

Operational Perspective

Michael Burke
Power System Control EirGrid



Real Time Power System Operation

50 Hz:
Generation = Demand

Safe, Secure and Economic
Operation of Power System

Control Centres:
NCC & CHCC

Bulk Transfer of Power on
Physical Transmission System

Single Electricity Market
(SEM): EirGrid & SONI



Current Implementation

- EirGrid:
 - Energy Management System (EMS) SCADA used for wind dispatch
 - Specific Wind Dispatch Tool used (non-standard EMS functionality)
 - Automatic setpoint calculation and multiple setpoint issue
 - Setpoint issued directly to wind generator control system
 - Relevant Market Instructions are automatically formed from EMS tool
- SONI:
 - EMS SCADA used for wind dispatch (separate EMS from EirGrid; same vendor)
 - No specific tool: individual wind generator setpoint issue
 - Setpoint issued directly to wind generator control system
 - Electronic Dispatch Instruction Logger (EDIL) used to generate market instructions



Current Dispatch Methodology

- Hierarchy
 - i. Windfarms which should be controllable but do not comply with this requirement/are not derogated from same
 - ii. Windfarms which are controllable
 - iii. Windfarms which are not required to be controllable/are derogated from this requirement/those in commissioning phase
- Methodology
 - EirGrid:
 - Curtailment: Pro Rata with respect to wind generator *availability*
 - Constraint: Managed on a case by case basis (Pro Rata if possible)
 - SONI:
 - Rota system for both curtailment and constraint



Why is a new tool required?

- New concepts and more complex calculation of wind generator setpoints:
 - Curtailment: Pro rata with respect to wind generator *actual power output*
 - Defined Constraint Groups
 - Grandfathering of Constraints:
 - Category 1,2,3, Firm, Partially-Firm, Non-Firm, Gate 3 etc.
 - Pro rata within bands
- SONI do not have a tool at present
- Increasing number of wind generators:
 - More automated process required
- Reporting of wind dispatch



New Wind Dispatch Tool: Project Overview

- Joint project between EirGrid and SONI
- Separate Implementation in EirGrid & SONI
 - Same look & feel
 - Similar interface with market systems
 - Different EMS environment
 - Jurisdictional wind dispatch
- Same Dispatch Methodology in EirGrid & SONI
- Using existing EMS vendor
- Target Q2 2014



Wind Dispatch Tool: Project Detail

- 3 Month Planning Phase
 - Ongoing in Q2 2013
 - Finalising specification for vendor
 - Develop prototype to test various dispatch scenarios
- 9 Month Implementation Phase
 - Vendor build phase
 - Factory and Site testing
 - Roll out in EirGrid and SONI
 - May be separate timelines for NCC and CHCC
 - Possibilities for streamlining will be investigated



Future EMS Developments

- EMS Integration Project
 - Integration of existing EirGrid and SONI EMS into single All Island EMS
 - Upgrade to latest EMS software available from vendor
 - Will facilitate all-island power system control (subject to licensing, regulatory approval etc.)
 - New Wind Dispatch Tool will be “ported” to this environment
 - Project planning phase complete
 - Target implementation Q1 2015



Operational Services and Performance

Karl O’Keeffe
April 16th 2013



Agenda

1. SEM-11-062 - Controllability Updates.
2. Grid Code, Modifications and Testing (Ireland).
3. DS3 Testing Review (EirGrid and SONI).



SEM-11-062

Background

- (i) WFPS that do not comply with this requirement/are not derogated from same; (circuit breaker used if active power controls are not working).
- (ii) Controllable WFPS; (wind dispatch tool).
- (iii) WFPS which are not required to be controllable/are derogated from this requirement / those in commissioning phase; (wind dispatch tool).

Categorisation Policy document

- 1st of December 2012 – Controllable WFPS.
- 1st of December 2013 – Operational Certificates (justification).

