

VOLT IQ

Smart IoT • Intelligent Operations • Smarter Decisions

Real-Time IoT Machine Performance Monitoring

KARTHICK RAJA L

Data Analyst | Power BI Developer



ABOUT THE PROJECT

VOLT IQ is a Smart Manufacturing IoT Analytics solution that combines real-time monitoring, anomaly detection, predictive maintenance, energy intelligence, and data quality management into a unified operational dashboard.

Business Questions Answered :

- Which machines are at risk of failure?
- Which assets need maintenance first?
- Where is energy consumption highest?
- Are sensor readings reliable?
- How can downtime be reduced?

Overview

Executive Command Center

Anomaly Intelligence

Data Quality

Predictive Maintenance

Energy & Efficiency

VOLT IQ – Executive Overview

Real-Time IoT Machine Performance Monitoring

Viewing: All Machines

Machine Info



50

Total Machines

270.80K

Total Energy(KpH)

8766

Total Anomalies

8.89%

Anomaly %

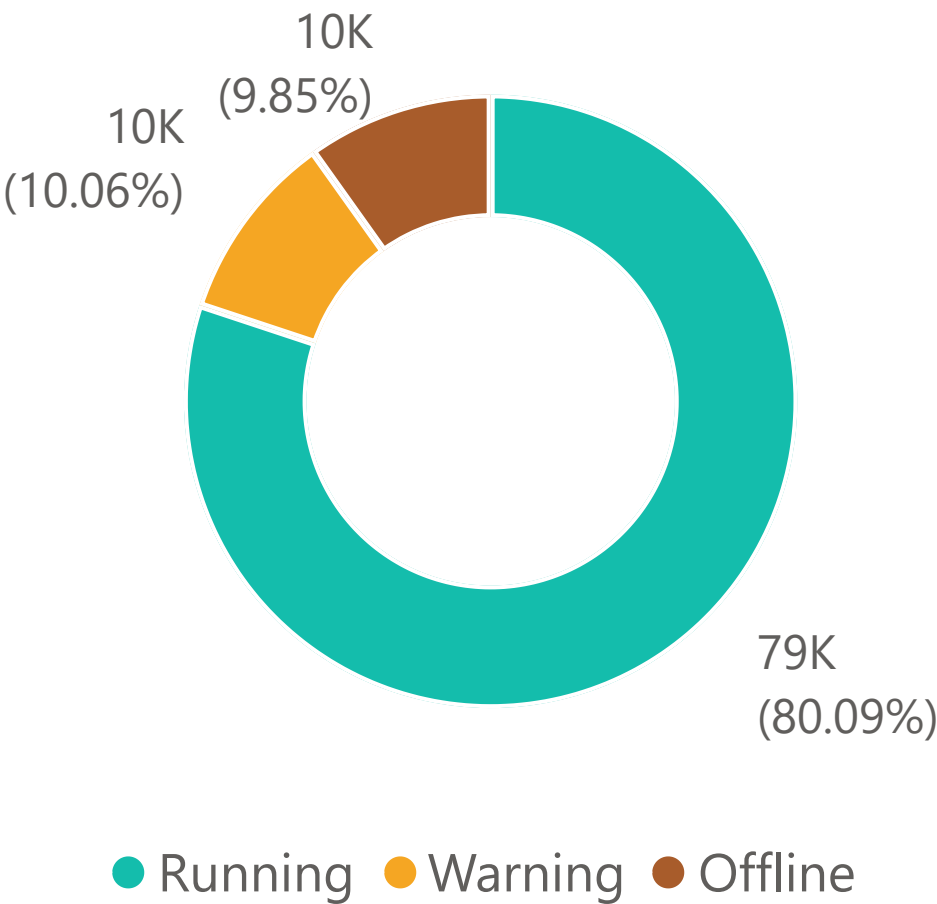
50.00

Avg Vibration

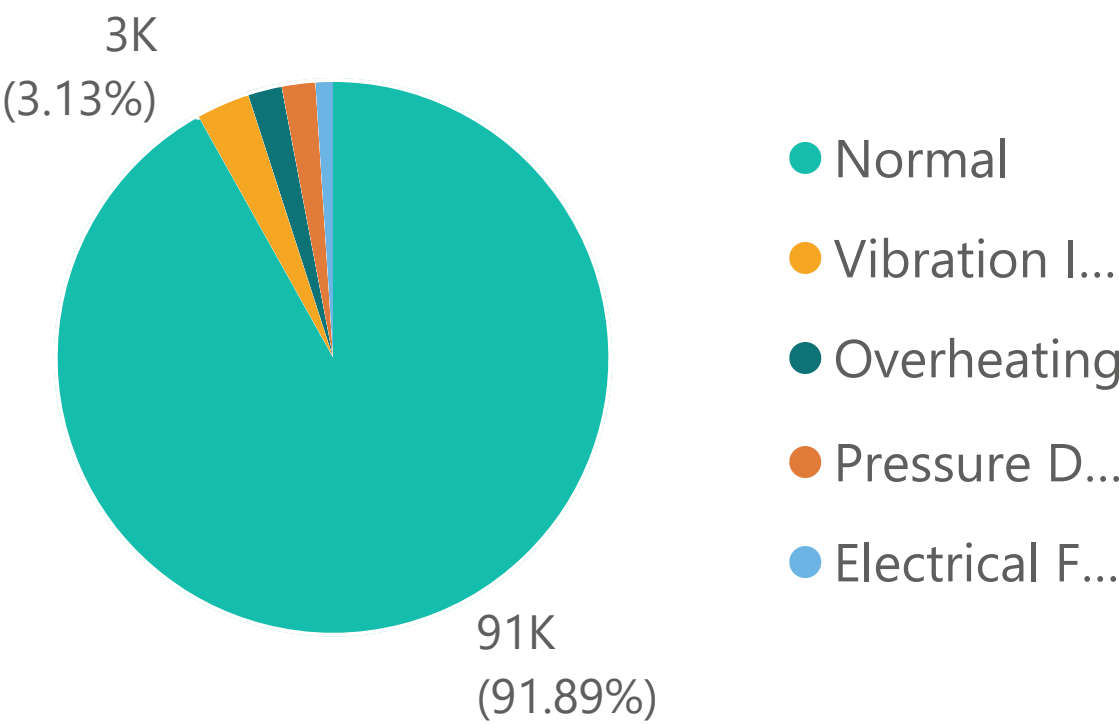
75.01

Avg Temperature

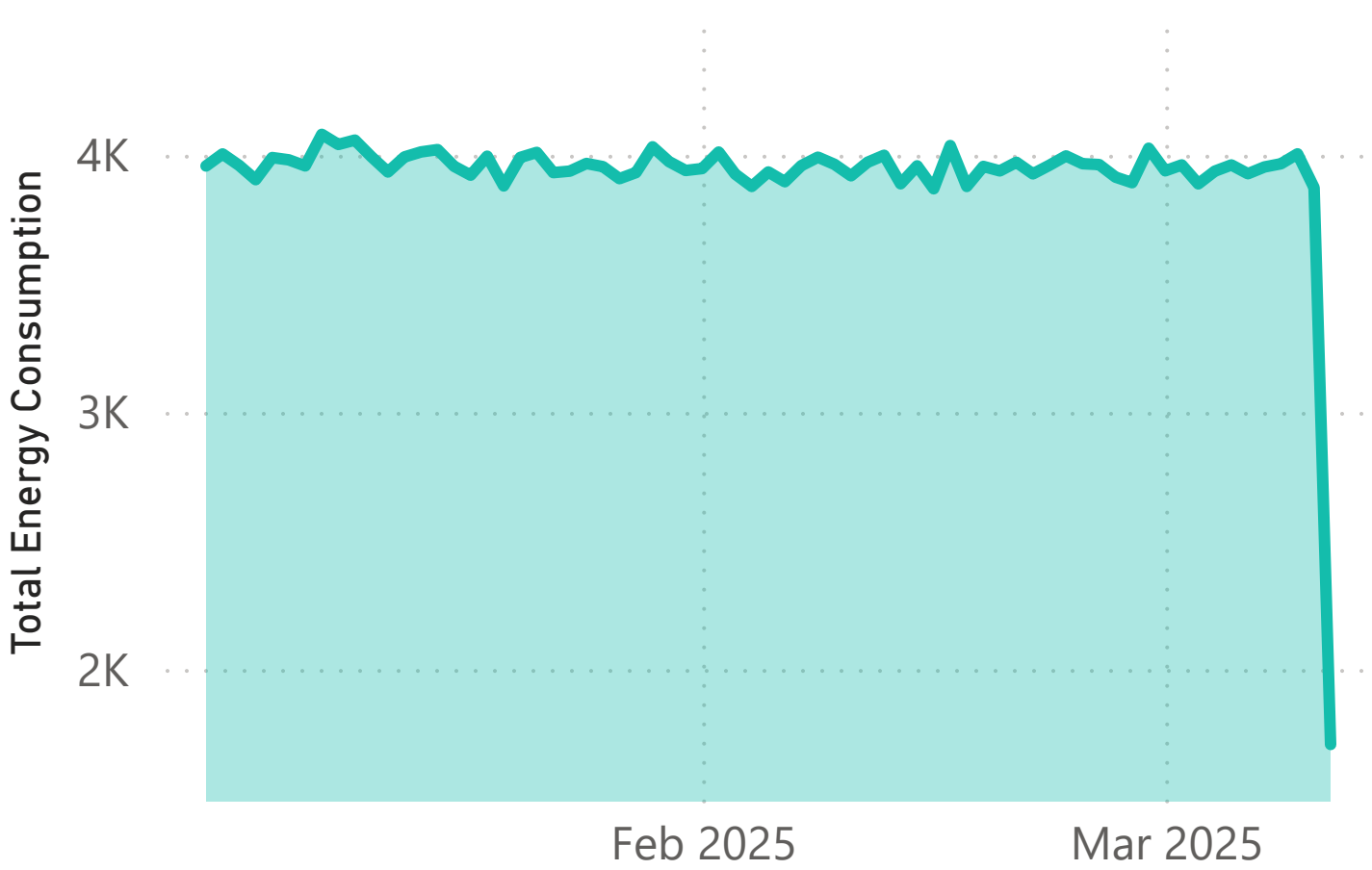
