# Central Jakarta Air Quality Forecast based on PM2.5

**Seng Hansun, Marcel Bonar Kristanda, Winarno**

***Abstract—*** ***Air, as one of the main key factor for all living beings, can be easily polluted by many pollutants. To know a region's air quality, an Air Quality Index (AQI) has been developed. There are many measurement elements to calculate AQI, but the most dominating one is PM2.5. PM2.5 is the measurement of particulate matter less than 2.5μ in diameter. In this study, we try to forecast the Central Jakarta Air Quality based on PM2.5. Three conventional moving average methods and one hybrid moving average method are incorporated in this study to predict future values of AQI based on historical data we have. Based on the experimental result on 730 preprocessed data, we found that all the conventional and hybrid moving average methods successfully implemented to forecast the future values of AQI in Central Jakarta.***

***Index Terms—Air Quality Index, Forecasting, Moving Average Methods, PM2.5.***

## I. INTRODUCTION

As one of the main key factor for all living beings, air can be easily polluted by many pollutants. There are five (5) major pollutants controlled by the Clean Air Act, i.e. the ground-level ozone, the particle pollution, the carbon monoxide, the sulfur dioxide, and the nitrogen dioxide [1]. All of these pollutants are so important that they are being used as the key indicators in calculating the Air Quality Index (AQI).

As an indicator that measures the daily air quality, the main focus of AQI is on health effects which can be experienced by human being within a few hours or days after breathing polluted air [1]. Its values ranged from 0 to 500, where the higher value corresponds to the greater air pollution level and to the greater health concern problems. The air quality index comprises of six categories with different coloring as shown in Fig.1.

| AQI | Air Pollution Level | Health Implications | Cautionary Statement (for PM2.5) |
|---|---|---|---|
| 0 - 50 | Good | Air quality is considered satisfactory, and air pollution poses little or no risk | None |
| 51 -100 | Moderate | Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution. | Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion. |
| 101-150 | Unhealthy for Sensitive Groups | Members of sensitive groups may experience health effects. The general public is not likely to be affected. | Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion. |
| 151-200 | Unhealthy | Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects | Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion |
| 201-300 | Very Unhealthy | Health warnings of emergency conditions. The entire population is more likely to be affected. | Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion. |
| 300+ | Hazardous | Health alert: everyone may experience more serious health effects | Everyone should avoid all outdoor exertion |

**Figure 1. AQI and its cautionary statement for PM2.5 [2]**

There are many measurement elements to calculate AQI, one of them is PM2.5. PM2.5 is the measurement of particulate matter (the particle pollution) less than 2.5μ in diameter, in contrast with PM10 for the large particle. Although there are many other elements, such as O3, CO, SO2, and NO2; PM2.5 has become the dominating measurement element in calculating AQI.

The characteristics of PM2.5 had been studied by He et al. [3]. They took weekly PM2.5 samples from two different locations in Beijing, China recorded from July 1999 to September 2000. Then the ambient mass concentration and chemical composition from the collected PM2.5 data were determined and studied as reported in their paper. The exposure to fine particulate matter (PM2.5) could lead to many high risks health issues. Apte et al. [4] for example, has estimated global and national life expectancy decrements that could be affected by PM2.5 for 185 countries. Rhee et al. [5] also found statistically significant associations relation between the long-term PM2.5 exposure and ozone concentrations with hospital admissions of Acute Respiratory Distress Syndrome (ARDS). The same results can also be seen from the researches and notable works of Chen et al. [6], Yazdi et al. [7], Wicks et al. [8], Aunan et al. [9], and David et al. [10].

Other research to predict the concentration of PM2.5 in an area has been done by Gu et al. [11]. They designed a new picture-based PM2.5 concentration predictor using pictures taken from mobile phones or cameras. Zhao et al. [12] also have proposed a multivariate linear regression model to get a short period prediction of PM2.5. Moreover, Huang et al. [13] have developed a high-performance machine-learning model to predict PM2.5 levels in North China Plain area. They used the random forest model with the latest Multi-angle implementation of atmospheric correction aerosol optical depth, meteorological parameters, land cover, and ground PM2.5 measurements from 2013 to 2015. As the study result, they can provide reliable historical data of PM2.5 concentrations in China.

In this study, we try to predict the AQI in Central Jakarta based on PM2.5. We implement three conventional moving average methods and a hybrid moving average method, named WEMA, to predict future values of AQI based on historical data we have. The next section will briefly explain the conventional and hybrid moving average methods being applied in this study. Later the data preprocessing phase and results will be given in Section 3. Some conclusion remarks and future works will be given as the ending section in this paper.

**Revised Manuscript Received on April 15, 2019.**

**Seng Hansun,** Informatics Department, Universitas Multimedia Nusantara, Indonesia. (hansun@umn.ac.id)

**Marcel Bonar Kristanda,** Informatics Department, Universitas Multimedia Nusantara, Indonesia. (marcel.bonar@umn.ac.id)

**Winarno,** Informatics Department, Universitas Multimedia Nusantara, Indonesia. (pmwinarno@umn.ac.id)

## II. THE MOVING AVERAGE METHODS

### A. SMA, WMA, and EMA

Three conventional moving average methods are implemented in this study, i.e. Simple Moving Average (SMA), Weighted Moving Average (WMA), and Exponential Moving Average (EMA). SMA, as the name suggests, is the simplest form of moving average. Each data point is equally weighted and averaged to predict the next future values. SMA can be formulated as:

$$SMA_n = \frac{1}{n}\sum_{t=k-n+1}^{k} A_t \tag{1}$$

WMA is a later version of SMA. Contrast with SMA, it assigns a special factor as the weighting value on the data being observed [14]. Greater weight values will be given to more recent data in a sequential manner and formulated as (2):

$$WMA_n = \frac{\sum_{t=k-n+1}^{k} w_t A_t}{\sum_{t=k-n+1}^{k} w_t} \tag{2}$$

EMA is like WMA where it puts a heavier weight to more recent data than older ones. But differ with WMA, the weighting factor incorporated in EMA is an exponential function. It can be calculated recursively as [14]:

$$S_1 = Y_1, \tag{3}$$

$$for\ t > 1, S_t = \alpha \cdot Y_t + (1-\alpha) \cdot S_{t-1} \tag{4}$$

### B. WEMA

Weighted Exponential Moving Average (WEMA) was first proposed in 2013 [15]. It is a hybrid variant of moving average methods that combine the WMA's weighting factor calculation with EMA procedures. Basically, there are two phases in WEMA, the first one is to find a new base dataset from the given time series data using WMA method. Then we used the new dataset following the EMA procedures in the second phase [16].

