



Commission for Energy Regulation

An Coimisiún um Rialáil Fuinnimh

**Future of Gas Entry Tariff Regime
Initial Modelling Evidence**

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1.0 Executive Summary

In June 2012, the CER published a Decision Paper (CER/12/087) on the future gas entry tariffing regime that would apply in Ireland. The reform outlined in that paper is required in light of changes in how gas is sourced in Ireland. The decision was subject to Judicial Review in the High Court. Judgment in the Judicial Review was given in December 2013.

Since then, there have been significant developments at an EU level which have an important bearing on the earlier CER Decisions. Specifically, the publication of the ACER Framework Guidelines on Tariffs and more recently, the publication of ENTSOG's Draft Network Code on Tariffs. Binding on all Member States, the Tariff Network Code is expected to be implemented in 2017 across the EU. As the CER considers that the tariff regime requires reform before 2017, it is desirable to implement changes now that are in line with the EU requirements.

It should be borne in mind here that the ACER Framework Guidelines in this particular case are quite detailed and prescriptive – in part reflecting the views of the European Commission. This applies to the cost allocation methodologies available to Member States, the circumstances which should prevail for particular options as well as detailed rules.

In June 2014 the CER published an Information Note which gave an initial introduction to the reform process by outlining the tariffing options available in the ACER Framework Guidelines and how each methodology may apply to Irish circumstances. This included the;

- Postage Stamp approach
- Capacity-Weighted Distance approach (CWDA)
- Distance to Virtual Point approach (VP)
- Matrix Approach (Matrix)

In this note the CER noted that the next steps were to publish models implementing the CWDA, VP and Matrix approaches. These models have now been prepared by CEPA and are being published.

The function of this consultation paper is to accompany the models published in conjunction with this paper and to summarise the initial modelling results. The paper briefly outlines the model options used, but the CER advises stakeholders to reread the Information Note published in June 2014 (CER/14/127) for further background on the various cost allocation methodologies that were available to the CER to choose from. The CER notes that the outputs (tariffs) produced by the models at this point are expected to vary considerably between this paper and the draft decision paper, which will be published in the New Year. The goal of this paper is to provide stakeholders with a clear view on the operation of the models, the underlying assumptions and the significance of the relevant inputs in each case.

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3.0 Background

3.1 Decision Paper CER/12/087 and Information Note CER/14/127

As stated in the June Information Note the reform required for the entry regime in Ireland is being driven by the changes in how gas is sourced in Ireland. At present the majority of gas in Ireland is sourced from Great Britain via sub-sea interconnectors (ICs) from Scotland, with a small amount from gas storage and production facilities in Kinsale. From 2015, it is expected that indigenous production from the Corrib gas fields will displace gas from the IC system. In addition a potential liquefied natural gas (LNG) project at Ballylongford Co. Kerry may contribute additional supplies to the Irish market.

The reasons for reform have been stated numerous times by the CER and are focused on ensuring that the reduced IC throughput does not push the wholesale price of gas in Ireland to a level that damages consumer interests and Ireland's energy competitiveness. In addition, the CER committed to ensuring that a tariff regime would be put in place that recognised and rewarded new supply-market entrants where they could be shown to be efficient by reference to other entry sources, in particular IC entry, which will continue to be the marginal source of gas supply for the foreseeable future.

In CER/12/087, the CER stated that the tariff reform policy would be based on forward-looking long run marginal cost (LRMC) considerations rather than historic costs.

Since then, developments at an EU level have continued, specifically the publication of the ACER Framework Guidelines on Tariffs and more recently, the publication of ENTSOG's Draft Network Code on Tariffs. Binding on all Member States, the Tariff Network Code is expected to be implemented by 2017 across the EU. As the CER considers that the tariff regime requires reform before 2017, it is desirable to implement changes now that are in line with the EU requirements.

It should be borne in mind here that the ACER Framework Guidelines in this particular case are quite detailed and prescriptive – in part reflecting the views of the European Commission. This applies to the cost allocation methodologies available to Member States, the circumstances which should prevail for particular options as well as detailed rules.

The June Information Note gave an initial introduction to the reform process by outlining the tariffing options available in the ACER Framework Guidelines and how each methodology may apply to Irish circumstances. This included the;

- Postage Stamp approach
- Capacity-Weighted Distance approach
- Distance to Virtual Point approach
- Matrix Approach

Each of these cost allocation methodologies were examined in terms of the inputs that could be used, economic cost concepts (based on historic costs, forward looking costs etc.) that

would apply to each methodology and the use of secondary adjustments, which includes equalisation, benchmarking and rescaling.

In addition, the Information Note outlined ACER's view on where Member States may apply the methodologies as well as the CER's initial thinking on which methodologies may be suitable for the Irish market, and whether the methodologies were consistent with CER/12/087.

Finally, the Information Note gave an indicative timeframe of the entry tariff reform process between June 2014 and September 2015.

Although the Information Note was intended to be an introduction to the topic, the CER did note that certain matters were settled. These included the decision to exclude applying the Postage Stamp methodology and that exit tariffs would continue to be postalised.¹ In addition, the CER indicated that as the ACER Framework Guidelines states that capacity is the principle cost driver that the collection of revenues in Ireland would be based primarily on capacity.

3.2 Responding to this consultation

To facilitate responses to this Consultation Paper the CER proposes a number of specific questions that will assist CER in the entry tariff reform. These questions are outlined in the relevant sections and are attached at Appendix B. We would request that respondents focus specifically on these questions in their response.

To facilitate respondents the CER has set up an online questionnaire which can be accessed at the link below.

<https://www.surveymonkey.com/s/H6WZ3JY>

We would request that where possible respondents respond via the online questionnaire.

As part of this consultation process the CER has published the models that accompany each of the cost allocation methodologies. The CER has organised a Public Workshop to accompany this Consultation Paper, details of which are published alongside this paper.

¹ This continues the policy direction on the matter given to CER in 2001. Postalisation of Exit tariffs would apply via the Equalisation secondary adjustment.

4.0 Key Assumptions and Model Inputs

As outlined in June Information Note, the ACER Framework Guidelines outline a choice of four Cost Allocation Methodologies which each NRA may apply in their system. These are;

Methodology	Cost Concept
Postage Stamp	Historic
Capacity Weighted Distance Approach (CWDA)	Historic
Virtual Point	Variant A (Forward looking)
	Variant B (Historic)
Matrix	Flexible

Table 4.1 - Methodologies

Although these four methodologies are described in the June Information Note, the CER has decided that only three of the methodologies will be modelled for Ireland. This includes the CWDA, Virtual Point (Variant A) and Matrix. Given that the Postage Stamp Approach does not provide locational signals to efficient new entry; and given that this was a key consideration in the 2012 decision (CER 12/087), the CER has ruled out the application of the Postage Stamp approach to Ireland for entry.

For the purposes of this Consultation Paper the CER will present three methodologies. As per the Framework Guidelines it is proposed that a chosen methodology must be examined against a counterfactual. The Framework Guidelines call for the methodologies to be assessed under the following criteria;

- Cost reflectivity
- Locational signals
- Transparency
- Tariff stability

In addition, the Framework Guidelines state that in assessing the chosen methodology, consideration must be given as to why a Virtual Point or Matrix approach is better suited to the system than the CWDA approach. This would prima facie indicate that where a forward looking approach is chosen then this must be compared against the historic inputs of the CWDA.

This Consultation Paper outlines all three methodologies and the corresponding, indicative tariffs for each. The CER is not at this time proposing one approach as best suited to the system. Rather, we request stakeholders to examine the merits of each methodology (and the merits of the two Matrix approaches) and how they would suit the Irish system and best serve Irish gas customers.

Q1. Bearing in mind that the CER is not at this time proposing one methodology as best suited to the Irish market; do stakeholders view the modelling of the three proposed methodologies as suitable? Please provide details where possible.

4.1 Standard assumptions for each methodology

For each of the modelled methodologies a number of standard assumptions are made. These assumptions include the number of Entry points and Exit Zones (aggregated exit points). This will indicate the level of supply and demand that will populate each methodology. The Entry points indicated below will be used as an input in all modelled scenarios. In certain scenarios some Entry points may not be active.

The Exit Zones are calculated by aggregating a number of Exit points and their peak day demand within a certain zone.

The 4 Entry points and Exit zones are indicated below.

Entry points	Moffat, Inch, Corrib, Shannon
Exit Zones	Dublin, Galway, Limerick, Cork, Waterford, Cork/ to Dublin, the North East Pipeline(NEP), Pipeline to the West (PTTW), Isle of Man (IoM), Gormanston

Table 4.2 - Entry points & Exit zones

The Virtual Point Variant A and Matrix methodologies require a representative network to model the gas flows on different segments of the network, In addition to the four Entry points and 10 Exit zones specified above, the modelling assumes six nodes corresponding to six points on the Irish gas network, chosen in such a way as to replicate the ring shaped nature of the gas transmission network in Ireland. Each Entry point connects to the closest node based on actual pipeline distances.