Machine Status Distribution



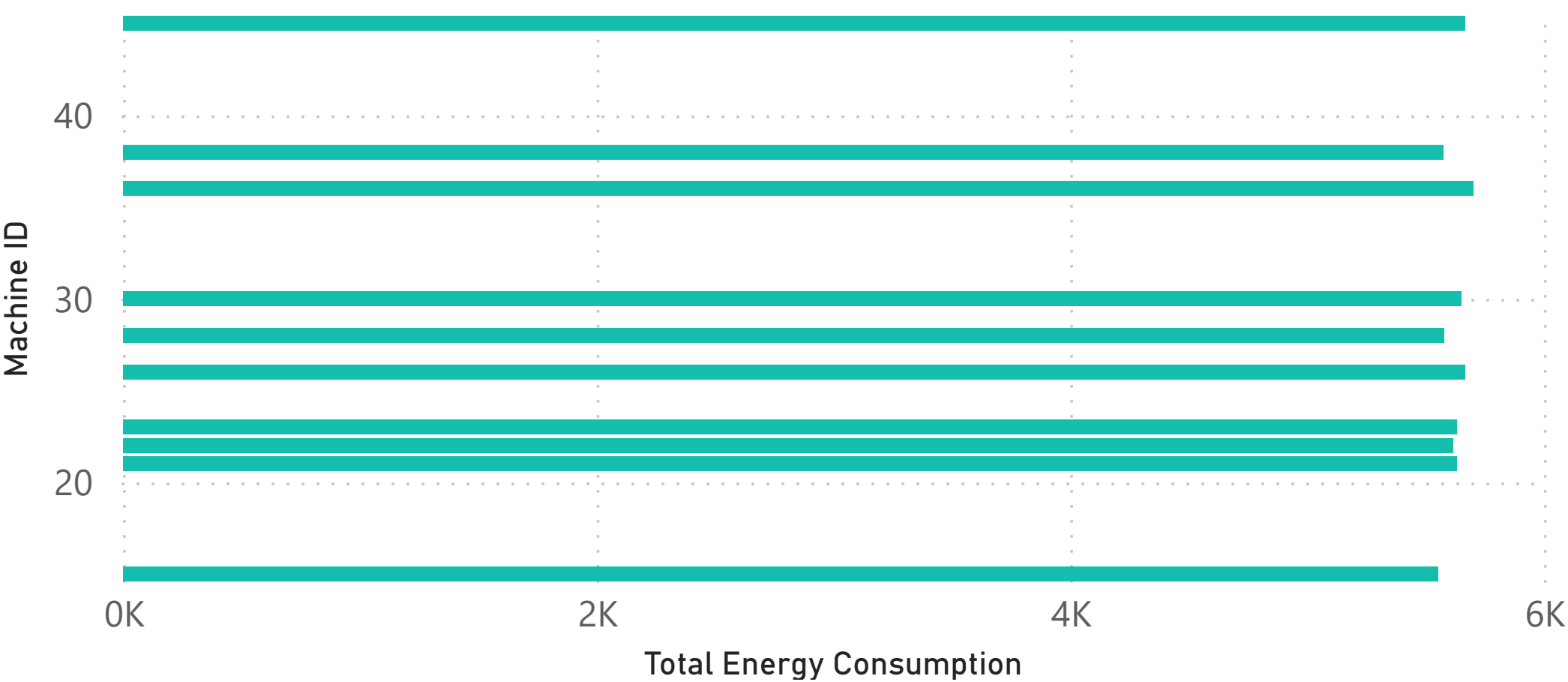
Failure Type Distribution



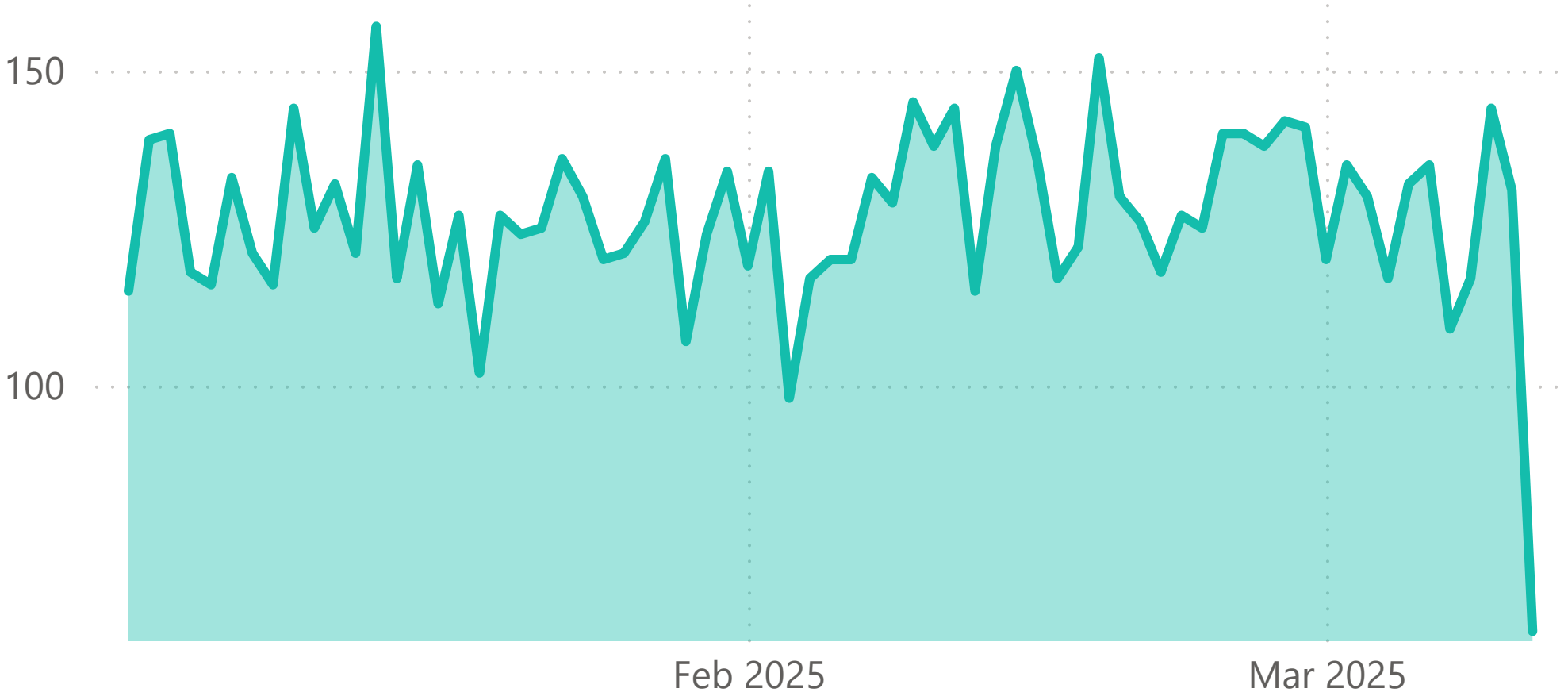
Energy Consumption Trend



Top 5 Energy Consuming Machines



Anomaly Trend



Machine ID

All

Anomaly Status

All

Machine Status Name

All

Predicted Failure Type

All

Date

1/2/2025

3/11/2025





8916

Total Anomalies

8.92%

Anomaly %

8916

Downtime Risk

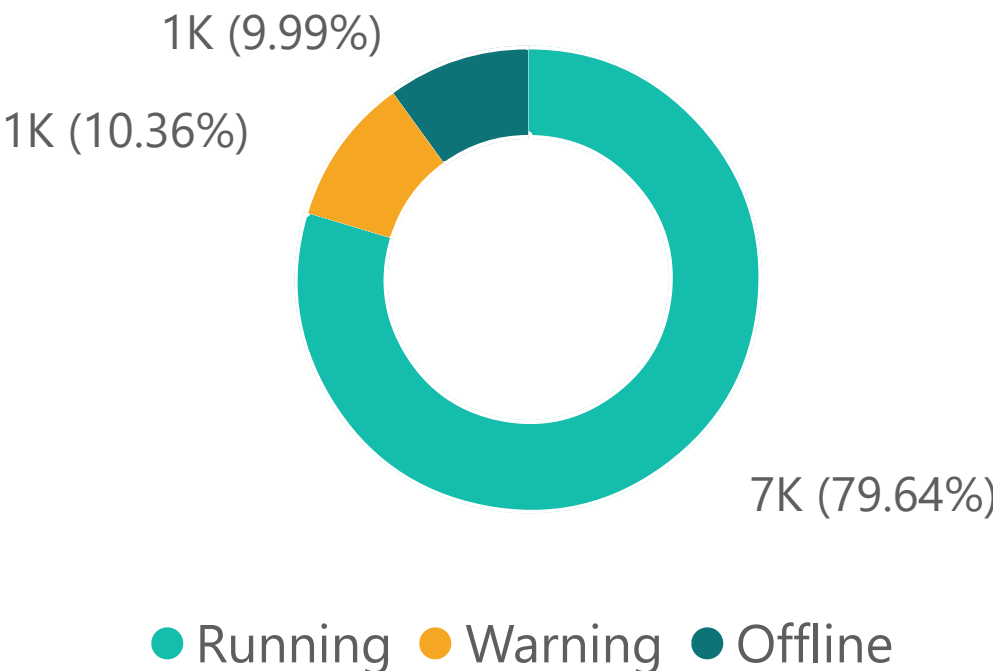
20K

Maintenance Count

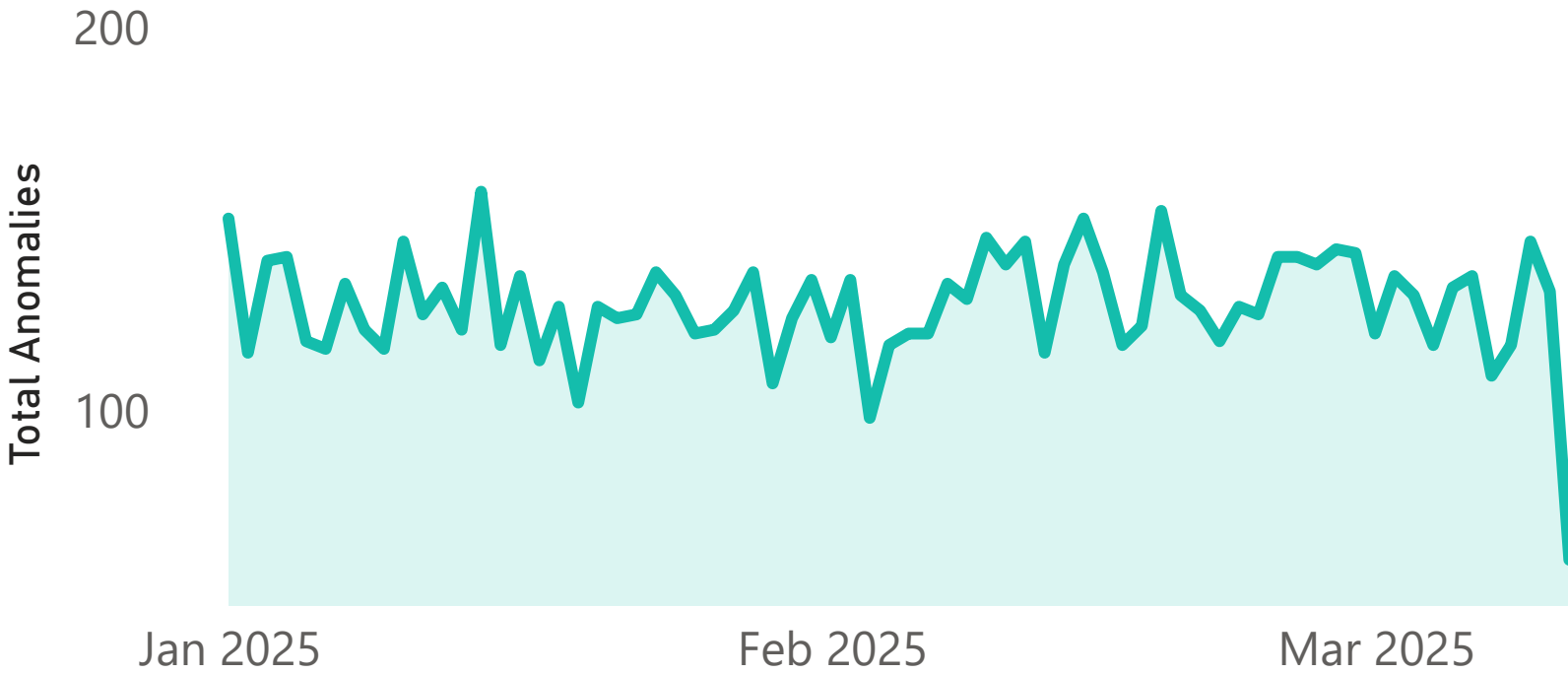
274.71K

Total (KpH)

