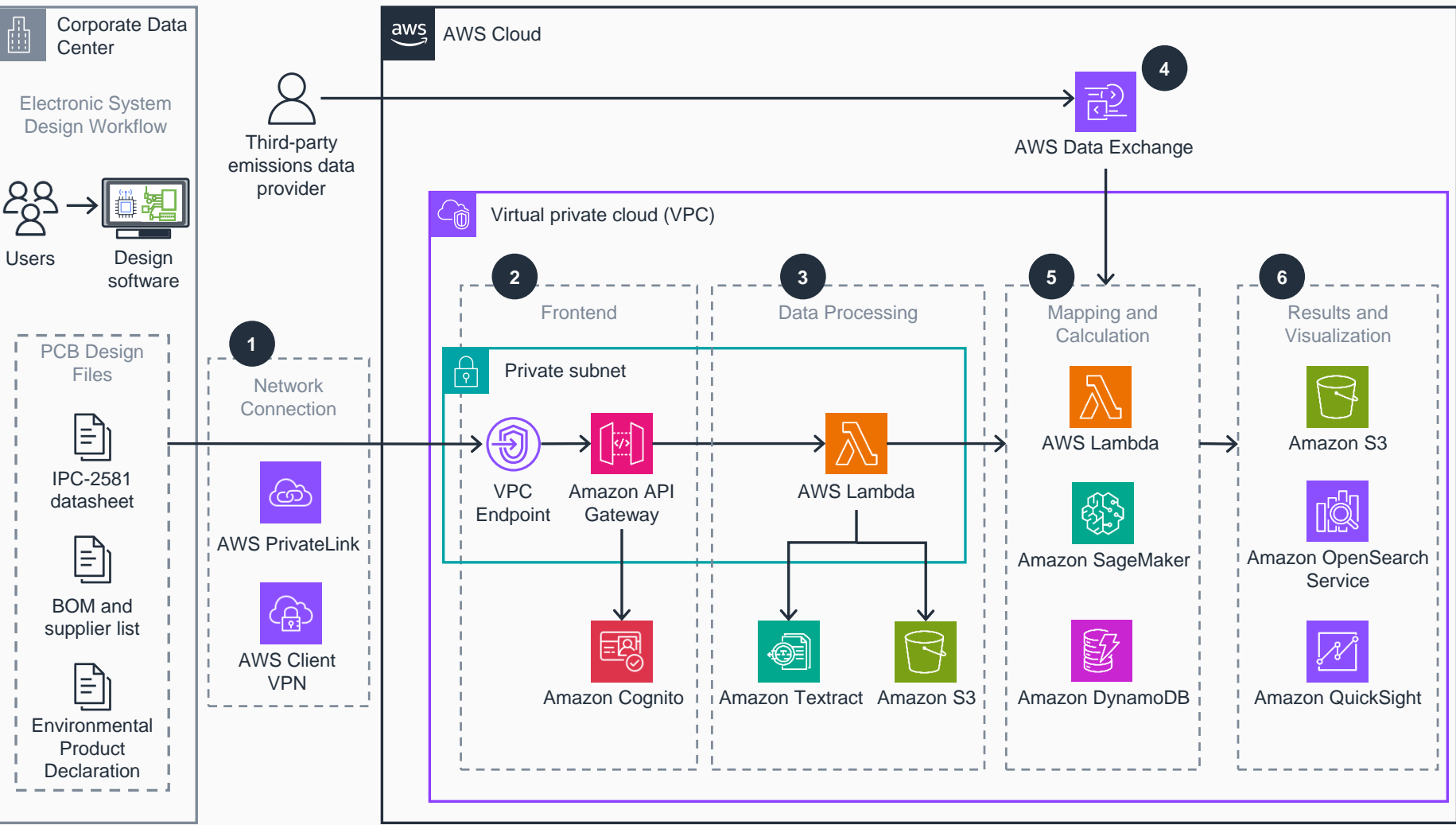


Guidance for Life Cycle Assessment (LCA) of Printed Circuit Boards on AWS

This architecture diagram demonstrates how you can implement an LCA workflow for PCBs using industry-standard IPC-2581 datasheets and a bill of material (BOM) list.



- 1 A corporate network is connected to the AWS Cloud using services such as **AWS PrivateLink** virtual private network (VPN) and **AWS Client VPN**. **PrivateLink** provides private connection between the corporate network and **Amazon Virtual Private Cloud (Amazon VPC)**. **AWS Client VPN** helps ensure remote workers can securely connect to both the corporate network and the AWS Cloud.
- 2 **Amazon API Gateway** is the frontend access point. The frontend permits users to request a new LCA analysis or retrieve past analysis results. **Amazon Cognito** ensures only authenticated users can access the API.
- 3 A presigned URL is created using **AWS Lambda** to upload design files to **Amazon Simple Storage Service (Amazon S3)** and convert IPC 2851 schema into a format consumable for impact factor matching. **Amazon Textract** extracts information from user-supplied bill of material (BOM) lists and Environmental Product Declaration reports.
- 4 **AWS Data Exchange** provides access to third-party environmental impact data. Users can subscribe to third-party data to perform LCA through a metered billing model.
- 5 The design data processed in Step 3 is mapped with third-party emissions factors. **Lambda** queries emissions factors from **AWS Data Exchange**. **Amazon SageMaker** matches hierarchical environmental impacts factors with BOM list. The LCA calculation for a design iteration are tagged and stored in **Amazon DynamoDB** for traceability and auditing in accordance with ISO 14040.
- 6 Final LCA calculation results are achieved in **Amazon S3**. Services such as **Amazon OpenSearch Service** and **Amazon QuickSight** provide users access to search and to visualize LCA metrics. This combination enables users to study where electronics engineers and procurements teams can apply changes to reduce environmental impact of the final design.

