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Submission on CRU's Electricity Network Tariffs 2022/23 – National Energy Security Framework Response Proposals

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This submission draws on both a review of the literature, economic theory and research carried out by the Economic and Social Research Institute. A bibliography is provided at the end of the document. Relevant points noted in the Call for Evidence will now be discussed in turn.

1. Transmission Revenue Allocation: Do you have any comments on the amount and distribution of the proposed transmission security of supply revenue allocation of €100m for the tariff year 2022/23?

2. Tariff Review Proposals Do Stakeholders have views on the collective suite of new proposals set out in this section?

Questions 1 & 2 will be discussed together, where some general comments on the proposals will be given.

The recovery of security of supply costs through transmission tariffs is not cost-reflective as these costs are not related to the transmission network but rather generation capacity requirements.

A key tenet of efficient pricing is cost-reflectivity. There are several economic principles that one may apply when setting tariffs for utilities that involve numerous cost components. One such approach is that of Coasian pricing (Coase 1946). This is the basis for multi-part tariffs that comprise a fixed, capacity and energy-related charge. Applying these principles to transmission tariffs, the volumetric price should be set equal to the marginal cost of electricity transmission (i.e. the cost of transmitting the last kWh of electricity through the system); the standing charge should be proportional to the burden that consumer places on fixed costs while a capacity charge should be proportional to each consumer's contribution towards the transmission capacity requirement.

The recovery of security of supply costs through transmission tariffs is not cost-reflective as these costs are not related to the transmission network but rather generation capacity requirements. This observation holds for the entire €478m, not just the €100m earmarked for time of use tariffs. Thus, recovering the costs incurred in procuring emergency generation via network tariffs moves both capacity remuneration revenues and transmission system usage charges away from cost-reflectivity.

A time of use tariff has potential to improve cost-reflectivity of electricity tariffs but not as specified in the proposal document

Time of use tariffs bring consumer tariffs closer to cost-reflectivity and can be welfare-improving (Vickrey 1971, Caves, Herriges et al. 1989). A cost-reflective time of use tariff is one whereby consumers receive a price that is reflective of the marginal cost of delivery at a given moment in time. As a general rule, a time of use tariff on electricity consumption should be calibrated to reflect the marginal cost of electricity delivery during a given time interval (Vickrey 1971, Caves, Herriges et al. 1989).

A cost-reflective tariff would restructure the existing costs according to the variation in marginal cost between time periods. While the proposed Time of Use tariff emulates this cost differential, it is carried out by adding an additional cost that is related to capacity procurement. This is not cost-reflective.

There are many overlapping and conflicting price signals.

A correctly specified time of use price should guide demand away from the peak in the right amounts at the right time. Multiple tariffs to achieve the same goal may create further distortions. For example, if a correctly-specified ToU tariff is in place, an additional incentive to shift will lead to greater shifting of demand than is socially optimal: individuals and firms will shift at a cost that is greater than the benefit of doing so.

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An additional tariff would only be worthwhile if the ToU tariff was incorrectly specified, as the additional tariff may bring the system close to the efficient outcome. A single, correctly-specified time of use tariff should be sufficient.

Secondly, multiple tariffs create numerous signals that must be managed. While the majority of the proposed tariffs are targeted towards firms and firms usually have strong incentives to respond efficiently to a given price signal, two concerns remain:

- The tariffs must be correctly specified. As firms will optimise their decisions in a way that is most cost-effective from their perspective, this requires that the tariff must be specified correctly or there may be unintended consequences. Some potential unintended consequences are discussed below.
- There are many potential signals which may be difficult to decipher. At best, this will add additional complexity to firm operations, incurring transaction costs. At worst, firms may not be able to respond to the entire suite of proposed measures in an effective manner, despite a strong incentive to do so.

One point not mentioned in the consultation document is the impact of increasing network charges on the collateral requirements placed on suppliers. The proposed tariff redesign will increase total tariffs by approximately 50%, and will also introduce a variable component to tariffs. Assuming the current method of calculating collateral remains, this will significantly increase costs for suppliers, both in terms of the magnitude and in terms of the costs of the extra variability that will apply to collateral costs. Suppliers are likely to face even further increases in gas and electricity prices coming into the winter, and so this increased financial burden as a result of the collateral requirement may put significant pressure on at least some firms. Consideration should therefore be given to maintaining collateral requirements at the 2021/22 regime, regardless of any changes to network tariffs.

Suggested cost-reflective structure

On foot of these points, a cost-reflective solution to the issues presented are as follows (in order of expected welfare maximisation)

1) Recovery of €478m through capacity mechanism; calibration of time of use tariffs on cost-reflective principles
2) Should it be necessary to recover the €478m through transmission charges, a prudent approach would involve doing so in a least-distortive manner. A flat-rate increment in the transmission charge minimises distortions and/or the likelihood of unintended consequences arising from mis-specified energy or capacity charges. Should a time-of-use component be desired, a cost-reflective tariff would restructure the existing costs according to the variation in marginal cost between time periods.

