ALLU

Smart Mobile Mining

Designed for soft rock mining

Designed for production

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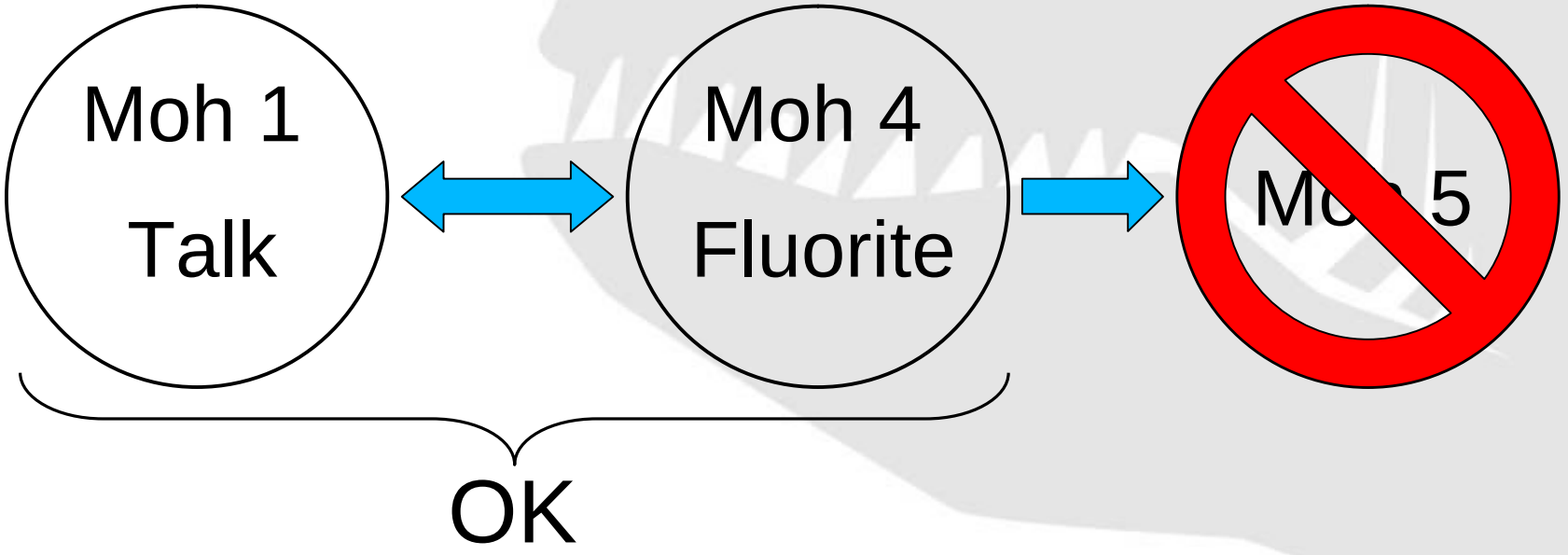
Smart mobile soft rock mining

What do we mean with soft rock mining?



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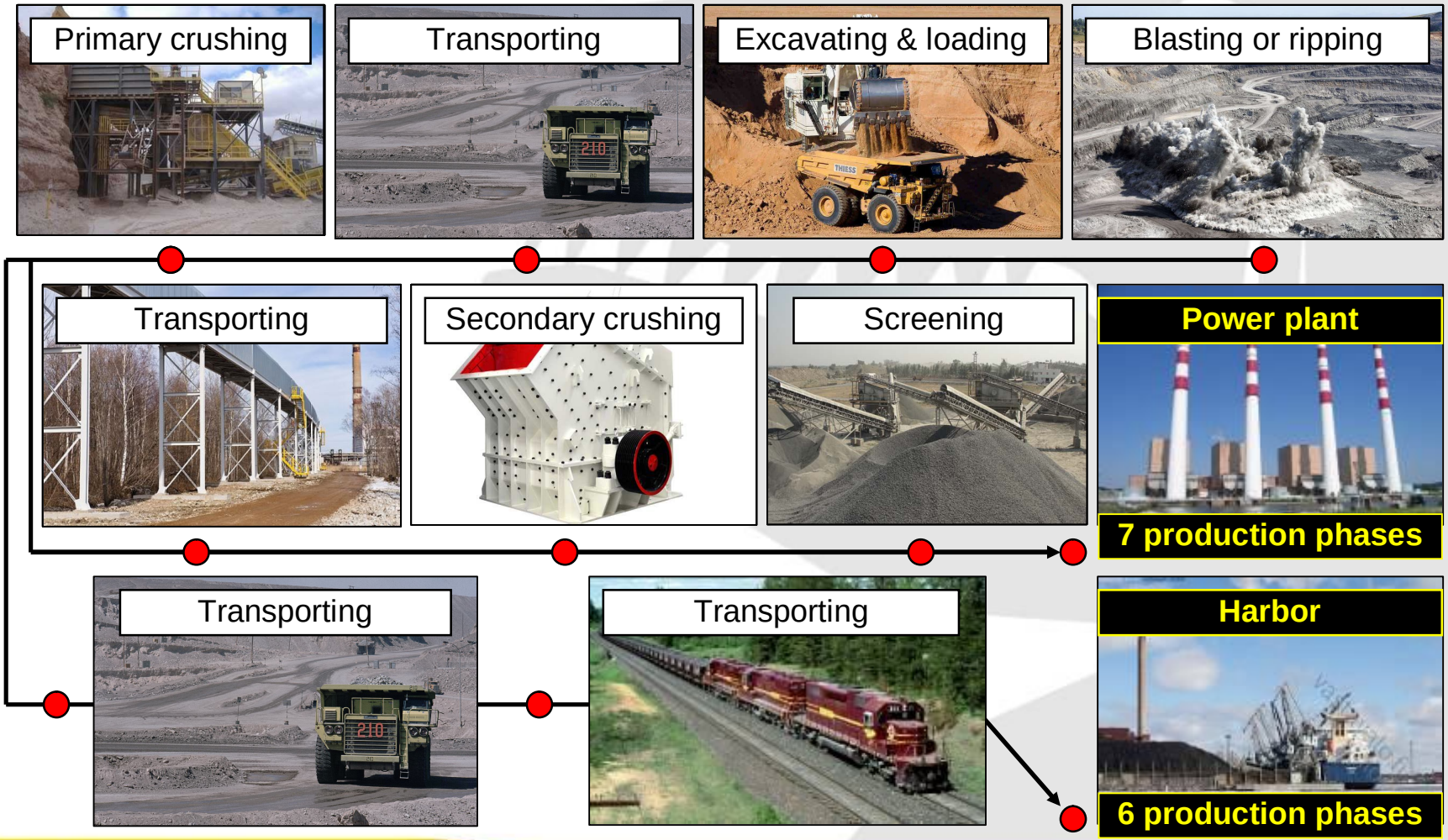
Conventional mining operation