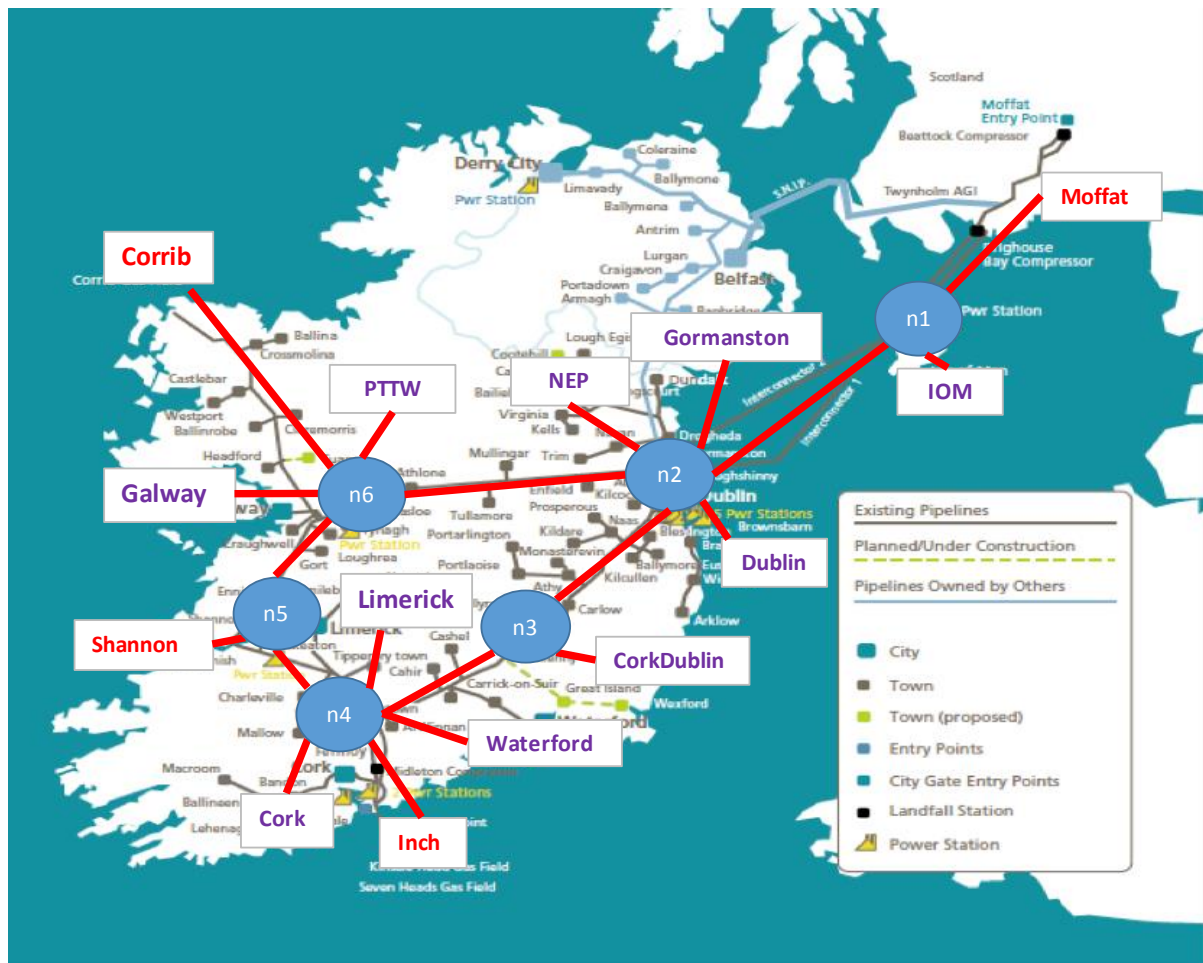


Figure 4.1 - Illustrative gas map of Ireland with internal nodes

4.1.1 Entry Point Scenarios

Depending on which Entry points are active, different scenarios can be modelled. Where an Entry point is active it is assumed that both a peak day flow and a booked capacity apply. In all scenarios (Exit zones) are active and demand is constant. Four scenarios have been modelled that remain constant across each methodology.

For each methodology a number of assumptions regarding the technical and booked capacity of the system and each Entry point must be made. These are outlined below. In Scenario 1, only Moffat and Inch are active. In Scenario 2, Corrib is active in addition to Moffat and Inch. Scenario 3 assumes all four Entry points are active, and Scenario 4 assumes that Corrib flows have declined and no new sources at the point have come on-stream, in addition Inch flows are assumed to have ceased.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Moffat	✓	✓	✓	✓
Inch	✓	✓	✓	×
Corrib	×	✓	✓	×
SLNG	×	×	✓	✓
Exits	✓	✓	✓	✓

Table 4.3 - Scenarios

Q2. Do stakeholders view the four Scenarios outlined above as appropriate for modelling purposes? Are there other scenarios with different active Entry points that should be considered?

4.1.2 Flexibility of inputs

One of the flexible input parameters available for the CER to adjust in determining an appropriate model for Ireland is the split between the revenues to be collected at Entry points and those collected at Exit points. To date, the CER does not apply an ex-ante determined entry-exit split.² However, the Framework Guidelines state that the application of an entry-exit split can be either an input to certain methodologies or may be an outcome of other methodologies. Similarly, at present the capacity-commodity split in Ireland is based on a 90:10 split. For the purposes of this consultation, the illustrative tariffs presented assume a 100:0 split. This is in line with ACER Framework Guidelines guidance that transmission services revenue should be recovered via capacity only charges. These methodologies represent a 100:0 capacity-commodity split which can be adjusted if necessary.³

Q3. Bearing in mind that ACER guidance suggests a 50:50 split between Entry and Exit for recovering allowed revenues what are stakeholders' views on the split?

4.2 Entry assumptions and merit order

A specific merit order to meet demand is implicit in Gaslink's Network Development Plan (NDP) 2014. This is based on indigenous production, followed by storage and gas flows from

² The revenues for entry revenues and revenues attributed to the onshore tariff are divided roughly 30:70 at present, this split is an output of the current cost allocation methodology.

³ It should be noted that the ENTSO-G Draft Network Code states that Allowed Revenues for Transmission Services are collected via capacity only reference prices. The CER notes that the current draft also references Commodity charges based on flows and a Complementary Revenue Recovery Charge as a means of recovering Allowed revenues for Transmission Services.

Moffat supplying the remainder. Supplies from LNG have not been modelled in the NDP.⁴ Therefore, in modelling each methodology an assumption has been made that the merit order would include LNG flows after indigenous production and storage, with Moffat IC flows providing the remainder where necessary.⁵

Changes to booked capacity at each of the Entry points will impact on the tariffs applicable at each Entry point. It should be noted that the assumed booked capacity figures do not reflect actual commercial booking behaviour, but the amount of capacity that would need to be booked by shippers to satisfy demand on a peak day. The expected capacity bookings is an estimate of what annual capacity booking shippers might book at each Entry point.

Entry Point	All	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Technical capacity (GWh/day)	Average peak flows (GWh/day)	Booked capacity (GWh/day)	Average peak flows (GWh/day)	Booked capacity (GWh/day)	Average peak flows (GWh/day)	Booked capacity (GWh/day)	Average peak flows (GWh/day)	Booked capacity (GWh/day)
Moffat	342	203	159	110	58	42	42	45	45
Inch	35	35	36 ⁶	35	36	16	16	-	-
Corrib	103	-	-	93	93	70	70	-	-
Shannon	-	-	-	-	-	109	58	193	142

Table 4.4 - Entry assumptions

Q4. What are stakeholders' views on the expected merit order? If alternatives are proposed please provide supporting evidence.

Q5. What are stakeholders' views on the expected capacity bookings? If alternatives are proposed please provide supporting evidence.

⁴ The supply scenarios in the NDP do not include Shannon LNG. However, the NDP does include details that Shannon LNG Phase 1 will provide up to 191.1 GWh/d of maximum export capacity.

⁵ A merit order with Shannon LNG has not been modelled in the NDP.

⁶ The technical capacity of Inch is 63GWh (which is based on the technical capacity of Midleton Compressor Station. However, upstream capacity is currently limited to approximately 35 GWh/d.

4.2 Exit assumptions

An Exit zone, in simple terms is an aggregation of a number of exit points off the transmission system which may include power stations, factories etc. There is a catchment area into which all the exit points are aggregated to form the zone. The technical capacities of these Exit zones are based on technical capacities of the AGIs.

The location of each Exit zone is calculated using a weighted average of all the exit points that are within the catchment area of that zone. It should be noted that the principal purpose of the Exit Zones is to apportion aggregate demand so as to provide a simple illustration of the impact of the application of the different cost allocation methodologies. For the Exit Zones a constant demand is assumed for all four scenarios across all cost allocation methodologies. Therefore, regardless of which Entry point flows arise from it is assumed in each of the methodologies that the demand at exits will remain the same. Differences will arise in how the merit order will meet the flows required at the exits.

The CER will continue the policy direction of postalising the exit tariff via the application of equalisation. Therefore, there will be no competitive advantage in being located in one zone vis-à-vis another.

