

# Charging Condition 3: Intermittent Generation

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# The condition

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- ◆ Review, invite and to consult on alternative methods of treating intermittent generation
- ◆ Bring forward changes by April 2007
- ◆ If no changes publish a report
- ◆ Questionnaire sent out in June 2005

# Issued covered

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- ◆ Interpretation of GB SQSS
  - ◆ Deterministic approach - minimum
  - ◆ Economic assessment - investment level
- ◆ Effect of different treatment
  - ◆ transport model
  - ◆ tariff model
- ◆ Is there sufficient evidence to justify treating intermittent generation differently in the charging arrangements?
- ◆ Related issues

# Licence requirement C7

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- ◆ Discrimination - need to reasonably reflect that such a class has different costs
- ◆ Is there a consistent quantifiable reduction in investment for Intermittent generation ?

# GB SQSS (1)

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- ◆ Deterministic and Economic assessment required
- ◆ Minimum transfer requirement - Deterministic
  - ◆ not designed for current situation
  - ◆ only applies to groups greater than 1500MW
- ◆ GB SQSS methodology is under review
- ◆ Deterministic approach leads to:
  - ◆ Thermal Modelled at 83%,
  - ◆ wind modelled at 60%
- ◆ Local connections, less than 1500MW , treated then same.

# GB SQSS (2)

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- ◆ SQSS also considers economic assessment
  - ◆ level of economic investment
- ◆ Review of proposed works indicates that economic assessment drives equal investment
- ◆ SQSS external review expected to conclude March 06

# SQSS Process

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- ◆ SQSS removes plant above 120%
- ◆ Factor then applied to plant by type
  - ◆ Thermal =1, Wind =0.72
- ◆ In importing areas wind assumed as 0
- ◆ Plant is then scaled to meet demand
  - ◆ Multiplied by 0.83
- ◆ Interconnection Allowance calculated
- ◆ Required transfer calculated
  - ◆ minimum level for security
- ◆ Economic assessment performed
  - ◆ economic level of investment

# Calculate Plant Margin and set Non Contributory Generation

	ACS demand (restricted) (GW)	Thermal Generation (GW)	Renewable Generation (GW)	Total Generation
Zone 1	6.85	8.699	2	10.699
Zone 2	57	68.4	0	68.4
Total	63.85	77.099	2	79.099

Plant margin of study

System 24%

Margin used

0.2

Non contributory generation

GW

2.479 3.134%

Generation adjusted for non contributory

	Total	Thermal		
Zone 1	10.364	8.364	Check PM	20.0%
Zone 2	66.256	66.256		
Total	76.62			

# Scaling of generation to meet demand

Availability factors (A)

	export, Z1	import, Z2
Conventional	1	1
Renewable	0.72	0

GB loss factor	2.2%
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	ACS demand (GW)	Contributory generation (GW)	Contributory conventional	Contributory renewable	P conventional	P renewable
Zone 1	6.85	10.364	8.364		2	7.176
Zone 2	57	66.256	66.256		0	56.844
total	63.85	76.620	74.620		2.0	64.019

65.255  
65.2547

GB transmission losses at time of peak (GW)	1.40
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S factor	0.858
Sfactor * Renewable availability factor	0.618
Margin	0.239 ok

# Calculate Required Transfer

	demand	thermal	renewable				
Zone 1	6.850	7.176	1.235				
Zone 2	57.000	56.844	0.000				
Calculation of IA							
Transfer from zone 1 to zone 2				1.561		Under planned conditions	
Sum demand and generation in zone 1				15.261			
Twice ACS peak				127.700			
Sum of demand and generation in smaller zone over twice ACS peak as a percentage				11.951			
IA as a percentage of total ACS peak				2.083		from circle diagram formula	
IA *peak ACS demand				1.330			
Required transfer (planned + half IA)				2.226		from SQSS	

# Economic assessment - example

Plant in Zone	<b>Existing thermal / new thermal</b>		
Volume at risk		0.483	GW
cost of risk		12,075.00	£ / h
cost over 1 year		1,449,000.00	£ / year
cost benefit	adequate capacity thermally		
Plant in Zone	<b>Existing thermal / new wind</b>		
Volume at risk		0.918	GW
cost of risk		22950	£ / h
cost over 1 year		2,754,000.00	£/year
	justify additional build		
Scenario a			
Plant in Zone	<b>New wind</b>		
Volume at risk		0.918	GW
cost of risk		55080	£ / h
cost over 1 year		6,609,600.00	£/year
cost benefit	justify additional build		

# Modelling

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- ◆ Modelled 1000MW wind and then reduced contribution in tariff and transport to show effect
- ◆ In tariff only
  - ◆ MWkm differentials do not change
  - ◆ Generation tariff increases very slightly
- ◆ In transport only
  - ◆ Differentials reduced
  - ◆ Affects demand and generation tariff
- ◆ In transport and tariff
  - ◆ Generation tariff and transport changes cancel
  - ◆ Demand tariffs increase
- ◆ Maximum tariff change under £0.5

# Wider issues

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- ◆ GB SQSS deterministic approach under review
- ◆ CUSC interaction
  - ◆ Linkage to rights
  - ◆ Tradability
  - ◆ Does intermittent need a different product?
- ◆ RETS £250 / GW
  - ◆ approximately £21/kW per annum

# Summary

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- ◆ 60% comes from the deterministic criteria
- ◆ Economic investment set by economic assessment
- ◆ No evidence that economic investment proposed for current schemes is less for intermittent
- ◆ Deterministic approach in GB SQSS is under review
- ◆ Will keep under review, but no justification at present to change charges for intermittent generation.