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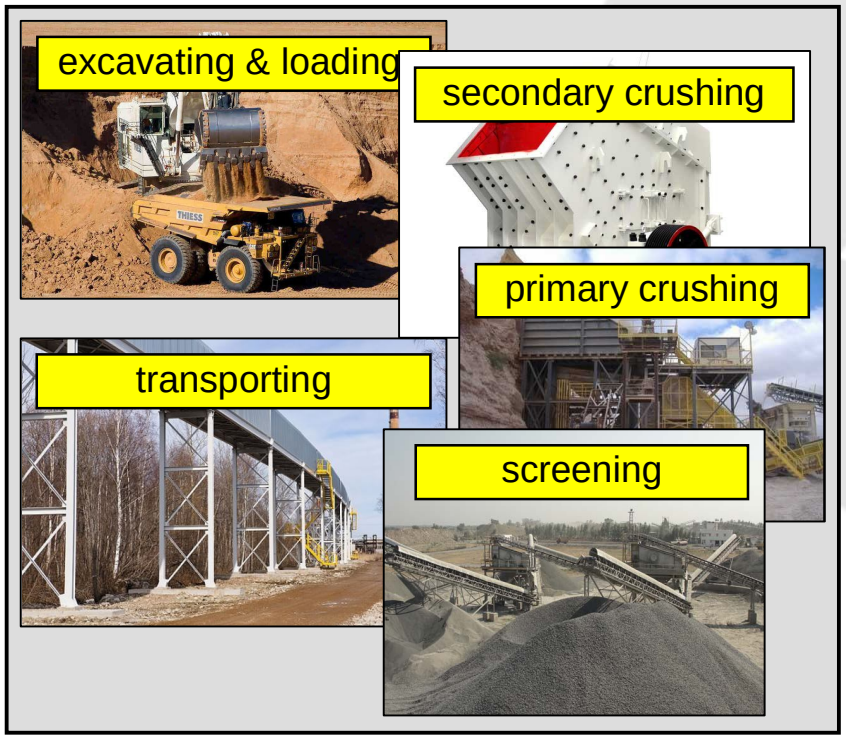
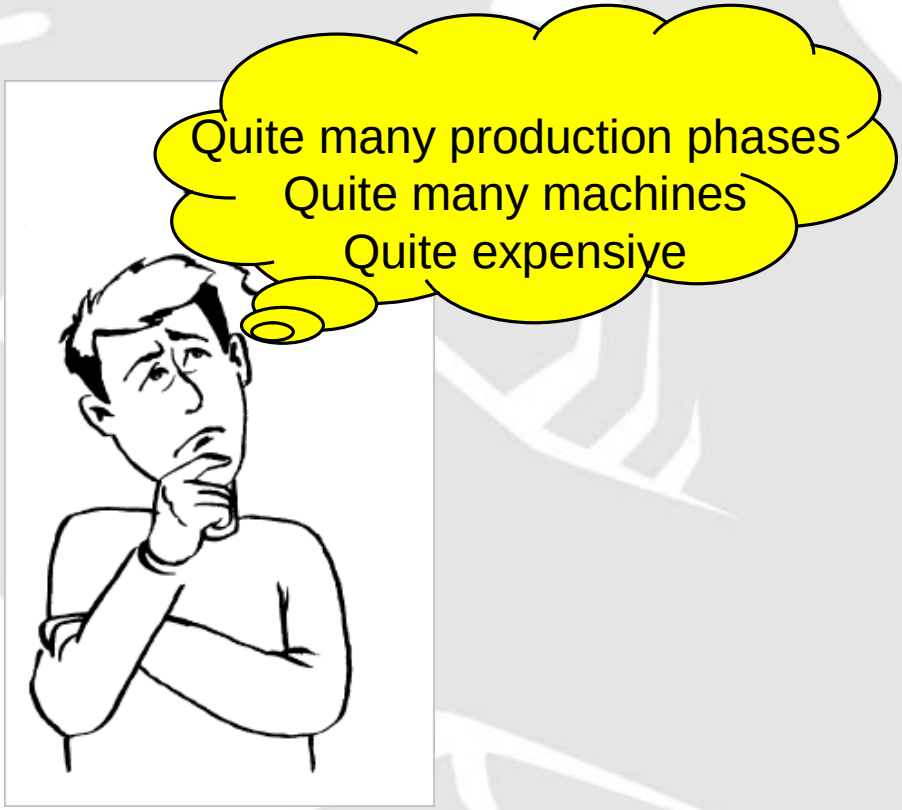
Could a mining operation be executed any other way?