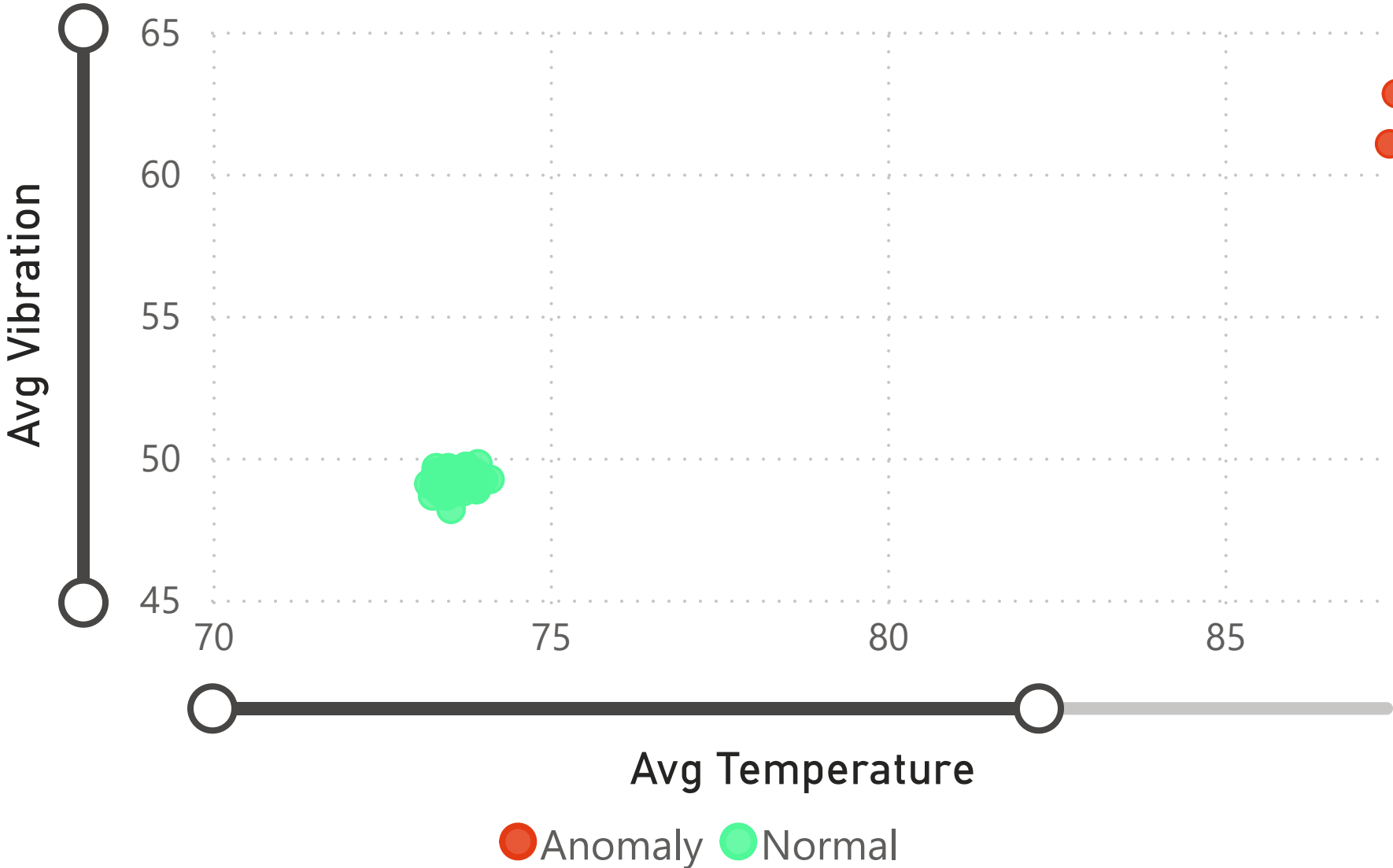
Anomaly Status Distribution



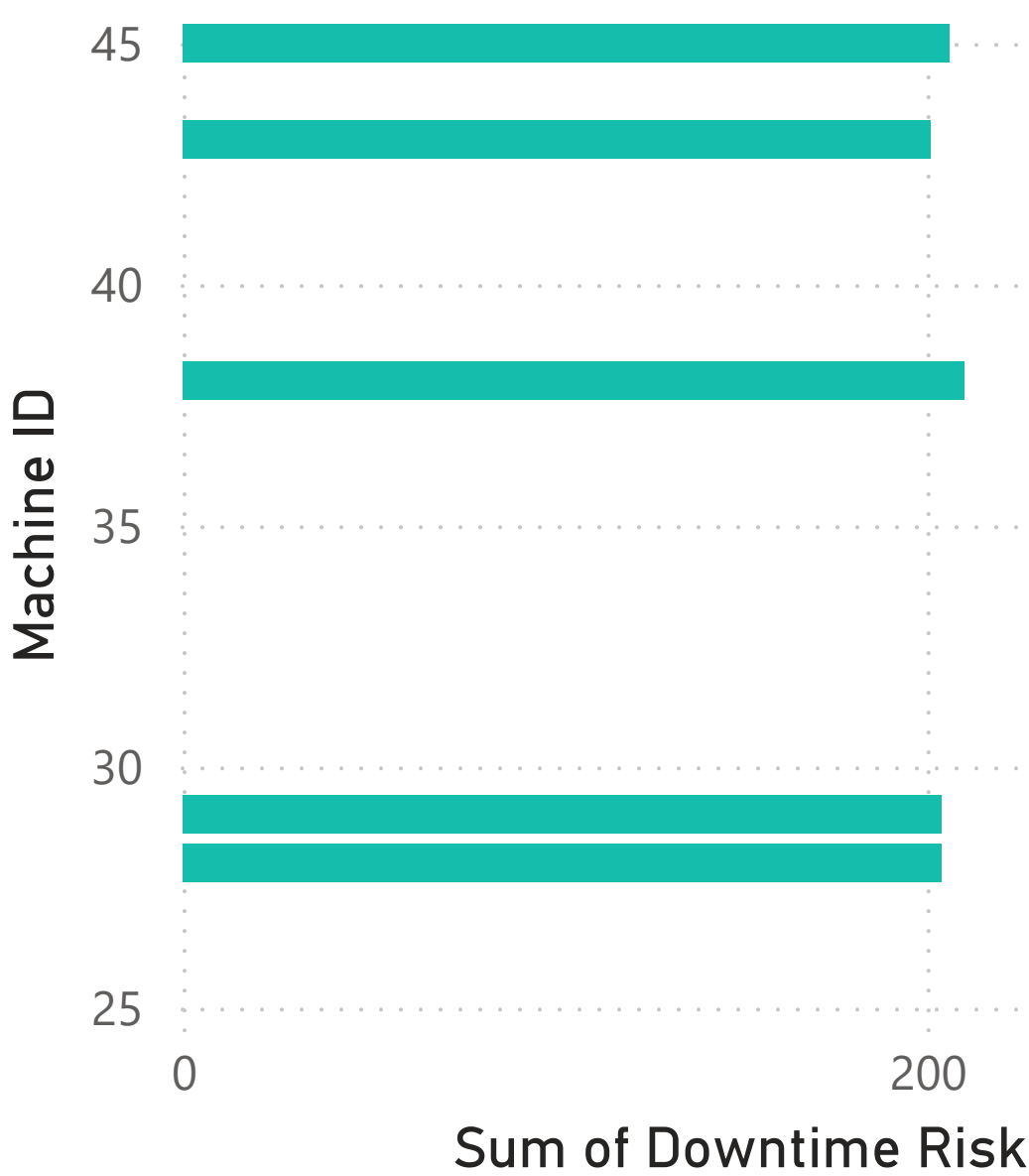
Anomaly Trend



Avg Temperature and Avg Vibration by Machine ID and Anomaly Status

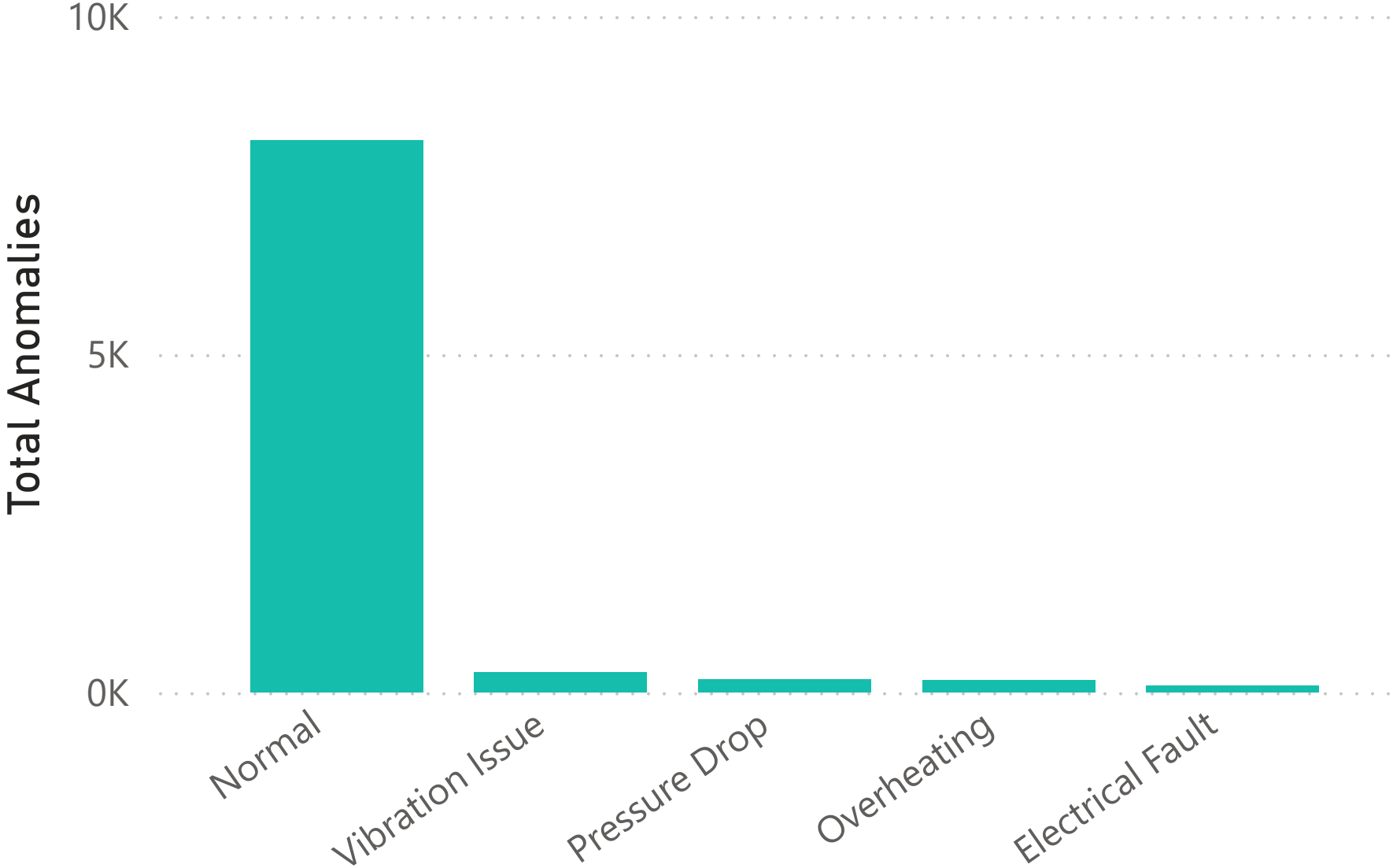


Top Risk Machines



Machine ID	Anomaly %	Average of Temperature	Average of Vibration
1	9.76%	74.86	50.00
2	8.33%	74.97	49.00
3	7.65%	74.80	50.00
4	9.98%	74.93	49.00
5	8.71%	74.97	49.00
6	9.67%	74.88	50.00
7	9.11%	74.98	49.00
8	8.69%	75.00	50.00
9	8.59%	75.28	50.00
10	8.95%	75.24	50.00
11	9.33%	75.57	50.00
12	8.59%	74.64	49.00
13	8.34%	75.26	50.00
Total	8.92%	75.02	50.00

Anomalies by Failure Type





234.27

Avg Remaining L...

20K

Maintenance Re...

75.02

Avg Temperature

50

Machines Near F...

