



The two sides of the coal story

While the demand for thermal coal evaporates, metallurgical coal is a growing commodity

By Kelsey Rolfe

C Crowsnest Pass Mayor Blair Painter is hoping Riversdale Resources' Grassy Mountain metallurgical (met) coal project could be his municipality's first real industry in almost 40 years, marking a return to the area's halcyon days as a mining district.

Located in the Rocky Mountains in southern Alberta, Crowsnest Pass has struggled since the area's last coal mine closed in 1983, ending nearly a century of mining in the area. Today, faced with an 86 per cent residential tax base (meaning most of the taxpayers are residents, not businesses that

pay the higher taxes that typically fund municipal coffers) and a reduction in funding from the provincial and federal governments, the local council has been largely hamstrung from making community investments. For community leaders, it is hard not to look with envy across the Rockies at the prosperous British Columbia towns of Sparwood and Elkford, where Teck Resources' met (or coking) coal mines operate. That region produces roughly 25 million tonnes per year of bituminous coal used in blast furnaces for steelmaking, most of it bound for plants in Asia.

“[We’ve been limited in] the improvements we can make throughout the community and the initiatives we want to do,” Painter said. “We definitely need the industry for economic reasons.”

Meanwhile, just outside of Edmonton, the municipal district of Parkland County is preparing for the end of the region’s major industry. The accelerated provincial phase-out of coal-fired power generation has been particularly hard on the region, site of six coal-fired power facilities and the Highvale coal mine, which owner TransAlta announced would be shut down by the end of 2021. Local leaders estimate at least 1,440 jobs will be cut by 2030, and note the newly converted natural gas power plants will need only half the employees to run. They are anticipating secondary impacts on seasonal jobs, coal service providers and overall community investment.

“Certainly it’s had a profound and significant impact on the residents as well as the revenues of Parkland County,” said Mayor Rod Shaigec, who added that the early Highvale closure came as somewhat of a surprise. “We are focused and hopeful we will get some financial infusion, particularly into infrastructure. Otherwise we are going to be challenged as we move forward.”

The future of coal leads in two directions. Thermal coal, long the cheapest and most popular form of power, is on the decline as a myriad of governments seek to phase it out of their energy mix, investors divest it from their portfolios and the economics of producing it become more challenging as renewable energy gets increasingly cheaper and natural gas provides power plants a relatively cleaner alternative. Met coal miners, meanwhile, can anticipate a rosier few decades off the back of renewable energy and low-carbon economy growth, and the rapid urbanization of developing nations. (The difference between the two coal types comes down to composition and quality. There is more ash, sulfur and moisture in thermal coal and more carbon in met coal. As BHP explains “Better quality met coal tends to have more...reactive fusible components, resulting in stronger coke.”)

Perhaps nowhere represents the diverging futures of coal better than Alberta, where the provincial government made a substantial bet on its vast resources of met coal in mid-2020 by repealing a long-standing land use policy that put curbs on open-pit coal mining in some of the province’s most beloved regions. At the same time, Alberta has seen a dramatic acceleration in its phase-out of thermal coal, putting it on track to have a coal-free power grid years ahead of schedule. Both developments have invited tough, and sometimes heated debates about how to balance the province’s economic health and employment numbers against long-term environmental stewardship.

New regulations

It may be a while until Painter knows whether the coal mine is coming to town. In mid-December 2020, weeks after Grassy Mountain hearings concluded, the federal government announced it had given the joint review panel until June 18, 2021, to issue its recommendation report. Gary Houston, vice-president of external affairs for Riversdale, is confident in the project, which would produce about 4.5 million tonnes of processed coal per year over a 23-year mine life.

“We’ve just passed through one of the most rigorous regulatory systems in the world and been able to defend our project,” he said. “We’re proposing a project that is providing a valuable contribution and a huge economic boost to the community. At

the same time, we’ve thought long and hard about environmental protections.”

If Grassy Mountain is given the green light, it could be the first of several new met coal mines in the region, thanks to the provincial government’s June 2020 repeal of the 1976 coal policy, which had strictly limited or outright banned coal development in the ecologically sensitive Rocky Mountains and Foothills. The biggest impact of the repeal was on category 2 lands, which are a swath of 1.4 million hectares with moderate-to-high environmental sensitivity where surface mining was previously banned, exploration was acceptable if limited and underground mining was permitted only where the mine’s surface impacts were deemed environmentally acceptable. The policy change lifted a hurdle for coal miners with projects in those areas, including Atrium Coal’s Elan project north of Grassy Mountain near Crowsnest Pass and Ram River Coal’s Ram River properties west of Red Deer. The government went a step further in late 2020, giving miners the opportunity to bid on 2,000 hectares of land on the eastern slopes of the Rockies, though it cancelled 11 leases originally issued in December and put a pause on future sales in January after significant blowback.

