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US weekly production reaches year high

US coal production totalled 15.9 million st in the week ended December 22, reaching the 2018 peak in weekly production unless the final week of the year tallies higher, data from the US Energy Information Administration showed recently.

This was the largest weekly production amount since the week ended September 2, 2017 with production of 16.4 million st.

Total US production in week 51 rose 3% from the prior week and increased 4.4% from the year-ago week. The rise was aided by week on week increases across all four basins – Central Appalachian, Northern Appalachian, Illinois Basin, and the Powder River Basin - along with production increase from three of the four basin from the corresponding 2017 week.

Production in Wyoming & Montana, which is largely made up of Powder River Basin coal, totalled over 7 million st, up 4.2% from the prior week and up 3% from the year-ago week. Through 51 weeks of the year production totaled nearly 334 million st, with annualised production expected to be over 341 million st.

CAPP production totalled over 2 million st, up 1.2% from the prior week and up 9% from the year-ago week.

Production through 51 weeks of the year totalled nearly 96 million st, with annualised production expected to total almost 97 million st.

Production in the NAPP basin totalled over 2.1 million st, up 2.6% from the week before and down 1.6% from the year-ago week.

Production through the most recently concluded week totalled over 101 million st, while annualised production would total over 101 million st.

Weekly coal production from the Illinois Basin totalled almost 1.7 million st, up 1.5% from the prior week and up 0.4% from the corresponding 2017 week. Production through 51 weeks totalled over 85 million st.

Annualised production in the basin would total over 104 million st.

Through the first 51 weeks of the year, US coal production totals over 740 million st, and down 2.7% from the same point last year with over 760 million st.

No shortage in the country

During April-November, 315.94 mt of the fuel supplied to power sector

There is no shortage of coal in the country right now, Minister for Coal Piyush Goyal informed the Lok Sabha recently.

"There is no shortage of coal for the power plants... During April-November 2018, Coal India Ltd (CIL) has supplied 315.94 million tonnes (mt) of coal to the power sector at a growth of more than 8% compared to the supply of 291.78 mt in the corresponding period of last year," Goyal said in a written reply to a question. "As per the Central Electricity Authority (CEA) report during the April-November 2018, total coal-based generation has been 99.16% of the programme generation with a growth of 5.50% over the corresponding period of last year. This has been possible due to increased supply of coal to the power sector," he added.

As per the CEA report, coal stock at power houses as on December 16, 2018 stood at 15.52 mt as against a stock of 12.20 mt on December 16, 2017, registering an increase of 27.20%.

But higher coal production does not mean that there are or will be lower coal imports.

In another statement, Goyal said, "As per provisional data released by the Directorate-General of Commercial Intelligence and Statistics (DGCI&S), during April-October, 2018 (during first seven month of current fiscal) the import of coal was 136.58 mt with a growth rate of 14.91%."

According to Goyal, during October 2018 alone, the coal and coke import was 22.17 mt as compared to 18.72 mt during October 2017 with a growth rate of 18.42%.

"This increase is largely due to growth of coking coal imports in which India is deficient and also imports by certain thermal power plants which were designed to run on imported coal," Goyal said.

"The imported quantity of 2017-18 at 208.27 mt is less than the imported quantity of 2014-2015 which stood at 217.79 mt even as power generation and industrial activity grew substantially after 2014-2015," Goyal pointed out.

Piyush Goyal, Minister for Coal

PIBTL handles first cargo

Pakistan International Bulk Terminals Limited (PIBTL) has unloaded first-ever pet coke coal vessel in just around 17 hours, saving the importer precious time and money.

"This was the first ever consignment of pet coke at PIBT which is more difficult to handle than normal coal due to its smaller size," a statement said recently. "But, it was handled with utmost efficiency and record turnaround time for the vessel in an environmental-friendly manner."

The vessel MV Zhongyu 89 arrived at Port Qasim at 4 pm on December 10. The vessel completed unloading of cargo by 11.10 am on December 11 and sailed out of the port on the same day at 2.50 pm.

"The speed with which the cargo was handled is in accordance with the best global efficiency standards and a record for a coal vessel in Pakistan."

Poland will burn coal beyond 2050

Poland will not have stopped burning coal for energy production by 2050, a senior local politician predicted in an interview recently.

Witold Stepien, 'marshal' (a Polish local government term for head) of the Lodz region from 2010 until last month, said that while he thought Poland would have "considerably less coal" in its energy mix by 2050, it will not have completely phased it out.

"I don't think by 2050 we can eliminate the use of coal to zero," Stepien stated through an interpreter. "We will need 10 to 15 years more."

Stepien is still a member of the Lodz regional assembly, affiliated with the centre-right European People's Party (EPP), and a member of the Committee of the Regions, a Brussels-based advisory institution.

But a coal phase-out date of somewhere around 2065 is not quite in line with what the European Commission has in mind.

The commission recently published a strategy for a carbon-neutral Europe by 2050.

EU climate commissioner Miguel Arias Canete (also EPP) was adamant when speaking to press at the UN climate change conference in the Polish city Katowice, earlier this month.

"It is clear we are going to decarbonise the economy. Not only the Polish, all the European Union is going to be decarbonised," he said.

"What is pretty sure [is] that in 2050 coal will not be in the energy mix," he said. Canete stressed that the EU should assure a "just transition" for the European regional economies dependent on coal.

Stepien agreed. "We need to talk to people. The most important is the social acceptance of the transformation process," he said.

"Every single person that works in the mine needs to be informed and shown the chances for the future that we create," Stepien added.

But the question is whether that transition can take place fast enough.

In Stepien's region, Lodz, there were more attractive jobs for people now working in coal mines, Stepien said.

But the situation was different for Silesia, the Polish region where the climate conference was held.

Not just because of economics, but also because coal is part of the region's identity.

"The problem in Silesia has a cultural dimension," said Stepien.

"It's based on many generations," he noted, adding that in Poland when people hear of Silesia, the first thing they think of is the coal mines.

"This is a process that will last for years. … I think it's a process of at least two generations," he said.

A coal phase-out of 2065 was "much more probable" than 2050, he added.

Despite political reluctance, moving away from coal can bring many benefits, supporters say.

That is because coal is not only bad for climate, but also for air quality.

In late 2018 the Health and Environment Alliance, a political pressure group, said that annually hard coal and lignite power plants caused some 5,830 premature deaths in Poland.

Currently, around 80% of Polish electricity is generated by burning coal.

Inner Mongolia reports fast industrial growth since 1978

Inner Mongolia Autonomous Region, China's leading coal and dairy producer, has seen its industrial sector taking off since China implemented the reform and opening-up policy 40 years ago, according to the local government.

The industrial added value of the region increased from less than 2.2 bn yuan (UK$320 m) in 1978 to 510.9 bn yuan in 2017, the region's industry and information technology department said in its latest update.

The region has been a major producer of coal, calcium carbide, and monocrystal silicon in China. Mengniu Dairy and Yili Group are heavyweights in the dairy sector.

The region's coal production capacity exceeded 1.33 bn tonnes in 2017, ranking first in China.

But in order to reduce its over-reliance on coal, the region has managed to raise the value of non-coal industries, such as wind and solar power generation, to account for 75% of its total industrial growth in 2017, the department said.

The region's installed electricity capacity reached 118 m kilowatts last year, ranking second in the country. During the 1978-2017 period, the region's power generation increased by 116 times.

Mechel expands long-term supply agreement with Japan's Itochu

Mechel, a leading Russian mining and metals company, reports expansion of the sales agreement with a major Japanese universal trading company Itochu Corporation.

The agreement stipulates that Mechel and Itochu Corporation agreed on potential sales of up to 800,000 tonnes of coking and thermal coal between December 2018 and March 2020.

The coal will be shipped from Mechel's Southern Kuzbass Coal Company and Elgaugol. The price will be determined by mutual agreement. Japan's major consumers and Asian steelmaking and power facilities will be the end consumers of Mechel's products.

"Our longstanding ties with Itochu Corporation are stepping up to a new level. Expanding our cooperation will help us consolidate our position in the Asia Pacific market. We are glad that Mechel's coal won positive appraisal from our Japanese partners, and we will ensure its high quality in the future as well," Mechel Mining Management Company's CEO Pavel Shtark commented.

Private players to again sell commercially in open market

Eight million tonnes of domestic coal extracted by private producers is expected to be commercially available for the first time in the open market after five-six years, a move that will end Coal India's monopoly which has been the sole domestic supplier of the dry fuel for the past four decades after the sector was nationalised in the 1940s.

The government has already set the ball rolling this year, iron & steel, cement and captive power plants were to submit technical bids for 18 coal blocks from which they can sell 25% of their production in the open market at Coal India prices.

However, following requests of potential bidders and also considering the number of requests received through email, the centre has decided to extend the timelines for various stages of the auction. According to the revised timeline, the last date for submitting technical bids was 2 January 2019, while price-based bidding for block auction would be held between 14 and 27 January 2019. This is for the second time that the timelines are being extended.

Nevertheless, the blocks on offer are scheduled to have a total peak rated production capacity of around 32 million tonnes of which eight million tonnes can be sold in the open market.

The process of coal block allocation was pushed on to a slow track last August when the fifth tranche of the coal block auctions did not evoke the necessary interest from the bidders.

Bids would be submitted by interested parties for the sixth and seventh tranche of the coal blocks auctions. In fact, the government has decided to offer the same set of blocks in the seventh tranche that were offered in the fifth block which did not generate much interest.

As per the clauses for this round of auction, the time limit for starting production from each of these mines has been increased to five years from four.

The government had initially offered 13 blocks for the sixth tranche, but it pulled off Odisha's Jamkhani block from the list a few days ago. Cement and captive power plants can bid for these blocks.

The centre has put on the block Brahampuri in Madhya Pradesh for this tranche which is expected to produce 0.36 million tonnes per annum (mtpa) at peak rated capacity (PRC). Three blocks from Jharkhand are on offer — Bundu (PRC 1 mtpa), Chitarpur (PRC 3.45 mtpa) and Gondulpara (PRC 4 mtpa).

In Maharashtra too, three blocks – Gondkari (PRC 1 mtpa), Khappa & Extn (PRC 0.30 mta) and Marki Mangli (PRC 0.20 mtpa) – are on offer.

Paringa intercepts Kentucky # 9 to the poplar grove slope

Paringa's Poplar Grove Mine has intercepted the Western Kentucky # 9 coal seam with the primary mine slope and both ventilation shafts

- Access to the coal seam enables the Company to move into the bottom development phase
- Bottom development connects the slope with both air shafts to establish the permanent mine ventilation system, as well as the installation of critical underground infrastructure
- The coal handling & processing plant and river dock are on target for commissioning
- Strong market fundaments prevail, with natural gas prices surging by as much as 50% in November

Paringa Resources Limited has announced that the company has intercepted the Western Kentucky Number 9 coal seam with the Poplar Grove primary transportation slope in Western Kentucky. The intersection of the coal seam by the Poplar Grove slope is a material milestone towards the production of coal.

Intercepting the coal seam enables the Company to progress to the next phase of mining activities, including bottom development. Bottom development involves the linking of the slope with both the intake and exhaust air shafts to establish the mine's permanent ventilation system, as well as the construction of critical underground infrastructure such as the bottom sump, slope belt tailpiece and tramp iron magnet. Production of coal from bottom development will be utilised to commission the coal handling and preparation plant ("CHPP") and to produce clean coal for sales to customers.

The CHPP is ready to receive first coal, with final exterior cladding and roofing to be completed shortly. All other materials handling infrastructure at the mine site is operational, enabling the transfer of run of mine material from the mine site to the CHPP. The Ainsworth dock on the Green River is also structurally complete and will be ready to receive the first coal processed by the CHPP.

Paringa has recently completed the last of seven job fairs (interview and hiring events) interviewing over 400 qualified applicants. Additionally, mining equipment is currently being received in anticipation for the transition from contract mining to owner-operated production in January.

Edenville energy plans expansion of Rukwa project in Tanzania

Edenville Energy PLC said recently the construction and commissioning of the Lamella clarifier water treatment plant in Tanzania is completed and expected to be operational quite soon.

Edenville Energy also said it has long-term contracts in place for 8,000 tonnes of washed coal per month and several additional regular monthly orders, which totals around 1,000 tonnes.

The company said its site improvements and expansion is "essential" at the Rukwa coal project to fulfil this production.

In November, Edenville entered into a conditional convertible funding agreement with an entity managed by the Lind Partners LLC to make up to USD2.8 million available for working capital and expansion purposes.

Edenville said the terms of the loan will be put to shareholders for approval at a general meeting, to be held in "due course".

In the period from September 11 to date, Edenville processed 26,659 tonnes run of mine coal, producing 6,647 tonnes of washed coal and 13,022 tonnes of fine coal. The company said 4,655 tonnes have been sold and shipped, with the "majority" being washed coal.

"We are pleased with the progress we are making as we continue to develop the project into a significant supplier of coal in east Africa. The delays to the completion of the pre-screening plant have been frustrating and largely outside our control, but by the company taking over the construction it is back on track for completion before the end of 2018," said Chief Executive Officer Rufus Short.

Short continued: "Since our last update we have made significant progress in other areas including two new contracts to supply a further 4,000 tonnes per month. We are deploying the funds provided by Lind to expand the project and provide much needed additional equipment to satisfy our customer's demands. We believe we are well positioned to further develop the project in 2019 and I look forward to providing our shareholders with further updates as appropriate."

Adani's Australia mine edging closer toward development

Indian billionaire Gautam Adani's Carmichael is located in Australia's huge Galilee Basin, which covers around 250,000 square kilometers – about the size of the UK If the region is fully developed, it has potential to more than double Australia's thermal coal exports, according to government estimates.

The Adani Group, which will self-finance the project after potential lenders dropped off, will also build infrastructure, including a vital rail line to help transport the coal to the coast for export. The International Energy Agency says its success will determine the fate of other large projects in the Galilee, including India's GVK Group and Australian billionaire Gina Rinehart's Alpha Coal project.

Australia is already the world's second-largest exporter of power station coal, contributing more than 200 m metric tons a year to the global seaborne trade. If Carmichael – along with its railroad – gets built, it will be despite almost a decade of concerted opposition from environmental groups.

"Adani with Carmichael could prove a catalyst for opening up the frontier Galilee Basin in central Queensland, with other big coal mines expected to follow," says Gavin Wendt, director at research house Minelife. "I don't think you'll see those projects coming to market without the critical mass that Adani will provide in terms of bringing infrastructure into play."

The International Energy Agency describes Carmichael as "probably the most controversial coal project currently under development" and says it's making the most progress of the several large mines that are being planned.

Carmichael, which has been scaled back to a A$2 bn ($1.4 bn) capital cost from its initial plan for a A$16 bn mega-mine, will build up to a production target of 27.5 m tons a year, according to the developer. Once work has started, projects on a similar scale typically take around two years to construct.

Thermal coal prices have more than doubled since 2016, driven by strong demand from power generators across Asia. Newcastle coal prices dipped 0.4% to settle at $101.85/ton on the ICE Futures exchange.

A dearth of new resources being commissioned points to prices remaining high in the years ahead, driving Adani's determination to press ahead in the Galilee. "New supply to replace depletion will be needed by early-mid next decade," analysts at UBS Group AG said in their 2019 global commodities outlook. "Coal export chains are more vulnerable to shocks than for many years, hence prices should trade higher."

Winds of change

On the global stage, pressure to reduce coal use in power generation is growing. A United Nations-backed report in October called for coal-fired power to be phased out by 2050 in order to avoid catastrophic damage from climate change.

There's a growing reluctance by lenders to invest in coal, so other projects in the Galilee are likely to encounter the same challenges as Adani, Wendt cautioned. Japan's Mitsubishi Corp. on Tuesday completed its exit from thermal coal after selling stakes in two Australian mines.

Tim Buckley, a prominent critic of Adani's plans, agreed that Carmichael could be a beach-head for the Galilee's development. "It might only be down to a 10 m ton per annum mine but it enables potentially up to 300 m tons. That is a climate catastrophe."

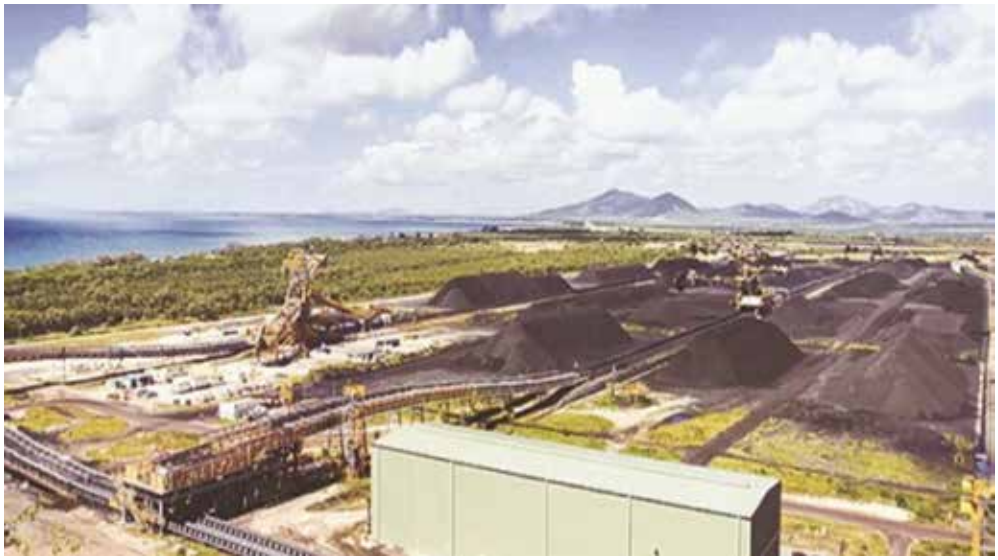
Equally, Adani may just end up building a stranded asset, said Buckley, an economist at the privately funded Institute for Energy Economics and Financial Analysis.

The risk for coal developers is that the economics of renewables is becoming more compelling. In India, where Adani plans to send most of its coal, wind and solar generation is already cheaper.

Adani accepts renewables will play an increasingly important role in the future energy mix, and is involved in the sector via projects such as its Rugby Run solar farm, also in Queensland. "But we must also ensure our energy sources are reliable and affordable, and that is where coal has a critical role to play," a company spokesperson said.

India is pushing hard to expand renewables output, yet the IEA still sees coal demand there growing by around 4% a year through 2023 to meet the country's fast-expanding energy needs. In its latest outlook for the industry, the IEA called India "coal's safest bet."

Adani will be keen to get started on the project before next year's federal election, which may see the main opposition Labor party form government, Buckley said. Senior Labor officials have voiced opposition to the project, yet it's an open question whether they would actively seek to block it, given its potential to add thousands of jobs in the region.



Plant closures might not lead to cheaper prices

Despite a record rate of US coal-fired power plant closures in 2018, domestic coal prices are unlikely to come under significant pressure, according to S&P Global Platts Analytics, partly because exports are currently providing an outlet for excess supply.

A lack of downside pressure will be welcomed by producers. Despite promises by US President Donald Trump to put coal miners back to work and his efforts to repeal Obama-era legislation seen as hostile to the industry, use of the fuel has continued to decline in the power sector.