Exit Zone	Technical capacity (GWh/day)	Location (co-ordinates)	Average peak flows (GWh/day)	Booked capacity (GWh/day)
Dublin	379	-6.3, 53.3	88	151
Galway	21	-9.1, 53.5	1	1
Limerick	43	-8.6, 52.5	2	3
Cork	217	-8.3, 51.9	54	59
Waterford	33	-7.2, 52.3	19	19
Cork to Dublin	133	-6.5, 53.2	13	19
The North East ⁷	72	-6.3, 53.6	31	11
Dublin to Galway ⁸	78	-8.2, 53.1	23	19
Gormanston	67	-6.3, 53.6	0	1
Isle of Man	7	-4.7, 54.3	6	14

⁷ North East Pipeline

⁸ Pipeline to the West

Table 4.5 - Exit zones**4.3 Expansion Constants**

For certain forward looking methodologies such as Virtual Point Variant A and the Matrix approach an expansion constant may be used. The purpose of the expansion constant is to provide a numerical value for the cost of expanding the capacity so that one unit of gas travels over a specified distance. An expansion constant does not identify the costs of a specific project, but rather takes a blended cost of past projects to arrive at a standardised expansion cost that may apply across the network. This would include a blend of a number of pipeline projects constructed by BGN. How this concept is used is explained in table 4.6 below:

How an Expansion Constant is used

The key cost drivers for gas transmission systems are the amount of gas to be transported and the distance over which the gas is to be transported. Expansion constants are a way of expressing these key cost drivers in a single number.

Essentially the expansion constant describes the cost of the pipeline required to move one unit of gas (normally expressed in GWh) by a distance of 1km. The example below illustrates how an expansion constant can be used where the expansion constant is €20 per unit of gas per km

Distance between the points = 150km

Quantity of gas to be moved = 100 units

Cost of the pipeline = €20/km/unit * 150km * 100 units = €300,000

Table 4.6 – Use of an expansion constant

An expansion constant may apply to the entire network or may apply to segments of the network. As the Irish gas system is both on land and subsea the CER views it as appropriate to consider the impact of applying two distinct expansion constants to reflect the different costs involved in incremental investment in each case.

This would reflect the fact that a significant portion of the Irish gas system is subsea. For the purposes of the initial modelling we have used an expansion constant of €11,000/MWh/km for the onshore segments and €33,000/MWh/km for subsea segments.

The choice of expansion constant(s) is expected to be a key part of the considerations in this consultation process.

Q6. What are stakeholders' views on the application of expansion constants to the system?

4.4 Capacity vs Commodity

At present transmission tariffs in Ireland are calculated on the basis of a 90:10 split between Capacity and Commodity. In line with ACER Framework Guidelines the tariffs indicated below are calculated on the basis of recovery based on capacity only.

Stakeholders should bear in mind that the 100% capacity charge will apply when comparing these indicative tariffs to those that currently prevail. The models included here are set to recover capacity only. The models can facilitate different capacity-commodity split in the “inputs” tab.

4.5 Secondary Adjustments

As per the Framework Guidelines, after the application of a chosen cost allocation methodology the initial tariffs may be adjusted by the application of secondary adjustments. For the purposes of the modelling presented in this Consultation Paper two secondary adjustments may apply namely, Equalisation and Rescaling.

Equalisation is applied to set a tariff for a certain set of points to the same level. The set of points must not be a mixture between domestic and cross-border points. As indicated in CER/12/087 and the June Information Note, the CER will continue with the policy of postalised domestic exit tariffs (as such South North Pipeline exit and Isle of Man exit tariffs would be set separately).⁹ This requires the equalisation of all exit tariffs after the application of the cost allocation methodology. In the three methodologies presented this is applied.

Rescaling is applied to ensure that the allowed revenues are recovered or to avoid negative capacity charges. For the three methodologies presented below Rescaling is applied to the Virtual Point and Matrix approach (forward looking approaches). In these methodologies after initial pre-adjusted tariffs are modelled, a fixed adder is applied to each tariff to obtain the required 50% of allowed revenues from Entry.

It should be noted that where a tariff for an Entry point is negative then this is constrained to zero. Therefore where a fixed adder is applied the adder will apply from a base of zero. Stakeholders should bear in mind which Entry points are active in each scenario (where the

⁹ The Isle of Man is connected only to the IC system and has its own spur pipeline infrastructure of the IC system. As noted in CER/12/013 the planned changes to the Gas Entry Regime structure will continue to ensure that the position of the Isle of Man is not adversely affected.

pre-adjusted tariffs are presented) to determine whether the tariff is constrained to zero or whether the Entry Point is not active in that scenario.

5.0 Capacity Weighted Distance Approach

The first methodology is the Capacity Weighted Distance Approach (CWDA). This approach aims to ensure that the Allowed Revenues are apportioned according to the capacity and distance of each of the Entry points.

For this methodology the following concepts are assumed.

	Entry	Exit
Distance	Fixed	Fixed
Capacity Concept	Booked	Booked
Cost Concept	Historical	Historical
Entry/Exit	50	50
Secondary Adjustments	NA	Equalisation

Table 5.1 - CWDA

This approach takes the historic allowed costs of the TSO and allocates them to each entry (and exit) according to the weight of the capacity/distance of each of the points. Either technical or booked capacity can be used for this calculation. For the purposes of this modelling expected booked capacity has been used. As the CWDA allocates all allowed revenue proportionately to entry and exit points there is no requirement for rescaling.

In Scenario 1 both Moffat and Inch rise, from the currently prevailing tariffs partly due to the rescaling of the Entry/Exit split to the 50:50 split outlined in the ACER Framework Guidelines which means that a larger revenue pot is allocated among Entry points. As other Entry points come on stream the Moffat tariff increases as the estimated booked capacity falls faster than the revenue share apportioned to it. This is a result of the fact that the revenue share collected from Moffat under the CWDA is a function of both distance (constant) and estimated booked capacity (declining).

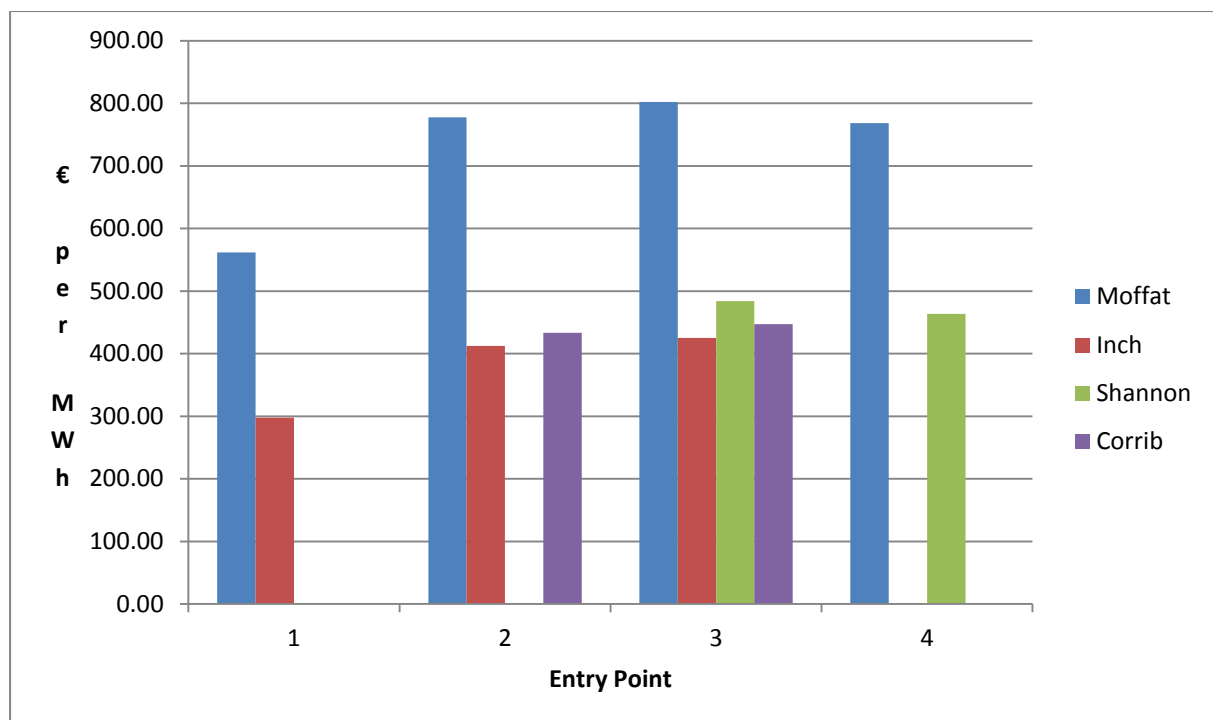


Table 5.2 - CWDA Tariffs

In each scenario Exit tariffs are equalised resulting in a **€336.62 per MWh/day** tariff.

The initial results presented in Table 6.1 show a high degree of consistency between Scenarios 2, 3 and 4. When comparing Scenario 2 and 3 for example, the addition of Shannon has only a marginal impact on the Moffat, Inch and Corrib tariffs. Similarly, when comparing Scenarios 3 and 4, removing Inch and Corrib from the calculations leads to a small drop in the tariffs of the remaining supply sources, Moffat and Shannon. Within the four Scenarios, the differential between the active supply sources does not vary greatly.