As explained in [17], WEMA procedures as follow:

1. Calculate the base dataset using WMA method as in Eq.(2)
2. Calculate the prediction data using

$$WEMA_t = \alpha \cdot Y_t + (1-\alpha) \cdot H_t \tag{5}$$

where $Y_t$ refers to the real datum value at time $t$, $H_t$ refers to the base value at time $t$, and $\alpha$ refers to the degree of weighting factor decrement.

3. Back to step 1) until all data point in the given period have circulated

## III. RESULTS AND DISCUSSION

### A. Data Preprocessing

In this study, we aim to predict the future values of AQI in Central Jakarta based on PM2.5. Therefore, we took the historical data of AQI based on PM2.5 from AirNow [18]. We used the 2019 PM2.5 MTD data which contains the last month data, from December 1, 2018 to January 1, 2019. A total of 744 data were recorded, but some of them have missing values, so the data preprocessing step was conducted. 13 zero data were removed and one outlier data (for data on 2018-12-20 at 10:00) was removed during this process. So, we have a total of 730 data in this study as shown in Appendix 1.

### B. Forecasting Results

To predict the future values of AQI in Central Jakarta, we will use Phatsa framework. Phatsa is a web based forecasting application that can be accessed freely on http://phatsa.com. It was built to help researchers and other users to do some analysis on their time series data. Phatsa implements all conventional moving average methods incorporated in this study, i.e. SMA, WMA, and EMA. It has also been developed to apply the hybrid WEMA method during the research development. Interested readers are welcome to read [19] for further information.

Using the collected and preprocessed AQI data, we predict the future values as shown in Fig.2 to Fig.5. Fig.2 shows the forecasting results using SMA method, Fig.3 shows the results for WMA method, Fig.4 shows the results for EMA method, and Fig.5 shows the results for WEMA hybrid method. Green line refers to the original data values, while the red line refers to the forecasted values. The initial data parameters being used in this experiment is 5 for the span data, 6 for the start index, and 1 for the prediction period.

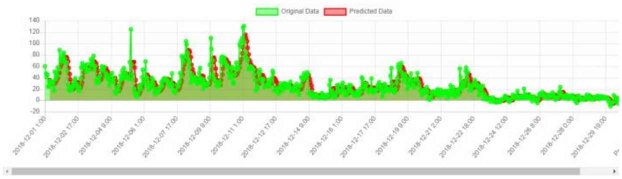


**Figure 2. SMA forecasting results**

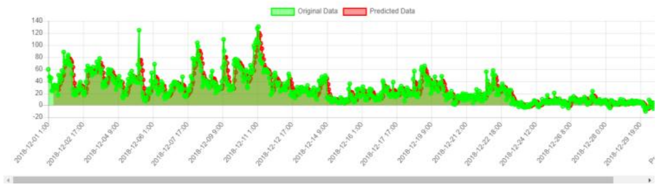


**Figure 3. WMA forecasting results**

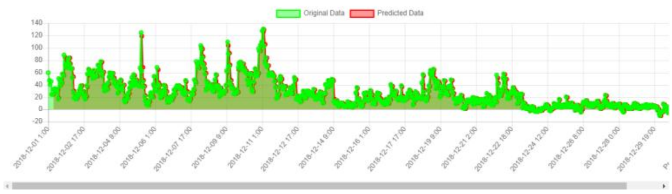


**Figure 4. EMA forecasting results**

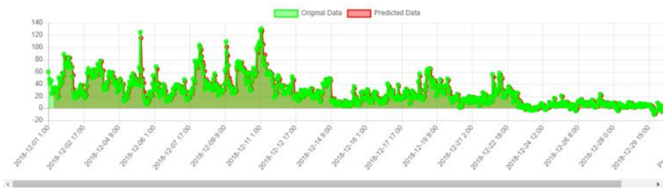


**Figure 5. WEMA forecasting results**

### C. Discussion

As can be seen on the figures, all the conventional and hybrid moving average methods could be used to predict the


Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

future values of AQI in Central Jakarta region. To get a more thorough analysis, we used three forecast error measurement criteria, namely the Mean Square Error (MSE), the Mean Absolute Percentage Error (MAPE), and the Mean Absolute Scaled Error (MASE). The corresponding forecast error result value for each implemented method is shown on Table 1.

**Table 1. Forecasting error results**

| MA method | MSE | MAPE | MASE |
|---|---|---|---|
| SMA | 165.0296 | 61.2452 | 1.0038 |
| WMA | 132.0707 | 55.3695 | 0.8964 |
| EMA | 96.7054 | 46.9402 | 0.7594 |
| WEMA | 95.6632 | 46.4815 | 0.7518 |

It can be easily inferred from Table 1 that EMA has excelled both SMA and WMA in terms of accuracy level. So among three conventional moving average methods, EMA gives the best forecasting results. A slightly improved has been achieved by the WEMA method. It excels all the conventional methods, including EMA method, in MSE, MAPE, and MASE criteria values. Therefore, WEMA is suggested to predict the future values of AQI in Central Jakarta than the other conventional moving average methods.

## IV. CONCLUSION

The Air Quality Index (AQI) in Central Jakarta based on PM2.5 has been successfully forecasted using three conventional and one hybrid moving average methods. Among all the incorporated methods in this study, WEMA has the smallest MSE value at 95.6632, MAPE value at 46.4815, and MASE value at 0.7518. Therefore, WEMA is most suggested to be used in forecasting AQI in Central Jakarta.

In the near future, other researches to implement other variants of WEMA, such as B-WEMA and H-WEMA, can be done. Comparative study on those three moving average methods can also be done, especially in forecasting the Air Quality Index.

## ACKNOWLEDGEMENT

This study was supported by the Indonesia Government, through the Research Grant of “National Strategic Research” (Penelitian Strategis Nasional-Institusi) scheme (Contract No. 034/KM/PNT/2018).

