

Background and explanation of How TLAFs are calculated

RA April 15th

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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

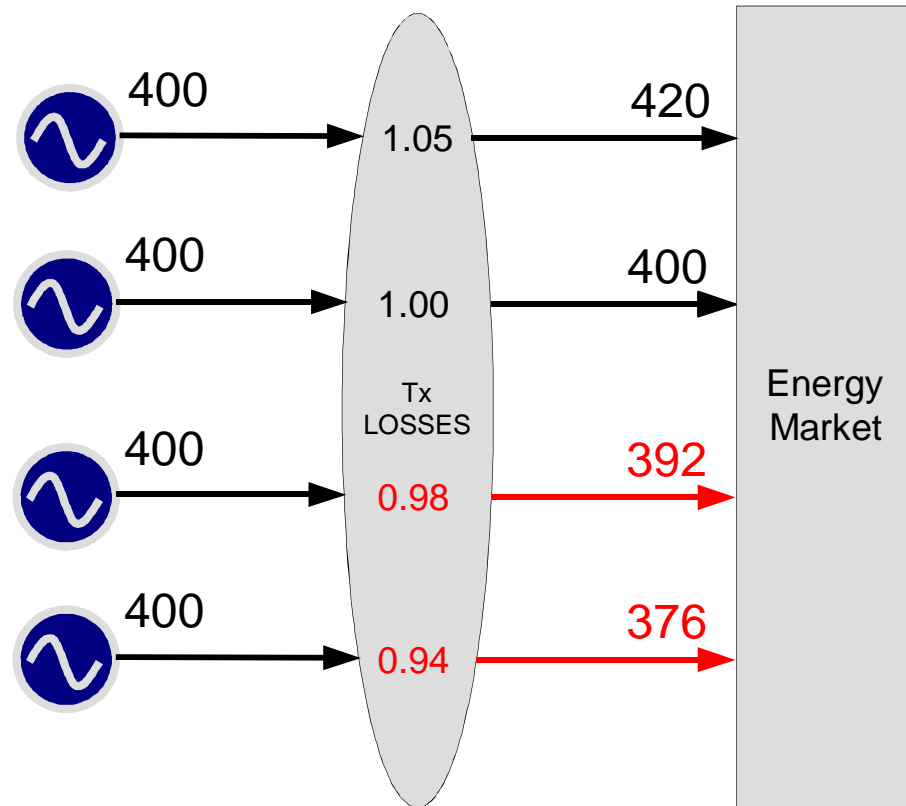


Background to Design

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



TLAF Adjusted Settlement Quantities



