Indian Mining Exchange

News Bulletin, 17th October 2011

Coking Coal, Thermal Coal and Lignite

India asks Czech Republic for tech help in coal mining

http://www.moneycontrol.com/news/current-affairs/india-asks-czech-republic-for-tech-helpcoal-mining_597332.html

Coking coal imports slip on costlier dollar, poor demand

http://business-standard.com/india/news/coking-coal-imports-slipcostlier-dollar-poor-demand-/452214/

Mongolia re-opens bidding for world's biggest coking coal deposit

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Crude Oil and Natural Gas

RIL to suspend oil and gas drilling - report

http://in.reuters.com/article/2011/10/17/idINIndia-59930320111017?feedType=nl&feedName=intopnews

Iron Ore, Iron and Steel

Capesize Shipping Costs Climb to 10-Month High on Ore Imports

http://www.businessweek.com/news/2011-10-14/capesize-shipping-costs-climb-to-10-month-high-on-ore-imports.html

With 'Global Ore' BHP enters new age of iron

http://www.mining.com/2011/10/14/with-global-ore-bhp-enters-new-age-of-iron/?utm_source=digest-en-mining-111014&utm_medium=email&utm_campaign=digest

DJ Brazil Vale Offers Chinese Steelmakers Iron Ore Price Discount – Report

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Pilbara iron ore prices 'will succumb'

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BHP rumoured to be bidding $1.3B for Brazilian iron ore producer

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China Launches its own Iron Ore Price Index

http://m.ibtimes.com/china-own-iron-ore-price-index-launched-228785.html

Bauxite, Alumina and Aluminium

Aluminium short-sellers? Not the villains this time

http://af.reuters.com/article/commoditiesNews/idAFL5E7LC3GW20111014?sp=true

India's NALCO finalises 270,000 T alumina export deal

http://af.reuters.com/article/metalsNews/idAFL3E7LE2KN20111014

Is Craft Beer's Move to Aluminum a Dirty Choice?

http://www.triplepundit.com/2011/10/green-craft-beer-dirty-aluminum/

COPPER

Copper demand continues to exceed supply

http://www.telegraph.co.uk/finance/commodities/8816732/Copper-demand-continues-to-exceed-supply.html

China's red metal alert

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South Africa's gold miners await technology breakthrough to save them

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Solar Energy

Solar Energy: The Quest for Cheap

http://www.businessweek.com/technology/solar-energy-the-quest-for-cheap-10132011.html

Biofuels

Don't Smoke That Fuel: ARPA-E funds energy research in tobacco, turpentines, camelina

http://biofuelsdigest.com/bdigest/2011/10/14/dont-smoke-that-fuel-arpa-e-funds-energy-research-in-tobacco-turpentines-camelina/

Coking Coal, Thermal Coal and Lignite

India asks Czech Republic for tech help in coal mining

Published on Tue, Oct 11, 2011 at 19:00 | Source : PTI

India today invited Czech Republic to set up facilities to manufacture underground coal mining machinery in the country.

"The Indian side impressed upon Czech Republic regarding the scope for establishing manufacturing facilities in India for underground mining machinery," an official statement said.

Coal Minister Sriprakash Jaiswal-led the Indian delegation which had discussions with the visiting group led by Czech Republic Trade and Industry Minister Martin Kocourek here today.

India also invited Czech Republic to participate in development of coal and lignite in the country.

"The other areas of interests for India for technical cooperation with Czech Republic include deep coal mining, lignite mining...both the sides evinced interest for increased participation in coal sector and machinery manufacturing," the statement said.

http://www.moneycontrol.com/news/current-affairs/india-asks-czech-republic-for-tech-helpcoal-mining_597332.html

Coking coal imports slip on costlier dollar, poor demand

Sadananda Mohapatra / Kolkata/ Bhubaneswar October 12, 2011, 0:32 IST

Coking coal imports dropped for the first time in last three months despite price fall in global markets as costlier dollar and an ailing steel industry demand squeezed import orders, said experts and traders.

In April-September period, coking coal imports through Kolkata and Haldia was 2.83 million tonne, down by 16 per cent compared with the same period last year. Imports at Visakhapatnam port dropped by 15.3 per cent and at Paradip, the decline was 3.3 per cent for the same period, data from Indian Ports Association showed.