## REFERENCES

4. AirNow. [Online]. Available: https://www.airnow.gov/index.cfm?action=aqibasics.aqi
5. World Air Quality. [Online]. Available: http://aqicn.org/city/indonesia/jakarta/us-consulate/central/
6. K. He, F. Yang, Y. Ma, Q. Zhang, X. Yao, C. K. Chan, S. Cadle, T. Chan, and P. Mulawa, “The Characteristics of PM2.5 in Beijing, China,” Atmospheric Environment, vol. 35, no. 29, pp. 4959-4970, Oct. 2001.
7. J. S. Apte, M. Brauer, A. J. Cohen, M. Ezzati, and C. A. Pope, “Ambient PM2.5 Reduces Global and Regional Life Expectancy,” Environmental Science & Technology Letters, vol. 5, no. 9, pp. 546-551, 2018.
8. J. Rhee, F. Dominici, A. Zanobetti, J. Schwartz, Y. Wang, Q. Di, and D. C. Christiani, “The Impact of Long-Term Exposure to PM2.5 and Ozone on the Risk of Acute Respiratory Distress Syndrome (ARDS) for the Elderly,” American Journal of Respiratory and Critical Care Medicine, 197:A6192, 2018.
9. X-C. Chen, H-C. Chuang, N-C. Lau, H-L. S. Yim, and K-F. Ho, “Personal Exposure to PM2.5 and Its Bioreactivity in Healthy Adults of Hong Kong,” ISEE Conference Abstract, vol. 2018, no. 1, Sept. 2018.
10. M. D. Yazdi, Y. Wang, Q. Di, A. Zanobetti, and J. D. Schwartz, “An LPW Estimate of the Effects of Annual Exposure to PM2.5 and Ozone on Hospital Admission Rates of Medicare Participants in the Southeast U.S.A.,” ISEE Conference Abstract, vol. 2018, no. 1, Sept. 2018.
11. H. T. Wicks, J. Bennett, M. Bechle, R. M. Parks, C. A. Pope, J. Marshall, R. Burnett, and M. Ezzati, “A National Study of the Mortality Effects of PM2.5 on All-Cause and Cause-Specific Mortality in the Contiguous U.S.,” ISEE Conference Abstract, vol. 2018, no. 1, Sept. 2018.
12. K. Aunan, Q. Ma, M. T. Lund, and S. Wang, “Population-Weighted Exposure to PM2.5 Pollution in China: An Integrated Approach,” Environment International, vol. 120, pp. 111-120, Nov. 2018.
13. L. M. David, A. R. Ravishankara, J. K. Kodros, J. R. Pierce, C. Venkataraman, and P. Sadavarte, “Premature Mortality Due to PM2.5 Over India: Effect of Atmospheric Transport and Anthropogenic Emissions,” GeoHealth, vol. 3, pp.1-9, Nov. 2018.
14. K. Gu, J. Qiao, and X. Li, “Highly Efficient Picture-Based Prediction of PM2.5 Concentration,” IEEE Transactions on Industrial Electronics, vol. 66, no. 4, pp. 3176-3184, June 2018.
15. R. Zhao, X. Gu, B. Xue, J. Zhang, and W. Ren, “Short Period PM2.5 Prediction based on Multivariate Linear Regression Model,” PLoS ONE, vol. 13, no. 7, e0201011, July 2018.
16. K. Huang, Q. Xiao, X. Meng, G. Geng, Y. Wang, A. Lyapustin, D. Gu, and Y. Liu, “Predicting Monthly High-Resolution PM2.5 Concentrations with Random Forest Model in the North China Plain,” Environmental Pollution, vol. 242, part A, pp. 675-683, Nov. 2018.
17. S. Hansun and M. B. Kristanda, “Performance Analysis of Conventional Moving Average Methods in Forex Forecasting,” Proceedings of 2017 International Conference on Smart Cities, Automation & Intelligent Computing Systems, Yogyakarta, Indonesia, 2017.
18. S. Hansun, “A New Approach of Moving Average Method in Time Series Analysis,” Proceedings of the 2013 IEEE International Conference on New Media (CoNMedia), Tangerang, Indonesia, 2013.
19. S. Hansun and M. B. Kristanda, “Major FX Forecasting with Hybrid Moving Average Approach,” International Journal of Engineering & Technology, vol. 7, no. 4.40, pp. 108-111, 2018.
20. S. Hansun, M. B. Kristanda, and P. M. Winarno, “Big 5 ASEAN Capital Markets Forecasting using WEMA Method,” TELKOMNIKA, vol. 17, no. 1, pp. 314-319, Feb. 2019.
21. AirNow. [Online]. Available: https://airnow.gov/index.cfm?action=airnow.global_summary#Indonesia$Jakarta_Central
22. M. B. Kristanda and S. Hansun, “Phatsa: A Web-Based Application for Forecasting using Conventional Moving Average Methods,” Proceedings of 4th International Conference on New Media. Yogyakarta, Indonesia, 2017.