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Could a mining operation be executed any other way?

Excavator or loader

+

Processing attachment

=

Processing machine

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One Step material processing with M Series crushing buckets

Simultaneous
Crushing – Separating - Enrichment – Loading

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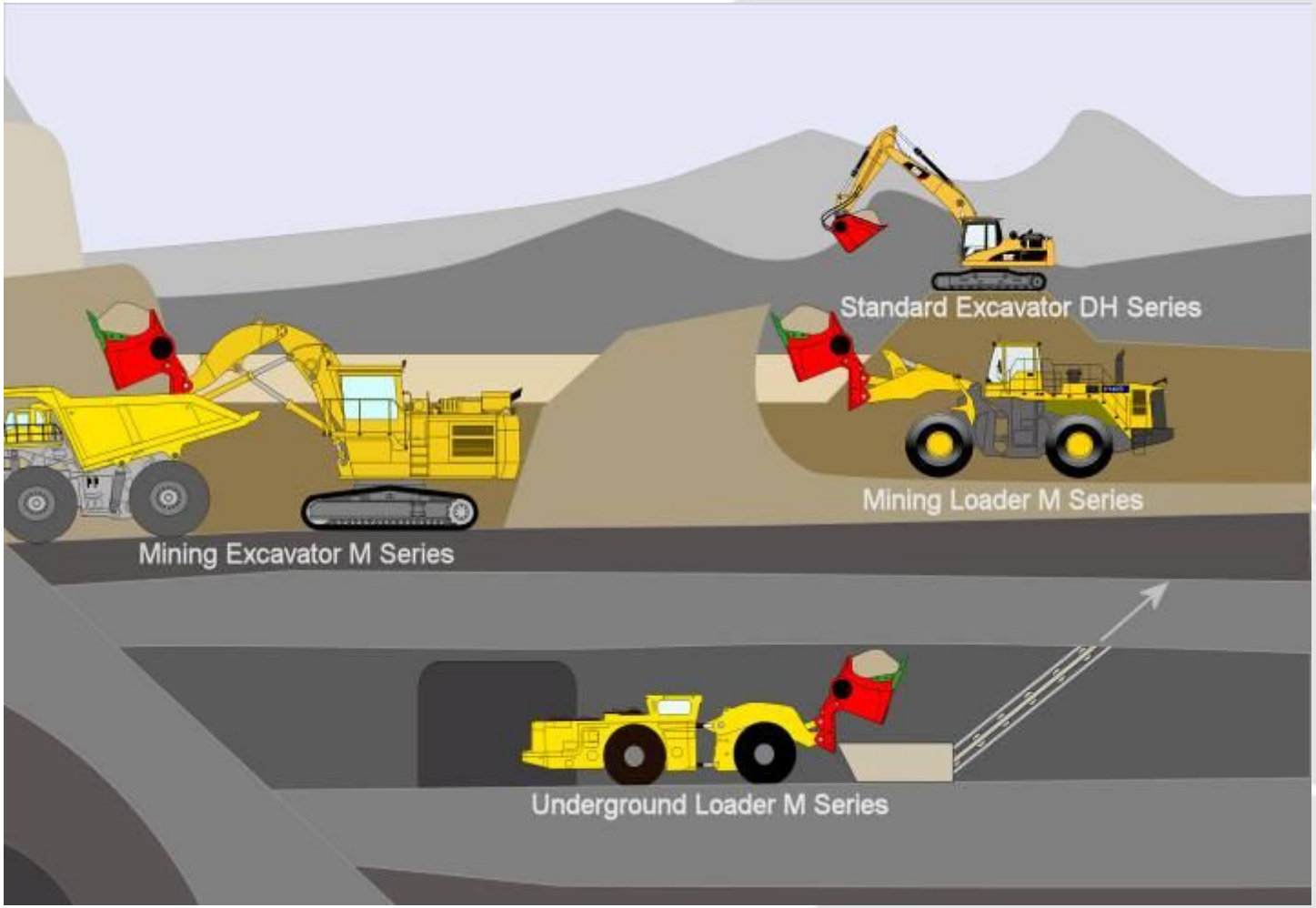
One Step material processing with M Series processing buckets