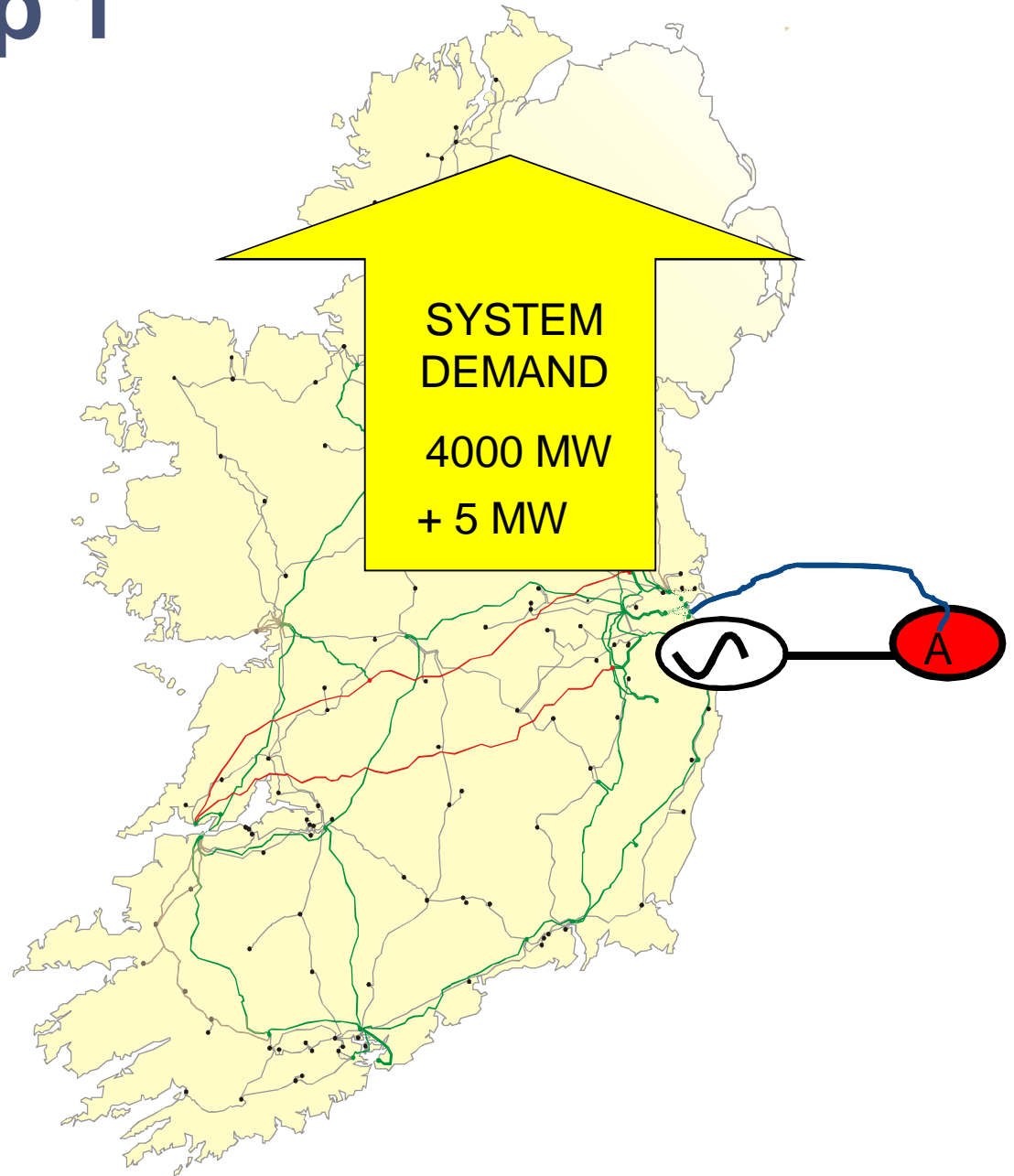
Methodology

- 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



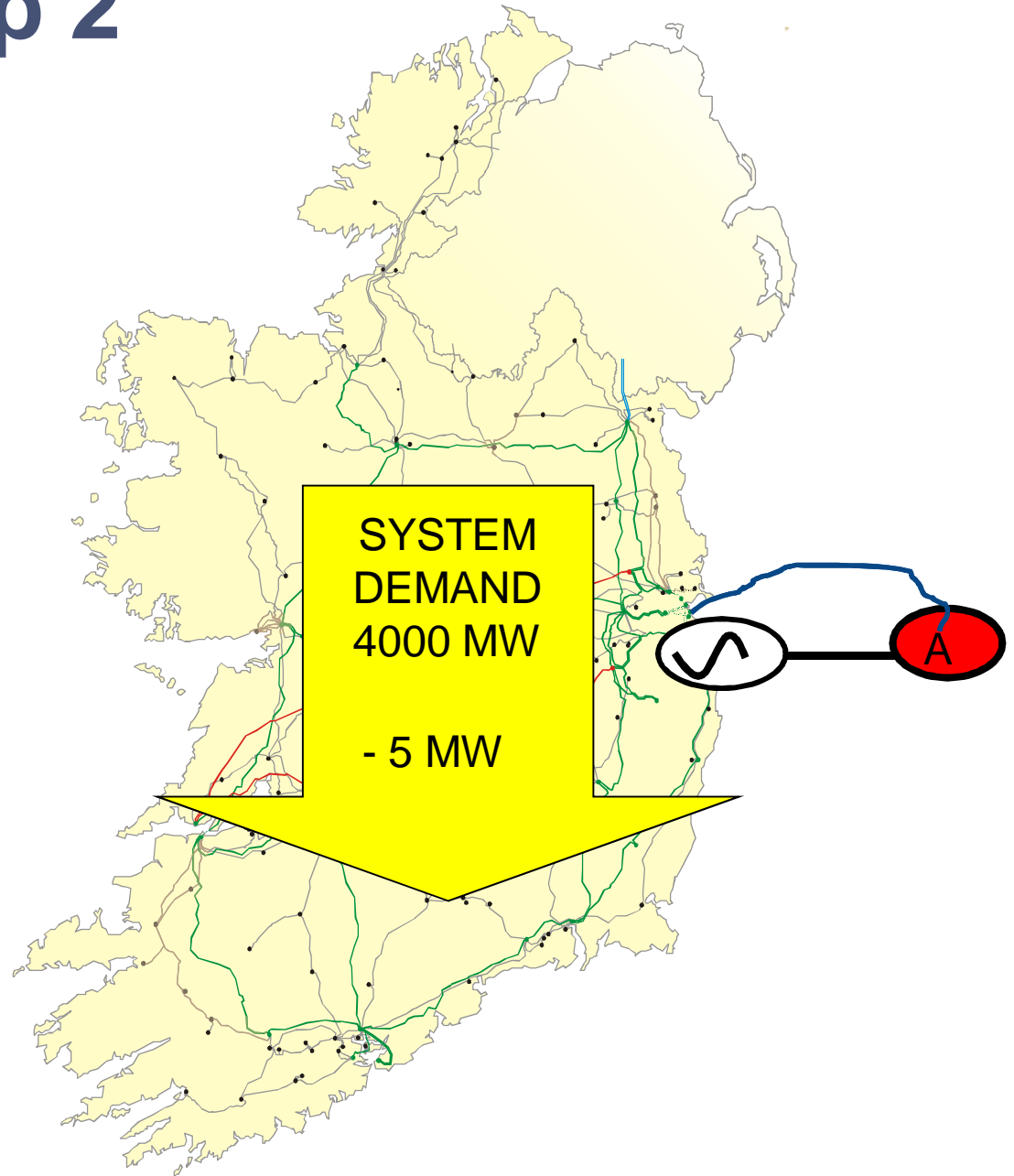
Example – Step 1

- 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!)

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

- 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