These three eastern Indian ports account for almost 60 per cent of India's coking coal import. In April-September, total imports declined by 0.4 per cent year on year, after growing 2.3 percent in April-August and 9.3 per cent in April-July period.

"The main reason for coking coal import drop is the depreciation of rupee against the dollar. The rupee has weakened by almost 6 per cent in the last month. Even though coking coal rates have gone down in dollar terms in global markets, Indian importers were unable to take the opportunity as dollar became costlier here," said Sandeep Jain, commodity analyst with Karvy Comtrade.

Coking coal is currently priced at $280 per tonne, down from $310 a tonne in July-August. The rates have come down as supply has improved from major exporter Australia after devastating flood there affected production in January.

India imports coking coal mainly from Australia and Indonesia to feed its speedily expanding steel industry. Of late, steel mills in India are running below their normal capacity because of shortage of iron ore availability as restrictions in major producing states like Orissa and Karnataka brought down productions.

"Steel industry demand for coke has come down given the higher rates for iron ore. Some steel plants have raised steel prices while traders are importing steel, which gives better return than coking coal imports," said Arun Bhattoria, a Kolkata-based coal trader.

http://business-standard.com/india/news/coking-coal-imports-slipcostlier-dollar-poor-demand-/452214/

Mongolia re-opens bidding for world's biggest coking coal deposit

Frik Els | October 9, 2011

The Wall Street Journal reports Mongolia is relaunching talks with international miners on developing the western block of Tavan Tolgoi in the South Gobi desert, the world's largest deposit of high-quality coking coal used in steelmaking.

Mongolia's National Security Council rejected a deal struck with US giant Peabody Energy, China's Shenhua and a Russian-Mongolian consortium mid-September, just two months after they were announced as winners. At the time losing bidders from Brazil, India and South Korea raised serious concerns and Japan went so far as to call the bidding process 'extremely regrettable'. Mongolia still hopes to privatize its Erdenes Tavan Tolgoi coal-mining company which controls the remainder of the 6 billion tonne resource for upwards of $3 billion next year.

WSJ.com reports the goal, said one Mongolian official familiar with the situation, is to award the contracts before Mongolian parliamentary elections in June.

Metallurgical coal has been trading at record levels of $330/tonne this year and the Tsankhi block on its own holds 1.2 billion tonnes of reserves. China's Shenhua was to be the lead developer with a 40% share with a Russian-Mongolian consortium and US-based Peabody Energy. Japanese trading firm Mitsui & Co, Brazil's Vale and Indian steel giant ArcelorMittal were among the losing bidders.

Japan and South Korea are tipped as likely successful bidders in the second round of offers. Reuters reports Mongolia, landlocked between Russia and China, exports all of its coal to its southern neighbor, China, and has long been wary of becoming a satellite valued only for its resources.

Reuters reported in July the Tavan Tolgoi area lacks the roads and railways needed to quickly and economically deliver the coal to markets. It also lacks the power and water supplies to support big mining camps. Shenhua started building an Inner Mongolia railroad

line from the coal-belt city Baotou to the Mongolian border 180 kilometers from Tavan Tolgoi in 2009.

Mongolia is likely to sell a stake in its Erdenes Tavan Tolgoi coal-mining company which controls the main block of the deposit that has been mined since the 1960s to the public next year, raising more than $3 billion.

Tavan Tolgoi is the second largest mining investment in Mongolia behind the Oyu Tolgoi gold-copper mine being built by Canada's Ivanhoe Mines. Ivanhoe and partner Rio Tinto in recent weeks had been in tough negotiations with the Mongolian government over ownership of the project after some political leaders started pushing for majority control of the massive mine scheduled to start production in 2013.

http://www.mining.com/2011/10/09/mongolia-re-opens-bidding-for-worlds-biggest-coking-coal-deposit/?utm_source=digest-en-mining-111009&utm_medium=email&utm_campaign=digest

Crude Oil and Natural Gas

RIL to suspend oil and gas drilling - report

Mon Oct 17, 2011 11:32am IST

REUTERS - Energy major Reliance Industries will suspend oil and gas drilling pending an internal valuation of its exploration and production strategy, the Mint newspaper reported on Monday citing sources briefed by the company.

The firm, India's most valuable company by market capitalization, has seen its growth outlook and market value hit hard this year by falling gas output from its huge gas fields off the east coast.

