

All Island Generator TUoS 2011/12 Indicative Tariffs Methodology Workshop

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OUTLINE

Overview

Description of method/assumptions

Analysis of indicative tariffs

Overview – Dynamic Model Features

**Forward looking
+ 5 years**

**Charges based on
NPV of cost of
new assets**

**Charges for assets
for 7 years after
built**

**Postage Stamp
charge for sunk
assets**

**4 Network
scenarios
examined**

**Load flow analysis
determines use of
network**

Overview – Dynamic Model

- The model looks at future network requirements in 5 years time and charges these based on current generation meeting the current demand i.e. looking at the existing use of future network

Description of Method

1

- Input files for Integra set up
 - Network files
 - Load files
 - List of generators liable for TUoS
 - Dispatch files
 - Cost files

2

- Load flow analysis was conducted to determine usage of all new assets in each of the four scenarios.

3

- Any units that uses a new assets was charged for this in proportion to their usage

4

- The maximum tariff from the 4 scenarios was identified for each unit & the resulting revenue recovery was calculated (capped at 30% of total revenue)

5

- Remaining revenue requirement was spread across all units by adding a postage stamp amount to give the final €/kW/year tariff for each unit.

Description of Method: 4 Scenarios

- Network pricing based on network planning
- 4 network planning scenarios
 - Winter peak, 0% wind
 - Summer peak, 80% wind
 - Summer peak, 0% wind
 - Summer min, 80% wind

Description of Method: Network

- Future 2016/2017 network (TFS & SYS)
 - Winter peak 2016
 - Summer peak 2017
 - Summer min 2017
- Current 2011/2012 demand (exported terms)
 - Winter peak 2011
 - Summer peak 2012
 - Summer min 2012

Description of Method: Generators

- Generators liable for TUoS
 - Connected or assumed to be connected for all or part of the tariff year 1st Oct 2011 to 30th Sept 2012
- Generators connected \geq 10MW
- Future generators \geq 10MW

Description of Method: Dispatch

- Generators dispatched to meet demand in scenario, Generators $\geq 5\text{MW}$
- Plexos derived merit order stack
 - based on plexos model for Constraints/DBC's
- Unconstrained model
 - Transmission
 - Generation
- Design reflects access to unconstrained Market Schedule

Description of Method: Dispatch

- Assumptions for Turlough Hill, hydro, wind, Moyle and priority dispatch plants

	WP Low Wind	SP Low Wind	SP High Wind	S Min High Wind
Turlough Hill	100% Gen	100% Gen	100% Gen	100% Pump demand
Hydro	100% Gen	100% Gen	100% Gen	0% Gen
Wind	0% Gen	0% Gen	80% Gen	80% Gen*
Moyle	440MW import	410MW import	410MW import	205MW import
Peat, Aughinish, Meath Waste	100% Gen	100% Gen	100% Gen	100% Gen

Description of Method: Asset Costs

- Cost of network reinforcements
 - Modern Equivalent Asset Value
- Include asset if within 5 year forecast horizon
- Include asset for max 12 years
 - 5 year forecast horizon
 - 7 year post-commissioning period

Description of Method: Asset Costs

- Assets included
 - New circuits
 - New stations
 - Incremental cost of upratings
- Assets excluded
 - Connection assets
 - DSO assets
 - Replacement assets at end of life
 - Voltage support devices

Description of Method: Asset Costs

- E.g. New circuit
 - Capital cost
 - Annualised capital cost
 - Net Present Value =

$$\frac{\textit{Annualised Capital Cost}}{(1 + \textit{Discount Rate})^{\textit{No of year}}}$$

Description of Method: Delayed Assets

- Include asset for max 12 years
 - 5 year forecast horizon
 - 7 year post-commissioning period
- If delayed, max 12 years applied

Description of Method: Revenue

- 25% of NI Network related costs
- 25% of ROI Network related costs

All-Island Revenue =	€60m
ROI Revenue =	€50m
NI Revenue =	€10m

- All island revenue “bucket” = €60M
- RA approved revenues to be used
- Indicative tariffs do not inc EWIC related costs