Performance Monitoring Process

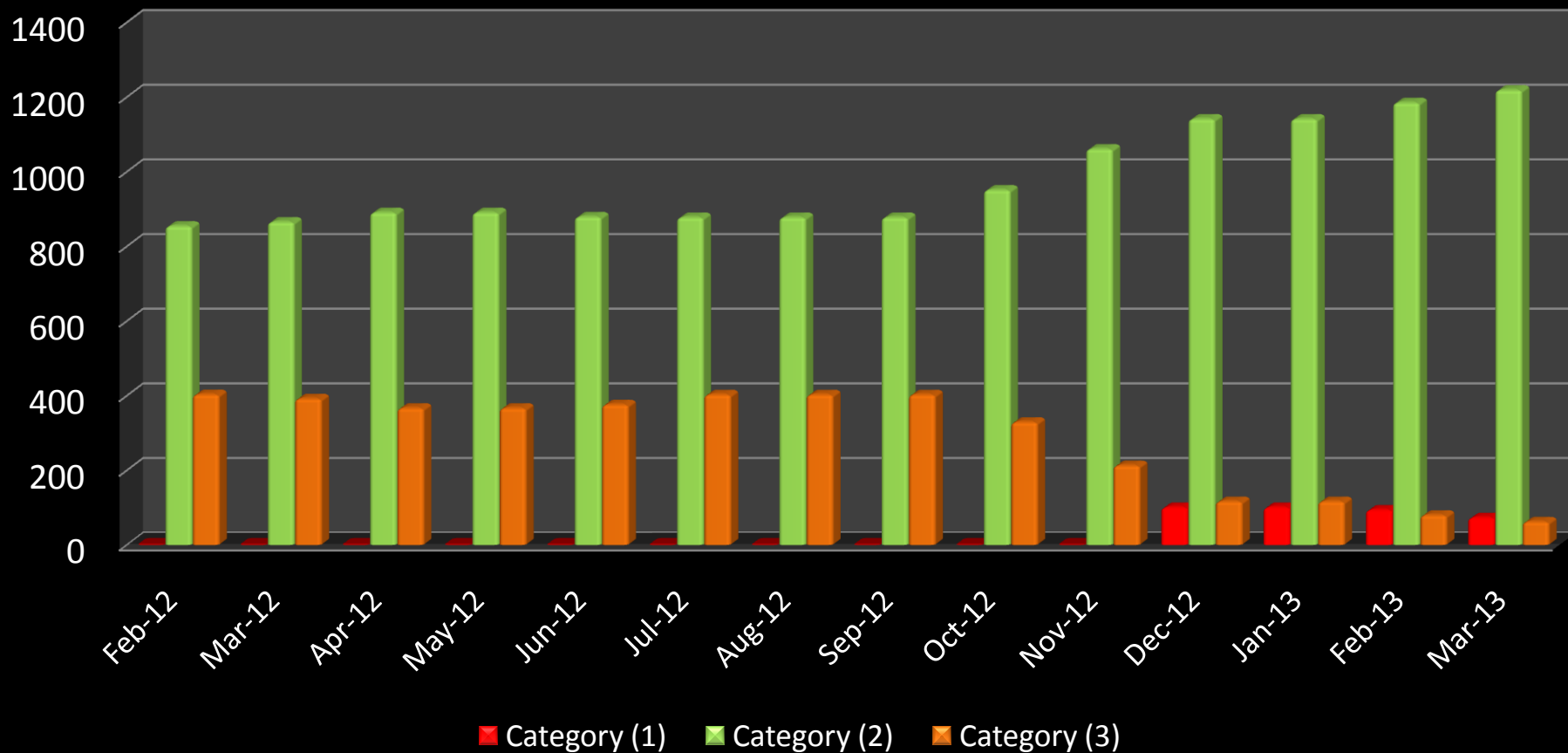
- 1st of February – Moving Categories for non-Controllable WFPS.



Further details published on www.eirgrid.com.

