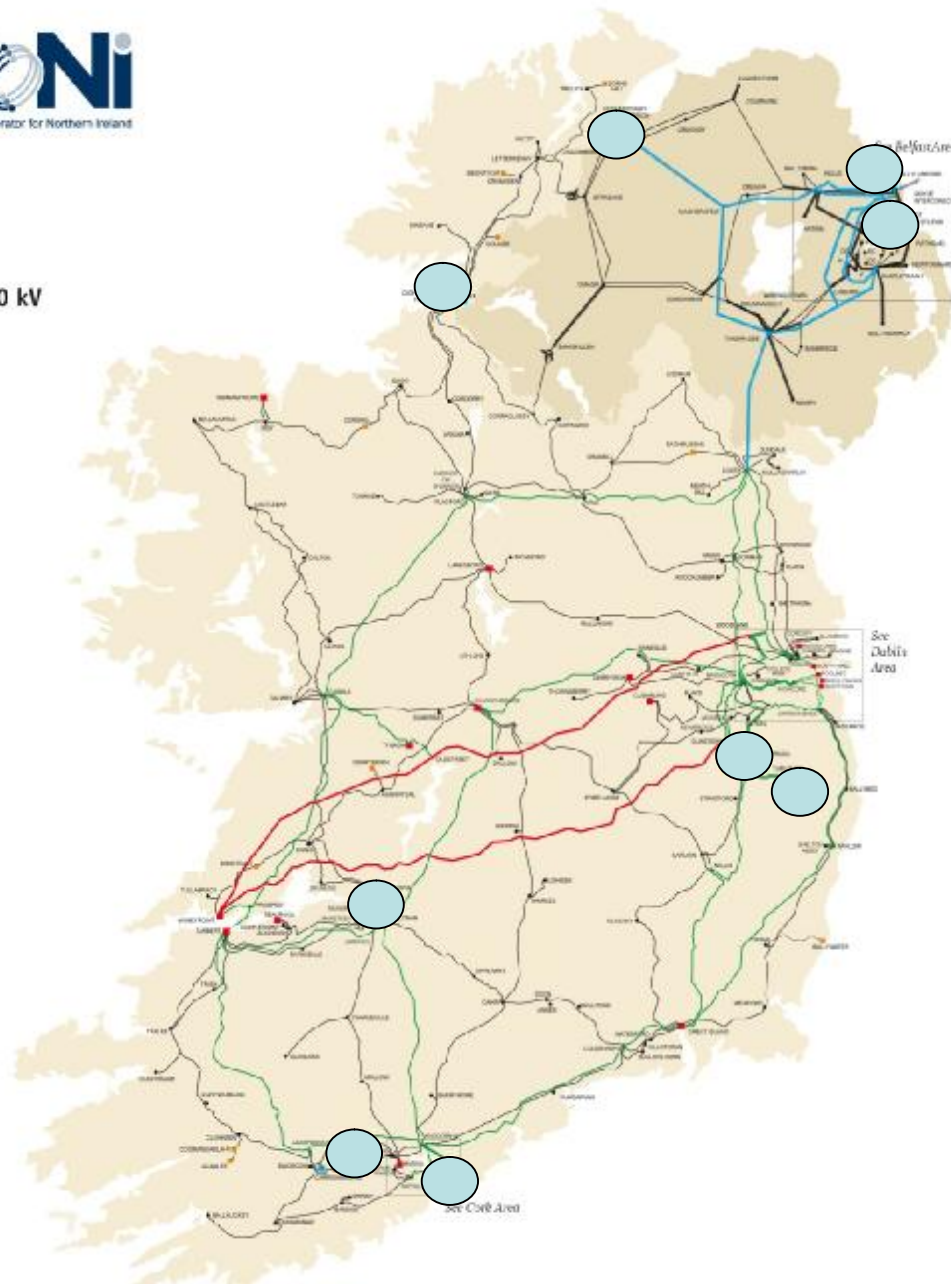


Transmission System
400 kV, 275 kV, 220 kV and 110 kV
October 2007

-  400 kV Lines
-  275 kV Lines
-  220 kV Lines
-  110 kV Lines
-  220 kV Cables
-  110 kV Cables
-  400 kV Stations
-  275 kV Stations
-  220 kV Stations
-  110 kV Stations
-  Phase Shifting Transformer