"Domestic demand in the US coal market has been falling pretty consistently in 2018 but we haven't seen that drive prices down," said Joe Aldina, US coal analyst at S&P Global Platts Analytics.

Full-year 2018 thermal coal exports from the US are forecast to reach 55.21 m short tons, according to S&P Global Platts Analytics, up 16% on the 47.66 m st tons shipped abroad in 2017.

Alongside record exports, coal companies have become more disciplined, reining in capital spending and avoiding oversupplying the market to prevent a price slide, Aldina added.

Record retirements

Power generators in the US are set to retire a total of 14.3 GW of coal-fired power plant capacity in 2018, up from 7.0 GW of capacity retired in 2017, according to a recent analysis carried out. This year will mark the highest level of retirements since 2015, when the US power companies included in the analysis retired 14.8 GW of coal-fired capacity.

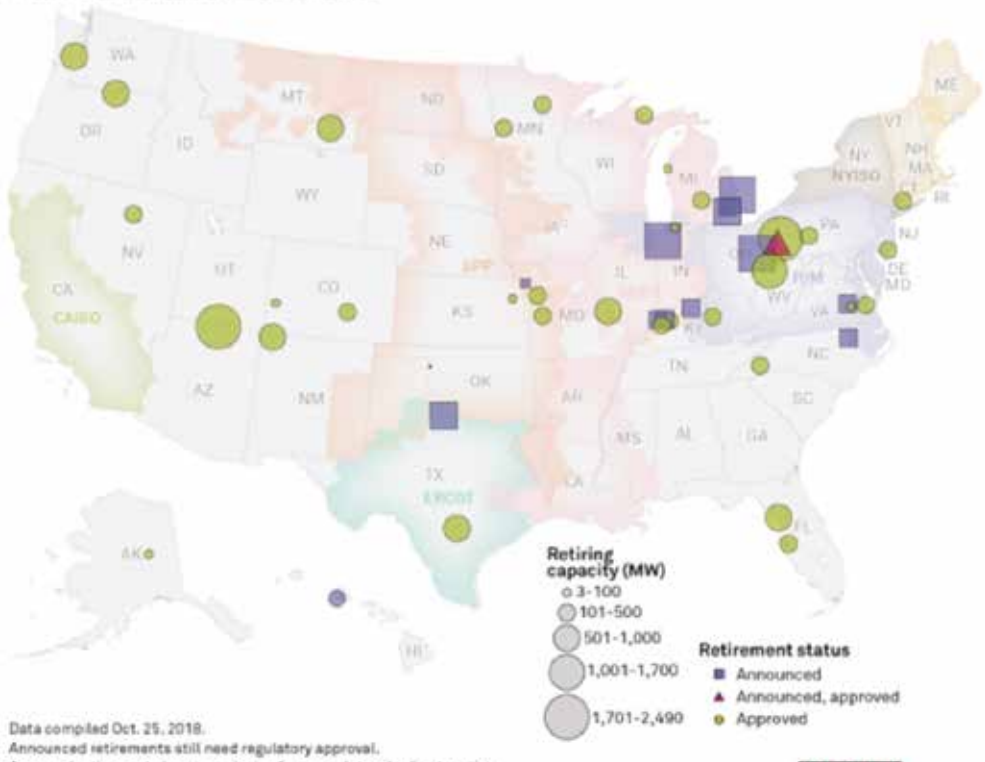
Another 22.9 GW of plant retirements have already been announced or received regulatory approval for 2019 to 2024, marking 71.6 GW retired or scheduled to be retired between 2014 and 2024. The analysis of federal data shows about 245.6 GW of current operating coal plant capacity in the US and does not include more recent retirement announcements from Entergy Corp. and a city-owned plant in Michigan.

Even if prices remain supported, plant closures will have a knock-on effect for US producers. Of the 671.1 million st tons of coal they delivered to domestic electricity generators in 2017, 23.2% was taken by plants scheduled to retire within two decades.

In the short term, the coal sector – as well as the broader US electricity market – will be mindful of potential for a supply crunch if this winter turns out to be particularly cold. "There's upside for coal demand this winter and stocks are running at multi-year lows," said Dan Klein, head of coal analytics at S&P Global Platts Analytics.

During the coming years, coal-fired generation in the US will likely come under further pressure from falling costs of new-build wind and solar capacity, as well as battery storage, which is expected to play a growing role in the electricity sector as technology advances.

Future coal capacity retirements



Data compiled Oct. 25, 2018.
Announced retirements still need regulatory approval.
Approved retirements have permission from regulatory bodies to retire.
Map credit: Ciaralou Aggalo Palicpic
Source: S&P Global Market Intelligence

Coal came back from the dead in 2018

Coal is having a rebound moment. Even as US and European miners endure bankruptcies, and regulations to cap carbon emissions, the black rock is gaining business in parts of Asia and Africa.

Developing countries are building a new generation of coal-fired power plants which will suck up production from major producers like Australia, Indonesia and South Africa.

Coal's revival has been a boon to shipping lines, traders, and mining companies. Global seaborne trade rose around 4% to an estimated 1.2 bn tons in 2018.

Three-quarters of that is thermal coal, which is used to keep power plants burning, feeding the modern economy – computers, heating and air conditioning systems. The rest is mostly coking coal, used to make steel, still a major industry in many parts of the world, especially in fast-growing parts of Asia.

The world's top seven coal exporters all increased shipments by dollar value during the first 10 months of 2018.

Top coal exporters, first 10 months, 2018

- Australia $42.2 bn (+14%)
- Indonesia $17.2 bn (+18%)
- Russia $13.7 bn (+25%)
- US $10.1 billion (+23%)
- Colombia $5.5 bn (+6%)
- South Africa $4.9 bn (+10%)
- Canada $4.6 bn (+5%)
- Netherlands $3.2 bn (-6.5%)
- China $623.3 m (-32%)
- Poland $616.7 m (-13%)

The countries buying the most coal are those expanding their supply of electricity generation, and those that still have vibrant steel industries.

Coal's resiliency is surprising for a few reasons. Countries are trying to cut down on their carbon emissions. The World Bank, Deutsche Bank and other financial institutions have cut back on their loans to coal companies.

But the economics still make sense for developing countries in Asia and Africa. Coal-fired power plants are less expensive to build than solar panel facilities, wind farms or other forms of sustainable energy. In addition, it's difficult for counties to invest in renewable energy without denting economic growth. And the US's withdrawal from the Paris accord signaled a relaxation of rules for coal miners.

Unsurprisingly, six of the top ten coal importers last year were in Asia.

Top coal importers, first 10 months, 2018

- Japan $20.7 bn (+10.2%)
- India $20.4 bn (+24.9%)
- China $17.6 bn (+15%)
- South Korea $13.8 bn (+9%)
- Taiwan $6.8 bn (+17%)
- Netherlands $4.7 bn (+0.6%)
- Germany $4.6 bn (-4.7%)
- Turkey $3.6 bn (+17%)
- Brazil $2.9 bn (+0.7%)
- Malaysia $2.7 bn (+25%)

Other countries are vying to join that list. In Bangladesh, for example, the government is expanding coal-fired power production. It expects to generate half the country's power with coal by 2030, from under 5%. Its imports from Indonesia have increased from zero to around two billion kg a year.

Bangladesh coal imports from Indonesia, first 11 months, 2014-2018

- 2018: 2.1 bn kg
- 2017: 1.8 bn kg
- 2016: 1.3 bn kg
- 2015: 2.6 bn kg
- 2014: 0

Coal use is even holding strong in the US, where power plants have been closing their coal-burning facilities and switching to gas. Carbon emissions in the U.S. increased by 3.4% in 2018, after falling for three years in a row, reversal analysts attributed to colder weather and the Trump administration's more favorable regulatory policies.

Shipments to Europe were flat. The European Union is trying to cut down on burning coal to power its cities. However, as Europe phases out its own mines, its countries will still need coal for a while. Germany has said it wants to end using coal in power plants by 2038.

Chinese authorities say they've been shutting coal-fired power plants in order to reduce pollution, but the country and its need for energy are so massive that there's no end in sight to burning coal.

The biggest bright spot in the global coal industry is India, which has been building new power plants to feed its booming middle classes hungry for electricity.

The dominant power of global coal trade and biggest seller to these Asian powerhouses is Australia, which ramped up shipments to Japan, China and India last year.

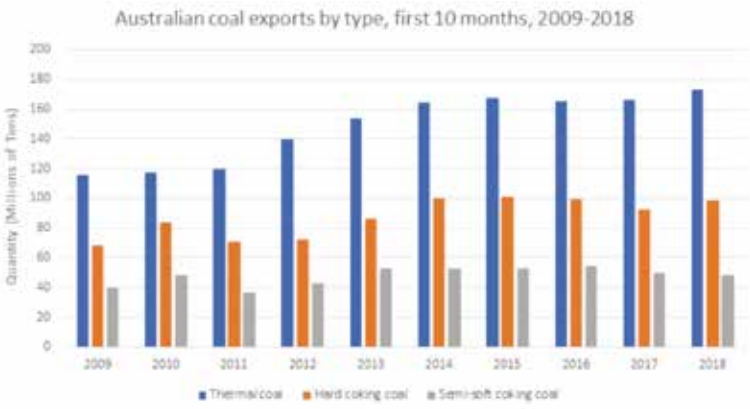
Top markets for Australian coal exports, first 10 months, 2018

- Japan $11.8 bn (+14%)
- China $8.8 bn (+17%)
- India $6.8 bn (+18)
- South Korea $4.4 bn (-2%)
- Taiwan $3.3 bn (+23%)
- Netherlands $1.2 bn (+5%)
- Brazil $693.6 m (-17%)
- Vietnam $661.2 m (+59%)
- Malaysia $642.7 m (+43%)
- France $478.9 m (+20%)

One strength of Australia's coal industry is its diversification. If you lump hard and semi-soft coking coal together, Australia's coking and thermal coal exports are roughly similar.

Coal is Australia's new cash cow: Exports have increased to $45.1 bn during the first 11 months of 2018, from $26.4 bn during the same time period in 2016.

And despite protests from environmentalists, coal's short-term future appears secure. It still accounts for a bit under 40% of all the electricity produced in the world, the same ratio as in the late 1990s.



Increasing production on agenda

The deputy head of Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) announced plans to increase coal production capacity in the country.

Ardeshir Sa'ad Mohammadi said that the project is in line with a master plan for steel production, reported imidro.gov.ir .

He said, "The Steel Master Plan seeks to achieve a capacity of six million tons for blast furnace which requires 3.7 million tons of coke and this in turn calls for producing five million tons of coal concentrate."

The IMIDRO official continued, "At present, a project to raise coal production capacity to 2.7 million tons is in progress, of which 750,000 tons is being implemented in Khomrud and three projects in Tabas."

Turning to these three plans, he said that two projects are being run by the private sector with a capacity of 400,000 and 750,000 tons while another project with an 800,000-ton capacity will be carried out by IMIDRO and with Chinese financing.

Once the new projects go on stream, 1.35 million tons of coal concentrate will be produced and this will help overcome supply problems, said Sa'ad Mohammadi.

He noted that in the blast furnace method, 0.6 ton of coke is required for producing one ton of steel adding that 1.4 ton of coal is used to produce one ton of coke.

Sa'ad Mohammadi referred to infrastructure affairs and said, "We need €13 billion for developing the infrastructure while the construction of steel mills will require €8 billion."

Mitsubishi to offload stake in two Australian coal mines for $540m

The coal mines in which Mitsubishi will divest stakes are the Clermont coal mine located in Queensland and the Ulan coal mine in New South Wales. The stakes are held by the Japanese firm's Brisbane-based subsidiary Mitsubishi Development.

In the Clermont Coal Mine, Mitsubishi will sell its 31.4% stake to GS Coal, which is a 50:50 joint venture formed by Glencore and Sumitomo.

On the other hand, the Japanese firm will sell its stake of 10% in the Ulan coal mine to Glencore's wholly-owned subsidiary Glencore Coal.

The transaction will enable Glencore to take 100% ownership in the Ulan coal mine, which is located within the Western Coalfields. The coal mine has a production capacity of about 11 million tons per annum.

Mitsubishi said that the transactions are a result of the measures it is implementing to streamline its asset portfolio.

The Japanese trading company, in a statement, said: "The sales are subject to the terms of the Clermont joint venture documents, under which other joint venture participants hold pre-emptive rights, and fulfillment of other conditions, including certain regulatory approvals. The completions of the sales are expected in 2019."

In the Clermont coal mine, which has been in production since 2010, GS Coal will increase its stake to 81.5% through the transaction. J-Power Australia and J. C. D. Australia are the other stakeholders in the coal mine with stakes of 15% and 3.5%, respectively.

The Clermont coal mine has a production capacity of 12 million tons per year.

Sumitomo, in a statement, said: "This agreement will allow us to continue supply of high quality thermal coal to our end users, adding to our continued commitment to energy security and its stable supply.

"Sumitomo Corp will continue to take action to achieve a low carbon society, based on our belief that climate change is a material concern that has lasting implications to our environment, society, and corporate activities for generations, while we continue to fulfill our social mission of stable energy supply."

Glencore and Sumitomo entered into the Clermont coal mine by acquiring a stake of 50.1% from Rio Tinto for $1.01bn in 2013.

Southeast Asian demand to grow at the fastest rate in world

Southeast Asian coal demand is forecast to rise 5% yearly through 2023 for the fastest growth rate worldwide, an International Energy Agency report published recently, as Asia makes up for declines in usage elsewhere.

Global coal demand appears likely to grow in 2018, though the IEA report predicts this demand will remain stable over the next five years.

India, China and Indonesia play major roles both as consumers and producers of coal, the biggest global emitter of carbon dioxide – a greenhouse gas – among energy sources. The Asia-Pacific region produces 70% of the world's coal, the IEA says.

Coal demand worldwide rose by 1% in 2017 after two years of decline, with decreases in Europe and the U.S. offset by growth in Asia.

Global economic growth drove increases in both industrial output and electricity use, with 61% of coal used to generate electricity while 19% went mostly for iron and steel production.

Global coal power generation increased by about 3%, accounting for 40% of the additional power generated worldwide. Developing countries with pressing demand for electricity often prefer coal, seeing it as the most abundant and cost-effective energy source.

India looks to account for the largest absolute rise in coal use, with the country responsible for 12% of global consumption in 2017. Its projected annual economic growth of 8% to 2023 will lift power demand by more than 5% yearly, the IEA says.

But India's yearly growth in coal demand is expected to slip below 4% through 2023 from the annual average of 6% in the past decade, thanks to the national push for renewable energy and the installation of more efficient technology for coal power generation.

However, China accounts for almost half of global coal consumption, and "coal's fate largely rests on the Chinese power sector," the IEA report said. Consumption nationwide increased marginally by 0.3% in 2017 after three years of decline.

Shinichiro Takiguchi, senior specialist at the Japan Research Institute, said "it is difficult to stop building new coal-fired power plants because the market is growing."

China's goal of cutting carbon dioxide emission levels per unit of gross domestic product means that Beijing is balancing environmental policies with economic growth, Takigichi said.

Nevertheless, China's coal demand is forecast to decline over time due to state-led policies pushing toward renewable energy and natural gas, the IEA says.

Recently at an annual UN climate talks in Poland, nearly 200 countries reached an accord to implement the Paris Agreement from 2020. Countries are to submit revised plans for greenhouse gas reductions.

The shift to cleaner energy is proving difficult, even in developed countries. In France, the government suspended its planned fuel tax increases after they were met by street protests.

Global pressure to reduce coal and increase renewable energy has led international banks such as ING and BNP Paribas to set guidelines for reducing their exposure to coal projects.

HSBC said this year it would stop financing new coal plants except in Bangladesh, Indonesia and Vietnam. These exceptions were made "in order to appropriately balance local humanitarian needs with the need to transition to a low-carbon economy," HSBC said.

In Japan, financial institutions including the three biggest banks have followed the global trend to limit funding for coal projects, although they have not ruled out financing

them.

Mitsubishi UFJ Financial Group guidelines say the company will "carefully consider" the financing of coal-fired plants based on international guidelines.

"Corporate management based on ESG [environmental, social and governance concerns] is the current premise for business continuity and sustainable growth," MUFG said.

Dai-ichi Life Holdings will not provide financing for coal power projects abroad, under a company rule, but the insurer does not rule out domestic projects.

"As a Japanese institutional investor, our view is that we need to take Japan's energy policy into consideration," Kazuyuki Shigemoto, general manager of the investment planning department, said in a statement. Dai-ichi currently finances no coal-fired power plant project.

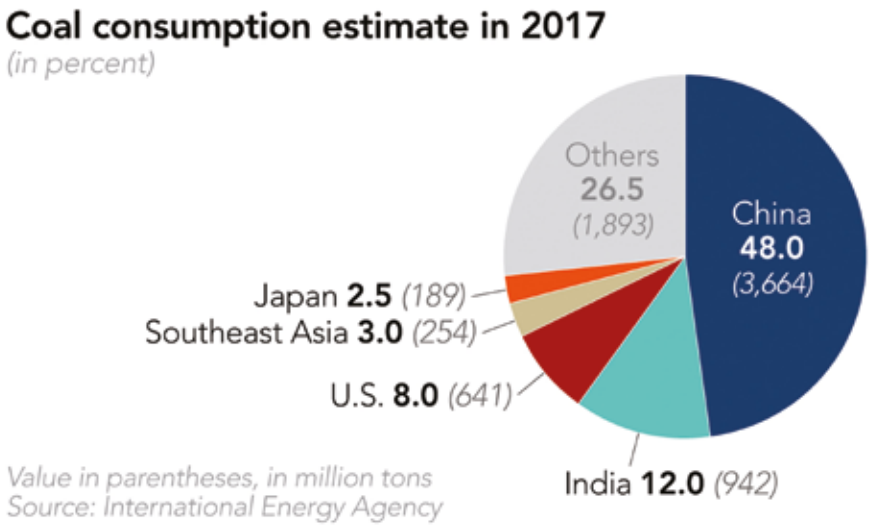
Trading house Marubeni this year became the first Japanese non-financial company to promise a withdrawal from new coal projects. The company also aims to cut its coal-fired electricity volume in half by 2030, in order to shift capital and manpower to renewable energy.

