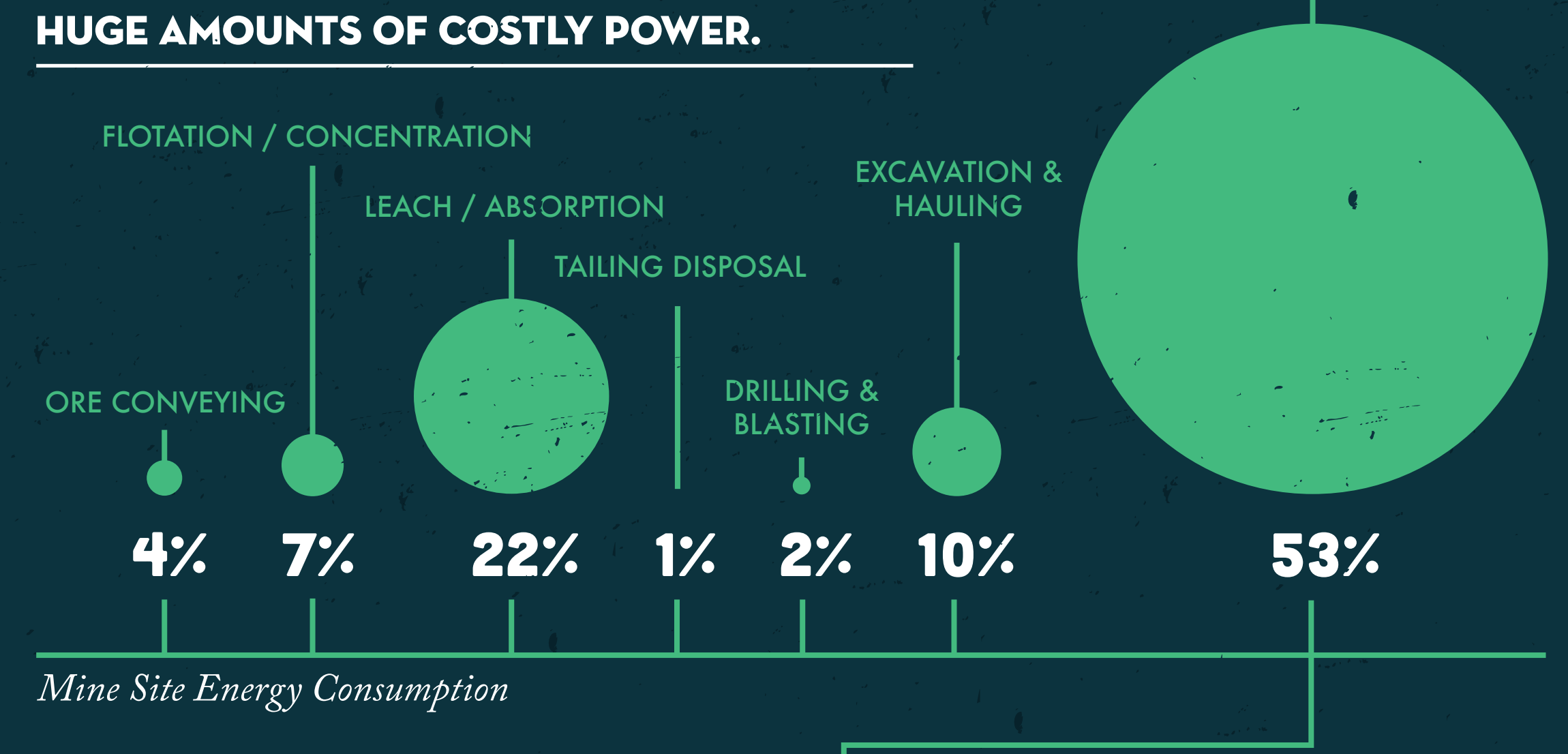
COMMINUTION

PLUGGING MINING'S LARGEST ENERGY DRAIN

IMPROVEMENT IN COMMINUTION PRESENTS A HUGE OPPORTUNITY FOR INCREASED EARNINGS.

ONCE MINED, ORES TYPICALLY MUST BE CRUSHED AND BROKEN BEFORE THE DESIRED MINERAL CAN BE EXTRACTED FOR USE IN THE MODERN WORLD.