WFPS Controllability updates

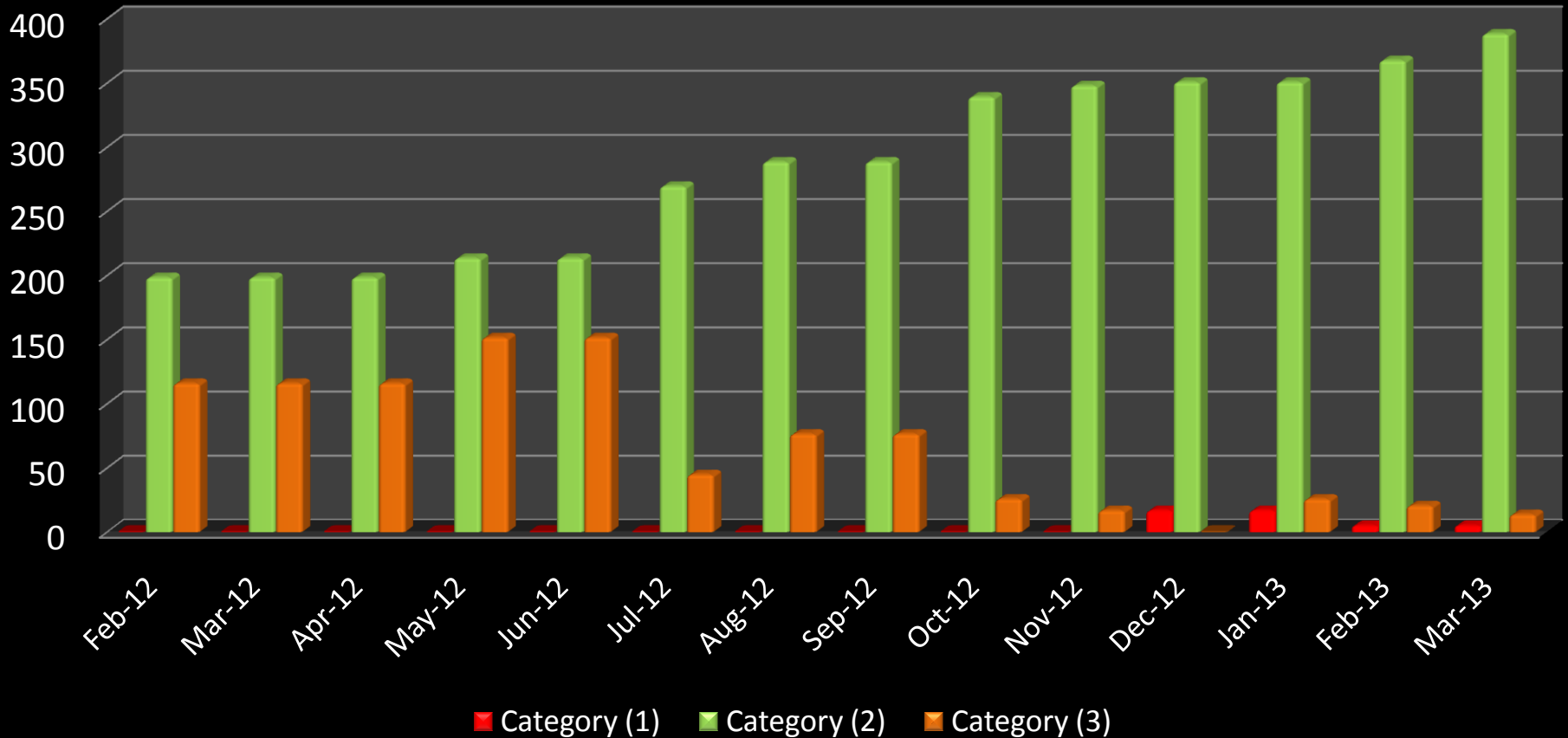
Categories of Controllability Ireland



Mar-13	MW
Category (1)	72.95
Category (2)	1218.8
Category (3)	62.1

WFPS Controllability updates

Categories of Controllability Northern Ireland



Mar-13 **MW**
Category (1) **5.1**
Category (2) **388.3**
Category (3) **13.8**



Grid Code, Modifications and Testing Ireland



Grid Code

- Modifications since Version 4.0 published.
<http://www.eirgrid.com/operations/gridcode/modifications/>
- A new version of the Grid Code Version 5.0 to be published in Q2 2013.
- Any User, the TSO or the CER can propose a modification.
- Modifications are proposed to the Grid Code Review Panel (GCRP), who recommends to the CER for approval.
- Modifications are effective from the date that they are approved by CER.
- The GCRP Members and area of representation
<http://www.eirgrid.com/operations/gridcode/membersconstitution/>



WFPS Grid Code Modifications

MPID	Description	Summary	CER Approved Effective Date
230	Fault Ride-Through	Active and Reactive Power responses redefined to offer a rapid response from during and after a system event.	26/02/13
228	Reactive Power	New reactive power specifications.	26/02/13
227	Frequency Response & Ramp Rates	Clarify the requirements on Ramp Rates and frequency.	26/02/13



Further information from GridCode@eirgrid.com / Arlene Chawke – (01 23701) or a GCRP representative

Next Steps

TSO will

1. Write to Wind Farm Power Stations (WFPS) seeking confirmation of compliance with Modifications.
2. Publish and present guidance notes for JGCRP in May.

WFPS to Submit to gridcode@eirgrid.com

1. Derogations as applicable.
2. Mitigation actions.
3. Timelines for testing and implementation.

Compliance Testing

1. Test procedure & Test Request Dates submitted by WFPS to generator_testing@eirgrid.com



DS3 Performance Monitoring and Testing Work stream

EirGrid, SONI Testing Review



EirGrid, SONI Testing Review

No.	Workshop	Date / Venue
1.	Centrally Dispatched Generator Units (CDGU) Review of Existing Process	EirGrid Offices 29/08/2012
2.	CDGU Recommendations	Ballymascanlon House, Dundalk 08/10/2012
3.	Wind Farm Power Stations (WFPS) Review of Existing Process	Crowne Plaza Hotel – Dundalk 19/11/2012
4.	WFPS Recommendations	EirGrid Offices 23/01/2013

