



Emerging Trends and Path Forward

Opportunities toward 2050

Laura Mottola

5 May 2022

All rights reserved. © BBA

BBA.CA

WHO WE ARE

One of
Canada's
leading private
consulting
engineering
firms since 1980.

Key industries we serve:



Energy and renewables



Mining and metals



Biofuels, oil and gas



Other industries
(forestry, pulp and paper)



WHO WE ARE

1,150+ employees
150+ partners
16 offices
across Canada and abroad



Santiago, Chile
flow
partners
A member of 

What are we witnessing?

Awareness in climate change and ESG principles is growing

Industry is changing due to

- Social demands
- Government climate action plans
- Rise of sustainable investing
- The Great Wealth Transfer

We are witnessing

- An energy transition
- Companies moving to decarbonize
- Businesses aligning with ESG best practices



What are the trends?

Energy Transition



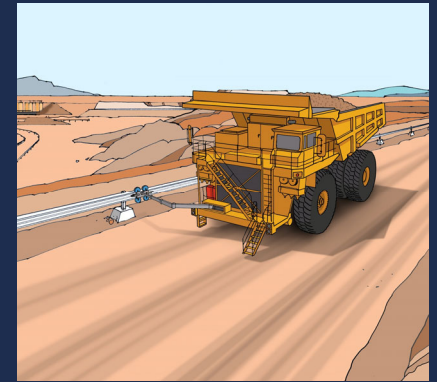
Decarbonization



ESG Practices

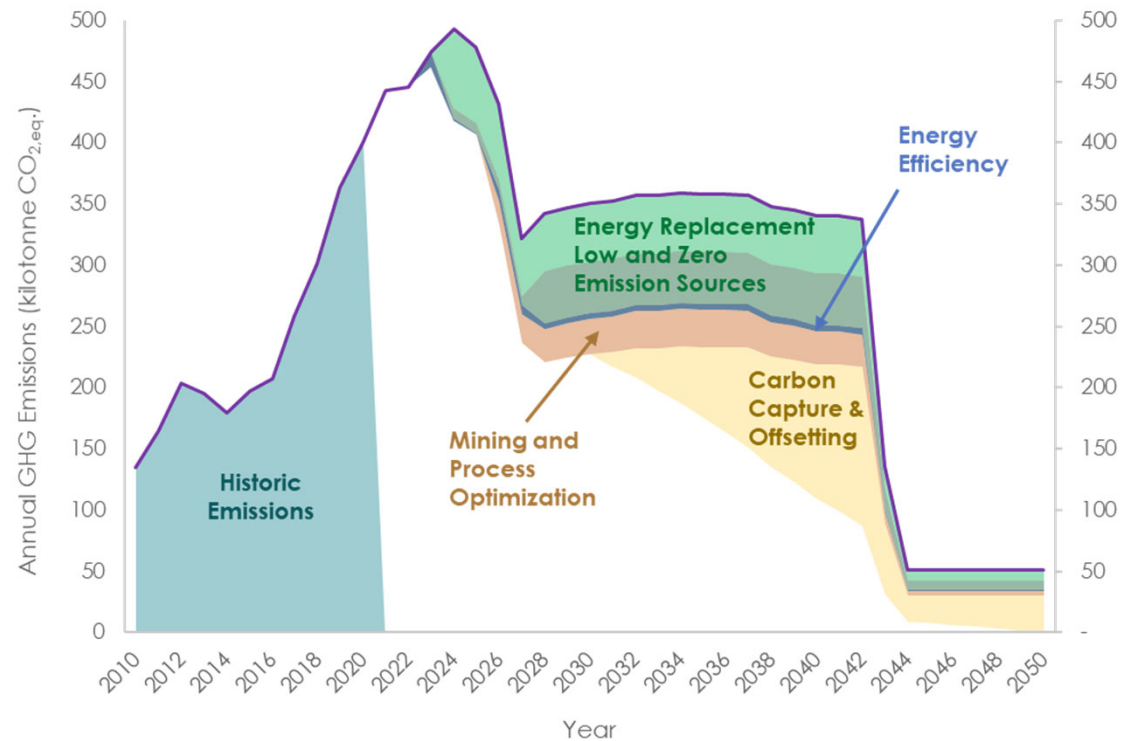


Technology & Innovation

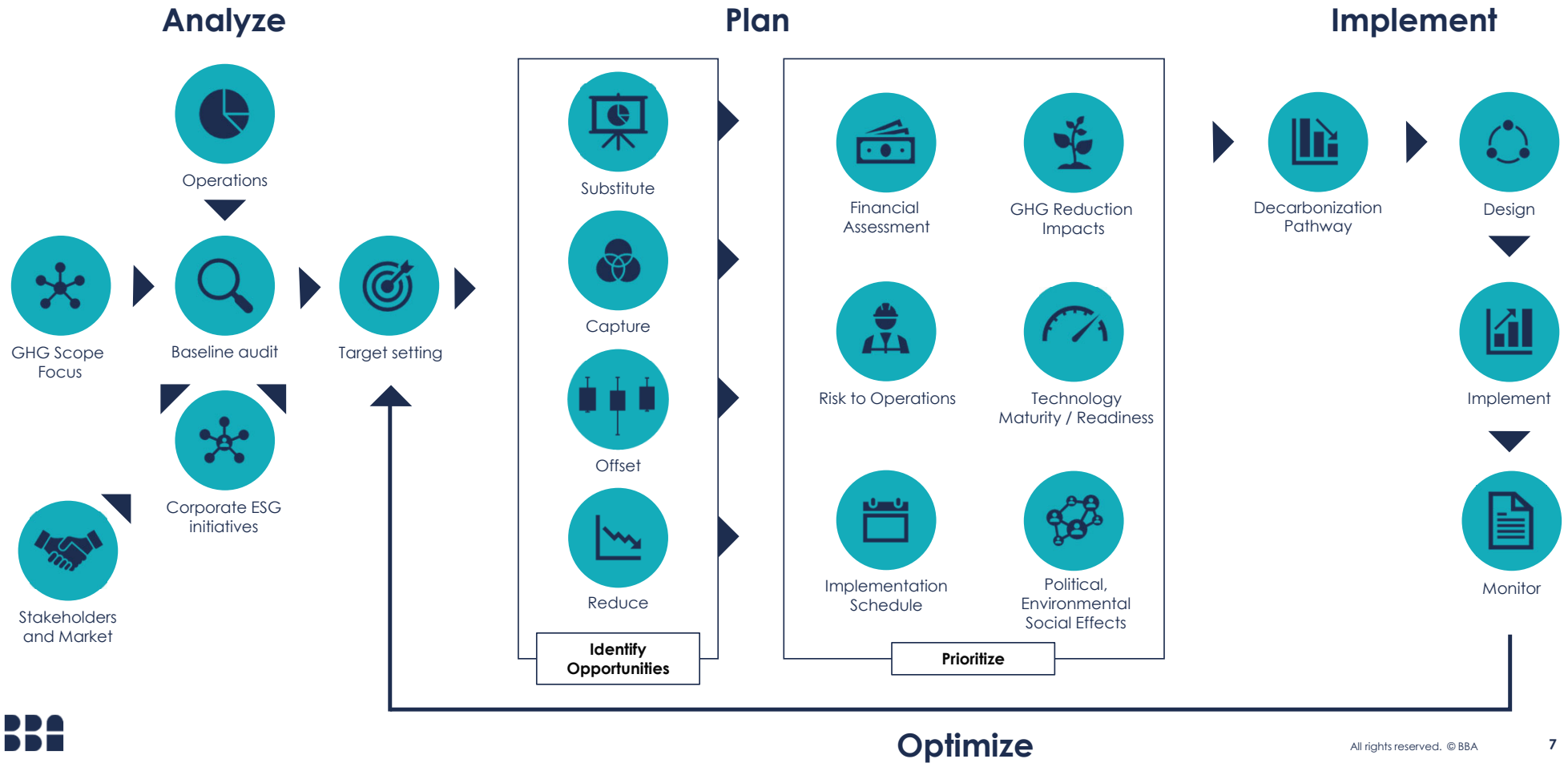


Decarbonization Planning

- Clear execution strategy
- Prioritized and staged abatement opportunities
- Timeline of decarbonization achievements
- Couples with an investment timeline



Decarbonization Planning



Solutions and path forward



Mine electrification

- BEV, fast and dynamic charging (trolley assist)
- Side and bottom trolley
- Fuel cell batteries
- New conveying technologies
- Combine above with automation
- Renewable energy integration and energy storage systems