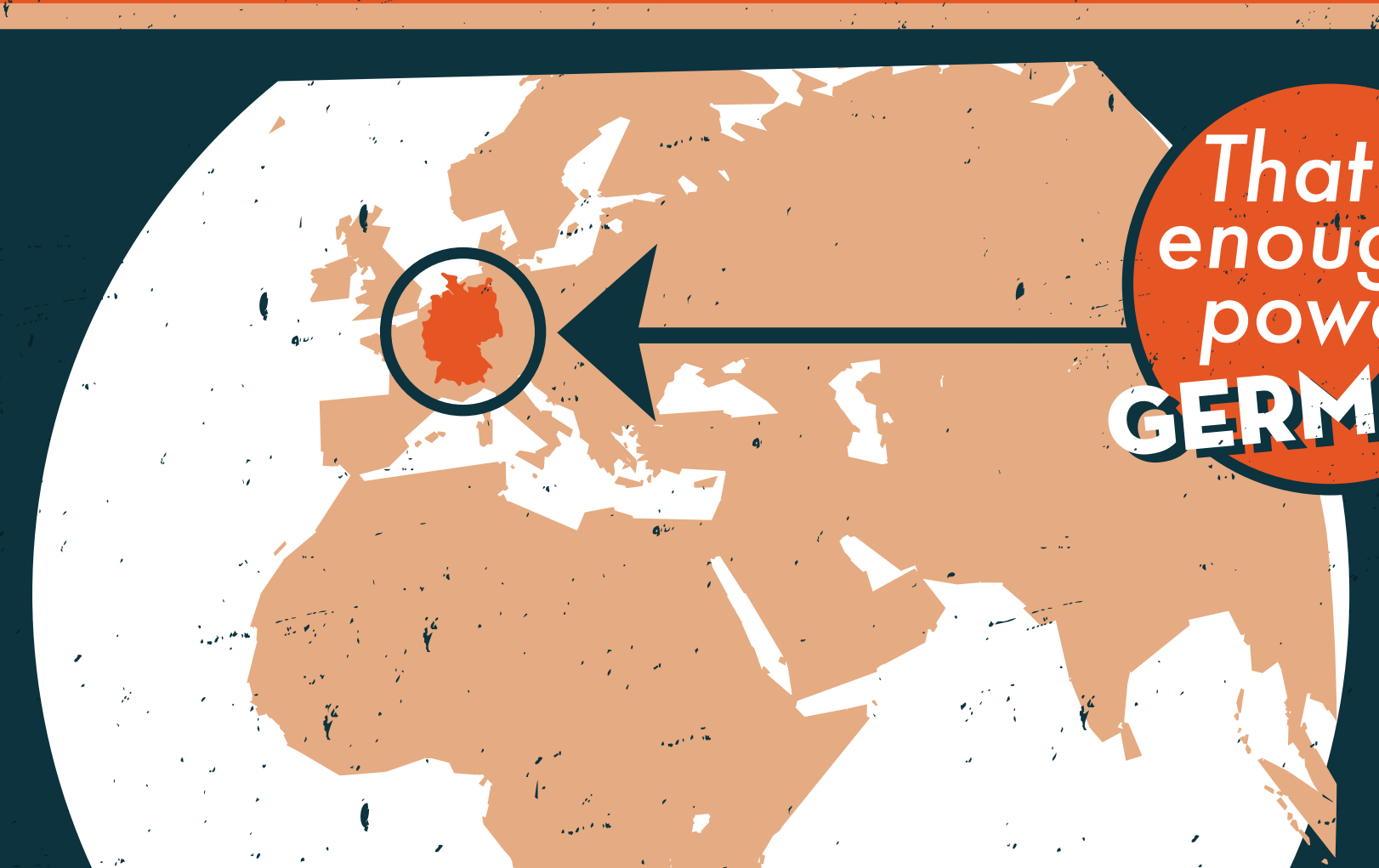
THIS PROCESS OF GRINDING AND CRUSHING ORE - COMMINUTION - REQUIRES HUGE AMOUNTS OF COSTLY POWER.



COMMINUTION ACCOUNTS FOR ABOUT HALF OF ALL MINE SITE ENERGY CONSUMPTION

AND REPRESENTS AT A MINIMUM 10% OF THE SITE PRODUCTION COSTS.