Progress update on Recommendations to Joint GCRP – May 2013



Workshops and Recommendations published:

<http://www.eirgrid.com/operations/gridcode/compliancetesting/>

Contacts

Generator_testing@eirgrid.com

Or

connections@soni.ltd.uk



Gate 3 Offer Execution

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Gate 3 Offer Execution

- Validity Periods
- Process for executing TSO Offers
- Modifications of Live and Executed Offers



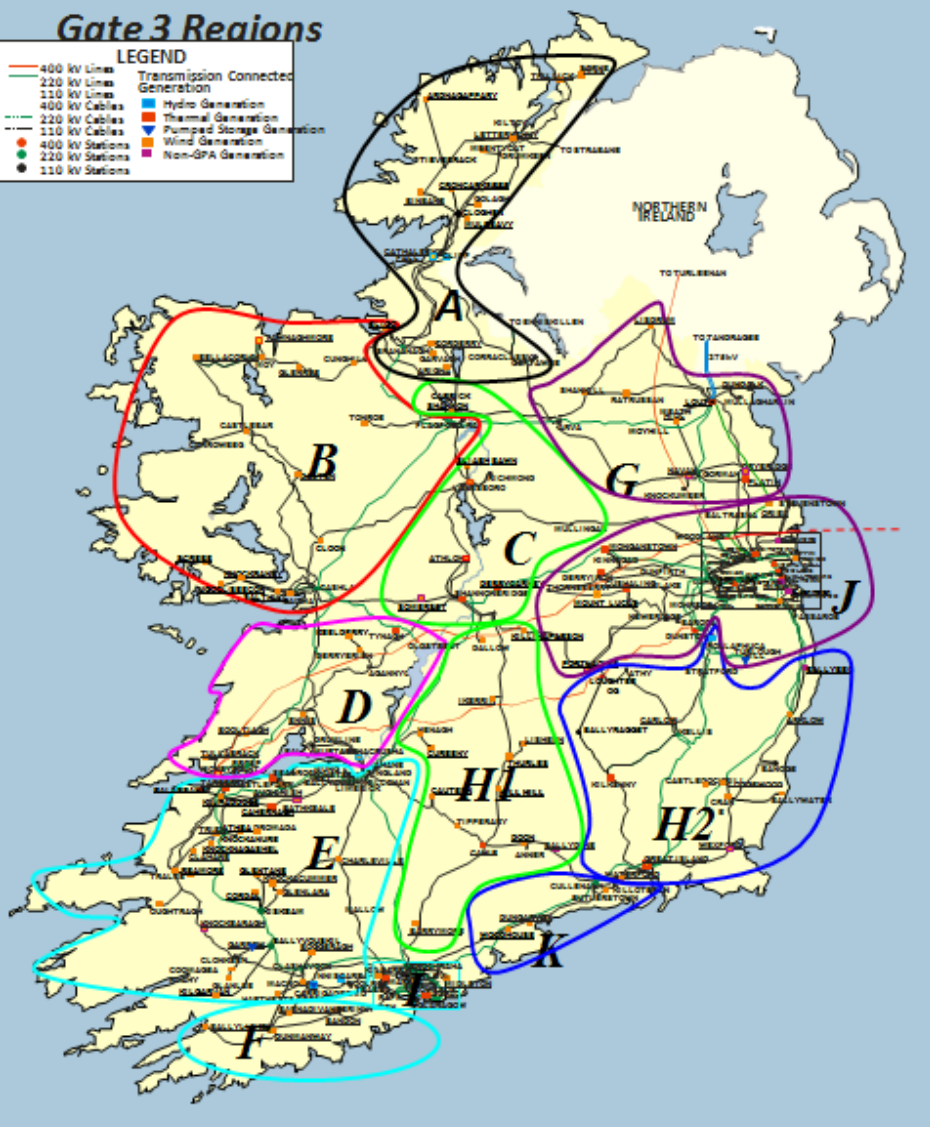
Gate 3 Offer Validity Period

- Offer Validity Period is 50 Business Days and commences on receipt of Constraint Report
- Constraint Reports will be issued on an Area by Area basis by TSO and DSO
 - Wind will issue before non-Wind
- No Extensions to Validity Period
 - Modifications do not extend the validity period



Gate 3 Regions

LEGEND	
— 400 kV Lines	■ Hydro Generation
— 220 kV Lines	■ Thermal Generation
— 110 kV Lines	■ Pumped Storage Generation
— 400 kV Cables	■ Wind Generation
— 220 kV Cables	■ Non-GPA Generation
— 110 kV Cables	
● 400 kV Stations	
● 220 kV Stations	
● 110 kV Stations	



