Background and explanation of How TLAFs are calculated

RA April 15th

Mark Needham

Version FINAL

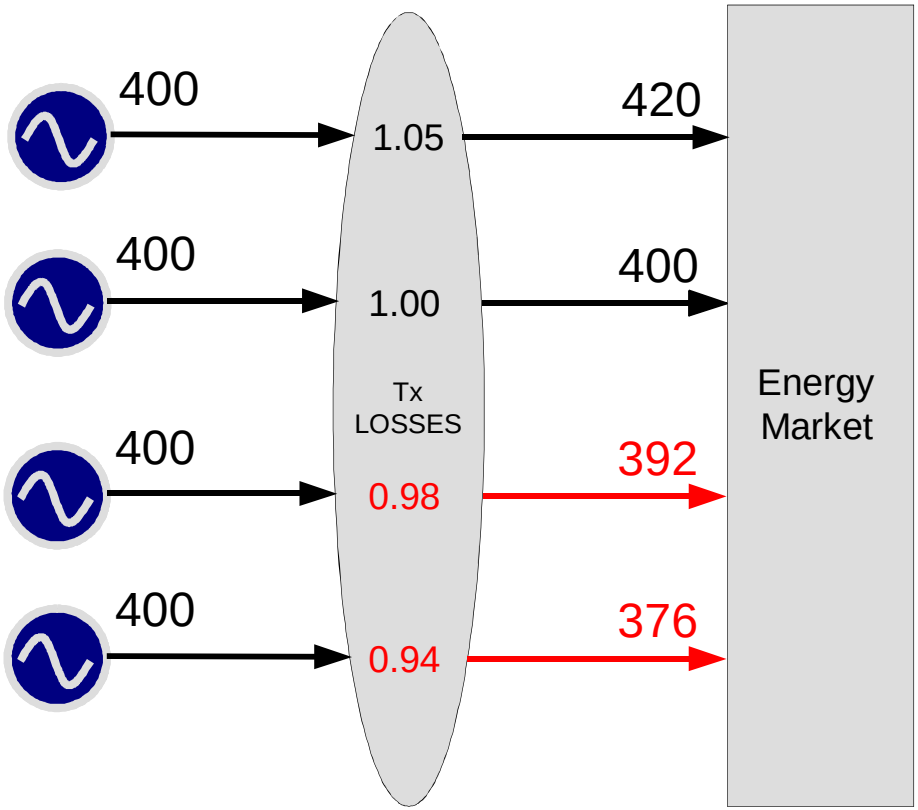
Background to Review 2009-2011

Time	Event
2005	SEM High Level Design Decision Paper
2007	Decision paper
2009	January: RAs asks TSOs to review Losses as part of Locational Signals
	March: Workshop takes place with industry
	April: Questionnaire seek views from industry
	May: Options Paper SEM-09-049 published by TSOs which discussed six different approaches
	June: Workshop takes place with industry
	July: Consultation closes on Paper
	November: Preferred Options Paper SEM-09-107 published
	December: Workshop takes place with Industry

Background to Design

Time	Event
2010	January: Consultation closes
2011	April: SEM-11-098 Consultation paper
2012	Decision Paper SEM-12-049