8916

Total Anomalies

8.92%

Anomaly %

8916

Downtime Risk

Maintenance Planning Table

Machine ID	Predicted Failure Type	Average of Remaining Life	Maintenance Status	Sum of Downtime Risk	Average of Temperature	Average of Vibration	Avg Humidity	Max Remaining Life	Running Record
1	Normal	256.07	Not Required	0	73.26	49.51	55.31	499	135
1	Electrical Fault	233.55	Required	3	75.79	43.96	59.46	499	
1	Normal	44.00	Required	173	84.83	56.65	53.49	489	18
1	Overheating	221.73	Required	3	75.85	51.77	58.27	481	
1	Pressure Drop	213.44	Required	4	74.86	49.17	60.83	487	
1	Vibration Issue	233.14	Required	4	75.83	48.87	55.43	484	
2	Normal	257.64	Not Required	0	73.67	49.64	55.52	499	142
2	Electrical Fault	186.08	Required	1	71.05	49.06	51.86	439	
2	Normal	68.39	Required	155	83.75	52.91	54.52	499	17
2	Overheating	203.47	Required	3	74.79	50.76	59.61	463	
2	Pressure Drop	189.35	Required	8	75.30	51.24	55.56	489	
2	Vibration Issue	225.56	Required	3	75.85	46.34	52.08	492	
3	Normal	264.07	Not Required	0	73.75	49.43	54.99	499	146
3	Electrical Fault	190.53	Required	4	76.73	50.01	52.57	472	
3	Normal	62.61	Required	136	82.39	59.51	58.05	499	16
3	Overheating	255.63	Required	5	75.86	48.69	56.56	493	
3	Pressure Drop	276.94	Required	1	74.39	52.50	54.13	491	
3	Vibration Issue	220.18	Required	7	75.41	49.74	58.34	496	
4	Normal	261.08	Not Required	0	73.11	48.89	55.07	499	143
4	Electrical Fault	262.38	Required	1	74.59	43.47	54.80	492	
4	Normal	52.70	Required	189	85.72	55.55	53.95	485	19
4	Overheating	262.28	Required	2	72.50	51.16	54.49	489	
4	Pressure Drop	264.29	Required	3	75.41	49.46	54.97	497	
4	Vibration Issue	215.43	Required	5	77.74	49.07	57.81	484	
Total		234.27		8916	75.02	50.01	55.00	499	8009



234.27

Avg Remaining Life

20K

Maintenance Required...

8916

Downtime Risk Count

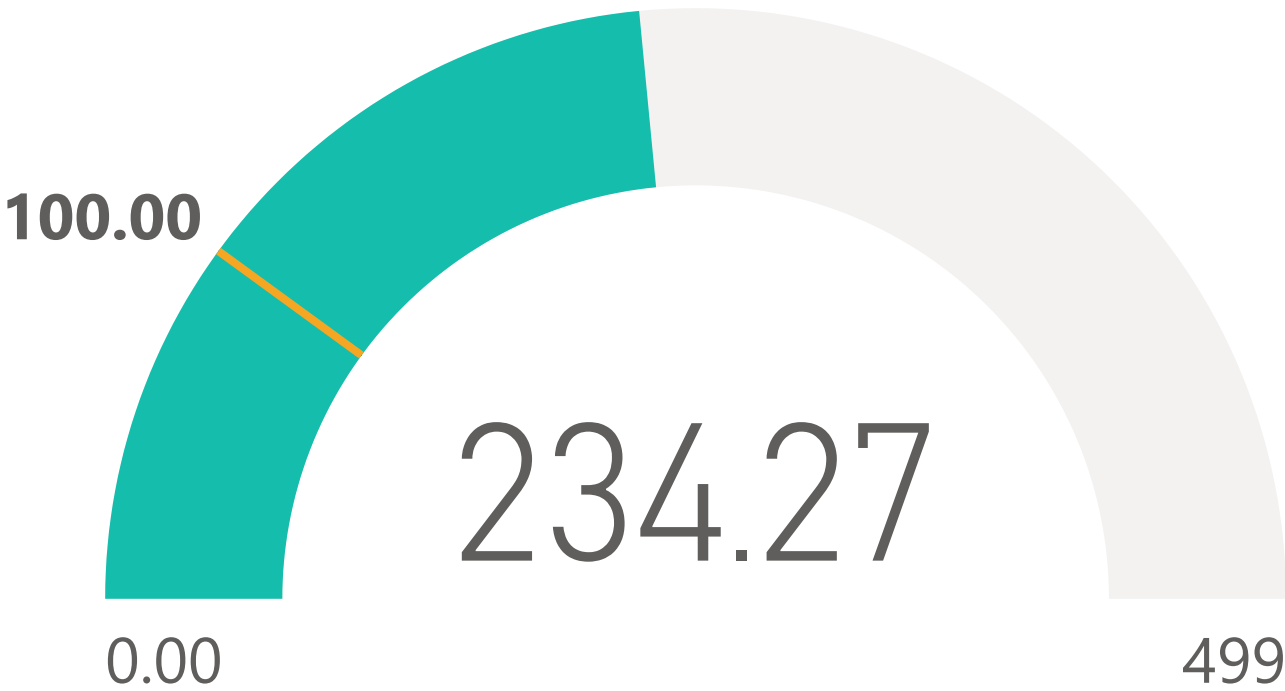
75.02

Avg Temperature

50

Critical Machine...

Average Remaining Life (Days)



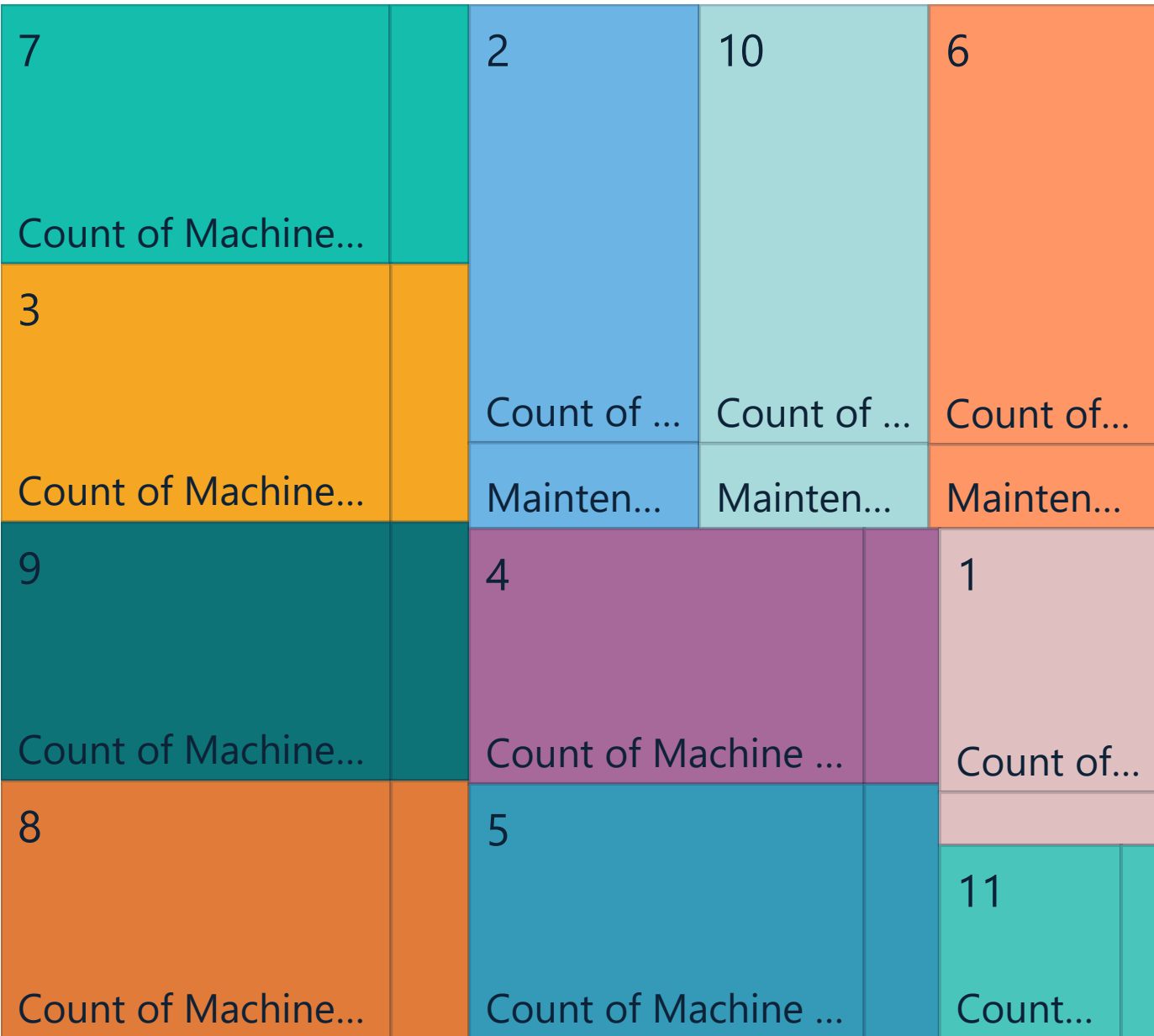
Top 10 Machines with Lowest Remaining Life