Q7. Do stakeholders view the application of a historical approach such as the CWDA as appropriate to Ireland? Please provide reasons as to why the approach is suitable, or not to Ireland.

Q8. Do stakeholders propose any modifications to the CWDA approach? If so, please provide reasons why.

Q9. Does the CWDA methodology promote tariffs that are stable and predictable? Please provide details.

Q10. The CWDA methodology has the ability to incorporate either technical capacity or booked capacity. What are stakeholders' views on the merits of using either?

6.0 Virtual Point Variant A

The Virtual Point (VP) Variant A adds additional dimensions to the concepts of distance and capacity in the CWDA and involves a representative network being used within the modelling. This representative network includes multiple internal nodes. It should be noted that the VPA approach is also a forward looking cost concept.

	Entry	Exit
Distance	Variable ¹⁰	Variable
Capacity Concept	Booked	Booked
Cost Concept	Forward looking	Forward looking
Entry/Exit	50	50
Secondary Adjustments	Reference Node to obtain 50/50 split is an input. Fixed adder.	Fixed adder. Equalisation.
Constraint	No negative tariff	No negative tariff

Table 6.1 - Virtual Point Variant A

The approach keeps the concept of distance and capacity as with the Capacity Weighted Distance approach.

However, rather than calculate the distance between each Entry Points and Exit Zone distances are calculated to a Virtual Point (in our model the use of a reference node). The Virtual Point Variant A approach introduces the concept of flow distances whereby flow direction is a determinant of setting tariffs. This is calculated within the model based upon average peak day flows from Entry points and from Exit zones. To accommodate the Entry/Exit split chosen as an input the Virtual Point is mathematically adjusted to meet this split.

This approach is forward looking and introduces forward-looking expansion constants to the system. The expansion constant is a numerical value relating to moving one unit of gas one kilometre. For the purposes of the Virtual Point approach this results in a value of moving gas from one entry point to the Virtual Point via the series of internal nodes on the system. In addition, the direction of flow is important as an increase in the direction of the predominant flow attributes a positive flow direction value, whereas a negative value is attributed to that segment if going contraflow.

Depending on which of the four Scenarios is modelled, the flow directions will change depending on which Entry points are active. For example, Corrib entry decreases the flows from Moffat and the predominant flow direction in the representative network would now be towards Moffat rather than coming from Moffat. An extra unit of gas coming on at Moffat under this scenario would reduce the (primary) Moffat tariff as it is receiving credit for

¹⁰ The distance of each Entry point to the Virtual Point will alter depending on the Supply & Demand profiles.

pushing gas against the pre-dominant flow. In modelling these results as each Entry point becomes active the eventual location of the Virtual Point will change. For the purposes of the modelling reference node 2 has been chosen as the reference node, the location of which then alters to accommodate the Entry/Exit split.

This impacts upon the adjustments made to the selected reference point in moving this Virtual Point and calculating tariffs.

In the modelling, negative primary capacity charges are explicitly avoided. A fixed adder is used as a secondary adjustment to amend the revenue recovered under the unadjusted tariffs to the overall allowed revenue level. This applies to both Entry points and Exit zones, which have separate fixed adders. In the case of under-recovery, a fixed adder supplements the calculated tariffs at each Entry point or Exit Zone; in the case of over-recovery, tariffs are adjusted downwards.

The tariffs indicated below are **pre-adjusted tariffs** that have not had secondary adjustments applied. In Scenario 1 the Inch Entry tariff is not indicated as an explicit constraint in the model does not allow negative tariffs, therefore the pre-adjusted tariff is set to zero. The same occurs in Scenario 2.

The pre-adjusted tariffs have utilised an expansion constant, which can differ depending on the segment within the Irish system. The selection of a different expansion constant on different sections of pipeline change relative tariffs and also change the secondary adjustment required.

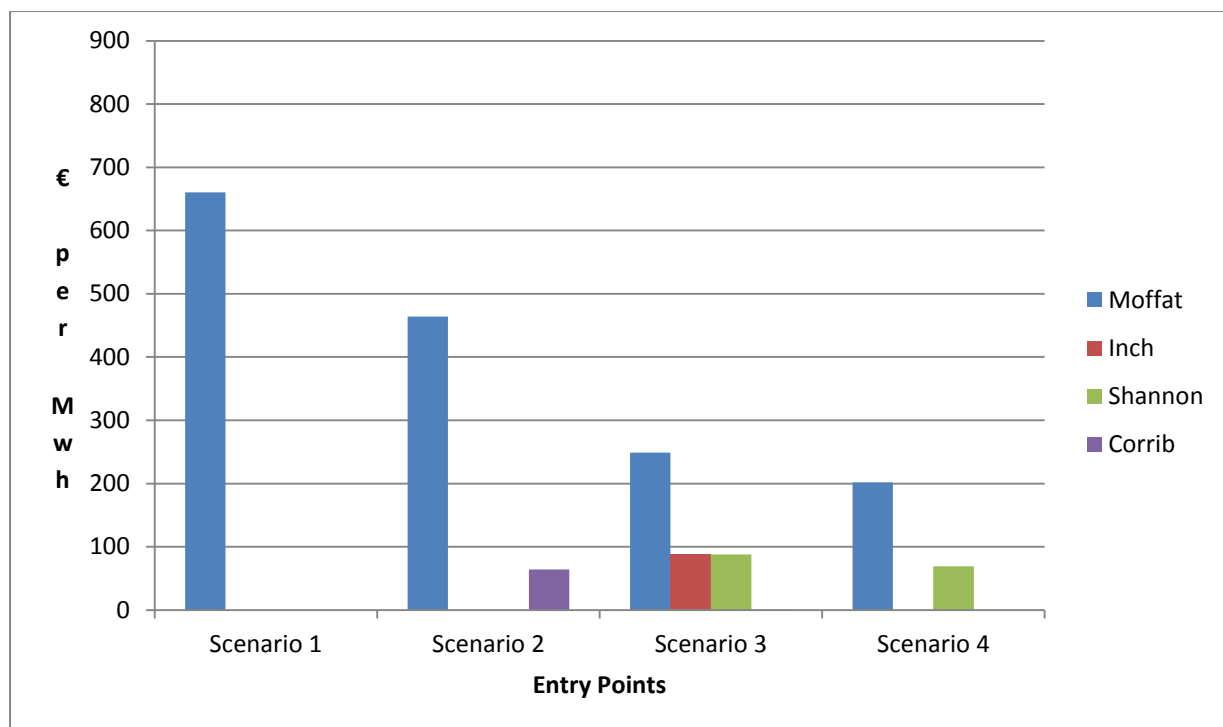


Table 6.2 - VPA Pre-adjusted tariffs

For a set of initial tariffs that do not recover the required revenue, a fixed adder is applied to each tariff. This is in line with the rescaling approach in the secondary adjustments. This adjustment is not required in the CWDA methodology. In Scenario 2 (Moffat, Inch, Corrib) this increases the Inch tariff from its zero constraint and increases all other Entry point tariffs to recover the required revenues from all Entry points. However, in Scenario 1 (Moffat and Inch only) the pre-adjusted tariffs are over-recovering. Therefore, both the Moffat and Inch tariff are adjusted downwards to avoid an over-recovery. This results in a negative tariff for Inch. While it is possible to insert a constraint into the model to constrain a negative adjusted tariff, for the purposes of this consultation paper this has not been done. This is to ensure that the differentials between the two active Entry Points are reflected in this Consultation Paper.¹¹

These tariffs after the secondary adjustments are illustrated below i.e. these are the tariffs indicated in Table 6.2 adjusted.