TLAF Adjusted Settlement Quantities



Methodology

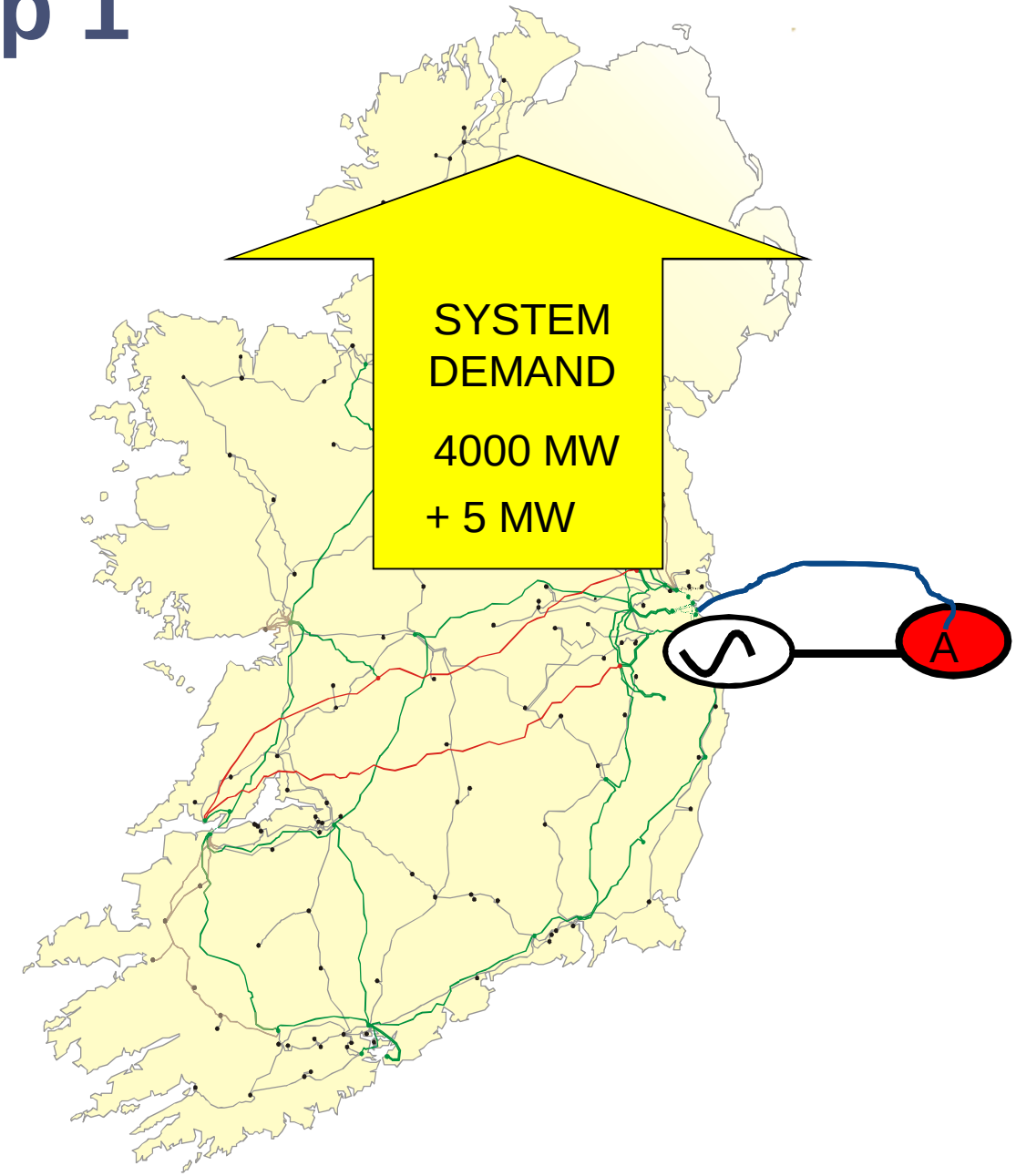
- Dispatch (average) based on the constrained Dispatch Balancing Costs model
- System Model (single all island model)
- Calculating Marginal Loss Factors, **MLFs**
- Convert from MLF to Transmission Loss Adjustment Factor

Example – Step 1

- Take EWIC as the study bus…but equally applies to Moyle
- Make Node A the system swing/slack bus
- **Increase** the system demand by 5 MW

