Northern Dynasty Minerals Ltd.

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Northern Dynasty: US green energy policies drive unprecedented demand for copper

May 17, 2021 Vancouver – Northern Dynasty Minerals Ltd. (TSX: NDM; NYSE American: NAK) ("Northern Dynasty" or the "Company") President & CEO Ron Thiessen said recent targets set by the United States government for America's transition to clean, renewable energy will drive a massive increase in domestic copper demand and consumption over the coming decade.

"For many reasons – including its cost, conductivity, ductility and durability – copper is an irreplaceable metal for renewable and low-carbon energy and electrification technologies," Thiessen said, noting the volume of copper used per unit of energy output in renewable energy systems (or copper intensity) can be 2 – 5 times greater than in conventional energy generation.

"The US imports more than 35%[1] of its annual consumption of refined copper today. When you consider the vast amounts of additional copper metal required to achieve both President Biden and US Congress' climate change adaptation goals, as well as the *American Jobs Plan* mandate to bring associated manufacturing jobs home to the United States, the increase in demand over the next decade will be truly staggering."

Among the renewable energy sources prioritized by the US government is offshore wind farms, for which President Biden set a target of developing 30,000 MW of new generating capacity by 2030. Achieving this goal, which would deliver enough renewable energy to power 10 million American homes, means the country must achieve a 7,000%-plus increase in its current offshore wind farm capacity in under a decade.

According to the International Energy Association ("IEA"), offshore wind is the most copper intensive source of mass energy generation – requiring an estimated eight tonnes of copper per megawatt of installed capacity ("t/MW") versus 2.9 t/MW for onshore wind, 2.82 t/MW for solar, 1.47t/MW for nuclear, 1.15 t/MW for coal and 1.1 t/MW for natural gas[2].

Recent precedents demonstrate that offshore wind installations can have even greater copper intensity than eight t/MW. For instance, Germany's 450 MW Borkum Riffgrund 2 offshore wind farm, commissioned in 2019, utilizes almost 15 tonnes of copper per installed megawatt of capacity – a copper intensity that could be surpassed in future as wind farms are built further from shore.

"What these numbers tell us is the United States' goal to transition from carbon-intensive energy derived from conventional sources such as coal and natural gas to renewable energy from clean sources such as wind and solar will drive a step change in the country's copper consumption," Thiessen said.

"Based on the President's 30,000 MW offshore wind generation target alone, the United States will have to source an additional 240,000 to 450,000 tonnes of refined copper metal between now and 2030. That represents about one-quarter to one-half of the country's current annual production."

President Biden's target for offshore wind is just one small part of a much larger proposed transition to clean and renewable energy generation in the United States. All of the energy infrastructure and technology deployments associated with this shift are copper intensive, and will serve to increase both the nation's copper consumption and the current gap between domestic supply and demand.

For example, President Biden has set a target for 100% of the electricity generated in the United States to be carbon-free by 2035. This means the roughly 60% of US electricity currently generated from coal, natural gas

[1] https://pubs.usgs.gov/periodicals/mcs2021/mcs2021-copper.pdf

[2] IEA, *The Role of Critical Minerals in Clean Energy Transitions* (May 2021)

and other carbon-emitting sources – about 3 trillion kilowatt hours ("kW/h") per year – must be replaced by sources like wind and solar.

The implications of this broader policy goal on future US copper demand are massive. Given intermittency issues associated with energy sources like wind and solar, and assuming there is no change in future US power demand over current levels, the requirement to generate an additional 3 trillion kW/h of power annually could necessitate the development of ~1,000 GW[3] of renewable power generating capacity in the United States over the coming 14 years.

If this gap were to be filled exclusively by offshore wind, the US would have to source 8 to 15 million tonnes of refined copper metal by 2035. Annual US copper consumption would increase by 600,000 to 1 million tonnes or more given the long-lead times associated with developing large-scale energy infrastructure – surpassing the country's current production of refined copper metal.

"It's unlikely the United States will meet its target of 100% carbon-free electricity by 2035 through offshore wind generation alone," Thiessen said. "But the calculations are sobering – particularly when you consider the country will also have massive copper requirements for power distribution, electrification technologies such as electric vehicles, retrofitting factories, commercial and residential buildings, and modernizing industries from agriculture to transportation."

Thiessen said the United States' need to secure a reliable supply of refined copper to achieve its climate change adaptation goals, and implement the *American Jobs Plan*, comes at a time when the rest of the world will also be pursuing copper-intensive infrastructure development and technological change. While US competitors such as China have spent the past decade or more securing its supply of strategic and critical metals including copper, the US mining and metals industry has struggled to achieve permit approvals for new, modern mining operations.