Reliance will halt drilling for an unspecified time until the review is completed and submitted to the government, three analysts present at a company meeting told the newspaper.

A Reliance spokesman declined to comment on the report when contacted by Reuters.

Controlled by billionaire Mukesh Ambani, Reliance posted its highest ever quarterly net profit in its Q2 results on Saturday, but analysts focused on slowing gas output and said refining margins were still below expectations.

Last month, India's upstream regulator said Reliance was producing 44 mscmd (million standard cubic metres per day) from its main D6 block, lower than the 60 mscmd it was producing a year earlier and far off the planned peak capacity of 80 mscmd.

The CAG last month criticised Reliance and the government over development of the gas field in the Krishna Godavari (KG) basin and called for revamping profit-sharing arrangements from oil and gas blocks.

Earlier this year, Reliance sold a 30 percent stake in 23 oil and gas blocks, some in the KG basin, to BP in a 7.2 billion deal.

The British company, with deepwater exploration expertise, has said it is confident of raising gas output from the field from 2014.

(Additional reporting by Prashant Mehra in Mumbai; Writing by Henry Foy; Editing by Ranjit Gangadharan)

http://in.reuters.com/article/2011/10/17/idINIndia-59930320111017?feedType=nl&feedName=intopnews

Iron Ore, Iron and Steel

Capesize Shipping Costs Climb to 10-Month High on Ore Imports

October 14, 2011, 11:59 AM EDT

By Michelle Wiese Bockmann

Oct. 14 (Bloomberg) -- The cost to hire capesize vessels climbed to a 10-month high as rising imports of iron ore to China boosted demand for the ships.

Monthly iron-ore shipments to China, the largest consumer of the material, will average 60 million metric tons from September through December, UBS AG said in a report dated yesterday. That would exceed the record 59 million tons imported in the first quarter of 2011, data compiled by Bloomberg show.

Daily rents for the fleet of 1,297 capesize vessels that haul iron ore and coal advanced 1 percent to $31,329 a day, the highest since Nov. 25, according to the London-based Baltic Exchange. The exchange provides freight costs on more than 50 maritime routes. Rates have more than tripled since Aug. 1.

Iron ore imports to China are expected to slow in the next few months as the country's growth moderates, steel prices fall and production declines, RS Platou AS, an Oslo-based investment bank, said in a weekly report e-mailed today.

"That said, a steep decline in iron ore prices could see sustained imports of iron ore despite easing demand," the bank said.

Iron ore, coking coal and steel products account for 51 percent of dry-bulk seaborne trade, estimated at 3.56 billion tons for 2011, according to Germany's DVB Bank SE, which

specializes in transportation lending. An estimated 63 percent of the 1-billion tons of ore shipped by sea this year will go to China, according to UBS.

Imports Cheaper

Since early August imported iron ore has been cheaper to buy than ore mined in China, supporting shipping hire costs, Omar Nokta, a New York-based shipping analyst at Dahlman Rose & Co., said in an e-mailed response to questions. That's only happened three or four times since 2008, he said.

Prices in China for the imported steel-making ingredient declined 8 percent this month, tempting buyers to delay purchases until prices fall even more, Plamen Natzkoff, a freight, iron ore and coal trader at London-based Ronly Holdings Ltd. said.

"The strength of demand is not what's driving the volume of shipments, it's the availability of the material that is driving the volume," Natzkoff said by phone. Miners in Australia and Brazil expanded production in the last two or three months, sending prices lower, he said.

Chinese mines produced the equivalent of 315 million tons of iron ore of 63 percent iron content, while the country imported 619 million tons in 2010, the United Nations Conference on Trade and Development said in a report published in July.

The Baltic Dry Index, a broader measure of commodity shipping costs, advanced 0.8 percent to 2,173 points, the highest since Dec. 7. Shipping rates rose for all four vessel types that the Baltic Dry Index tracks. Panamaxes, the largest to navigate the Panama Canal, gained 1.1 percent to $16,702 a day. Smaller supramaxes rose 0.7 percent to $16,671 and handysizes climbed 0.4 percent to $11,911.

http://www.businessweek.com/news/2011-10-14/capesize-shipping-costs-climb-to-10-month-high-on-ore-imports.html

With 'Global Ore' BHP enters new age of iron

Frik Els | October 14, 2011

Fox Business reports global number one miner BHP Billiton plans to create a new, more transparent system for pricing iron ore called Global Ore by the end of the year or early next year, the chief executive of the company's Ferrous and Coal division said Thursday.

