

City Talk

The impact of water and power disruptions like in Texas can last weeks, if not months. REUTERS



OUR LAWMAKERS MUST SEE LIGHT IN TEXAS BLACKOUT

Last week, I explained how a lack of running power generation capacity can lead to supply interruptions for some people.

Let me explain the other issues that can affect people when temperatures suddenly plummet.

The occurrence of freezing temperatures in tropical regions is rare, but when it happens, transport, power and water infrastructure can be severely affected.

For instance, rail services can get disrupted because wheels on steel rails lose friction, affecting their safe operation.

On roads, ice can leave vehicles susceptible to skidding and cause multicar pileups, so authorities must close them off.

For power systems, apart from inadequate generating capacity due to the ineffectiveness of wind and solar power, as well as the freezing of equipment affecting fossil fuel plant operations, the transmission system also takes a heavy toll.

High voltage transmission by overhead lines are efficient, but when systems designed for the tropics suddenly face subzero temperatures, ice on the isolation blocks can cause short-circuits, so transmission lines are cut off to ensure safety. Without power and heat, the ice on the isolation blocks will not thaw.

An associated breakdown in water supply usually occurs when power is shut down, as most water supply systems require pumping stations, which are invariably powered by electricity.

Worse still, once a water supply system stops, the stagnant water columns in the supply pipes quickly freeze up.

Unfortunately, ice has a larger volume per unit mass compared to water, and such small piping can easily break under the freezing pressure. Water supply cannot be restored until the broken pipes are replaced.



Nuts and bolts

Edmund Leung

Even if temporary repairs are made and supply is partly resumed, the water in the system may be contaminated and fail to meet hygiene standards for safe drinking.

In Asian countries, we are used to drinking only boiled water, but in Western countries, drinking water directly from the tap is the norm. Besides, there are no facilities for boiling water under these conditions, especially when there is no electricity supply.

We can therefore imagine the dire straits Texans were in with the freezing conditions of the past fortnight.

Even when temperatures return to normal, it will take weeks, if not months, before reliable water and electricity supplies can be restored. For those who are accustomed to these modern facilities, life without electricity and water must be unbearable.

Public facilities are essential services and in normal situations, they are built and maintained on a budget with few contingencies.

Hopefully, such incidents will prompt the city government to adjust, redesign and replace systems so they can cater for extreme climate conditions in the future.

We all learn from mistakes. But this will be a wake-up call for any city or country.

The next time capital budgets are submitted for approval, hopefully legislators will understand the need to accept higher costs for better reliability.

Appropriate maintenance costs must be allowed to ensure such facilities are updated continuously to serve the community's needs.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over Hong Kong's iconic infrastructure