In fact: COMMINUTION CONSUMES 1.8% OF ALL ELECTRIC POWER GENERATED IN THE WORLD.*



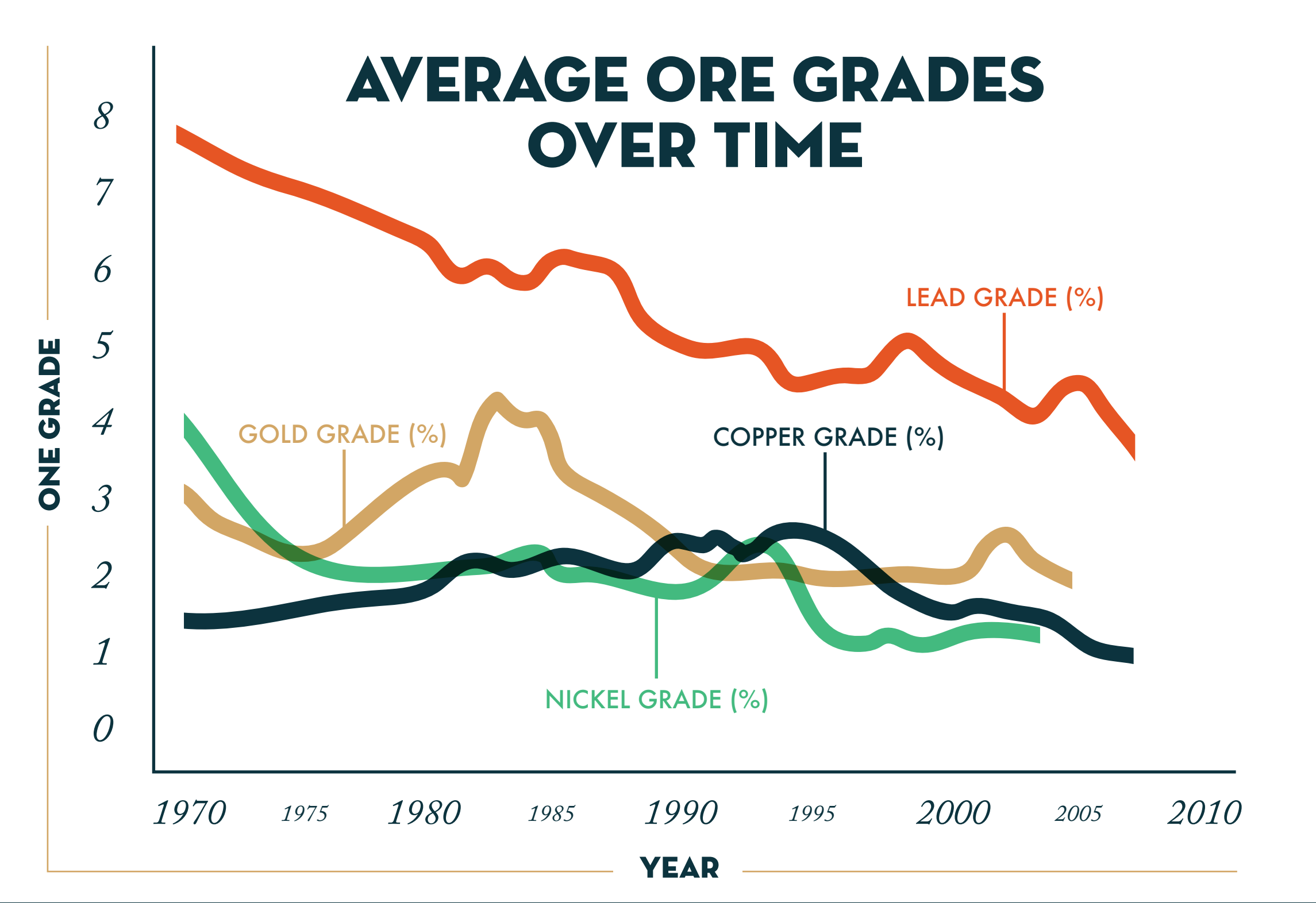
TWO IMPORTANT TRENDS IN THE MINING INDUSTRY ARE ONLY MAKING MATTERS WORSE.

