# Performance of Thermal Power Plants in Tropical, Dry, Temperate, Continental, and Polar Climate Regions

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## Appendix

This file contains

Figure A.1 to 5A.5

Table A.1 to A.6

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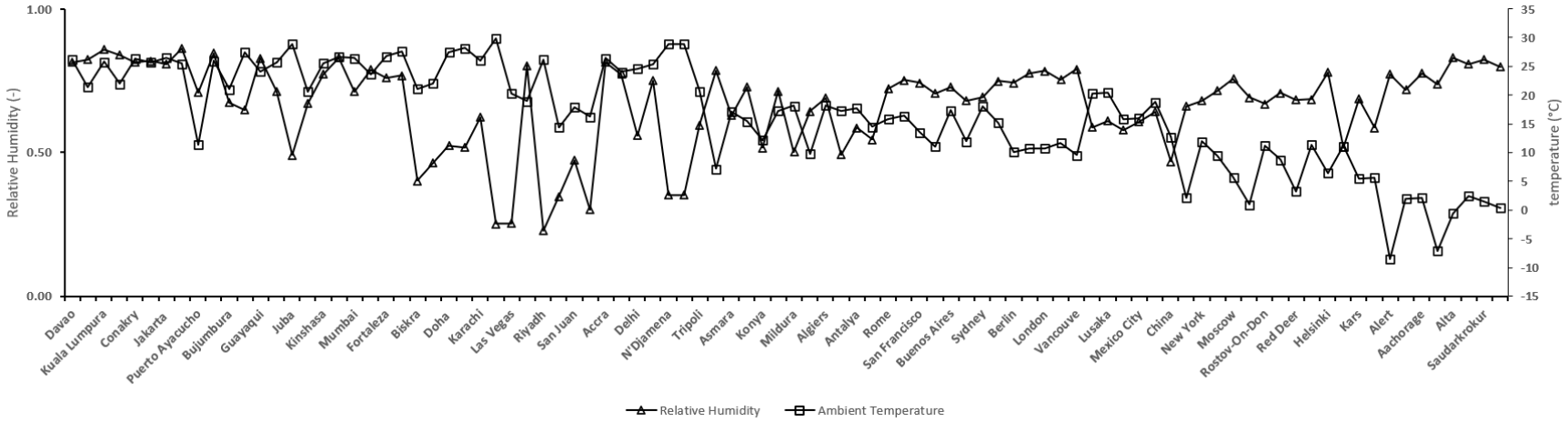


**Figure A.1**: Profiles of Ambient Temperatures and Humidity Across Various Locations. Note: Some Locations are Omitted due to Duplicate Values

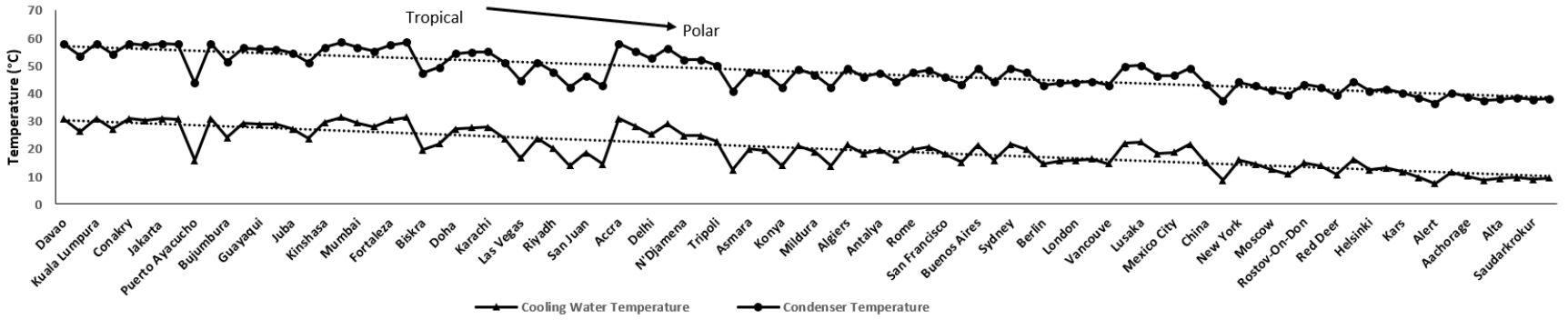


**Figure A.2**: Profiles of Cooling Water and Condenser Temperatures Across Various Locations. Note: Some Locations are Omitted due to Duplicate Values

