Hypex Bio Sustainable mining explosives

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Problem statement

- Around 20 million tons of Ammonium Nitrate (AN) explosives are used globally
- AN explosives cause significant CO2 greenhouse gas emissions and environmental issues
- AN explosives are hazardous to the environment and require high energy production
- Emissions from AN explosives lead to billions of dollars in post-processing and production downtime



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Why does this matter?

- Post detonation gases are highly toxic
- Ventilation times are long, longer for deep underground mines
- Short- and long-term exposure to nitrate fumes (NOx) leads to severe health issues
- AN leads to leading to high levels of ammonia formation in leeching water
- Water treatment of nitrates and ammonia is expensive
- Europe aims to reduce greenhouse gas emissions by 40% by 2030 compared to 1990.



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The solution

- Solution is a new Hydrogen Peroxide Explosive Biodegradable (Hypex Bio)
- Hypex Bio uses hydrogen peroxide (HP) instead of Ammonium Nitrate (AN)
- Detonation are water vapor, CO2 and CO, no NOx, nitrates nor ammonia gas nor leeching
- Hypex Bio provides the same blasting effect as AN explosives
- 1 kg of HP costs less than 0.25 kg of CO2, implying CO2 emission reductions of up to 90%.







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Project points

- HPG technology not feasible for mining industry
- HPE solution fully verified as acceptable in Boliden mining environment



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• Water-gel (HPG) composition, tested at Boliden Kankberg mine as a pilot project

Hypex Bio team used this experience to develop hydrogen peroxide emulsion (HPE)







Outcome

- HPG project allowed for pilot HPE compositions
- HPE technology refined to commercial maturity
- Proven commercially viable and reached TRL 9, CE
- Hypex Bio platform CE approved
- Global patents pending •





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In pictures









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Impact

- Hypex Bio's advances prove a greener future for bulk explosives is possible
- New era of civil explosives research
- Rollout of technology will address majority of ANE issues
- Technology will allow for savings and improved competitiveness for Swedish mining industry.





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The Future

Hypex Bio is committed to high ambitions, which implies a transition from ANE to HPE globally.

The company is currently working on implementing the technology into production in the Scandinavian and European mining and civil construction industries.

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