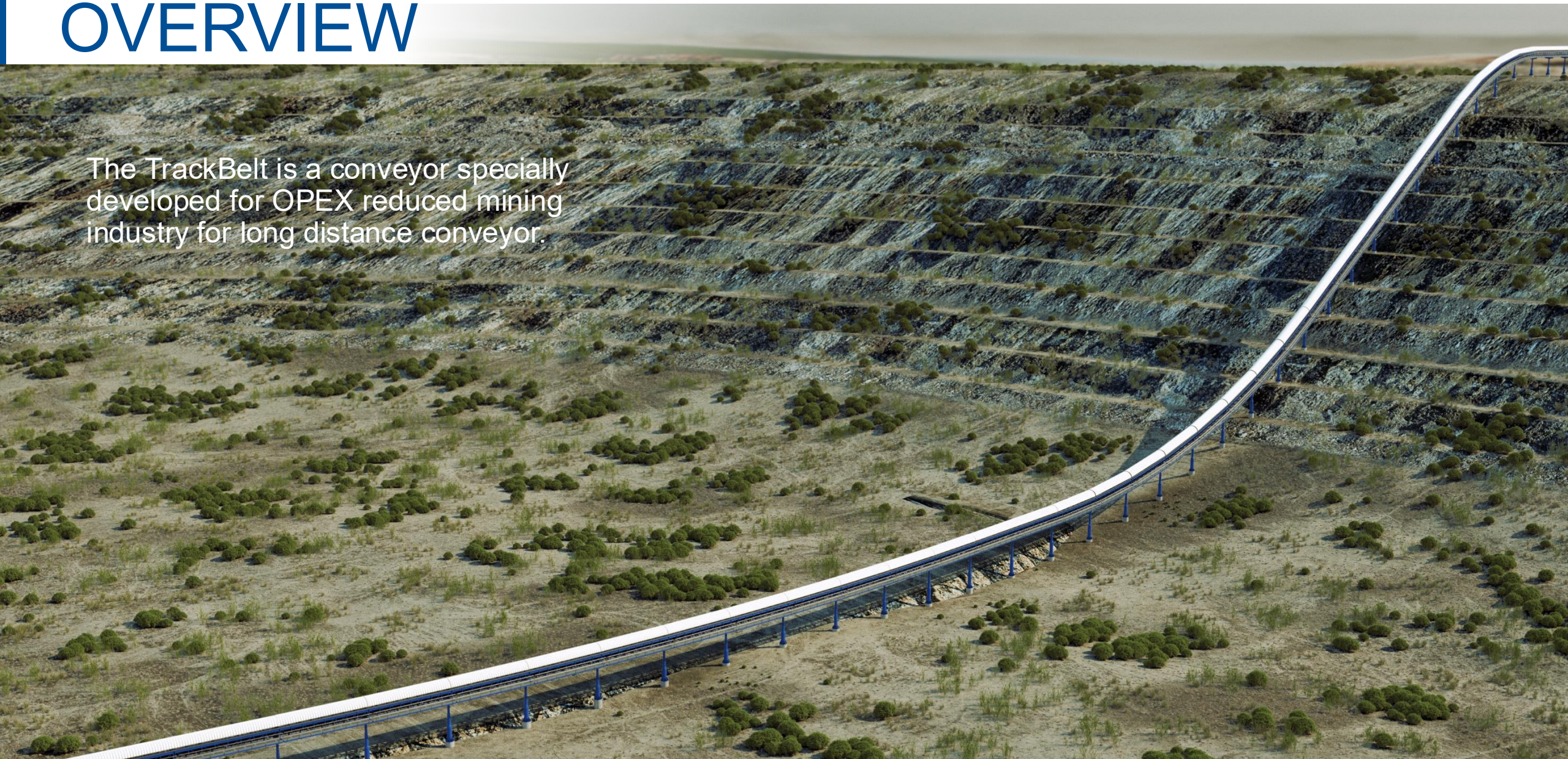
KOCH SOLUTIONS

TRACKBELT

NEW Transport Technology

KOCH SOLUTIONS

TRACK BELT
OVERVIEW



TRACKBELT - OVERVIEW

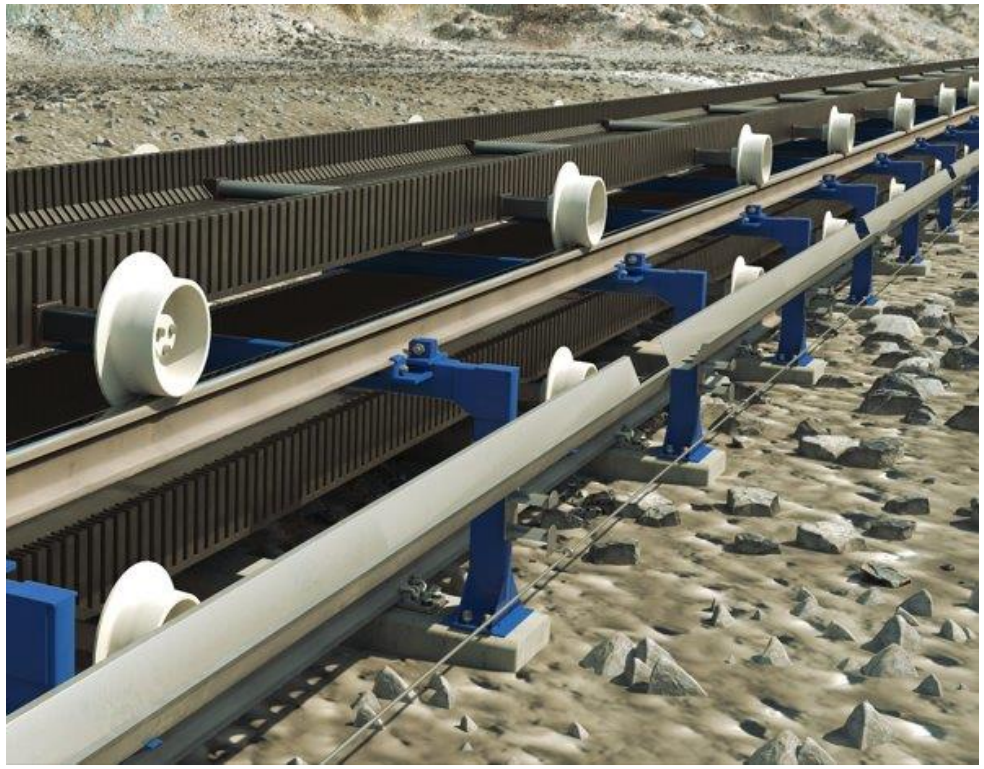
GENERAL

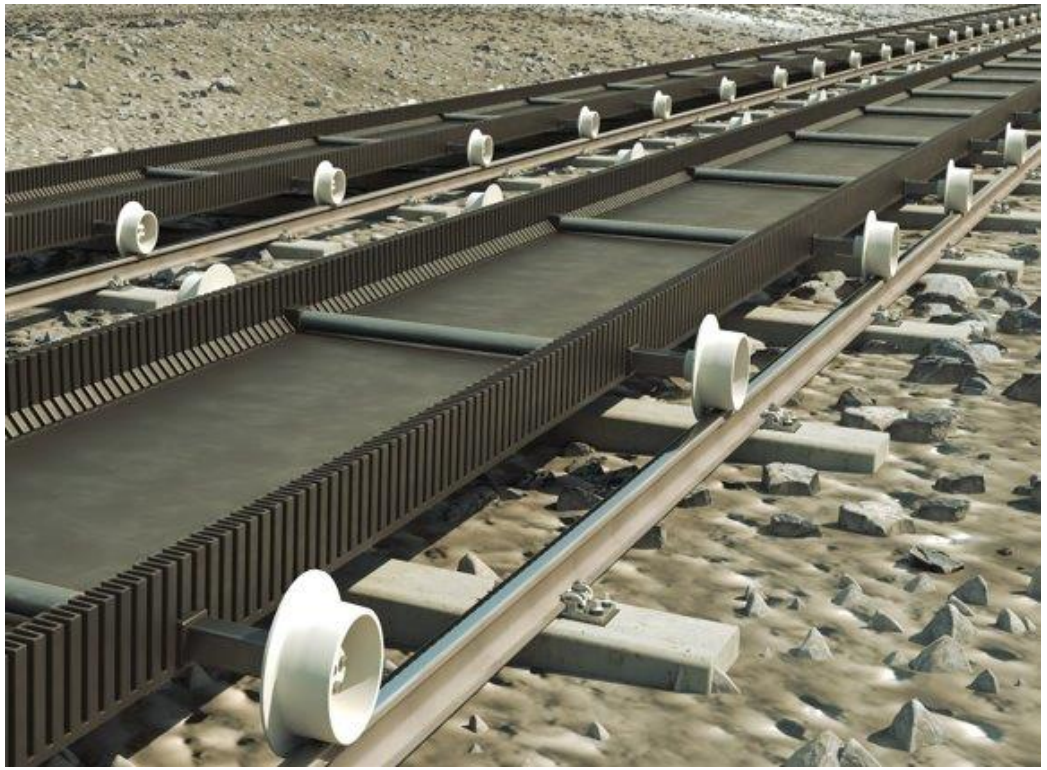
The TrackBelt is a bulk material handling conveyor, which combines the benefits of well proven technologies, the ***RAILWAY*** and the conventioal ***CONVEYOR BELT***, hence the brand name TrackBelt. This new system offers a maximum number of benefits all together with attractive ***CAPEX*** and what is even more important it contributes to a massive reduction in ***OPEX*** or even generates operational profit through power generation. The vision behind this system is the continuously conveying railway system. The innovative design concept based on a continuous track-bound conveyor offers a totally new approach to materials handling. The hauling function is performed by the belt equipped with corrugated side walls and fixed wheel sets running on steel rails.

TRACKNELT OVERVIEW

CONFIGURATIONS

- Standard configuration above each one
- Bi-directional conveying in side-by-side configuration





TRACKBELT OVERVIEW

KOCH SOLUTIONS

MAIN CHARACTERISTICS OF THE TRACKBELT SYSTEM

- Major saving in OPEX
- „Massive“ electric power savings (for long distance conveyor, appr. 1/3rd of a conventional conveyor is to be expected)
- Extremly reduced rolling resistance
- No abrasion between conveyor and wheel sets/idlers
- Very little line maintenance (all idlers are fixed on the belt and passing station)

TRACKBELT OVERVIEW

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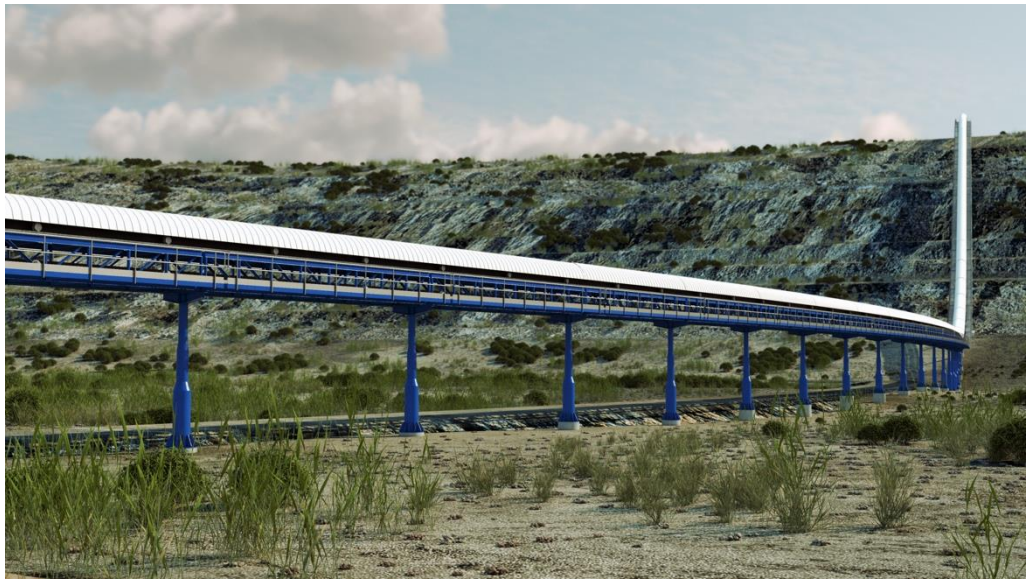
MAIN CHARACTERISTICS OF THE TRACKBELT SYSTEM

- Wheel set servicing or replacement can be carried out in the head or tail station
- Advantages in possible track alignments (more inclination, less earth movement):
- Convex radius (~ 50m), by using support idlers due to flat belt
- Concave radius (~ 50m) by using support rails on the top of the wheels