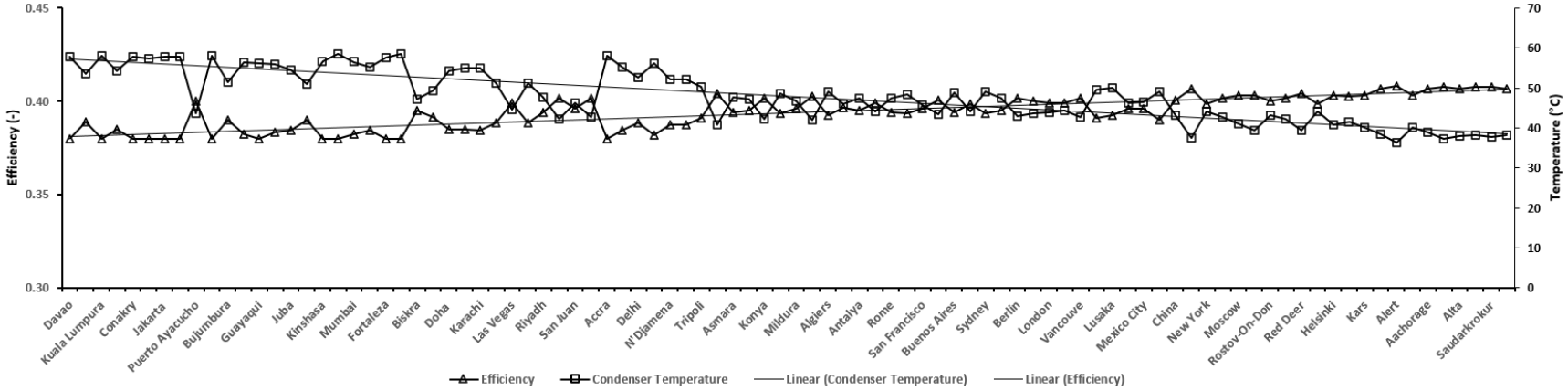


**Figure A.3**: Profiles of Thermal Power Plant Efficiency and Ambient Temperature Across Various Locations. Note: Some Locations are Omitted due to Duplicate Values

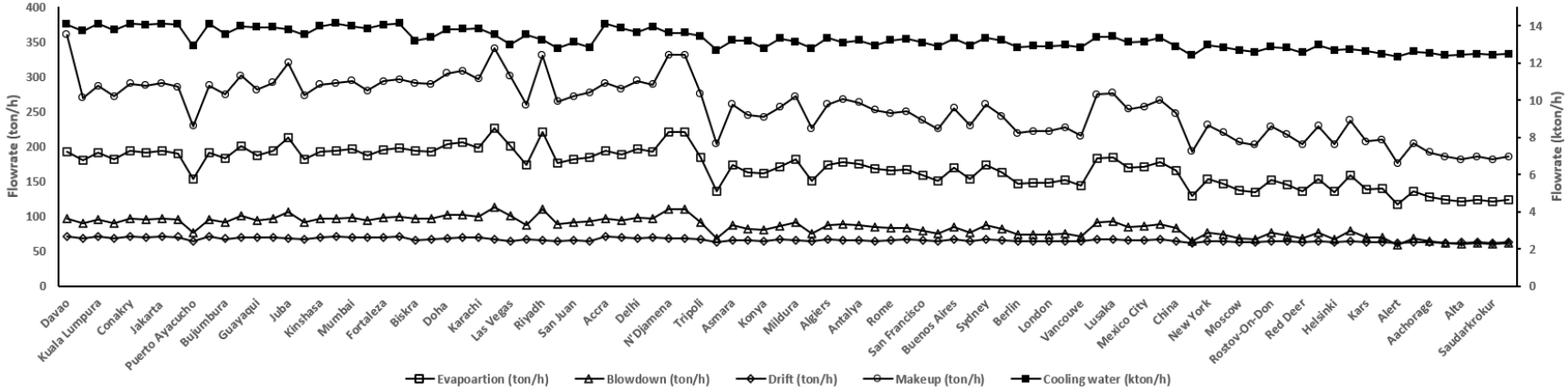


**Figure A.4**: Profiles of Evaporation, Drift, and Blowdown Losses, Makeup, and Cooling Water Across Various Locations. Note: Some Locations are Omitted due to Duplicate Values

