Every building is exposed to a unique set of meteorological conditions (winds, air temperature, sun, etc.). Sometimes these conditions are well represented by the measured meteorological data from the local airport and, sometimes, not. In other cases, changes in local meteorological conditions driven by land use or global climate change, are required. A 3D map of wind conditions is also needed for pollutant transport calculations. Meteorological Data Refinement (MDR) / Re-Construction allows for the determination of the site-specific climate for structures.

Benefits to Project

- Determines the site-specific wind climate with confidence when surface weather station records are not available, not applicable, or when the quality of the records is questionable.
- Supports analyses of specific passive features or overall performance of ultra low-energy buildings.
- Provides a 3D map of weather data for pollutant transport or tall structure design.
- Supplies detailed wind properties (e.g., turbulence intensity and wind angles of attack) unavailable in most weather station records.
- Assesses impacts of global climate change or land use changes as needed for future-proofing a building design.

Key Features

- **Weather Data Anywhere Around the Globe:** By using the world’s largest meteorological data centres, inadequate weather records near the site are enhanced.
- **Weather Data at High Elevations:** Critical wind speeds, wind directions and air temperatures are obtainable at any elevation – valuable for very tall structures.
- **Weather Data for Unique Wind Events:** Thunderstorms, hurricanes, specific regional winds (e.g., Mistral & Shamal), etc. are modelled with accuracy.
- **3D Computer Modelling:** Weather patterns are in 3D, as are RWDI’s results. RWDI uses the most sophisticated weather prediction models to replicate wind conditions in 3D at the project site.

Wind profiles for different wind events are determined by RWDI’s unique methods.

Human changes to land use (shown in pink) impact the severity of heat islands. This can be forecasted for master planning adjustments.