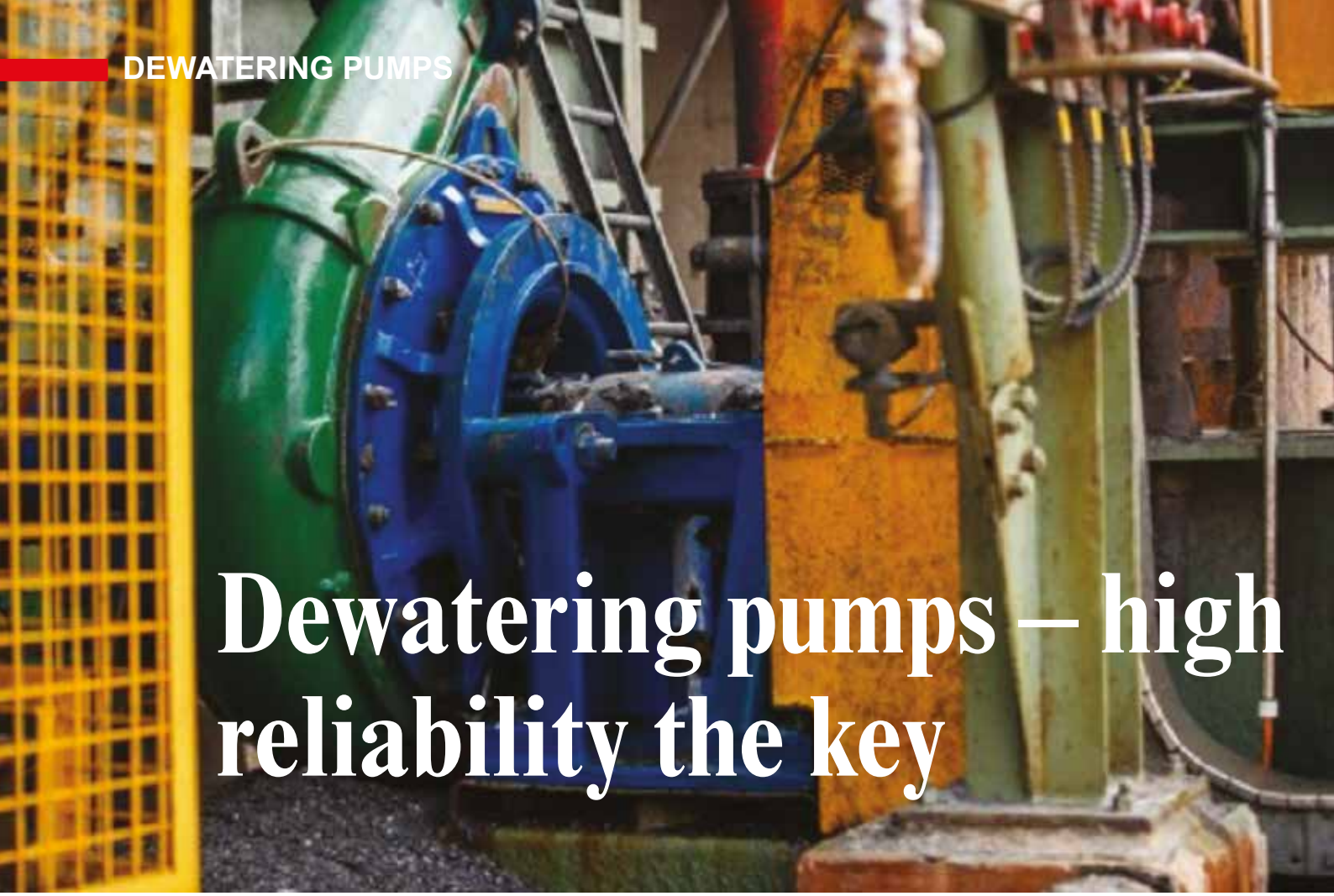
"Financial and insurance sectors have tremendously decreased their investment in coal," said Takashi Fujinaga, senior operating officer of Marubeni's power division.

Yet the company might pursue future projects with the current best available technology, the ultra-supercritical steam generator. Marubeni also is continuing ongoing coal projects in countries such as Indonesia and Vietnam.

The impact of these initiatives on coal consumption is debatable. Divestment by financial institutions would affect the cost of coal power projects, but the world remains "quite early on in the process of pushing coal out," said Simon Flowers, chief analyst and chairman for U.K. based research company Wood Mackenzie.

"We expect under any circumstances for fossil fuels to provide over 70% of all primary energy demand for the next 25 years," Flowers said.





Dewatering pumps – high reliability the key

Dewatering techniques and equipment have been refined over many decades, and no significant step changes in equipment capabilities are on the horizon. However, there are opportunities for technology transfer from recent developments in other industries. An example is improvements in remote monitoring and control of pumping systems, routinely used in other industries but rarely used on mine and quarry sites. Such systems are ripe for wider application on mine sites, where they offer potential benefits to the mine operator in the form of reduced energy costs, reduced carbon emissions and increased equipment life.

When considering possible future trends in dewatering and groundwater control, there is no realistic expectation that there will be a step change in technologies or costs in the foreseeable future. The basic laws of physics govern the hydromechanical performance of pumps and it is difficult to see how there could be any more than incremental improvement in these systems. Similarly, most groundwater exclusion technologies have existed in their current form for more than 50 years, and have been highly refined in relation to costs and effectiveness. However, developments in materials, equipment design, and information technology will undoubtedly lead to improvements in plant efficiency, reliability, and safety over time. It is also possible, indeed likely, that some unheralded technological advances, apparently far removed from mining and quarrying may have a significant impact on mine dewatering.

Deep coal seams require mine dewatering pumps of high capacity, high head, and high reliability. Mining ESPs (electric submersible pumps) are an adaptation of fresh-water or oil-well ESPs. To pump from a horizontal coal seam, special pump configurations are required. Downhole conditions are severe. Mine water is acidic and carries suspended solids. Electrics on mining ESPs are regulated and safety requirements are extensive. Surface-located ESP electrical controls are a major factor in pump reliability. The electrical designer must examine the particular mine requirements to apply effective ESP controls

From active to closed mines, safety and reliability are the greatest necessities in surface and underground mining in order to ensure that there are no disruptions in extraction. Coal operations around the world both underground and surface rely on efficient pumps in order to remove mine water reliably from operating areas and to drain water from mines reliably and quickly in emergencies, responsible water management continues long after a mine closure, the depletion of most coal operations in both Germany and the UK being worthy examples.

The mining industry, driven by a need for profitability, efficiency and yield maximisation, is one of the world's toughest industrialised working environments. However,

too often in such a competitive arena companies are using the wrong pumping solution for their specific mining application

This involves a thorough assessment of the requirements of the site, including the mine plan, operating depths, and existing infrastructure, as well as the required water in-flow, and tailoring systems to suit those needs.

Getting it right, however, could mean a significant reduction in costs and improvement in performance.

Weir Group- Warman

Charles Warman invented the Warman slurry pump in Kalgoorlie in 1938. It was a hard wearing slurry pump that used replaceable liners and a replaceable impeller, something that had never been done before. Charles Warman was a visionary and an innovator. The use of rubber lining in the pump was ground breaking as it reduced total ownership costs, was safer to handle and offered extended wear life in many abrasive slurry applications. It was quickly adopted throughout Western Australia and by the 1950s, as customer demand rose, Charles Warman expanded his business by opening offices in Sydney and Perth.

During the 1960s the rapid growth of the business continued with manufacturing and sales outlets established around the world. The Warman Series 'A' pump was accepted and became world leader in its field. Further work on the Warman AH® pump resulted in the development of interchangeable metal and rubber wearing components.
The Weir Group Plc acquired the Warman pump in 1999, and a whole new chapter began. As part of the Weir

Minerals division, a number of technological advancements were achieved for the Warman pump range. 2002 saw the development of a revolutionary new impeller and inlet design for pumping mineral froths and high density viscous slurries, and in 2009, Weir Minerals developed the Warman WBH pump with axial and rotationally adjustable throatbush to even out wear. Due to its innovative design, this pump soon became the new slurry pump standard, other well-known brands for different applications include Floway®, Lewis® and Gabbioneta™

Weir Minerals enhances pump maintenance with adjustment technology

With a longstanding reputation for engineering expertise, Weir Minerals continually develops solutions and technology to better serve the mining industry. Recognising that throatbush wear rate has a major impact in the overall efficiency of slurry pumps, Weir Minerals has developed superior rotating and axial adjustment technology.

In many applications, the pump's throatbush is the component that has the shortest life compared to the impeller and liners, with considerable variability.

Adjusting the gap between the throatbush and the impeller front shroud reduces hydraulic recirculation in the pump. This prevents localised wear on the throatbush, improves hydraulic efficiency and lowers the total ownership cost for the operator. To avoid impacting the plant's production, these adjustments are often performed while the pump is operating. However, this can have safety implications for individuals working at the front of the pump unit.

"Manually adjusting an alloy throatbush on a large pump requires several people and is labour intensive. It requires mechanical tools to adjust the four pusher bolts, one at a time, in order to reduce the gap between the throatbush and impeller. We wanted to find a safer and quicker way to extend the wear life of the pump with regular adjustments, which led us to development of this technology," states Marcus Lane, Global Product Manager for Centrifugal Pumps for Weir Minerals.

"Our automated throatbush adjustment solutions are available for pumps fitted with either rubber or alloy throatbushes on Warman slurry pumps used in the most

arduous applications, and have been designed with our customers' safety and pump operation in mind. By mechanising the adjustment procedure, personnel are removed from the line of fire, and the accuracy of axial movement is increased," states Ron Bourgeois, Director of Slurry Pumping Technology Group for Weir Minerals.

Weir Minerals' automated adjustment systems speed up the process, allowing for more frequent adjustments with minimal effort. When maintaining an alloy throatbush, all four bolts are adjusted at the same time to ensure even adjustment and accurate positioning, improving the wear life of the throatbush.

Rubber throatbush adjustment is considerably different because it poses the risk of hysteresis and premature failure of the throatbush. The goal is not to adjust to a minimum clearance but to maintain a standard gap to ensure that there is no contact between the impeller and throatbush, whilst periodically rotating the throatbush face to avoid acceleration of localised wear.

"We developed an automated rotating solution which maintains an optimum gap between the throatbush and impeller front shroud for the particles to flow through without catching and tearing the rubber. The localised surface wear is usually near the discharge position, but by slowly rotating the throatbush, we even out the material loss over the entire face. Field results have been very positive, showing an average of 40% increase in wear life," states Claudio Needham, Application Engineer for Weir Minerals.

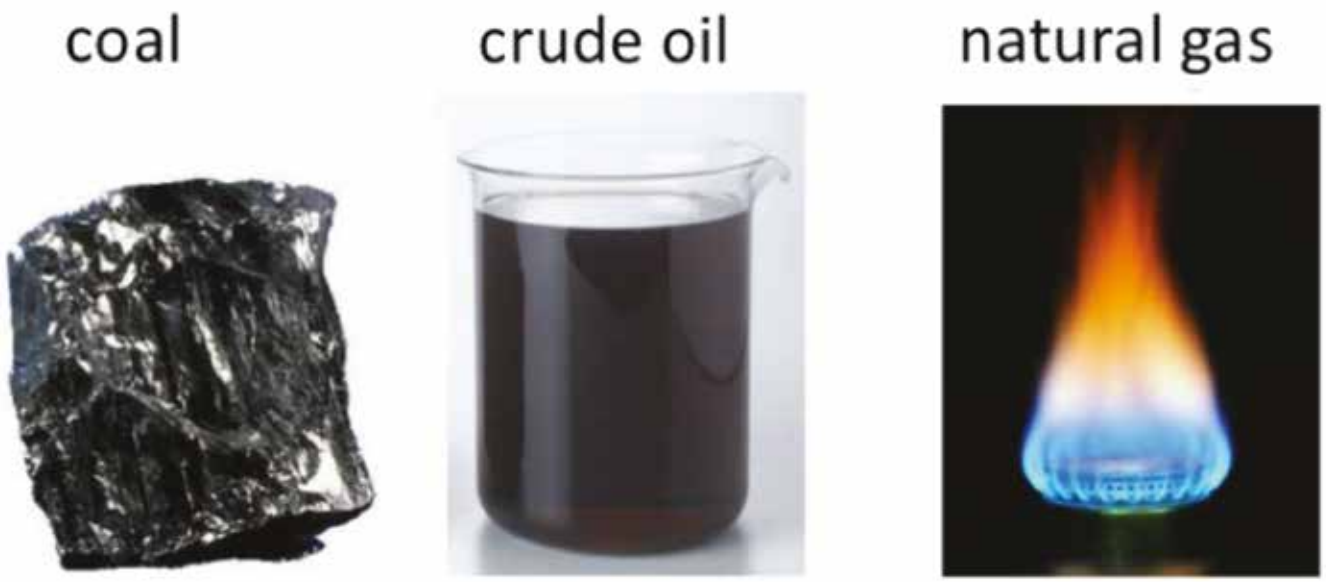
For the smaller Warman® slurry pumps used in medium to heavy duty applications, Weir Minerals offers a single point adjustment mechanism, providing both axial and rotational repositioning. This allows one individual to safely stand to the side of the pump while making the adjustment.

Mining operators who have trialled Weir's adjustment technology have reported improved wear life and safer, simpler maintenance through the process of regular adjustment.

Weir Minerals has already taken its adjustment technology one step further by integrating it with their IIoT Synertrex® platform to offer predictive maintenance feedback.

"This is made possible through machine learning. Over time Synertrex learns from past adjustments, recording how many times the throatbush was adjusted and the magnitude of adjustment each time. This trending data is collected and analysed by Synertrex to communicate future adjustment requirements. Through automating all adjustments, we can successfully communicate remaining useful life, and inform customers of optimum times to adjust the pump to increase efficiency and maximise wear life," Marcus Lane concludes.

Powering the world



The United States and the world need to continually improve electrical energy mixes with respect to economic and environmental factors. Key sources of U.S. and world energy include natural gas, coal, nuclear power, hydropower and renewables (such as wind and solar).

Despite much debate on which are the right and wrong power sources, the reality is nearly two-thirds of the global electricity currently come from fossil fuels. The climate-harming emissions of these sources vary and their abundance in parts of the world – both must be considered in the energy debate.

This also means renewable energy sources still make up a small portion of power generation. Their capability to produce consistent power must also be considered.

In the U.S., we rely most heavily on natural gas and coal as power sources, American electric power sources include:

- Natural gas: 32%
- Coal: 30%
- Nuclear power: 20%
- Hydropower: 7.5%
- Wind: 6.3%
- Solar: 1.3%
- Other fuels: 2.9%

Similarly, world electrical power is produced by:

- Coal: 41%
- Natural gas: 22%
- Hydropower: 16%
- Nuclear: 11%
- Wind: 6%
- Solar: 1%
- Other fuels 3%

Let's now work through the pros and cons of each electrical energy source, with focuses on the U.S. and the world.

COAL

Coal is not our cleanest fuel, but it is the least expensive and most abundant. It will be critical to develop use of advanced coal technologies like the ultra-supercritical pulverised coal process, which is already in commercial use. That would reduce power-plant emissions from coal and promise even greater reductions in the years ahead.

For countries like China and India whose economies are based on coal, advanced coal technologies could become the energy of choice for many. And don't count out coal in the United States or Europe, given forecasts that coal will continue to play a major role through about 2040.

Keep in mind also that Germany, which increased its use of coal following the Fukushima nuclear accident in Japan, is building some of the most advanced coal plants in the world.

A pragmatic energy strategy, one that reflects global energy trends and weighs economic and environmental health should be the path forward. While we may be ramping down our use of coal, others are not. China, the world's largest carbon emitter, is now using more coal than the rest of the world combined.

However, an important issue is the fact that coal from China, India, U.S. and Europe are increasing to add to world carbon emissions. So, coal energy must continually be improved, while adding cleaner fuels such as natural gas and nuclear power.

NATURAL GAS

Utilities have increased the use of gas in place of coal. Importantly, natural gas produces just half the carbon dioxide when burned to generate electricity. Consequently,

coal plants are being converted to use cleaner natural gas. While there is room for debate about various climate plans, it is clear that the cornerstone of American energy policy and climate action is the fracking revolution.

Fortunately, through surging gas production from vast shale formations, the U.S. has become the largest natural gas producer in the world. Gas, now cheap and abundant, is driving a U.S manufacturing renaissance, reducing energy bills and allowing a transition away from coal.

The problem may be an eventual lack of robust competition. It begs the question: What will be the cost of natural gas when it is our only major source of electric power?

NUCLEAR POWER

As for nuclear power, it is our only large emissions-free energy source. But building new large nuclear plants can take too long, so existing plants need to stay on-line as long as feasible.

In addition, on the horizon is a new generation of small modular reactors that can be built in less time and at a fraction of today's cost.

HYDROPOWER

While not discussed much these days, use of water power to produce electrical power is substantial and is free of carbon emissions. Hydropower produces about 7.5% of U.S. electricity and 16% of the global electricity.

Interestingly, hydropower is still our largest renewable energy source.

RENEWABLES

But what about more popular renewables such as wind and solar? These can be helpful, but currently provide only about 8% of our electricity and work only when the wind is blowing or the sun is shining.

Thus, wind and solar only provide energy about 30% of the time. For comparison, nuclear plants are "on line" some 90% of the time, with coal and gas in the 60 to 70% range.

As a result, backup power from natural gas, nuclear or coal are needed to ensure a steady stream of electricity when wind or solar is used. And don't forget that costly taxpayer subsidies are needed for most renewables.

The bottom line is that the most important aspect of the six major producers of electricity is: All of them are important and robust competition between producers is critical.

J. Winston Porter, Ph.D., is a national energy and environmental consultant, based in Atlanta. He previously worked as an assistant administrator of the U.S. EPA.

Professor models system using baking soda filled capsules to capture CO2 emissions

Picture of microcapsules that can capture carbon dioxide from power plant exhaust.

Coal and natural gas represent the majority of the US energy supply. Even with pollution controls, burning these fossil fuels for energy releases a tremendous amount of carbon dioxide into the atmosphere. Research uses microcapsule technology that may make post-combustion carbon capture cheaper, safer, and more efficient.

Although the use of renewable energy is on the rise, coal and natural gas still represent the majority of the United States energy supply. Even with pollution controls, burning these fossil fuels for energy releases a tremendous amount of carbon dioxide into the atmosphere – in the U.S. alone, coal and natural gas contributed 1,713 million metric tons of CO_2, or 98% of all CO_2 emissions from the electric power sector in 2017.1 In an effort to mitigate these effects, researchers are looking for affordable ways to capture carbon dioxide from power plant exhaust.

Research led by the University of Pittsburgh and Lawrence Livermore National Laboratory (LLNL) uses microcapsule technology that may make post-combustion carbon capture cheaper, safer, and more efficient.

“Our approach is very different than the traditional method of capturing carbon dioxide at a power plant,” said Katherine Hornbostel, assistant professor of mechanical engineering at Pitt’s Swanson School of Engineering. “Instead of flowing a chemical solvent down a tower (like water down a waterfall), we are putting the solvent into tiny microcapsules.”

Similar to containing liquid medicine in a pill, microencapsulation is a process in which liquids are surrounded by a solid coating.

“In our proposed design of a carbon capture reactor, we pack a bunch of microcapsules into a container and flow the power plant exhaust gas through that,” said Hornbostel. “The heat required for conventional reactors is high, which translates to higher plant operating costs. Our design will be a smaller structure and require less electricity to operate, thereby lowering costs.”

Conventional designs also use a harsh amine solvent that is expensive and can be dangerous to the environment. The microcapsule design created by Hornbostel and her collaborators at LLNL uses a solution that is made from a common household item.

"We're using baking soda dissolved in water as our solvent," said Hornbostel. "It's cheaper, better for the environment, and more abundant than conventional solvents. Cost and abundance are critical factors when you're talking about 20 or more meter-wide reactors installed at hundreds of power plants."