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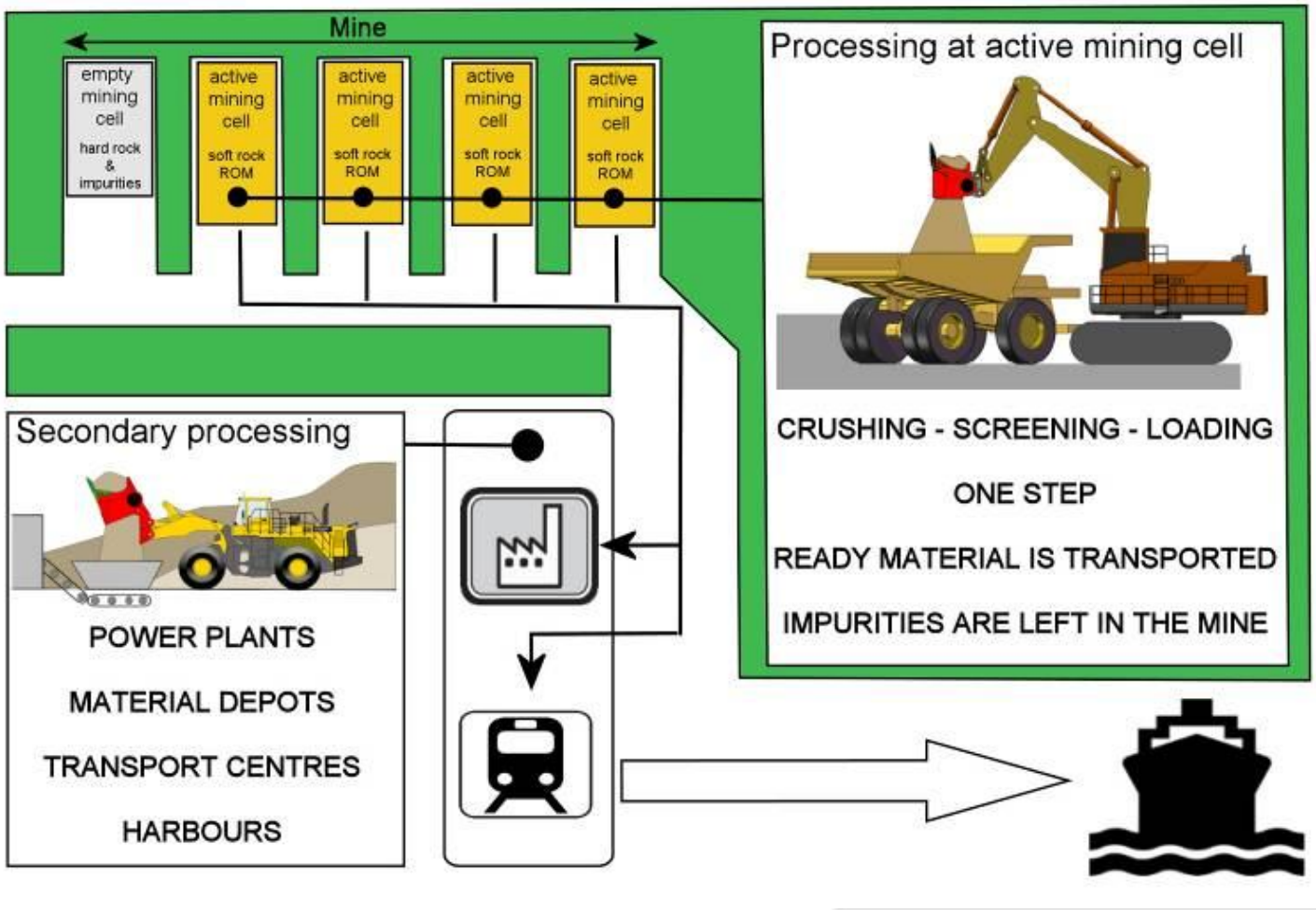
One Step material processing with M Series processing buckets



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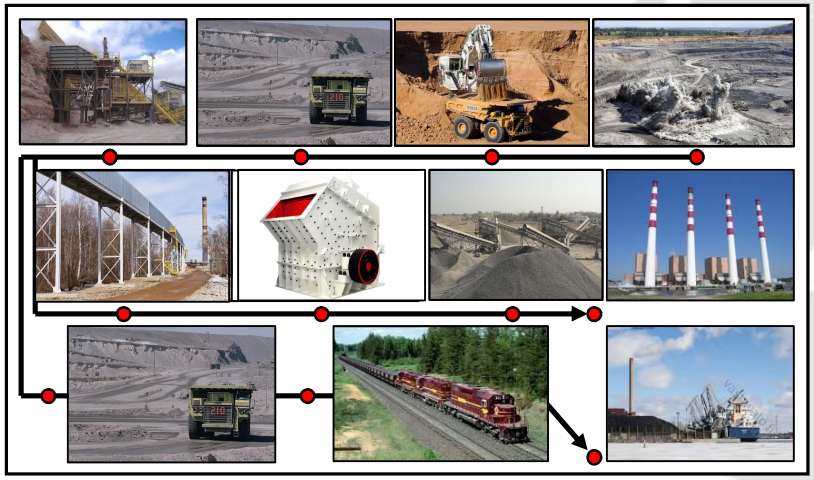
What are the biggest differences?