Machine ID	Anomaly %	Downtime Risk Count	Avg Remaining Life
1	9.76%	187	227.67
6	9.67%	187	231.35
11	9.33%	182	229.20
31	8.28%	160	236.51
35	8.99%	172	240.01
37	8.40%	165	230.58
Total	9.29%	1793	231.88

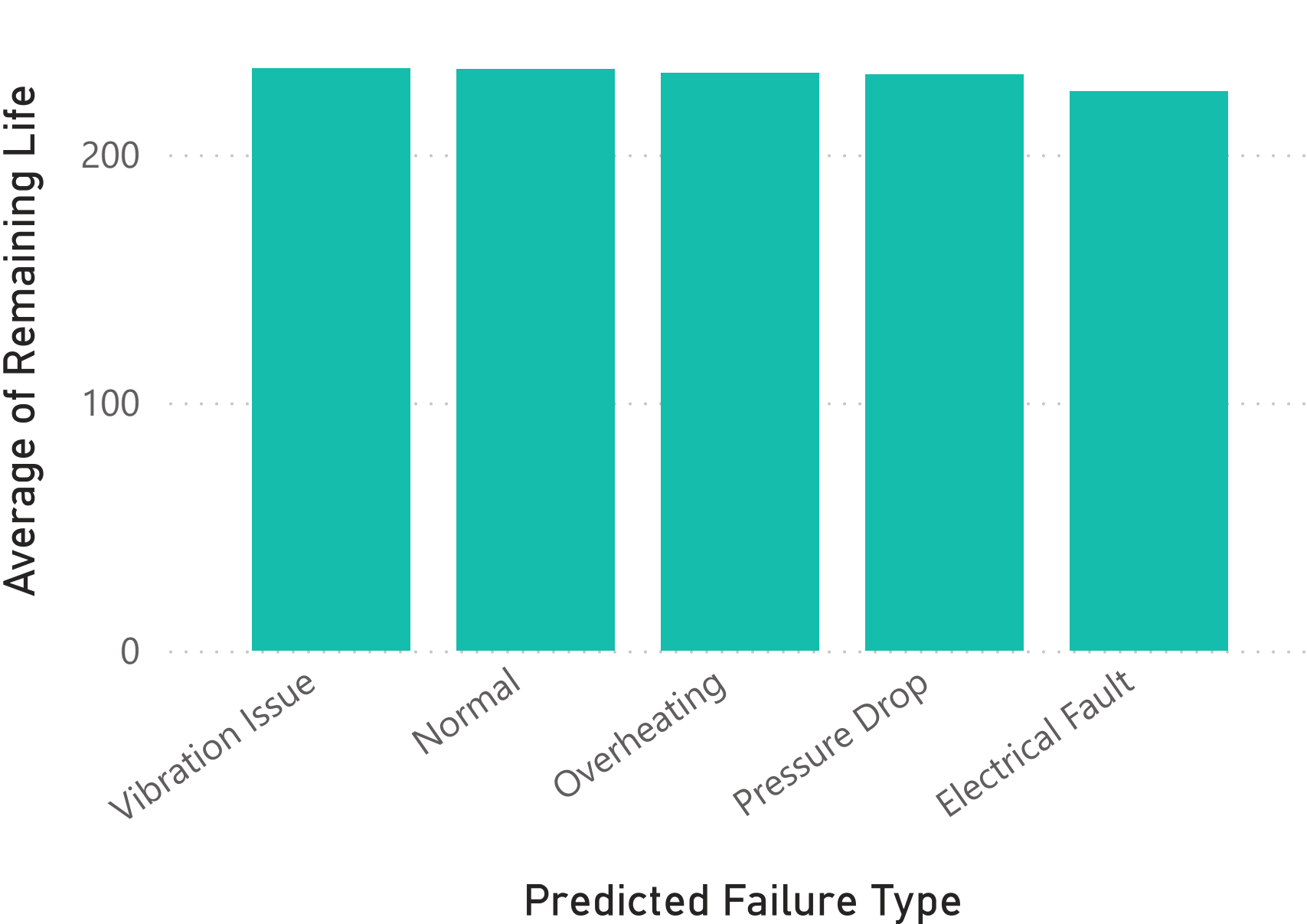
Maintenance Planning Table

Machine ID	Predicted Failure Type	Average of Remaining Life	Mainten...
1	Normal	256.07	Not Rec
1	Electrical Fault	233.55	Require
1	Normal	44.00	Require
1	Overheating	221.73	Require
1	Pressure Drop	213.44	Require
1	Vibration Issue	233.14	Require
2	Normal	257.64	Not Rec
2	Electrical Fault	186.08	Require
2	Normal	68.39	Require
2	Overheating	203.47	Require
2	Pressure Drop	189.35	Require
2	Vibration Issue	225.56	Require
Total		234.27	