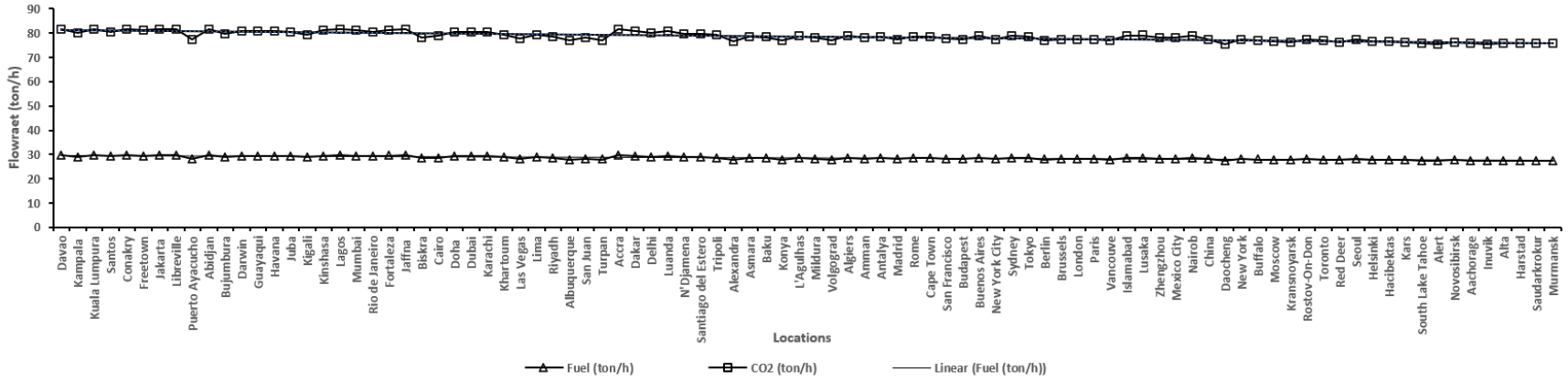


**Figure A.5**: Profiles of Fuel Consumption and $CO_2$ Emission Across Various Locations. Note: Some Locations are Omitted due to Duplicate Values