Hornbostel explained that the small size of the microcapsule gives the solvent a large surface area for a given volume. This high surface area makes the solvent absorb carbon dioxide faster, which means that slower absorbing solvents can be used. "This is good news," says Hornbostel, "because it gives cheaper solvents like baking soda solution a fighting chance to compete with more expensive and corrosive solvents."

"Our proposed microcapsule technology and design are promising for post-combustion carbon capture because they help make slow-reacting solvents more efficient," said Hornbostel. "We believe that the decreased solvent cost combined with a smaller structure and lower operating cost may help coal and natural gas power plants maintain profits long-term without harming the environment."

Credit: John Vericella at Lawrence Livermore National Laboratory

Adani's road to Carmichael edges forward as work begins

Adani has launched roadworks for access to the Carmichael coal project in Queensland despite delays in securing a key environmental approval from the state government.

The Indian company, which has engaged a regional Queensland business for development of the road, has started the works under legal approvals it has already gained.

Adani, after declaring the Galilee Basin project 100% financed in late November 2018, expected to start construction of the mine and rail development last month.

It has, however, been thwarted by the Queensland Government, which has not granted an environmental management plan approval required for the Carmichael development to progress.

But work has recently started on grid by-passes, according to Adani, which will allow larger machinery and equipment to be transported to site.

Adani Mining chief executive officer Lucas Dow said the works were permitted under its current approvals and would also benefit future mines in the Galilee Basin.

"The road upgrades are an important step to prepare for the construction of the Carmichael project to ensure larger equipment can be transported to site, and the infrastructure meets future demand for increased traffic," Dow said.

"We're getting on with doing everything we can under our current approvals. In terms of getting started on the mine, we have submitted our remaining management plans."

Dow said Adani had "certainty of process and timing at both the federal and local government level" for approval of the management plans to get started on Carmichael.

"…however the Queensland Government has to date been unwilling to commit," Dow said.

"We are simply seeking a fair go from the Queensland Government, as we are committed and wanting to start delivering upon the 1500 direct jobs and 6750 supporting jobs that the Carmichael project will deliver for central and northern Queensland."

Adani's updated development plan for the Carmichael development involves a self-funded investment of $2 bn for a smaller mine than the company had previously proposed.

The initial operation would have annual production of between 10–15 mt of thermal coal.

Adani has appointed several contractors and suppliers for the development, including two Wangan and Jagalingou certified businesses to deliver job opportunities for Indigenous communities.

"We know there are thousands of jobseekers ready to work and it's frustrating when the Queensland Government continues to move the goal posts and make changes at the 11th hour, to what should be standard approval processes," Dow said.

TNB's power plant project achieves national grid connectivity

Unit 1 of Jimah East Power Sdn Bhd's coal-fired power plant in Port Dickson, Negeri Sembilan, successfully achieved its first synchronisation on 10 December.

Jimah East Power is a 70% subsidiary of Tenaga Nasional Bhd (TNB).

TNB said the first synchronisation means the generator of Unit 1 had been synchronised to the Malaysian grid system and commenced supplying electricity to it.

"This is a major milestone towards the unit completion," it said in a statement.

TNB Chairman Tan Sri Leo Moggie said the project, Malaysia's Fourth Ultra-Super Critical (USC) Coal-Fired Power Plant, would increase TNB's generation capacity to over 14,000 MW.

He also said the power plant is TNB's third USC Coal-Fired Power Plant and the other two are Manjung 4 and Manjung 5, both located in Lumut, Perak.

"This milestone is significant as it confirms the project progress at 97%," he added.

The RM12-billion plant comprises two units of 1,000 MW USC Coal-Fired Power Plant, with Unit 1 scheduled to start commercial operation in June 2019 and Unit 2 in December 2019.

Meanwhile, Toshiba Energy Systems and Solutions Director and General Manager Takao Konishi said Toshiba is committed to contributing to the realisation of a low carbon economy and a stable power supply in Malaysia, by providing world leading power generation technologies.

USC technology is an efficient coal burning technology with 40% efficiency compared to pulverised coal-firing technology, which has a 36% efficiency.

Power generated from the Jimah East Power facility will be sold to TNB under a 25-year power purchase agreement.

Iran's output rises

Iran's two major coal producers' concentrate output stood at 522,947 tons during the first nine months of the current fiscal year (March 21-Dec. 21) to register a 3% increase compared with last year's corresponding period.

As reported by Iranian Mines and Mining Industries Development and Renovation Organisation, Tabas Parvadeh Coal Company accounted for 453,665 tons of the total figure.

Central Alborz Coal Company's output stood at 69,282 tons.

Global demand will remain steady through 2023: IEA

Coal remains the second-largest global source of primary energy, behind oil, and the largest source of electricity

Global coal demand will edge higher until 2023 as growth in India and other Asian countries offsets a decline in Europe and the United States, the International Energy Agency (IEA) said.

Consumption of the fuel is expected to rise by an average of 0.2% a year from 5,355 million tonnes of coal equivalent (MTCE) in 2017 to 5,418 MTCE in 2023, the Paris-based agency said.

The report comes days after nearly 200 countries agreed to rules for implementing a landmark climate deal aimed at curbing emissions from fossil fuels to keep global temperature rises this century well below 2 degrees Celsius.

"Despite significant media attention being given to divestments and moves away from coal, market trends are proving resistant to change," the report said.

Coal remains the second-largest global source of primary energy, behind oil, and the largest source of electricity.

For the world to meet its climate goals, more work is needed to develop carbon capture, storage and use (CCSU) technology which captures and then either stores carbon dioxide underground or uses it in other industries, the IEA said.

"Simply put - to meet our sustainability goals, there can be no future for coal without CCSU," IEA executive director Fatih Birol said.

Just 18 large-scale carbon capture and storage plants are in operation around the world, according to the Global CCS Institute.

Coal consumption in China is projected to fall 0.5% per year to 2,673 MTCE in 2023, driven in part by efficiency improvements and policies to curb air pollution.

A sharp increase is predicted for India, with demand rising by 146 MTCE to 708 MTCE in 2023, boosted by a rise in coal-fired power output and production of crude steel, the IEA said.

Turkey breaks local production record in 2018

Turkey hit a record high with the production of local coal amounting to 101.5 million tonnes in 2018, Energy and Natural Resources Minister, Fatih Donmez announced recently.

Turkey's public sector produced 53.35 million tonnes of local coal in 2018 while the private sector contributed 48.21 million tonnes.

Donmez shared in his Twitter message that Turkey produced 87.8 million tonnes of domestic coal in 2017.

State and private sector production amounted to 42.47 million tonnes and 45.4 million tonnes, respectively in 2017.

Australia's Whitehaven second-quarter production up 11%

Australia's largest independent coal producer Whitehaven Coal said recently its second quarter saleable coal production rose 11% as a timely pickup in production from its Narrabri mine bolstered output.

Managed saleable coal production for the three months to Dec. 31 2018 came in at 5.6 m tonnes, compared with production of 5 m tonnes a year ago, the company said in a statement.

The miner's sales fell 7% for the quarter to 5.4 m tonnes.

Whitehaven, which produces both thermal and metallurgical coal, reaffirmed its full year 2019 saleable production guidance at 22 m tonnes to 23 m tonnes on a managed basis.

The miner posted record quarterly run of mine coal production of 7.4 m tonnes, boosted by strong performance at both its Narrabri and Maules Creek mines.

Technical issues at the Narrabri mine had undercut Whitehaven's coal production in the previous quarter. The mine accounted for about 40% of Whitehaven's production in the second quarter.

Whitehaven sells its high grade coal across Asia, with the company citing the governments of Japan and Korea as its main customers. The miner has been able to avoid the slowdown in demand faced by its peers, who sell to China.

Whitehaven's stock price lost slightly in 2018. However, it fared far better than its peers on Australia's benchmark energy index, which declined nearly 11% in 2018.

Strong support for the industry

In response to the New Year Address of Supreme Leader Kim Jong Un the ministries and national organs strongly support the coal-mining industry.

From the beginning of the New Year dozens of the ministries and central organs supplied great numbers of equipment and materials to coal mines across the country and presented aid goods to the miners.

The Ministry of External Economic Relations, the Ministry of Finance and the External Construction Guidance Bureau are also not outdone in backing up coal mines for patriotic purposes. The officials of the ministries and bureau called at the February 8 Jikdong, Sochang and Hoean Youth Coal Mines and the Jenam Coal Mine on the New Year's Day. They provided the miners with plenty of materials like bearings for coal wagons and bar steel, thus arousing them to further production.

The officials of the Ministry of Land and Maritime Transport, the Ministry of Electronics Industry and the Maritime Administration of the DPRK went to the Chonsong Youth Coal Mine and the Ryongdae, Tokchon and Joyang Coal Mines and handed over to the mines conveyor belts, air hoses, belts and other materials badly needed for coal production as well as lots of items for labor protection, so as to dynamically encourage the miners to mass-produce coal.

The officials of the Ministry of Machine-building Industry, the Ministry of Urban Management, the State Planning Commission and the Ministry of Public Health carried their aid materials to many coal mines in the western region of the country and greatly inspired the militant spirit of the miners so that they could do well in their work from the outset of the New Year.

Believing that they join the coal miners to be in the forefront of independent national development, many other ministries and national organs, too, tapped reserves to the full and provided an abundance of aid materials.

Germany plans to quit Coal by 2038

In an effort to fight climate change, Germany announced plans to quit coal mining and burning by 2038.

All 84 of the country's coal-fired power plants will be shut down over the 19-year time frame, a government appointed commission announced recently.

It's a significant move as nearly 40% of Germany's electricity comes from coal-fired power plants.

"This is a historic accomplishment," Ronald Pofalla, one of four commission leaders, announced at a news conference after more than 20 hours of negotiations.

"It was anything but a sure thing. But we did it," he added. "There won't be any more coal-burning plants in Germany by 2038."

The commission's plan provides about $45 bn in aid to coal-producing regions affected by the phase-out. Chancellor Angela Merkel's government is expected to adopt the plan.

"Good for the economy and climate: The report of the climate/coal commission is widely supported by business and environmental organizations," Economy Minister Peter Altmaier, a trusted advisor to Merkel.

If the exit goes according to plan, renewable energy will effectively supply 65-80% of Germany's power in two decades' time, since the country also pledged to close all its nuclear reactors by 2022, the Times noted.

Renewable energy replaced coal as Germany's main power source for the first time last year, accounting for 41% of the country's electricity, according to Reuters.

But some environmentalists warned that the commission's recommendations are not ambitious enough for Germany to meet its obligations under the Paris climate agreement.

Germany, which has the highest greenhouse gas emissions across the European Union, needs to phase the highly polluting fossil fuel out of its electricity sector by 2030 in order to meet its Paris target, according to Climate Analytics, a Berlin-based climate science and policy non-profit organization.

"If Germany were to adopt the coal commission's

proposal, it would be the only EU country with a coal exit date after 2030, setting a worrying precedent for climate action in Europe and around the world," the group said in a press release.

"Delaying coal exit until 2038 would put Germany behind other leading European economies including France and the United Kingdom, both members of the Powering Past Coal Alliance. The alliance includes 30 governments (of those 11 are EU member states), 22 provinces and cities and 28 transnationals, who pledged to phase out coal by 2030."

"Germany has finally stepped up and joined most of its European neighbors in setting a phase-out date for coal, with support for workers, and deserves credit for that," Jennifer Morgan, the executive director of Greenpeace International, said in a press release. "But the target of 2038 is not enough to protect Germany or other countries from the dangerous impacts of climate change, nor to meet the goals of the Paris agreement."

"Every week we see more and more evidence that climate change is accelerating, bringing with it forest fires, violent storms, and other extreme weather. That should be pushing countries, and Germany should be leading to increase their ambition, to deliver more and to deliver it faster," Morgan added.

Alliance Resources 2018 sales jump to record 40.42 million st

Alliance Resource Partners' coal sales jumped to a record high in 2018, primarily due to a boost in thermal and metallurgical coal exports, the coal producer said.

In its Q4 earnings call, the Tulsa, Oklahoma-based company said it sold a record-high 40.42 million st of coal in 2018, up 6.9% from 37.82 million st sold in 2017.

"We achieved record sales volumes in 2018, driven primarily by a significant expansion of ARLP's presence in the international thermal and metallurgical coal markets with the year-over-year shipments to those markets increasing by 4.6 million tons to 11.2 million tons, or approximately 27.8% of our total 2018 coal sales volumes," President and CEO Joe Craft said on the call.

In Q4, the company sold 10.46 million st of coal, up 3.9% from Q3 and 3.6% higher than the year-ago quarter, "primarily due to increased export sales from our Gibson mining complex," CFO Brian Cantrell said.

Coal sales prices averaged $46.34/st in Q4, up from $45.71/st in the previous quarter and $45.03/st in the year-ago quarter. It was the highest quarterly average since $48.01/st in Q4 2016.

In the latest quarter, Alliance sold 7.98 million st of Illinois Basin coal at an average sales price of $40.26/st, compared with 7.25 million st sold at an average price of $39.92/st in Q3 and 7.39 million st sold at $39.13/st in the year-ago quarter.

Appalachian tons sold came to over 2.48 million st in Q4, down from 2.83 million st in the previous quarter and 2.71 million st in the year-ago quarter. Average sales in the latest quarter were at $64.03/st, up from $59.60/st in Q3 and $60.12/st in the year-ago quarter.

At the end of the quarter, Alliance Resources reported coal stockpiles of 600,000 st, down from 900,000 st at the end of Q3 and 700,000 st after the end of the year-ago quarter.

"A strong winter heating season across our market territory has increased coal burn and reduced stockpiles, allowing ARLP to expand and strengthen its domestic contract position," Craft said.

Production increased to 10.2 million st in Q4, from 9.87 million st in Q3 and 9.4 million st in the year-ago quarter.

Craft said the company shipped coal to 31 countries in 2018, but most of the 11.2 million st of exports went into Europe, Africa and India.

The company reported net income of $50.77 million in Q4, down from $77.24 million in the year-ago quarter, while revenue increased to $531.84 million, from $483.23 million in Q4 2017.

Total net income and revenue in 2018 was $366.6 million and $2 billion, up 20.7% and 11.5% year on year, respectively.

North Korea's push to use more, clouds environmental future

North Korean leader Kim Jong Un sees coal as a key way to boost the economy, but burning more coal may worsen pollution in a country already choking on some of the world's most toxic air.

With the country staggering under the weight of international sanctions over its nuclear weapons program and human rights violations, defectors and analysts say Pyongyang has increased the domestic use of coal, which is blocked for export.

Seven coal power plants and one oil-fired plant produce nearly 50% of North Korea's electricity, with the rest coming from hydro power, according to South Korean government data. For households, co But an increased reliance, which Kim announced in his New Year address, may have deadly implications.

Per capita, North Korea's air pollution mortality rate was the world's highest at 238.4 deaths per 100,000 population as of 2012, a 2017 report from the World Health Organization (WHO) showed. That was 10 times higher than the rate in South Korea and higher than those of China and India, where smog often envelops major cities.

North Korea has acknowledged the correlation between coal and polluted air, but said it has had limited access to cleaner options.

"A combination of limited capital investment in infrastructure, limited access to efficient and low emission technologies ... and reliance on energy produced from coal in low efficiency thermal power plants has impacted air quality in urban and industrial areas," North Korea's 2012 report on environment and climate change outlook submitted to United Nations Environment Programme (UNEP) said.

According to the report, coal is the main fuel used by homes in North Korean cities. In rural areas, wood is the main source, while coal comes in second.

Many rural North Koreans say they're aware of the pollution, but have more pressing problems.

"From the moment we woke up, we had to think about how much rice was left in our jar and how much firewood we had," said Ji Cheol-ho, a North Korean defector who lived in a coal mine town in North Hamgyong province before fleeing to the South in 2007.

Terex Trucks gears up for bauma 2019

Terex Trucks' recently updated TA300 articulated hauler will soon be making its first international tradeshow appearance at bauma Munich 2019.

Visitors to the bauma 2019 exhibition in Munich, Germany, will have the chance to get up close to the newly upgraded Terex Trucks TA300 articulated hauler. This will be the first time the machine has been displayed at an international trade show and it will take pride of place on the company's outdoor stand: FN 720/9. The Terex Trucks team will be at the event, which runs from April 8th to 14th, to show visitors how the company's two articulated haulers – the TA300 and TA400 – deliver low total cost of ownership and high productivity at jobs including large-scale construction projects, infrastructure developments and quarries.

Undivided attention

"Bauma is the world's leading construction machinery trade fair, and as such, it's a showcase of virtually every machine in the industry – but for Terex Trucks, it's all about the articulated hauler," says Paul Douglas, Managing Director of Terex Trucks. "The articulated hauler is the only product Terex Trucks manufactures – so therefore we're able to focus all our attention on this machine. We are the experts in all things articulated hauler. That's one of the key messages we want to get across at bauma 2019: we specialise in robust, reliable articulated haulers. We will also be discussing the investments and improvements we've made in our product line and our growing dealer network. All of this, which is underpinned by our long-standing expertise in the field, has helped us to make sure our articulated haulers are even more productive and reliable. Terex Trucks is the strongest it's ever been."

"Having recently launched an updated version of the TA300 that boasts improvements in fuel efficiency, performance, productivity and operator comfort, we see bauma 2019 as the perfect opportunity to display the hauler in front of a global audience," continues Paul. "As well as this, we'll also be using the show as a chance to inform people about our TA400, which is the biggest articulated hauler we make. In terms of maximum payload, it's 10 tonnes (11 tons) bigger than the TA300."

Since August, the TA300 has incorporated the new EP320 transmission, which comes with two additional forward gears – eight in total – as well as four reverse gears. This helps to ensure smoother gear shifting and thereby superior operator comfort. In addition to this, the TA300 now delivers a 5% improvement in fuel efficiency, as well as enhanced performance, productivity and operator comfort. It also now comes with long life transmission fluid, which has helped to increase the length of time between oil maintenance intervals from 1,000 to 4,000 hours. The hauler's maximum speed has also increased to 55 km/h (34 mph), up from 50 km/h (31 mph). Ultimately, this means that customers can achieve faster cycle times, reduce the cost of operation per tonne and minimise their fuel consumption. "The TA300 is one of our staple products, hence why we worked long and hard to make it even better for our customers," says Paul. "The upgraded TA300 was rigorously tested for nearly two years internally and by operators on real job sites, working in a variety of conditions."

Growth in Germany

A glimpse into its latest products won't be the only thing that Terex Trucks will be offering at bauma 2019. The Scottish manufacturing company will also be hosting a press event for representatives of the international media on April 11th at 4:00pm. Paul Douglas, the company's Managing Director, and his team will be on site to discuss product news, market conditions and future plans. "Terex Trucks is currently expanding its presence in key markets and that includes Germany as well as the US and France," concludes Paul. "We already have three well-established dealers in Germany but we're looking to sign more – particularly in the east and north-east of the country. Bauma will be a good opportunity for us to meet and attract new customers and dealers."

Output rise to improve South32 profit

Diversified miner South32 Ltd has nearly doubled its second-quarter metallurgical coal output and raised its production guidance for a major mine in 2019.

First quarter coking coal output by South32 has tripled.