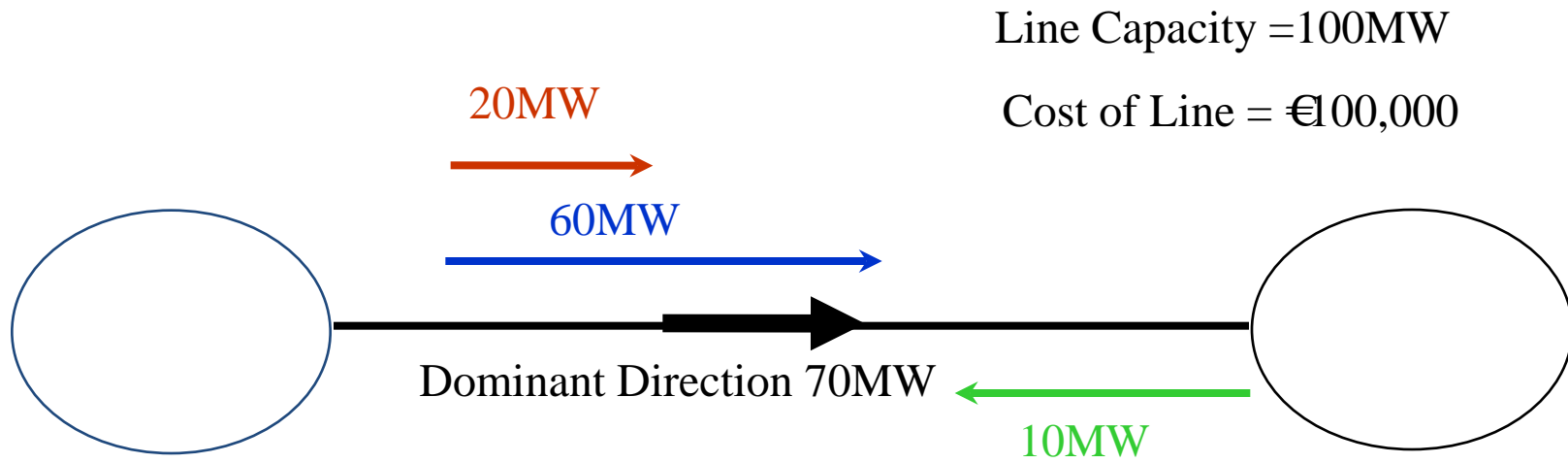
Description of Method – Load flow analysis

- DC Load flow
 - Performed in Integra
 - Reverse MW-mile methodology
 - Establishes the extent of the network used by each generator
 - Rewards where a generator offsets the dominant flow on a line
 - Potential for negative tariffs
 - Load flow ran for each of the 4 scenarios
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Implementation of Reverse MW-Mile

1. Base case DC load flow
 - Identifies the dominant flows
2. Identify generator of interest
3. Decrease load on a pro-rata basis
4. Re-run DC load flow
 - Identifies usage of lines by the generator
5. Compare direction of flow with base case
 - Identifies charge/credit to generator
6. Calculate generator locational payment
7. Repeat steps 2 to 6 for all generators

Example: Reverse MW-Mile Approach



Generator 1: $20/100 = €20,000$

Generator 2: $60/100 = €60,000$

Generator 3: $-10/100 = -€10,000$



Any unit that uses a new asset is charged/credited for this in proportion to their usage

Description of Method: 1MW Incremental Tariff

- If a generator was not dispatched in the merit order, a tariff is derived using a dispatch of 1MW in order to get a tariff for every unit in all scenarios

Description of Method – Final Tariff Calc

- Max tariff from the 4 scenarios
- Resulting revenue recovery calculated
 - Capped at 30% of total revenue (scale by 47%)
 - Locational tariff = max tariff scaled
- Plus 70% postage stamp
 - €3.5416/kW/year
- Final tariff = locational + postage stamp

Description of Method: Tariff Adjustments

- Moyle in model but not charged
- Negative tariffs
 - Intermittent generation, lower cap €0
 - Non-intermittent generation, no cap