Trend One: FALLING GRADES

As the highest grade orebodies are mined and exhausted first, the average grades of ores are falling across the board.

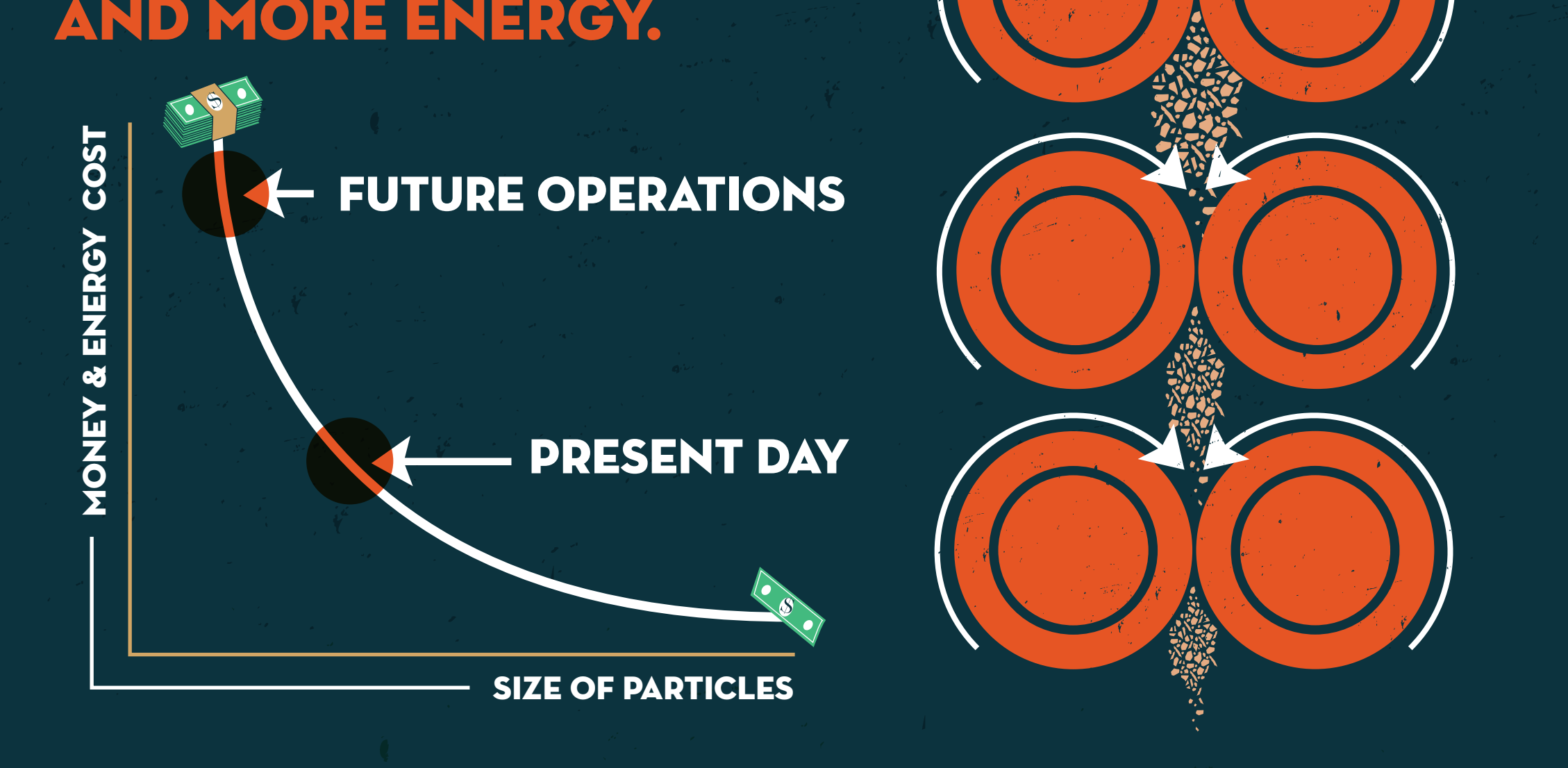
*Comminution, including hard rock mining, quarrying, cement, and coal pulverising, uses about 1.8% of global electricity and contributes 0.58% of global greenhouse gas emissions. The hard rock mining sector accounts for roughly a quarter of this, representing approximately 0.5% of global electricity and 0.13% of emissions (T. Napier Munn 2015, S. Morrell 2024)."