Conventional

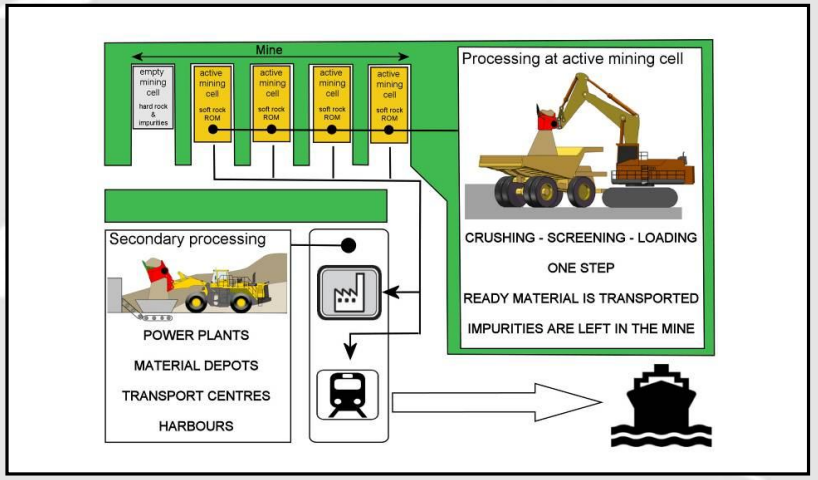


7 steps → ready material → power plant

6 steps → ready material → export

5 machines + conveyor system
- ❑ Excavator
- ❑ Dumper
- ❑ 2 crushers
- ❑ Screening plant

One Step



3 steps → ready material → power plant

4 steps → ready material → export

2 machines
- ❑ Excavator attached with ALLU M series
- ❑ Dumper

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Target mining operations

- Oil Shale mining
- Coal mining
- Bauxite mining
- Phosphate mining
- Lime stone mining
- Kaolin mining
- Dolomite mining
- Gypsum mining
- Rock salt mining
- Other similar minerals & rock

Crushing, screening, enrichment and loading performed in One Step

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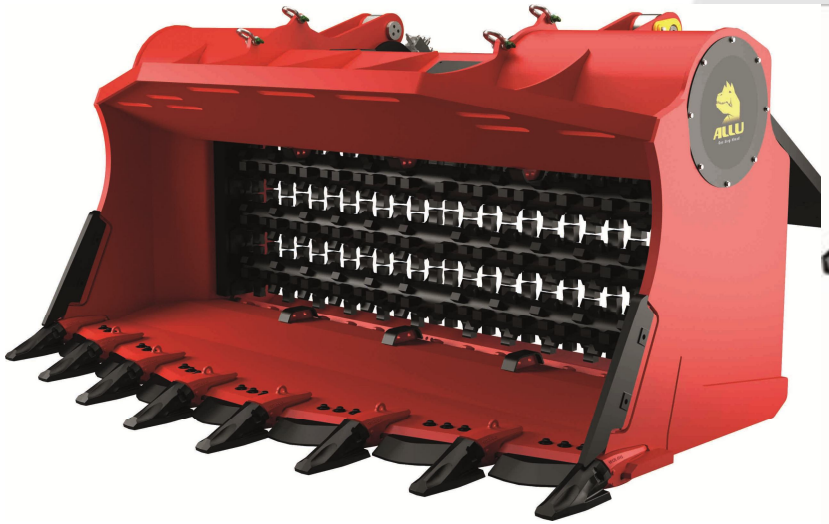
ALLU M series product line designed for mining



Hydraulically powered attachment that coverts the carrier into a processing machine
3 models for mining excavators
3 models for mining wheel loader
Can also be mounted on sub terrain loaders

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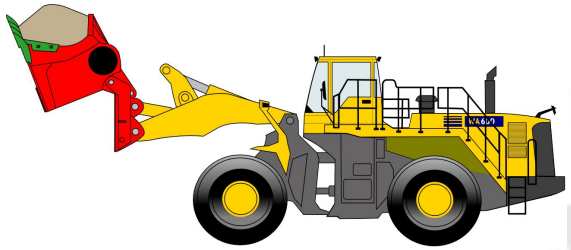
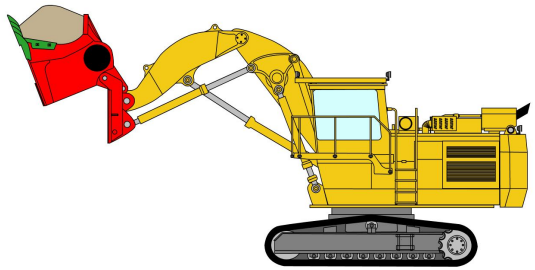
ALLU M series product line designed for mining



Model	Operating weight	Volume
M 3-32 L	30 – 50 ton	5,0 m3
M 3-32	50 – 60 ton	6,5 m3
M 4-32	60 – 90 ton	8,0 m3



Model	Operating weight	Volume
M 3-20	50 – 70 ton	3,0 m3
M 3-23	70 – 120 ton	4,5 m3
M 4-23	120 – 160 ton	6,0 m3

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Carrier example

- Komatsu WA 600
- Mining loader
- 53 ton operating weight
- Hydraulic output 460 l/min, 350 bar
- Two way auxiliary hydraulics
- Regular bucket 6,4-7,0 m3
- Tipping load straight 34 tn.
- Tipping load 43 degrees 29 tn.