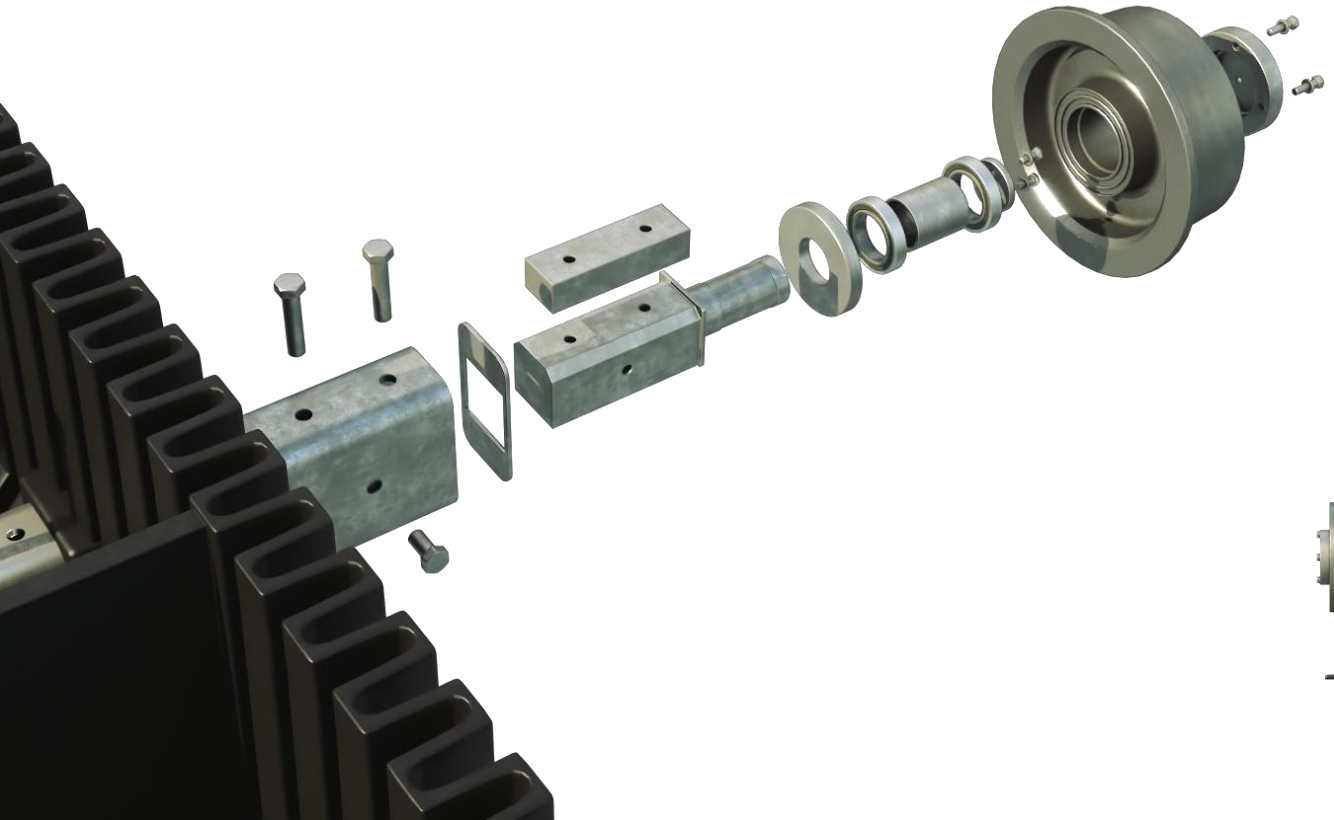
TRACKBELT OVERVIEW

CONFIGURATIONS

- Station - Transferstation
- Line – Curve, Elevated, Tunnel, Bridge



TRACKBELT - WHEELS



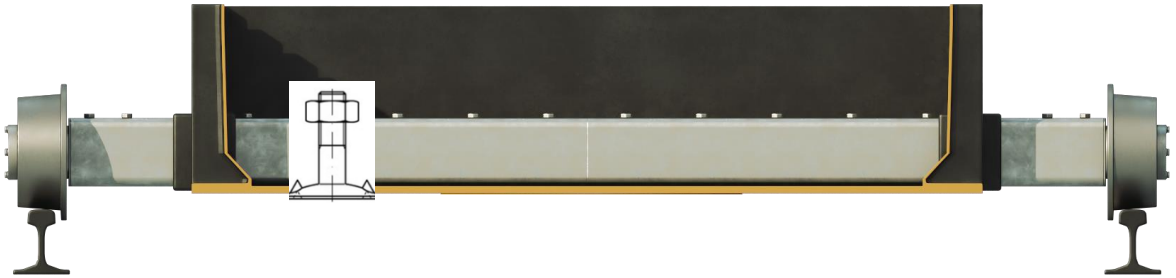
The wheel's each side are assembled on an axle.

The axle is located on the top of the belt and fixed with T-bolts on the belt.

The wheel can be made of steel or plastic, depends on the project preferences/requirements: noise, "explosion", reduced friction,….

All wheels passing a single maintenance station and can be maintained and replaced, as well automatically controlled with:

Wear predicting camera's, heat and vibration sensing equipment accurately identifying and logging service requirements.



TRACKBELT - BELT

The belt is called as a “Side-Wall-Belt”

By using a standard belt which is equipped (hot vulcanised) at both side with a corrugated sidewall

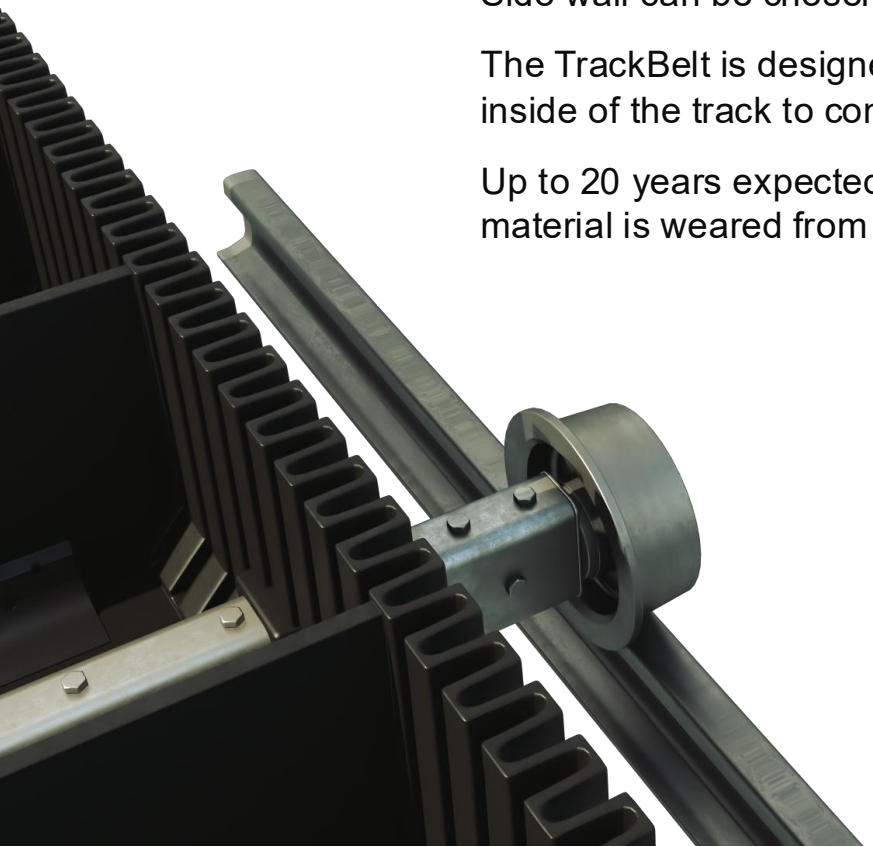
The belt is typically on a lower ST grading compared to conventional CV

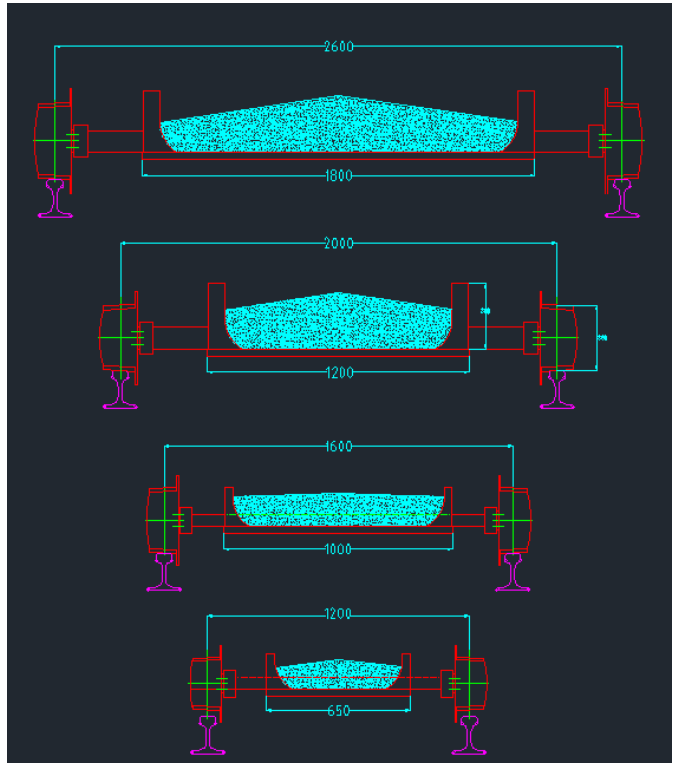
Belt configurations are set to a max. width of 1800mm

Side wall can be chosen for up to 500mm

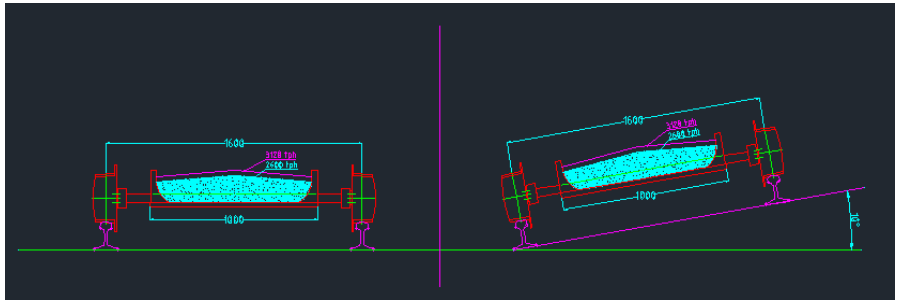
The TrackBelt is designed to transverse horizontal curves, by lifting the inside of the track to compensate for the belt tension.