Total = 10 MW

Base case losses = 10 MW

Scaling Factor = 0.01



Step 5

- System model losses (from PSSE) \neq real system losses
 - a **final scaling** needs to be carried out
- **K Factor**

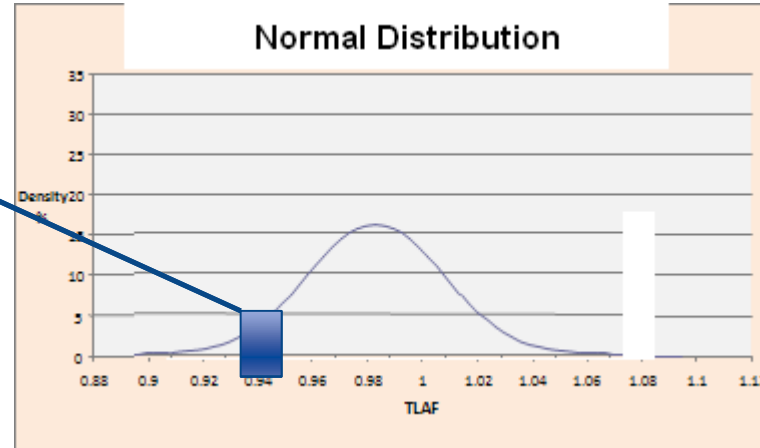
$K = \text{System Model Losses} - \text{Target Loss Projection}$