The repeal, which has invited swift criticism from conservationists and two requests for judicial review from landowners and First Nations, was partly born of the province’s challenging economic circumstances. Facing a mild recession in 2019 largely due to pipeline uncertainty, Alberta was already struggling before the COVID-19 pandemic and the oil price war hit. In January 2020, the province’s 7.3 per cent unemployment rate exceeded the Canadian average of 5.5 per cent. As of December 2020, it was 11 per cent.

Alberta energy minister Sonya Savage called the coal policy redundant in the face of more modern regulatory processes and land-use policies. “As we strengthen our focus on economic recovery and revitalization, we will continue to make common-sense decisions to create certainty and flexibility for industry, while ensuring sensitive lands are protected for Albertans to continue to enjoy,” she said in May.

Tony Mauro, senior director of regulatory and stakeholders at Australia-based Atrium, said the new provincial policy has caused very few changes for the company, save for no longer needing ministerial approval for Elan. “The coal policy required a heightened level of review, but really the corollary to that is that since 1976 we’ve really evolved in terms of our environmental management, our legislation and regulation to the point where all the things we have to do today, even before the repeal of the policy, aren’t going to change,” he said.

The environmental argument against coal

Opponents to coal mining have expressed worries that mining could affect the region’s air and water quality as well as wildlife and species at risk. They draw attention to one species of fish: the westslope cutthroat trout. In British Columbia’s Elk Valley, Teck Resources has struggled with high selenium concentrations from its mines and legacy mining in the region, which has damaged the native trout population. The company has invested \$742 million in selenium treatment facilities that treat millions of litres per day, and will treat even more when Fording River’s facility comes online in 2021.

Riversdale is planning to employ similar technology. The mine’s proposed selenium treatment system would store rocks containing selenium and capture and treat the water that comes

into contact with them. “This is a modern coal mine, we’re standing on the shoulders of all the coal mining that’s happened before and all the good work that’s come before us in all respects,” Houston said.

But Morrison is wary. “[Teck has] had major issues with selenium releases and has spent [millions] of dollars trying to get that selenium problem under control and still have not been able to address it,” she said. “They are piloting some new approaches in the Elk Valley, but it’s really new and so we don’t know on a long term its efficacy and ability to be maintained.”

The economic argument for coal

Coal proponents, however, focus on the economic advantages that come with new mine developments. New coal projects would bring tax revenues for all governments and hundreds of good paying jobs, particularly to currently low-income regions, said Robin Campbell, president of the Coal Association of Canada. “Looking at an average, a coal miner [is paid] in the \$100,000 range. They’re making good money and they’re long-term jobs. It’s a real benefit to rural communities.”

From an economic standpoint Alberta’s bet on met coal is solid. While the economic slowdown prompted by the pandemic battered met coal prices as short-term demand went slack, supply and demand are expected to rebalance in the medium term as the recovery prompts further steel production, said Ben Carstein, lead analyst for metallurgical coal mining cost research at CRU Group.

Towards the end of the decade, Carstein said CRU forecasts supply to fall more quickly than demand “as existing mines deplete, creating a gap between demand and supply, in return requiring new projects to be developed.”

Steel will be needed for clean energy projects and other low-carbon economy staples such as hybrid and electric cars and rapid transit, but the biggest driver of demand in the coming decades is expected to be increasing urbanization in key emerging markets, particularly India, Southeast Asia and Latin America. According to Anthony Knutson, principal analyst for coal at Wood Mackenzie, the firm expects seaborne metallurgical coal exports to hit around 400 to 500 million tonnes annually between 2040 and 2050, up from roughly 300 million tonnes per year currently.

“If we assume that the real global growth drivers are still China, India, et cetera, ...we’re not at that stage yet where they’ve reached that middle-class [infrastructure],” added Nick Szucs, Canadian equity analyst at Leith Wheeler Investment Counsel.