Equipped with 6,5 m3 ALLU M 3-32

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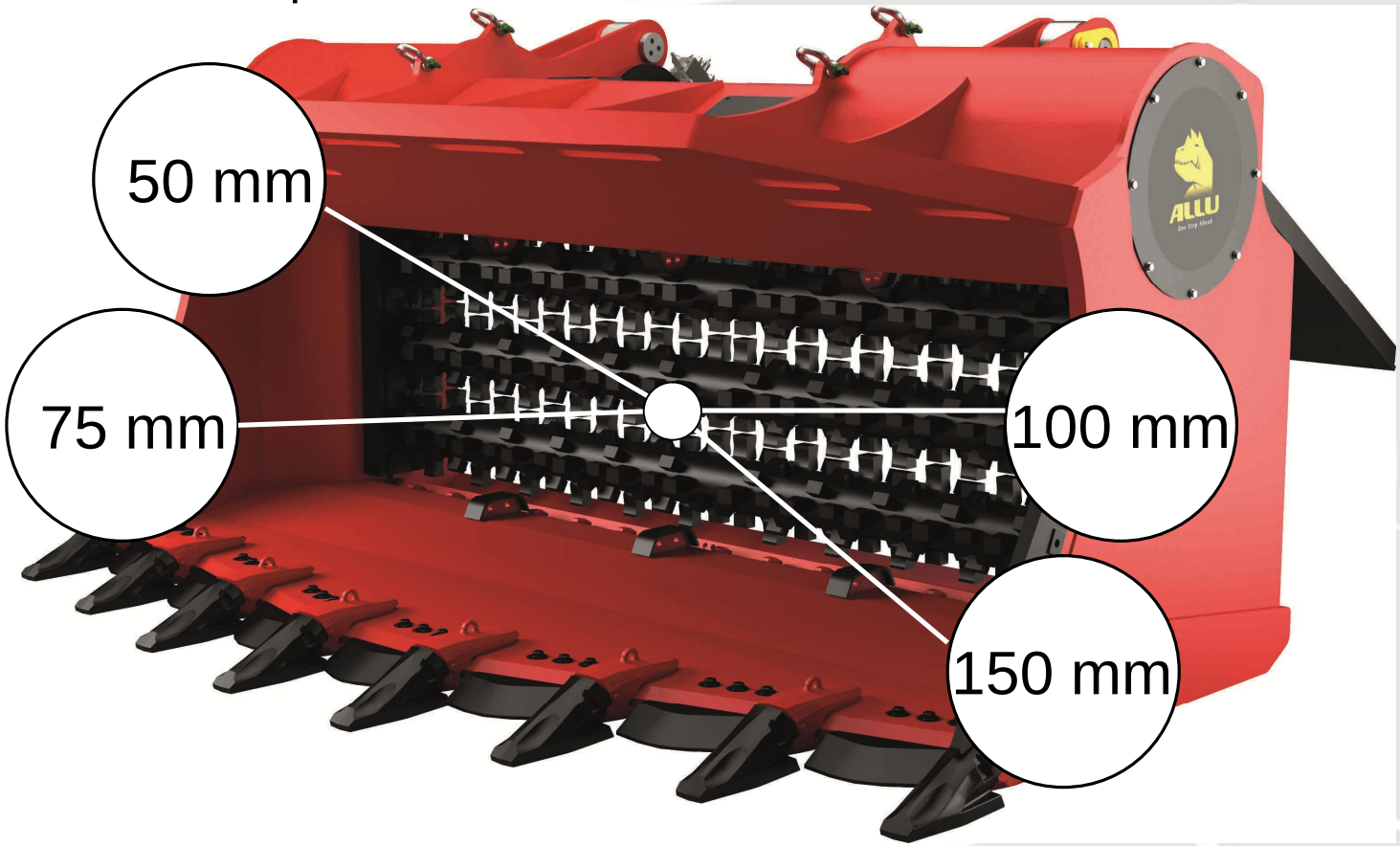
The M series adapts to the needs & ROM of the customer



4 drum configurations – 4 fragment sizes – 100 % crushing – crushing & separating