$$\text{TLAF} = \text{Scaled MLF} - K$$



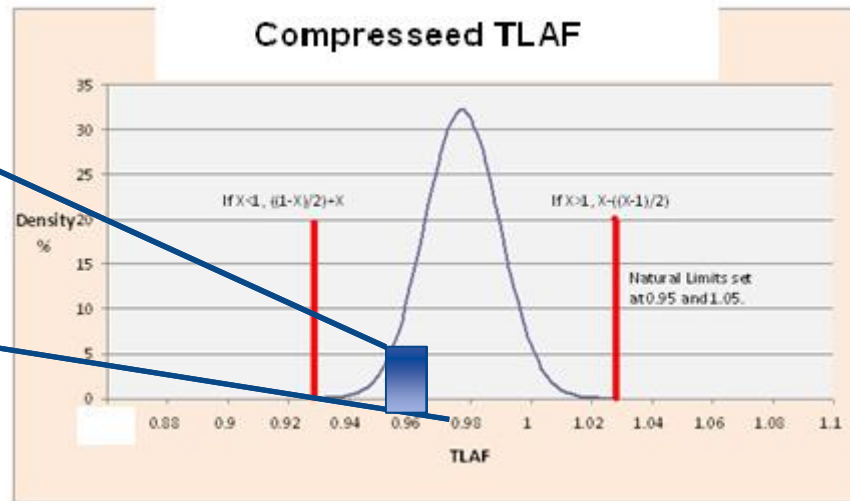
Step 6

I/C Region



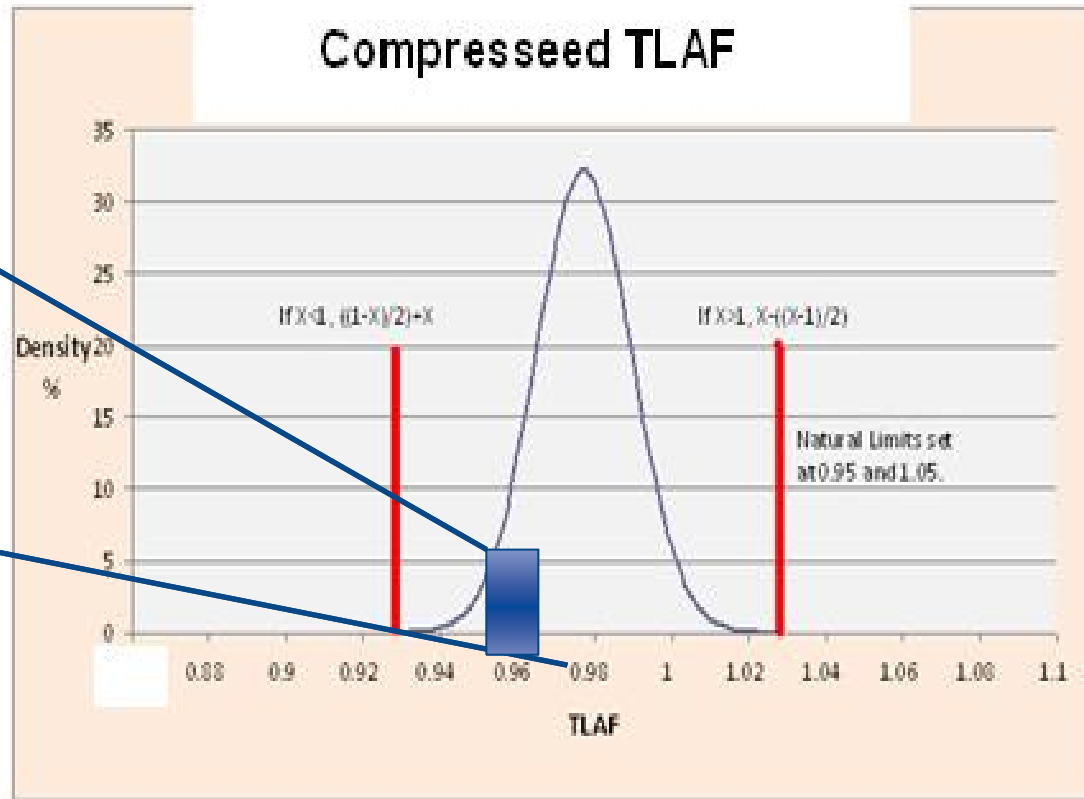
I/C Region

Average 0.98



I/C Region

Average 0.98



TLAFs – Customer

2012/2013 APPROVED TRANSMISSION LOSS ADJUSTMENT FACTORS - ROI MARKET PARTICIPANTS																										
Market Participant -	Transmission	Oct	Oct	Nov	Nov	Dec	Dec	Jan	Jan	Feb	Feb	Mar	Mar	Apr	Apr	May	May	Jun	Jun	Jul	Jul	Aug	Aug	Sep	Sep	
Transmission Connected	Station	kV	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
EAST WEST INTERCONNECTOR	Deeside	400	0.964	0.963	0.971	0.963	0.969	0.961	0.967	0.961	0.965	0.968	0.967	0.967	0.963	0.962	0.962	0.974	0.964	0.974	0.964	0.975	0.967	0.976	0.963	0.973

EWIC TLAFs for 2012/2013 between 0.957 and 0.975

Moyle 2750.9971.0000.9940.9970.9940.9980.9930.9980.9930.9990.9940.9980.9930.9960.9940.9980.994

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

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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.”