Up to 20 years expected life of the belt– not running over rollers. The material is weared from loading to unloading and bumping over rollers.

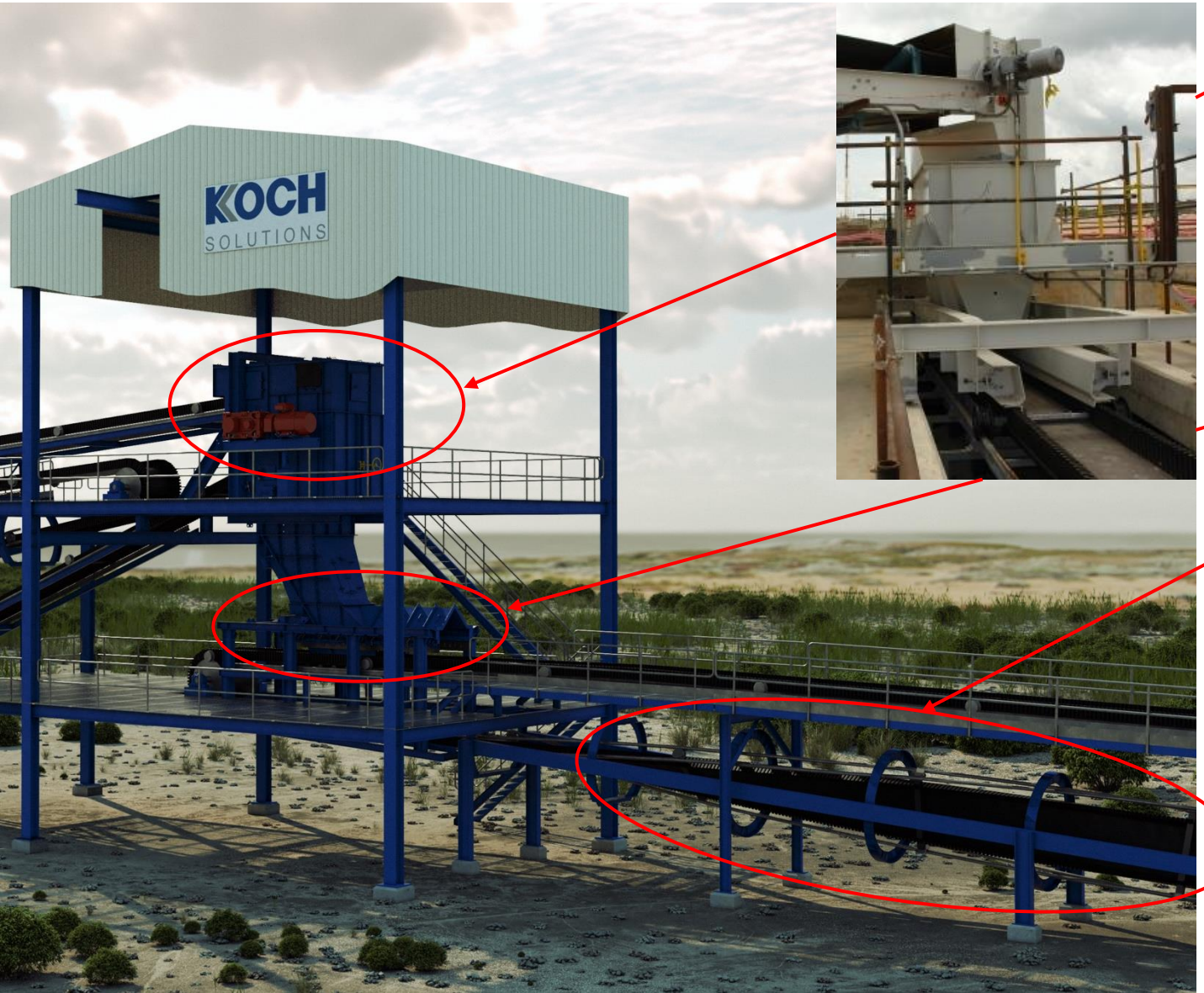




Straight / Curved



TRACKBELT – DRIVE SYSTEMS



Drive system:

- using standard drive systems used for conventional conveyors

Take up tension system:

- Using also standard Take up and tensioning systems as for conventional conveyors

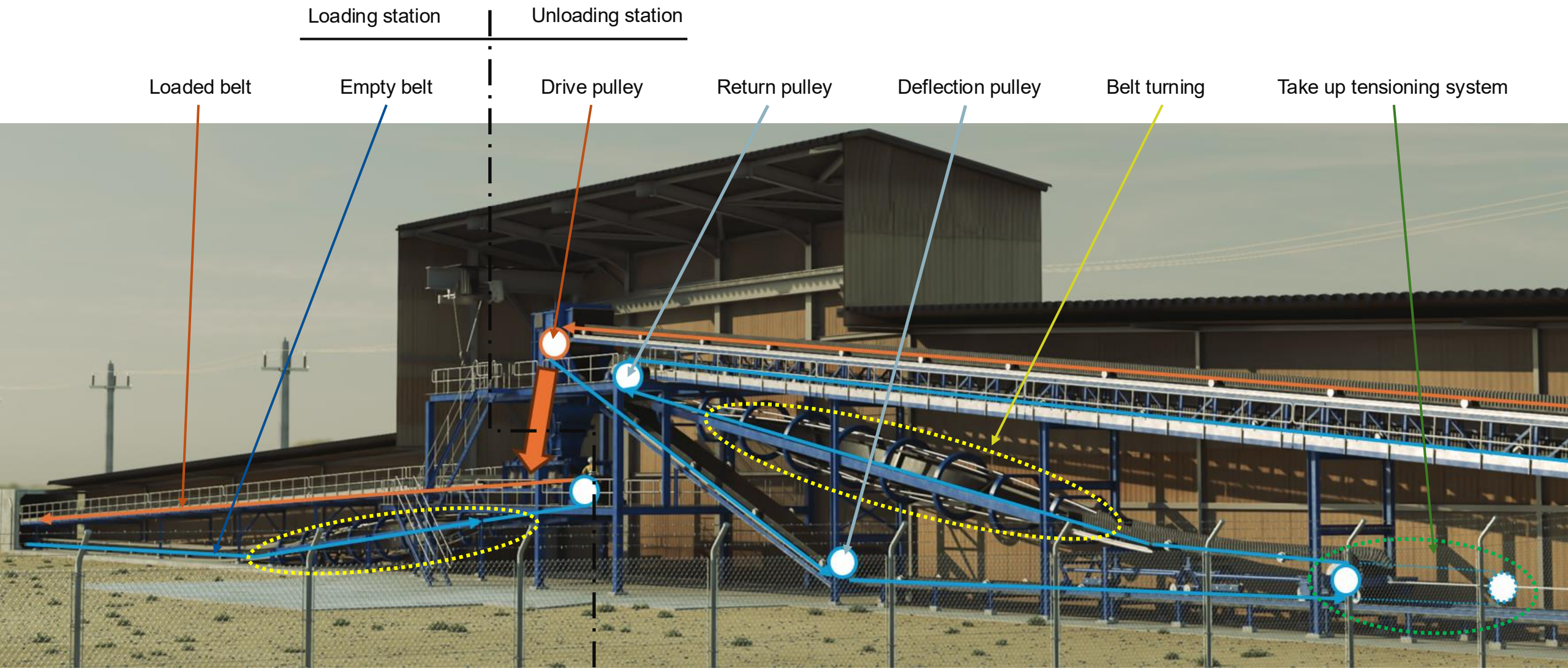
Belt loading system:

- Due to the flat belt with side wall setup, a flat impact table will protect the belt on the lower side, whereas a special chute design will feed the belt in-between the side wall.

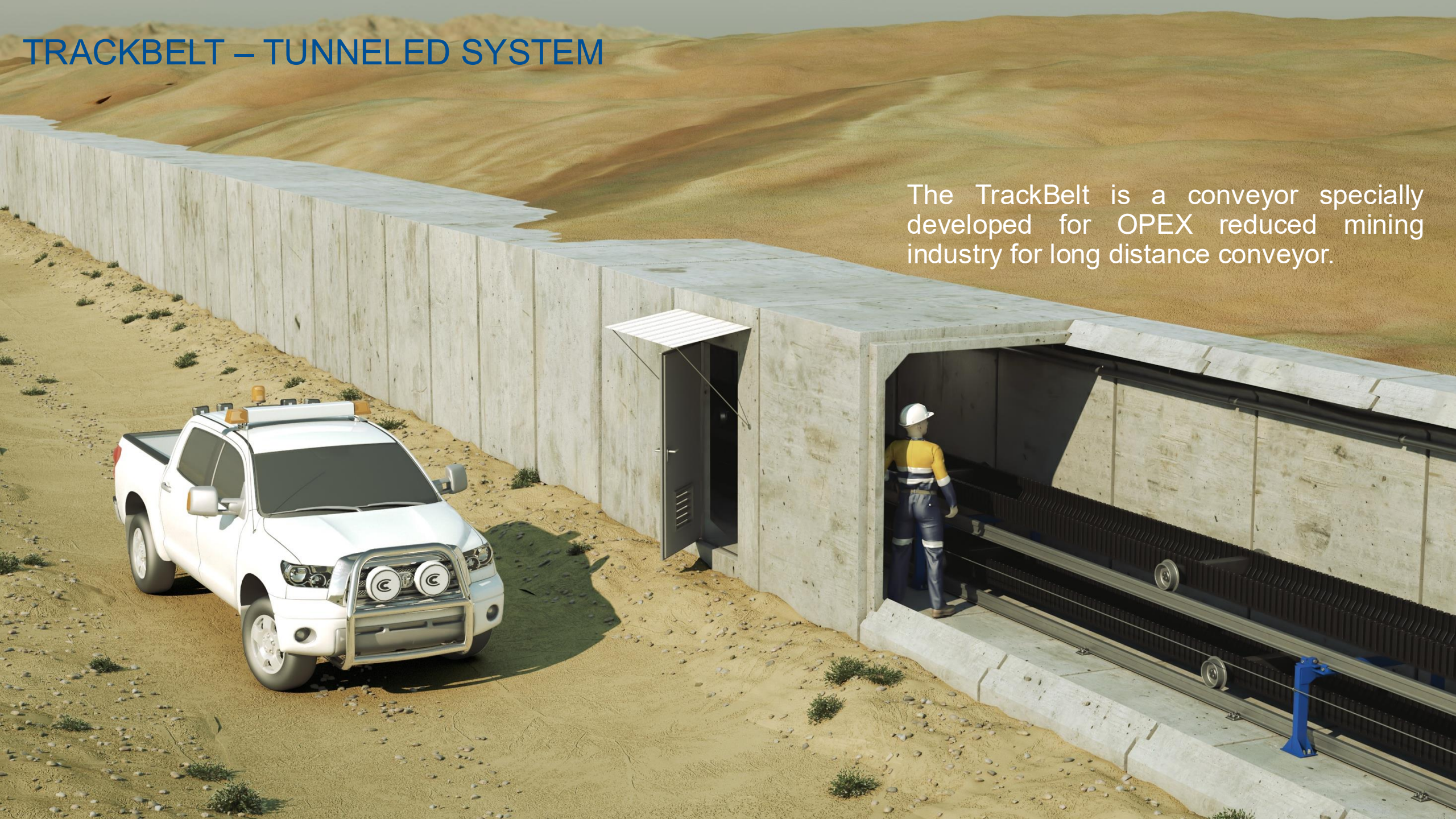
Belt turning:

- The belt will be turned after passing the unloading station (drum) by 180° as well again before passing the drum at the loading station. Therefore, no spillage will be lost on the return side.