Production of coking or metallurgical coal, which is a key steel-making ingredient, rose to about 1.6 million tonnes in the December quarter from 788,000 tonnes a year earlier. The figure was substantially higher than a Citi estimate of 804,000 tonnes.

The company raised its fiscal 2019 guidance for production from its Illawarra Coal Project by 7% to an expected 6.5 million tonnes. Illawarra accounts for most, if not all of South32's coking coal output.

First quarter coking coal output by the company had tripled following strong performance at its mines.

The company, which is also the world's largest manganese miner, clocked a small decline in production for the quarter with about 1.4 million wet metric tonnes of manganese ore produced.

The diversified miner's aluminum production rose slightly to 247,000 tonnes in the quarter. Aluminum prices had slumped in late December after the United State's decision to lift sanctions on Russian behemoth Rusal.

Separately, the company said Katie Tovich will succeed Brendan Harris as its chief financial officer, starting from May 1, 2019.

Government revisits decision to grant planning permission to the uk's newest mine

The government has agreed to revisit its decision to grant planning permission to a new coal mine in County Durham after admitting "a flaw" in the decision making-process. Residents have long argued that the mine would be inconsistent with the government's coal phase-out plan.

The Department for Communities, Housing and Local Government has agreed to revisit the decision to allow the Bradley coal mine, in Pont Valley, to proceed after a judicial review was brought by local resident June Davison, who lives less than 300 metres from the mine.

Davison argued that the Secretary of State James Brokenshire had failed to justify his decision to allow the mine to proceed given another proposed mine near Druridge Bay in Northumberland was rejected in 2018 on the grounds that it was incompatible with the UK's climate change commitments.

Davison's case has been adjourned until 25 February 2019 after the department "identified a flaw in the original decision-making process" and agreed to revisit the decision within 35 days. Residents will be able to bring a fresh judicial review if no decision is made within that timeframe.

Reacting to the decision, Davison said in a statement:

"The Secretary of State can't repair the damage that has been done here but the least he can do is stop it getting worse. We are fighting back for what remains of the wildlife in the Pont Valley, for the climate and for the health of our community."

Anne Harris, a campaigner with the Coal Action Network, which has been helping local residents resisting the coal mine, said:

"The government should seize this opportunity to end the dirty industry of opencast coal extraction for good. Supporting either Bradley or Druridge Bay would be inconsistent with their promise to end coal use in power stations by 2025."

The Bradley coal mine is operated by Banks Group, which owns a number of coal mines in the North East, including one on the estate of hereditary peer and climate science denier Matt Ridley.

Banks Group inherited the permission for the Bradley mine in June 2015 after the previous owner, UK Coal, went bust. Work began at the mine in May 2018. Planning permission for the mine would have expired on 3 June 2018 had work not commenced by that date.

The mine's rapid development meant local residents that opposed it "didn't have time to get together and organise" a proper resistance to the project, they previously told DeSmog UK.

In July 2018, a DeSmog UK investigation identified a number of ways in which the company appeared to have contravened its contract with the local council – known as a section 106 agreement – in order to commence work before the deadline.

Mark Dowdall, Environment and Community Director for Banks Group, said in a statement:

"Work is continuing to progress well at Bradley in the safest, most efficient and most environmentally responsible way possible, with more than 40 people from in and around the local area now directly employed at the site, and we do not believe there would be any justification for the revocation of the planning permission that was granted to the scheme through the appropriate processes."

Asia Pacific region leads the way

The age of coal may be entering its twilight years. But coal, as a contributor to global energy supplies, is some way from a museum piece just yet. The shift in global coal-fired generation of electricity from the US and Europe to more modern power stations in Asia could mean that greenhouse gas emissions from coal still fall. Many of the new plants in Asia use "high efficiency low emissions" (HELE) technologies, which can achieve significant reductions compared with the older plants in developed countries.

While coal use for power appears to have peaked in developed countries, there is still growth in many emerging economies, particularly in south-east Asia, for the most carbon-intensive fuel available. The outlook for China, which accounts for a little under half the world's coal demand, is uncertain: the government is making efforts to curb emissions from coal, but power generators are still seeking to build new plants. Coal remains an appealing solution for countries that need to meet fast-rising demand for electricity, are seeking to minimise costs, and are not setting reductions in greenhouse gas emissions as the prime objective of energy policy so while the number of coal-fired power plants built worldwide has fallen over the past two years, Asia leads the world in building new coal power plants and developing new mines.

World coal use rose in 2017 for the first time in three years, and continued again in 2018. Prices for thermal coal used for power generation have risen strongly driven by high temperatures in China and other Asian countries that have increased demand for air-conditioning and hence for electricity.

Demand growth has also been driven by rising populations, the rapid pace of urbanization, enormous increases in industrial production, and the progressive extension of access to modern electricity to larger segments of rural populations.

China is Asia's main coal-producing force, not only being the largest coal-producing country in the Asia-Pacific region, but also the largest in the world.

The region's coal industry comprises China, India, Australia, Indonesia, Kazakhstan, Thailand, Vietnam and New Zealand. China contributed 68% towards the region's total coal production. In contrast to China's colossal production, India also offers a 13% share of regional production, while Australia accounted for an 8.5% share and Indonesia made a 7.2% contribution.

Top countries excluding China in the region by coal proved recoverable reserves include: Australia (76,400 Mt), Indonesia (28,017 Mt), Thailand (1,239 Mt), New Zealand (571 Mt) and Vietnam (150 Mt). Top producing countries are: Australia (484.5 Mt), Indonesia (392 Mt), Vietnam (41.5 Mt), Thailand (15.2 Mt) and New Zealand (3.4 Mt).

AUSTRALIA

Australia has immense coal reserves all over the country and in Northern Territory and is a major global producer and exporter. Australia's share of global coal production was around 6% in 2016. Around 80% of coal is produced in open-cut mines,

which allows higher rates of resource recovery in a more cost effective way. About 98% of the country's bituminous coal is produced in just two states – Queensland (52%) and New South Wales (46%). The country consumed only 46.6 million tonnes of oil equivalent from the 275 mt produced in 2015. The largest consumers of Australian coal include Japan, China, South Korea, India and the European market.

LATEST PROJECT APPROVAL

During November last year MacMines Austasia Pty Ltd welcomed the approval by the Coordinator General of the China Stone Coal project. This is a major step in the development of the Project.

MacMines Austasia is a 100% subsidiary of the Meijin Energy Group, a China Shanxi Province major diversified private energy company. Meijin is China's top metallurgical coke producer and has interests in coal mining, steel production and clean energy production. As well as MacMines Austasia, Meijin is a major shareholder in Australian Ilmenite Resources and Australian Gas and Oil, both based in the Northern Territory.

Meijin has the capability and support to develop the China Stone coal project and brings with it several major Chinese enterprises to aid the project's completion.

China Stone's conditional EIS approval is a milestone in the projects' path toward building a 38 million ton per annum open cut and underground mine in the Galilee Basin. The project is the fifth coal mine in the Galilee Basin to reach this stage. The company has applied for mining leases to enable the project to proceed and this next step will take time to complete.

Critical to the development of China Stone Coal Project is the completion of a railway which links the northern Galilee Basin to Abbot Point coal terminal. This is the key enabling infrastructure for the project and MacMines is considering options to deliver this outcome.

CARMICHAEL – APPROVALS STILL NOT COMPLETE

Adani made a string of announcements in 2018 regarding the project but cannot hide the fact that it has not yet signed a royalty's deal with the Queensland government, which analysts estimate would be worth $315m to the company in deferred payments during the early years of production. Questions remain about whether Adani can meet the terms of state government's royalty's framework that would allow such a deal.

Adani also has to negotiate access to the Aurizon rail network. It is unclear who will pay for necessary upgrades to the railway.

Julien Vincent, the executive director of Market Forces, an NGO encouraging environmentally sustainable investment, said the latest announcement was "an act of desperation from Adani".

"[Adani] knows the window of opportunity to build its Carmichael mega coal mine is rapidly closing," he said.

"It's also an admission of failure, as the company has tried and failed for almost a decade to find a financial backer and now has no option but to move its unpopular project ahead with its own capital.

"Adani's claim of financial close remains highly questionable. Financial close is what happens when everything is in place. This is a project that still doesn't have all of its approvals."
The State Government also approved the mining lease for Fitzroy Australia Resources' Ironbark No. 1 mine, 35km north-east of Moranbah.

Mines Minister Dr Anthony Lynham said the underground longwall operation was expected to employ 160 contractors during construction and up to 350 operational staff.

It will to produce up to 6 million tonnes per annum run of mine coal, mostly hard coking coal, with first production expected from the first quarter of 2020.

Fitzroy Australia Resources acquired Ironbark No.1, neighbouring Carborough Downs mine and the Broadlea project from Brazilian mining giant Vale in November 2016. Ironbark will share major infrastructure with Carborough Downs.

INDONESIA

Indonesia is a key player in the international coal market, with vast reserves, high production and export levels. It is one of the world's top exporters of thermal coal, but production levels are estimated to fall due to a severe reduction of coal miners' profits (decline by 60% from 2011 to 2014) and declining exports to China. The oversupply of coal will most likely feed the power sector in the country, as government plans to increase power generation by 35 GW by 2019, out of which around 20 GW are expected to be coal-fired plants. The largest coal fired plant is under construction, the PLTU Batang, and will have a capacity of 2 GW. Some of the coal projects in the country include: IndoMet (resources – 1.3 billion tonnes), Tutupan (resources – 668 Mt, latest output – 42 million tons per annum) and Wara (resources – 176 Mt, latest output – 3 mtpa) operated by Adaro Energy; Lati (resources – 745 Mt, latest output – 11 mtpa), Binungan (resources – 300 Mt, latest output – 5 mtpa) and Sambarata (resources – 190 Mt, latest output – 4 mtpa) operated by Berau Coal; Satui (resources –34.2 Mt, latest output – 5 mtpa) and Mulia (resources – 239 Mt, latest output – 5 mtpa) operated by PT Arutmin Indonesia.

VIETNAM

Vietnam has around 200 coal mines and major coal producers include Vietnam Coal and Minerals Industrial

Banpu – The company aims to acquire mines near its Indonesian and Australian operations to capitalise on rising coal prices

Group (Vinacomin) with 41 Mt of anthracite coal in 2013, Vietmindo with 3 Mt in 2013, Dong Bac Corporation with 3 Mt production in 2013 and 319 Corporation. The country shifted from being a net coal exporter to a net coal importer. Increasing energy demand will most likely impact coal demand to surge to 86.4 Mt/year from an estimated 47.5 Mt in 2016, according to a 2016 government report. In addition, it is estimated that coal demand will reach 121.5 Mt/year by 2025 and 156.6 Mt/year by 2030. Power sector is the main consumer of coal with around 70% of consumption in 2016. Government estimates show significant amounts of coal resources, located in the northern basin of the Red River Delta with 42 billion Mt of coal resources, followed by the north-eastern basin with 4 billion Mt. One of the main projects includes the construction of Duyen Hai coal terminal in the southern province of Tra Vinh by 2020, with a maximum capacity of 40 Mt/year of coal.

THAILAND

Thailand's Banpu, Asia's biggest coal miner, has ambitions to become an integrated energy company, but says the coal business will remain its core over the next few years as it buys more mines abroad to capitalise on strong demand, particularly in Asia Pacific.

President and Chief Executive Somruedee Chaimongkol said Banpu has earmarked $600 million in capital expenditure this year, including for mergers and acquisitions, aiming to buy mostly small and medium-sized mines near its existing facilities to help increase production amid rising global coal prices.

In August last year Banpu paid $30 million to acquire PT Nusa Perdana Resources (NPR) in Indonesia, via its local subsidiary. The mine is located near Banpu's existing mine, allowing the sharing of infrastructure to help cut costs.

"Infrastructure such as roads and ports are crucial facilities needed for coal mining and coal trading, and sharing those facilities by acquiring small-size coal mines adjacent to Banpu's existing mines could help cut production costs substantially and allow the company to have a profit margin even if global coal prices ease," said Somruedee.

Banpu has five mines in Indonesia and five in Australia. The company also has a 46% stake in a coal mine in China. However, Somruedee said the company is unlikely to make any aggressive acquisitions in China. "Coal produced from our mines in Indonesia and Australia is classified as ranging from standard to higher quality, which can be sold at a good price at a time that the global coal price is higher," said Somruedee.

The latest acquisition in Indonesia will help increase Banpu's coal reserves by 77 million tons, taking its reserves to a minimum of 12 years. With more acquisitions, Banpu expects to raise total coal reserves to 15 years over the next few years.

Despite developing new power businesses, coal will remain the company's core business for at least five to seven years, it says.

Currently, coal accounts for 66% of total revenue, while the power business accounts for 20%, gas for 8%, while the rest is from its renewable power generating business.

Somruedee said coal's share of total revenue is set to drop to 50% by 2025, while the contributions from power, gas and its energy technology businesses are due to rise. However, the company realised that, for developing countries, especially in Asia Pacific, coal remains the most competitive power source. With rising demand, Banpu targeted total coal sales of 45 million tons in 2018,

Banpu posted net profit of $84 million in the first half of 2018, down 27% from $116 million in the same period last year.

Store Norske Spitsbergen Grubekompani

The Norwegian Government, which owns Store Norske Spitsbergen Grubekompani AS, have decided to close the Coalmines in Lunckefjell and Svea at Svalbard. The area has to be cleared and all the equipment including spare parts are to be sold. The clearing process will take place over several years and the machines and equipment will be sold continuously as they are released.

The following surface equipment will be announced for sale:

Production equipment
- Coal processing plants (400tph and 100tph)
- 2000tph Ship loader with conveyors, crusher and screen, reclaim feeders and hoppers

Power production and distribution
- Diesel powered Power station 17 MW
- Mobile diesel generators
- Electrical Distribution system with transformers, cables and switchgear.

Other equipment
- Water supply system with filtration
- Front loaders
- Excavators
- Lorries
- Tractors
- Trucks, forklifts
- Telehandlers
- Shot crete mixing plant and spraying system
- Air compressors with driers, tanks and galvanized pipelines

Buildings
- Accommodation buildings (modular)
- Office buildings (modular)
- Fabric covered buildings
- Various size cabins

For more detailed information, see:
https://snskmachinesales.com

The following equipment from the mines will be announced for sale:

Development equipment
- Continuous Miners
- Bolter Miners
- Shuttlecars
- Feeder-Breakers
- Roof Bolters
- Drill Rigs
- Electrical Equipment with Transformers and Switchgear

Production equipment
- A Complete 240 meter Longwall consisting of; 139 x 2/1075 Tonne Roof Support units @1.756m centres
- Operating Range from 1300mm to 3000mm
- Armoured face conveyor (AFC)
- Stageloader
- Shearer
- Heavy Duty Crusher
- Matilda Belt Tail End
- Control and monitoring system
- Ex-Electrical Equipment with Transformers and Switchgear

Other equipment
- Water pumps and pipelines
- Distribution systems for power in Ex-design with transformers and switchgear
- Monitoring and Communication Systems
- Tractors
- Loaders
- Telescopic forklifts
- Air compressors with driers, tanks and galvanized pipelines

Complete Belt conveyors Including:
- Drive station, delivery units, reeler & belt clamps
- Standard loop take up units
- loading sections for return ends
- Structure and belting
- Return ends units and electrical equipment

Breaking new ground

It's fair to say that most people would view industrial conveyor belts simply as long lengths of thick black rubber that have to carry things from one end to the other, which is not very exciting and hardly rocket science surely?. In reality, conveyor belts perform an enormously important function and have to cope with all manner of potentially destructive materials, often in very demanding environments. Creating rubber compounds and belt constructions that can do these things is actually a surprisingly complex science.

Although rubber belt technology has progressed quite considerably in recent years, there has not been a genuinely ground-breaking advance for a very long time indeed. Until now it seems, because Dunlop Conveyor Belting in the Netherlands and their sister operation in North America (Fenner Dunlop Americas) have rather quietly introduced a very new and unique design of belt that they claim is considerably more durable and tougher than conventional ply belting. The accompanying market strategy is also to be extremely competitive on price, which certainly is not an approach that Dunlop are known for. *Here, Leslie David unearths more about an innovation that some believe will ultimately change conventional thinking on conveyor belt construction*.

THE CONVEYOR BELT MARKET

In order to appreciate the significance of what Dunlop are doing it is important to first look at the market backdrop. In terms of what conveyor belts need to handle, the vast majority of rubber conveyor belts are only required to cope with abrasive wear (abrasion resistant). The size of the market for specialist belts that need to withstand demands such as heat, oil, extreme cold or fire for example is appreciably smaller. Users of wear resistant belts are spoilt for choice because there are so many manufacturers competing for a share of a global market that is worth hundreds of millions. Conveyor belt users can opt for a high quality belt that possesses genuinely good resistance to wear (abrasion) and therefore will provide a much longer and therefore more economical lifetime. Alternatively, at the other end of the scale, conveyor operators can choose to use 'economy' belts with the double-edged sword of exceptionally low pricing on the plus side but with much, much more rapid rates of wear on the negative side.

This 'economy' end of the market is dominated by belting imported from South East Asia. It is not uncommon for belt manufacturers and traders to import from Asia to supplement their own production thus enabling themselves to offer low price belting to their customers in Europe and elsewhere. However, one or two of the biggest players such as Dunlop Conveyor Belting in the Netherlands refuse to play such a game. In fact they do not even target this end of the market. Instead, they focus their efforts entirely on high quality long-life belting, heavy-duty specialist belting and hi-spec belts such as fire, oil or heat resistant.

Although this strategy has served them well, their research & development teams have still continued to search for what might be regarded as the Holy Grail of conveyor belting, which is super-tough, high quality belt that can compete at the economy end of the market. And now they believe that they have found just that. In the Netherlands they have branded their discovery *Ultra X*.

AN AGE-OLD DILEMMA

It is a fact that even the strongest, heaviest belts can be ripped, torn or punctured by heavy, sharp materials or foreign objects, either falling from height or becoming trapped.

