Monitoring and Measurement of Key Characteristics Planning Worksheet (example)

**Date: 03/29/201X Prepared by: Matt Horne**

**Key Characteristic: Energy sources, current energy use and consumption**

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| **Energy Source/**  **Energy Use/**  **Energy Consumption** | **Department** | **How will it be monitored/ measured?** | **How often will it be monitored/ measured?** | **How will the data be analyzed?** | **What calibration is required?** |
| Facility natural gas | Facility | Utility meter | Monthly | Month to month comparison for previous 3 years | Utility responsibility |
| Dryer natural gas |  | Flow meter | Continuous | Continuous monitoring by operator for change in consumption | Annual calibration by equipment manufacturer |
| Electricity | Facility | Utility meter | Monthly | Month to month comparison for previous 3 years | Utility responsibility |
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**Key Characteristic: Significant energy uses**

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| **Significant Energy Use** | **Department** | **How will it be monitored/ measured?** | **How often will it be monitored/ measured?** | **How will the data be analyzed?** | **What calibration is required?** |
| Compressed air system | Fabrication | Power usage | Weekly | Trends in amp draw and EnPI considering impact of temperature changes | Compressor power meter - Semiannual calibration by equipment manufacturer |
| Boiler | Powerhouse | Fuel input | Continuous | Trends in fuel flow and EnPI | Boiler gas flow meter - Semiannual calibration by equipment manufacturer |
| Roof-top HVAC | Administration | Power usage | Weekly | Trends in amp draw and EnPI considering impact of temperature change | Roof top power meter - Semiannual calibration by equipment manufacturer |
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**Key Characteristic: Variables affecting significant energy uses**

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| **Significant Energy Use Variable** | **Department** | **How will it be monitored/ measured?** | **How often will it be monitored/ measured?** | **How will the data be analyzed?** | **What calibration is required?** |
| Compressed air system | Fabrication | Average ambient temp. | Daily | Monitor temperature changes for input to performance calculations | Outside temp. recorder on roof-top HVAC - Semiannual calibration by equipment manufacturer |
| Boiler | Powerhouse | Stack gas oxygen and temperature | Monthly | Monitor for increase in oxygen level or stack temperature | Stack gas analyzer – Annual calibration by equipment manufacturer |
| Roof-top HVAC | Administration | Average ambient temp. | Daily | Monitor temperature changes for input to performance calculations | Outside temp. recorder on roof-top HVAC - Semiannual calibration by equipment manufacturer |
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**Key Characteristic: Future energy use and consumption of the significant energy uses**

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| **Future Energy Use/Consumption** | **Department** | **How will it be monitored/ measured?** | **How often will it be monitored/ measured?** | **How will the data be analyzed?** | **What calibration is required?** |
| Compressor electricity consumption | Fabrication | Sales forecast from marketing department | Review of monthly report | Review for trends in market to estimate production | Comparison with other market indicators e.g. trade association estimates |
| Boiler natural gas consumption | Powerhouse | Almanac for forecast rainfall | Monthly | Review for rainfall trends to plan for pre-production drying process | NOAA rainfall outlook |
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**Key Characteristic: Energy Performance Indicators (EnPIs)**

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| **EnPI** | **Department** | **How will it be monitored/ measured?** | **How often will it be monitored/ measured?** | **How will the data be analyzed?** | **What calibration is required?** |
| Compressed air system | Fabrication | Compressed air output | Weekly | Trend in EnPI | Air flow meter on compressor output – Semiannual calibration by equipment manufacturer |
| Boiler | Powerhouse | Feed water flow | Monthly | Trend in EnPI | Feed water flow meter - Semiannual calibration by equipment manufacturer |
| Roof-top HVAC | Administration | Unit cooling output | Weekly | Trend in EnPI | 1-Air flow meter on roof-top discharge - Semiannual calibration by equipment manufacturer  2-Evaporator coil temp. difference - Semiannual calibration by equipment manufacturer |

**Key Characteristic: Action plan completion and effectiveness in achieving objectives and targets**

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| **Action Plan/**  **Objectives and Targets** | **Department** | **How will it be monitored/ measured?** | **How often will it be monitored/ measured?** | **How will the data be analyzed?** | **What calibration is required?** |
| Target: Reduce compressed air use by 3% by Dec. 2018 | Fabrication | Power usage | Monthly | Comparison with 201X baseline | Power meter - Semiannual calibration by equipment manufacturer |
| Target: Reduce facility natural gas use by 5% by Dec. 2018 | Facility | Facility natural gas meter | Continuous | Comparison with 201X baseline | Utility responsibility |
| Target: Reduce boiler natural gas use by 10% by Dec. 2018 | Powerhouse | Fuel input | Continuous | Comparison with 201X baseline | Boiler gas flow meter - Semiannual calibration by equipment manufacturer |
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**Key Characteristic: Prioritized energy performance improvement opportunities**

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| **Energy Improvement Opportunity** | **Department** | **How will it be monitored/ measured?** | **How often will it be monitored/ measured?** | **How will the data be analyzed?** | **What calibration is required?** |
| Conduct regular air leak survey | Fabrication | Ultrasonic leak detection | Weekly | Air leaks recorded for repair by maintenance | Ultrasonic leak detector – Annual calibration by equipment manufacturer |
| Install controls for Improved boiler air/fuel ratio | Powerhouse | Stack gas analysis | Weekly for first 6 months then monthly | Trend lines showing oxygen and stack temperature | Stack gas analyzer - Annual calibration by equipment manufacturer |
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**Key Characteristic: Actual vs. expected energy consumption**

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| **Actual vs. Expected Energy Consumption** | **Department** | **How will it be monitored/ measured?** | **How often will it be monitored/ measured?** | **How will the data be analyzed?** | **What calibration is required?** |
| Current compressor electrical consumption vs. consumption expected with implementation of air leak program | Fabrication | Power usage | Monthly | Comparison of actual usage post air leak program implementation against 201X baseline | Power meter - Semiannual calibration by equipment manufacturer |
| Current boiler gas consumption vs. consumption expected with installation of air/fuel ratio controls | Powerhouse | Flow meter | Continuously | Comparison of actual usage post controls installation against 201X baseline | Boiler gas flow meter - Semiannual calibration by equipment manufacturer |
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