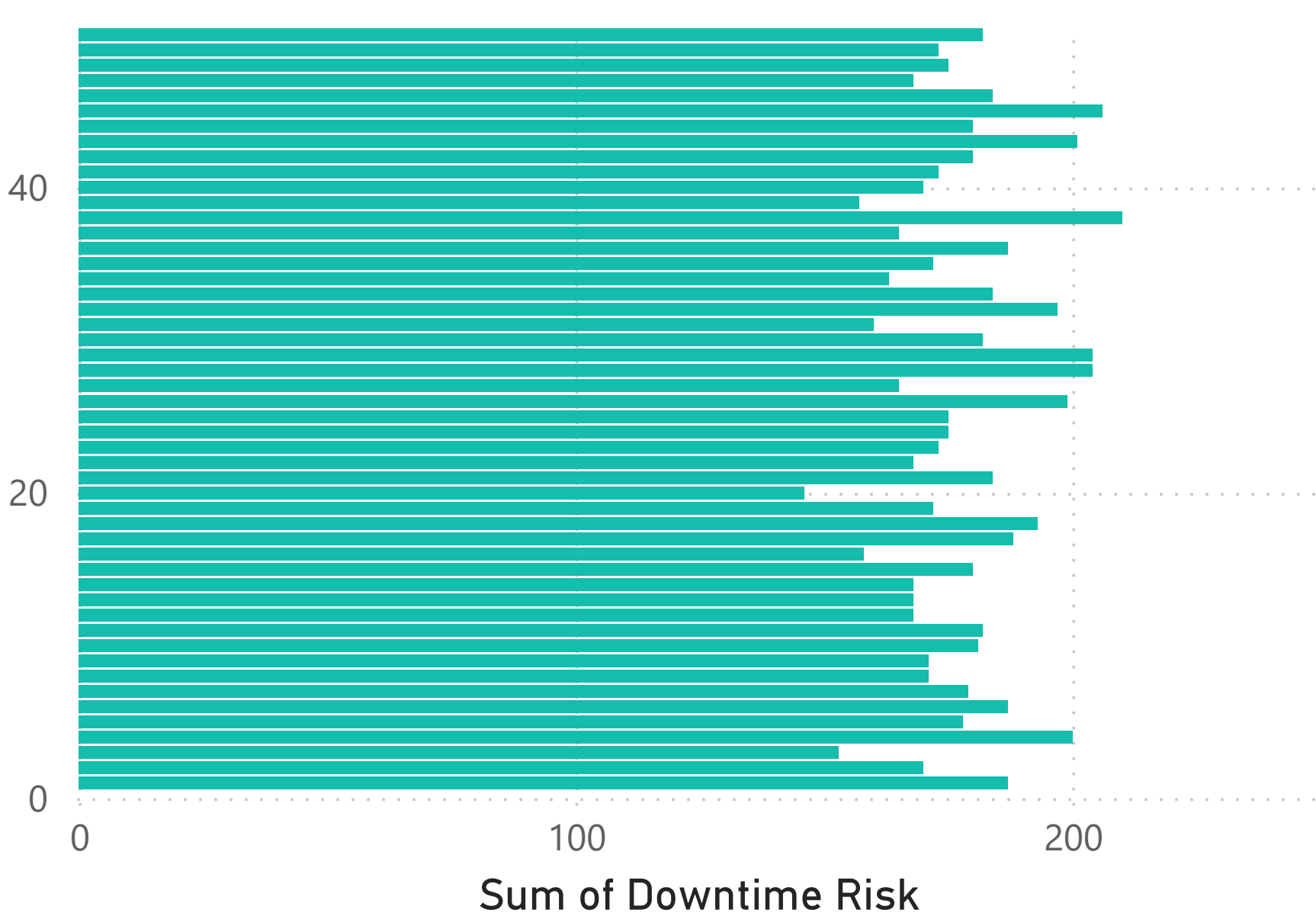
Maintenance Activity Heatmap



Remaining Life by Failure Type



Downtime Risk by Machine



VOLT IQ - Energy & Efficiency Intelligence

Predicted Failure Type

All

Anomaly Status

All



234.27

Avg Remaining L...

20K

Maintenance Re...

8916

Downtime Risk ...

75.02

Avg Temperature

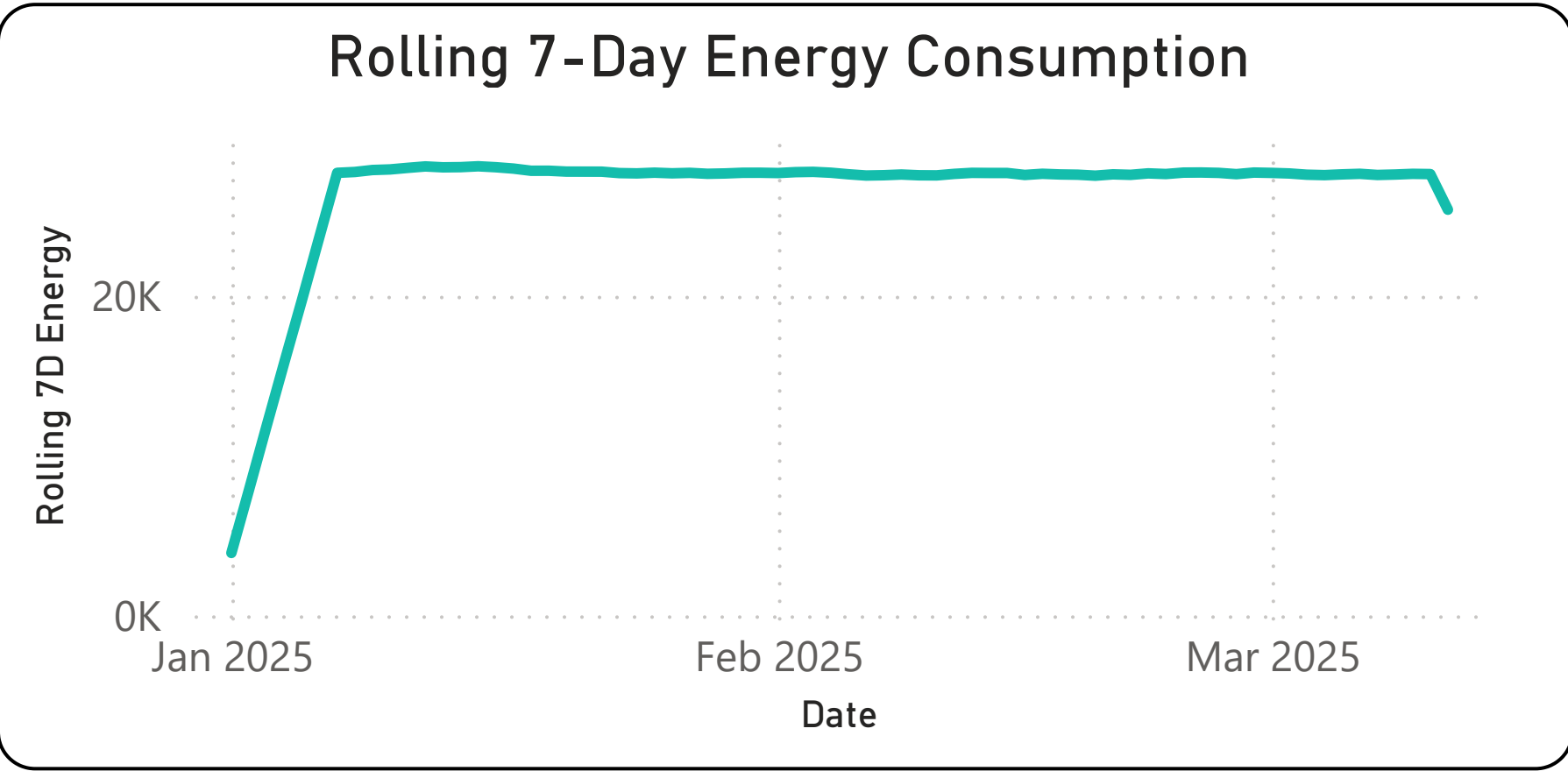
50

Machines Near ...

Date

1/1/2025

3/11/2025



Hourly Energy Consumption Heatmap

Machine ID	Sum of Hour	Avg Energy Consumption
1	21649	2.73
2	23257	2.68
3	22513	2.80
4	22696	2.79
5	23510	2.75
6	22018	2.72
Total	1145740	2.75

