

Salt Partners

Mechanical solar salt harvesting worldwide

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Basic types of salt harvesting methods

- **Manual harvest by hand and manual transport**
- **Manual harvest with tools and manual transport**
- **Manual harvest with tools and mechanised transport**
- **Mechanised harvest with machinery and mechanised transport**

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Locations covered in this presentation



Mexico
Portugal
Bulgaria
Greece
Namibia
India
China
Australia

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Salt harvesting by bare hand



In Ghana, the most primitive salt harvesting method, by bare hand, is being practised today

MARIA ROCK

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Manual harvest and mechanised transport



In Bulgaria, the transport of the harvested salt has been mechanised but the harvesting itself is still by hand.

Two belt conveyors bring the salt to a slurring vessel mounted on a tractor.

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Hydraulic transport of salt slurry



Hydraulic transport lines. One pipe carries the slurry, the other line brings the transport brine back to the slurrying vessel on the tractor.

Men push the lines mounted on wide wheels.

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Salt washing plant on wheels



Salt slurry is discharged to the middle of the salt washing cone. The overflowing transport brine is pumped back to the harvesting unit.

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Basic types of mechanical salt harvesters

- **Tractor driven or self propelled**
- **On wheels or on Caterpillar trails**
- **Driving on salt bed or on crystalliser floor**
- **Cutting salt bed upwards or downwards**
- **Discharging onto belt conveyors or into trailers**

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Harvesting system in Yucatan, Mexico

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Tractor pulled harvester on double wheels drives with one side on the salt with the other side on the crystalliser bottom. The harvester lifts the salt to a truck pulled trailer, driving with double wheels on the salt.

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Harvesting system in Yucatan, Mexico



The salt layer is first ripped, then ploughed in a row. Salt floor is maintained on the crystalliser bottom. Cost of multiple operations is weighed against the cost of equipment.

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Washing plant feeding system in Yucatan



Salt is discharged from the trailers automatically, directly into the feeding hopper of the washing plant.

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Harvesting system in Kalloni, Greece



Kalloni saltworks operate a harvesting system consisting of a harvesting machine driving on the salt bed, cutting the salt on the side and lifting the salt onto belt conveyors has been in operation since many years.

Harvester on Caterpillar trails drives on the salt and cuts is alongside.

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Kalloni salt harvesting system

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The Kalloni harvester operation is controlled by a man walking alongside the machine. He adjusts the position of the cutting edge by a hand held controller.

Watch the salt layer being lifted from the mud floor by the cutting edge.

Salt is cut downwards, thrown upwards and lifted by a rubber belt to the belt conveyors.

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Kalloni salt transport system

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Belt conveyors bring the salt to a bin on wheels driving on a causeway. Lorries bring the salt to the washing plant.

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Messolonghi (Greece) harvesting system



At Messolonghi, the harvester cuts the salt in front and drives on the crystalliser mud bed. It lifts the salt to a system of engine driven belt conveyors.

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Messolonghi (Greece) harvesting system



The cutting level is controlled mechanically by a plate sliding on the salt layer surface. The salt is broken upwards and lifted to a belt conveyor.

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Walvis Bay (Namibia) harvesting system



Walvis Bay salt harvesting system was supplied by ROV Durrant Engineering Pvt. Ltd., South Africa. Harvester moves on Caterpillar trucks both on the salt and on the crystalliser floor. Salt is loaded directly to the trailers.

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Walvis Bay harvester



Salt is cut by a rotating drum upwards and discharged to a chain elevator located behind.

Cutting elevation is controlled by laser.

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Salt transport at Walvis Bay



Wide wheel tracks with two trailers bring the salt from the harvester to the washing plant.

Salt is discharged from the trailers automatically.

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Not always are salt harvesters successful



Example of a wrongly designed salt harvester that landed on the scrap yard.

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Conclusions

- **There are many salt harvesting systems in operation**
- **Which system is the best for you, depends on many factors**
- **Do-it-yourself development end up as a failure**
- **Properly designed systems give decades of good service**
- **Salt Partners experience is at your disposal**

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salt into
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