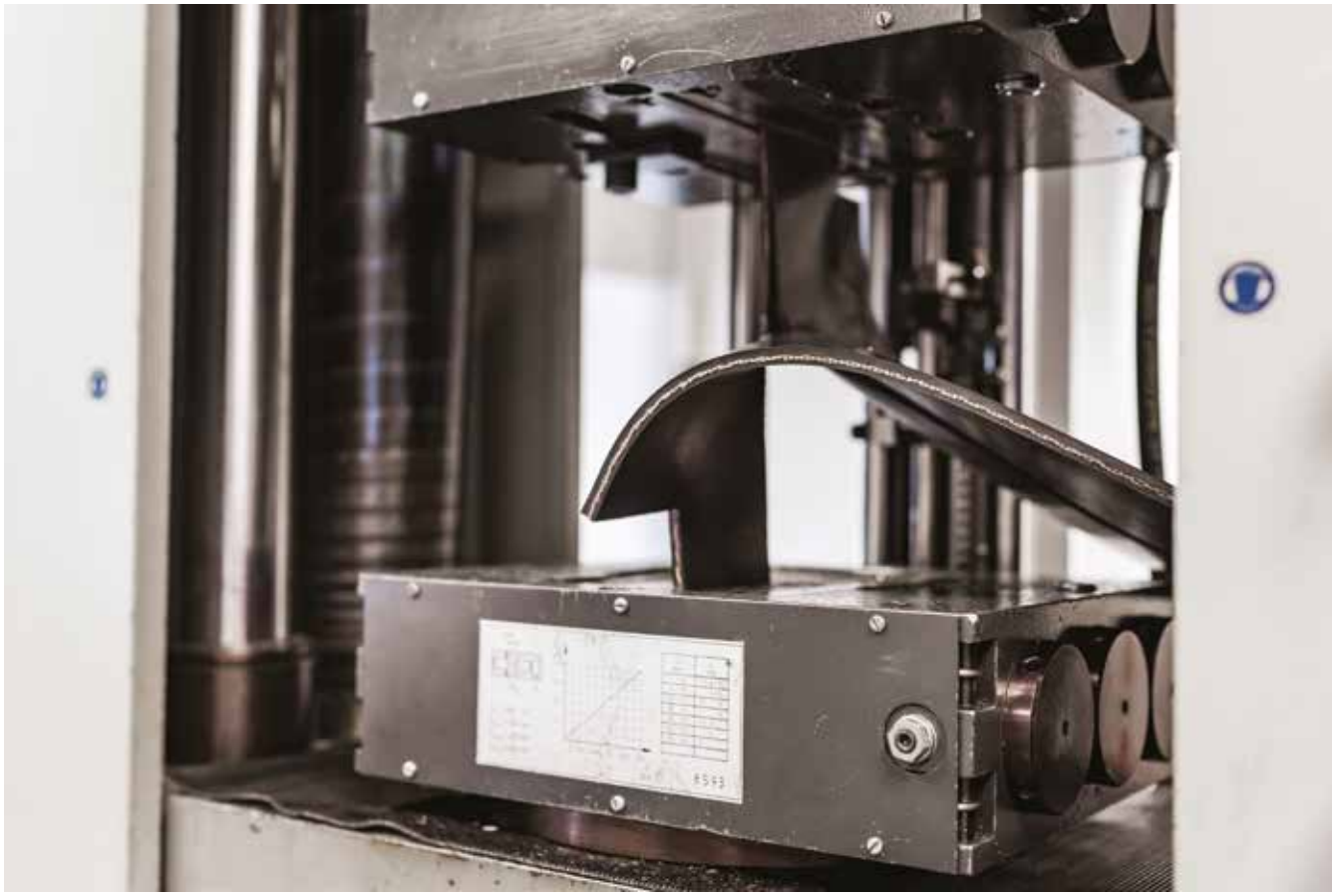
80% of all belts have to be replaced because of damage

"Accidental damage is something that virtually all conveyor operators have to contend with" says Dr. Michiel Eijpe, Dunlop's development director in the Netherlands. *"Belts can often be destroyed within a matter of a weeks or months. We estimate that about 80% of all belts have to be replaced because of damage long before they are anywhere near the end of their wear life. Using low grade 'sacrificial' belts invariably proves to be a false economy for a lot of reasons including loss of production and high maintenance and the high cost of frequently having to fit replacement belts. It's an age-old dilemma".*

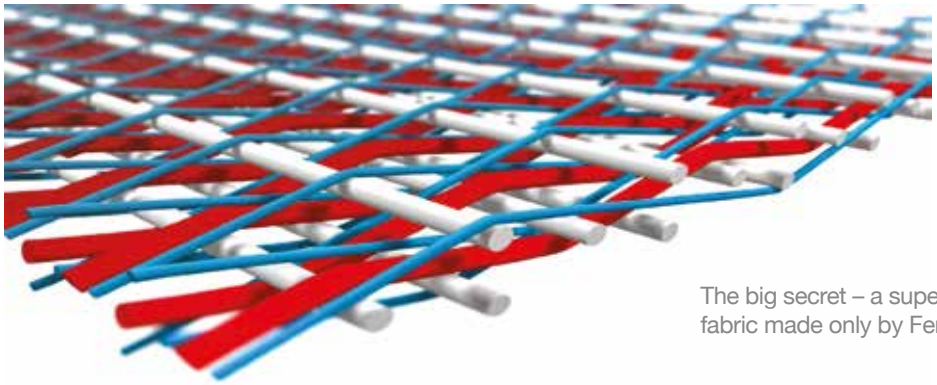
According to Dr. Eijpe, the problem of rapid wear caused by abrasion was solved long ago. *"Our belts are well-recognised as being the longest lasting belts on the market. For us, the rubber covers were the easy part. The biggest challenge was designing a 'problem solver' belt that could really handle impact, ripping and tearing while at the same time creating a belt that could be priced economically. To do that we focussed our attention on the actual belt construction; primarily the ply fabric itself".*

THINKING OUTSIDE OF THE BOX

What the engineers and technicians of Dunlop on both sides of the Atlantic did was to forget convention and think outside of the box. They went back to the drawing board to design and develop a new and unique super-strength



Five times greater ear resistance



The big secret – a super-strength 'breaker welt construction' fabric made only by Fenner Dunlop

'breaker weft construction' single-ply belt. The basis of their concept is an amazingly tough patented fabric that is exclusively made in their own in-house fabric weaving facility in the USA. Dunlop say that the fabric has more than **3 times** greater longitudinal rip resistance and up to **5 times** better tear resistance and a far superior resistance to impact compared to traditional 3-ply belting.

WHAT'S THE BIG SECRET?

Dunlop engineers say that Ultra X owes its outstanding strength to its specially woven carcass. This fabric design uses crimped warp polyester yarns to provide high strength and low stretch. These are combined with strong 'binder' and 'filler' yarns to create strength and stability under load and to give exceptional rip, tear and impact resistance. Throughout its development, sections of belt were repeatedly tested to destruction. The tear resistance of Ultra X is strictly measured according to the international EN ISO 505 standard. Tests for rip and tear resistance are only made on the actual belt carcass so the top and bottom covers are always removed. This ensures that the thickness and quality of the rubber cover does not influence the accuracy and consistency of the test results.

TICKING ALL THE BOXES

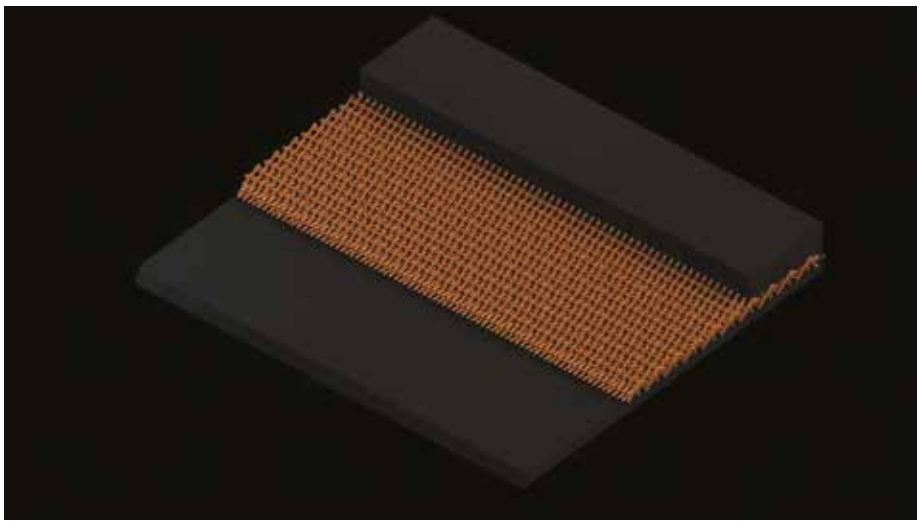
As Dr. Eijpe explained earlier, protecting the carcass with hard-wearing rubber covers was the easy part. Certainly for the time being, all Ultra X belts are produced with Dunlop AA anti-abrasion covers as standard. *"Using this grade of rubber ensures that the belt has excellent resistance against the cutting and wearing caused by coarse materials and a resistance to abrasion that outperforms typical DIN Y requirements (average loss of less than150mm³) by as much as 20%"*

"And as with all of our cover qualities, our AA grade rubber is extensively tested in compliance with EN ISO 1431 for ozone resistance (50 pphm, strain 20%, 96 hours no cracking) and resistance to the damaging effects of UV light. We know from experience that these are essential design characteristics that are vital in helping to avoid premature replacement of the belt due to cracking of the belt surface". Dr Eijpe was also keen to point out that all Dunlop cover qualities are produced in compliance with REACH (Registration, Evaluation and Authorisation of Chemical substances) regulation EC 1907/2006 and are anti-static according to EN ISO 284. *"Ozone resistance, REACH compliance and being anti-static are all important credentials as far as we are concerned. Besides, ticking as many boxes as possible makes it easier for the end user to choose our belts!"*

A QUESTION OF STRENGTH

Ultra X is available in abrasion resistant rubber and in two strengths - Ultra X1 (Type 330), which is designed for users of EP315/2 and 400/3 conventional ply belts and Ultra X3 (Type 550), which is designed to replace EP500/3, 500/4, 630/3 and 630/4 ply belts.

The fact that Ultra X is a single-ply construction belt designed to replace conventional two, three and even four-ply belts has already raised quite a few eyebrows (and questions) amongst traditionalists. The first question that seems to be on everyone's lips is how on earth can a single-ply belt provide sufficient tensile strength and yet still have such high levels of rip, tear and impact resistance? Rob van Oijen is manager of application engineering in Dunlop's Drachten headquarters and is clearly well-versed in explaining not only the how's and why's but also rather adept at throwing in some not inconsiderable additional benefits as well.



Single-ply construction designed to replace two, three and even four-ply belts

Ideally suited to run on mobile machinery despite small pully diameters

"We keep coming back to the genuinely unique fabric that we are using. Besides being able to withstand the kind of punishment that would destroy a normal belt, Ultra X has amazing tensile strength. The longitudinal tensile strength of the X1 is 330N/mm and the X3 has a longitudinal strength of 550N/mm. The fact is that we stepped away from the conventional range of multi-layer belting for good reason. A single-ply construction requires a finger-splice joint to be made and the big advantage of finger splice joints is that they retain up to 90% of the belt's tensile strength whereas a 2-ply step splice only retains a maximum of 50% and a 3-ply step joint can only achieve a maximum tensile strength of 67%".

"When such a high level of splice efficiency is combined with the X1 and X3 tensile strength then at the very least it effectively creates equivalent tensile strengths and belt safety factors that would be expected from comparable 3 or 4 layer conventional belting. Belt safety factors are one of the prime selection criteria so this is a really important advantage."

Rob freely admits that finger splices do take longer to make (initially about 30% longer in his experience but such a difference would be expected to reduce quite significantly with growing experience) and that they are a turn-off for some vulcanisers, especially those who only want to use cold splice techniques. However, he is convinced that with a little help and encouragement that viewpoint can be changed. *"The technical and economic arguments in favour of finger splicing are unquestionable. Finger splice joints are immensely strong and durable and when you consider the fact that Ultra X has an appreciably better performance compared to conventional ply belt it means that the need to repair and re-splice joints will be much less frequent".*

The power of less. A single-ply belt that out-performs multi-ply

High levels of rip, tear & impact resistance

"To help our customers we supply the finger splice kits, materials and tools, a guide manual, a training film and we even provide training and supervision where warranted". For those who still remain dead set against the idea of finger splicing the good news is that Ultra X just happens to possess excellent mechanical fastener retention with Superscrew 63 as the recommended choice of fastener.

There certainly does not appear to be any question mark against the overall strength of Ultra X because, as their promotional film proudly states, an Ultra X3 single ply belt is able to pull up to 56 tonnes in weight, which is the equivalent of 40 mid-sized family cars or 2250 bags of cement.

ENDLESS OPPORTUNITIES

The OEM market is a specific target for Dunlop because Ultra X is flexible enough to be used on smaller drive pulley diameters. Sales & marketing director Andries Smilda says that they are already seeing a growing number of orders from OEM's for endless belts. *"The X1 drive pulley diameter for over 60% rated tension can be as small as 315mm and the X3 drive pulley diameter, again for over 60% rated tension, can be as small as 400mm. This means that Ultra X is ideally suited to run on mobile conveyors, crushers and road machinery that are notorious for having small pulley diameters. Up until it has been almost impossible to use high-impact, rip resistant belt because conventional ply belt has to be pretty thick to be able to take the punishment. The problem is that machine design tolerances and the stress placed on the inner carcass and the splice joint by continual flexing over small diameter pulleys seriously limits what can be fitted. Ultra X overcomes that problem".*

Certainly, Dunlop in Europe are so confident that Ultra X will prove to be a game changer in the OEM market that they have geared up their endless belt production capacity, not only in Drachten but also in their service facilities in Poland and Italy.

UNDER THE RADAR

Dunlop actually launched Ultra X more than a year ago but its introduction to the market place was deliberately low-key and therefore under the radar of most of the market. Andries Smilda explains that they had many reasons for such a cautious approach. *"We knew that we were onto something special with Ultra X but Dunlop being Dunlop we still wanted to prove it in the field so we worked with tried and trusted end-users and OEM's".* One of Dunlop's many successes so far is that Ultra X is now the belt of choice in the biggest quarry in Europe while at least one OEM has found that using Ultra x has more than doubled the average belt lifetime. *"The past year has confirmed that Ultra X is all that we thought it would be and more. Although we have several thousands of meters in use we have not had one single complaint or technical issue so now we are ready to shout about it from the rooftops".*

When talking to Smilda he makes no secret of the next steps that Dunlop want to take. *"We are escalating the sales & marketing activity. We are primarily focussing on OEM's and vulcanisers who are progressively minded*

enough to see the enormous advantages of Ultra X and who are looking to gain a competitive edge over their competitors. This is where we see the potential to sell the kind of volumes we need to achieve sufficient economy of scale in the production process".

COMPETING ON QUALITY AND PRICE?

There is also a surprising openness about the need to be able to "slug it out on price" in the day to day 'economy belt' market and why and how they are able to offer prices that are at least comparable (and often lower than) multi-ply belting. *"We have not," he says, "and of course never would, comprise on quality for the sake of a lower price offering. That is simply not our culture. Actually there are several reasons why we can price Ultra X so competitively".*

"Firstly, the single-ply carcass is made from fabric that we manufacture in-house. That's a big advantage both quality and cost-wise. Having a single-ply construction also allows for maximum efficiency of production because there are fewer calender runs. And having no rubber skim between the plies not only results in a thinner, stronger carcass, it also keeps the cost down". Dunlop are making longer production runs at a maximum width of 2000mm and are only selling Ultra X in full roll lengths of 300 meters. Endless and 'pre-prepared' belts need to be ordered in multiples. *"Selling and shipping short lengths creates additional costs that impact on the selling price but for all customers starting out with Ultra X for the first time we are of course trying to be as flexible as possible. We know for from experience that once they see what Ultra X can do then they will be coming back for more!"*

A CULTURAL CHANGE

There is no questioning the belief and enthusiasm that everyone at Dunlop Conveyor Belting seems to have for There is no questioning the belief and enthusiasm that everyone at Dunlop Conveyor Belting seems to have for Ultra X. There is also no question about their history of innovation when it comes to conveyor belts; from creating the very first fire resistant belts through to heavy duty application belting such as Dunlop UsFlex. It's clearly part of their culture.

At the same time, what is also clear is that they are looking for something of a cultural change not only from OEM's and vulcanising companies but ultimately from the end-user market as a whole. To many, the very notion that compared to traditional multi-ply belting, a relatively lightweight, single-ply construction belt can provide the necessary tensile strength together with considerably more resistance to ripping, tearing and impact; have a much greater splice strength, require fewer repairs and reduce both maintenance costs and the frequency of belt replacements is difficult to comprehend. Remember, this is Dunlop we are talking about so to do all of this while at the same time competing on price is an even bigger ask. But if the market can perhaps take off its blinkers and look just a little beyond its long-held beliefs and preferences then I strongly suspect that Ultra X really could be a game changer.

The conveyor safety audit

Regular inspections help identify and eliminate slip, trip or fall hazards

There are many danger areas related to conveyors, some common to all systems and others specific to individual applications. But too often, the details of a conveyor's safety issues are not well documented, and instead these hazards become accepted in the facility as inherent risks. They are often communicated as common knowledge and passed along like folklore from one worker to the next.

Over time, this common knowledge has a tendency to fade or disappear altogether. Contributing factors include changes in management, new ownership, personnel shifts in engineering, maintenance or operations, as well as employee retirements and relocations. As a result, the in-house knowledge of conveyor systems erodes. In many cases, even the lists of the major components in a conveyor system may not be kept up to date in the safety, engineering, purchasing and/or maintenance departments. The files become outdated or, perhaps worse, the information is retained only in the mind of one or two people.

STEP ONE: FACT-FINDING MISSION

It's good practice to conduct regular safety assessments of a plant's conveyor systems. This census appraises the components, structures and installed equipment to identify any hazards that may exist.

A safety survey is best conducted by a team of at least two workers, with the 'buddy system' helping to identify and rank issues found during the conveyor 'walkdown,' minimizing reporting concerns that may result from assumptions or misunderstandings. Ideally, one person would be knowledgeable about the specific conveyor and the overall process being surveyed, and the second person familiar with conveyors in general.

Over-familiarity with the specific conveyor can actually be a detriment that results in overlooking a problem situation that has been part of the system for a long time. If the second member of the survey team comes from a different part of the facility or is an outside contractor or consultant, that person provides a fresh perspective. In addition, an outside consultant will have a new frame of reference and expertise, without preconceived notions as to why things are the way they are. The result is a team better able to identify what can and should be done to mitigate risks.

The conveyor safety assessment is usually conducted by 'walking the belt.' The safety team walks the system: inspecting its operation, performing minor safety adjustments, and noting more significant conditions or problems for later attention. During this appraisal, potential hazards are observed, identified and recorded.

The 'buddy system' helps identify and rank potential safety issues

No guard can improve safety if it's not re-installed after service [Image courtesy of the United States Mine Rescue Association]

The belt walkers should take detailed notes of the problems observed. For example: 'Unguarded pinch point on the tail of Conveyor B could result in an entrapment,' or 'Significant spillage at the tail of Conveyor 3 could cause a slip/trip/fall incident.' It's better to make notes as the issues are recognised, rather than waiting until the inspection is finished on a particular conveyor. Information could be recorded using a pad of paper, notebook or a tablet computer. Even a cell phone with a voice recording app can be employed to capture observations from the walk, especially those details that might be forgotten by the time the inspector returns to the office and gets distracted by other tasks.

A digital camera, cell phone or tablet device also allows the inspectors to take photos or video footage of any issues found, which can then be incorporated into an ensuing report or shared with others in the organization. Once this information is collected, it should be archived in a single, central location that's readily accessible to key personnel. The growing body of information can be used to instruct maintenance or repair crews assigned to address the issues, or to educate workers unfamiliar with the operation or equipment, to better prepare them for any potential hazards they may encounter. Technologically-advanced operations may have specialised computer software to incorporate and organise vast amounts of information into a digital asset library, which becomes a centralised repository for personnel to quickly access detailed safety information that's specific to each individual conveyor.

CONVEYOR UP OR CONVEYOR DOWN?