Steelmaking’s carbon challenge

While met coal is expected to be around for the long term, experts are watching technology developments in the steelmaking sector that could significantly reduce the need for coal. Steelmaking represents seven per cent of global carbon emissions, and companies are facing increasing pressure to reduce their footprint.

Currently, electric arc furnaces (EAFs) and direct reduced iron (DRI) represent the easiest paths to lower carbon emissions. Unlike blast furnaces, which use met coal as a reductant to turn iron oxide into pure iron, EAFs can use both iron and scrap metal, and the more scrap that is fed in, the less coal is required. DRI, which is produced when carbon monoxide and hydrogen

are used to remove oxygen from iron ore (keeping it in a solid state rather than melting it in a blast furnace), reduces the need for coal. According to the World Steel Association, producing 1,000 kg of crude steel in an EAF typically requires 710 kg of scrap steel, 586 kg of iron ore (DRI or hot metal), 150 kg of coal, 88 kg of limestone and 2.3 gigajoules of electricity. A traditional blast furnace producing the same amount of steel requires 1,370 kg of iron ore, 780 kg of coal, 270 kg of limestone and 125 kg of scrap steel.

“For impacted workers and communities, we need to implement a just transition, provide them with easier pathways to transition into other work, earlier retirement, whatever is the best solution that fits their situation.”

– Binnu Jeyakumar, director of clean energy at the Pembina Institute

In 2018 the World Steel Association reported that EAFs produced 28 per cent of the 1,809 million tonnes of global crude steel production – compared to 72 per cent for blast furnaces – but Knutson said their use is becoming more prevalent across the globe, particularly in China. Wood Mackenzie expects EAF production to almost double by 2050, and the use of scrap metal to increase to 900 million tonnes annually in that time, up from 500 million tonnes currently. DRI production is about 100 million tonnes per year currently, and is expected to grow by about 50 per cent by 2050.

Some companies have even bigger plans. In October 2020, steelmaking giant ArcelorMittal Europe announced it would produce 30,000 tonnes of green steel in 2020, scaling up to 600,000 tonnes by 2022, as part of its plan to achieve net zero by 2050. The company’s strategy involves developing a series of industrial-scale hydrogen projects. One will attempt to use hydrogen as a reductant in blast furnace-based steelmaking, and another will use it in DRI. The company is also considering developing a large-scale DRI plant, which would use natural gas but be built “hydrogen-ready.”

Thyssenkrupp Steel also launched a series of tests aimed at injecting hydrogen into a working blast furnace in 2019. In Sweden, SSAB, LKAB and Vattenfall started up their joint pilot plant for hydrogen DRI in August 2020.

Hydrogen could be a game-changer, eliminating the need for met coal entirely, but its adoption faces several major hurdles. All the hydrogen tests underway are in the early pilot stage. In order to make a dent in emissions, the element would have to be produced without fossil fuels, something that’s currently highly expensive to do (just 0.5 per cent of all hydrogen currently produced is made this way). It also requires a huge amount of electricity to produce, and faces unique transportation and storage challenges.

Wood Mackenzie doesn’t expect hydrogen to have any impact on the use of met coal until close to 2050. “I was listening to the [stakeholders in the] Grassy Mountain hearings, and I understand their concerns. Hydrogen came up quite a bit and I’d love them to understand that...people are making the efforts but you can’t flick it on,” Knutson said. “It’s like turning around a big ocean liner. It’s not going to happen overnight.”

Thermal coal market cooling

While there is promise for met coal mines in the province, Alberta's thermal coal industry is coming to a rapid end. The province's three major energy providers – Capital Power, TransAlta and ATCO – are all on track to transition their coal-fired power plants to natural gas by 2022 or 2023, making its energy grid coal-free seven years ahead of the 2030 timeline set out by the provincial and federal governments.

The move away from thermal coal in the formerly dependent province has been swift and stunning: in 2020, the rock represented 27 per cent of Alberta's power mix – down significantly from about 50 per cent in 2015, and from 64 per cent in 2006.

According to Binu Jeyakumar, director of clean energy at the Pembina Institute, the feat was made possible by a few driving factors. Phase-out messaging sent strong signals to the power industry, and Alberta sweetened the deal with transition payments to companies initially planning to operate their coal-fired units past 2030. The provincial carbon-pricing scheme introduced by former Premier Rachel Notley in 2015 also played an important role.