TRACKBELT – STATION (TRANSFER) SYSTEMS



TRACKBELT – TUNNELED SYSTEM

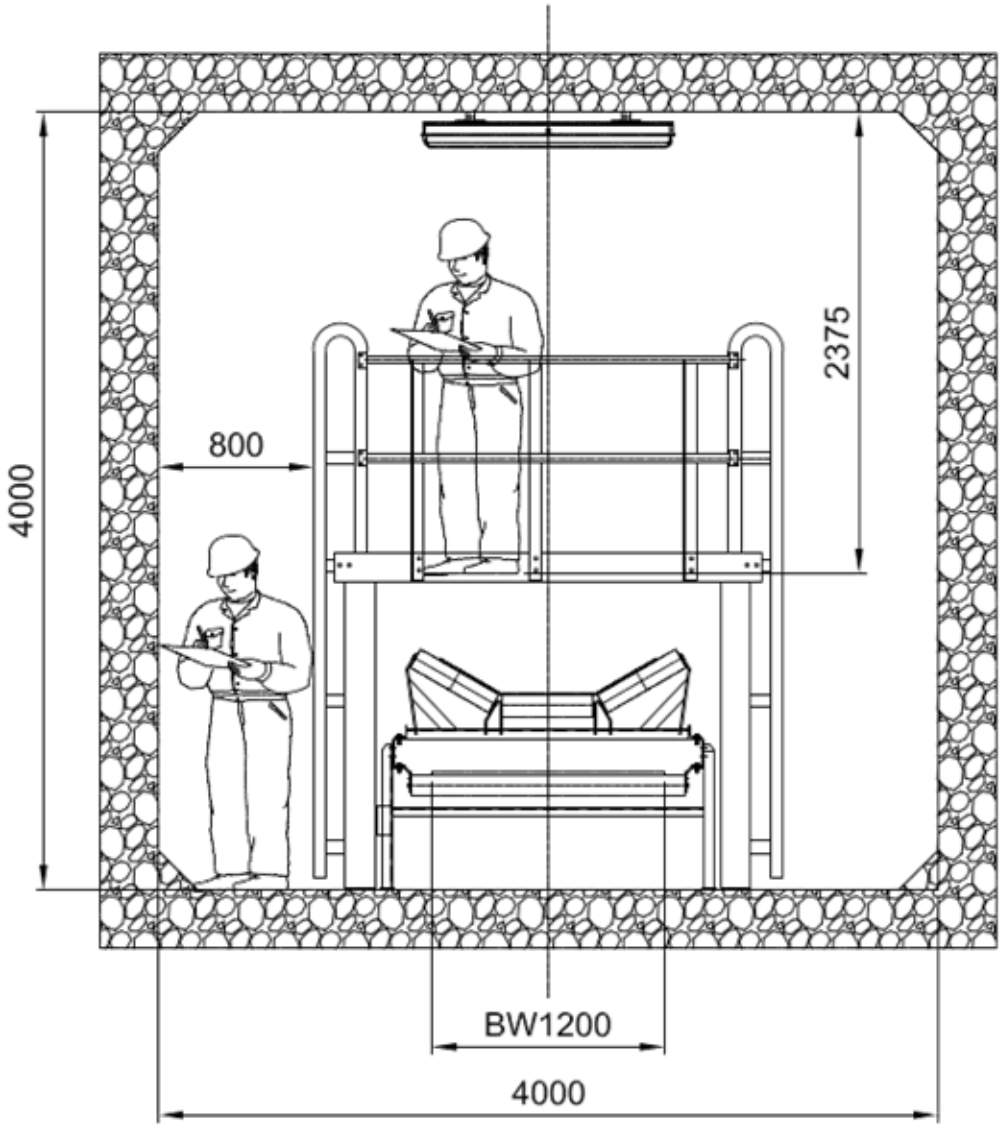


The TrackBelt is a conveyor specially developed for OPEX reduced mining industry for long distance conveyor.

