CARBON SOLUTIONS | *Service*

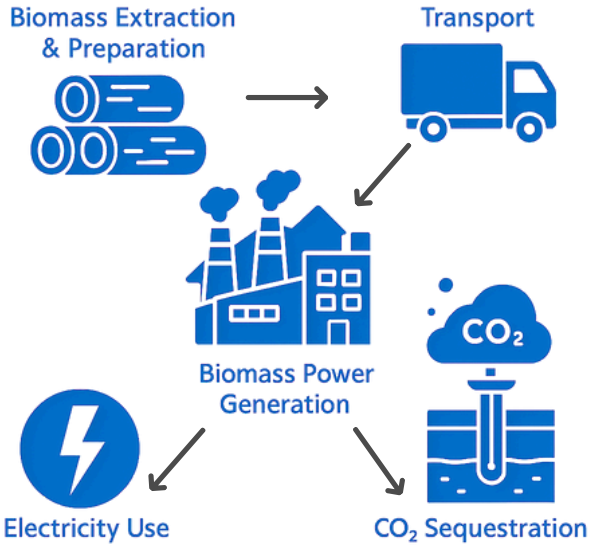
LCA { Life Cycle Assessment

Quantifying environmental impacts across full value chains

What is Life Cycle Assessment?

Full system analysis to quantify environmental impact from raw material extraction to end-of-life handling

- Identify areas to reduce environmental impact
- Eliminate & reduce wasteful streams and processes
- Save on operating costs and meet business goals



Example Life Cycle Stages of a Biomass Power Plant with CCS

What Carbon Solutions Can Do for You

Full Life Cycle Assessments (LCA)
ISO 14040/44–compliant cradle-to-grave and cradle-to-gate studies for any product or system.

Process & Product Carbon Footprinting
Quantitative greenhouse gas and impact analysis across all life-cycle stages, including EPD development.

Tier 2 & Tier 3 Emissions Accounting
Supply-chain and use-phase impact modeling for broader Scope 3 integration — indirect emissions across the value chain.

Scenario & Sensitivity Analysis
Evaluate environmental trade-offs of technologies and supply-chain configurations.

Grant & Reporting Support
Documentation and modeling support for 45V, 45Q, IRA, and LPO programs.

Third-Party LCA Review & Verification
Independent reviews for compliance, grants, and publication readiness.

Case Study: 21st Century Powerplant

Iterative Life Cycle Assessment Supports Enables Design of a Carbon-Negative Power Plant

Waste products co-fired with standard fuel: *waste coal, forest residue, and virgin coal*

Novel combustors: *PFBCs and atmospheric fluidized bed biomass boiler*

Emission abatement: *carbon capture and storage*

Outcomes

Carbon negative design: -143 to -55 gCO2eq per kWh produced

Parameterized life cycle model: 5-13% biomass combusted to reach carbon zero through phases

Learn more about LCA and how it can support your organization by scanning the QR code above.