## APPENDIX

**Table 2. Central Jakarta PM2.5**

| Period | Value | Period | Value | Period | Value | Period | Value |
|---|---|---|---|---|---|---|---|
| 2018-12-01 1:00 | 60 | 2018-12-02 18:00 | 17 | 2018-12-04 11:00 | 33 | 2018-12-06 4:00 | 41 |
| 2018-12-01 2:00 | 47 | 2018-12-02 19:00 | 22 | 2018-12-04 12:00 | 32 | 2018-12-06 5:00 | 39 |
| 2018-12-01 3:00 | 41 | 2018-12-02 20:00 | 39 | 2018-12-04 13:00 | 40 | 2018-12-06 6:00 | 25 |
| 2018-12-01 4:00 | 45 | 2018-12-02 21:00 | 58 | 2018-12-04 14:00 | 15 | 2018-12-06 7:00 | 19 |
| 2018-12-01 5:00 | 24 | 2018-12-02 22:00 | 65 | 2018-12-04 15:00 | 12 | 2018-12-06 8:00 | 22 |
| 2018-12-01 6:00 | 24 | 2018-12-02 23:00 | 60 | 2018-12-04 16:00 | 16 | 2018-12-06 9:00 | 31 |
| 2018-12-01 7:00 | 33 | 2018-12-03 0:00 | 58 | 2018-12-04 17:00 | 23 | 2018-12-06 10:00 | 24 |
| 2018-12-01 8:00 | 34 | 2018-12-03 1:00 | 61 | 2018-12-04 18:00 | 18 | 2018-12-06 11:00 | 40 |
| 2018-12-01 9:00 | 33 | 2018-12-03 2:00 | 57 | 2018-12-04 19:00 | 27 | 2018-12-06 12:00 | 36 |
| 2018-12-01 10:00 | 28 | 2018-12-03 3:00 | 50 | 2018-12-04 20:00 | 35 | 2018-12-06 13:00 | 28 |
| 2018-12-01 11:00 | 33 | 2018-12-03 4:00 | 64 | 2018-12-04 21:00 | 43 | 2018-12-06 14:00 | 15 |
| 2018-12-01 12:00 | 17 | 2018-12-03 5:00 | 52 | 2018-12-04 22:00 | 38 | 2018-12-06 15:00 | 11 |
| 2018-12-01 13:00 | 50 | 2018-12-03 6:00 | 54 | 2018-12-04 23:00 | 52 | 2018-12-06 16:00 | 15 |
| 2018-12-01 14:00 | 38 | 2018-12-03 7:00 | 54 | 2018-12-05 0:00 | 39 | 2018-12-06 17:00 | 21 |
| 2018-12-01 15:00 | 49 | 2018-12-03 8:00 | 64 | 2018-12-05 1:00 | 57 | 2018-12-06 18:00 | 14 |
| 2018-12-01 16:00 | 43 | 2018-12-03 9:00 | 72 | 2018-12-05 2:00 | 40 | 2018-12-06 19:00 | 16 |
| 2018-12-01 17:00 | 58 | 2018-12-03 10:00 | 62 | 2018-12-05 3:00 | 49 | 2018-12-06 20:00 | 20 |
| 2018-12-01 18:00 | 55 | 2018-12-03 11:00 | 66 | 2018-12-05 4:00 | 45 | 2018-12-06 21:00 | 24 |
| 2018-12-01 19:00 | 88 | 2018-12-03 12:00 | 78 | 2018-12-05 5:00 | 40 | 2018-12-06 22:00 | 32 |
| 2018-12-01 20:00 | 72 | 2018-12-03 13:00 | 54 | 2018-12-05 6:00 | 39 | 2018-12-06 23:00 | 25 |
| 2018-12-01 21:00 | 68 | 2018-12-03 14:00 | 61 | 2018-12-05 7:00 | 38 | 2018-12-07 0:00 | 35 |
| 2018-12-01 22:00 | 74 | 2018-12-03 15:00 | 36 | 2018-12-05 8:00 | 67 | 2018-12-07 1:00 | 39 |
| 2018-12-01 23:00 | 81 | 2018-12-03 16:00 | 30 | 2018-12-05 9:00 | 125 | 2018-12-07 2:00 | 39 |
| 2018-12-02 0:00 | 84 | 2018-12-03 17:00 | 38 | 2018-12-05 10:00 | 63 | 2018-12-07 3:00 | 39 |
| 2018-12-02 1:00 | 73 | 2018-12-03 18:00 | 40 | 2018-12-05 11:00 | 45 | 2018-12-07 4:00 | 37 |
| 2018-12-02 2:00 | 66 | 2018-12-03 19:00 | 32 | 2018-12-05 12:00 | 37 | 2018-12-07 5:00 | 33 |
| 2018-12-02 3:00 | 66 | 2018-12-03 20:00 | 43 | 2018-12-05 13:00 | 21 | 2018-12-07 6:00 | 36 |
| 2018-12-02 4:00 | 52 | 2018-12-03 21:00 | 53 | 2018-12-05 14:00 | 14 | 2018-12-07 7:00 | 32 |
| 2018-12-02 5:00 | 27 | 2018-12-03 22:00 | 60 | 2018-12-05 15:00 | 8 | 2018-12-07 8:00 | 26 |
| 2018-12-02 6:00 | 19 | 2018-12-03 23:00 | 54 | 2018-12-05 16:00 | 11 | 2018-12-07 9:00 | 24 |
| 2018-12-02 7:00 | 20 | 2018-12-04 0:00 | 59 | 2018-12-05 17:00 | 7 | 2018-12-07 10:00 | 28 |
| 2018-12-02 8:00 | 17 | 2018-12-04 1:00 | 59 | 2018-12-05 18:00 | 13 | 2018-12-07 11:00 | 47 |
| 2018-12-02 9:00 | 19 | 2018-12-04 2:00 | 50 | 2018-12-05 19:00 | 22 | 2018-12-07 12:00 | 27 |
| 2018-12-02 10:00 | 25 | 2018-12-04 3:00 | 42 | 2018-12-05 20:00 | 27 | 2018-12-07 13:00 | 16 |
| 2018-12-02 11:00 | 24 | 2018-12-04 4:00 | 46 | 2018-12-05 21:00 | 27 | 2018-12-07 14:00 | 17 |
| 2018-12-02 12:00 | 31 | 2018-12-04 5:00 | 40 | 2018-12-05 22:00 | 20 | 2018-12-07 15:00 | 14 |
| 2018-12-02 13:00 | 35 | 2018-12-04 6:00 | 37 | 2018-12-05 23:00 | 41 | 2018-12-07 16:00 | 18 |
| 2018-12-02 14:00 | 39 | 2018-12-04 7:00 | 26 | 2018-12-06 0:00 | 54 | 2018-12-07 17:00 | 27 |
| 2018-12-02 15:00 | 25 | 2018-12-04 8:00 | 35 | 2018-12-06 1:00 | 35 | | |
| 2018-12-02 16:00 | 29 | 2018-12-04 9:00 | 44 | 2018-12-06 2:00 | 30 | | |
| 2018-12-02 17:00 | 21 | 2018-12-04 10:00 | 48 | 2018-12-06 3:00 | 68 | | |


*Published By:*
*Blue Eyes Intelligence Engineering*
*& Sciences Publication*

| Period | Value |
|---|---|
| 2018-12-07 18:00 | 24 |
| 2018-12-07 19:00 | 25 |
| 2018-12-07 20:00 | 33 |
| 2018-12-07 21:00 | 48 |
| 2018-12-07 22:00 | 43 |
| 2018-12-07 23:00 | 78 |
| 2018-12-08 0:00 | 75 |
| 2018-12-08 1:00 | 67 |
| 2018-12-08 2:00 | 77 |
| 2018-12-08 3:00 | 77 |
| 2018-12-08 4:00 | 104 |
| 2018-12-08 5:00 | 98 |
| 2018-12-08 6:00 | 84 |
| 2018-12-08 7:00 | 73 |
| 2018-12-08 8:00 | 66 |
| 2018-12-08 9:00 | 58 |
| 2018-12-08 10:00 | 31 |
| 2018-12-08 11:00 | 46 |
| 2018-12-08 12:00 | 38 |
| 2018-12-08 13:00 | 42 |
| 2018-12-08 14:00 | 39 |
| 2018-12-08 15:00 | 34 |
| 2018-12-08 16:00 | 41 |
| 2018-12-08 17:00 | 31 |
| 2018-12-08 18:00 | 29 |
| 2018-12-08 19:00 | 35 |
| 2018-12-08 20:00 | 48 |
| 2018-12-08 21:00 | 57 |
| 2018-12-08 22:00 | 38 |
| 2018-12-08 23:00 | 39 |
| 2018-12-09 0:00 | 30 |
| 2018-12-09 1:00 | 21 |
| 2018-12-09 2:00 | 36 |
| 2018-12-09 3:00 | 27 |
| 2018-12-09 4:00 | 28 |
| 2018-12-09 5:00 | 25 |
| 2018-12-09 6:00 | 30 |
| 2018-12-09 7:00 | 30 |
| 2018-12-09 8:00 | 40 |
| 2018-12-09 9:00 | 63 |
| 2018-12-09 10:00 | 109 |
| 2018-12-09 11:00 | 90 |
| 2018-12-09 12:00 | 70 |
| 2018-12-09 13:00 | 45 |
| 2018-12-09 14:00 | 39 |
| 2018-12-09 15:00 | 34 |

