Fails to meet criteria	Not promising	Meets in some respects	Potentially meets criteria	Meets criteria

* For explanation of criteria see Box B, page 22

ASSESSMENT TABLE: **Mining**

	Credible			Capable		Compelling			Priority approach
	Maturity	Economic viability	Social acceptability	Fit for purpose	Net-zero pathway potential	To critical stakeholders	Related costs and benefits	Economic development opportunities	
Electric mining equipment	Reasonably mature. OEMs have begun to sell battery electric equipment. Hydrogen fuel cell mining equipment under development	High - higher capital costs offset by lower operational costs	No particular problems	Yes	Yes. Essential	Yes because of maturity and potentially favorable economics	Reduced air pollution. Could be combined with autonomous and connected vehicle technology but requires new labour skills at mine site. Benefits from safety,	High - some mining equipment is already assembled in Canada. Opportunities for research, design, engineering, and assembly in Canada	Very high
On-site renewable energy generation and storage	Early mature and continuously improving	Can be good but site-specific	No particular problems	Yes	Yes	Yes when site circumstances are appropriate	Reduces reliance on diesel generators, improves reliability of power supplies, requires new labour skills at mine site, reduces local air pollution	High, given the current low adoption of these technologies and the potential for domestic suppliers	Very high
Small modular nuclear reactors (SMRs)	Low - SMRs are pre-commercial	Too early to tell what costs will be	Public concerns around safety and waste disposal	Yes. Scaling of plant to demand will be critical	Yes in principle. For full net zero requires decarbonized production chain	Strong support from the nuclear industry	Can provide emission free heat and power to local communities. Requires new labour skills at mine site. Multiple issues: long term waste storage, risk of accident, security, decommissioning costs. Complicates site remediation	Yes, given existing nuclear industry	Low to Medium. Technology not yet available
Transformation of extraction and processing technologies	Different degrees of maturity	Dependent on specific technology and process	No particular concerns	In principle	Yes: contributes by lowering requirements for decarbonized energy production and storage	From operators when cost effective	Reduces operational costs. Can reduce water use, tailings	High. Innovations can be marketed for global applications	Medium/high Essential for electrification
Metal recycling and recovery technologies	Many already mature	Dependent on specific materials and technology	No particular concerns	In principle	Can contribute. to net zero. Requires decarbonised energy supply	Potentially	Reduces operational costs, creates additional revenue stream	Some., market innovations for global applications	Medium Complements other approaches
Materials efficiencies in consumer sectors	Varied	Depends on application	No particular concerns	In principle	Can contribute, by reducing need for primary or recycled materials. But spread across many economic sectors and difficult to secure	Appealing to end use industries, not necessarily primary producers	Reduces material throughput, air and water pollution, biodiversity pressures	Potentially, but spread across many industries	Low to Medium Complements other approaches