The change in Alberta mirrors a global shift away from thermal coal, prompted both by declining liquid natural gas and renewable energy costs and strong policy support from governments. According to the International Energy Association's (IEA) 2020 report, global coal consumption is estimated to have fallen by seven per cent, or over 500 million tonnes, between 2018 and 2020. The IEA estimated a further five per cent drop occurred during 2020 – the largest one-year drop since the Second World War. Meanwhile, the report said, lower natural gas prices globally due to the expansion of LNG supply have made gas-fired power plants more competitive than coal-fired units. Based on governments' stated policy commitments, the IEA expects natural gas use to grow 2,070 terawatt hours between 2019 and 2040, while coal will decline 864 terawatt hours. Wind and solar energy usage, meanwhile, is expected to grow by more than 4,000 terawatt hours each.

In that environment, it is becoming increasingly difficult to make a buck off thermal coal, Jeyakumar said. A 2018 Carbon Tracker study reported 42 per cent of coal plants worldwide are running at a loss. "I would say that industry was making a really wise business decision by moving away from coal."

This comes as 97 national and subnational governments and various organizations have committed to transitioning to a coal-free future. Financial support for thermal coal projects is drying up, with 130 "globally significant" banks and insurers having committed to divest from coal mining or coal-fired power plants – with 43 of those commitments in 2020 alone – according to the Institute for Energy Economics and Financial Analysis.

The route to a full phase-out won't be a consistent drop, with the IEA noting China, India and various Southeast Asian countries in particular are expected to increase their use in the coming years. While Europe and the United States will reduce their consumption, they now only represent about 10 per cent of worldwide coal use. Globally, coal demand is expected to flatten out at around 7.4 billion tonnes in 2025.

The phase-out has prompted the "just transition" movement in Canada and other countries to ensure coal workers can find other employment. According to the Pembina Institute, phasing out coal would impact 3,100 jobs in Alberta alone by 2030, with the majority of those jobs coming from mining. "For impacted

workers and communities, we need to implement a just transition, provide them with easier pathways to transition into other work, earlier retirement, whatever is the best solution that fits their situation," Jeyakumar said.

In early 2019, the federal government's Just Transition for Canadian Coal Power Workers and Communities Task Force released 10 recommendations, including funding local transition centres, providing workers a financial bridge to retirement and creating a funding program for workers staying in the labour market. The Alberta government also created the \$5 million Coal Community Transition Fund and made financial assistance available for re-employment, retirement, relocation and education for workers.

But according to Campbell, governments have not done enough. The federal panel lacked voices from the coal industry, and while power companies received financial incentives, mining companies got nothing. "You had people who worked hard in the industry providing a solid power base for this province. For the government to turn their back, I think [that] was wrong."

Jeyakumar, meanwhile, said the shortened timeline in Alberta for phasing out coal-fired plants puts the pressure on both levels of government to ramp up their supports. "This should motivate everyone to step up the efforts, because it is facing us in the immediate future."

The future, with or without coal

Parkland County understands the loss of coal revenues better than most communities. The district has faced a steady decline in coal-related tax revenues since 2016, and in 2019 cut its budget by 5.5 per cent from the previous two years.

But the community isn't down and out. Two major highway infrastructure projects in the area have brought in hundreds of construction jobs. The county has also brought in an energy-pellet plant, a pet food plant and a cannabis production facility, and is working on a 20-year economic development plan with two other municipalities. "We don't expect to be fully compensated, but we have taken significant steps as a municipality to take hold of our own destiny as well," said Shaigec. "We've made some difficult financial decisions as we move forward, but we're trying to ensure that we maintain a low tax rate and that we are sustainably moving forward."

In Crowsnest Pass, Painter said Grassy Mountain could be a major boon if it is approved. The municipality would earn \$500,000 per year in additional tax revenue from just the mine's load-out area, as well as other benefits. "We're anticipating, on the residential side, new families moving in. So we're looking forward to some additional residential tax revenue," he said. "It [would benefit] our schools, our retail businesses, our hospitals. It makes all those things more viable."

But the council and local residents, while largely supportive, have some reservations. They have expressed concerns about the potential noise and disruption of the region's "dark sky" atmosphere, but the biggest worries are about the area's water and air quality. "We are a mountain community, outdoor recreation is a big part of our [economy], so it's important that the two co-exist together," said Painter.

Campbell thinks it is possible, in Crowsnest Pass and elsewhere in the province. "We've always found a balance between the environment and the economy," he said, "and we continue to strive for that balance." 