| Period | Value |
|---|---|
| 2018-12-09 16:00 | 34 |
| 2018-12-09 17:00 | 25 |
| 2018-12-09 18:00 | 25 |
| 2018-12-09 19:00 | 26 |
| 2018-12-09 20:00 | 32 |
| 2018-12-09 21:00 | 28 |
| 2018-12-09 22:00 | 68 |
| 2018-12-09 23:00 | 75 |
| 2018-12-10 0:00 | 77 |
| 2018-12-10 1:00 | 72 |
| 2018-12-10 2:00 | 65 |
| 2018-12-10 3:00 | 75 |
| 2018-12-10 4:00 | 67 |
| 2018-12-10 5:00 | 62 |
| 2018-12-10 6:00 | 63 |
| 2018-12-10 7:00 | 59 |
| 2018-12-10 8:00 | 48 |
| 2018-12-10 9:00 | 40 |
| 2018-12-10 10:00 | 43 |
| 2018-12-10 11:00 | 56 |
| 2018-12-10 12:00 | 59 |
| 2018-12-10 13:00 | 31 |
| 2018-12-10 14:00 | 29 |
| 2018-12-10 15:00 | 45 |
| 2018-12-10 16:00 | 56 |
| 2018-12-10 17:00 | 66 |
| 2018-12-10 18:00 | 54 |
| 2018-12-10 19:00 | 55 |
| 2018-12-10 20:00 | 59 |
| 2018-12-10 21:00 | 99 |
| 2018-12-10 22:00 | 95 |
| 2018-12-10 23:00 | 105 |
| 2018-12-11 0:00 | 109 |
| 2018-12-11 1:00 | 128 |
| 2018-12-11 2:00 | 130 |
| 2018-12-11 3:00 | 103 |
| 2018-12-11 4:00 | 75 |
| 2018-12-11 5:00 | 84 |
| 2018-12-11 6:00 | 69 |
| 2018-12-11 7:00 | 71 |
| 2018-12-11 8:00 | 55 |
| 2018-12-11 9:00 | 57 |
| 2018-12-11 10:00 | 60 |
| 2018-12-11 11:00 | 60 |
| 2018-12-11 12:00 | 58 |
| 2018-12-11 13:00 | 55 |

| Period | Value |
|---|---|
| 2018-12-11 14:00 | 54 |
| 2018-12-11 15:00 | 45 |
| 2018-12-11 16:00 | 36 |
| 2018-12-11 17:00 | 18 |
| 2018-12-11 18:00 | 21 |
| 2018-12-11 19:00 | 25 |
| 2018-12-11 20:00 | 49 |
| 2018-12-11 21:00 | 54 |
| 2018-12-11 22:00 | 49 |
| 2018-12-11 23:00 | 38 |
| 2018-12-12 0:00 | 33 |
| 2018-12-12 1:00 | 35 |
| 2018-12-12 2:00 | 38 |
| 2018-12-12 3:00 | 23 |
| 2018-12-12 4:00 | 24 |
| 2018-12-12 5:00 | 25 |
| 2018-12-12 6:00 | 27 |
| 2018-12-12 7:00 | 29 |
| 2018-12-12 8:00 | 36 |
| 2018-12-12 9:00 | 27 |
| 2018-12-12 10:00 | 25 |
| 2018-12-12 11:00 | 34 |
| 2018-12-12 12:00 | 39 |
| 2018-12-12 13:00 | 52 |
| 2018-12-12 14:00 | 48 |
| 2018-12-12 15:00 | 17 |
| 2018-12-12 16:00 | 20 |
| 2018-12-12 17:00 | 22 |
| 2018-12-12 18:00 | 15 |
| 2018-12-12 19:00 | 18 |
| 2018-12-12 20:00 | 12 |
| 2018-12-12 21:00 | 22 |
| 2018-12-12 22:00 | 23 |
| 2018-12-12 23:00 | 30 |
| 2018-12-13 0:00 | 25 |
| 2018-12-13 1:00 | 18 |
| 2018-12-13 2:00 | 21 |
| 2018-12-13 3:00 | 30 |
| 2018-12-13 4:00 | 30 |
| 2018-12-13 5:00 | 26 |
| 2018-12-13 6:00 | 23 |
| 2018-12-13 7:00 | 28 |
| 2018-12-13 8:00 | 27 |
| 2018-12-13 9:00 | 22 |
| 2018-12-13 10:00 | 22 |
| 2018-12-13 11:00 | 33 |

| Period | Value |
|---|---|
| 2018-12-13 12:00 | 17 |
| 2018-12-13 13:00 | 17 |
| 2018-12-13 14:00 | 20 |
| 2018-12-13 15:00 | 24 |
| 2018-12-13 16:00 | 18 |
| 2018-12-13 17:00 | 25 |
| 2018-12-13 18:00 | 29 |
| 2018-12-13 19:00 | 16 |
| 2018-12-13 20:00 | 19 |
| 2018-12-13 21:00 | 10 |
| 2018-12-13 22:00 | 26 |
| 2018-12-13 23:00 | 26 |
| 2018-12-14 0:00 | 41 |
| 2018-12-14 1:00 | 41 |
| 2018-12-14 2:00 | 36 |
| 2018-12-14 3:00 | 47 |
| 2018-12-14 4:00 | 42 |
| 2018-12-14 5:00 | 44 |
| 2018-12-14 6:00 | 39 |
| 2018-12-14 7:00 | 49 |
| 2018-12-14 8:00 | 46 |
| 2018-12-14 9:00 | 13 |
| 2018-12-14 10:00 | 12 |
| 2018-12-14 11:00 | 10 |
| 2018-12-14 12:00 | 15 |
| 2018-12-14 13:00 | 9 |
| 2018-12-14 14:00 | 5 |
| 2018-12-14 15:00 | 6 |
| 2018-12-14 16:00 | 8 |
| 2018-12-14 17:00 | 11 |
| 2018-12-14 18:00 | 11 |
| 2018-12-14 19:00 | 9 |
| 2018-12-14 20:00 | 6 |
| 2018-12-14 21:00 | 6 |
| 2018-12-14 22:00 | 4 |
| 2018-12-14 23:00 | 4 |
| 2018-12-15 0:00 | 6 |
| 2018-12-15 1:00 | 13 |
| 2018-12-15 2:00 | 11 |
| 2018-12-15 3:00 | 6 |
| 2018-12-15 4:00 | 5 |
| 2018-12-15 5:00 | 3 |
| 2018-12-15 6:00 | 7 |


Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

| Period | Value |
|---|---|
| 2018-12-15 7:00 | 10 |
| 2018-12-15 8:00 | 9 |
| 2018-12-15 9:00 | 6 |
| 2018-12-15 10:00 | 27 |
| 2018-12-15 11:00 | 36 |
| 2018-12-15 12:00 | 16 |
| 2018-12-15 13:00 | 18 |
| 2018-12-15 14:00 | 10 |
| 2018-12-15 15:00 | 9 |
| 2018-12-15 16:00 | 5 |
| 2018-12-15 17:00 | 6 |
| 2018-12-15 18:00 | 13 |
| 2018-12-15 19:00 | 26 |
| 2018-12-15 20:00 | 25 |
| 2018-12-15 21:00 | 27 |
| 2018-12-15 22:00 | 18 |
| 2018-12-15 23:00 | 14 |
| 2018-12-16 0:00 | 17 |
| 2018-12-16 1:00 | 26 |
| 2018-12-16 2:00 | 31 |
| 2018-12-16 3:00 | 24 |
| 2018-12-16 4:00 | 17 |
| 2018-12-16 5:00 | 9 |
| 2018-12-16 6:00 | 10 |
| 2018-12-16 7:00 | 9 |
| 2018-12-16 8:00 | 16 |
| 2018-12-16 9:00 | 23 |
| 2018-12-16 10:00 | 27 |
| 2018-12-16 11:00 | 19 |
| 2018-12-16 12:00 | 26 |
| 2018-12-16 13:00 | 17 |
| 2018-12-16 14:00 | 14 |
| 2018-12-16 15:00 | 13 |
| 2018-12-16 16:00 | 11 |
| 2018-12-16 17:00 | 8 |
| 2018-12-16 18:00 | 9 |
| 2018-12-16 19:00 | 17 |
| 2018-12-16 20:00 | 11 |
| 2018-12-16 21:00 | 9 |
| 2018-12-16 22:00 | 10 |
| 2018-12-16 23:00 | 21 |
| 2018-12-17 0:00 | 15 |
| 2018-12-17 1:00 | 41 |
| 2018-12-17 2:00 | 38 |
| 2018-12-17 3:00 | 30 |
| 2018-12-17 4:00 | 23 |

| Period | Value |
|---|---|
| 2018-12-17 5:00 | 24 |
| 2018-12-17 6:00 | 25 |
| 2018-12-17 7:00 | 30 |
| 2018-12-17 8:00 | 18 |
| 2018-12-17 9:00 | 18 |
| 2018-12-17 10:00 | 15 |
| 2018-12-17 11:00 | 18 |
| 2018-12-17 12:00 | 21 |
| 2018-12-17 13:00 | 39 |
| 2018-12-17 14:00 | 20 |
| 2018-12-17 15:00 | 14 |
| 2018-12-17 16:00 | 15 |
| 2018-12-17 17:00 | 19 |
| 2018-12-17 18:00 | 17 |
| 2018-12-17 19:00 | 20 |
| 2018-12-17 20:00 | 26 |
| 2018-12-17 21:00 | 27 |
| 2018-12-17 22:00 | 32 |
| 2018-12-17 23:00 | 27 |
| 2018-12-18 0:00 | 20 |
| 2018-12-18 1:00 | 24 |
| 2018-12-18 2:00 | 7 |
| 2018-12-18 3:00 | 18 |
| 2018-12-18 4:00 | 15 |
| 2018-12-18 5:00 | 29 |
| 2018-12-18 6:00 | 26 |
| 2018-12-18 7:00 | 22 |
| 2018-12-18 8:00 | 19 |
| 2018-12-18 9:00 | 21 |
| 2018-12-18 10:00 | 17 |
| 2018-12-18 11:00 | 21 |
| 2018-12-18 12:00 | 43 |
| 2018-12-18 13:00 | 57 |
| 2018-12-18 14:00 | 28 |
| 2018-12-18 15:00 | 16 |
| 2018-12-18 16:00 | 18 |
| 2018-12-18 17:00 | 14 |
| 2018-12-18 18:00 | 21 |
| 2018-12-18 19:00 | 31 |
| 2018-12-18 20:00 | 39 |
| 2018-12-18 21:00 | 59 |
| 2018-12-18 22:00 | 64 |
| 2018-12-18 23:00 | 54 |
| 2018-12-19 0:00 | 59 |
| 2018-12-19 1:00 | 65 |
| 2018-12-19 2:00 | 49 |

| Period | Value |
|---|---|
| 2018-12-19 3:00 | 43 |
| 2018-12-19 4:00 | 34 |
| 2018-12-19 5:00 | 43 |
| 2018-12-19 6:00 | 46 |
| 2018-12-19 7:00 | 41 |
| 2018-12-19 8:00 | 20 |
| 2018-12-19 9:00 | 31 |
| 2018-12-19 10:00 | 25 |
| 2018-12-19 11:00 | 37 |
| 2018-12-19 12:00 | 38 |
| 2018-12-19 13:00 | 47 |
| 2018-12-19 14:00 | 33 |
| 2018-12-19 15:00 | 27 |
| 2018-12-19 16:00 | 25 |
| 2018-12-19 17:00 | 23 |
| 2018-12-19 18:00 | 38 |
| 2018-12-19 19:00 | 37 |
| 2018-12-19 20:00 | 39 |
| 2018-12-19 21:00 | 48 |
| 2018-12-19 22:00 | 32 |
| 2018-12-19 23:00 | 26 |
| 2018-12-20 0:00 | 18 |
| 2018-12-20 1:00 | 17 |
| 2018-12-20 2:00 | 9 |
| 2018-12-20 3:00 | 17 |
| 2018-12-20 4:00 | 19 |
| 2018-12-20 5:00 | 13 |
| 2018-12-20 6:00 | 15 |
| 2018-12-20 7:00 | 19 |
| 2018-12-20 8:00 | 23 |
| 2018-12-20 9:00 | 16 |
| 2018-12-20 11:00 | 2 |
| 2018-12-20 12:00 | 5 |
| 2018-12-20 13:00 | 1 |
| 2018-12-20 14:00 | 5 |
| 2018-12-20 15:00 | 12 |
| 2018-12-20 16:00 | 16 |
| 2018-12-20 17:00 | 15 |
| 2018-12-20 18:00 | 15 |
| 2018-12-20 19:00 | 12 |
| 2018-12-20 20:00 | 12 |
| 2018-12-20 21:00 | 17 |
| 2018-12-20 22:00 | 20 |
| 2018-12-20 23:00 | 8 |
| 2018-12-21 0:00 | 17 |
| 2018-12-21 1:00 | 9 |