  => 4005 MW
- Record the increase at the study node

  => 5.1 MW



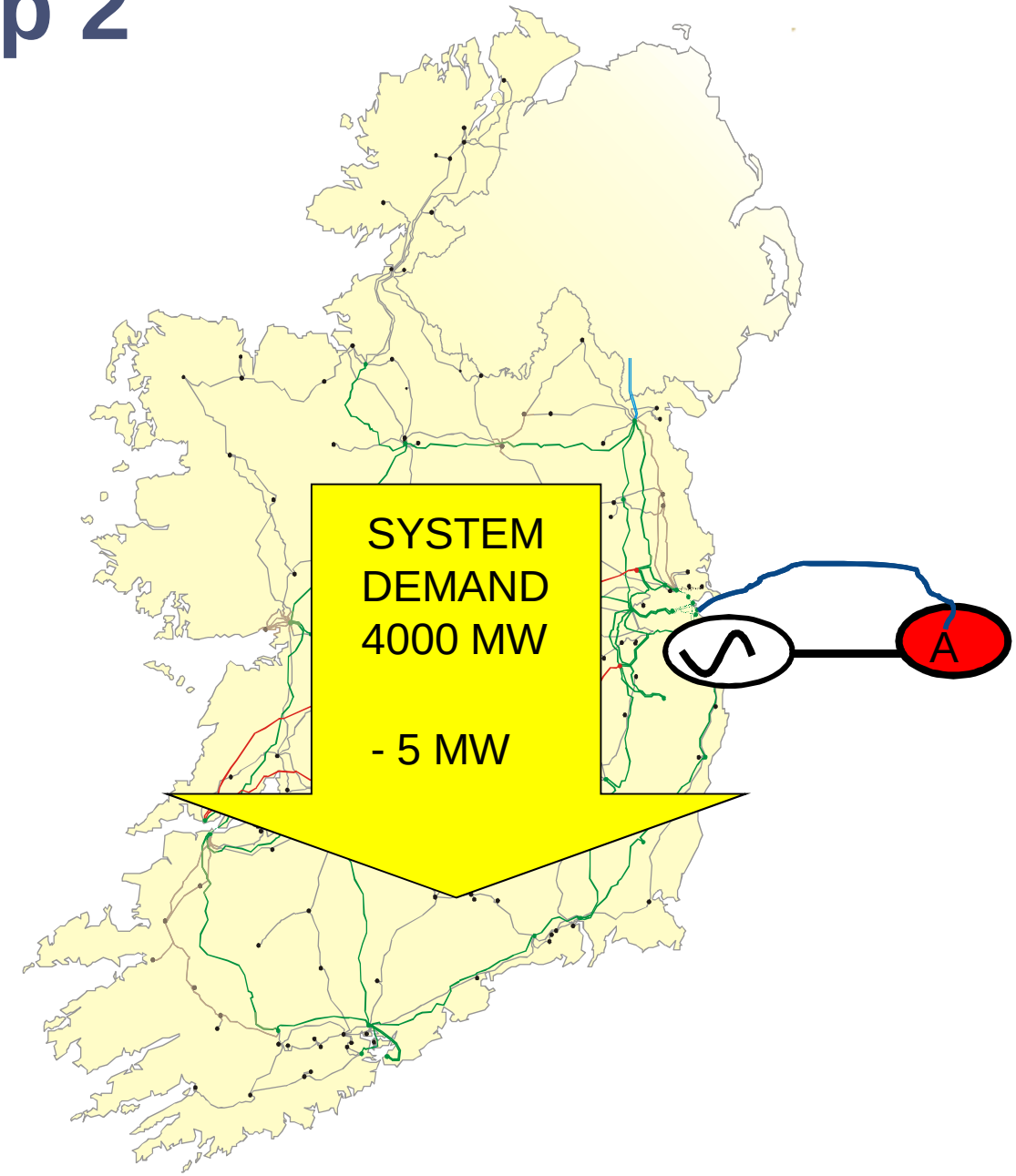
Example – Step 2

- **Decrease** the system demand by 5 MW

  => 3995 MW

- Record the decrease at the study node

  => -5.2 MW



Example – Step 3

(*Figures for illustrative purposes only!)*

$$MLF_{NODE\ A} = \frac{5}{Avg\ (5.1,\ 5.2)} = 0.971$$

- The program does this for all the transmission nodes in the system model

Station	Export Generation	+5MW	-5MW	MLF
Node A	0.0	**5.1**	**-5.2**	**0.971**
Node B	90.0	**5.2**	**-5.1**	**0.979**
Node C	40.0	**5.2**	**-5.1**	**0.971**
Node D	470.0	**5.1**	**-5.1**	**0.972**
Node E	10.0	**5.1**	**-5.0**	**0.991**
Node F	0.0	**5.2**	**-5.1**	**0.970**
Node G	5.0	**5.2**	**-5.2**	**0.968**
Node H	0.0	**4.8**	**-4.8**	**1.047**
Node I	25.0	**5.1**	**-5.1**	**0.985**
Node J	0.0	**5.1**	**-5.1**	**0.986**

Example – Step 4

- Marginal loss methods create an over recovery of losses
  - need to be scaled to reflect the system model (PSSE) losses
- Scaling of the derived marginal loss factors to meet the modelled system losses is performed using the shift method

Example –Step 4 contd.