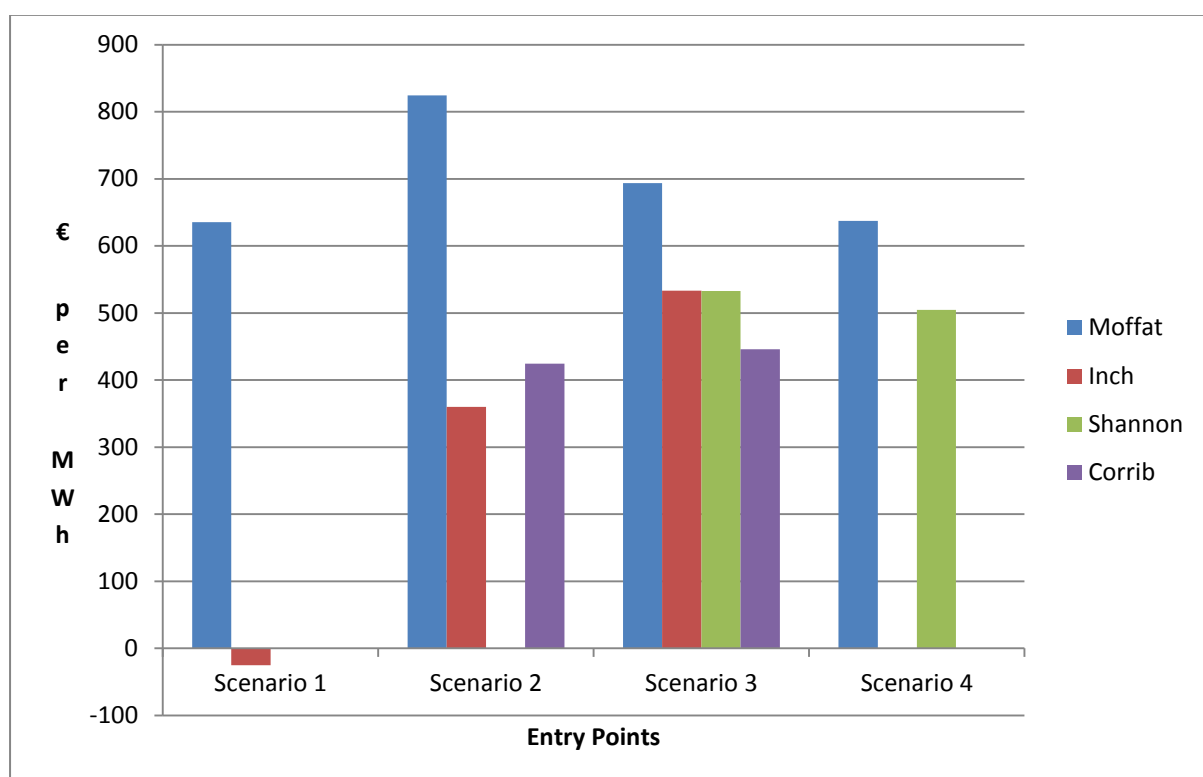


Table 6.3 - VPA Tariffs after secondary adjustments

In each scenario Exit tariffs are equalised resulting in a **€336.62 per MWh/day** tariff.

The initial model results, shown in Table 5.3, indicate a high degree of volatility between scenarios and, in addition, the approach shows some quite significant tariff differentials within scenarios.

¹¹ Given a negative adjusted Inch tariff and a positive Moffat tariff, to constrain Inch to zero, the Moffat tariff would need to decrease. The increase in the Inch tariff and decrease in the Moffat tariff loses the calculated differential. We would anticipate that the model would be adjusted to constrain this adjusted negative tariff.

Q11. Do stakeholders view the application of a forward looking Virtual Point based approach as appropriate to Ireland? Please provide reasons as to why the approach is suitable, or not to Ireland.

Q12. Do stakeholders propose any modifications to the VP approach? If so, please provide reasons why.

Q13. Does the Virtual Point Variant A promote tariffs that are stable and predictable? Please provide details.

7.0 Matrix approach

The Matrix approach shares many similarities to the Virtual Point Variant A approach. For example its use of a representative network and expansion constants. The Matrix approach is a more static methodology as there is no need to select a reference node. This differs from the Virtual Point approach where the reference node that acts as the Virtual Point moves depending on the different scenarios modelled.

Although the distance between Entry and Exit points is fixed, the capacity that each Entry point will provide on an average peak day will fluctuate depending on the number of Entry points and the merit order assumed.¹²

Like the Virtual Point approach a forward looking cost concept, based on expansion constants is used. In addition, a constraint is added to avoid pre-adjusted negative tariffs and an Entry/Exit split of 50:50 is assumed.

	Entry	Exit
Distance	Constant ¹³	Constant
Capacity Concept	Average Peak day	Average Peak day
Cost Concept	Forward looking	Forward looking
Approach	Expansion Constant	Expansion Constant
Entry/Exit	50	50
Secondary Adjustments	Fixed adder.	Fixed adder. Equalisation.
Constraint	No negative tariffs	No negative tariffs

Table 7.1 – Matrix

However, unlike the Virtual Point Variant A approach the methodology is based on distance between all Entry/Exit combinations rather than distance to a Virtual Point.

In addition, flow direction is a key factor. Where the marginal unit flow follows the direction of flow then a positive value is applied to that pipeline segment. Where a unit is against the direction of flow then a negative value is ascribed.¹⁴ At present there is discretion as to what level of negative value is applied. For the purposes of the modelling presented negative expansion constants have a value of 1.

¹² This merit order is based on that outlined in Section 2.2.

¹³ Unlike the VP approach the distance of each Entry point to each Exit Zone is static. However, as the Entry point merit order may change the capacity that each Entry point provides will fluctuate.

¹⁴ The ENTSO-G Draft Network Code suggests that this constant negative may be between 0-1. In this scenario we have assigned a 100% negative constant where applicable.

Q14. The draft Network Code on Tariffs indicates that NRAs have discretion as to the level of the negative expansion constant. Considering that the Matrix must take account of the flow direction what are stakeholder's views on the value of negative expansion that should be applied?

As with the Virtual Point Variant A the pre-adjusted tariffs are shown below. These are prior to the application of adders to each Entry Point to reach the required 50% of allowed revenues from Entry Points. In Scenario 1 Inch is not shown as the tariff is constrained to zero.

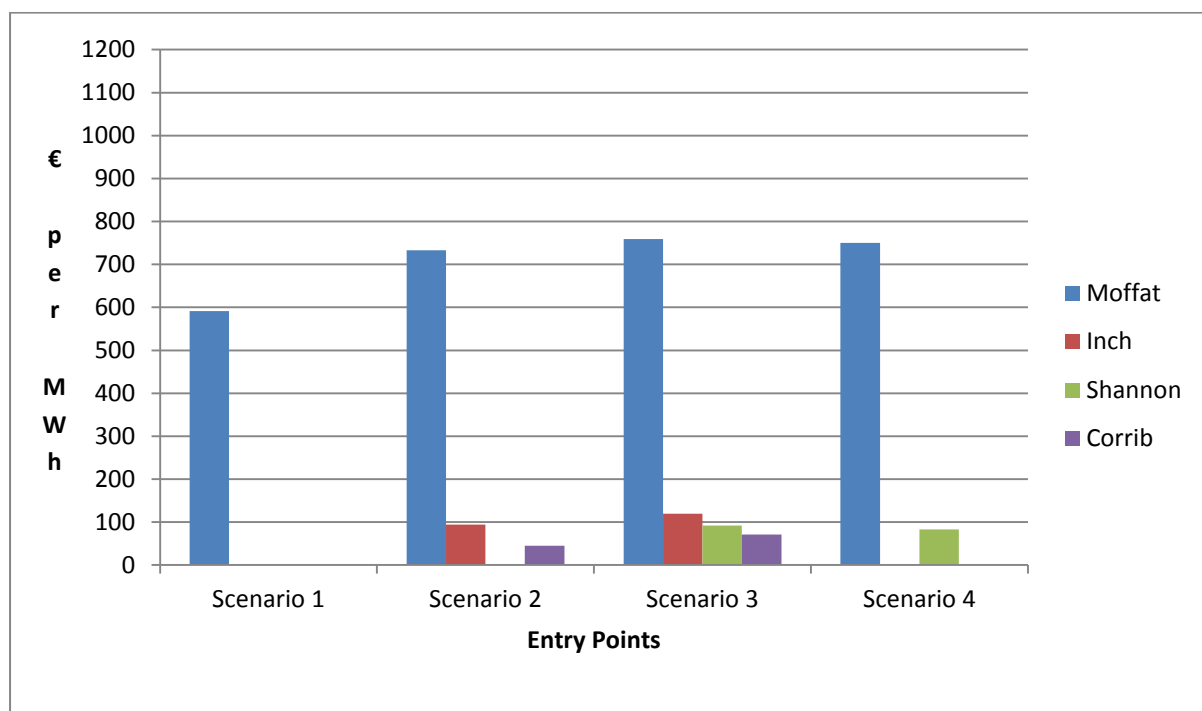


Table 7.2 - Matrix Pre-adjusted tariffs

The primary driver in the differentials between the Moffat Entry tariff and the Inch, Shannon and Corrib tariffs is the value of the expansion constant that is used for Moffat (the “wet” expansion constant). This gives a unit cost from Moffat to each Exit zone that is higher than other Entry points, which in turn give rise to a higher tariff.

With the addition of fixed adders to each pre-adjusted tariff the tariffs at each Entry point increases to recover the 50% of allowed revenues from entry.