**Table A.1**: Thermal Power Plant Performance Parameters (Tropical Climate)

| No. | Climate Zone | Location | Country | $T_a$ | $\varphi$ | $T_w$ | $T_c$ | $\square_o$ | $\dot{M}_w$ | $\dot{M}_{wmakeup}$ | $\dot{M}_f$ | $CO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | °C | | °C | °C | | kt/h | (t/h) | t/h | t/h |
| **1** | Af | Davao | Philippines | 26.19 | 0.82 | 30.70 | 57.78 | 0.38 | 14.07 | 360.04 | 29.63 | 81.48 |
| **2** | Af | Kampala | Uganda | 21.43 | 0.82 | 26.30 | 53.58 | 0.39 | 13.71 | 270.14 | 29.16 | 80.20 |
| **3** | Af | Kuala Lumpur | Malaysia | 25.78 | 0.86 | 30.89 | 57.96 | 0.38 | 14.09 | 286.97 | 29.65 | 81.54 |
| **4** | Af | Santos | Brazil | 21.96 | 0.84 | 27.02 | 54.27 | 0.39 | 13.77 | 271.71 | 29.24 | 80.41 |
| **5** | Am | Conakry | Guinea | 26.34 | 0.81 | 30.83 | 57.90 | 0.38 | 14.08 | 290.30 | 29.64 | 81.52 |
| **6** | Am | Freetown | Sierra Leone | 25.72 | 0.82 | 30.29 | 57.39 | 0.38 | 14.04 | 287.73 | 29.58 | 81.36 |
| **7** | Am | Jakarta | Indonesia | 26.43 | 0.81 | 30.82 | 57.90 | 0.38 | 14.08 | 290.87 | 29.64 | 81.52 |
| **8** | Am | Libreville | Gabon | 25.47 | 0.86 | 30.65 | 57.73 | 0.38 | 14.07 | 285.70 | 29.62 | 81.46 |
| **9** | Am | Puerto Ayacucho | Venezuela | 11.41 | 0.71 | 15.76 | 43.75 | 0.40 | 12.91 | 229.29 | 28.12 | 77.34 |
| **10** | Aw | Abidjan | Ivory Coast | 25.92 | 0.85 | 30.88 | 57.95 | 0.38 | 14.09 | 287.73 | 29.65 | 81.53 |
| **11** | Aw | Bujumbura | Burundi | 20.98 | 0.67 | 23.95 | 51.35 | 0.39 | 13.53 | 274.33 | 28.92 | 79.53 |
| **12** | Aw | Darwin | Australia | 27.41 | 0.65 | 29.24 | 56.39 | 0.38 | 13.96 | 301.63 | 29.48 | 81.06 |
| **13** | Aw | Guayaquil | Ecuador | 24.12 | 0.83 | 28.92 | 56.08 | 0.38 | 13.93 | 281.10 | 29.44 | 80.95 |
| **14** | Aw | Havana | Cuba | 25.72 | 0.71 | 28.79 | 55.95 | 0.38 | 13.92 | 291.17 | 29.43 | 80.92 |
| **15** | Aw | Juba | South Sudan | 28.89 | 0.49 | 27.16 | 54.41 | 0.38 | 13.79 | 320.08 | 29.26 | 80.46 |
| **16** | Aw | Kigali | Rwanda | 20.66 | 0.67 | 23.60 | 51.03 | 0.39 | 13.50 | 273.40 | 28.88 | 79.43 |
| **17** | Aw | Kinshasa | DRC | 25.53 | 0.77 | 29.47 | 56.60 | 0.38 | 13.97 | 288.64 | 29.50 | 81.11 |
| **18** | Aw | Lagos | Nigeria | 26.67 | 0.83 | 31.36 | 58.42 | 0.38 | 14.13 | 291.10 | 29.70 | 81.68 |
| **19** | Aw | Mumbai | India | 26.41 | 0.71 | 29.37 | 56.51 | 0.38 | 13.96 | 294.49 | 29.49 | 81.09 |
| **20** | Aw | Rio de Janeiro | Brazil | 23.62 | 0.79 | 27.92 | 55.12 | 0.38 | 13.85 | 280.13 | 29.33 | 80.67 |
| **21** | As | Fortaleza | Brazil | 26.72 | 0.76 | 30.38 | 57.47 | 0.38 | 14.05 | 293.43 | 29.59 | 81.38 |
| **22** | As | Jaffna | Sri Lanka | 27.65 | 0.77 | 31.38 | 58.43 | 0.38 | 14.13 | 296.51 | 29.70 | 81.68 |
| **Max** | | | | **28.89** | **0.86** | **31.38** | **58.43** | **0.40** | **14.13** | **360.04** | **29.70** | **81.68** |
| **Min** | | | | **11.41** | **0.49** | **15.76** | **43.75** | **0.38** | **12.91** | **229.29** | **28.12** | **77.34** |
| **Average** | | | | **24.59** | **0.77** | **28.44** | **55.63** | **0.38** | **13.89** | **288.48** | **29.39** | **80.83** |