Station	Export Generation	+5MW	-5MW	MLF	Marginal Losses Allocation	Scaled MLF	Scaled Marginal Loss Allocation
Node A	0.0	5.1	-5.2	0.971	0.000	0.981	0.000
Node B	90.0	5.2	-5.1	0.979	1.884	0.989	0.984
Node C	40.0	5.2	-5.1	0.971	1.167	0.981	0.767
Node D	470.0	5.1	-5.1	0.972	13.150	0.982	8.450
Node E	10.0	5.1	-5.0	0.991	-0.006	1.001	-0.012
Node F	0.0	5.2	-5.1	0.970	0.000	0.980	0.000
Node G	5.0	5.2	-5.2	0.968	0.162	0.978	0.112
Node H	0.0	4.8	-4.8	1.047	0.000	1.057	0.000
Node I	25.0	5.1	-5.1	0.985	0.382	0.995	0.132
Node J	0.0	5.1	-5.1	0.986	0.000	0.996	0.000

Total = 17 MW

Base case losses = 10 MW

Scaling Factor = 0.01

Total = 10 MW

Step 5

- System model losses (from PSSE) ≠ real system losses
  - a **final scaling** needs to be carried out

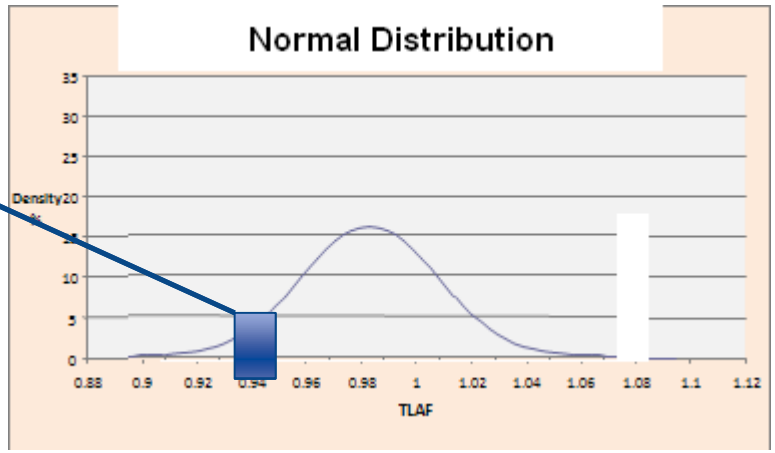
- **K Factor**

K = System Model Losses – Target Loss Projection

TLAF = Scaled MLF - K

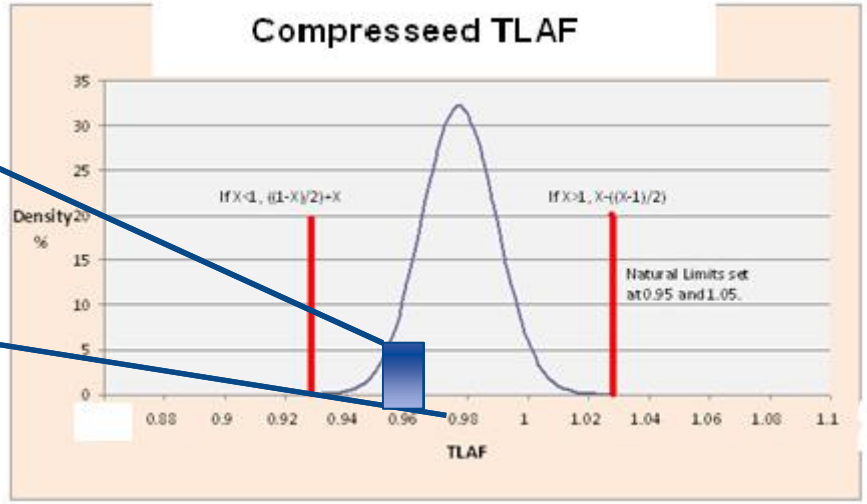
Step 6

I/C Region



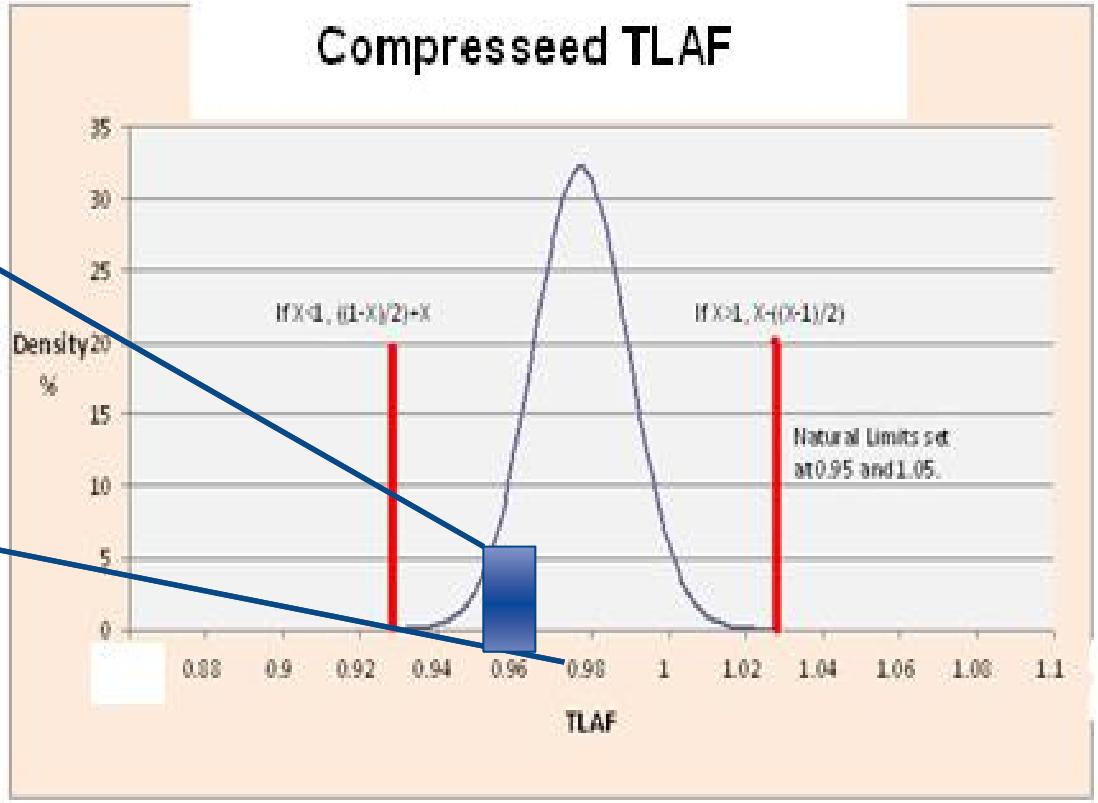
I/C Region

Average 0.98



