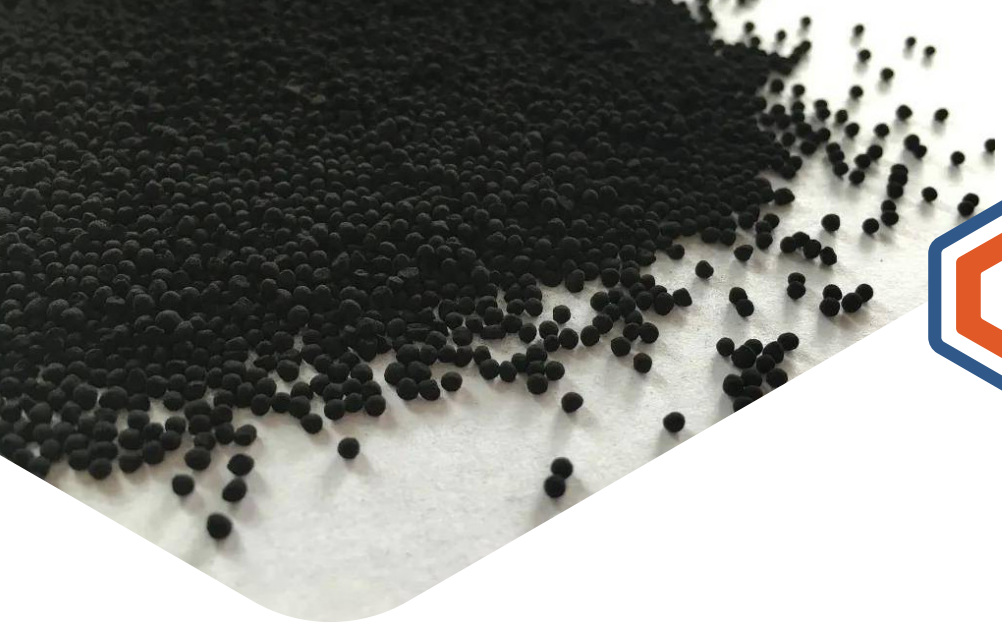


EKONA™

Evaluate methane pyrolysis as a clean carbon black pathway.
info@ekonapower.com

Clean Carbon Black

A LOWER-EMISSION OPTION FOR CARBON BLACK INDUSTRIES SUPPLYING TIRE AND GENERAL RUBBER MANUFACTURING, PLASTICS, CONSTRUCTION MATERIALS, AND ADVANCED MATERIALS

Carbon black is a high-performance carbon material engineered in a range of grades to deliver specific properties in applications such as tires, rubber, and plastics. It is widely used today, with expanding applications in construction materials such as asphalt and cement.

Most carbon black is produced through the emissions-intensive furnace-black process using carbon black oil as feedstock. While demand is shifting toward lower-emission materials, established production methods offer limited pathways to reduce emissions intensity.

Manufacturers of tires, plastics, and rubber goods face a fundamental challenge: meeting performance and cost requirements while reducing the environmental impact of the materials they use.

CLEAN CARBON BLACK REQUIREMENTS

For clean carbon black to function as a viable commodity under current and emerging conditions, its production must meet a narrow set of simultaneous requirements.

COST COMPETITIVENESS

Must remain cost competitive with conventional carbon black across regions to be viable in commodity markets

EMISSIONS REDUCTION

Lifecycle emissions must be reduced to meet customer and corporate demand for products with lower environmental impacts

INDUSTRIAL SCALE

Continuous, high-volume production is required to match the capacity of existing furnace black plants (~60 tpd carbon black per reactor train)

GRADE FLEXIBILITY

Production systems must support a range of ASTM grades to meet application-specific requirements

OPERATIONAL RESILIENCE

Requires predictable supply with minimal exposure to feedstock, power, or logistics volatility

Challenges with decarbonizing carbon black

CONVENTIONAL AND EMERGING CARBON BLACK PATHWAYSHAVE TRADE-OFFS IN EMISSIONS, OPERATING COSTS, FEEDSTOCK DEPENDENCE, AND INFRASTRUCTURE REQUIREMENTS

Conventional furnace black: High lifecycle emissions associated with carbon black oil (CBO) feedstock.

Furnace black with CCS: Additional cost and reliance on carbon capture, transport, and storage infrastructure.

Process electrification: Reduces combustion emissions but increases dependence on low-emission electricity and power cost stability.

Ekona's methane pyrolysis pathway

Methane pyrolysis produces carbon black using natural gas feedstock, reducing reliance on carbon black oil while lowering emissions without CCS or large-scale electrification.