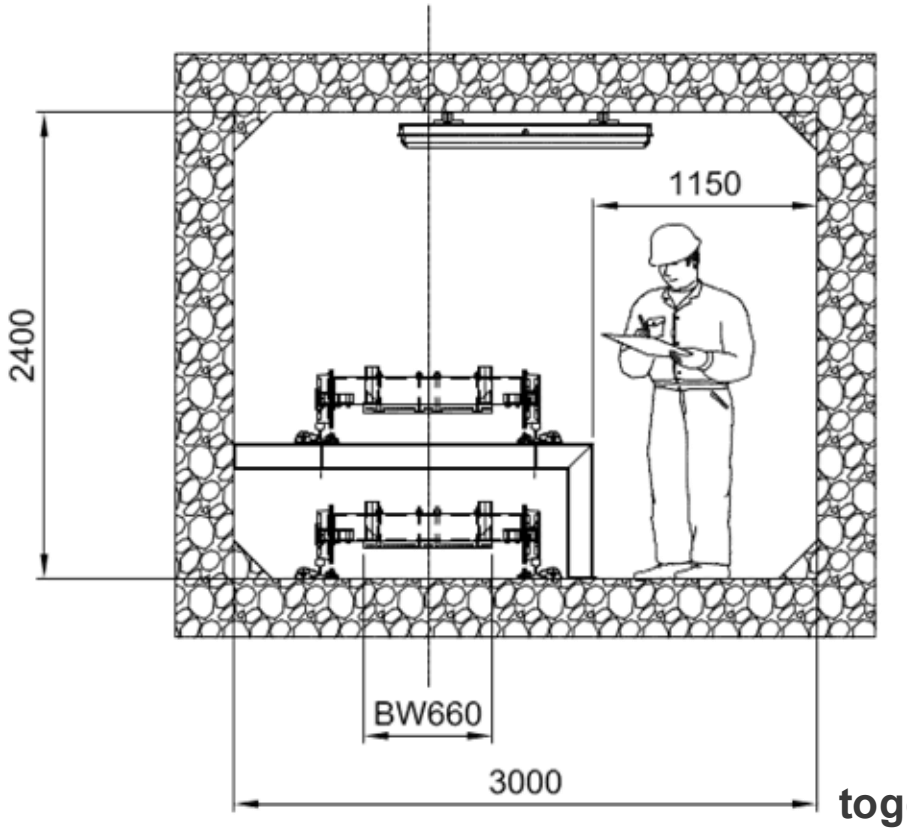
TRACKBELT – TUNNELED SYSTEM

COMPARISON

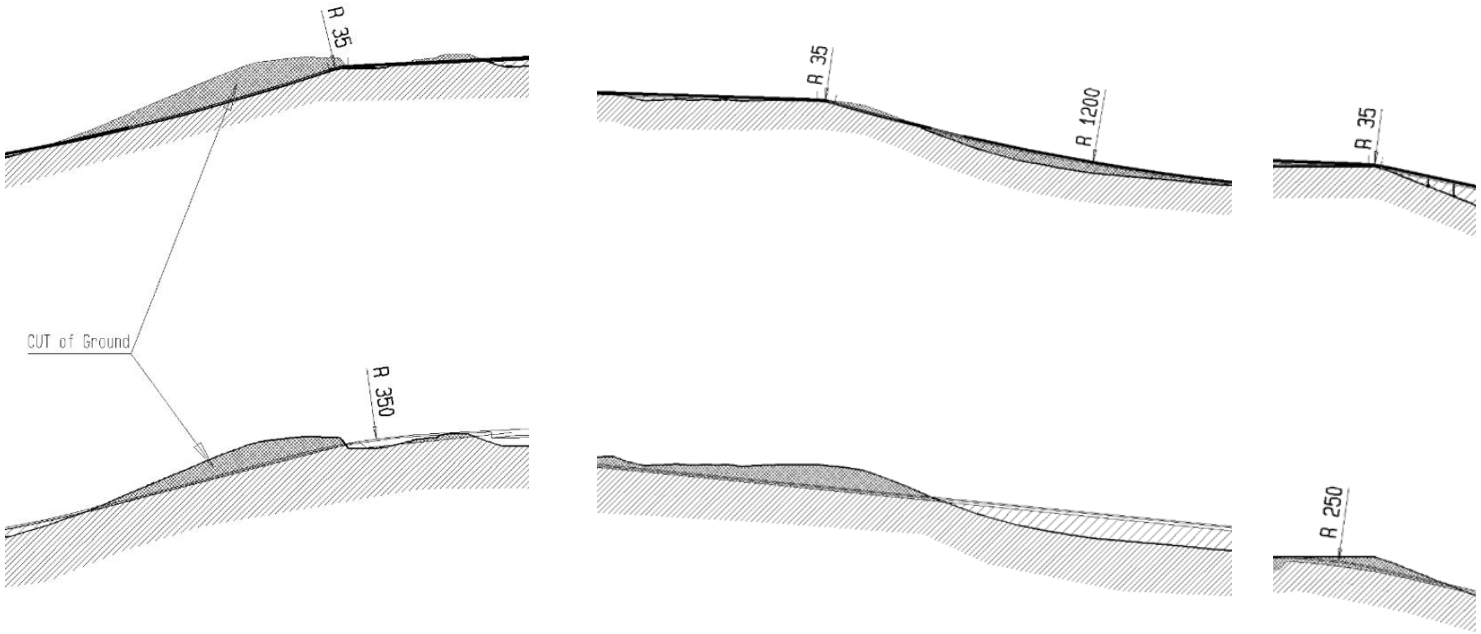
Conventional Conveyor

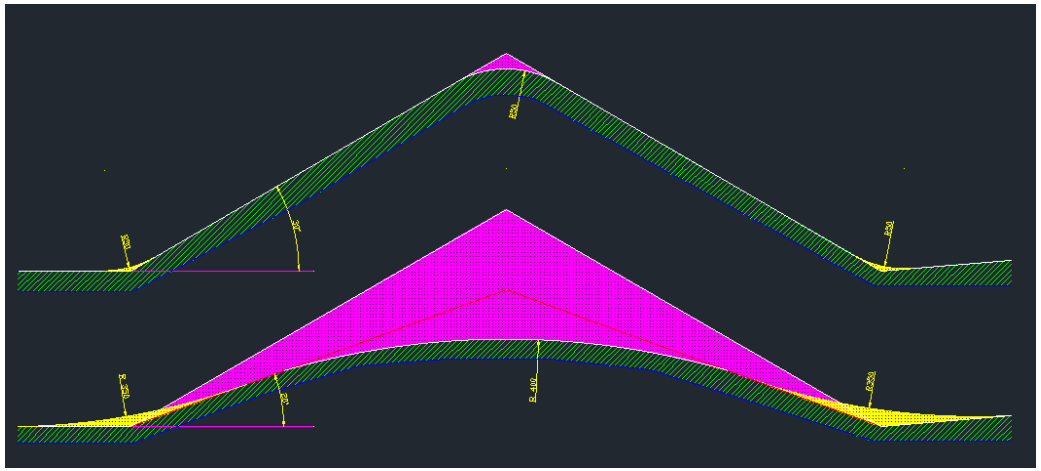


TrackBelt



TRACKBELT – CUT&FILL



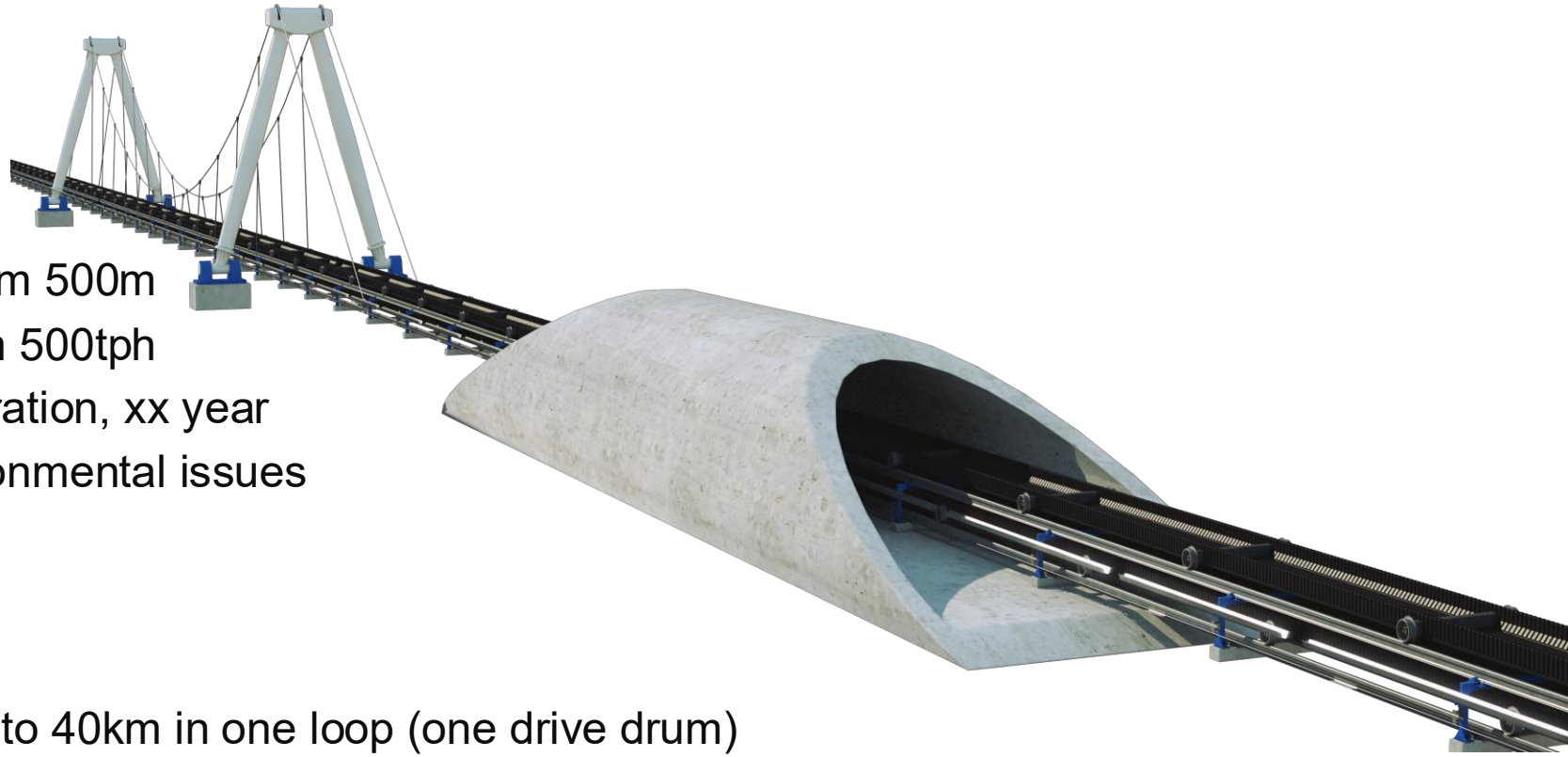


Comparison

	TrackBelt	Conv. Conveyor
Bulkmaterial	bauxite	bauxite
Length	5603 m	5603 m
Lift	5 m	5 m
Speed	5,2 m/s	5,2 m/s
Capacity	2700 tph	2700 tph
Lump size	150 mm	150 mm
Installed power	2x 700 kW	6x 600 kW
Belt size	ST 3000	ST 2500
Belt width	1000 mm	1200 mm
Side wall	200 mm	N/A mm
CUT of ground	5300 m²	11300 m²
ELEVATED area	5800 m²	11600 m²
CONCAVE radius min. possible	50 m	500 m
CONVEX radius min. possible	35 m	250 m

TRACKBELT OVERVIEW

PREFERRED APPLICATION