Transmission Connected Generation

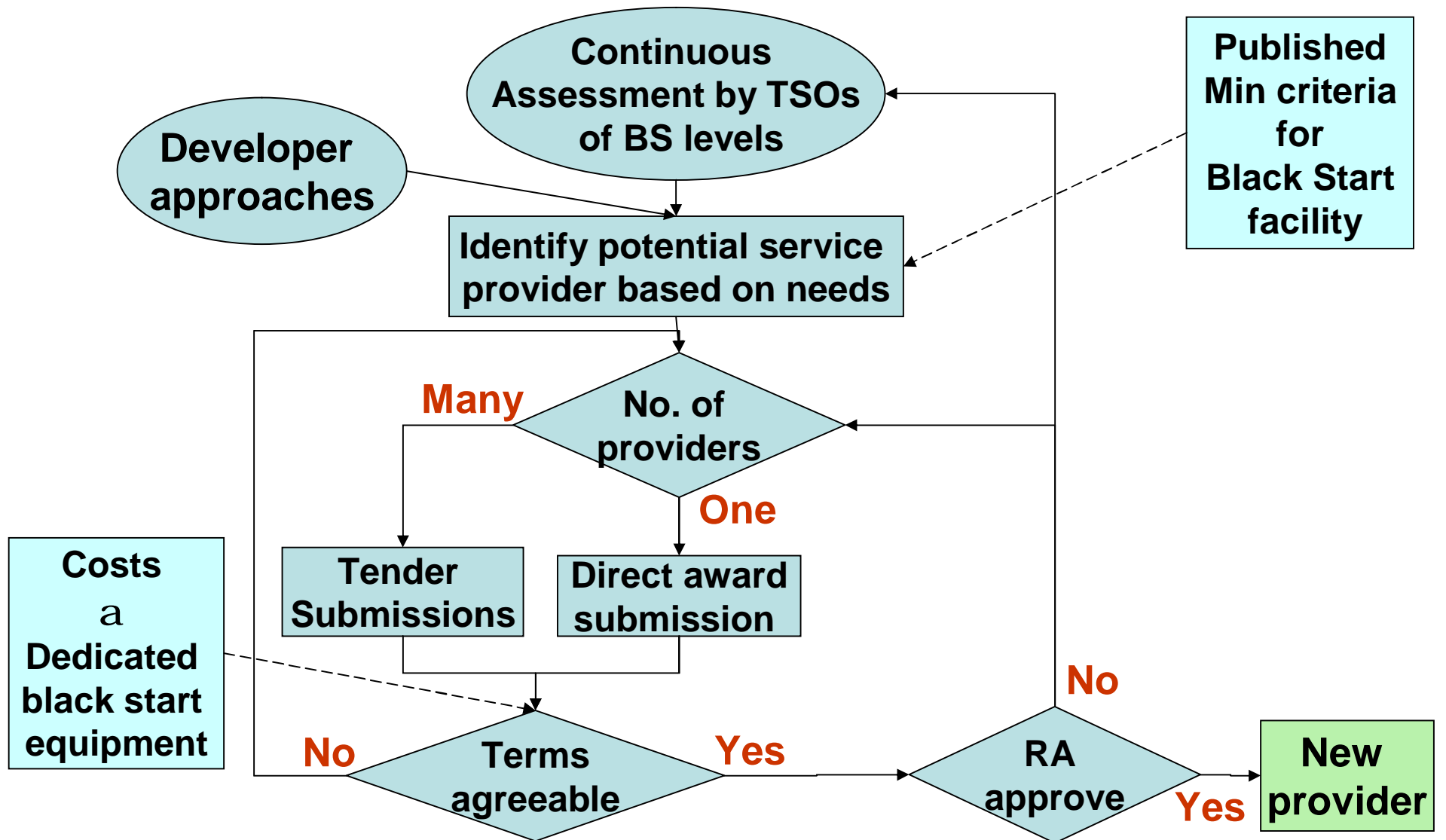
-  Hydro Generation
-  Thermal Generation
-  Pumped Storage Generation
-  Wind Generation



Black Start – Regulators' Decision

- **Negotiated contracts – RA approved**
- Tender process & direct awards with emphasis on transparency and non-discrimination
- Payment based on cost of dedicated equipment
(fixed, maintenance, testing, usage)
- Penalties applicable for non-performance
- Search for new BS plant instigated by either TSO
- Review of BS contracts. Existing BS facilities not disadvantaged with implementation of new arrangements

Black Start – Transparent Process Example



Black Start – Points of Discussion

Early identification of potential new sites

Black Start contract length – Life of plant? 10 years?

Factor in generation capacity of site?

Factor in number of adjacent stations BS provider can start?

If multiple units on site, payment proportional to which units available?

During testing, impact on adjacent units

Black Start – Payment Example (Trading Period Basis)

Generator Maximum Export Capacity	100 MW	
Black Start Unit	1 MW	
Capital Expenditure on BS Unit	€1 M	
Investment/Contract term	10 Years	
Capital Expenditure Annuity	€150 k	} €300 k
Annual Overheads	€ 50 k	
Operating Costs	€100 k	
Rate of Return	6 %	} →
Agreed Availability of BS Rate	95 %	
		→ €40/h

Black Start – Settlement Perspective

Payment: Daily Payment or ½ hour Trading Period Payment

½ hour Trading Period	Generator Declared Available	Black Start Capability Declared Available	Payment
Example 1	Yes	Yes	Yes
Example 2	Yes	No	No
Example 3	No	Yes	No

Testing:

Test Type	Test Result	Penalty Option 1	Penalty Option 2
Generator initiated	Fail	0	0
TSO initiated	Fail	No payments until test passed	3 months payment (In example: ~ €80k)