BHP, Vale and Rio Tinto control nearly 70% of the 1 billion tonne annual iron ore seaborne trade and dominate price talks. The pricing of iron ore which have shifted from secretive negotiations and annual contracts over the last couple of years to prices linked to the spot market constitutes a "true revolution" say analysts. Firm demand from China's construction sector and a drop off in India's exports have been behind the strength in spot iron ore prices which, at above $170 a tonne, have trebled from late 2008. In August results for BHP Billiton showed its iron ore division accounted for the bulk of its record $22 billion in profits.

Fox Business reports Marcus Randolph told an audience at the World Steel Association here that he was working with members in the audience to develop a pricing system that would allow iron ore prices to be quoted on a screen in order to provide market participants with a more transparent price than index providers such as Platts.

MINING.com reported at the end of September speaking to reporters at an industry conference in Qingdao China, the world's largest iron ore miners said they have seen no weakness in demand from China. Forecasts for China's imports by 2015 now top 1 billion tonnes – up more than 60% from 2010 – due to the relatively high cost and the low quality of its domestic supplies.

MINING.com reported in August that iron ore miners have begun to call the shots as China's 27 largest steel companies saw a 15.7% decrease in the first-half profits from a year earlier as soaring iron ore costs squeezed margins. The woes of China's steelmakers, which have been switching to cheaper low grade ore to cut costs, are in stark contrast to profits at miners.

MINING.com reported in August New York brokerage GFI's announcement that it now offers on-screen iron ore swap trading is the latest indication that the economics of the world's foremost dry bulk commodity are being changed fundamentally. Started in 2008, derivatives trading in iron ore is up fourfold this year after setting a record in July as investment banks enter the massive market in numbers.

http://www.mining.com/2011/10/14/with-global-ore-bhp-enters-new-age-of-iron/?utm_source=digest-en-mining-111014&utm_medium=email&utm_campaign=digest

DJ Brazil Vale Offers Chinese Steelmakers Iron Ore Price Discount - Report

RIO DE JANEIRO, Oct 14, 2011 (Dow Jones Commodities News via Comtex)

Brazilian miner Vale SA (VALE, VALE5.BR) is proposing to reduce the price of iron ore sold on contract to Chinese steel mills in the final quarter of 2011 in the light of falling market prices, Reuters said Friday, citing unidentified Chinese steelmaking sources.

The Brazilian miner, which is the world's largest producer and exporter of the steelmaking ingredient, made the proposal by letter due to Chinese resistance to current quarterly contract prices of more than $175 a metric ton delivered China, Reuters said. The Chinese don't want to continue paying the contract prices when spot prices for iron ore have fallen to $160 a ton at present, according to the Reuters report.

Since April 2010, after the annual "benchmark" system of iron ore prices collapsed due to Chinese resistance, iron ore has been sold largely on quarterly contracts which are based on the average spot market prices in the three months preceding the quarterly contract period. However, in recent weeks spot market prices have fallen amid global market volatility, and this has led Vale and other iron ore producers to propose sales at nearer current spot market prices, according to the report.

According to independent iron ore price discovery service Platts, spot iron ore prices this week fell to their lowest since Nov. 2010.

A Rio de Janeiro-based spokesman for Vale declined to comment on the Reuters report.

-By Diana Kinch, Dow Jones Newswires, Tel 55 21 2586 6086, diana.kinch@dowjones.com

(END) Dow Jones Newswires

10-14-11 1702ET

http://futures.tradingcharts.com/news/futures/DJ_Brazil_Vale_Offers_Chinese_Steelmakers_Iron_Ore_Price_Discount___Report_166519915.html

Pilbara iron ore prices 'will succumb'

Barry Fitzgerald
October 15, 2011 .

Iron ore prices have fallen by about 9 per cent in the past month in response to the Western world's economic woes.

THE price of Australia's biggest export earner - Pilbara iron ore - has begun to crack under the pressure of the global economic slowdown.

But unlike the price collapse that accompanied the September 2008 start to the global financial crisis, spot prices for the steel-making raw material remain at historically high levels of more than $US160 a tonne.

The second-ranked Pilbara producer, BHP Billiton, has also confirmed that despite suggestions to the contrary, no shipments of iron ore have been turned back by China, the world's biggest steel producer.