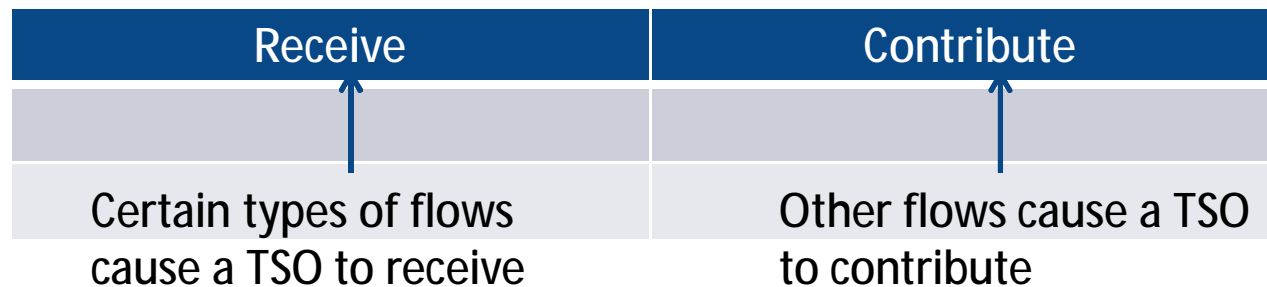


ITC explained

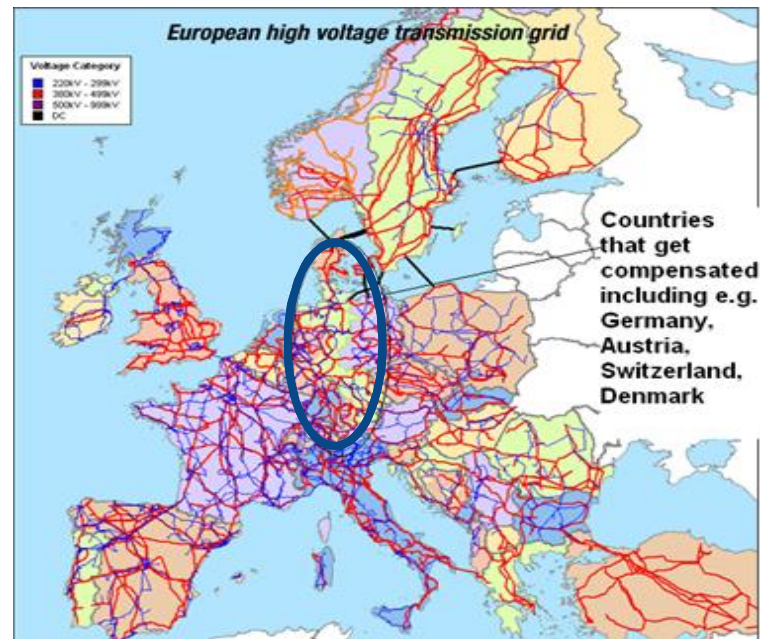
- 2 elements
 - Infrastructure
 - losses
- 2 mechanisms
 - Cross Border Transits
 - With or without Transits