**Table A.2**: Thermal Power Plant Performance Parameters (Dry Climate)

| No. | Climate Zone | Location | Country | $T_a$ | $\varphi$ | $T_w$ | $T_c$ | $\square_o$ | $\dot{M}_w$ | $\dot{M}_{wmakeup}$ | $\dot{M}_f$ | $CO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | °C | | °C | °C | | kt/h | (t/h) | t/h | t/h |
| **23** | BWh | Biskra | Algeria | 21.08 | 0.40 | 19.53 | 47.25 | 0.40 | 13.19 | 290.57 | 28.49 | 78.35 |
| **24** | BWh | Cairo | Egypt | 22.08 | 0.46 | 21.82 | 49.38 | 0.39 | 13.37 | 289.74 | 28.72 | 78.97 |
| **25** | BWh | Doha | Qatar | 27.48 | 0.53 | 27.09 | 54.36 | 0.39 | 13.78 | 305.27 | 29.25 | 80.45 |
| **26** | BWh | Dubai | UAE | 28.17 | 0.52 | 27.63 | 54.87 | 0.39 | 13.83 | 308.08 | 29.31 | 80.60 |
| **27** | BWh | Karachi | Pakistan | 26.06 | 0.62 | 27.80 | 55.03 | 0.38 | 13.84 | 296.90 | 29.33 | 80.66 |
| **28** | BWh | Khartoum | Sudan | 29.87 | 0.25 | 23.64 | 51.08 | 0.39 | 13.51 | 340.45 | 28.90 | 79.46 |
| **29** | BWh | Las Vegas | USA | 20.25 | 0.25 | 16.64 | 44.60 | 0.40 | 12.98 | 301.15 | 28.22 | 77.60 |
| **30** | BWh | Lima | Peru | 18.92 | 0.80 | 23.69 | 51.12 | 0.39 | 13.51 | 259.92 | 28.90 | 79.47 |
| **31** | BWh | Riyadh | Saudi Arabia | 26.23 | 0.23 | 20.03 | 47.70 | 0.39 | 13.23 | 330.58 | 28.54 | 78.47 |
| **32** | BWk | Albuquerque | USA | 14.36 | 0.35 | 13.88 | 42.14 | 0.40 | 12.78 | 264.62 | 27.97 | 76.92 |
| **33** | BWk | San Juan | Argentina | 17.92 | 0.47 | 18.55 | 46.34 | 0.40 | 13.12 | 272.20 | 28.40 | 78.09 |
| **34** | BWk | Turpan | China | 16.20 | 0.30 | 14.47 | 42.73 | 0.40 | 12.83 | 277.47 | 28.04 | 77.10 |
| **35** | BSh | Accra | Ghana | 26.42 | 0.81 | 30.89 | 57.96 | 0.38 | 14.09 | 290.51 | 29.65 | 81.54 |
| **36** | BSh | Dakar | Senegal | 24.03 | 0.77 | 28.07 | 55.28 | 0.38 | 13.86 | 282.48 | 29.35 | 80.72 |
| **37** | BSh | Delhi | India | 24.63 | 0.56 | 25.22 | 52.59 | 0.39 | 13.64 | 294.24 | 29.06 | 79.93 |
| **38** | BSh | Luanda | Angola | 25.41 | 0.75 | 29.04 | 56.19 | 0.38 | 13.94 | 288.56 | 29.45 | 80.99 |
| **39** | BSh | N'Djamena | Chad | 28.93 | 0.35 | 24.79 | 52.18 | 0.39 | 13.60 | 331.39 | 29.02 | 79.80 |
| **40** | BSh | Santiago del Estero | Argentina | 28.93 | 0.35 | 24.79 | 52.18 | 0.39 | 13.60 | 331.39 | 29.02 | 79.80 |
| **41** | BSh | Tripoli | Libya | 20.67 | 0.60 | 22.63 | 50.15 | 0.39 | 13.43 | 275.76 | 28.80 | 79.19 |
| **42** | BSk | Alexandra | New Zealand | 7.13 | 0.78 | 12.35 | 40.71 | 0.40 | 12.67 | 203.54 | 27.82 | 76.51 |
| **43** | BSk | Asmara | Eritrea | 17.14 | 0.63 | 19.93 | 47.59 | 0.39 | 13.22 | 260.50 | 28.52 | 78.43 |
| **44** | BSk | Baku | Azerbaijan | 15.42 | 0.73 | 19.43 | 47.21 | 0.40 | 13.19 | 244.93 | 28.49 | 78.36 |
| **45** | BSk | Konya | Turkey | 12.20 | 0.52 | 13.93 | 42.17 | 0.40 | 12.78 | 242.36 | 27.97 | 76.92 |
| **46** | BSk | L'Agulhas | South Africa | 17.25 | 0.71 | 21.07 | 48.66 | 0.39 | 13.31 | 256.05 | 28.64 | 78.75 |
| **47** | BSh | Mildura | Australia | 18.15 | 0.50 | 18.85 | 46.61 | 0.40 | 13.14 | 272.08 | 28.42 | 78.16 |
| **48** | BSk | Volgograd | Russia | 9.78 | 0.64 | 13.76 | 42.08 | 0.40 | 12.78 | 225.86 | 27.97 | 76.92 |
| **Max** | | | | **29.87** | **0.86** | **31.38** | **58.43** | **0.40** | **14.13** | **360.04** | **29.70** | **81.68** |
| **Min** | | | | **7.13** | **0.23** | **12.35** | **40.71** | **0.38** | **12.67** | **203.54** | **27.82** | **76.51** |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average** | | | | **22.56** | **0.64** | **24.72** | **52.15** | **0.39** | **13.60** | **285.51** | **29.02** | **79.81** |