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BHP's chief executive, ferrous metals and coal, Marcus Randolph, told the World Steel Association in Paris on Thursday that the company had not had any shipment cancelled or delivery time and prices renegotiated.

He said BHP was producing as fast as it could, echoing comments by the No. 1 Pilbara producer, Rio Tinto, earlier in the week.

But BHP agrees that iron ore prices will succumb to the wall of new supply due in coming years.

''If all of the projects come online - and there are $US430 billion of projects - we will exceed the requirements of the steel industry in our forecast,'' Mr Randolph said.

Iron ore prices have fallen by about 9 per cent in the past month in response to the Western world's economic woes.

The price of coking coal, Australia's second-biggest export earner and another steel-making raw material, has also weakened in recent weeks to $US256 a tonne from the $US300 a tonne-plus prices seen after the Queensland floods earlier this year.

But unlike iron ore, supply is forecast to remain ''tight'', with few new sources of supply due to come on stream in the near future.

''Watch coking coal markets because there are not enough projects to actually supply what the market is going to require in the next decade,'' Mr Randolph said.

''We have relatively more bearish forecasts for iron ore's future than we have for coking coal, despite the fact that the last decade has been a wonderful decade to be an iron ore producer.''

BHP is promoting the creation of a new system of pricing to be called ''Global Ore'', which would give producers and customers ''a more transparent and 'live' price than is now available''.

http://www.smh.com.au/business/pilbara-iron-ore-prices-will-succumb-20111014-1lp7p.html

BHP rumoured to be bidding $1.3B for Brazilian iron ore producer

Andrew Topf | October 16, 2011

Mining M&A is heating up with more takeover rumours, says The Australian, quoting a report from UK-based newspaper The Sunday Times.

The Times reported that BHP Billiton (NYSE: BHP), the world’s largest miner, is close to launching a $1.3 billion bid for Ferrous Resources, a Brazilian iron ore producer controlled by a number of international hedge funds including Philip Falcone’s Harbinger Capital.

According to The Australian, Ferrous is valued at some $3.9 billion, with the company "needing to spend about $5bn developing its Viga mine in Minas Gerais state in Brazil, which would include a 400km slurry pipe to carry the ore to its own port at Presidente Kennedy in nearby Espirito Santo state."

The report comes just two days after another British newspaper, The Independent, reported that BHP and Anglo American (LON:AAL) could make a joint bid for US coal giant Walter Energy valued at a whopping $6 billion.

Global miners are scrambling for coal assets as metallurgical coal trades at record levels above $330/tonne.

BHP's interest in Brazilian iron ore has increased recently with a $3.5 billion expansion of the Samarco iron ore pellet plant, which is half-owned by BHP and the other half by Vale SA, the world's leading iron ore exporter.

http://www.mining.com/2011/10/16/bhp-rumoured-to-be-bidding-1-3b-for-brazilian-iron-ore-producer/?utm_source=digest-en-mining-111016&utm_medium=email&utm_campaign=digest

China Launches its own Iron Ore Price Index

By Esther Thomas October 11, 2011 3:41 AM EDT

China, the world's biggest consumer of iron ore, Monday launched its own iron ore price index in a bid to gain a foothold in the global pricing of the raw commodity.

In the first week of October, China's iron ore import price index stood at 652.41, down 0.13 points from the previous week. The average cost, insurance and freight price of imported iron ore was $176.22 per metric ton in the first week of October, down three cents from a week ago.

The China Iron Ore Prices Index uses iron ore prices of April 1994 as base for computation. It covered two indices, one for domestically produced iron ore and another for import price. It is released weekly.

China created its own iron ore index following the corporate strategies and policy restructuring of global mining giants Rio Tinto, Vale and BHP Billiton to adjust iron ore prices quarterly or monthly from the previous long-term contract pricing.

The China Iron Ore Prices Index is compiled by the China Iron and Steel Association, the China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exporters, and the Metallurgical Mines' Association of China.

Presently, global trading of iron ore is based on three major indices - the Steel Index, the Metal Bulletin Iron Ore Index and the Platts Iron Ore Index.

The import price index will be based on data gathered from eight ports, while domestic iron ore price index comes from the prices of iron ore concentrates in 14 provinces, autonomous regions and municipalities, including 32 mining areas.