THE XCALIBER™ REACTOR PLATFORM

INTEGRATED

Co-produces carbon black and low-emission syngas within a single system

FLEXIBLE

Uses existing natural gas supply and can retrofit with conventional carbon black infrastructure

SCALABLE

Designed for repeatable, industrial-scale deployment across geographies

EFFICIENT

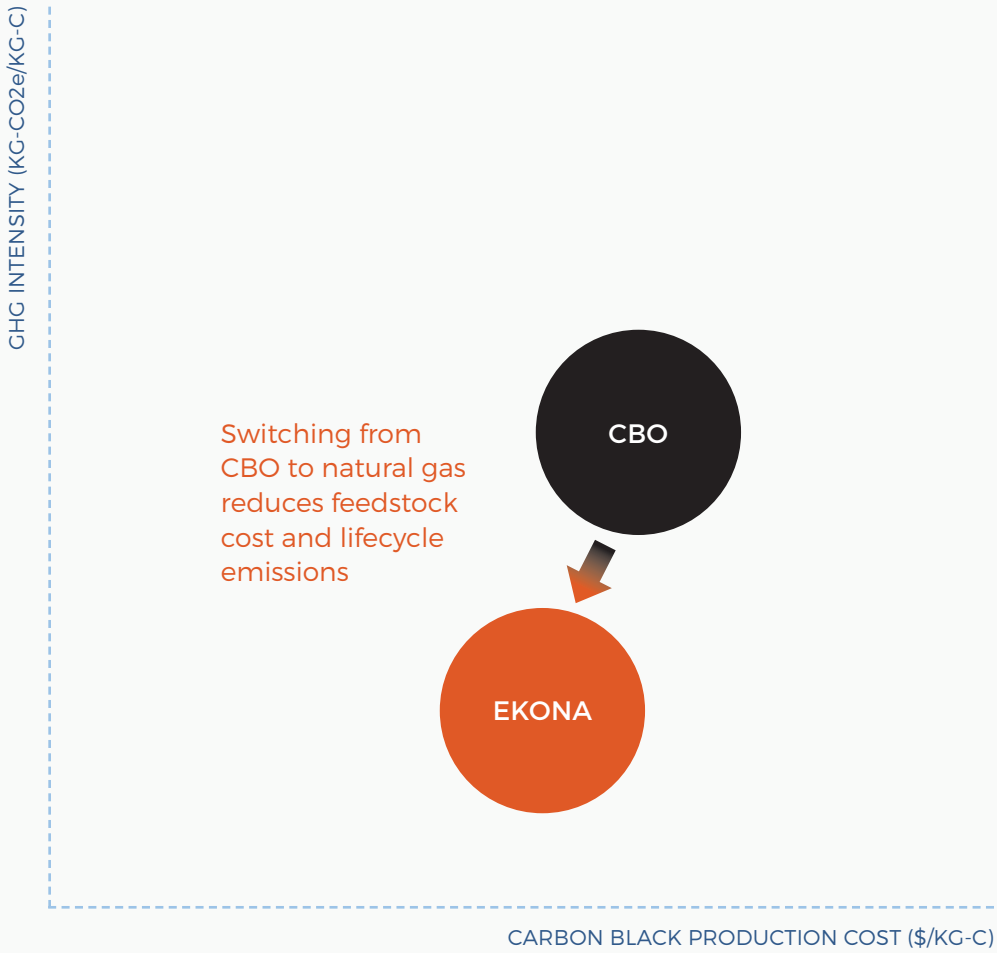
Minimizes requirements for water, new pipelines, and dedicated renewable power

Comparison with furnace black process

Ekona has developed a commercial-scale design package and techno-economic model to evaluate how Ekona's xCaliber methane pyrolysis platform performs in a Canadian industrial use case, producing ASTM-grade clean carbon black and low-emission syngas for industrial heat.

EKONA DELIVERS CLEANER, COST-COMPETITIVE CARBON BLACK

- Competitive cost of carbon black production
- Lower lifecycle emissions than conventional furnace black
- Reduced exposure to electricity and CCS-related cost volatility
- Reduced dependence on carbon black oil supply



Assumptions

- Results reflect a commercial-scale system producing 60 tpd of carbon black
- Cost and emissions of Ekona's carbon black are compared with an equivalent grade of conventional furnace black
- ASTM-grade carbon black is sold as the primary product
- The co-produced low-emission syngas is used as a fuel for industrial heat
- Lifecycle emissions are allocated between the carbon black product and the syngas co-product on an economic basis

CBO: FURNACE BLACK PROCESS USING CARBON BLACK OIL
EKONA: XCALIBER PROCESS USING NATURAL GAS

Explore the underlying clean carbon black analysis

Detailed technical and regional assumptions underpinning this summary are available on request.

Evaluate methane pyrolysis as a carbon black production pathway.

Connect with Ekona to explore how methane pyrolysis performs under commodity market conditions. info@ekonapower.com

ABOUT EKONA

Ekona develops clean hydrogen and clean carbon black solutions for industrial deployments. Our xCaliber™ methane pyrolysis platform leverages existing natural gas infrastructure to produce low-emission hydrogen and clean carbon black at scale, supporting cost-effective decarbonization across energy intensive industries and materials markets. ekonapower.com

USE CASE SCOPE, LIMITS, AND KEY ASSUMPTIONS

This use case is a summary-level representation of Ekona's low-emission carbon black analysis. It is intended to illustrate the operating context, economic considerations, and emissions performance of methane pyrolysis under a defined set of assumptions. A more detailed technical and economic assessment, including full modeling inputs and region-specific results, underpins this summary and is available separately.