- ✓ All conveyor length starting from 500m
- ✓ All conveyor with capacity from 500tph
- ✓ All conveyor for long term operation, xx year
- ✓ All conveyor which have environmental issues esp. cut & fill

- ✓ The system is designed for up to 40km in one loop (one drive drum)
- ✓ The system is designed for up to 20.000tph
- ✓ The system is designed for lifetime (mainly belt) up to 20 years.
- ✓ The system allows to reduce earth movement (cut & fill) of average 50% compared to conventional conveyor

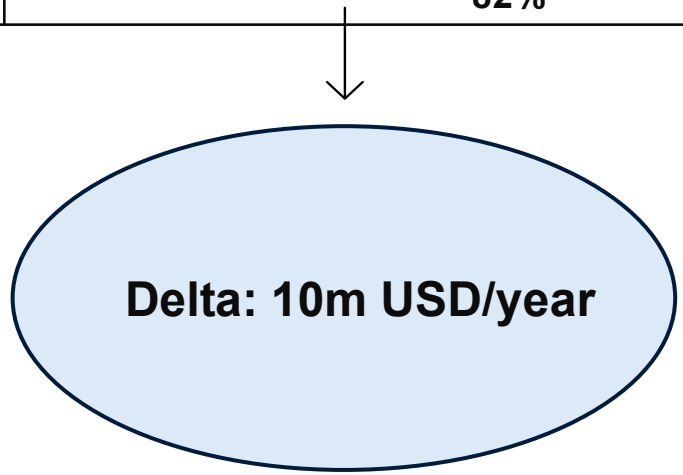
TRACKBELT OVERVIEW

COMPARISON: ENERGY CONSUMPTION

System length	13.000 m
Vertical fall	100 m
System capacity	2.000 tph
Operation power – **Trackbelt**	989 kW
Operation power – Conventional Conveyor	5.558 kW