| Period | Value |
|---|---|
| 2018-12-21 2:00 | 19 |
| 2018-12-21 3:00 | 16 |
| 2018-12-21 4:00 | 15 |
| 2018-12-21 5:00 | 10 |
| 2018-12-21 6:00 | 13 |
| 2018-12-21 7:00 | 17 |
| 2018-12-21 8:00 | 15 |
| 2018-12-21 9:00 | 16 |
| 2018-12-21 10:00 | 4 |
| 2018-12-21 11:00 | 12 |
| 2018-12-21 12:00 | 18 |
| 2018-12-21 13:00 | 9 |
| 2018-12-21 14:00 | 26 |
| 2018-12-21 15:00 | 15 |
| 2018-12-21 16:00 | 11 |
| 2018-12-21 17:00 | 23 |
| 2018-12-21 18:00 | 17 |
| 2018-12-21 19:00 | 7 |
| 2018-12-21 20:00 | 7 |
| 2018-12-21 21:00 | 11 |
| 2018-12-21 22:00 | 18 |
| 2018-12-21 23:00 | 20 |
| 2018-12-22 0:00 | 11 |
| 2018-12-22 1:00 | 56 |
| 2018-12-22 2:00 | 41 |
| 2018-12-22 3:00 | 20 |
| 2018-12-22 4:00 | 32 |
| 2018-12-22 5:00 | 22 |
| 2018-12-22 6:00 | 26 |
| 2018-12-22 7:00 | 32 |
| 2018-12-22 8:00 | 51 |
| 2018-12-22 9:00 | 58 |
| 2018-12-22 10:00 | 38 |
| 2018-12-22 11:00 | 50 |
| 2018-12-22 12:00 | 28 |
| 2018-12-22 13:00 | 18 |
| 2018-12-22 14:00 | 25 |
| 2018-12-22 15:00 | 18 |
| 2018-12-22 16:00 | 25 |
| 2018-12-22 17:00 | 26 |
| 2018-12-22 18:00 | 30 |
| 2018-12-22 19:00 | 36 |
| 2018-12-22 20:00 | 32 |

| Period | Value |
|---|---|
| 2018-12-22 21:00 | 26 |
| 2018-12-22 22:00 | 28 |
| 2018-12-22 23:00 | 21 |
| 2018-12-23 0:00 | 9 |
| 2018-12-23 1:00 | 12 |
| 2018-12-23 2:00 | 25 |
| 2018-12-23 3:00 | 25 |
| 2018-12-23 4:00 | 17 |
| 2018-12-23 5:00 | 25 |
| 2018-12-23 6:00 | 2 |
| 2018-12-23 7:00 | 12 |
| 2018-12-23 8:00 | 9 |
| 2018-12-23 9:00 | 4 |
| 2018-12-23 10:00 | 1 |
| 2018-12-23 12:00 | 2 |
| 2018-12-23 13:00 | 5 |
| 2018-12-23 14:00 | 2 |
| 2018-12-23 15:00 | -2 |
| 2018-12-23 16:00 | 1 |
| 2018-12-23 17:00 | 1 |
| 2018-12-23 19:00 | 5 |
| 2018-12-23 20:00 | 3 |
| 2018-12-23 21:00 | -2 |
| 2018-12-23 22:00 | -3 |
| 2018-12-23 23:00 | -2 |
| 2018-12-24 0:00 | -3 |
| 2018-12-24 1:00 | -1 |
| 2018-12-24 2:00 | 1 |
| 2018-12-24 3:00 | -1 |
| 2018-12-24 4:00 | -2 |
| 2018-12-24 5:00 | -1 |
| 2018-12-24 6:00 | 2 |
| 2018-12-24 7:00 | 1 |
| 2018-12-24 8:00 | 2 |
| 2018-12-24 9:00 | 5 |
| 2018-12-24 10:00 | 8 |
| 2018-12-24 11:00 | 7 |
| 2018-12-24 12:00 | 5 |
| 2018-12-24 13:00 | 2 |
| 2018-12-24 14:00 | -1 |
| 2018-12-24 15:00 | -2 |
| 2018-12-24 16:00 | 1 |
| 2018-12-24 17:00 | 2 |
| 2018-12-24 18:00 | 2 |
| 2018-12-24 19:00 | 10 |
| 2018-12-24 20:00 | 6 |

| Period | Value |
|---|---|
| 2018-12-24 23:00 | 5 |
| 2018-12-25 0:00 | 8 |
| 2018-12-25 1:00 | 4 |
| 2018-12-25 2:00 | 9 |
| 2018-12-25 3:00 | 17 |
| 2018-12-25 4:00 | 4 |
| 2018-12-25 5:00 | 3 |
| 2018-12-25 6:00 | 7 |
| 2018-12-25 7:00 | 6 |
| 2018-12-25 8:00 | 8 |
| 2018-12-25 9:00 | 5 |
| 2018-12-25 10:00 | 4 |
| 2018-12-25 11:00 | 21 |
| 2018-12-25 12:00 | 10 |
| 2018-12-25 13:00 | 8 |
| 2018-12-25 14:00 | 7 |
| 2018-12-25 15:00 | 4 |
| 2018-12-25 16:00 | 6 |
| 2018-12-25 17:00 | 11 |
| 2018-12-25 18:00 | 6 |
| 2018-12-25 19:00 | 4 |
| 2018-12-25 20:00 | 3 |
| 2018-12-25 21:00 | -1 |
| 2018-12-25 22:00 | 6 |
| 2018-12-25 23:00 | 7 |
| 2018-12-26 0:00 | 5 |
| 2018-12-26 1:00 | 1 |
| 2018-12-26 3:00 | -1 |
| 2018-12-26 4:00 | -4 |
| 2018-12-26 5:00 | 1 |
| 2018-12-26 7:00 | 9 |
| 2018-12-26 8:00 | 12 |
| 2018-12-26 9:00 | 10 |
| 2018-12-26 10:00 | 12 |
| 2018-12-26 11:00 | 15 |
| 2018-12-26 12:00 | 11 |
| 2018-12-26 13:00 | 7 |
| 2018-12-26 14:00 | 6 |
| 2018-12-26 15:00 | 10 |
| 2018-12-26 16:00 | 7 |
| 2018-12-26 17:00 | 6 |
| 2018-12-26 18:00 | 4 |
| 2018-12-26 19:00 | 10 |
| 2018-12-26 20:00 | 6 |
| 2018-12-26 21:00 | 10 |
| 2018-12-26 22:00 | 8 |