AVERAGE ORE GRADES OVER TIME



As the target minerals comprise lower volumes of the mined ore, the ore must be ground and crushed to smaller particles.

THIS REQUIRES MORE AND MORE ENERGY.

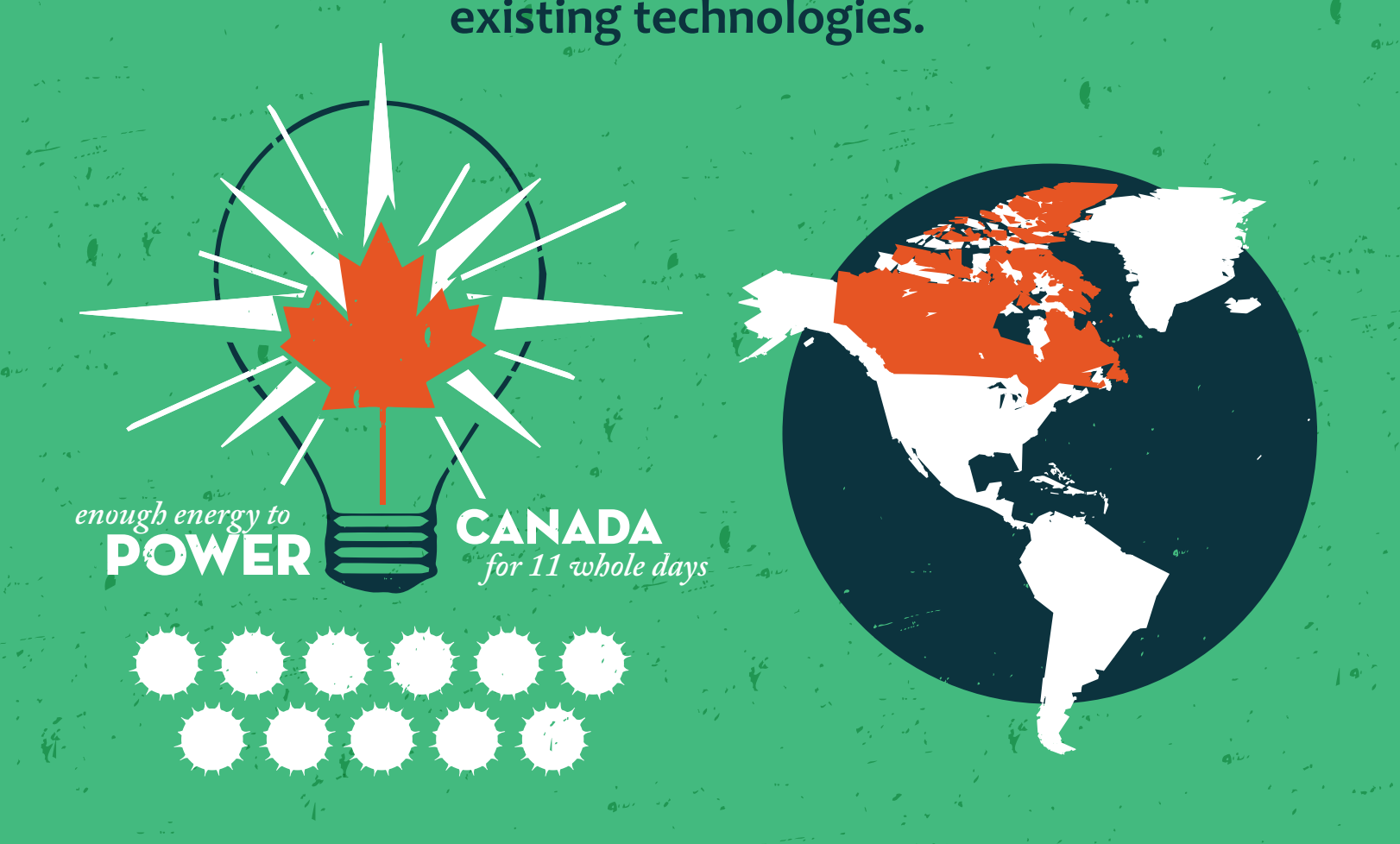


Trend Two: RISING COSTS

As the easily accessible orebodies are exhausted, mining operations are moving into more remote areas of the world, where infrastructure is limited and power is more costly.

