

Annex 4 - Comparing LRMC and SRMC signals

Considering and comparing LRMC and SRMC

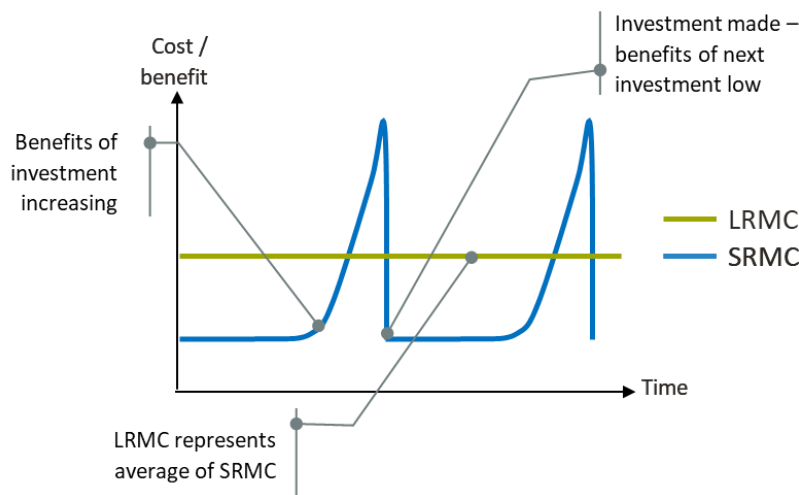
In theory, cost reflective locational signals can either be based on long run marginal costs (LRMC) or short run marginal costs (SRMC):

- **LRMC** - Under a national wholesale pricing approach, network charges such as TNUoS are the means of sending a locational signal, and are typically based on the LRMC of expanding the network; and
- **SRMC** - Under a zonal wholesale pricing approach, the locational signal is embedded in wholesale energy price differentials (i.e. SRMCs) between locations, taking network capacity as it actually is at any point in time.

With regard to zonal wholesale prices (i.e. SRMC based signals), generation and load are incentivised to produce and consume to avoid congestion. Price differentials that emerge between zones represent the value at the margin of a MWh of incremental transmission. The value of incremental transmission rises (i.e. the price differentials between zones increase) as congestion increases and falls as congestion declines (e.g. following network investment).

Although the signals are very different in nature, SRMC and LRMC signals should in theory result in the same expected locational signal over time if the network is developed optimally. This is illustrated in Figure 2. This is because optimal expansion of the network would entail investing in capacity up to the point where the cost of incremental investment (i.e. the LRMC) is expected to equate to the benefit society derives from the investment, which is in turn related to the difference in energy costs between locations resulting from lack of capacity (i.e. the SRMC).

Figure 2: Comparison of LRMC and SRMC signals



Note: In this example the SRMC signal reflects the lumpy nature of investment and the impact of spare capacity following a lump of investment on the case for further investment in the short term.

In practice, LRMC and SRMC based signals can diverge: i) as a result of the network development diverging from optimal development (noting that once optimal investments have been identified, transmission investments have historically had long lead times and are often subject to delays), and ii) due to the assumptions made when calculating LRMC based charges, like future demand, generation and network investment costs.

Annex 4 - Comparing LRMC and SRMC signals

SRMC signals on their own, correspond to the actual network conditions that exist, responding to changes in network investment, or new sources of generation or demand locating in a particular zone. However, the principle challenge associated with SRMC based signals relates to predictability and risk where both nodal and zonal pricing regimes transfer a significant amount of risk to market participants which is out of their control. The price differentials are very sensitive to changes in the level of spare capacity between particular zones/nodes and therefore if network investment (and the location of generation and demand) is subject to a lot of uncertainty, it can create a very uncertain signal for investors. As such, it would produce a less useful signal for investors to respond to in terms of locational siting decisions. An attempt to reduce this risk transfer was part of the reason why nodal pricing has been discounted as an option in REMA. And while the risk transfer is likely to be less significant under zonal compared to nodal, it is still likely to remain an issue.