

CARMAKY



2022 | **COMPANY
PROFILE**

BULK MATERIALS HANDLING SYSTEMS

FROM PIT TO PORTS ACROSS AFRICA



WHAT WE DO

Design of complete bulk materials handling systems across the mining and minerals processing industries, power stations and bulk handling terminals

Established in 2008, Carmaky is an engineering company specialising in projects for the mining, minerals, and material handling sectors. We have a passionate team with vast design, execution, and operational expertise, working in collaboration with a globally distributed network of associates. We leverage this experience and collaboration to deliver solutions to our clients which are safe, reliable, flexible, efficient, innovative, and fit-for-purpose.

As a systems integrator, we partner with speciality equipment and component suppliers to deliver complete world-class systems and solutions.

Our client-centric approach - reflected in our mantra of using the right people to do the right thing at the right time – guides our engineering and project service efforts. We believe in developing a close collaborative environment with our clients, associates, consultants, engineering peers and technology providers to create trust and maximise performance.



CARMAKY

OUR SERVICES

◀ Consulting and Project Development

◀ Equipment Supply

◀ Engineering

◀ Plant Conveyors and Systems

◀ In-Pit Crushing and Conveying

◀ Overland Conveyors

◀ Underground Conveyors and Systems

◀ Crushing and Screening Plants

◀ Storage and Reclaim

◀ Ports and Terminals

Consulting and Project Development

Carmaky offers consulting services during the concept, scoping and pre-feasibility study phases of project development for bulk materials handling systems.

Most bulk material handling systems are custom designed, and there is rarely only one feasible solution. Instead, a most appropriate solution is reached by considering factors such as climate, elevation, terrain, material properties, mine life and capital vs operating expenses.

We offer specialised consulting services for the early stages of projects including alternative system layouts and configurations, budget quotations, system calculations, trade-offs, and optimisations. Our involvement in a project can begin as early as the concept or scoping and pre-feasibility study stages – the earlier we are involved, the more help we can provide. These efforts in the initial stages of project development can be instrumental in reducing risk and increasing confidence in cost estimates.



OUR SERVICES

CONTINUED

Equipment Supply

We specialise in the design and supply of equipment essential to efficient and seamless production processes at the core of many industrial operations. This includes:

- ✓ **Belt conveyors**
 - Overland, Relocatable, Plant and Underground Conveyors
 - Modifications and upgrades
 - Chutes and transfer towers
- ✓ **Storage and reclaim**
 - Stockpiles
 - Bins and hoppers
 - Storage facilities
 - Stackers
 - Reclaimers
 - Feeders (apron, belt, vibrating, low profile)
 - Truck and railcar loading and unloading incl. Tipplers
- ✓ **Crushing and screening plants**
 - Primary gyratory, jaw crusher and mineral sizing stations
 - Secondary and tertiary cone crushing and screening stations
 - SAG and ball mill feed systems
- ✓ **Ancillary equipment and systems**
 - Dust control
 - Grinding ball handling systems
 - Electrical and control systems
 - Stockyard equipment
 - Ship loading equipment



Engineering

Our team brings together a wealth of experience and specialised knowledge in engineering for bulk material handling systems. This includes:

- ✓ **System design**
 - Dynamic simulation
- ✓ **Mechanical and conveyor engineering**
 - Conveyor static analysis
 - Conveyor dynamic analysis
 - Horizontal curve design
 - Discrete Element Modelling (DEM) chute design
- ✓ **Civil and Structural engineering**
 - Modularisation
 - Analysis and Engineering
- ✓ **Electrical engineering**
 - Conveyor drives including Variable Frequency Drives (VFD)
 - Power distribution
 - Modular electrical rooms
- ✓ **Control and instrumentation engineering**
 - Conveyor and equipment safety instrumentation
 - Programmable Logic Controller (PLC) design and programming
 - Control system interfacing





In-Pit Crushing and Conveying

Carmaky offers innovative In-Pit Crushing and Conveying (IPCC) solutions which provide the flexibility, reliability, and lower operating costs demanded from this increasingly popular technology.

In-Pit Crushing and Conveying technology offers increasingly valuable ore transportation benefits including reduced operating costs, lower noise levels, lower dust emissions, and lower greenhouse-gas emissions.

We supply individual components (such as belt conveyors) or complete systems for IPCC. We partner with reputable equipment manufacturers to supply crushers, sizers and spreaders as required.

Our IPCC system expertise include:

- Permanent plants
- Semi-mobile plants
- Mobile plants
- Shiftable conveyors
- Extendable conveyors
- Spreading systems

Plant Conveyors and Systems

We design and supply plant conveyors and systems that are capital efficient, fit-for-purpose, and reliable.

Plant conveyor systems involve numerous critical interfaces with other structures, facilities and access ways. Successful design of these systems requires critical attention to safe constructability, ease of access for maintenance, and shutdown and tie-in planning for brownfield projects. Another key consideration is system reliability which includes careful design of transfer chutes, overall system control design, and PLC programming.

