Future Energy Landscape

In the spring, cherry blossoms, in the summer, the cuckoo, in the autumn, the moon, and in the winter, the snow, clear, cold?

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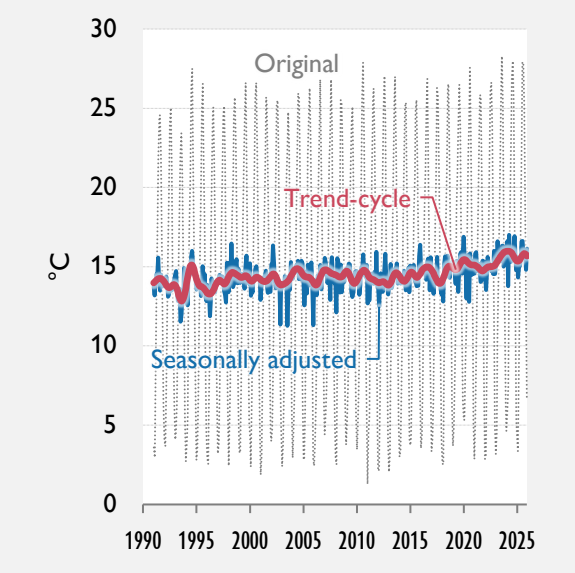
Recent years have seen frequent occurrences of high temperatures, including three consecutive summers of intense heat up to 2025 (Figure 1). Simultaneously, there are voices suggesting that days where one can truly feel spring or autumn are becoming fewer, with the year seemingly reduced to just two seasons: winter and summer. In the Tokyo suburbs last autumn, temperatures defied the saying 'The heat and cold last only until the equinox' and plummeted sharply in late October. Autumn felt as though it had passed in the blink of an eye.

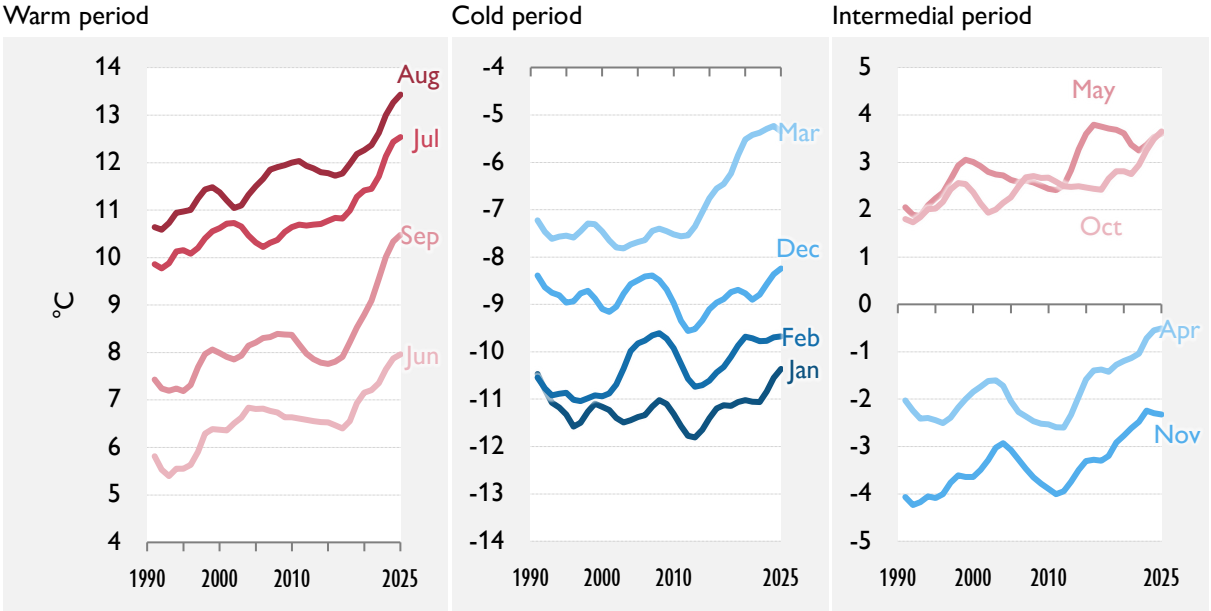
The trend in change producing this sensation can be grasped more clearly from the seasonal factors and trend obtained by seasonally adjusting the average temperatures (Figure 2). Over the past decade or so, warm periods have shown a warming trend in every month. The rise in July temperatures is particularly marked, alongside August, bringing forward the start of summer. September faces an even greater temperature increase, with the lingering heat delaying the arrival of autumn. Conversely, the cold period may defy many people's expectations. While 'global warming' is a widely recognised term, the changes observed are not as pronounced as during the warm period. Only March has seen a rapid increase in temperatures. In Tokyo, cherry blossom blooming advanced to mid-March by the early 2020s. Winter arrives at roughly the same time but now departs more swiftly.