China's demand for iron ore continues to escalate amid the slump in prices of the commodity. Its steel output accounted for 44.3 percent of the world's total in 2010. On the other hand, iron ore imports last year were recorded at 618 million metric tons, 62.5 percent of the total import.

http://m.ibtimes.com/china-own-iron-ore-price-index-launched-228785.html

Bauxite, Alumina and Aluminium

Aluminium short-sellers? Not the villains this time
Fri Oct 14, 2011 7:26am GMT

* Aluminium open interest rising since July, price falls

* Sizable short selling, but not significant

* Fundamentals, precarious economies also to blame

By Susan Thomas

LONDON, Oct 14 (Reuters) - Short-selling, a popular target in volatile and rumour-riddled markets, has been blamed by aluminium producer Alcoa's chief executive for a big fall in the price of the metal and with it the company's share price.

"They are betting against aluminum as a proxy for betting against the global economy," Klaus Kleinfeld said this week, warning of "very offensive short-selling going on by speculators".

Traders close to the market were more cautious.

"I can't say I haven't seen it, I have seen sizeable short selling, but I don't know if it's significant enough to justify what he said," a London metals trader said.

Short selling is a common way for hedge funds and other investors to bet on falling commodities or shares prices.

Benchmark three-month aluminium on the London Metal Exchange has fallen more than 16 percent since July .

At the same time, open interest -- the number of outstanding contracts -- in aluminium has been rising steadily with a burst higher from around mid-September, partly indicating that investors are taking short positions on the prospect that prices will fall further.

Analysts and traders say this shows many smaller short postions held by a wide variety of investors.

"Open interest is very high, while it's been rising prices have come off, but we don't think it's one person, we think there are a few shorts on aluminium," a second trader said.

"They'd better be quick about taking profits," he added. "Prices are already near the marginal cost of production. If they all try to cover their shorts at the same time, the spike up is going to be huge."

A short position on the LME is not necessarily speculative; producers also take positions. And LME data indicates that there are no significant short players in the LME aluminium market.

The LME's futures banding report shows four short aluminium position holders at 5-9 percent and one for 10-19 percent for November, while other LME data shows one position holding stocks and cash contracts of 30-40 percent.

VILLAINS

Short sellers are usually vilified in tough times, and this year has been no exception.

In a coordinated attempt to restore confidence in Europe's fragile economies, France, Italy, Spain and Belgium imposed a ban in August on short-selling financial stocks.

At the height of the volatility in August and September, there were days when base metals fell, in tandem with the euro, stock markets, gold and silver.

"The drop was more to do with people getting out of investments, that was the start of it, because they needed to cover elsewhere, so everything moved suddenly in very high correlation," the first trader said.

"I don't know if it was short selling aluminium by speculators but maybe some people thought this is the end of the world, and let's make money from if before others do."

In any case, he added, with short selling in some financial stocks forbidden "you have to go elsewhere if you want to short something".

A physical trader at a large Swiss merchant said there are undoubtably speculative short sellers in the aluminium market, but that is also due to the fundamentals and precarious macro economic situation.

Still, there's enough short selling to leave more than one person disgruntled.

"Whoever it is, they have a few bob in the kitty," one veteran LME trader said. "It's not about supply and demand anymore, it's who's got the deepest pockets. I don't like it."

http://af.reuters.com/article/commoditiesNews/idAFL5E7LC3GW20111014?sp=true

India's NALCO finalises 270,000 T alumina export deal

Fri Oct 14, 2011 1:26pm GMT BHUBANESWAR, India Oct 14 (Reuters) - Indian state-run National Aluminium Co Ltd has finalised a long-term contract for 270,000 tonnes of alumina exports at 16.2 percent of the LME aluminium price on an FOB basis, commercial director Ansuman Das said on Friday.

The London-based buyer will receive the alumina in nine batches of 30,000 tonnes each between January and December next year, he told Reuters.

NALCO, whose tenders serve as a global benchmark, last month finalised a long-term contract for 300,000 tonnes of alumina exports for deliveries in 2012 to a European buyer at about 16 percent of the LME aluminium price on an FOB basis. (Reporting by Jatindra Dash; editing by Malini Menon)

http://af.reuters.com/article/metalsNews/idAFL3E7LE2KN20111014

Is Craft Beer's Move to Aluminum a Dirty Choice?

by Presidio Marketing | October 11th, 2011

A bauxite mine in Australia.