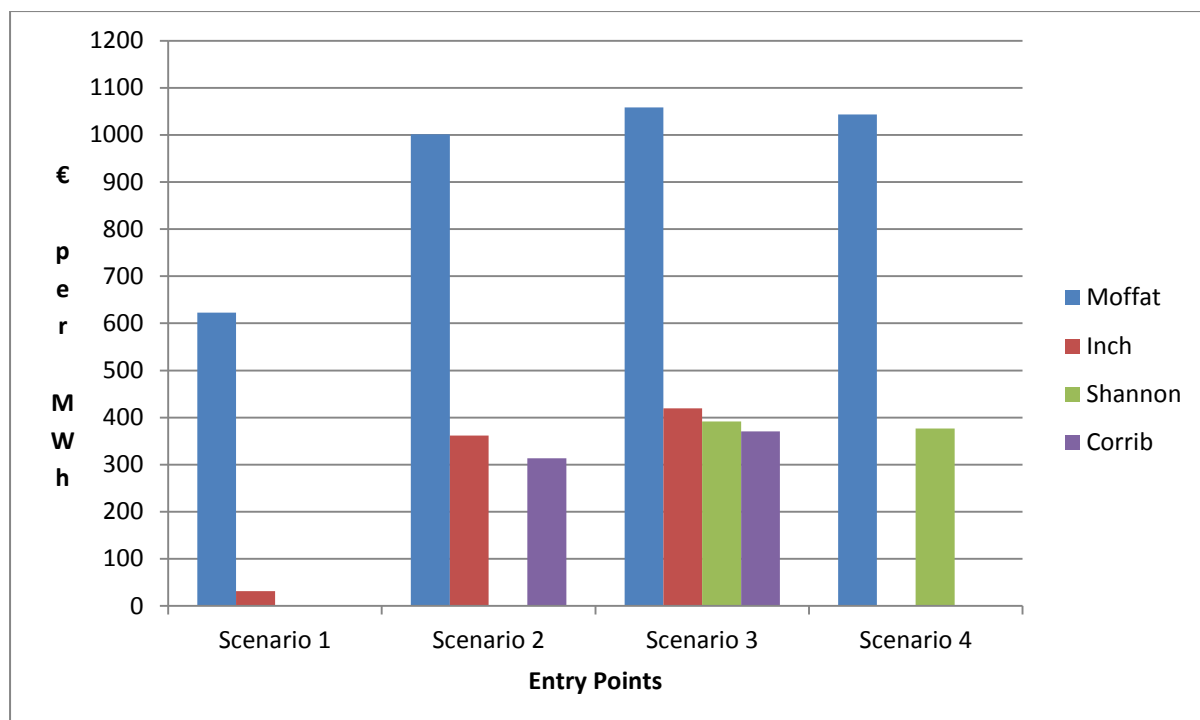


Table 7.3 Matrix Tariffs after secondary adjustments

In each scenario Exit tariffs are equalised resulting in a **€336.62 per MWh/day** tariff.

The initial adjusted Matrix tariffs shown in Table 7.3 show a very high differential between Moffat and other supply sources. This differential between Moffat and other Entry points is stable between scenarios.

Q15. Do stakeholders view the application of the Matrix approach as appropriate to Ireland? Please provide reasons as to why the approach is suitable, or not to Ireland.

Q16. Do stakeholders propose any modifications to the Matrix approach? If so please provide reasons why.

Q17. Does the Matrix approach promote tariffs that are stable and predictable? Please provide details.

7.1 Matrix using Project based costs

In addition, the Matrix can accommodate costs associated with specific future projects that have been identified as necessary for reinforcement of the system instead of using expansion constants as above. For the purposes of this consultation paper we have included two specific projects identified as necessary in the 2013 Gaslink Network Development Plan.

These are;

- Twinning South West Scotland Onshore System (SWSOS)

- Strategic reinforcement between Goatsland Co. Limerick and Curraleigh Co. Tipperary

The matrix cost allocation methodology can be applied to derive forward looking gas transmission tariffs that take account of the expected incremental costs of network reinforcement, utilising the matrix approach to set the entry and exit charges.

The Framework Guidelines contain limited specific details on how the matrix of unit costs should be populated, potentially allowing some flexibility in decisions on issues such as the approach to defining the incremental unit costs.

In the section on publication requirements the Framework Guidelines states that there is flexibility in terms of the cost concept used. The forward looking cost concepts includes “*standardised costs of expansion of the system*” as have been applied to the VPA and Matrix approaches in this Paper. In addition, the Framework Guidelines allow for a cost concept based on “*investment plan based costs: the costs that are estimated in a specific investment plan for building additional capacity*”

Therefore, one approach to populating the matrix, could involve deriving unit costs from planned or potential future Irish transmission network investment projects. A similar principle of using project based costs was applied in CER/12/087.

The following illustrates how a project cost based approach could be applied within a matrix methodology in Ireland. The tariffs are purely illustrative given that were a project cost based methodology applied in practice, further analysis would be required of the applied project costs.

7.2 Implementation of project costs approach

A simple illustration of the project costs approach is presented below based on the following unit cost assumptions:

- a Moffat Long Run Average Incremental Cost (LRAIC) project cost estimate is calculated using Twinning and compressor investment projects;¹⁵
- a LRAIC associated with Shannon’s Entry point is derived from an estimated incremental capacity and cost of the Curraleigh West to Goat Island reinforcement.¹⁶

. These unit costs have then been used to populate the matrix as follows:

- The Moffat LRAIC is assumed to apply to all Moffat / Exit zone combinations (see Table A1 below).
- The LRAIC associated with the Shannon (Foynes) Entry point is applied to the Cork, Waterford, Cork Dublin, North East and Western Exit zones.
- Zero unit costs are applied for Inch and Corrib Entry points as existing capacity is assumed to be sufficient to handle incremental demand at these two Entry points.

¹⁵ The LRAIC estimate developed for CER/12/087 (see CER/12/030b - <http://www.cer.ie/document-detail/Future-of-Gas-Entry-Tariff-Regime/683>)

¹⁶ The LRAIC is calculated as the annuitised discounted incremental cost of the Curraleigh West to Goat Island project divided by its discounted incremental peak day throughput for the planning period.

	Moffat	Inch	Shannon	Corrib
Dublin	Moffat LRAIC	-	-	-
Galway	Moffat LRAIC	-	-	-
Limerick	Moffat LRAIC	-	-	-
Cork	Moffat LRAIC	-	Shannon LRAIC	-
Waterford	Moffat LRAIC	-	Shannon LRAIC	-
Cork Dublin	Moffat LRAIC	-	Shannon LRAIC	-
North East	Moffat LRAIC	-	Shannon LRAIC	-
Western region	Moffat LRAIC	-	Shannon LRAIC	-
Gormanston	Moffat LRAIC	-	-	-
Isle of Man	Moffat LRAIC	-	-	-

Table 7.4 - Matrix populated using estimated project costs

Having populated the matrix using the project cost assumptions in Table 7.4 above, the matrix is solved as per the methodology described in the ACER Framework Guidelines to determine tariffs for each Entry point.¹⁷

The tariffs obtained under the Matrix methodology using the LRAIC matrix are presented in Table 7.5 below. These are the tariffs determined after applying the secondary adjustment required to match allowed revenues. These illustrative tariffs are indicated below.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Moffat	530.3	621.3	628.5	622.2
Inch	433.7	498.2	504.9	0.0
Shannon	0.0	0.0	516.9	509.3
Corrib	0.0	498.2	504.9	0.0

Table 7.5 - Tariffs under the project costs matrix

¹⁷ Exit tariffs are assumed to be equalised as with the other model results.

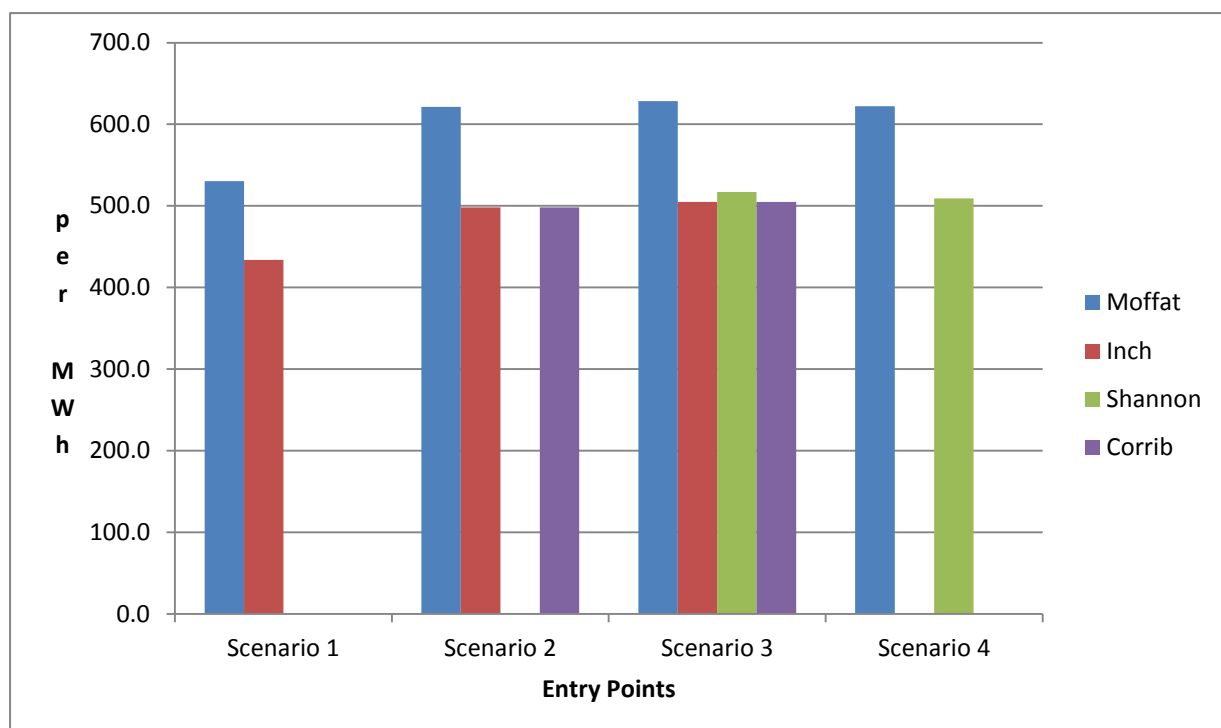


Table 7.6 - Project Costs Matrix Approach

In each scenario Exit tariffs are equalised resulting in a **€336.62 per MWh/day** tariff.