The question of whether or not to walk the belt and conduct a safety assessment of the conveyor when the system is operating is worthy of some consideration. Walking the system when the belt is moving allows the personnel to see more of the real problems that affect conveyor safety. If the conveyor is not moving, many key indicators are hidden, such as vibrations in the structure and fluctuations in the belt's line of travel.

The decision as to whether to walk the belt when the conveyors are running or not may depend on external factors, such as when manpower is available, the level of service work expected or the plant's policies. Regardless, a significant amount of caution is advisable any time personnel are in close proximity to a moving conveyor. The majority of conveyor accidents occur when maintenance or housekeeping is being done on or around an energised conveyor. Even when successfully completed, these tasks can create hazards that persist long afterward, such as discarded components or forgotten tools.

WHEN THE INSPECTION IS COMPLETE

Obviously, walking the belt has little benefit unless constructive action is taken based on the information acquired on the trip. In the mining industry, the federal Mine Safety and Health Administration (MSHA) released its final rule modifying workplace examination requirements for surface and underground mines, and for the contractors and construction companies that provide services at these operations. The revised standard requires each "working place" to be examined at least once per shift for conditions that may adversely affect the safety or health of miners, before work begins or as workers begin work in that location. Employers must promptly notify workers in affected areas of any uncorrected conditions that may adversely affect them, and must promptly initiate appropriate corrective action.

Obviously, recording the observations and then submitting them to the proper channels is the reason the trip audit is conducted. The facility's safety personnel or plant management should be alerted to the specific safety hazards and potential risks uncovered by the survey. Once all of the data is collected from a conveyor safety walk, it should be prioritised and then acted upon. One matrix for risk assessment is presented in CEMA Technical Report 2015-01: Recommended CEMA Risk Assessment Process, a technical report that presents a methodology for conducting risk assessment and addressing the risk.

Extreme caution is advised when inspecting a moving conveyor

Risk Assessment Matrix				
Probability / Severity	Catastrophic (1)	Critical (2)	Marginal (3)	Negligible (4)
Frequent (A)	High	High	Serious	Medium
Probable (B)	High	High	Serious	Medium
Occasional (C)	High	Serious	Medium	Low
Remote (D)	Serious	Medium	Medium	Low
Improbable (E)	Medium	Medium	Medium	Low
Eliminated (F)	Eliminated			

CEMA Technical Report 2015-01 assigns a risk level based on severity and probability

Each of the observed issues can be evaluated and its root cause(s) identified by plant personnel or outside professionals. When the causes of problems have been confirmed, solutions should be arranged. Things that can be fixed immediately should be.

Remaining concerns should be documented so proper resources (time, funding, manpower) can be allocated to deliver the required solutions.

A 'walk the belt' safety inspection does not determine how to solve the problems, but it's an invaluable tool used to identify issues, and thus a key step in resolving them. With good records of the concerns noted on a conveyor walk – or better yet, a regular series of conveyor walks – the operation has the opportunity to prevent safety problems, rather than react to them. Therein lies the real benefit of any conveyor system inspection.

A thorough survey will identify most of the safety concerns involving a conveyor. Regular walks keep the impacts of system changes to a minimum, and the act of walking the conveyor keeps safety in the minds and eyes of the employees. This is an effective way to demonstrate management commitment and a very visible aid in promoting a culture of safety.

Neglected safety equipment such as broken emergency stop switches create an immediate hazard

The survey team should be empowered to stop the conveyor if an immediate danger is found

BEST PRACTICES: CONVEYOR SAFETY AUDIT

1. Survey as a team, with one person familiar with the day-to-day operation and maintenance of the conveyor and a second person with general knowledge of conveyor design but not the specifics of the conveyor being surveyed.

2. Make notes to document findings, place 'Repair Needed' tags, take pictures and keep records.

3. Prioritise hazards in terms of the likelihood of occurrence and the severity of harm.

4. Take immediate action to mitigate potential hazards. It's good practice to have a maintenance team or contractor staffed and pre-authorised to take action to resolve the root causes of safety concerns.

5. Authorise the survey team to issue stop work orders if they find a problem(s) of immediate danger.

CLOSING THOUGHTS

Conveyors apply large amounts of mechanical energy to what is essentially a giant elastic band, stretched tight and threaded through a maze of components. This stretched band is often loaded with tons of material, sometimes using drive motors as large as 600 HP (450 kW). Given the weight, inertia and kinetic energy, enormous forces are involved. The human body, able to generate less than 1 HP, is simply no match.

Yet anyone who works around conveyors should know that the equipment can be dangerous. Even so, workers are still maimed and killed by conveyors every year. Despite the posting of signage, the proclamation of safety edicts and the establishment of safe work procedures, experience has shown that these methods are not totally effective in eliminating conveyor accidents. The efforts are undermined by the inherent dangers of a conveyor system, the unsafe practices of workers and a focus on production over safety. Unless the potential safety issues are identified and addressed in thorough and honest assessments, there will continue to be injuries – and even fatalities – involving belt conveyor systems. Regular audits should be an integral element of the safety culture at any facility employing conveyors to move bulk materials.

The SQC2S RM is a compact secondary belt cleaner for installation in tight spaces

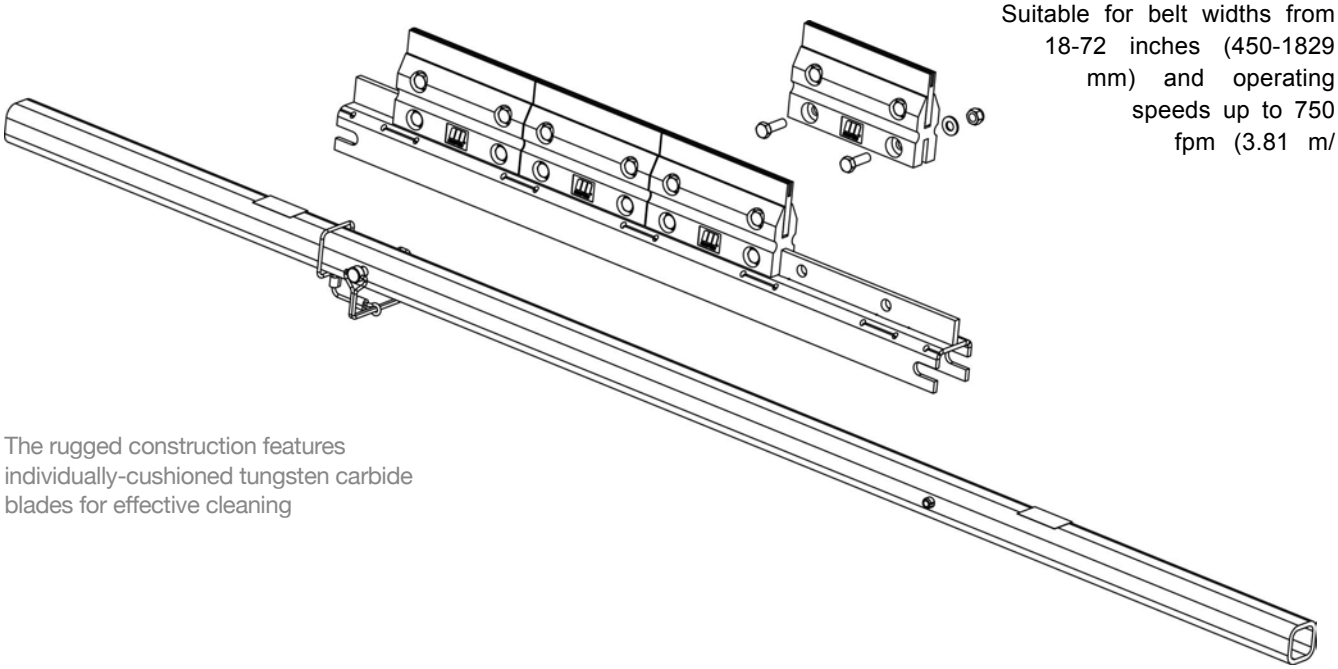
Conveyor belt cleaner for tight spaces

A global leader in conveyor belt cleaning technologies has introduced a new design specifically for applications where space for installation is limited. The new SQC2STM RM (Reduced Mini) Cleaner from Martin Engineering is a compact secondary belt cleaner that allows installation in close quarters, built with a narrow profile that resists material build-up. Patented rubber buffers maintain cleaning pressure on the new design, engineered to deflect and allow splices to pass without damage to the belt or cleaner, even on reversing belts. The rugged construction incorporates individually-cushioned stainless steel blades with tungsten carbide tips for effective cleaning with negligible risk to belt, splice or blade, and it can withstand even punishing operating conditions, including corrosive environments, high-speed belts and high-tonnage loads.

"The blades conform to the belt profile, adjusting individually to deliver continuous contact across the belt," explained Dave Mueller, Conveyor Products Manager at Martin Engineering. "In a perfect world, bulk materials would load uniformly, wearing the blade evenly, but that rarely happens. By having multiple segments attached to a single rigid assembly, the tension can be maintained and adjusted accurately, quickly and safely."

Like the other designs in the SQC2 product line, blade removal and replacement is a simple operation by removing the lock pin from the main support assembly and sliding out the cartridge. The lock pins are a key component to Martin Engineering's "no-reach design," which allows workers to conduct their lockout / tag-out procedure more safely. The unit is one of Martin Engineering's Safety First™ family of products, helping customers achieve OSHA compliance.

Suitable for belt widths from 18-72 inches (450-1829 mm) and operating speeds up to 750 fpm (3.81 m/



The rugged construction features individually-cushioned tungsten carbide blades for effective cleaning

The new design can withstand punishing operating conditions, including high-speed belts and high-tonnage loads

sec), the SQC2S RM blade sections conform to the belt profile by adjusting individually to deliver continuous contact across the entire belt. The unit can be used in applications involving operating temperatures between -30°F and 300°F (-34°C and 149°C). The design features all steel powder coated construction, (except for the rubber buffer), with . A dust-tight door to cover the opening for the mainframe has also been designed to fit the reduced component size, for a clean, efficient installation.

The SQC2S RM requires just 5.27 inches (134 mm) of space from the tip of the blade to the bottom of the mainframe. Similar to the original design, when the blade wears out, the removable cartridge allows easy replacement, so the end user can have a spare cartridge on the shelf. When the time comes to switch them out, the conveyor is only out of service for a matter of minutes. The used cartridge may then be taken back to the shop, where the blades can be replaced and the cartridge put back on the shelf for the next changeout.

The tensioners allow simple adjustment of blade-to-belt pressure to maintain cleaning efficiency, regardless of blade wear. The SQC2S RM is expected to find utility in applications where installation space is at a premium, including biomass, recycling, waste-to-energy, trash sorting, foundries and steel production.

Martin Engineering is a global innovator in the bulk material handling industry, developing new solutions to common problems and participating in industry organizations to improve safety and productivity. The company's series of Foundations reference books is an internationally-recognised resource for safety, maintenance and operations training -- with more than 20,000 print copies in circulation around the world. The entire 500+ page volumes can also be downloaded as free PDFs from the Martin web site. Martin employees take an active part in ASME, SME, VDI, CMA and CEMA, and the firm played a pivotal role in writing and producing the 7th edition of the CEMA reference book, Belt Conveyors for Bulk Materials. Martin Engineering products, sales, service and training are available from factory-owned business units in Australia, Brazil, China, Columbia, France, Germany, India, Indonesia, Italy, Mexico, Peru, Russia, Spain, South Africa, Turkey and the UK.

For more information, contact us at info@martin-eng.com, visit www.martin-eng.com, or call (800) 544-2947.

Blade replacement is a simple operation by removing the lock pin and sliding out the cartridge

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MINING INSIDE

bauma

German innovation at its best

Due to the long history, there is a deep knowledge base as well as continuous technological development in German mining equipment manufactures ability to provide technical expertise to a global marketplace.

Innovation is very evident among Germany's manufacturers, with a willingness to look at radical solutions, Many German manufacturers are also often more amenable to tailor-made solutions than some of their competitors around the world. Many German suppliers will develop or modify products for specific applications, rather than sticking rigidly to 'off-the-shelf' equipment

German mining technology has a proud reputation around the world. Equipment that has been deployed in the home industry and has withstood the challenges of the German mining environment has no trouble operating elsewhere. One of the main advantages of collaborating with German mining equipment suppliers is that it reflects this carbon copy of its own industry standards that includes the reliability of mining procedures, the security of supplies, the qualified workforce and skilled engineers, the excellent infrastructure, stabile political conditions, the proximity to customers, sound and inspiring industrial relations.

Even though Germany still mines more lignite than any other country in the world, it was recognised many years ago that the future of conventional mining and new technological innovations thus lay elsewhere. For centuries, mining has had a profound influence on the landscape, culture and lives of millions of people all over the world.

Today the mining industry is trying to reinvent itself and Germany is playing a major role with German equipment manufacturers relishing the challenge to modernise the world's mining industry with its technical expertise searching for innovative ideas and interdisciplinary solutions with the potential to lead the world's mining sector into the future and its two main mining Universities are also playing a major role in producing the engineers and technology of the future.

RWTH Aachen University is the largest university of technology in Germany and one of the most renowned in Europe. Every year, numerous international students and

RWTH Aachen University

Technische Universität Bergakademie Freiberg

scientists come to the university to benefit from its high quality courses and excellent facilities, both of which are recognised at an international level.

RWTH Aachen University is in the process to become an integrated, interdisciplinary technical university. The engineering focus of the university is associated with the natural sciences and medicine. The arts, social sciences and economics, structurally linked to the core disciplines, also make a significant contribution to the university's teaching and research profile. With its 260 institutes in nine faculties, RWTH Aachen is among the leading European scientific and research institutions. 43,721 students in 144 courses of study are enrolled in the winter semester of 2015/16, including almost 8,000 international students from more than 120 countries.

Technische Universität Bergakademie Freiberg is the oldest existing mining science university in the world and has a focus on four core fields – geo, material, energy, and environment.

The university ranks amongst the ten strongest research universities in Germany due to third-party funding per professor and occupies the top position in the new federal states. The Technische Universität Bergakademie Freiberg also developed a strong relationship with partners from the industry.

The university offers a unique environment for studying and engaging in research activities for more than 5,600 students. TU Bergakademie Freiberg offers19 Bachelor degree courses, 31 Master degree courses and 12 Diploma degree courses in the fields of Geoscience, Geo-Engineering, Engineering Sciences, Natural Sciences, Mathematics and Computer Science and Economics & Business Administration. Each Bachelor degree course can be continued with at least one appropriate Master degree course.

Given the development of raw material prices and the positive outcomes of mining companies around the world, the industry expects solid growth after a stabilization and recovery phase. The increasing demand for mining equipment will also be reflected at Bauma 2019: Europe is considered the leading equipment supplier to the worldwide mining industry and 2019 holds some exciting challenges for innovative products.

A lot of this expertise will be on show once again at this year's Bauma exhibition in Munich featuring exhibitors worldwide.

Both Mining and Quarry world and Coal International will be present at this year's Bauma and we take a look at some of the innovations on show.

BEUMER Group at bauma 2019

At bauma, which will take place in Munich from 8 to 14 April, BEUMER Group will provide information on their efficient transport solutions for the mining industry, among

Reliable across rough terrain

other areas. Overland conveyors and Pipe Conveyors transport various raw materials over long distances and often through rough terrain. This is generally faster, more cost-efficient and environmentally friendly than trucking. The system supplier also offers comprehensive technology for the cement and building materials industries and is the only supplier to provide complete packaging lines from a single source – from filling and palletising to transport packaging of the pallet.

The overland conveyors and Pipe Conveyors of BEUMER Group can be used by companies in the mining industry to transport various bulk materials, even over long distances and often through rough terrain. High angles of inclination and tight curve radii enable individual routing adapted to the respective task and topography. BEUMER Group relies on camera-equipped drones for the planning, projection, implementation and documentation of these systems. Using special software solutions, the system supplier evaluates the aerial photographs photogrammetrically to generate digital terrain models.

The product range of the system supplier includes stackers and bridge reclaimers for storage yards, whether with or without blending bed systems. These stack bulk material and guarantee a maximum blending effect. Users can also efficiently homogenise large quantities of different bulk materials and bulk material qualities and thus ensure the uniformity of the raw materials used. For efficient loading, BEUMER Group supplies ship loaders with fixed booms and extendable telescopic belt conveyors, as well as bulk loading heads, which are used to load bulk materials into silo vehicles quickly and without dust.

BEUMER Group will present economic solutions for companies from both the cement and building materials industries at the trade fair. In cement plants, clinker with temperatures of 500 to 800 degrees is transported from the kiln cooling system to the silos. With its belt apron conveyors, BEUMER Group offers robust solutions for efficient transport. A belt instead of a chain as the traction element allows higher speeds and a slimmer design while still delivering the same level of performance. These conveyors are therefore particularly suitable for modernisations.

When it comes to filling, palletising and packaging cement, BEUMER Group offers complete packaging lines from a single source – a unique selling point in this industry. The system supplier offers the BEUMER fillpac filling machine for different requirements in various versions. The unique feature of this filling technology is that it can handle a wide range of materials, from very fine to coarse structures. In addition, various palletising solutions and a high-performance packaging system with sophisticated features are available.

Against the background of the global climate debate, the use of so-called alternative fuels and raw materials (AFR) in the energy-intensive cement production is steadily increasing. BEUMER Group offers tailor-made systems for the entire material flow chain in cement plants – from receiving and unloading the delivery vehicle to storing, sampling, conveying and dosing the solid alternative fuels.

BEUMER at bauma: hall B2, booth 413

LiuGong and Dressta

LiuGong and Dressta will showcase a 20-machine line up of tough equipment designed for the world's toughest conditions. This line-up clearly demonstrates the company's capability to deliver machines for every major application; mining, quarry and aggregate, demolition, material handling, utilities, landscaping, road and highway and agriculture. The six new machines making their bauma debut have been inspired by close collaboration with customers. They include new; wheel loaders, excavators, a motor grader, a forklift and two new dozers from Dressta. These new machines clearly underline the company's commitment to listening to customers and to working with them to create value adding machines. LiuGong and Dressta certainly have a strong product story to tell but their principal communication aim at bauma is to listen. They want to use the opportunity to generate real customer feedback for their products and services today and gain insight into what customers really need for tomorrow.

THE ALL NEW 909 ECR COMPACT RADIUS EXCAVATOR

The new 909 ECR is a perfect example of LiuGong's customer centric approach. Designed in close co-operation with UK plant hire customers, this compact radius machine is new from the ground up and has been designed to fill a gap in the UK's rapidly growing rental market. Offering excellent stability, the 909ECR is a highly versatile tool carrier enabling it to use a wide variety of attachments, ranging from buckets to hammers, in road and inner-city applications.