**Table A.3**: Thermal Power Plant Performance Parameters (Temperate Climate)

| **No.** | **Climate Zone** | **Location** | **Country** | $T_a$ | $\varphi$ | $T_w$ | $T_c$ | $\square_o$ | $\dot{M}_w$ | $\dot{M}_{wmakeup}$ | $\dot{M}_f$ | **$CO_2$** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **°C** | | **°C** | **°C** | | **kt/h** | **(t/h)** | **t/h** | **t/h** |
| **49** | Csa | Algiers | Algeria | 18.17 | 0.69 | 21.52 | 49.10 | 0.39 | 13.34 | 260.14 | 28.69 | 78.89 |
| **50** | Csa | Amman | Jordan | 17.24 | 0.49 | 18.14 | 45.98 | 0.40 | 13.09 | 267.51 | 28.36 | 77.99 |
| **51** | Csa | Antalya | Turkey | 17.76 | 0.59 | 19.58 | 47.31 | 0.40 | 13.20 | 263.21 | 28.50 | 78.37 |
| **52** | Csa | Madrid | Spain | 14.45 | 0.55 | 16.06 | 44.06 | 0.40 | 12.93 | 252.16 | 28.16 | 77.44 |
| **53** | Csa | Rome | Italy | 15.81 | 0.72 | 19.73 | 47.45 | 0.39 | 13.21 | 247.77 | 28.51 | 78.42 |
| **54** | CSb | Cape Town | South Africa | 16.37 | 0.75 | 20.71 | 48.32 | 0.39 | 13.28 | 250.42 | 28.60 | 78.65 |
| **55** | CSb | San Francisco | USA | 13.53 | 0.74 | 17.98 | 45.79 | 0.40 | 13.07 | 237.63 | 28.34 | 77.92 |
| **56** | Cfa | Budapest | Hungary | 11.08 | 0.71 | 15.16 | 43.31 | 0.40 | 12.88 | 225.51 | 28.09 | 77.25 |
| **57** | Cfa | Buenos Aires | Argentina | 17.33 | 0.73 | 21.26 | 48.85 | 0.39 | 13.32 | 255.14 | 28.66 | 78.81 |
| **58** | Cfa | New York City | USA | 11.91 | 0.68 | 15.91 | 44.04 | 0.40 | 12.94 | 230.25 | 28.17 | 77.47 |
| **59** | Cfa | Sydney | Australia | 18.02 | 0.69 | 21.55 | 49.13 | 0.39 | 13.35 | 260.33 | 28.69 | 78.89 |
| **60** | Cfa | Tokyo | Japan | 15.18 | 0.75 | 19.71 | 47.49 | 0.40 | 13.22 | 243.48 | 28.53 | 78.46 |
| **61** | Cfb | Berlin | Germany | 10.10 | 0.74 | 14.66 | 42.83 | 0.40 | 12.84 | 219.52 | 28.04 | 77.11 |
| **62** | Cfb | Brussels | Belgium | 10.73 | 0.78 | 15.65 | 43.70 | 0.40 | 12.90 | 221.73 | 28.12 | 77.34 |
| **63** | Cfb | London | UK | 10.77 | 0.78 | 15.77 | 43.79 | 0.40 | 12.91 | 221.76 | 28.13 | 77.36 |
| **64** | Cfb | Paris | France | 11.66 | 0.75 | 16.26 | 44.25 | 0.40 | 12.95 | 227.16 | 28.18 | 77.50 |
| **65** | Cfb | Vancouver | Canada | 9.53 | 0.79 | 14.65 | 42.80 | 0.40 | 12.83 | 214.97 | 28.03 | 77.09 |
| **66** | Cwa | Islamabad | Pakistan | 20.29 | 0.59 | 22.06 | 49.64 | 0.39 | 13.39 | 274.45 | 28.75 | 79.06 |
| **67** | Cwa | Lusaka | Zambia | 20.39 | 0.61 | 22.48 | 49.98 | 0.39 | 13.41 | 276.31 | 28.78 | 79.13 |
| **68** | Cwa | Zhengzhou | China | 15.78 | 0.58 | 18.31 | 46.25 | 0.40 | 13.12 | 253.79 | 28.40 | 78.11 |
| **69** | Cwb | Mexico City | Mexico | 15.98 | 0.61 | 18.67 | 46.43 | 0.40 | 13.12 | 256.84 | 28.40 | 78.10 |
| **70** | Cwb | Nairobi | Kenya | 18.76 | 0.64 | 21.56 | 49.11 | 0.39 | 13.34 | 266.59 | 28.68 | 78.87 |
| **Max** | | | | **20.39** | **0.79** | **22.48** | **49.98** | **0.40** | **13.41** | **276.31** | **28.78** | **79.13** |
| **Min** | | | | **9.53** | **0.49** | **14.65** | **42.80** | **0.39** | **12.83** | **214.97** | **28.03** | **77.09** |
| **Average** | | | | **15.04** | **0.68** | **18.52** | **46.35** | **0.40** | **13.12** | **246.67** | **28.40** | **78.10** |