| Period | Value |
|---|---|
| 2018-12-26 23:00 | 10 |
| 2018-12-27 0:00 | 14 |
| 2018-12-27 1:00 | 10 |
| 2018-12-27 2:00 | 4 |
| 2018-12-27 3:00 | 1 |
| 2018-12-27 4:00 | 5 |
| 2018-12-27 5:00 | 3 |
| 2018-12-27 6:00 | 5 |
| 2018-12-27 7:00 | 13 |
| 2018-12-27 8:00 | 16 |
| 2018-12-27 9:00 | 23 |
| 2018-12-27 10:00 | 13 |
| 2018-12-27 11:00 | 9 |
| 2018-12-27 12:00 | 6 |
| 2018-12-27 13:00 | 6 |
| 2018-12-27 14:00 | 4 |
| 2018-12-27 15:00 | 8 |
| 2018-12-27 16:00 | 6 |
| 2018-12-27 17:00 | 10 |
| 2018-12-27 18:00 | 6 |
| 2018-12-27 19:00 | 2 |
| 2018-12-27 20:00 | 7 |
| 2018-12-27 21:00 | 8 |
| 2018-12-27 22:00 | 6 |
| 2018-12-27 23:00 | 7 |
| 2018-12-28 0:00 | 9 |
| 2018-12-28 1:00 | 4 |
| 2018-12-28 3:00 | 1 |
| 2018-12-28 4:00 | 1 |
| 2018-12-28 5:00 | -2 |
| 2018-12-28 6:00 | -4 |
| 2018-12-28 8:00 | 8 |
| 2018-12-28 9:00 | 8 |
| 2018-12-28 10:00 | 6 |
| 2018-12-28 11:00 | 5 |
| 2018-12-28 12:00 | 1 |
| 2018-12-28 13:00 | 2 |
| 2018-12-28 14:00 | 3 |
| 2018-12-28 15:00 | 1 |
| 2018-12-28 16:00 | 1 |
| 2018-12-28 17:00 | 4 |
| 2018-12-28 18:00 | 7 |
| 2018-12-28 19:00 | 10 |
| 2018-12-28 20:00 | 6 |
| 2018-12-28 21:00 | 2 |
| 2018-12-28 22:00 | 9 |

| Period | Value |
|---|---|
| 2018-12-28 23:00 | 5 |
| 2018-12-29 0:00 | 2 |
| 2018-12-29 2:00 | 1 |
| 2018-12-29 3:00 | 2 |
| 2018-12-29 4:00 | 3 |
| 2018-12-29 5:00 | 6 |
| 2018-12-29 6:00 | 4 |
| 2018-12-29 7:00 | 3 |
| 2018-12-29 8:00 | 6 |
| 2018-12-29 9:00 | 8 |
| 2018-12-29 10:00 | 6 |
| 2018-12-29 11:00 | 2 |
| 2018-12-29 12:00 | 3 |
| 2018-12-29 13:00 | 7 |
| 2018-12-29 14:00 | 5 |
| 2018-12-29 15:00 | 7 |
| 2018-12-29 16:00 | 5 |
| 2018-12-29 17:00 | 4 |
| 2018-12-29 18:00 | 6 |
| 2018-12-29 19:00 | 4 |
| 2018-12-29 20:00 | 5 |
| 2018-12-29 21:00 | 4 |
| 2018-12-29 22:00 | -1 |
| 2018-12-30 0:00 | 1 |
| 2018-12-30 1:00 | -7 |
| 2018-12-30 2:00 | -10 |
| 2018-12-30 3:00 | -4 |
| 2018-12-30 4:00 | -4 |
| 2018-12-30 5:00 | -3 |
| 2018-12-30 8:00 | 9 |
| 2018-12-30 9:00 | 6 |
| 2018-12-30 10:00 | 4 |
| 2018-12-30 11:00 | 4 |
| 2018-12-30 12:00 | -2 |
| 2018-12-30 13:00 | -5 |
| 2018-12-30 14:00 | 4 |
| 2018-12-30 15:00 | 2 |
| 2018-12-30 17:00 | 7 |
| 2018-12-30 18:00 | 9 |
| 2018-12-30 19:00 | 7 |
| 2018-12-30 20:00 | 17 |
| 2018-12-30 21:00 | 2 |
| 2018-12-30 22:00 | 3 |

| Period | Value |
|---|---|
| 2018-12-30 23:00 | 3 |
| 2018-12-31 0:00 | 7 |
| 2018-12-31 1:00 | 6 |
| 2018-12-31 2:00 | 3 |
| 2018-12-31 3:00 | 4 |
| 2018-12-31 4:00 | 3 |
| 2018-12-31 5:00 | 3 |
| 2018-12-31 6:00 | 4 |
| 2018-12-31 7:00 | 3 |
| 2018-12-31 8:00 | 7 |
| 2018-12-31 9:00 | 10 |
| 2018-12-31 10:00 | 10 |
| 2018-12-31 11:00 | 12 |
| 2018-12-31 12:00 | 11 |
| 2018-12-31 13:00 | 11 |
| 2018-12-31 14:00 | 9 |
| 2018-12-31 15:00 | 6 |
| 2018-12-31 16:00 | 7 |
| 2018-12-31 17:00 | 6 |
| 2018-12-31 18:00 | 17 |
| 2018-12-31 19:00 | 6 |
| 2018-12-31 20:00 | 6 |
| 2018-12-31 21:00 | 6 |
| 2018-12-31 22:00 | 15 |
| 2018-12-31 23:00 | 23 |
| 2019-01-01 0:00 | 16 |