Area	Estimated Date Range for <u>Issue</u>	Estimated Date Range for <u>Expiry</u>
K	24 Apr – 3 May	4 Jul - 15 Jul
D	8 May- 31 May	17 Jul – 12 Aug
H2	8 May- 31 May	17 Jul – 12 Aug
H1	8 May- 31 May	17 Jul – 12 Aug
B	4 Jun – 28 June	13 Aug – 6 Sep
F	4 Jun – 28 June	13 Aug – 6 Sep
J	4 Jun – 28 June	13 Aug – 6 Sep
E	10 Jun – 5 Jul	19 Aug – 13 Sep
A	17 Jun – 12 Jul	26 Aug – 20 Sep
G	24 Jun – 12 Jul	2 Sep – 20 Sep
C	24 Jun – 12 Jul	2 Sep – 20 Sep
I	24 Jun – 12 Jul	2 Sep – 20 Sep
Non-Wind	1 Jul – 19 Jul	9 Sep – 27 Sep



Associated Transmission Reinforcements

- Firm Access Quantities for all Gate 3 Wind were published in December 2012
- Determination of Associated Transmission Reinforcements is now complete
- ATRs will be issued alongside the constraint reports
- For Non Wind: ATRs and FAQs will be issued together
- Gate 3 Validity Period is not associated with the receipt of ATRs



TSO Offer Execution

- To execute an Offer the Applicant must meet the conditions precedent which include:
 - Make First Stage Payment
 - Put in place MEC Bond (where applicable)
 - Sign the offer
- After signing the applicant will receive an offer acceptance letter
 - Contains information including Long Stop Dates
 - 36 Months post **Scheduled** Consents Issue Date
 - 30 Months post **Scheduled** Operational Date
- A Kick Off Meeting will be scheduled within 20 Business Days of Execution



Executing TSO Offer: First Stage Payment

- The First Stage Payment (FSP) Mechanism* applies to Gate 3 Transmission Renewable Generators
 - This may be different to what is currently in your offer
- A Sliding Scale Mechanism now applies to FSP
 - Full amount of the FSP may not be due on execution.
 - Amount due on execution depends on Scheduled CID date
 - The remaining amount is due 12 months prior to your Scheduled Consents Issue Date.
- First Stage Payments are non-refundable

*CER/11/083



TSO First Stage Payment

- Renewable:
 - **Contested**
 - $FSP = \text{€}10,000$ per MW
 - **Non Contested**
 - $FSP = \text{Greater of } [X \text{ and } 10\% \text{ of the connection charge}] \text{ where}$
 - $X = \text{Lesser of } [\text{€}10,000 \text{ per MW of contracted capacity (MEC); } 50\% \text{ of the connection charge}]$

Example: €1,000,000 connection charges for 37 MW windfarm

$X = \text{Lesser of } (\text{€}370,000; \text{€}500,000) = \text{€}370,000$

$FSP = \text{Greater of } [\text{€}370,000, \text{€}100,000] = \text{€}370,000$

- *Non – Renewable*
 - $FSP = 10\% \text{ of the connection charge} + \text{MEC Bond } (\text{€}10,000/\text{MW})$



Offer Modifications

- Modifications come in for a range of reasons
 - Splits & Mergers
 - Relocation Requests
 - Request to change to Connection Works e.g. Cable, GIS etc.
 - Increase/Decrease in number of transformers
 - Updates to Turbine Data
 - Phasing
 - Change in contesting works
- Very Important to get Modifications in Early
 - Some modifications can impact on connection works and therefore stop work on project until modification is executed
 - Changing from Line to Cable can require complex studies
- High Volume of Modifications may delay offers



Sub Groups

- Project Starts when critical mass have signed
 - When enough MW has signed to warrant the connection works to go ahead
 - Members of same sub-group will have aligned validity period expiry date
- Sub-Group Agreement is required for any modification that may change connection works
 - One party cannot unilaterally hold up progress on connection works by requesting a modification
 - If one or more parties wants to change the connection works e.g. AIS to GIS **all** parties must agree and seek to modify their agreements accordingly
 - Splits, Mergers, Relocations can all impact on connection works



Sub Groups - Continued

- We proceed with connection works as set out in contract until a contract modification is signed
 - We cannot act on the basis of general discussions or hearsay
 - We must have contractual basis for progressing works/planning for something different from what is in the offer
 - This is for the protection of all parties within the subgroup and for the TUoS customer
- COPP is a good source of information about sub-groups



Thank you for Listening