3. Should these arrangements be a temporary response to significant forecast security of supply costs for 2023 and 2024, or should a more enduring approach be considered?

Signalling is important for both future investment in the electricity market and for wider industrial policy. A stable and predictable regulatory environment is important to guide investment in the right amounts at the right time. The introduction of unexpected regulatory changes creates risk for investment that is very difficult to hedge. All else being equal, investment will be guided away from Ireland towards more stable alternatives. Indeed, the expectation that unexpected changes are within the realm of possibility may be sufficient to deter investment.

Effective signalling is important to give a clear understanding for investment. Should measures such as these be required in the short-run, communicating clearly the period during which these measures will be applicable may partially mitigate some of the negative impacts on investment incentives. In particular, signalling and communicating clearly that any tariff changes are emergency measures, are not intended to hold in the long run, and will be replaced as soon as practicable with a properly-designed suite of tariffs that reflect the societal costs and benefits of secure electricity supply may mitigate some of the potential negative consequences of the

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magnitude and unexpected nature of these tariff changes. For this reason, restricting any tariff changes to the immediate future may prove wise.

Furthermore, the potential for adverse consequences of the Incremental Block Tariff, in particular, may also render an emergency, temporary framing more beneficial than an enduring approach. This is discussed below in more detail.

A first-best solution in the long-term is to introduce arrangements that are cost-reflective and impact decisions before they are made. For instance, should additional connections impose direct capacity costs on the system, a cost-reflective charging regime would indicate that these costs should be borne at the point of connection rather than at a later date.

Peak ('ToU') Network Tariffs

4. Do Stakeholders have views on the appropriateness of the proposed TOU tariff, or the methodology used in the calculation of rates for 2022/2023?

A time of use tariff is potentially welfare-improving as it can bring consumer costs closer to wholesale costs. However, as discussed above, it is important that these tariffs are cost-reflective and calibrated to the underlying marginal cost. While the proposed Time of Use tariff emulates this cost differential, it is carried out by adding an additional cost that is related to capacity procurement. This is not cost-reflective and potentially distorts decision-making.

Furthermore, the design of the wholesale market, and the hourly determination of wholesale prices according to short run marginal cost, exposes consumers, either directly or via their supply companies, to the true underlying costs of electricity generation. According to economic theory, a limited or non-existent response to wholesale prices by consumers indicates either (a) that very limited demand response is socially optimal or (b) that price signals from the wholesale market are not being passed through to final customers in a manner that incentivises or enables them to respond via reduced or shifted demand. Determining which of the above holds, and examining whether or how to redesign the wholesale market in the event that (b) holds, would enable optimal consumer demand response via a correctly-specified time-of-use price, without introducing possible distortions in the electricity market in general and network tariffs in particular.

Domestic consumers cannot respond to time of use pricing without a smart meter and smart tariff. Smart tariff uptake rates in Ireland to date are low, but they are not out of line with those observed elsewhere. A recent meta-analysis of 27 studies across 6 countries found the median uptake of time of use tariffs was 27%, with substantial variation in those estimates (0-99%) (Nicolson, Fell et al. 2018). Furthermore, they find that the uptake rate for opt-in tariffs is much lower than opt-out, and also that the median proportion of domestic energy bill payers who express willingness to switch to a TOU tariff in national surveys is five times higher than the median enrolment rate to TOU tariffs. In light of these findings from the literature, the potential for new time of use tariffs to reduce peak demand via smart tariffs may be limited. There may be an argument for exploring alternative legal grounds for smart tariff adoption, which may enable suppliers to boost uptake of smart contracts.

The consultation document states that distribution peak tariffs will apply only to those that have a smart meter installed and have opted into smart services while transmission peak tariffs will apply to all domestic and non-domestic households this year (in subsequent years EirGrid will be required to align with the approach taken for distribution). This may mean a supplier with a domestic customer who has a smart tariff will face an extra transmission charge on this household's peak usage regardless, but will face an extra distribution charge only if the household opts into a smart contract. This approach may discincentivise, rather than incentivise, the uptake

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of smart contracts, as in the absence of a steep discount for off-peak consumption, remaining on a standard contract may therefore be in consumers' best interest.

Increasing Block Tariffs

5. Do Stakeholders have views on the appropriateness, and level, of the proposed Increasing Block tariff, or the methodology used in the calculation of rates for 2022/2023?

Incremental Block Pricing (IBP) represents a departure from marginal cost pricing and is therefore distortive. It is often introduced for distributional reasons as less-wealthy consumers tend to consume less. However, it guides low-energy consumers towards consuming more than they would otherwise and high energy consumers towards consuming less than they would otherwise (see (Borenstein 2012) for an estimation of welfare losses associated with retail IBP tariffs in the US for this purpose). There is also a literature suggesting that householders fail to deal with the complexity associated with complex IBP tariffs and therefore respond to the average rather than marginal price (Ito 2014). This may be less relevant for firms who have a profit motive and strong incentive to navigate the complexity.