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Reactive Power

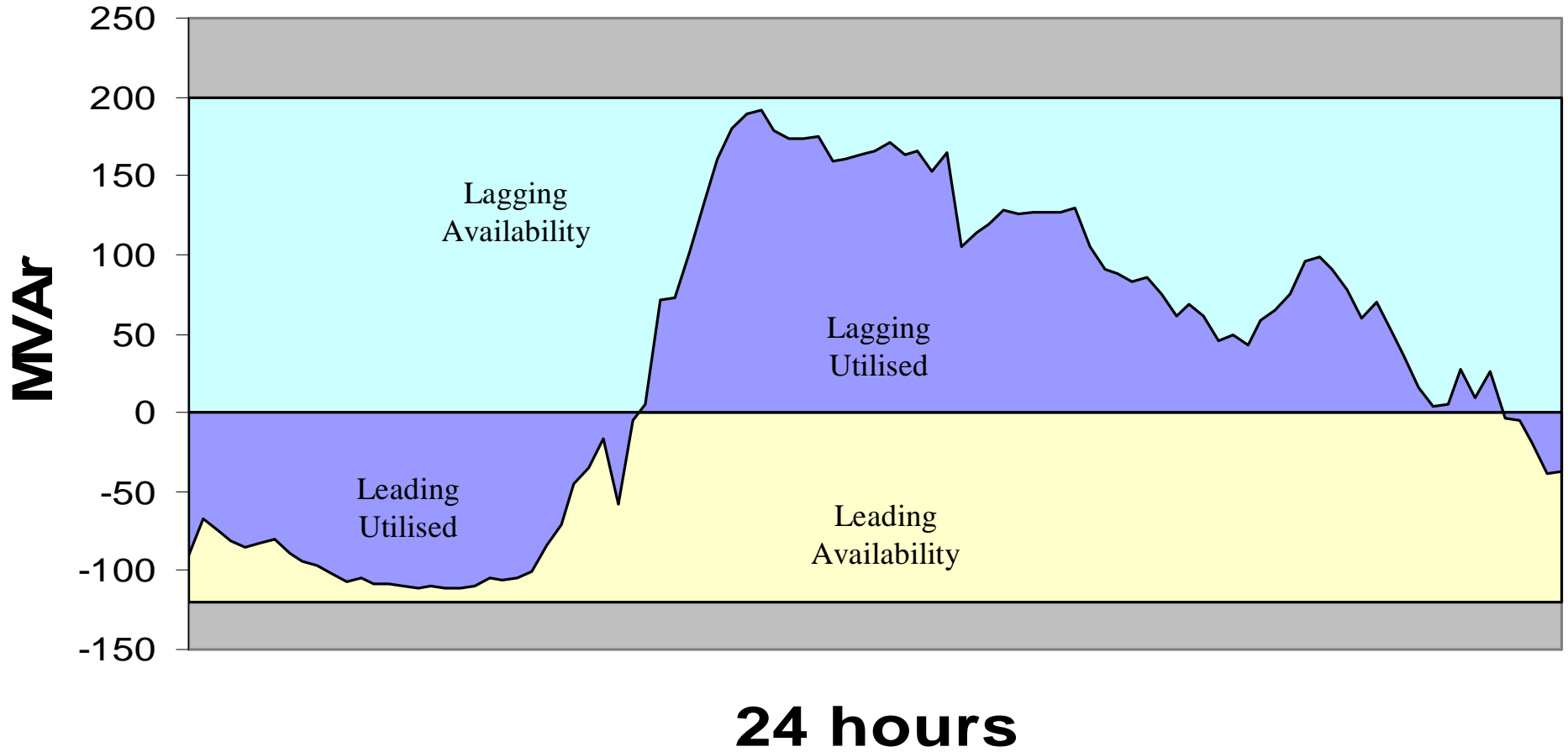
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Reactive Power - Overview

- **Maintain and control the voltage balance on the system**
- **Vital to maintain a secure and stable Power System**
- **Avoid damage to the**
 - **Transmission System**
 - **Generation plant**
 - **Other connected parties**

Generator Unit over a Trading Day



Reactive Power – Regulators' Decision

- ∅ Two rates - FIXED and VARIABLE
- ∅ Penalties for underperformance
- ∅ Longer-term requirements covered in long-term contracts
- ∅ Costs socialised and subject to regulated caps