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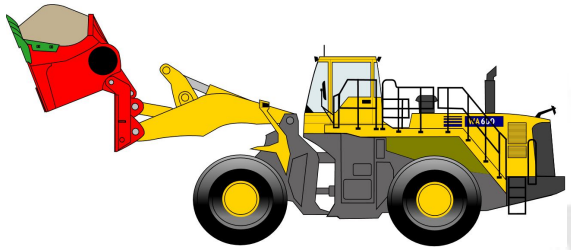
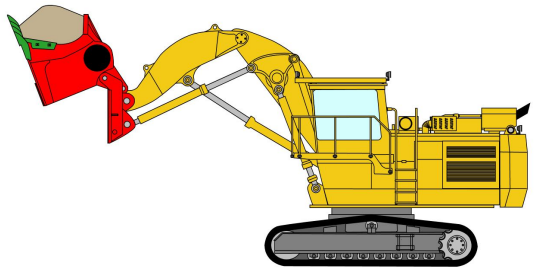
ALLU M series product line designed for productivity



Model	Volume	Capacity
M 3-32 L	5,0 m3	250 ton / hour
M 3-32	6,5 m3	350 ton / hour
M 4-32	8,0 m3	450 ton / hour



Model	Volume	Capacity
M 3-20	3,0 m3	350 ton / hour
M 3-23	4,5 m3	500 ton / hour
M 4-23	6,0 m3	600 ton / hour

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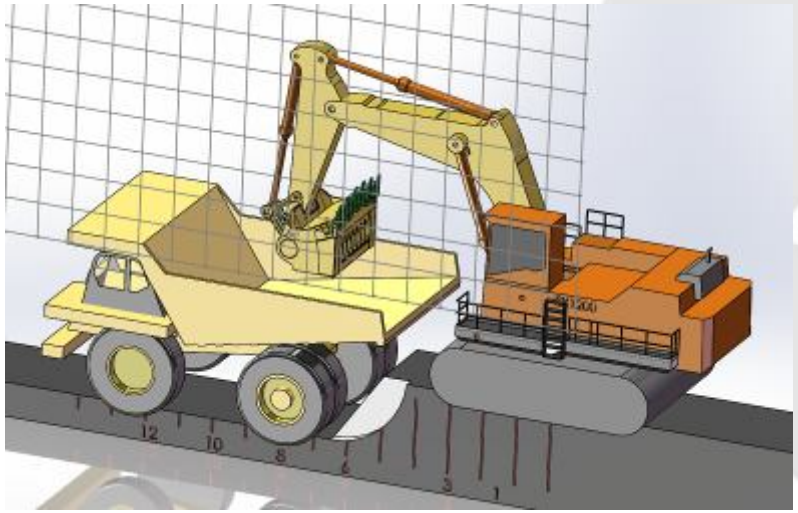
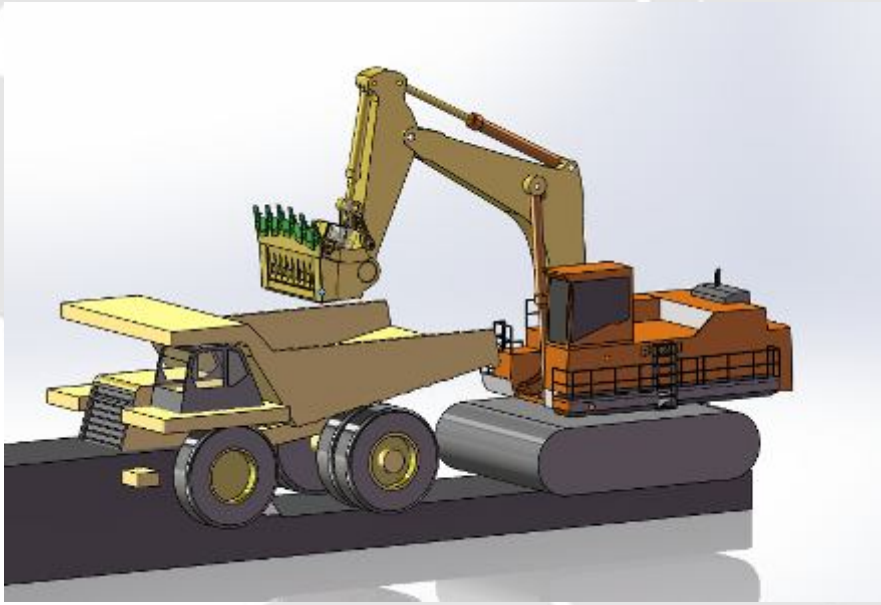
The M series adapts to the needs & ROM of the customer

Backhoe for top of heap position



Front shovel for ground level position



Excavator is recommended for primary work in the mine because of work speed & reach

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The M series adapts to the needs & ROM of the customer

Power Plants

Transportation centre

Depots classification

Harbor operations

Loader is recommended for secondary & service work because of best mobility

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Intelligent material processing equipment

- operator data monitor inside cabin
- mobile data uplink to service terminal
- hydraulics monitoring
- time monitoring
- parts temperature monitoring
- parts condition monitoring
- bucket process angle monitoring
- assists operator
- prevents break down before happening
- real time after sales service
- and even more

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Benefits summary

- strong, rigid and durable construction
- designed especially for mining carriers
- higher cost efficiency in the mine
- increases loader utilization time
- less investment costs for process equipment
- high versatile production
- very high equipment mobility
- multipurpose machine
- separates hard waste material while crushing
- no need for site electrics

we bring the machine to the material and not the material to the machine

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Conventional open cast Oil Shale mining for power plant