The introduction of an IBP guides demand reductions towards larger users. This is potentially distortive; it opens up the possibility that a greater proportion of demand reduction is carried out by more costly large users rather than less costly smaller users. While there may be a distributional preference to targeting certain large users, doing so will likely incur a welfare loss.

This IBP also discriminates against large and growing energy users, relative to large but static energy users. New demand is penalised relative to existing demand, without economic or social justification. Furthermore, there is no commensurate incentive for large energy users to reduce their demand, via energy efficiency or other measures, only to stop increasing demand. This is unlikely to prove optimal as it is at least possible that the net benefit from facilitating a large energy user to reduce their demand relative to last year is greater than the net cost of a large energy user increasing their demand relative to last year.

There is also a possibility to induce perverse behaviour. An incentive may exist for a large energy user to inflate their demand to a sufficient extent this winter, incurring a significant one-time cost, allowing them to avoid tariffs from next year on, assuming the thresholds for Winter 2023/24 are set off the maximum demand in 2022/23. This behaviour would lead to a large increase in demand from XLEUs this Winter. It is not possible to quantify the probability of this behaviour, but it may prove optimal for any energy user that anticipates sustained growth in its electricity demand over the next few years, all else equal.

6. Do you have any comments on the treatment of new connections with regard to this proposed new tariff?

The levying of this tariff on all new demand represents a considerable barrier to entry and may face legal challenge. The principles of cost-reflectivity dictate that network charges on new connections should reflect the cost of the network investment required but not the existence of new demand.

System Alert

7. Do Stakeholders have any comments on the proposed introduction of a System Alert Tariff or the rates to apply for the tariff year 2022/23?

This may have long-term implications for investment incentives in Ireland. From the perspective of the energy user, system alerts are random. They cannot be anticipated nor can they be hedged easily. The cost imposed on operations are unpredictable ahead of time. Economic theory suggests that for those risks that cannot be

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diversified or hedged, the cost of those risks should be allocated to the groups or categories best able to bear them (Newbery, Pollitt et al. 2018). In the context of electricity generation, the group best able to bear the cost of these risks is energy users in general. The proposed System Alert tariffs does the opposite, by allocating the costs of system alerts to a small, albeit growing, subset of energy users.

Such a tariff design may have long-term investment and industrial policy consequences. If investors anticipate unhedgeable risks of an uncertain magnitude and of sufficient frequency, this may be a factor guiding less investment in Ireland. Indeed, should investors believe that such tariffs are possible, this may be sufficient to reduce investment.

Decarbonisation

8. Do Stakeholders have any comments on the proposed introduction of a Decarbonisation Network Tariff or the rates to apply for the tariff year 2022/23?

The existence of a separate decarbonisation tariff suggests that the price signals from the wholesale market are too weak. High RES-E levels should put downward pressure on day ahead prices, which should incentivise demand response by those large energy users that are targeted by this tariff. A lack of response to low wholesale market prices may indicate the socially optimal level of demand is being realised, reflecting a very low price elasticity of demand, or it may reflect a market failure in setting and/or facilitating response to wholesale market prices. If the first case holds, the decarbonisation tariff will be socially suboptimal, by definition.

If in fact the second case holds, the proposed decarbonisation tariff is highly unlikely to correct the market failures and may in fact introduce further distortions. In particular, the fact that the tariff is levied as a step change (€7.7669 on every MWh below 25% SNSP, nothing on every MWh above) suggests that the utility from decarbonisation is discontinuous. This is not the case, because climate change is a function of total carbon emissions. A truly cost-reflective tariff would therefore increase linearly in carbon intensity rather than applying at a certain level of SNSP and not at others.

There is also a possibility of free-riding at times where the system is only just below the target of 25% SNSP, where one demand unit curtails their demand in order to avoid the tariff, and in so doing raises SNSP above 25%, thereby benefitting all other demand units that did not reduce their demand. Such free riding is difficult to model or avoid but distorts outcomes.

Finally the choice of SNSP as the metric for the decarbonisation tariff reflects both RES-E penetration and interconnector imports and exports. In particular, imports put upward pressure on SNSP and exports put downward pressure on SNSP. The "decarbonisation" tariff may therefore apply in response to export levels. RES-E penetration also has a degree of predictability to it while net exports may differ greatly from expectations in response to an unforeseen event such as the unexpected outage of an interconnector or generation units in Ireland and/or Great Britain. For this reason, RES-E penetration would be a more appropriate metric for the decarbonisation tariff than SNSP.

9. Do Stakeholders have a view on the SNSP level proposed for the setting of this tariff?

The specific level is less important than the fact that setting one step-change level, rather than changing the tariff as a function of SNSP, is distortive, as discussed above.

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