Green hydrogen

- Combustion fuel (furnace HFO substitute)
- Hydrogen fuel cell (electromobility)
- Alternative fuel feedstock at mining operations
- Green steel production and other industrial products
- Combine with carbon capture for synthetic fuel production



Carbon capture and sequestration

- Point-source carbon capture
- Direct Air Capture
- Sequestration/EOR (enhanced oil recovery)
- Conversion to new utilization (synthetic fuel)



Energy efficiency

- Process optimization
- Heat recovery
- Waste reduction
- Thermal generation (plasma torch, electric boiler)



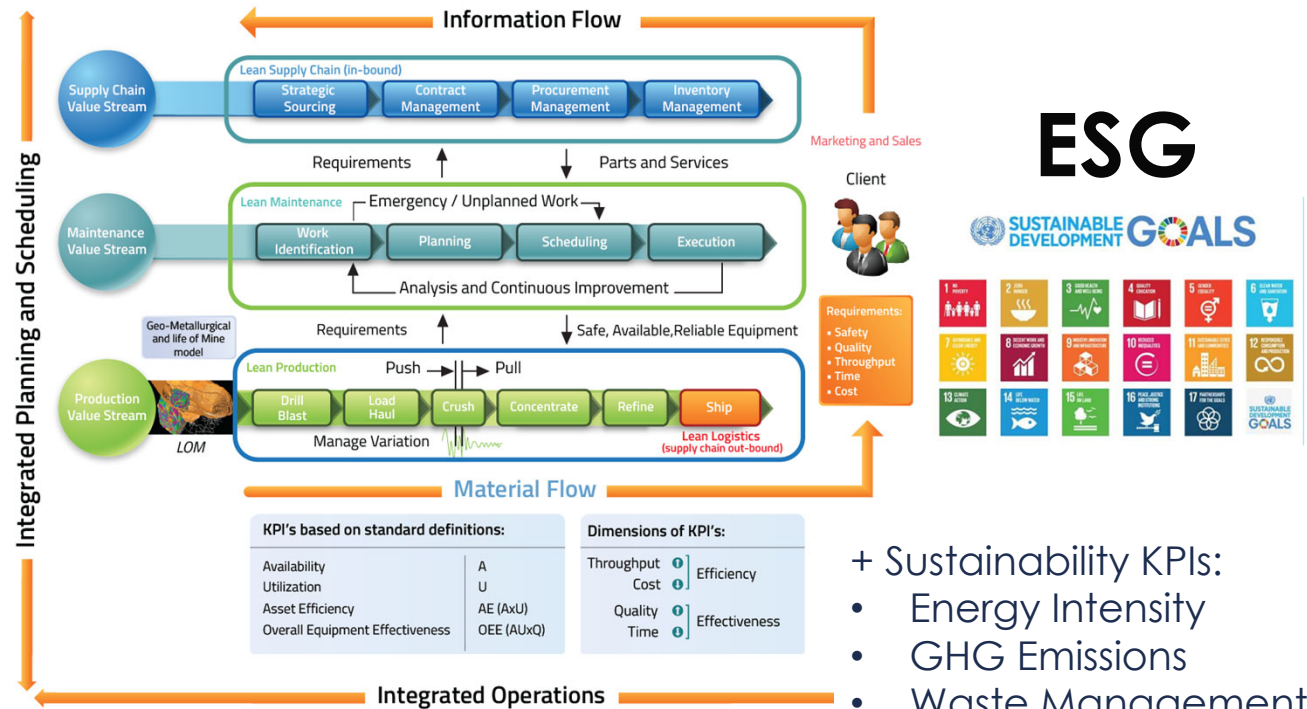
Digital

- Integrated Operations
- Digital Value Stream Management with Lean Mining®
- Predictive analytics
- Simulation and optimization
- Automation
- Expert systems, AI-assisted




Integrated ore-to-market value stream management

Lean Mining® Value Stream Management



- + Sustainability KPIs:
- Energy Intensity
- GHG Emissions
- Waste Management
- Water Consumption
- Environmental Impact
- Social Acceptance





The time
to act is
now.

Develop your
decarbonization
strategy and roadmap.

Select path forward and
adjust along the way.



Thank you

Laura.Mottola@bba.ca

BBA.CA