Operating Weight	Max. Net Power	Standard Bucket Capacity	Max. Digging Force	Max. Digging Reach
8,900 kg	44 kW (59 hp) @ 2,200 rpm	0.28	63 kN	6,847 mm

NEW 950 DEMOLITION EXCAVATOR

New for heavy demolition applications is LiuGong's new 950 demolition excavator. This machine is the result of extensive customer consultation and with close collaboration with partners Kocurek UK. It is a perfect example of LiuGong's ability to adapt and develop its machines to perfectly match the customer's application. Positive customer feedback focuses on the machine's improved stability and stronger 30m long reach boom which allows the 950 to punch well above its weight. The

design of the attachment group also allows changing of standard equipment to high reach equipment and vice-versa in 30 minutes or less. This design of modular joint is now over 20 years in production and is well proven having been incorporated into over 700 units working in the field on 20 ton to 150-ton base machines. Greater reach and the ability to handle heavy weight attachments ensures that the 950 gets the job done faster. Operator comfort and safety are top priority in this demolition application excavator. The cab is modified by replacing the front window screen with 5-layer laminated glass and also to the same modification, including extending, to the roof glass. The front and roof glass are then butt joined to the front screen to give unsurpassed upward vision for the operator when working his attachments. Thanks to increased visibility with the tilted cabin, a ROPS/FOPS certified cab and standard rearview camera, the operator can focus on the job with confidence.

Operating Weight	Max. Net Power	Max. working pin height	Max. Pin Reach	Maximum attachment weight
64,320 kg	282 kW (378 hp) @ 2,100 rpm	30 m	17 m	3000 kg

NEW 848H WHEEL LOADER WITH ERGO TRANSMISSION

Versatility is a key demand for customers operating in Waste and Recycling applications. The 848H with new Ergo transmission delivers multi-tool flexibility with maximum power, minimum emissions and a safe and comfortable operator environment. The new Cummins QSB6.7 combined with a wet axel and a 5-speed transmission, with a lock-up clutch torque converter as standard, complies with Stage 4 regulations without compromising on power. Advanced load sensing hydraulics and auto shift transmission ensure rapid cycle times. Productivity is further enhanced by LiuGong's quick coupler which enables fast and easy swapping of attachments.

Rated Power	Operating Weight	Standard Bucket Capacity	Dump Clearance	Breakout Force
129.2 kW (173 hp) @ 2,100 rpm	15,500 kg	2.7 m^3	2,840 mm	129 KN

NEW STAGE V 856H WHEEL LOADER

With a new Stage V engine, the 856H brings LiuGong's performance capability to more customers in material handling and aggregate preparation. As well as complying with the latest EU Emissions regulations, customer clinics also highlighted load and carry and V cycle speeds as crucial to the success of machines in this segment. With the New 856H, LiuGong have delivered an emissions compliant machine which moves more – for less. Carrying and V cycle speeds are consistently high owing to the 856H's Stage V engine, wet axel, 5-speed transmission and standard lock-up clutch torque converter.

Ergonomically designed joystick further enhances the operator comfort and increases total productivity. Silicone oil shock absorbers improve the ride quality over the roughest terrain and help prevent material spillage

Rated Power	Operating Weight	Standard Bucket Capacity	Dump Clearance	Breakout Force
168 kW (225 hp) @ 2,000 rpm	21,200 kg	Side dump bucket 2.5 m^3	4,021 mm (side dump) / 2,894 mm	175 KN

NEW 890H WHEEL LOADER FOR EUROPEAN MARKET

It's a tough world and the 890H lives up to LiuGong's promise of "Tough Equipment." For customer applications which require heavy lifting the 890H delivers more power for less consumption. The Cummins Stage 4 engine is designed to develop more power at low speed, maximizing torque output. The power shift transmission and advanced load sensing hydraulics combine to deliver superior breakout force with speed and agility. Efficiency is improved further by the Intelligent Power Cut Off function, which improves braking and supports the hydraulics in reducing fuel consumption. The 890H also features driver safety and comfort improvements including enhanced dust filtration which significantly improves the cab environment.

Max Gross Power	Operating Weight	Bucket Capacity Range	Dump Clearance	Breakout Force
276 kW (370 hp) @ 2,100 rpm	30,800 kg	4.5-9 m^3	3,330 mm	245 kN

NEW 4180D MOTOR GRADER

The new 4180D motor grader is a completely new machine and is the embodiment of LiuGong's design DNA. The UK based industrial design team worked in close cooperation with customers and operators to rethink the traditional grader. The resulting machine boasts best-in-class 324° panoramic visibility owing to a unique 5 post cab with a single C-pillar, a completely new cab interior which sets the benchmark for comfort and efficiency. New impact resistant materials have also been introduced to provide better weight distribution and increase recyclability. In addition, access for routine maintenance has also been improved to reduce downtime.

Operating Weight	Max. Net Power	Max. Drawbar Pull	Max. Travel Speed	Blade Width
15,500 kg	142 kW (193 hp) @ 2,200 rpm	86 kN	42 km/h	3,960 mm

NEW 2016A-T ELECTRIC FORKLIFT

LiuGong's new 2016A-T forklift, uses advanced electrics to create the benchmark for efficiency, performance and operator comfort. In customer clinics, operators asked for a machine which would help them improve their day-to-day working. LiuGong delivered with a machine which gives the operator 15% more working space. Access for routine maintenance has also been improved via a 90° opening hood, which saves the operator valuable time. The powertrain has reliability "built in" through the use of high quality, proven components.

Power Type	Controller	Load Center	Capacity	Max. Lifting Height	Tire
Electric	AC	500 mm	1,500 kg	3,300 mm	Solid

NEW STAGE V TD-15 DOZER

For Dressta, customer collaboration is also engrained in the company's product DNA.

The new TD-15 and TD-25 crawler dozers are a perfect example of listening in action. The UK industrial design team along with R&D conducted exhaustive customer research into the operator's world before designing these new machines. The TD-15 is a completely new machine which benefits from a Stage V compliant powertrain and has been designed to offer maximum versatility through the widest choice of frame structures and blades. New load sensing steering provides more precise blade and ripper control and reduces fuel consumption up to 10%. The TD-15 also benefits from a new cab design which greatly improves operator comfort, safety and visibility with 30% more glass and the inclusion of rear-view cameras. Access for routine maintenance has been made easier to ensure the uptime and efficiency of the machine.

Operating Weight	Max. Net Power	Max. Drawbar Pull	Blade Capacity	Max. Ripper Penetration
20,760 kg	159 kW (213 hp) @ 2000 rpm	535.3 kN	3.8 m^3 (Angle Blade) – 5.95 m (Semi-U)	600 mm (Multi-shank) – 762 mm (Single-shank)

NEW TD-25 DOZER

The voice of the customer is clearly apparent in the new TD-25. As with the TD-15, this is a completely new machine in which visibility and safety have been greatly improved with 30% more glass in the cab and the inclusion of rear cameras. A new Bogie undercarriage design delivers a unique comfort for operator, especially on extreme rocky application and still delivers the best in class drawbar pull and productivity. The operator environment has been radically improved within the pressurised cab. Special attention has been focused on the operational ergonomics to improve efficiency and reduce fatigue. Improvements in the suspension and hydraulics further improve the operator experience by reducing noise and vibration.

Operating Weight	Max. Net Power	Max. Drawbar Pull	Blade Capacity	Max. Ripper Penetration
41,250 kg	246 kW (330 hp) @ 2000 rpm	794 kN	9.6 m^3 (Semi-U) – 21 m^3 (Coal)	760 mm (Multi-shank) – 1700 mm (Deep Single-shank)

Dressta dozers from 78 to 536HP, combine a durability, enhanced operator environment and proven technology giving unrivalled productivity in all dozing and ripping applications.

For further information on LiuGong, please visit: www.liugong.com
For further information on DRESSTA, please visit: www.dressta.com

Taking a load off the environment with SSAB EcoUpgraded

At SSAB, we are convinced that good environmental stewardship also drives good business. We are firmly committed to reducing our own carbon footprint and that of our customers. We take action in many different ways – as a signatory to the UN Global Compact, through our membership in environmental research projects and organizations, and by improving our own manufacturing processes, procedures and policies.

But perhaps our most important effort stems from collaborating with customers. With our SSAB EcoUpgraded program, customers can upgrade to high-strength steel and reduce the weight of their equipment, improve fuel economy and extend product lifetime – all factors that have a major impact on reducing their carbon footprint.

BUILDING MUSCLE – WHILE STAYING LEAN, MEAN AND GREEN

When customers upgrade from standard steel to high-strength steel, they can cut the weight of the end product while maintaining the same strength and increasing durability and productivity. From a lifecycle perspective, this is crucial because most of the negative environmental impact comes from a product's use phase.

And because high-strength steel is stronger than conventional mild steel, less steel is needed to manufacture the product. This also reduces CO2 emissions. An SSAB EcoUpgraded product will generate CO2 savings that exceed the CO2 emitted during the production of the upgraded part. The amount of the savings varies depending on the design and whether or not it is weight-critical.

SSAB looks at each specific application and compares the potential CO2 savings in the use phase to the CO2 emitted during production. This way, we identify products that would benefit the most from an upgrade to high-strength Strenx® performance steel and/or Hardox® wear plate. Once the CO2 payback time is reached, the vehicle will continue to deliver CO2 savings far in excess of the original CO2 debt.

ROCK-SOLID BENEFITS

Here's how high-strength steels from SSAB benefit both the environment and our customers' businesses.

- Thinner dimensions of steel can be used without compromising on strength
- Fewer resources used in the manufacture of SSAB EcoUpgraded components and vehicles
- Less fuel needed for the same work – haul the same load in fewer number of trips
- Lower carbon dioxide emissions over entire lifecycle
- Meet and stay ahead of tougher environmental requirements and legislation
- OEMs can enhance their environmental profile and gain a competitive edge

FROM GOOD TO GREAT: A CUSTOMER SUCCESS STORY

Successful projects and satisfied customers bear witness to the success of EcoUpgraded on many levels. For one customer, an ultra-light tipper chassis used 610 kg of Strenx® 960 Plus to replace 750 kg of S700MC steel. And in the body, 830 kg of Hardox® 500 Tuf replaced 1,000 kg of Hardox® 450.

This brought a total weight reduction of 18% for the upgraded parts. The body's lifetime was doubled, to 12 years, eliminating the need to change the body on this chassis. And the weight was reduced by 310 kg, which increased the load capacity by the same amount.

GET THE FULL ECOUPGRADED STORY AT BAUMA MUNICH 2019

We've crunched the numbers. We've created the PowerPoints. And our customers have seen the savings. SSAB is eager to show the data and tell the stories behind additional customer successes.

We welcome you to Hall A6, Stand 439, on April 8-14, 2019 at Bauma Munich. Visitors will be able to get their hands on a supersize sample of an SSAB EcoUpgraded part, discuss results, and learn more about the benefits of SSAB EcoUpgraded.

How to meet SSAB at Bauma Munich

For further information, please contact:

Thomas Hörnfeldt, Vice President Sustainable Business & Public Affairs, thomas.hornfeldt@ssab.com, phone: +46 8 56232140

New Wirtgen 220 SM 3.8/220 SMi 3.8 Surface Miner: Maximum Performance in Soft Rock

High daily outputs in windrows are no problem for the new Wirtgen 220 SM 3.8/ 220 SMi 3.8. With a cutting width of 3.8 m and a cutting depth of up to 350 mm, the 708 kW surface miner is perfect for soft-rock mining in operations of all sizes

Wirtgen's 220 SM 3.8/220 SMi 3.8 surface miner selectively mines raw materials up to a cutting depth of 350 mm and a uniaxial compressive strength of 35 MPa. Thanks to its 3.8 m wide cutting drum designed specifically for soft-rock mining, the compact surface miner achieves maximum productivity at low operating costs and is perfect for use in small to large mining operations.

EFFICIENT AND ENVIRONMENTALLY SUSTAINABLE RAW MATERIAL EXTRACTION

Selective extraction makes it possible to mine raw materials with a high level of purity. The material, which is extracted in an environmentally friendly manner without drilling or blasting, is continuously deposited behind the machine in a windrow and then loaded onto trucks with other equipment.

In this context, refraining from drilling and blasting makes it possible to conduct efficient mining operations close to industrial sites and other infrastructure such as pipelines or high-voltage power lines, which ultimately results in the optimised exploitation of the deposit.

POWERFUL CUTTING DRUM UNIT

The cutting drum is designed specifically for demanding windrow applications in soft rock, such as coal or salt.

Thanks to the state-of-the-art, large-capacity operator's cabin with an optional camera system, the operator has an excellent view of the machine and the surrounding work area. The generously sized windows also give the operator a clear view of the cutting edge

Maximum cutting performance combined with the ideal use of engine power and low specific fuel consumption allows raw materials to be mined in an extremely cost-effective process. Six different adjustable cutting drum speeds ensure that the machine can be perfectly adapted to the material being extracted. This leads to a significant reduction in pick wear, minimal diesel consumption, and increased productivity, which translate into an impressive daily output and low cost per ton of extracted material.

RELIABLE OPERATION AND SAFETY ARE THE TOP PRIORITIES

In surface mining, the continuous availability of the machine and its safe operation are of critical importance. This is why the surface miner's components are designed to achieve a long service life, even under extreme conditions. For example, filters in all circuits and a pressurised hydraulic reservoir ensure maximum purity in the hydraulic system and, as a result, safe operations. The clean oil in turn prolongs the service life of the downstream components and thus increases the availability of the machine.

SPACIOUS ROPS/FOPS OPERATOR'S CABIN

The 220 SM 3.8/220 SMi 3.8 also meets occupational safety requirements in surface mining thanks to the standard-equipped ROPS/FOPS operator's cabin. The cabin features additional soundproofing and vibration isolation, allowing the operator to work for several hours without the risk of fatigue. The ergonomically designed and clearly arranged controls are integrated into the armrests of the driver's seat, and all of the machine's key functions are logically incorporated into the multifunctional joysticks. This means that the operator can operate the machine intuitively in just a few steps and fully concentrate on high-precision mining. The state-of-the-art, fully air-conditioned, large-capacity cabin also features generously sized windows, giving the operator a direct view of the cutting edge and with it, the results of their work.

HIGH-PRECISION LEVELING WITH LEVEL PRO PLUS

The LEVEL PRO PLUS leveling system has a proven track record in road construction and mining and is intuitive and easy to operate. A flat or inclined formation level can be created with absolute precision thanks to side plate scanning and the cross-slope sensor. The machine is also ready to be equipped with GPS or laser control.

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Exhibitions and conferences

Over the last 20 years Tradelink with both *Coal International* and *Mining & Quarry World* has always maintained a presence at major exhibitions in India, China, Russia, USA, Poland, South Africa and Europe. Our policy has always been especially with our foreign language issues that every single operating company and operations Management and Engineers within the region have all received copies of the journals before the event leaving us to distribute further bonus copies from our stand. We very rarely over the many years we have attended see any other International journals present especially so in Russia, India and China

Having already attended earlier exhibitions, we will continue our presence throughout 2018 at the following:

Intermat Paris – ***France***
UGOL ROSSI Novokuznetsk – ***Russia***
Hillhead – ***England***

Bonus distribution at the following events:

Ugol Rossii & Mining 2018: 5-8 June Novokuznetsk, Russia
25th World Mining Congress 2018: 19-22 June Astana city, Kazakhstan
Hillhead 2018: 26-28 June Hillhead Quarry Buxton Derbyshire UK
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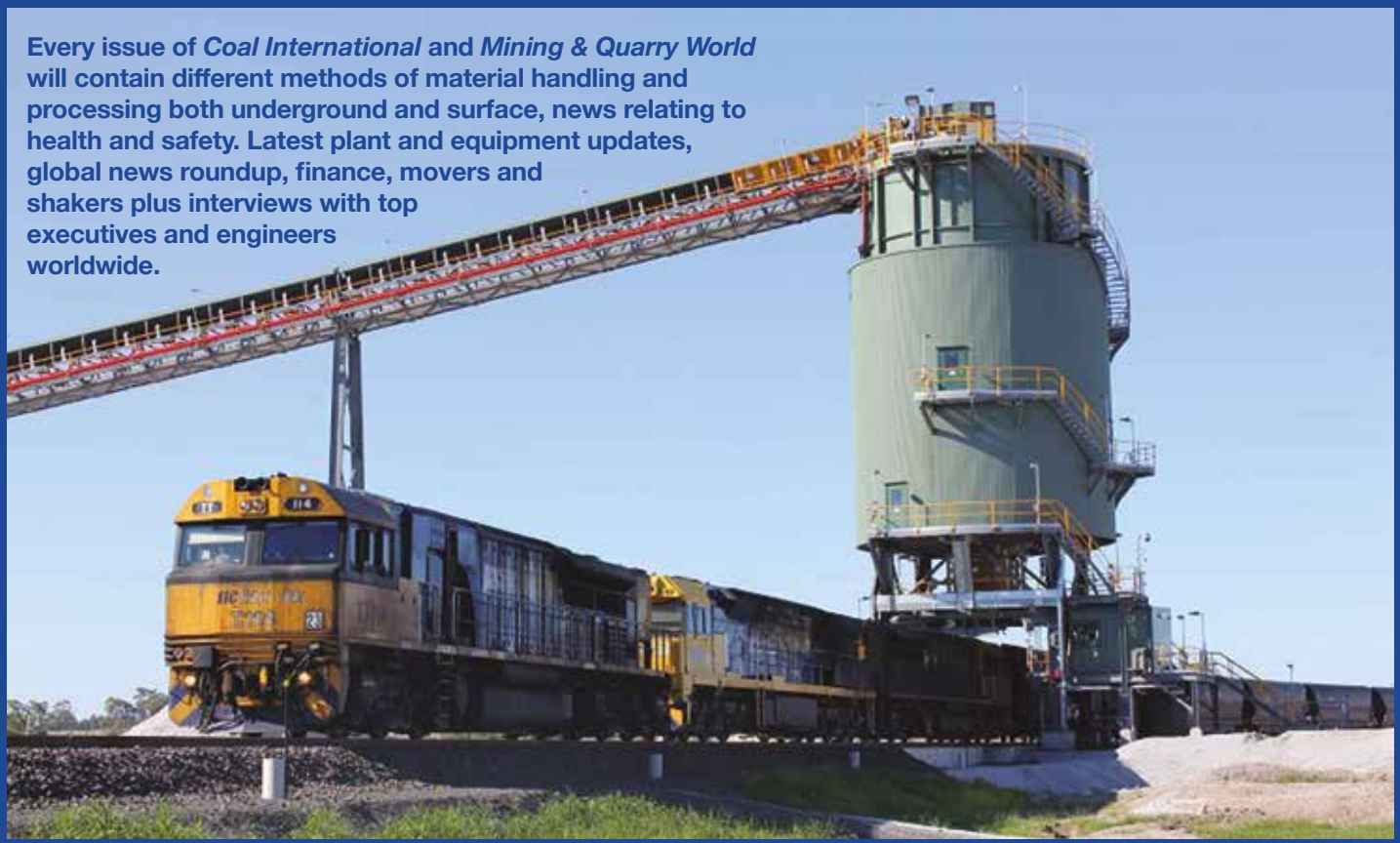

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Quality you can rely on

The new KOMATSU PC 3000-6 has a new cab, but that's not all. Improvements have been targeted to raise productivity. Whether it is the new hydraulic management control for faster cycle time, robust undercarriage for extended life or re-designed service points to reduce on-board maintenance time, it's there to improve on the existing superior standard of safety and reliability.

High digging performance, service friendly and extended reliability - insist on the PC 3000-6 for a profitable investment in productivity.

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THE NEW PC 3000-6

Optimising the detail

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