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



ITC explained



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

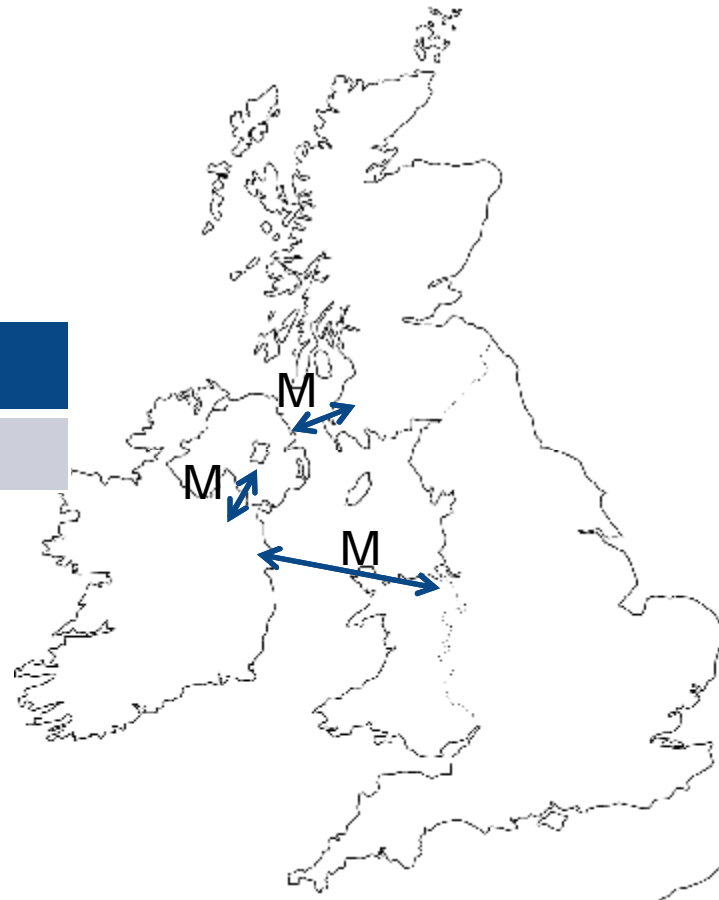


ITC Infrastructure explained

- Net Flows
- Cross Border Transits

Receive	Contribute
Transits	Net flows

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

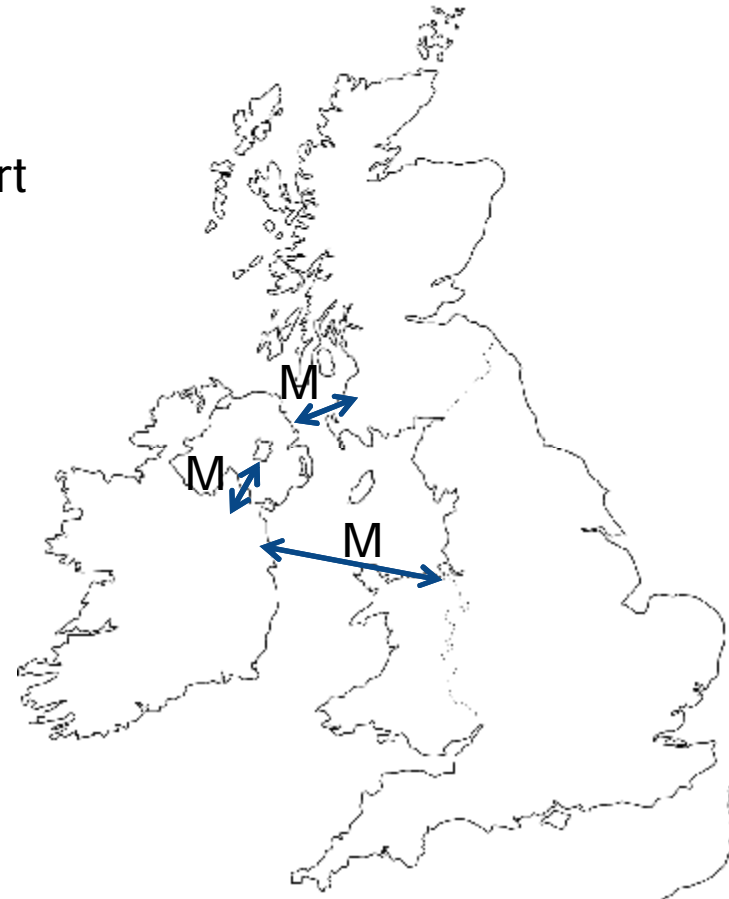


ITC Infrastructure explained

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

Transit = $\Sigma \min(\text{Import}, \text{Export})$
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