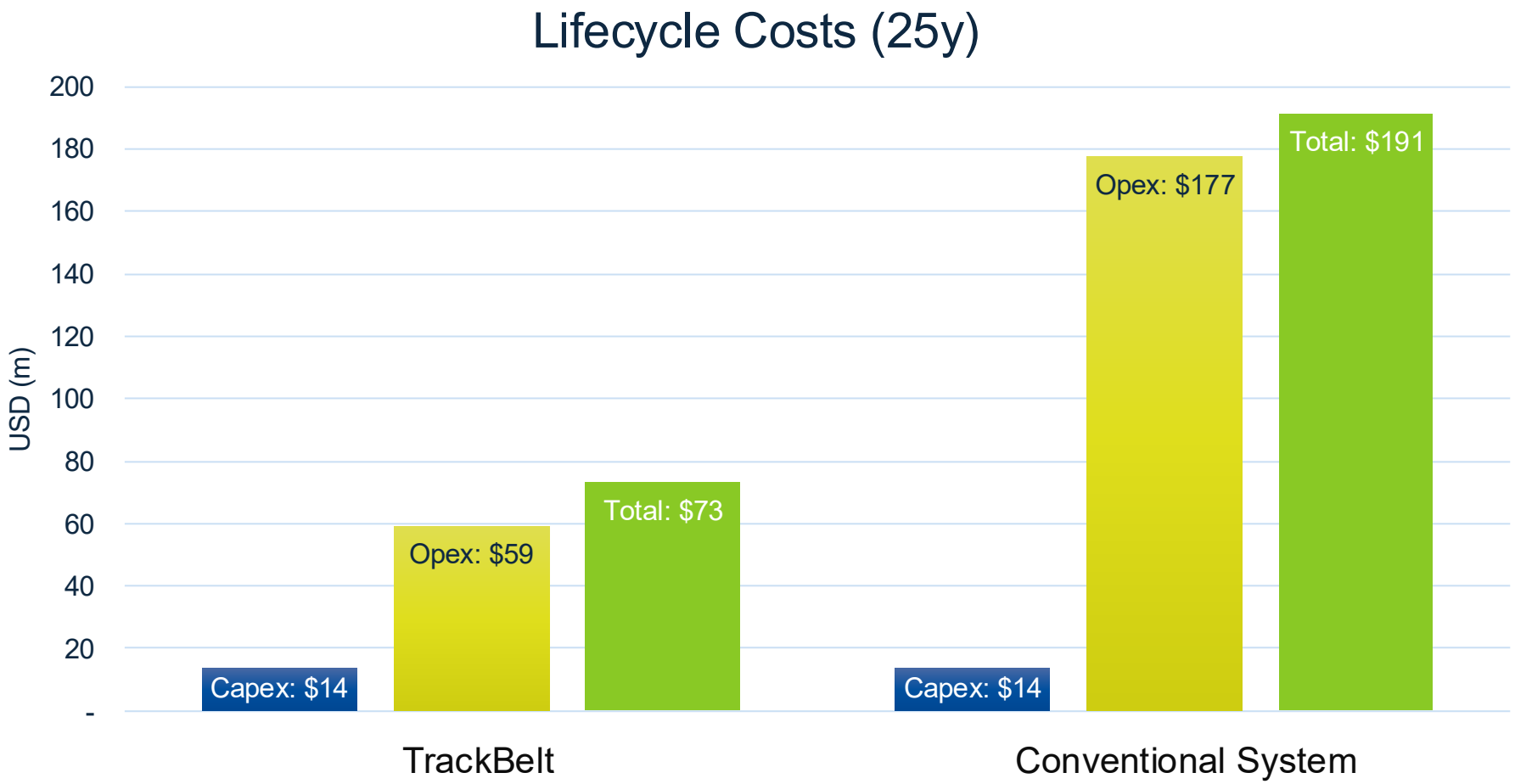
Assumptions	
Days of operations per year	365 d/y
Operation hours per day	20 h/d
Operation hours per year	7.300 h/y
Energy costs (by Generator)	0.3 USD/kWh

Description	Project Trackbelt	Conventional Conveyor
Energy per year	7.219.700 kWh	40.573.400 kWh
Difference	33.353.700 kWh	
Energy costs per year	2.165.910 USD	12.172.020 USD
Difference	**82%**	



TRACKBELT OVERVIEW

COMPARISON: TOTAL COST

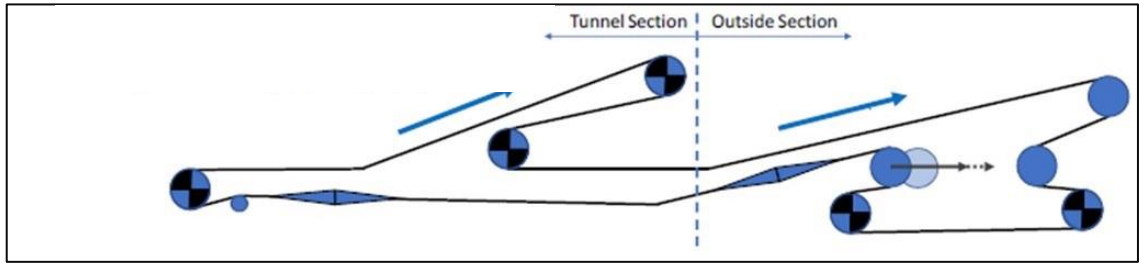


TRACKBELT OVERVIEW

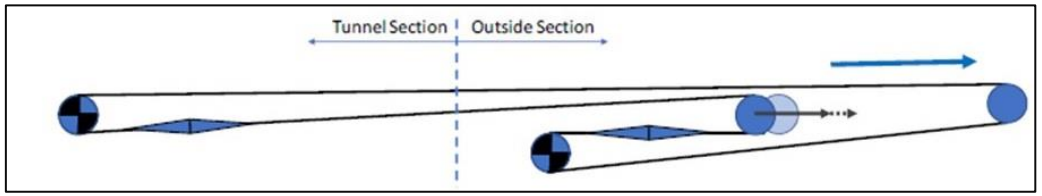
COMPARISON: TRACKBELT AND CONVENTIONAL CONVEYOR

Description	TrackBelt	Conv. Conveyor
Material handled	xxxxx	xxxxx
Horizontal conveying length	40.000 m	40.000 m
Vertical conveying height	150 m	150 m
Max. inclination	5°	5°
Theor. mass flow	2.800 t/h	2.800 t/h
Max. lump size	150 mm	150 mm
Belt speed	6,0 m/s	6,5 m/s
Power consumption cont.	**4.800** kW	**15.000** kW
Installed power	**6.000** kW	**16.000** kW
Idler spacing	each 7 m	each 5 m
Belt type	ST 3.060	ST 3.500
Safety factor (cont.)	3,7	3,6
Safety factor (start up worst condition)	3,1	3,1
Belt width	1.000 mm	1.200 mm
Side wall	180 mm	---
Cleat	necessary > 28°	necessary > 18°
Diameter tunnel	490 cm	490 cm

Drive concept – Conv. Conveyor



Drive concept – TrackBelt



together.forward