"The United States today is home to several of the most significant undeveloped copper resources in the world, and possesses both the industrial expertise and environmental oversight to develop them safely and responsibly," Thiessen said. "Whether it chooses to do so, or whether it opts to increasingly rely on foreign producers – including those with questionable environmental and human rights records, and those controlled by competitors like China – will be entirely up to the current generation of political leadership."

Thiessen said development of several world class, modern copper mines in the United States is the first important step toward the overall goal of self-sufficiency in a mineral that will be critical to America's transition to a sustainable, low-carbon future.

About Northern Dynasty Minerals Ltd.

Northern Dynasty is a mineral exploration and development company based in Vancouver, Canada. Northern Dynasty's principal asset, owned through its wholly owned Alaska-based U.S. subsidiary, Pebble Limited Partnership, is a 100% interest in a contiguous block of 2,402 mineral claims in southwest Alaska, including the Pebble deposit, located 200 miles from Anchorage and 125 miles from Bristol Bay. The Pebble Partnership is the proponent of the Pebble Project, an initiative to develop one of the world's most important mineral resources.

[3] Includes an allowance for intermittency

For further details on Northern Dynasty and the Pebble Project, please visit the Company's website at www.northerndynastyminerals.com or contact Investor services at (604) 684-6365 or within North America at 1-800-667-2114. Review Canadian public filings at www.sedar.com and US public filings at www.sec.gov.

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Forward Looking Information and other Cautionary Factors

This release includes certain statements that may be deemed "forward-looking statements" under applicable law. All statements in this release, other than statements of historical facts, that address permitting, development and production for the Pebble Project are forward-looking statements. These statements include statements regarding (i) the mine plan for the Pebble Project, (ii) the social integration of the Pebble Project into the Bristol Bay region and benefits for Alaska, (iii) the political and public support for the permitting process, (iv) the ability to successfully appeal the negative Record of Decision and secure the issuance of a positive Record of Decision by the US Army Corps of Engineers and the ability of the Pebble Project to secure state permits, (v) the right-sizing and de-risking of the Pebble Project, (vi) the design and operating parameters for the Pebble Project mine plan, (vii) exploration potential of the Pebble Project, (viii) future demand for copper and gold, (ix) the potential partnering of the Pebble Project, and (x) the ability and timetable of NDM to develop the Pebble Project and become a leading copper, gold and molybdenum producer. Although NDM believes the expectations expressed in these forward-looking statements are based on reasonable assumptions, such statements should not be in any way be construed as guarantees that the Pebble Project will secure all required government permits, establish the commercial feasibility of the Pebble Project or develop the Pebble Project. Assumptions used by NDM to develop forward-looking statements include the assumptions that (i) the Pebble Project will obtain all required environmental and other permits and all land use and other licenses without undue delay, (ii) studies for the development of the Pebble Project will be positive, (iii) NDM's estimates of mineral resources will not change, (iv) NDM will be able to establish the commercial feasibility of the Pebble Project, and (v) NDM will be able to secure the financing required to develop the Pebble Project. The likelihood of future mining at the Pebble Project is subject to a large number of risks and will require achievement of a number of technical, economic and legal objectives, including (i) obtaining necessary mining and construction permits, licenses and approvals without undue delay, including without delay due to third party opposition or changes in government policies, (ii) finalization of the mine plan for the Pebble Project, (iii) the completion of feasibility studies demonstrating that any Pebble Project mineral resources that can be economically mined, (iv) completion of all necessary engineering for mining and processing facilities, (v) the inability of NDM to secure a partner for the development of the Pebble Project, and (vi) receipt by NDM of significant additional financing to fund these objectives as well as funding mine construction, which financing may not be available to NDM on acceptable terms or on any terms at all. NDM is also subject to the specific risks inherent in the mining business as well as general economic and business conditions, such as the current uncertainties with regard to COVID-19.

The National Environment Policy Act Environmental Impact Statement process requires a comprehensive "alternatives assessment" be undertaken to consider a broad range of development alternatives, the final project design and operating parameters for the Pebble Project and associated infrastructure may vary significantly from that currently contemplated. As a result, the Company will continue to consider various development options and no final project design has been selected at this time.

For more information on the Company, Investors should review the Company's filings with the United States Securities and Exchange Commission and its home jurisdiction filings that are available at www.sedar.com