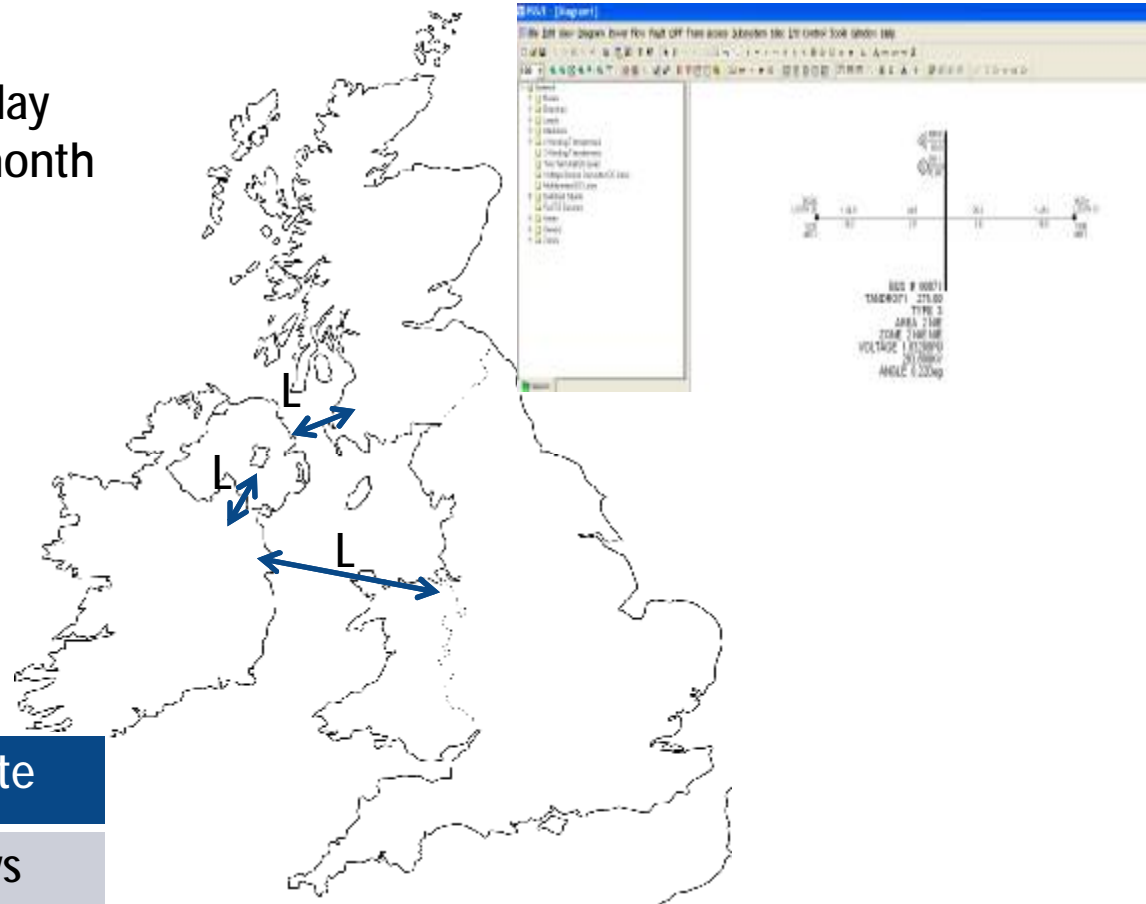
- Map onto up to 745 hours in a month

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

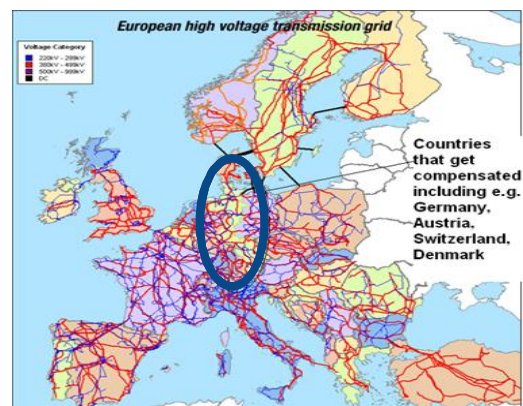
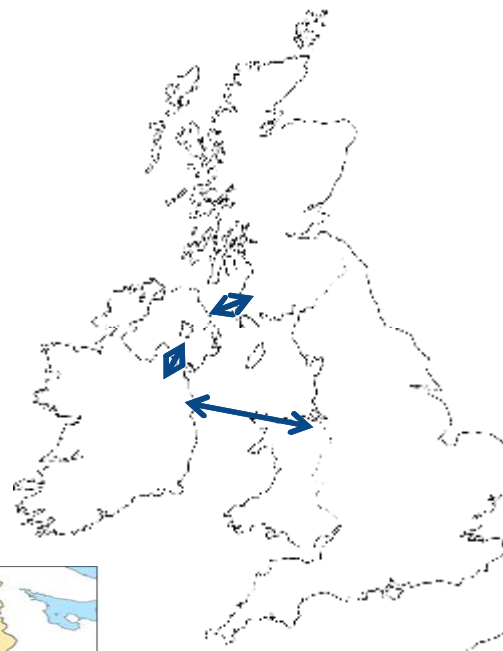


Receive	Contribute
Transits LOSSES	Net flows



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