Our team can deliver on each aspect of effective plant conveyor design and execution. The Carmaky design team includes constructability experts, and we work closely with client operations and construction teams to plan critical tie-ins and commissioning activities while providing exceptional leadership in risk management and HAZOP processes.

Our plant system expertise includes:

- Belt conveyors - elevated, enclosed, curved
- Transfer chutes and structures
- Bins, hoppers, silos, bunkers
- Feeders
- Dust control
- Modular electrical rooms
- Ancillary equipment and systems



OUR SERVICES CONTINUED



Overland Conveyors

Carmaky has extensive experience in the engineering and supply of overland conveyors. Our offering includes state-of-the-art control systems, dynamic analysis, regenerative systems, and horizontal curves.

With many years collective experience in the design, manufacture, delivery, and commissioning of complex overland conveyors, we enable clients to benefit from the increasing number of advantages this technology holds over trucking.

With advancements in drive, belt, braking and control system technology, the adaptability and reliability of overland conveyors offer increasingly effective long-distance transport solutions. However, as overland conveyor complexity increases, the need for comprehensive dynamic analysis becomes even more crucial.

Our overland conveyor experience and expertise includes:

- Challenging terrain
- Horizontal and vertical curves
- Downhill and regenerative
- Mobile trippers
- State-of-the-art drive systems (VFD, wound rotor, etc.)
- Dynamic braking
- Condition monitoring
- Active take-up systems
- Modular design for overland sections

Underground Conveyors and Systems

Carmaky designs and supplies custom material handling systems as part of underground mine infrastructure.

The design and manufacture of underground equipment differs significantly from surface-based equipment since it is subject to relocation, extension, and requires assembly and maintenance in limited-space conditions.

Our capabilities include design and specification of major sub-assemblies, belting reels and structure sections for safe and efficient transport underground with consideration of entry methods, excavation dimensions, turning radii and ease of assembly. Additionally, we design underground conveyor structures with consideration for possible future extensions.





Crushing and Screening Plants

Carmaky designs and supplies integrated crushing and screening plants with components carefully integrated into the overall material handling system.

We provide complete design and supply of crushing and screening plants. Our team works closely with crusher and screen original equipment manufacturers (OEMs) to build plants around the process, incorporating all associated truck dumps, feeders, conveyors, structures and bins. Having no exclusive agreements with OEMs, we can supply the most cost-effective system which meets all process requirements, or work with the clients preferred supplier.

We take advantage of the OEM's process simulation to provide critical inputs such as bin sizing, stockpile requirements, and other key information to ensure that each project is designed as a truly holistic system.

Storage and Reclaim

We design and supply storage systems for a wide range of material handling project types including concentrator feed systems, concentrate handling facilities, ports and terminals, and power plants.

Carmaky develops customised storage alternatives for this critical element of material handling and processing facilities, whether the project involves open stockpiles, longitudinal storage, bunkers, or silos. We optimise first-in-first-out material flow, live capacity requirements, product separation, material degradation, residence time and reclaim methods and provide insightful system simulations to help determine optimum storage capacity, and trade-offs involving reclaim equipment.

We base the reclaim system selection on a range of parameters including material characteristics, reclaim capacity, redundancy, capital vs. operating cost, and other project specific criteria. Typical reclaim systems include low profile feeders, belt feeders, apron feeders, dozer traps and hoppers.

Reclaim systems such as belt feeders, apron feeders, dozer traps, hoppers, and others, are selected based on various parameters including material characteristics, reclaim capacity, redundancy, capital vs. operating cost, and other project specific criteria.

We combine insight and understanding to apply our expertise to a range of material handling projects including:

- Concentrator feed systems
- Concentrate handling facilities
- Ports and terminals
- Power plants



OUR SERVICES

CONTINUED



Ports and Terminals

Carmaky offers complete system capabilities for ship loading and unloading, incorporating all interconnecting storage and reclaim conveyor systems, dust control, storage and ancillary systems.

Bulk cargo terminals operate with fixed parameters (ship loading / unloading rate, storage size) and variable parameters (product type, berth occupancy, vessel size). In terms of bulk cargo terminal facility design there are several unique elements including:

- Ship loader type and selection criteria (linear, quadrant, luffing, slewing, with or without ship cranes, etc.)
- Design considerations for corrosion, seismic, wind, tidal range
- Railcar unloading systems (unit train, rotary vs. bottom dump, indexing systems)

We combine our knowledge of these intricacies with an understanding of the fundamentals of material handling equipment design to provide complete system capabilities.

As a systems integrator, we accomplish this by partnering with reputable proprietary equipment suppliers for ship loaders, ship unloaders, stackers and reclaimers, and railcar unloaders, incorporating all interconnecting storage and ancillary systems.

*"Coming together is a beginning.
Keeping together is progress.
Working together is success."*

- Henry Ford



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