I/C Region

Average 0.98



TLAFs – Customer

2012/2013 APPROVED TRANSMISSION LOSS ADJUSTMENT FACTORS - ROI MARKET PARTICIPANTS

Market Participant - Transmission Connected	Transmission Station	kV	Oct Day	Oct Night	Nov Day	Nov Night	Dec Day	Dec Night	Jan Day	Jan Night	Feb Day	Feb Night	Mar Day	Mar Night	Apr Day	Apr Night	May Day	May Night	Jun Day	Jun Night	Jul Day	Jul Night	Aug Day	Aug Night	Sep Day	Sep Night
[illegible]	[illegible]	400	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

EWIC TLAFs for 2012/2013 between 0.957 and 0.975

Moyle 275 0.997 1.000 0.994 0.997 0.994 0.998 0.993 0.998 0.993 0.999 0.994 0.998 0.993 0.996 0.994 0.998 0.994

MOYLE TLAFs for 2012/2013 between 0.990 and 1.000

TLAFs – RAs & SEMO

- Prepared in accordance with the statutory and licensing arrangements pertaining in each jurisdiction
- Timeline
  - Draft all island TLAFs to RAs May
  - RAs' Decision, June
- Submitted to the SEMO in accordance with the T&SC

Merci Beaucoup/ Tack så mycket

Any questions?

