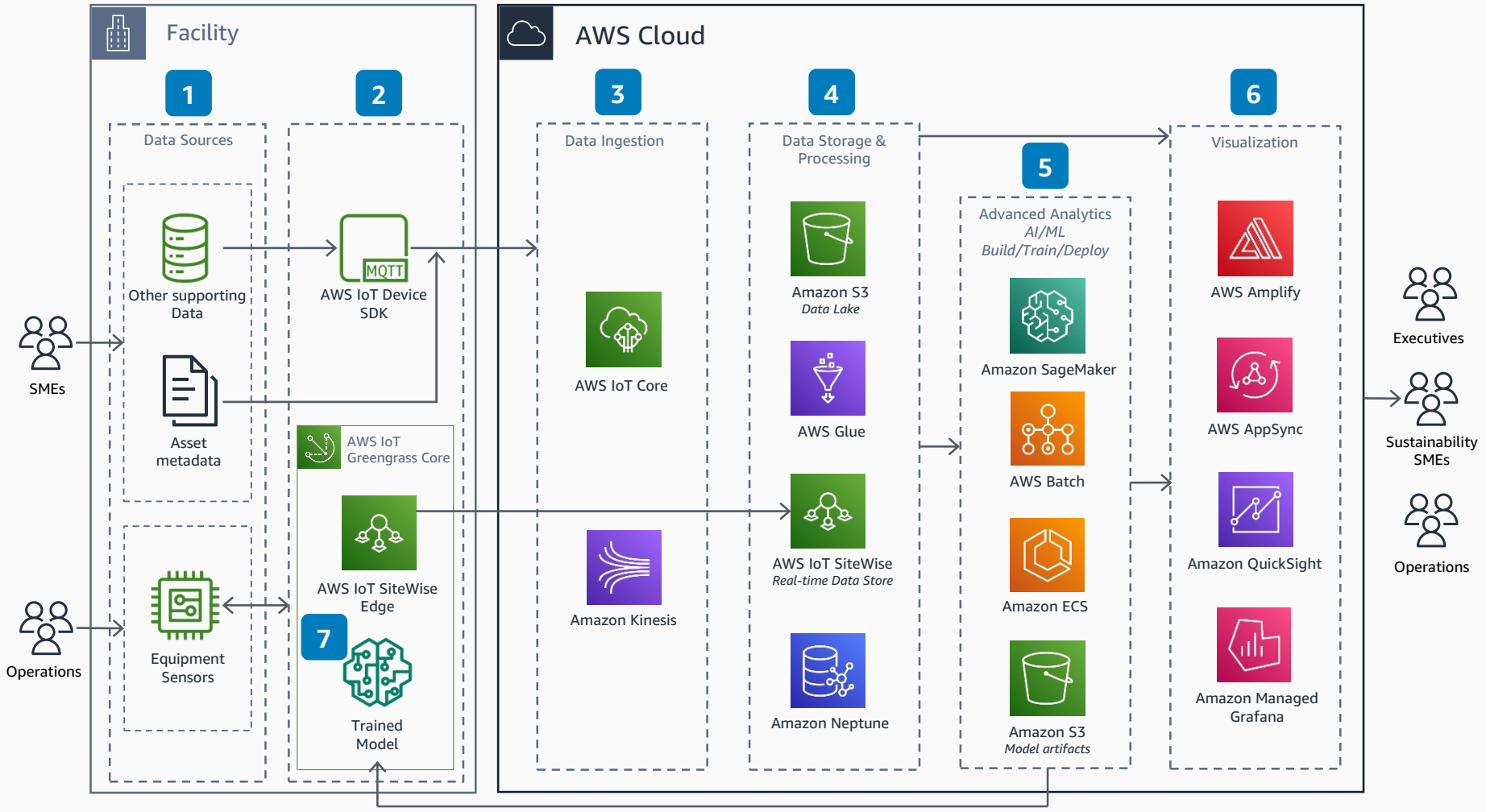
Guidance for Monitoring and Optimizing Energy Usage on AWS

This architecture shows how to collect, monitor, and optimize energy usage for heavy equipment within a Building Management System (BMS).



1. Operations and Subject Matter Experts (SMEs) install the required sensors (such as Temperature sensors) on the equipment of interest. Sensor or asset metadata, and other supporting data (such as suppliers information), should also be located as a primary data source for Energy Use Optimization.

2. Sensors transmit telemetry data to the Cloud through **AWS IoT SiteWise Edge** on **AWS IoT Greengrass** core. Supporting data and other metadata may come through **AWS IoT Core**, AWS IoT Device SDKs, or an **Amazon Simple Storage Service** (Amazon S3) upload in batch format through FTP or API.

3. While sensor data (telemetry) are automatically ingested to an **AWS IoT SiteWise** Data Store through **AWS IoT SiteWise Edge**, other metadata, or batch internet of things (IoT) messages, can be collected through standard **AWS IoT Core** and **Amazon Kinesis**.

4. **AWS IoT SiteWise** can act as a real-time data store for the sensor data. Other supporting information can be stored in a data lake (like **Amazon S3**) with scheduled extract, transform, and load (ETL) jobs built using **AWS Glue**. Asset and facility metadata can be stored as graph relationships in **Amazon Neptune**.

5. With the processed data in the data lake and **AWS IoT SiteWise**, you can start training your Machine Learning (ML) model on **Amazon SageMaker** and **AWS Batch**. The trained model artifact can be packaged as a docker image in **Amazon Elastic Container Service** (Amazon ECS) for better scalability.

6. Enrich the sensor data stored in **AWS IoT SiteWise** with asset model and model hierarchy. Build a real-time dashboard using **AWS AppSync**, **AWS Amplify**, **Amazon Managed Grafana** or **Amazon QuickSight**. Configure the dashboards or reports to monitor energy usage and track cost savings.

7. ML-based recommended IoT setpoints, or other controllable knob settings, are deployed through **SageMaker**. Optionally, deploy edge models on **AWS IoT Greengrass** core.

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AWS Reference Architecture