

**Updated Projections for Temperature in Hong Kong in the 21<sup>st</sup> Century  
by the Hong Kong Observatory**

**Summary for the Layman**

The Hong Kong Observatory (HKO) has updated its projections for the temperature in Hong Kong in the 21<sup>st</sup> century, in the light of the revised global projections in the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC), which was published in 2007. This is a follow-up to its initial study carried out in 2004, based on the projections presented in the Third Assessment Report (AR3) of IPCC.

The computations are based on projected global scenarios of economic and social development, which would result in different amount of greenhouse gases being emitted into the atmosphere. A list of the scenarios adopted by IPCC is given in the Annex.

Urbanisation is an additional contributor to the rising temperature of cities. This update also takes into account the urbanisation effect in Hong Kong. In the lower-bound situation, the level of urbanisation is frozen; in the upper-bound situation, urbanisation effect grows at a constant rate.

In this summary, three sets of results are presented and labeled as:

- (a) “middle-of-the-road” - average of the scenarios as well as of the two situations regarding urbanisation;
- (b) “low-end” - low emission scenario and frozen urbanisation;
- (c) “high-end” - high emission scenario and continued urbanisation.

The numerical values are shown in the attached table, together with the previous results based on AR3. The average values for 1980-1999 are also included in the table for comparison. The results are summarised below :

■ **Rising Temperature**

***The average temperature of Hong Kong will continue to increase.***

Compared with the 1980-1999 average of 23.1°C, the average temperature in Hong Kong in the decade 2090-2099 is expected to rise by **4.8°C** according to the middle-of-the-road projection. The corresponding low-end and high-end values are **3.0** and **6.8 °C** respectively.

#### ■ **More Hot Nights and Very Hot Days**

*The annual number of hot nights (days with a minimum temperature of 28°C or above) and very hot days (days with a maximum temperature of 33°C or above) in summer will increase.*

The annual number of hot nights in summer is expected to increase from the average of 15 nights in 1980-1999 to **41 nights** in 2090-2099 (middle-of-the-road projection). The corresponding low-end and high-end estimates are **30** and **54 nights** respectively.

The annual number of very hot days is expected to increase from the 1980-1999 average of 7 days to **15 days** in 2090-2099 (middle-of-the-road projection). The corresponding low-end and high-end estimates are **12** and **19 days** respectively.

#### ■ **Cold Days to become absent in some winters**

*The annual number of cold days in winter (days with a minimum temperature of 12°C or below) will continue to drop.*

The average annual number of cold days is expected to drop below one in the decade **2030-39** (middle-of-the-road projection). The corresponding low-end and high-end estimates are **2040-2049** and **2020-2029** respectively. The previous estimate based on AR3 was 2090-2099. The average annual number of cold days at the end of the last century (1980-1999) was 14 days.

A scientific paper discussing the revised projections in detail is available online at <http://www.weather.gov.hk/publica/reprint/r764.pdf>.

**Projections for average temperature, annual number of hot nights, and annual number of very hot days in Hong Kong**

| Parameter                             | Projections for 2090-2099 based on AR4 |                            |          | Projections for 2090-2099 based on AR3 | Average for 1980-1999 |
|---------------------------------------|----------------------------------------|----------------------------|----------|----------------------------------------|-----------------------|
|                                       | low-end                                | middle-of<br>-<br>the-road | high-end |                                        |                       |
| Average temperature (°C)              | 26.1                                   | 27.9                       | 29.9     | 26.5                                   | 23.1                  |
| Annual number of hot nights (nights)  | 30                                     | 41                         | 54       | 30                                     | 15                    |
| Annual number of very hot days (days) | 12                                     | 15                         | 19       | 24                                     | 7                     |
| Annual number of cold days (days)     | <1                                     | <1                         | <1       | <1                                     | 14                    |

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