**Table A.4**: Thermal Power Plant Performance Parameters (Continental Climate)

| No. | Climate Zone | Location | Country | $T_a$ | $\varphi$ | $T_w$ | $T_c$ | $\square_o$ | $\dot{M}_w$ | $\dot{M}_{wmakeup}$ | $\dot{M}_f$ | $CO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | °C | - | °C | °C | - | kt/h | (t/h) | t/h | t/h |
| **71** | Dfa | China | Beijing | 12.71 | 0.47 | 14.96 | 43.24 | 0.40 | 12.88 | 247.86 | 28.10 | 77.27 |
| **72** | Dwb | Baocheng | China Dwb) | 2.18 | 0.66 | 8.66 | 37.47 | 0.41 | 12.41 | 192.67 | 27.50 | 75.63 |
| **73** | Dfa | New York | USA | 11.91 | 0.68 | 15.99 | 44.10 | 0.40 | 12.94 | 230.68 | 28.18 | 77.49 |
| **74** | Dfb | Buffalo | USA | 9.44 | 0.71 | 14.50 | 42.76 | 0.40 | 12.83 | 219.69 | 28.04 | 77.11 |
| **75** | Dfb | Moscow | Russia | 5.72 | 0.76 | 12.52 | 40.93 | 0.40 | 12.69 | 206.27 | 27.85 | 76.59 |
| **76** | Dfc | Krasnoyarsk | Russia (Dfc) | 0.92 | 0.69 | 10.79 | 39.40 | 0.40 | 12.56 | 202.16 | 27.70 | 76.17 |
| **77** | Dfa | Rostov-On-Don | Russia | 11.18 | 0.67 | 14.97 | 43.16 | 0.40 | 12.87 | 228.63 | 28.08 | 77.22 |
| **78** | Dfb | Toronto | Canada | 8.72 | 0.71 | 13.98 | 42.28 | 0.40 | 12.80 | 217.45 | 27.99 | 76.97 |
| **79** | Dfc | Red Deer | Canada | 3.22 | 0.68 | 10.74 | 39.32 | 0.40 | 12.56 | 203.12 | 27.69 | 76.14 |
| **80** | Dwa | Seoul | South Korea | 11.32 | 0.69 | 16.06 | 44.22 | 0.40 | 12.96 | 229.64 | 28.20 | 77.54 |
| **81** | Dfb | Helsinki | Finland | 6.37 | 0.78 | 12.30 | 40.72 | 0.40 | 12.67 | 202.74 | 27.83 | 76.53 |
| **82** | Dsb | Hacibektas | Turkey | 11.13 | 0.52 | 13.16 | 41.48 | 0.40 | 12.73 | 237.37 | 27.90 | 76.73 |
| **83** | Dsb | Kars | Turkey | 5.51 | 0.69 | 11.60 | 40.10 | 0.40 | 12.62 | 207.37 | 27.77 | 76.36 |
| **84** | Dsb | South Lake Tahoe | USA | 5.66 | 0.59 | 9.72 | 38.39 | 0.41 | 12.48 | 209.92 | 27.59 | 75.88 |
| **Max** | | | | **12.71** | **0.78** | **16.06** | **44.22** | **0.41** | **12.96** | **247.86** | **28.20** | **77.54** |
| **Min** | | | | **0.92** | **0.47** | **8.66** | **37.47** | **0.40** | **12.41** | **192.67** | **27.50** | **75.63** |
| **Average** | | | | **7.57** | **0.66** | **12.85** | **41.25** | **0.40** | **12.71** | **216.83** | **27.89** | **76.69** |