Figure 1 | Average temperatures



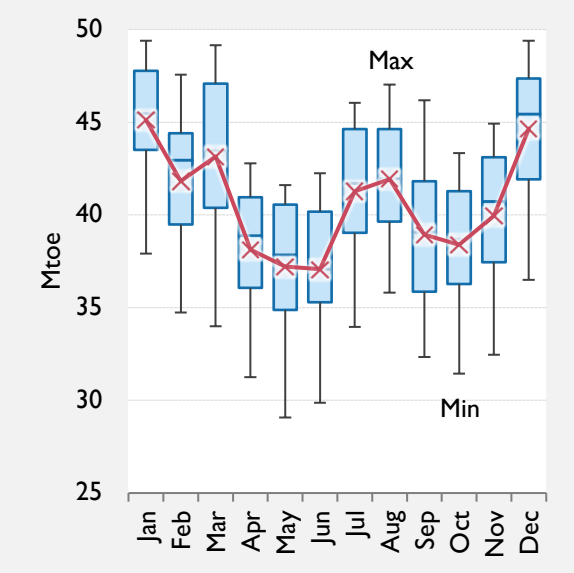
Note: Simple average of 42 locations nationwide
Source: Calculated from Japan Meteorological Agency data

Figure 2 | Seasonal factors of average temperatures



The impact of these changes extends beyond the emotional realm of losing one's familiar sense of seasons. The resulting poor harvests of fruit and vegetables could fuel rising prices. Sectors such as clothing, where demand patterns are heavily influenced by the seasons, are being forced to rethink their sales strategies. So, how is energy consumption (Figure 3) being affected?

Figure 3 | Primary energy supply (Jan. 1995–Oct. 2025)

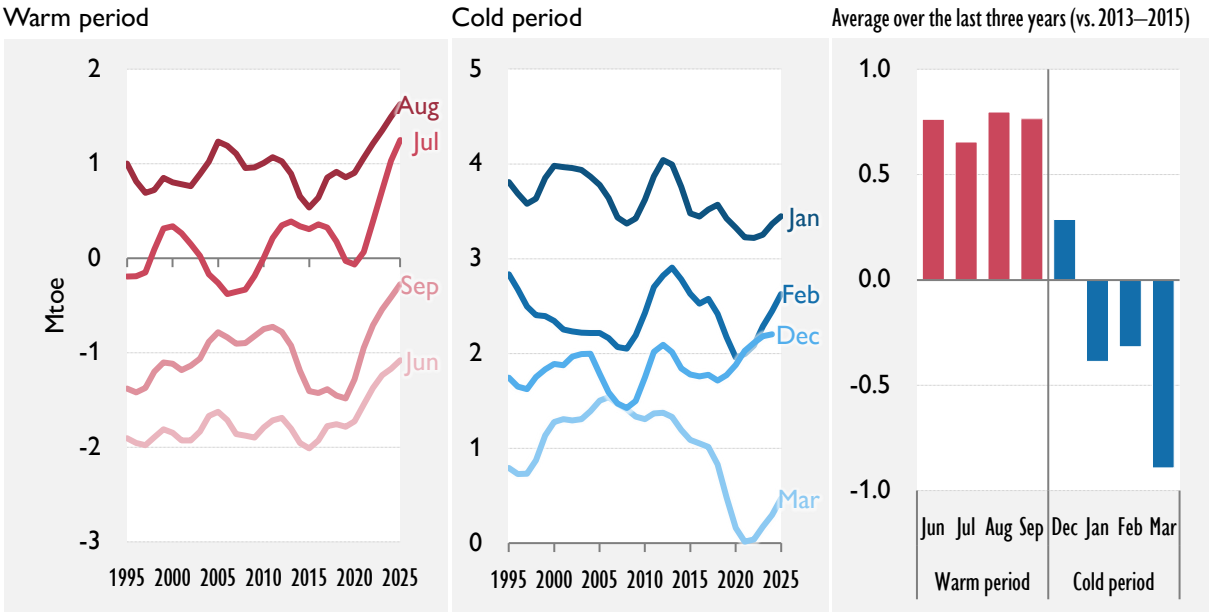


Source: IEEJ 'EDMC Energy Trend'

Over the past decade or so, the trend has been for warming during warm periods to increasingly contribute to higher energy consumption through rising demand for space cooling (Figure 4). This is particularly pronounced in September, where temperature rises have been steep, and in July over the last five years or so. Conversely, during cold periods, the earlier end to winter and earlier onset of spring exerts downward pressure on space and water heating demand in March. Naturally, this contributes to a reduction in energy consumption.

As seasonal transitions shift, September moves from a month where temperatures suppressed energy consumption towards a neutral month, whilst July transitions from a neutral month towards one where temperatures boost consumption. Conversely, March is shifting from a month where temperatures boosted energy consumption towards a neutral month. Should these trends persist, it will further necessitate enhancing energy supply capacity to cope with prolonged and more intense summers, reviewing inventory levels at the start of summer and late winter, and reconsidering the timing of regular inspections and maintenance of supply facilities, which are concentrated during periods of low energy demand.

Figure 4 | Contribution of temperatures (degree days) to seasonal factors of primary energy supply



Source: (Seasonal factors + trend when not using user variables in the X-13ARIMA-SEATS seasonal adjustment method) – (Seasonal factors + trend when using cooling degree days and heating degree days as user variables).

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