Reactive Power – Options for Fixed & Variable

Payments for
Availability

Payments for
Utilisation

Payments for
Controllability

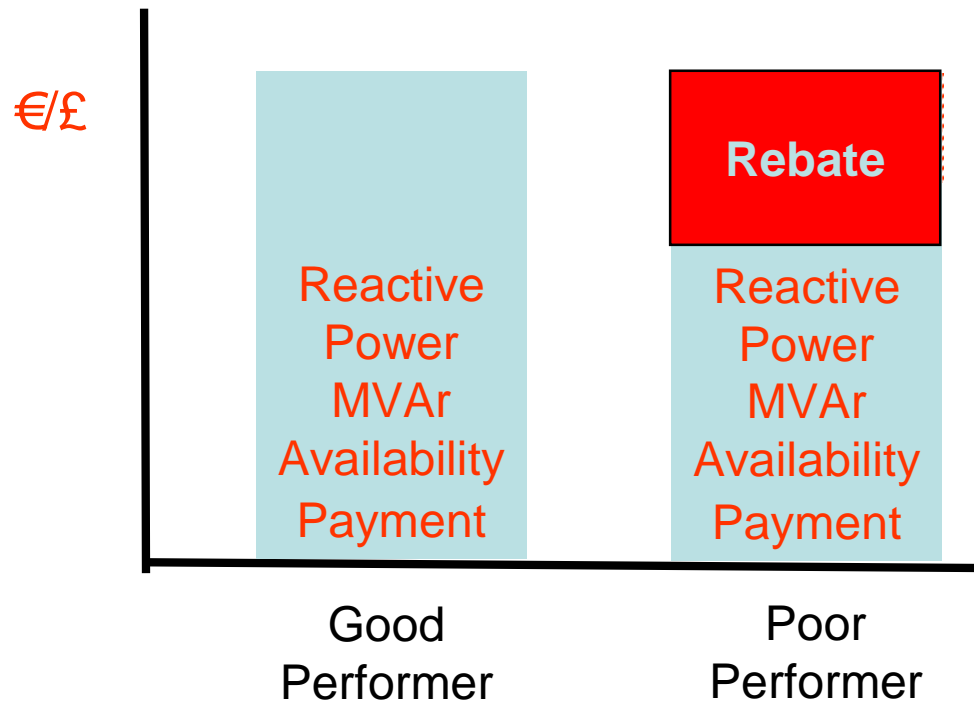
Payments for
Reliability

Payments
Location Based

Rebates for underperformance

Reactive Power – Option A: Availability model

Reactive Power payment on **MVar Availability**

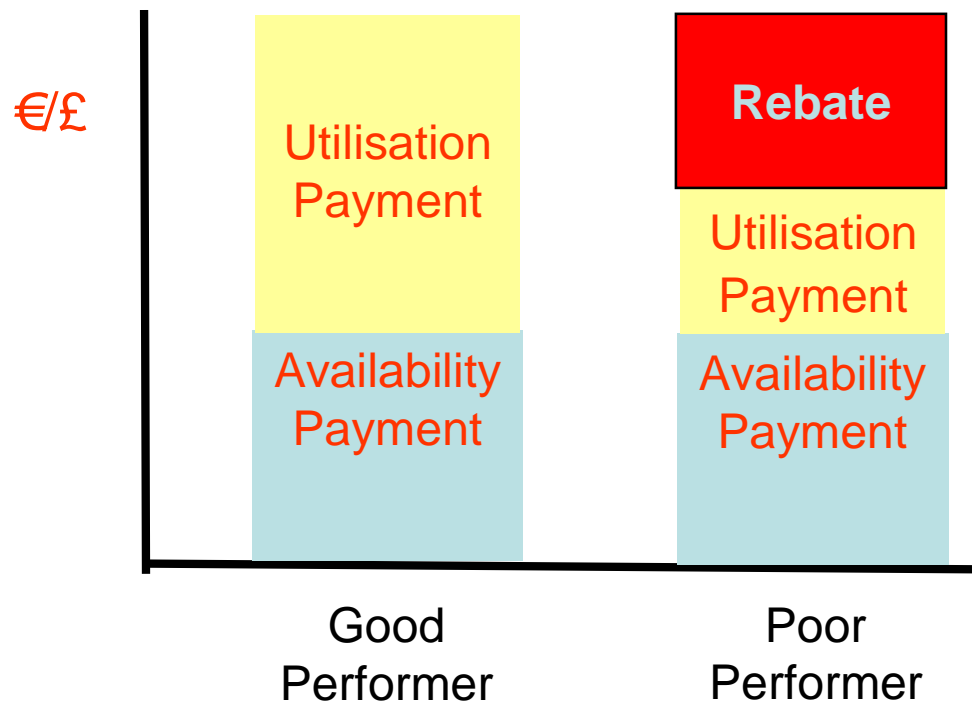


Rebate

eg Reactive Power Capability of the generating unit is reduced

Reactive Power – Option B: Availability & Utilisation model

FIXED FOR AVAILABILITY
VARIABLE FOR UTILISATION



All Units get paid for **both** Availability and Utilisation of Reactive Power

Reactive Power – Other Possible Refinements

Controllability factor

Reliability factor

Differing lag V lead rate

Reactive Power – Option C: Location model

Strong RP Location

Weak RP Location



How should locational rate be calculated?

Example of RP Payments

	TP1	TP2
Availability Lagging	200	200
Payment @ (€0.152 /Mvarh)*0.5	€15.20	15.20
Availability Leading	120	120
Payment @ (€0.152 /Mvarh)*0.5	€9.12	€9.12
Utilisation (Lagging Mvar)	100	50
Utilisation (Leading Mvar)	0	10
Payment @ (€1.28 /MVArh)*0.5	€64.00	€38.40
Total Payment	€88.32	€47.52

Reactive Power – Other Considerations

Consistent Measurement:

Point of measure (Generation or Export)

