



“Mining companies are becoming more innovation friendly. And vertical consolidation is expected to grow in the mining industry, where mining companies acquire technology providers to achieve exclusivity and prevent competitors from realizing similar economic benefits.”

-From the report

September 2013

52 pages

104 footnotes

15 tables, charts & figures

Emerging Green Mining Innovation

Managing risk and profiting from new mining technology breakthroughs

As important as mining is, old and relatively inefficient techniques and equipment are still standard in many modern mining facilities today. New cleantech innovations hold promise for making mining more profitable, safer and better for the planet.

There are clear benefits to implementing new technologies, but there is also risk. Mining companies

historically haven't liked adopting new, unproven technology. That attitude is now changing, as companies are increasingly motivated by the dramatic economic benefits promised by new green mining breakthroughs.

Select companies around the world are poised to reinvigorate mining with cleantech innovations. Which ones stand the best chances of

success? How can existing players manage risk in the face of new innovation?

This report examines disruptive new technologies in biological tailings remediation, water treatment, hydrometallurgy, carbon sequestration and more. And it makes recommendations for investors, mining companies, policy makers, entrepreneurs and service providers.

REPORT INCLUDES

- Definition of mining cleantech, and relevance to profiled companies
- Drivers of new cleaner mining tech innovation
- Profiles of 47 companies, some with their technology illustrated
- Detail of emerging sectors like bioleaching and fuel and maintenance reduction

ALSO FEATURES

- Taxonomy of clean mining technology
- Findings based on interviews with technology vendors and other market insiders
- Recommendations for mining co.'s, entrepreneurs, policy makers and more

ESSENTIAL FOR

- Companies across the mining value chain, from small technology companies to large multinationals
- Investors seeking disruptive innovators
- Service providers seeking promising mining technology companies as clients
- Governments
- And others

Single user \$595

Site license \$950

Purchase and download from kachan.com.

Contact us at kachan.com/contact, or call +1-415-390-2080



Executive summary	5
Defining mining cleantech	5
Mine life cycle summary	7
Mining operations	8
The state of the art in mining technology innovation today	9
Cleaner mining technology market sizing	12
Sector profiles and leading emerging technology companies	14
Power reduction	14
Comminution efficiency	15
Low power separation	16
Hydrometallurgical processes	17
Other alternative processes	19
Fuel and maintenance reduction	20
Equipment route optimization	20
Fuel additives/filters	22
Natural gas conversion	23
Electric conversion	24
Improved lubricants, polymers and coatings	26
Training simulators	27
Other fuel reduction approaches	28
Toxicity reduction	29
Bioleaching	29
Bioremediation/phytoremediation	31
Non-cyanide separation	32
Emissions reduction	33
Dust management	33
Particulate sequestration	34
Carbon sequestration	35
Water reduction	36
AMD/ARD remediation	37
Water filtration/reuse	38
Wastewater processing	39
Tailings remediation	40
Desalination	42
Shortcomings & potential challenges	44
Recommendations	45
Conclusions	48
Methodology & bibliography	48

BASED ON

- Interviews with mining cleantech vendors
- Review of secondary sources
- In-depth access to leadership of the Clean Mining Alliance industry trade association

WORKSHOP OPTION

Seek more detail? Have a team you wish to share this research with? An interactive workshop presenting the findings of this report is available, onsite in person or via Internet presentation.

Workshops are available at a two hour base. Additional hours are available. Workshops include a site license to the report for unlimited internal distribution within your organization. Contact us for pricing and scheduling.

"Aside from economic benefits, cleantech can offer increased job satisfaction/HR value and mitigate social justice tensions. It can also reduce emissions and help contain contaminants, and provide a safer working environment for miners. These 'softer' benefits of clean technologies can also help boost mining companies' returns."

- From the report

ABOUT US »

Kachan & Co. is a boutique cleantech research and advisory company headed by Dallas Kachan—former managing director and executive editor of the Cleantech Group, the original provider of cleantech industry research.

Kachan publishes and markets analysis that charts the future of clean technology. Clients include global institutional cleantech investors, as well as some of the world's largest corporations such as BP, Deloitte, Ernst & Young, IBM, Veolia and others. View previous reports at www.kachan.com.

cleantech analysis and consulting

Download report from kachan.com. Or call us +1-415-390-2080

www.kachan.com

San Francisco | Toronto | Vancouver

KACHAN
& Co.