Selective mining:

1. Removal of top layers → drag liner
2. Selective mining → ripper dozer
   - lime stone layers partly removed
3. Loading of material → electric excavator
4. Material transportation to storage → dumper
5. Blending of material → ripper dozer
6. Blended material to crusher → ripper dozer
7. Material crushed → crushing plant
8. Transportation to power plant → train

The required calorific value is achieved by blending different grades of material

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Oil Shale mining with M Series for power plant → dry enrichment method

One Step mining:

1. Removal of top layers → drag liner
2. Blasting
3. One Step processing in the mine of all layers
   - crushing of oil shale
   - lime stone separation
   - loading
4. Material transportation to power plant → dumper

The required calorific value is achieved by removing lime stone from ROM

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Rough comparison of selective and one step dry enrichment method

Selective mining	Dry enrichment
8 steps in the material flow	4 steps in the material flow
6 machines needed	3 machines needed
Calorific value by blending material	Colorific value by lime stone removal
Indirect material flow from the mine	Direct material flow from the mine
Lot of lime stone in material	Lime stone removed from ROM in the mine
Burning produces a lot of ash	Minimum ash when burning

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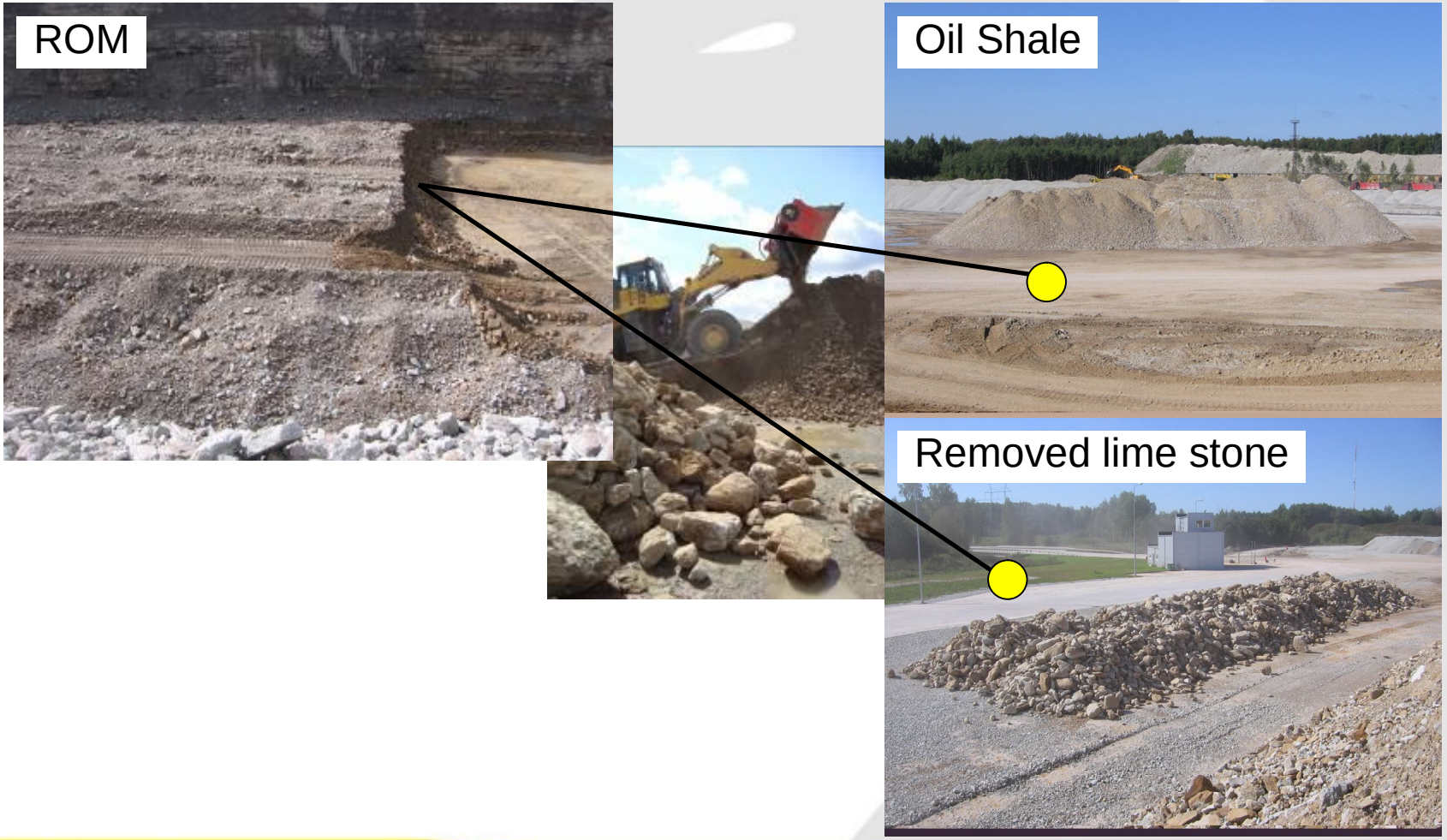
One step dry enrichment with ALLU method in brief



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Thank you

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