Device

Tolerance Bands

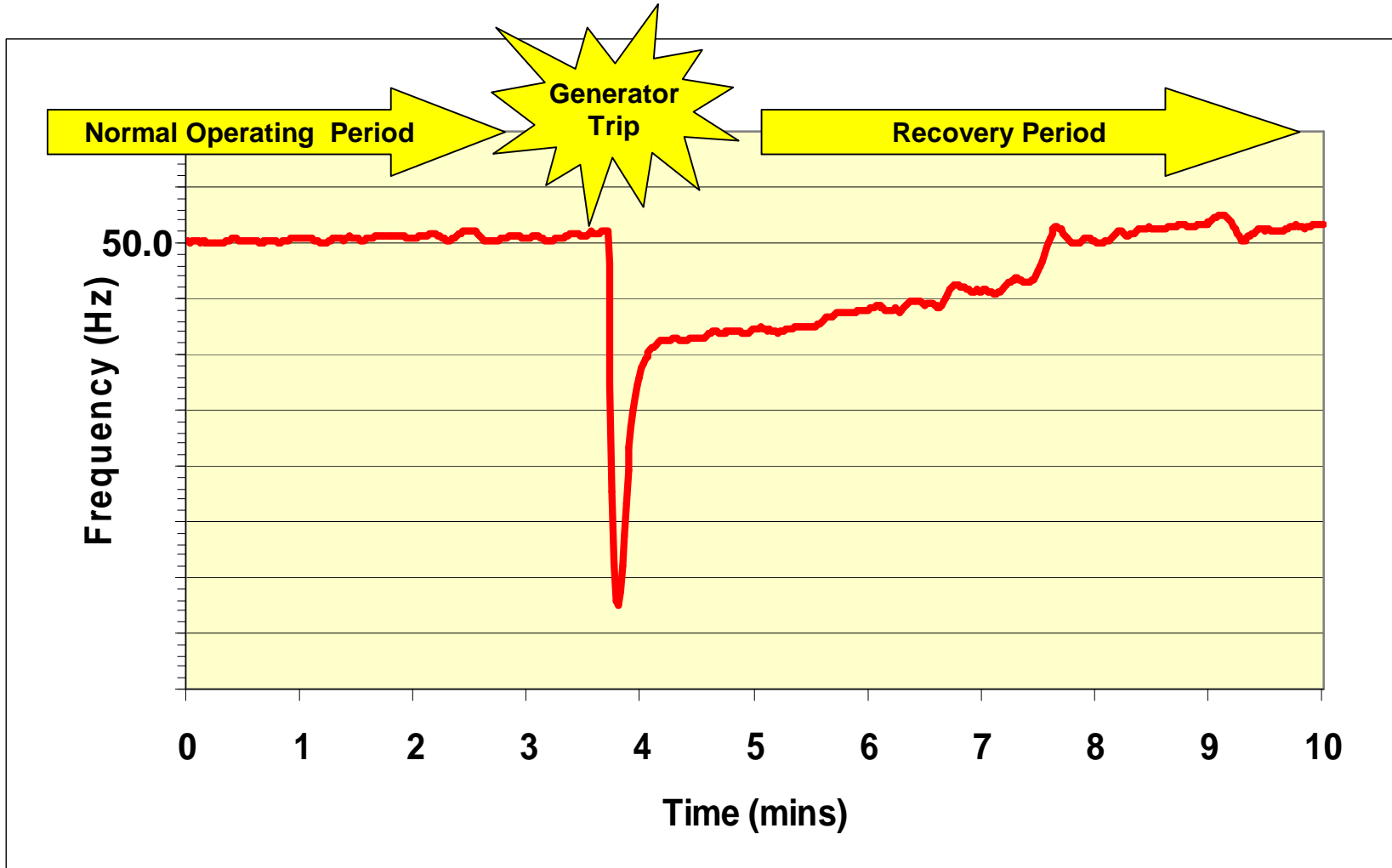
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Operating Reserve

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Operating Reserve – Overview



Operating Reserve – Regulators' Decision

Reserve Remuneration Scheme	Demand Side Management
Reserve Causation	Grid Code Requirement

Operating Reserve – Reserve Remuneration Scheme

- Fixed min **regulated rate** for each reserve type
- Variable depending on system requirements and participant availability
- Regulated max caps on rates or annual expenditure
- Take account of available capacity
- Complementary separate long term contracts
- Penalties

Operating Reserve – System Operators' Perspective

Ensure adequate reserve in place



Pay for Service

Enforce Grid Code

Valuable Service Characteristics

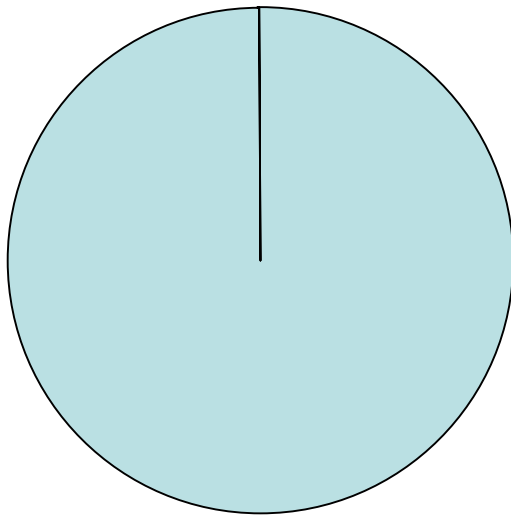
Availability
Reliability
Economic Provision
Controllability