**Table A.5**: Thermal Power Plant Performance Parameters (Polar Climate)

| No. | Climate Zone | Location | Country | $T_a$ | $\varphi$ | $T_w$ | $T_c$ | $\square_o$ | $\dot{M}_w$ | $\dot{M}_{wmakeup}$ | $\dot{M}_f$ | $CO_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | °C | - | °C | °C | - | kt/h | (t/h) | t/h | t/h |
| **85** | ET | Alert | Canada | -8.57 | 0.77 | 7.38 | 36.32 | 0.41 | 12.32 | 175.93 | 27.39 | 75.31 |
| **86** | ET | Novosibirsk | Russia | 1.96 | 0.72 | 11.51 | 40.02 | 0.40 | 12.61 | 204.14 | 27.76 | 76.34 |
| **87** | ET | Aachorage | USA | 2.14 | 0.78 | 10.21 | 38.84 | 0.41 | 12.52 | 191.30 | 27.64 | 76.01 |
| **88** | ET | Inuvik | Canada | -7.12 | 0.74 | 8.56 | 37.37 | 0.41 | 12.40 | 185.78 | 27.49 | 75.60 |
| **89** | ET | Alta | Norway | -0.64 | 0.83 | 9.22 | 37.95 | 0.41 | 12.45 | 181.55 | 27.55 | 75.76 |
| **90** | ET | Harstad | Norway | 2.47 | 0.81 | 9.61 | 38.31 | 0.41 | 12.48 | 185.64 | 27.59 | 75.86 |
| **91** | ET | Saudarkrokur | Iceland | 1.54 | 0.82 | 9.01 | 37.75 | 0.41 | 12.43 | 181.09 | 27.53 | 75.70 |
| **92** | ET | Murmansk | Russia | 0.37 | 0.80 | 9.45 | 38.15 | 0.41 | 12.46 | 185.55 | 27.57 | 75.81 |
| **Max** | | | | **2.47** | **0.83** | **11.51** | **40.02** | **0.41** | **12.61** | **204.14** | **27.76** | **76.34** |
| **Min** | | | | **-8.57** | **0.72** | **7.38** | **36.32** | **0.40** | **12.32** | **175.93** | **27.39** | **75.31** |
| **Average** | | | | **-0.98** | **0.78** | **9.37** | **38.09** | **0.41** | **12.46** | **186.37** | **27.56** | **75.80** |

**Table A.6**: Koppen Geiger Climate Classification (Kottek, et al., 2006)

| Type | Description |
|---|---|
| **Tropical climate (A) is divided into 4 subgroups** | |
| **Af** | Equatorial rainforest, fully humid |
| **Am** | Equatorial monsoon |
| **Aw** | Equatorial savannah with dry summer |
| **As** | Equatorial savannah with dry winter |
| **Dry climate (B) is divided into 4 subgroups** | |
| **BWh** | Desert climate: Hot |
| **BWk** | Desert climate: Cold |
| **BSh** | Steppe climate: Hot |
| **BSk** | Steppe climate: Cold |
| **Temperate climate (C) is divided into nine subgroups** | |
| **CWa** | Monsoon-influenced humid subtropical climate |
| **CWb** | Monsoon-influenced temperate oceanic climate |
| **CWc** | Monsoon-influenced subpolar oceanic climate |
| **Cfa** | Humid subtropical climate |
| **Cfb** | Subtropical highland climate |
| **Cfc** | Subpolar oceanic climate |
| **Csa** | Hot-summer Mediterranean climate |
| **Csb** | Warm-summer Mediterranean climate |
| **Csc** | Cold-summer Mediterranean climate |
| **Continental climate (D) is divided into 12 subgroups** | |
| **DWa** | Monsoon-influenced hot-summer humid continental climate |
| **DWb** | Monsoon-influenced warm-summer humid continental climate |
| **DWc** | Monsoon-influenced subarctic climate |
| **DWd** | Monsoon-influenced extremely cold subarctic climate |
| **Dfa** | Hot-summer humid continental climate |
| **Dfb** | Warm-summer humid continental climate |
| **Dfc** | Subarctic climate |
| **Dfd** | Extremely cold subarctic climate |
| **Dsa** | Mediterranean-influenced hot-summer humid continental climate |
| **Dsb** | Mediterranean-influenced Warm-summer humid continental climate |
| **Dsc** | Mediterranean-influenced subarctic climate |
| **Dsd** | Mediterranean-influenced extremely Cold subarctic climate |
| **Polar climate (E) is divided into two subgroups** | |
| **ET** | Tundra climate |
| **EF** | Frost climate |