The initial tariffs produced by the project costs matrix approach, shown in Table 7.6, suggests a high degree of consistency between and within Scenarios. Differentials between supply sources are within a similar range in each scenario, and there is no major variance in supply sources' tariffs between scenarios.

Applying the project cost approach in practice would require calculation of LRAICs for each entry-exit point combination under a base investment scenario (similar to the method applied in the CER/12/087 decision for the Moffat tariff). This should reflect projected investment requirements based on projected flows and capacity requirements between each of the Irish network entry-exit point combinations.

To calculate the LRAICs, the incremental capacity requirements, together with the annuitised total cost, of each project will need to be determined. The timing of investment projects would also need to be taken into consideration given LRAICs require discount factors to be applied to costs and the incremental peak day capacity provided by a project.

Q18. What are stakeholders' views on applying project based costs to the Matrix approach?

Q19. Do stakeholders' view the application of a Matrix approach using Expansion Constants or a Matrix approach using project based costs as more suitable to Ireland?

8.0 Tariff Stability vs. Tariff Predictability

A key question for stakeholders in any gas regime is the degree of certainty that surrounds network tariffs. This is important in the medium term to ensure that efficient signals are given to encourage Entry points to both locate where it is efficient, and to ensure that the capacity they provide the system is proportionate to the needs of the system.

In the June Information Note, the CER stated that along with tariffs that were transparent and cost-reflective, the CER stated that it would aim to produce tariffs that were stable. Tariff stability aims to provide entry tariffs that do not fluctuate over a specific period such as a Price Control period. Tariff stability aims to give certainty to stakeholders with medium term business planning.

In the Irish context with changing flows over the next number of years, tariff stability may be a challenge to deliver. In particular, as different Entry points enter the system the stability of tariffs will inevitably alter. Therefore, the deliverability of stable tariffs will be a challenge when both the number of Entry points increase and this, in turn results in changes to the flow patterns on the system. This would be most markedly evident in Scenario 3 where both Corrib and Shannon are active Entry points. This would change the dominant flows from the east to the west.

Linked to tariff stability is tariff predictability. This concept is closely linked to transparency, whereby a regulatory regime that delivers transparent data allows stakeholders to predict tariff levels. In Ireland where changes to both the number of Entry points and flows from each will vary in the coming years, it may be more likely that the CER can deliver tariff predictability to stakeholders. If we take the same example of the CWDA methodology again, we can see that the booked capacity at Corrib is likely to change according to the data available. While this does not provide tariff stability (as booked capacity is a key component of the methodology and will fall resulting in changes to the capacity weighted distance of the methodology) it does allow stakeholders to predict tariff levels where the key inputs are provided.

It should be noted that the Framework Guidelines and the ENTSO-G draft Network Code on Tariffs contain provisions on the publication of information. For example, Article 24 of the draft Network Code on Tariffs states that;

“The information relevant for tariff calculation shall be published in order to enable networks users:

- (a) To estimate to a reasonable extent the reference price for the next tariff period, and where the tariff period does not coincide with the regulatory period, for each tariff period within the remainder of the respective regulatory period.¹⁸”*

¹⁸ ENTSO-G Draft Network Code on Tariffs at page 31 of 54

The CER is of the view that the publication of the model should allow stakeholders to reasonably predict the level of tariffs based on expected allowed revenue.

Q20. How can stability and predictability in tariffs be evaluated and quantified?

Q21. Apart from the publication of models behind tariffs what other factors do stakeholders view as necessary for tariff predictability and/or stability?

9.0 Storage

The ACER Framework Guidelines makes specific reference to the benefits that storage can provide the transmission system and that these benefits can be considered in setting or approving tariffs for storage facilities.

The Network Code on Tariffs shall specify that, in setting or approving tariffs for entry and exit points from and to gas storage facilities, NRAs shall consider the following aspects:

- *The benefits which storage facilities may provide to the transmission system.*
- *The need to promote efficient investments in networks.*

NRAs shall also minimize any adverse effect on cross-border flows.¹⁹

The CER is of the view that, at present, gas storage provides valuable security of supply benefits to the system and that the availability of storage should be recognised as part of the future tariff regime. The CER is considering the treatment of storage as part of this tariff review.

Q22. What are stakeholders' views on the benefits that Storage can provide the transmission system?

Q23. Are there any other issues stakeholders would like to raise?

¹⁹ ACER Framework Guidelines Section 3.4

10.0 Next Steps

This Consultation Paper forms part of an overall tariff regime reform which was indicated in the June Information Note. The timeframe is indicated below.

Timeline	
Consultation Paper	2 nd September-14 th October (6weeks)
Public Workshop	23 rd September
NTLG Meeting 3	24 th October
NTLG Meeting 4	25 th November
NTLG Meeting 5	16 th December
Draft Decision Document	20 th January 2015-3 rd March 2015 (6 weeks)
Public Workshop 2	10 th February 2015
NTLG Meeting 6	31 st March 2015
Decision Document	1 st June 2015

Table 9.1 –Timeline for decision

As part of this consultation, the CER would like to invite feedback on the questions posed, preferably via the online questionnaire link below.

<https://www.surveymonkey.com/s/H6WZ3JY>

The CER encourages the use of the online questionnaire but bears no responsibility should the online service be unavailable for whatever reason. In such unforeseen circumstances you are requested to send your responses to;

Colm Ó Gormáin at cogormain@cer.ie or to the following address;

Colm Ó Gormáin
Commission for Energy Regulation,
The Exchange,
Belgard Square North,
Tallaght,
Dublin 24

In addition, the CER has organised a Public Workshop to invite feedback on the results presented in this Consultation Paper. A separate invitation to this Workshop has been published alongside this Consultation Paper

Annex A: Developments since finalisation of the ACER Framework Guidelines

Since the publication of the Framework Guidelines, ENTSO-G has published a draft Network Code on Tariffs. At the time of publication this draft is out for consultation. In the following sections we describe the process through which the European Tariff Network Codes will be developed.

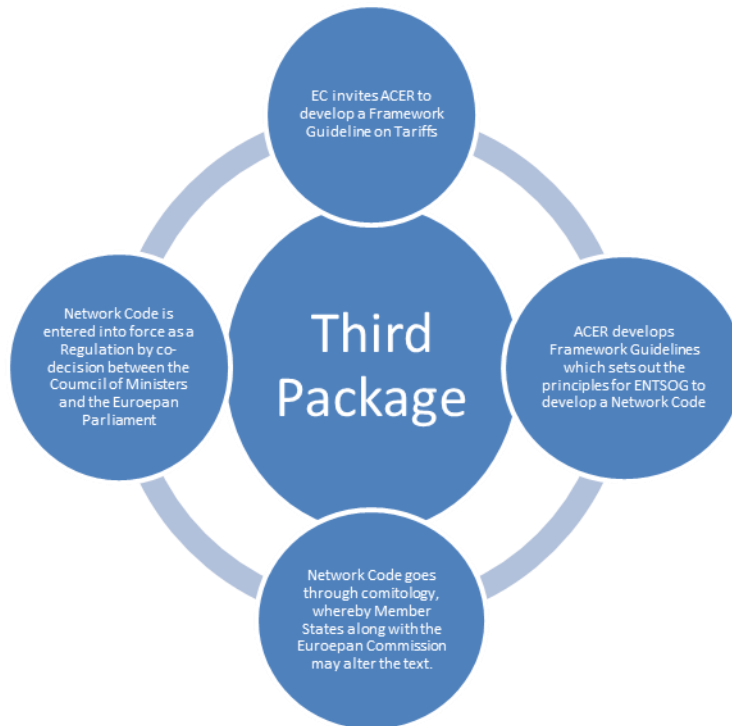
A.1 Process for development of Network Codes

The legislative basis for the development of the Framework Guidelines is the Third Package of energy legislation. For gas this consists of a Directive (2009/73/EC) and two Regulations [Regulation (EC) 713/2009 & Regulation (EC) 715/2009]. Regulation 713 provides for the establishment of the Agency for Cooperation of Energy Regulators (ACER) and Regulation 715 established ENTSO-G and sets out (as the European Association of TSOs) the responsibilities and duties of ACER.