Incentive System Characteristics

Reward providers of best service
Fair
Understandable

Operating Reserve – Option A: Pay for Available

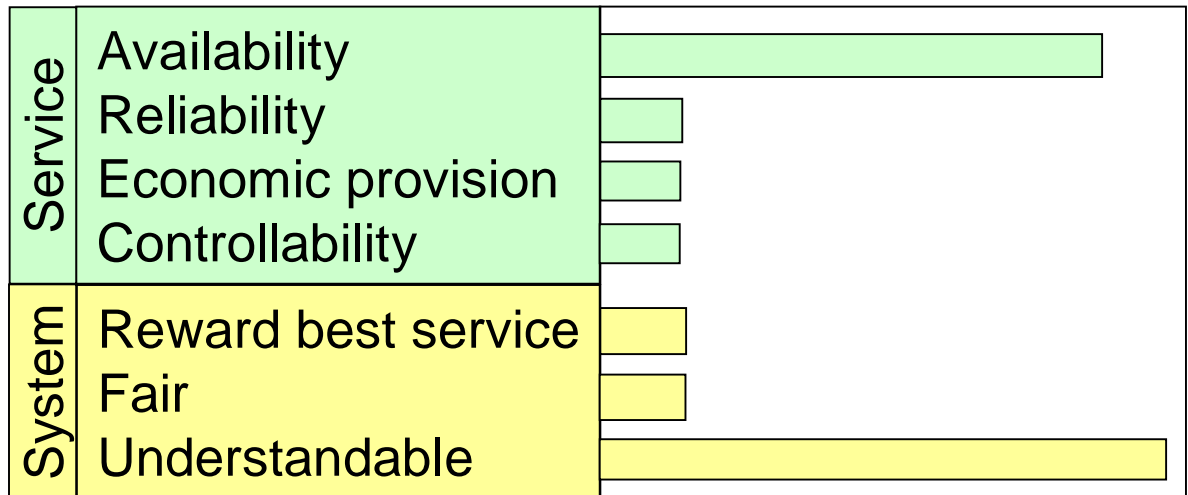
Payment to Individual Provider



■ Availability

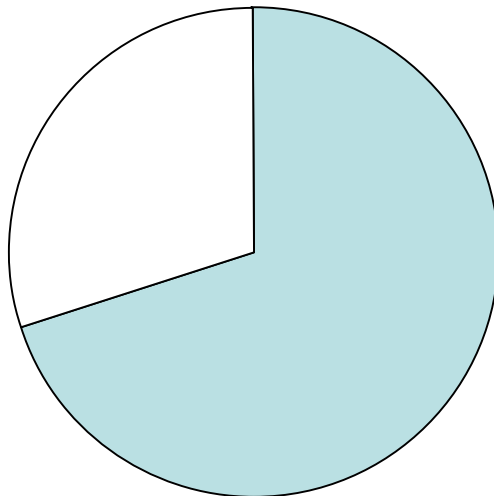
Incentive Effectiveness

Low Medium High



Operating Reserve – Option B: Pay for Available with Rebate

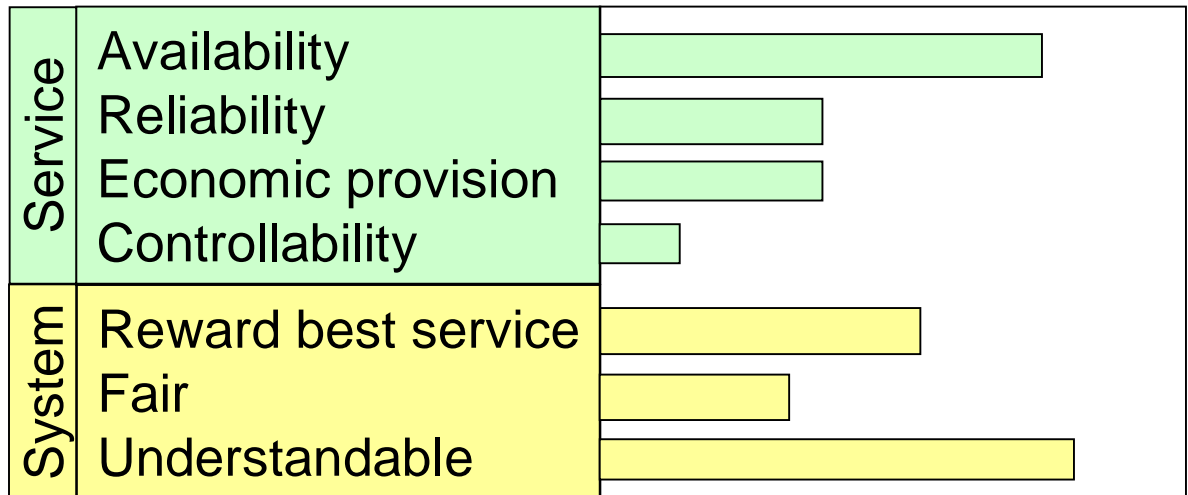
Payment to Individual Provider



- Availability
- Rebate

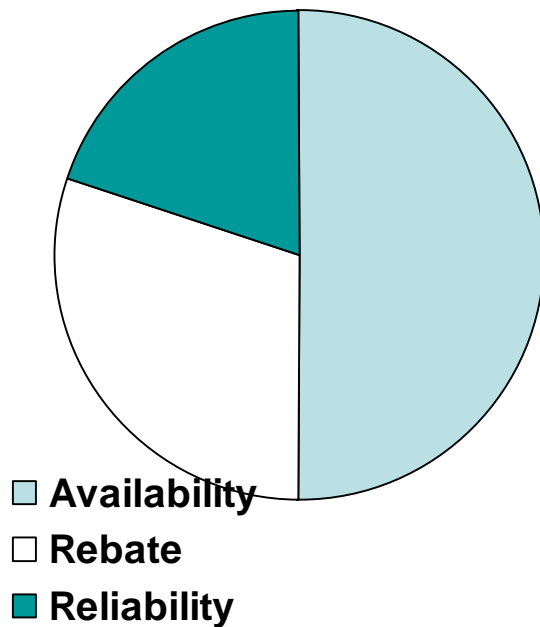
Incentive Effectiveness

Low Medium High

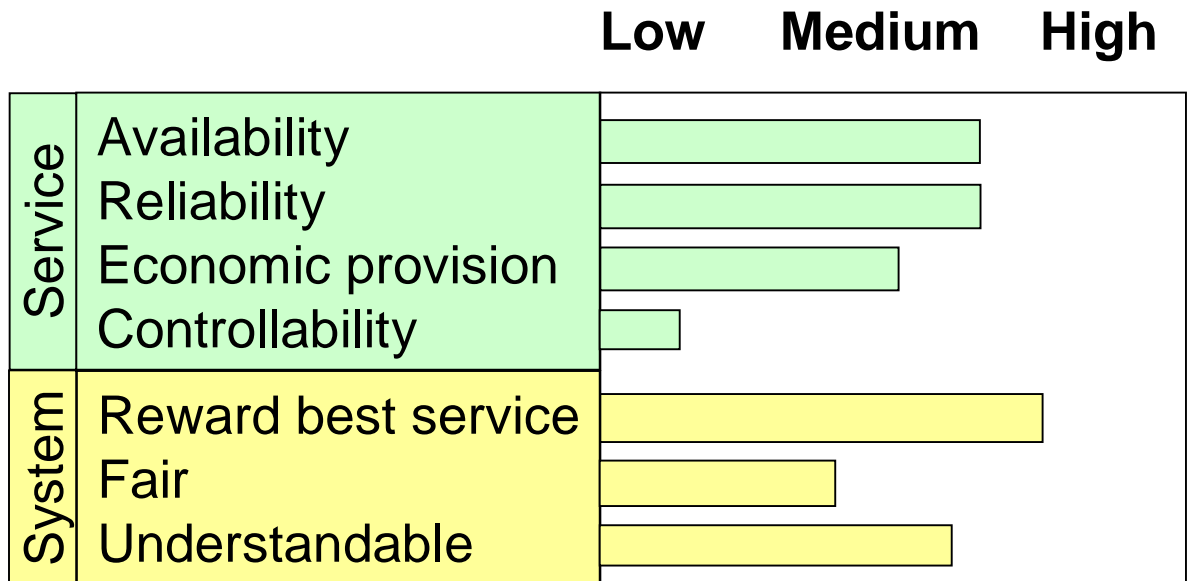


Operating Reserve – Option B2: Pay for Available & Reliable

Payment to Individual Provider

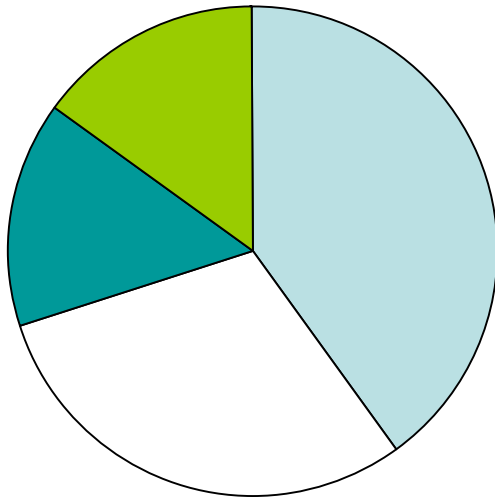


Incentive Effectiveness



Operating Reserve – Option C: Pay for Many Characteristics