Background and explanation of How ITC is calculated

April 15th

Mark Needham

Version FINAL

Background to ITC 2001-2013

Time	Event
2001	ITC starts life as an agreement amongst a small number of TSOs less than 12
2001-7	# Participating TSOs grows
2008/9	Agreements between TSOs (not binding) EirGrid and SONI join as do 40 TSOs
2009	Regulation 2009/714 access to network for cross border exchanges in electricity
2010	Regulation 2010/838 guidelines relating to ITC mechanism
2011	Regulation kicks in
2012	Review of Fund size
2013	ACER recommendation to phase out fund and redevelop

What is Inter TSO Compensation?

“Transmission system operators should be compensated for energy losses …. and the costs of making infrastructure available.”

ITC explained

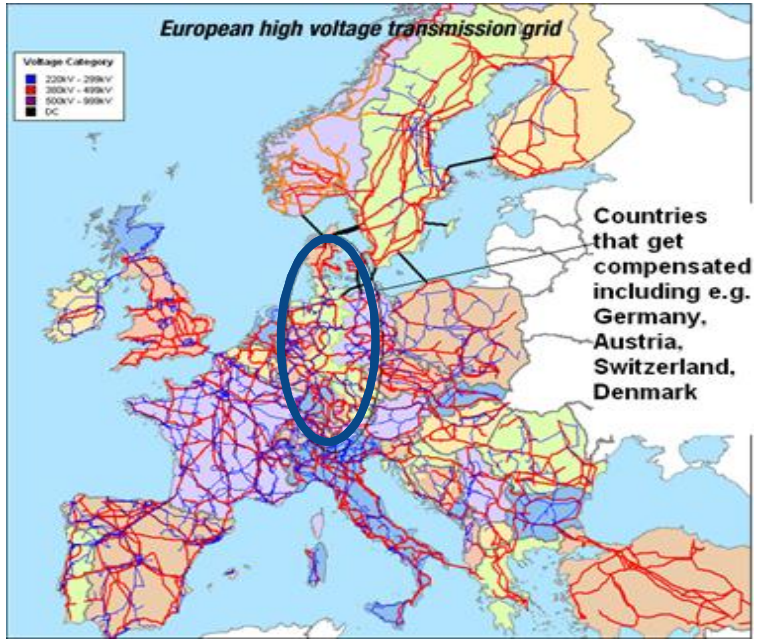
- 2 elements
  - Infrastructure
  - losses
- 2 mechanisms
  - Cross Border Transits
  - With or without Transits

- But the total comes to €100m
- There are receivers and contributers

Receive	Contribute
Certain types of flows cause a TSO to receive	Other flows cause a TSO to contribute

EirGrid semo SONI

ITC explained



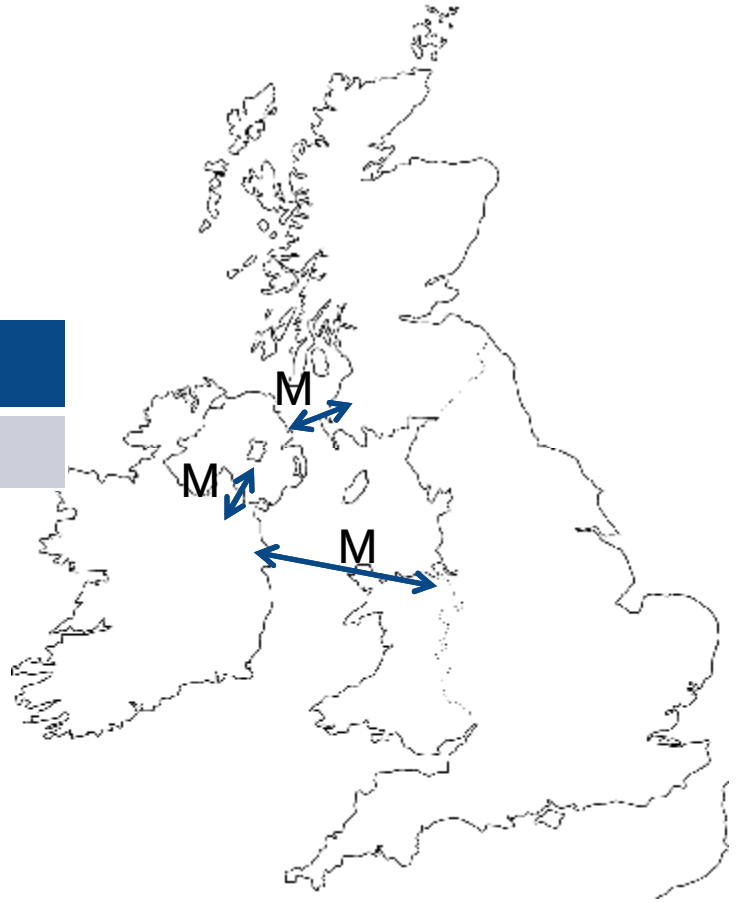
Receive	Contribute
German TSOs, Swiss Grid, Danish TSO etc	EirGrid, SONI; UKNG, French TSO etc etc
€100m	€100m