By John Heylin

Craft beer is considered by many to be one of the leading green industries in America right now. High costs have inspired brewers to treat their own waste water, ship across the country by rail, and reclaim heat from boiling tanks for use elsewhere in the brewing process. Support from craft beer drinkers has also given them the freedom to grow their own hops and move to more expensive organic ingredients.

Sadly this seems to be taking a turn. A lot of craft beer is now being switched from glass bottles to aluminum cans. The reason being that people want to take beer hiking,

backpacking, to the beach, and ball games. Glass is simply too heavy. Aluminum also has benefits such as being lighter for reduced shipping costs, the recycling process is less energy-intensive, and canning lines for these small breweries are a small fraction of the size of an unreliable and always breaking bottling line. Yet despite all this, the move to aluminum is the wrong one.

Aluminum is an amazing metal. It's strong enough to be put into cars, bicycles and airplanes. It's light enough to make a drastic improvement in shipping costs for beer and soda. It's also energy-cheap to recycle it due to its pliability. But for all the good aluminum does, it has to come from somewhere, right? It needs to be mined, and the mining process and the refining of aluminum is quite possibly one of the least green things on this planet.

To mine aluminum you first must strip-mine the land in order to get the deposits of bauxite which contain aluminum. One must dig up the entire topsoil translating to vast acreage of forestland other terrain being removed entirely. It's almost beautiful how clean and red the mined areas look, the efficiency of the process itself is impressive in its destruction. The removal of the topsoil takes away the ability for the land to absorb water, resulting in landslides, iron and nutrient-rich soil suffocating streams, and the resulting bacterial blooms created by this slurry. There's a reason aluminum mining is scarce in the United States, this is why:

In order to remove the aluminum from the bauxite heavy chemicals are needed to dissolve the ore materials from the soil. Sodium Hydroxide, a nasty chemical, is paired with extreme heat to accomplish this task. Five tons of bauxite is needed to produce one ton of unrefined aluminum (alumina). When you consider just how many tons of aluminum are used in the United States alone each year with only a 50% recycle rate, that adds up to a lot of moved earth. And don't think that the remains from the process are harmless, just ask Hungary which had to evacuate entire towns due to the remaining toxic sludge breaking through its dam. These places are unable to sustain plant life and won't in the near future.

Let's not forget the gases released during the refining process, sulfur dioxide, chlorine, carbon monoxide and the incredibly dangerous hydrogen fluoride. Hydrogen fluoride actually replaces calcium in bones leading people exposed to it to have what's called "brittle bones" and when exposed to moisture is prone to explosion. Even the loading process onto ships at the ports of countries like Jamaica and Australia are killing the reefs, saturating them in heavy metals.

That's it right? Wrong. Aluminum mining is very energy intensive. The Akosombo Dam in Ghana was built with funding from the Volta Aluminum Company, flooding an area large enough to give it the title of "world's largest man-made lake by surface area," displacing 80,000 people, and all to power their smelters. Only 20% of the power generated by this dam goes to the people of Ghana who frequently have power shortages, the rest going to the Volta Aluminum Company. A recent study also discovered that the added weight of the new Lake Volta has caused readjustments in the earth's crust leading to geological destabilization in the region.

The point is that only after it's ripped from the earth, chemically treated, refined, shipped, smelted and processed is it a green product. If we recycled every scrap of aluminum it might make it worth it, but the cost to the earth and to these countries is a cost we're willing to pay for but they cannot afford. Like the myth of clean coal, clean aluminum is still a lie and craft brewers need to stay away from it.

http://www.triplepundit.com/2011/10/green-craft-beer-dirty-aluminum/

COPPER

Copper demand continues to exceed supply

By Garry White, and Emma Rowley

7:30 PM BST 09 Oct 2011

Dr Copper's diagnosis for the global economy looks pretty dire. Futures prices for the economically sensitive metal are down by almost a third since their high earlier this year.

According to preliminary ICSG data, global growth in copper demand for 2011 is expected to exceed global growth in copper production, with a production deficit of about 200,000 metric tonnes of refined copper expected for the year.

The metal is regarded as a leading indicator of the global economy. It is used in the construction of buildings, power generation and transmission and the manufacture of consumer electronics.