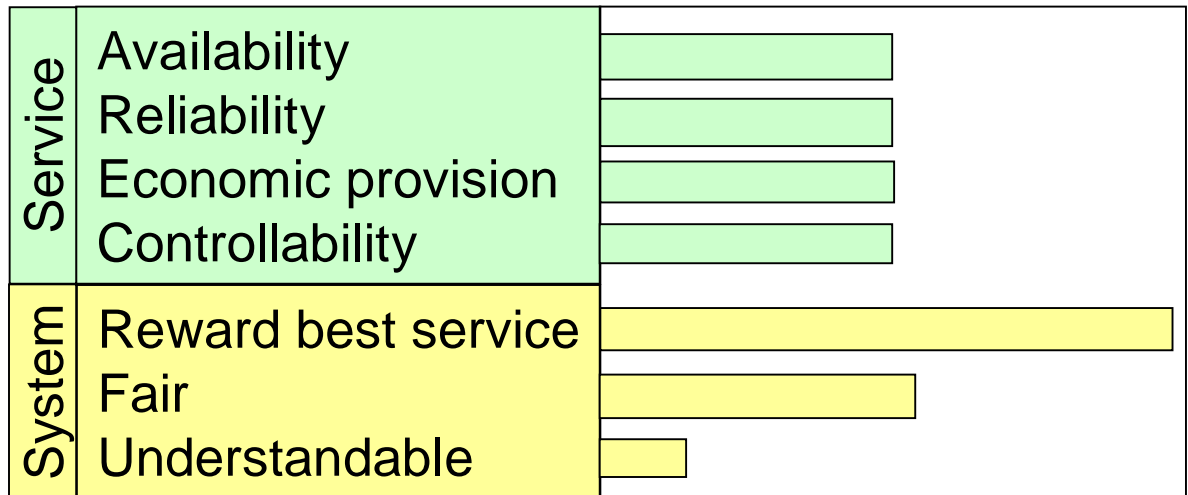
Payment to Individual Provider



- Availability
- Rebate
- Reliability
- Controllability

Incentive Effectiveness

Low Medium High



1 Trading Period OR Payments

Unit 1, Available for 100MW, Average Output = 75MW

	Declared OR	Available OR	Actual OR Rate	OR Payment
POR	20MW	20MW	€1.66/MW	€16.60
SOR	20MW	20MW	€1.5 /MWh	€15.00
TOR1	30MW	25MW	€1.38/MWh	€17.25
TOR2	30MW	25MW	€1.38 /MWh	€17.25
RR	40MW	25MW	€1.15 /MWh	€14.38
Total OR Payments for 1 Trading Period				€80.48

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Other Ancillary Services

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Other Services

- Harmonisation of Existing Services.
- Potential new services:
 - Fast Response
 - Frequency Regulation
- Arrangements for new services will be based on existing arrangements.