ITC Infrastructure explained

- Net Flows
- Cross Border Transits

Receive	Contribute
Transits	Net flows

- Ex-post hourly metered flows up to 745 per month

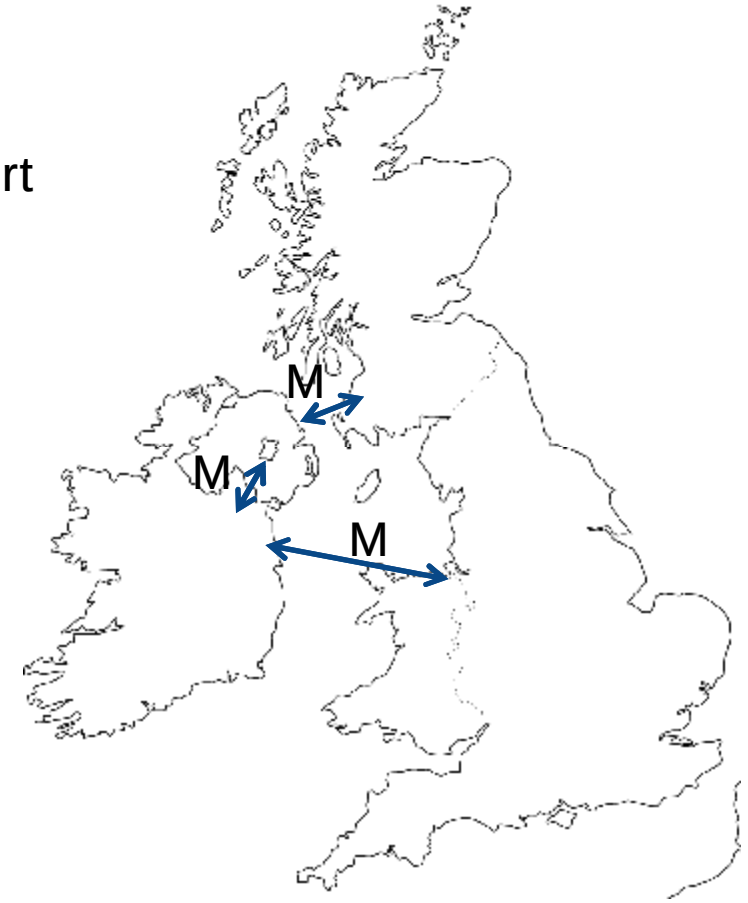


ITC Infrastructure explained

Net flow = Import – Export or Export – Import
e.g. Import is 100 and export is 50 then
Net flow is 50

Transit = Σ min (Import, Export)
e.g. if Import is 0 and export is 50
Then transit is 0