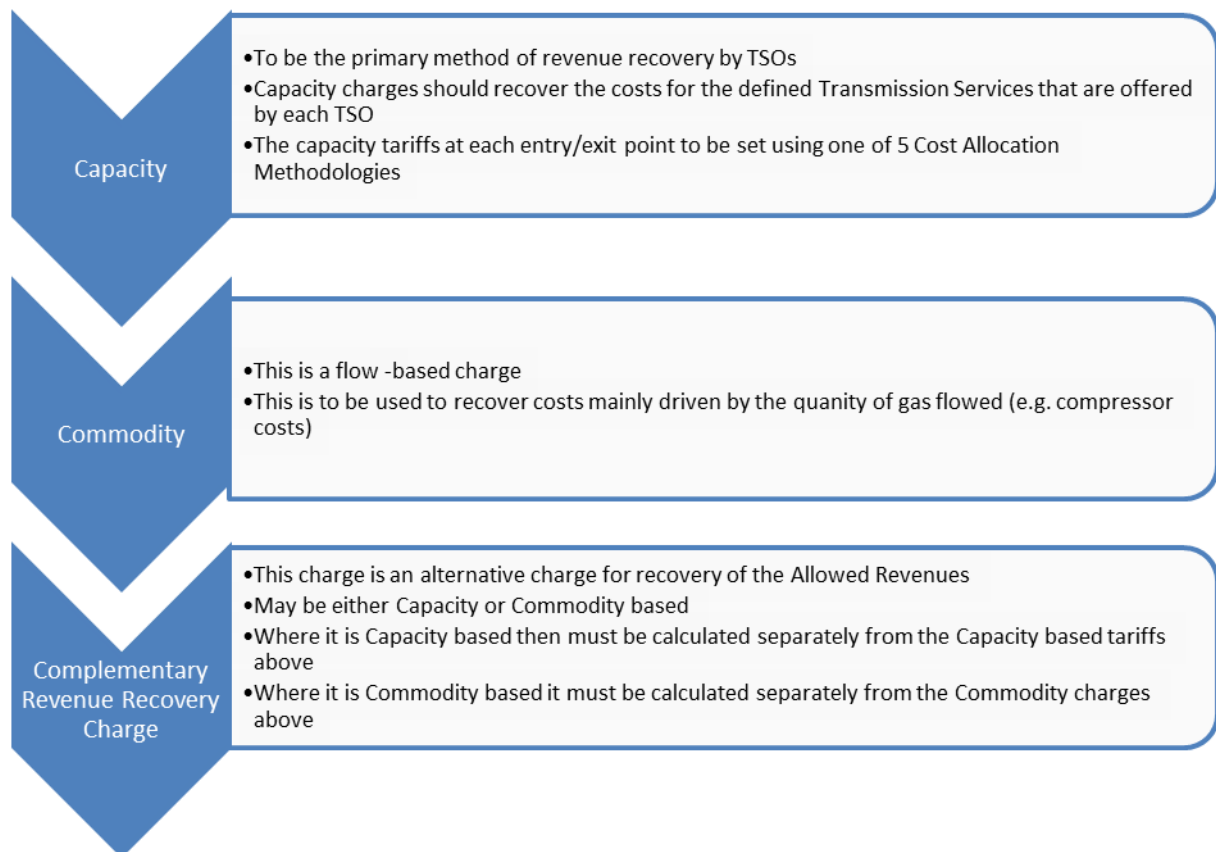
Regulation 715 places specific tasks on both ACER and ENTSO-G with regards to the development of Framework Guidelines and Network Codes. After invitation by the European Commission, ACER develops a non-binding Framework Guideline. This is subject to majority approval by the NRAs of the Member States.

After ACER has published the Guidelines, ENTSO-G is invited to submit a detailed Network Code based on the principles set out in the Framework Guidelines. After this is finalised it is presented to the EC. The draft Network Code then goes through a process referred to as comitology where the European institutions (the Commission, the Council (acting for the Member States) and the Parliament) have an opportunity to review, amend and ultimately approve the draft Network Code.



A.2 What changes have occurred since the publication of the Framework Guidelines?

In addition to the publication of a new cost allocation methodology (described below) the details contained in the draft Network Code have provided clarity on the choice of inputs available for the cost allocation methodology, as well as how target or allowed revenues are recovered via other mechanisms. The diagram below highlights how the revenues of the TSO may be recovered subsequent to the clarifications/changes included in the ENTSO-G Draft Network Code.



In addition to the four cost allocation methodologies included in the ACER Framework Guidelines ENTSG has included a fifth cost allocation methodology based on the use of assets (pipelines) by homogeneous groups of users. This approach is based on identifying homogenous groups of users and allocating costs based on the assets that are necessary to provide peak day demand to that homogenous group.

Finally, the Draft Network Code contains details of the secondary adjustments that are similar to those contained within the ACER Framework Guideline.

A.3 How does CER set network tariffs today?

At present the CER sets 3 network tariffs - 2 entry tariffs and 1 exit tariffs. The Entry point tariffs include;

- IC Capacity & Commodity charges
- Inch Capacity & Commodity charges

In addition an Onshore Capacity & Commodity tariff is levied as the Exit tariff for Ireland. To date, the historic costs of Bord Gáis Networks have been used to calculate the tariffs, e.g. the cost associated with the Inch entry assets have been divided by an anticipated level of annual Inch entry bookings for the tariff year. As these tariffs are based on historic costs they aim to recover the costs associated with building the current system. There is no pre-

determined split at present between recovery at Entry points and recovery at Exit points. In simple terms, the costs of remunerating (and operating) specific assets are allocated to the two Entry points to give allowed revenue per Entry point. The cost of remunerating (and operating) the remaining assets are allocated to all Exit points to give allowed revenue across all exit points. At present, revenue recovery is split roughly 30:70 between Entry and Exit.

As over 95% of gas in Ireland is currently sourced via the IC Entry point, the price of wholesale gas in Ireland is set by the cost of the gas at the British National Balancing Point (NBP) plus the cost of moving that gas to Ireland i.e. Cost of Irish gas = GB Exit + IC Entry. While this has to date been adequate, with major flow changes occurring in the next number of years this approach to entry tariff will no longer be in the best interests of Irish gas customers. The CER is of the view that in light of the changes occurring at an EU level, it is sensible to present options to stakeholders that are compatible with EU developments and that will suit the changing flow profiles in Ireland.

Annex B: Questions

Q1. Inputs

Bearing in mind that the CER is not at this time proposing one methodology as best suited to the Irish market; do stakeholders view the modelling of the three proposed methodologies as suitable? Please provide details where possible.

Q2. Inputs

Do stakeholders view the four Scenarios outlined above as appropriate for modelling purposes? Are there other scenarios with different active Entry points that should be considered?

Q3. Inputs

Bearing in mind that ACER guidance suggests a 50:50 split between Entry and Exit for recovering allowed revenues what are stakeholders' views on the split?

Q4. Inputs

What are stakeholders' views on the expected merit order? If alternatives are proposed please provide supporting evidence.

Q5. Inputs

What are stakeholders' views on the expected capacity bookings? If alternatives are proposed please provide supporting evidence.

Q6. Inputs

What are stakeholders' views on the application of expansion constants to the system?

Q7. CWDA

Do stakeholders view the application of a historical approach such as the CWDA as appropriate to Ireland? Please provide reasons as to why the approach is suitable, or not to Ireland.

Q8. CWDA

Do stakeholders propose any modifications to the CWDA approach? If so, please provide reasons why.

Q9. CWDA

Does the CWDA methodology promote tariffs that are stable and predictable? Please provide details.

Q10. CWDA

The CWDA methodology has the ability to incorporate either technical capacity or booked capacity. What are stakeholders' views on the merits of using either?

Q11. Virtual Point

Do stakeholders view the application of a forward looking Virtual Point based approach as appropriate to Ireland? Please provide reasons as to why the approach is suitable, or not to Ireland.

Q12. Virtual Point

Do stakeholders propose any modifications to the VP approach? If so, please provide reasons why.

Q13. Virtual Point

Does the Virtual Point Variant A promote tariffs that are stable and predictable? Please provide details.

Q14. Matrix

The draft Network Code on Tariffs indicates that NRAs have discretion as to the level of the negative expansion constant. Considering that the Matrix must take account of the flow direction what are stakeholder's views on the value of negative expansion that should be applied?

Q15. Matrix

Do stakeholders view the application of the Matrix approach as appropriate to Ireland? Please provide reasons as to why the approach is suitable, or not to Ireland.

Q16. Matrix

Do stakeholders propose any modifications to the Matrix approach? If so please provide reasons why.

Q17. Matrix

Does the Matrix approach promote tariffs that are stable and predictable? Please provide details.

Q18.Matrix

What are stakeholders' views on applying project based costs to the Matrix approach?

Q19. Matrix

Do stakeholders' view the application of a Matrix approach using Expansion Constants or a Matrix approach using project based costs as more suitable to Ireland?

Q20. Tariff Stability & Predictability

How can stability and predictability in tariffs be evaluated and quantified?

Q21. Tariff Stability & Predictability

Apart from the publication of models behind tariffs what other factors do stakeholders view as necessary for tariff predictability and/or stability?

Q22.Storage

What are stakeholder's views on the benefits that Storage can provide the transmission system?

Q23. General

Are there any other issues stakeholders would like to raise?