Indicative tariffs

	Indicative 11/12 tariff	Indicative 08/09 tariff Option 4	Current tariff
Max tariff (€/kW/yr)	7.2026	11.6835	10.3043
Minimum tariff (€/kW/yr)	3.9258	1.836	0.0000
Range (€/kW/yr)	3.2767	9.8474	10.3043

Comparison with Current Tariffs

- Beware – different methodologies

	Indicative Tariff 11/12	ROI Published Current Tariff 10/11	NI Published Current Tariff 10/11
Model description	Dynamic + postage stamp	Static+ postage stamp	Postage stamp
Jurisdiction	ROI and NI	ROI only	NI only
Cost database	Costs for future planned developments included using a 5 year horizon. Once the asset is classified as built, it remains in the cost file for 7 years	Costs for every asset in the current network included. No future looking component included. Also, lightly loaded lines (less than 20% of capacity utilised) are excluded from the cost file	n/a
Scenarios	4 different scenarios considered	Only 1 scenario considered (Winter Peak)	n/a
Dispatch	Dispatch is as per merit order plus dispatch assumptions	Dispatch on all generators is “pro-rata”	n/a

Analysis – Which scenarios are driving the tariffs?

	Winter Peak		Summer Peak 0% wind		Summer Peak 80% wind		Summer Minimum	
	MW	Direction	MW	Direction	MW	Direction	MW	Direction
2nd N/S circuit	14.7	S->N	66.4	S->N	116.5	S->N	31.2	N->S
Existing N/S circuit	125	N->S	27.6	N->S	110	S->N	34	N->S
Net flow	110.3	N->S	38.8	S->N	226.5	S->N	65.2	N->S

Analysis - Drivers behind tariffs

- Enniskillen Wind
- Tariff set during summer min, high wind
 - Max tariff = €7.8793/kW/year, derived from:
 - Total costs = €89,830
 - Generator dispatch = 11.4MW
 - Max Tariff = €7.8793/kW/year
 - Final Tariff = €7.2026/kW/year

Analysis - Drivers behind tariffs

BUS NUM.	FROM NAME	BUS NUM.	TO NAME	UNIT COST €/kW	BASE FLOW MW	AGENT FLOW MW	AGENT COST (€'000s)
3774	CAVAN	90440	TURL4-	6.27	-31.07	-4.24	26.54
3774	CAVAN	5464	Woodland	5.13	69.8	3.94	20.23
79010	ENNK1_	87510	OMAH1-	1.85	17.14	5.65	10.42
79010	ENNK1_	87510	OMAH1-	1.85	17.14	5.65	10.42

From analysis the main contributors to the tariff are the

- 2nd north – south interconnector and associated ROI circuit between Cavan and Woodland
- Up-rated circuits between Enniskillen and Omagh

Analysis - Drivers behind tariffs

- Trien Wind
- Tariff set during summer peak, high wind
 - Max tariff = €5.4264/kW/year, derived from:
 - Total costs = €204,550
 - Generator dispatch = 37.7MW
 - Max Tariff = €5.4264/kW/year
 - Final Tariff = €6.0629/kW/year

Analysis - Drivers behind tariffs

BUS NUM.	FROM NAME	BUS NUM.	TO NAME	UNIT COST €/kW	BASE FLOW MW	AGENT FLOW MW	AGENT COST (€'000s)
3462	Kilpaddo	3942	Moneypoi	2.34	305.81	17.97	41.98
3192	Knockanu	3191	Knockanu	2.39	-45.86	-14.87	35.52
3774	CAVAN	90440	TURL4-	6.27	116.42	5.3	33.24
3774	CAVAN	5464	Woodland	5.13	-108.05	-5.66	29.01

From analysis the main contributors to the tariff are the

- 220kV cable from Moneypoint to the new Kilpaddoge station in north Kerry
- New 220/110kV station at Knockanure
- 2nd north – south interconnector and associated circuit between Cavan and Woodland

Analysis – Which scenarios are driving the tariffs?

- For NI generators
 - Tariffs set by Summer Min scenario
 - Dominant North → South flow
- For ROI generators
 - Majority of tariffs set by Summer Peak 80% wind
 - Dominant South → North flow

QUESTIONS?