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Implementing Generator Performance Penalties

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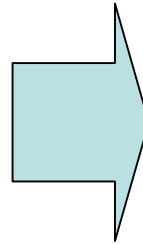
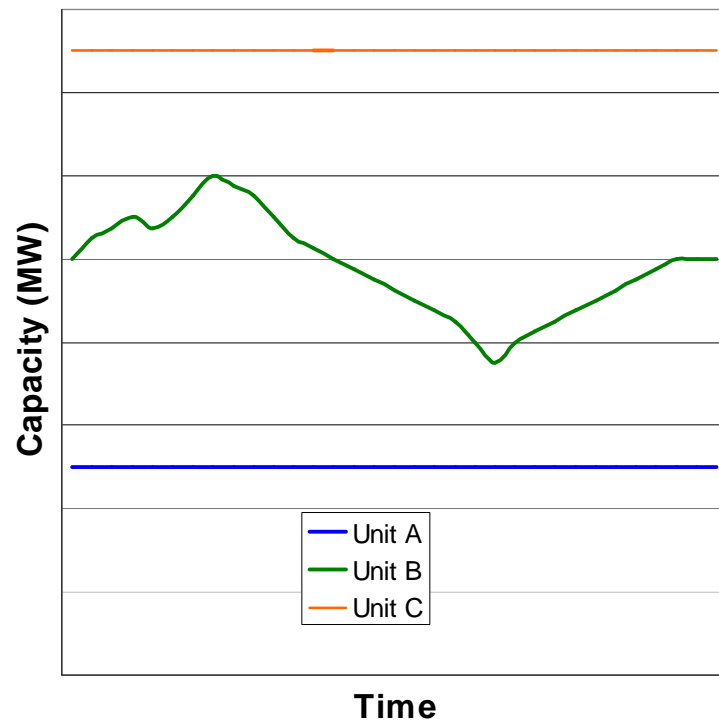
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Why?

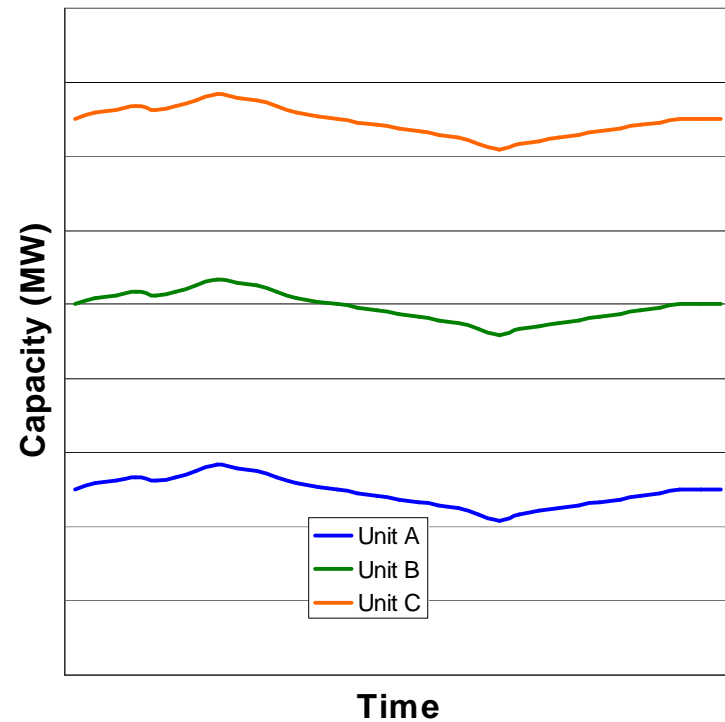
- System Security
- Financial Implications
- Penetration of renewables
- Level playing field for Generation.

Example

Frequency Regulation



Frequency Regulation



Principles

- Beneficial to All Island Inc.
- Polluter Pays
- General Consumers no worse off

Existing Measures

- In RoI – Revoke licence and disconnection
 - Measure too blunt to be effective
- In NI – Penalties in place
 - Performance improved following introduction

International Study

- Financial penalties
 - Limited fuel mix;
 - Limited interconnection; and/or
 - Tight capacity margins
- Disconnection threat is real
- Testing done at regular intervals
- Cost to generators accounts

New Units

- Must be Grid Code Compliant
- If Not:
 - may not be connected;
 - may experience penalties;
 - may be given non-firm access; or
 -

Existing Generators

- Penalties for non-compliance
- Existing derogations?

Escalation in Penalties

- TSO notes non-compliance
- Delays in compliance

Derogation

- Derogation fees shall apply
- Financial and technical assessment
- Time limited derogations only in future.

Charge Options

- Simple set of penalties
 - £ per MW or MVar
- Generator specific penalties
 - Dependant on non-compliance
- Review annually

Distribution of Revenue

- Final end Consumer

Testing

- Compliance verification
 - Event driven
 - Cyclic e.g. annually or every 5 years
 -
- Costs to the Generator's account.

Major Issues

- Alignment of Grid Codes
- Treatment of existing derogations
- Treatment of NIE Energy (PPB) contracted Generators
-

Conclusions

- Should increase system security
- Fair to all stakeholders including Generators
- Should encourage generator performance
- Should increase penetration of renewables

Any Questions??

- What is your opinion on:
 - Causer pays?
 - Simple set of penalties?
 - Fees for derogation assessment?
 - Final end consumer receives revenue?
 - Event Driven Testing ?
 - Existing Derogations?

Any Questions??

- Any additional issues?
- Are there other options for new generators?

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Additional Potential Payments & Charges

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Additional Potential Payments & Charges

Trips & Fast wind downs

Short Notice Re-Declarations

Dual Fuel

Multi-mode operation

Environmental Constraints

In addition: Generator Testing Charges

Next Steps

Workshop Summary Note to issue & publish next week.

SONI & EirGrid welcome all comments within the context of the Regulators' Decision on the implementation of:

- **Harmonised Ancillary Services**
- **Generator Performance Penalties**
- **Additional Potential Payments & Charges**

Comments by 31st May 2008 co-ordinated through:

conor.kavanagh@eirgrid.com
leslie.burns@soni.ltd.uk