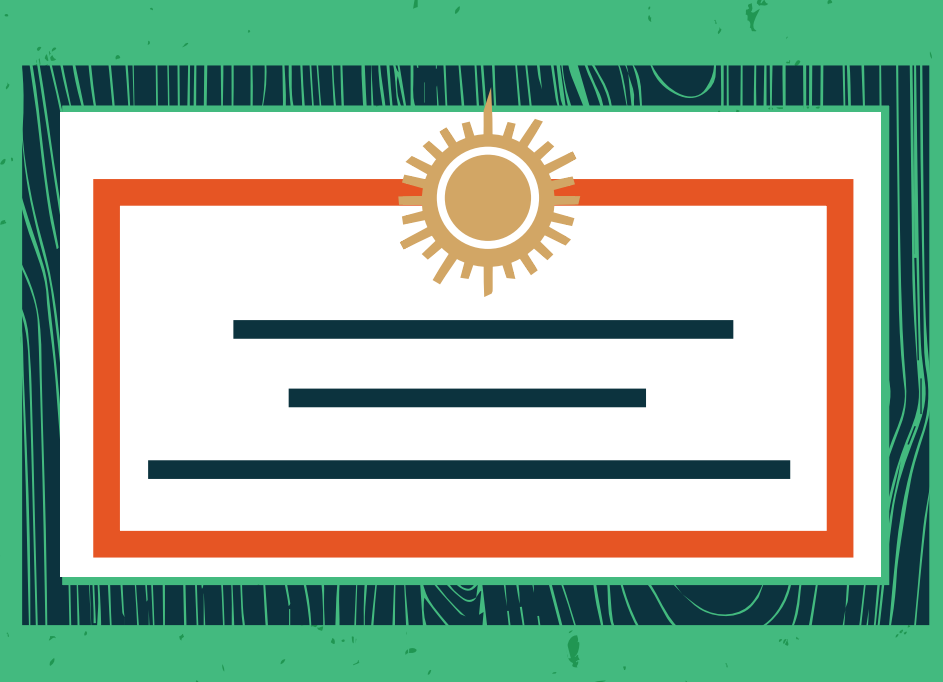
IT HAS NEVER BEEN MORE IMPORTANT TO IMPROVE COMMINUTION EFFICIENCY.

Studies show improvements of 25% or more are often available with existing technologies.



BY INCREASING COMMINUTION EFFICIENCY, MINING OPERATIONS CAN:

COMMINUTION EFFICIENCY IS ALSO BECOMING AN IMPORTANT "*ESG AND SOCIAL RESPONSIBILITY*" DRIVER.



THE GOOD NEWS IS THAT METHODS FOR IMPROVEMENT ALREADY EXIST. COMMINUTION CAN BECOME MORE ENERGY EFFICIENT THROUGH:

LEADERS IN THE INDUSTRY ARE NOW MOVING FORWARD. FOR EXAMPLE:

Compañía Minera Antamina doubled its SAG mill throughput between 2007 and 2010 through comminution optimization.

The Newmont Boddington Gold Mine has also optimized comminution processes and has doubled secondary crusher capacity and utilization.

+50%

Barrick Gold Corporation (world's largest gold producer) improved its comminution process last year at three mine sites and:

ACHIEVED AN AVERAGE REDUCTION IN ENERGY OF 5.3% FOR EACH MINE.

CREATED $5.2 MILLION ANNUALLY IN DIRECT ELECTRICAL SAVINGS.

AS WE EXHAUST EASILY-ACCESSIBLE, HIGH-GRADE OREBODIES, COMMINUTION EFFICIENCY IS BECOMING INCREASINGLY MORE IMPORTANT TO GREENHOUSE GAS EMISSIONS AND MINING OPERATIONS' BOTTOM LINES.

TO LEARN MORE ABOUT HOW COMMINUTION EFFICIENCY CAN BE IMPROVED VISIT WWW.CEECTHEFUTURE.ORG

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