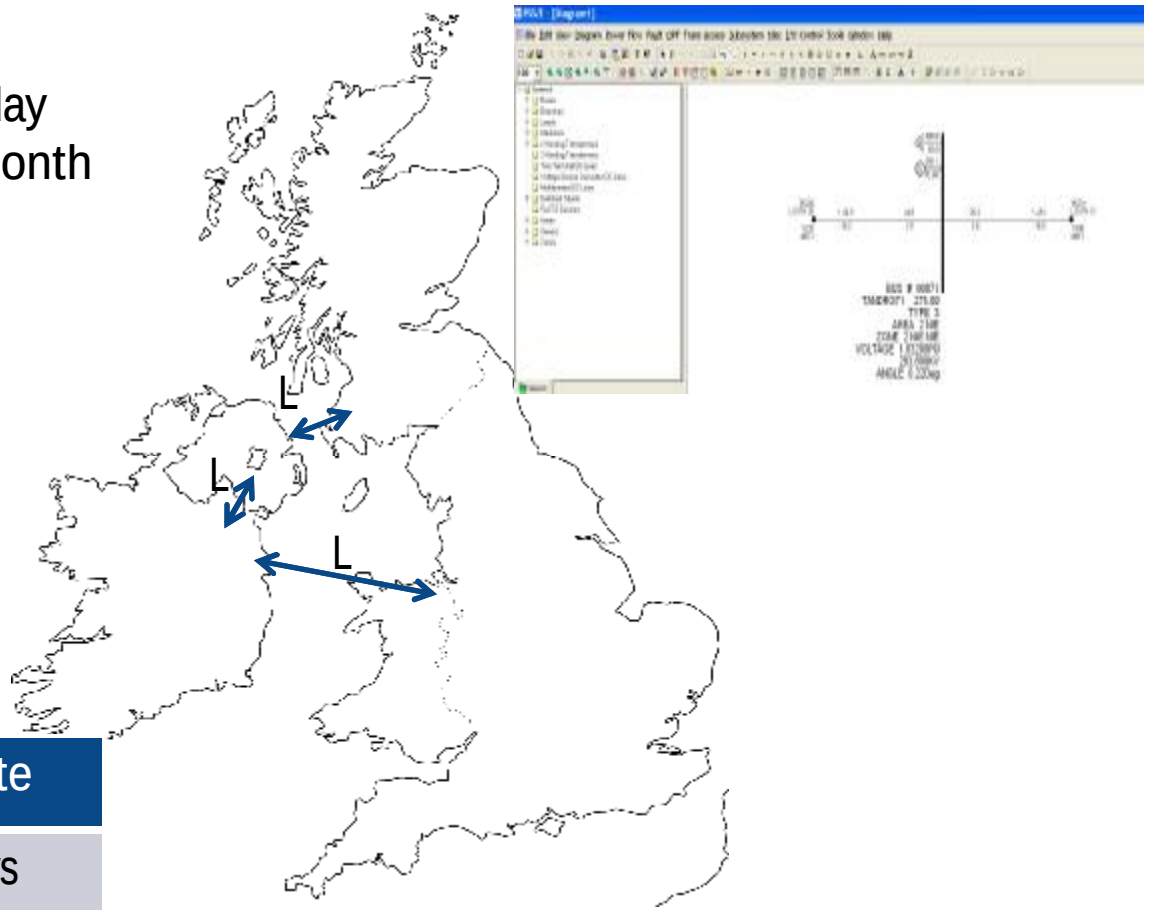
Receive	Contribute
Transits	Net flows



ITC losses explained

6 snapshots Per Month:
•02:30; 10:30;18:30
3rd Wednesday and Previous Sunday
•Map onto up to 745 hours in a month
With or without Transit

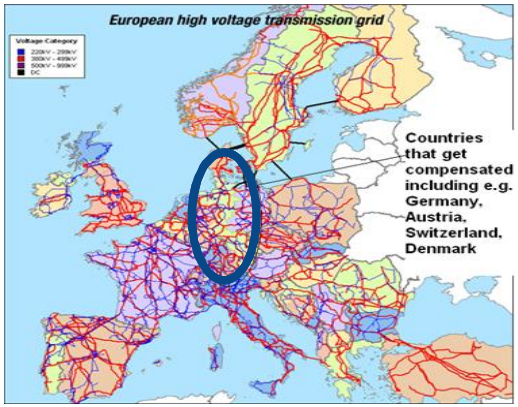
•Run a load flow with flows on interconnectors and calculate losses on entire system
•Run another load flow without flows and calculate losses on entire system
•The difference is due to I/C



Receive	Contribute
Transits LOSSES	Net flows

Overall ITC Calculation

Receive	Contribute
Transits Losses	Net flows
€100m	€100m



Comparison Between TLAFs and ITC

TLAF	ITC
Not related to a fund	All adds up to a fixed Fund
Market Based	Not Market Based
SEM	Jurisdiction
2 lines	3 tie-lines
Ex-Ante	Ex-post
Stable	To be redeveloped-no consensus in Europe

ACER Recommendation 2013

A new regulation to be developed before 2015

- More limited infrastructure compensation
- Takes more cognisance of Cross Border Cost Allocation for new investment etc
- Includes measures for loopflows etc


EIRGRID
semo
Single Electricity
Market Operator
SONI
System Operator for Northern Ireland