Copper wiring and plumbing are integral in these items. So, the higher the demand for copper, the more buoyant the global economy is said to be. That's why the recent fall off a cliff is of great concern.

However, there are other dynamics at work because copper is the metal with one of the tightest supply and demand fundamentals around.

Last week, the International Copper Study Group (ICSG) released its latest assessment of copper market dynamics – and its view should be supportive of the price.

According to preliminary ICSG data, global growth in copper demand for 2011 is expected to exceed global growth in copper production, with a production deficit of about 200,000 metric tonnes of refined copper expected for the year. For 2012, ICSG data have forecast a deficit of about 250,000 tons as supply growth continues to lag demand growth. By 2013, however, increased production and lower growth in demand are expected to yield a nearly balanced market.

"There is still a risk of demand figures being subject to additional downward revisions," Carsten Fritsch, a metals analyst at Commerzbank, said. "For one thing, there is a general economic slowdown, especially in the OECD countries, and comparatively high copper prices

could already have prompted customers to opt for substitutes on a considerable scale," he added.

"The research group CRU expects a drop in demand this year of up to 500 thousand tons, or 2.5pc, because plastics, aluminium and fibre optics are viable substitutes," Mr Fritsch noted.

"However, with China's economy still going full steam ahead, and a lower availability of scrap metal, which is hampering growth in secondary production, we still envisage a structural deficit on the copper market this year and next," he said. The ICSG also noted that there were downside risks to its forecasts. "Numerous factors including a world economic slowdown, European Union sovereign debt issues, political disturbances in the Middle East and North Africa, and market price volatility create significant uncertainty, and the global market balances could vary from those projected."

The market has also been hit by copper from China as well. "Copper stood under the influence of Chinese destocking through 2011, which reduced the country's net imports by around 360,000 tons in recent months," Michael Widmer, Metals Strategist at BofA Merrill Lynch, said.

"With excess stocks now extremely low and assuming no hard landing in China, we anticipate that the country's metal purchases will increase," he added.

However, Mr Widmer was not so bullish yet on the copper price. "Yet, in a falling market, pre-emptive large-scale buying would be unprecedented," he said, "Factoring in also a likely stabilisation of the US economy through 2012, we believe more visible upward pressure on prices will not emerge until then."

So it appears that the market at the moment is being driven by sentiment more than the fundamentals – but this is the case in equity markets too.

Commodities and equities currently appear to be discounting a deep and troublesome slump. So all eyes remain on Europe to see if the politicians can fix the banking system – because that's what it needs to turn these markets around.

It's not all doom and gloom, however. Thursday and Friday saw prices bounce as hopes of a European resolution grew as traders bet that low prices would prompt China to restock.

However, a sustained rise in prices does not appear to be on the cards just yet.

http://www.telegraph.co.uk/finance/commodities/8816732/Copper-demand-continues-to-exceed-supply.html

China's red metal alert

Stratfor Published 6:41 AM, 12 Oct 2011

Copper prices have been experiencing increased volatility in recent weeks, dropping 30 per cent since early August and reaching a fourteen-month low as a result of Europe’s

deepening debt crisis and the overall slowing of the global economy. China has been using copper, also known as the 'red metal', as a financing tool, thereby linking it to financial and real estate markets. This means that a sustained drop in the price of the metal – certainly a possibility amid the recent volatility – could deliver an unexpected hit to the Chinese economy.

The use of copper in financial markets

Even though China is the world's largest consumer of copper, the drop in prices has not come as a welcome development. This is because of the different ways China uses copper. Though China's demand for the metal has surged over the last ten years due to domestic construction, industrial production and the needs of the manufacturing industry, copper has also taken on an important role in financing. An increasing number of Chinese firms have been using copper as a financing tool – stockpiling the metal and using it as collateral – because the government's measures to curb inflation have limited the firms' access to credit. Such financing links the price of copper to other key elements of the Chinese economy, including the growing speculative real estate bubble.

China's tightening monetary policy has made it more difficult to access credit through official channels. As a result, Chinese small- and medium-size enterprises have increasingly turned to copper for use as collateral in loans, which are then funnelled into other sectors of the economy. The falling price of copper means that the collateral initially put up for the loans in yuan is no longer worth what it once was, decreasing the likelihood that the borrower will be able to pay back the loan. If firms default on debts, then others connected in the chain will default – and determining where loans have been invested is nearly impossible.

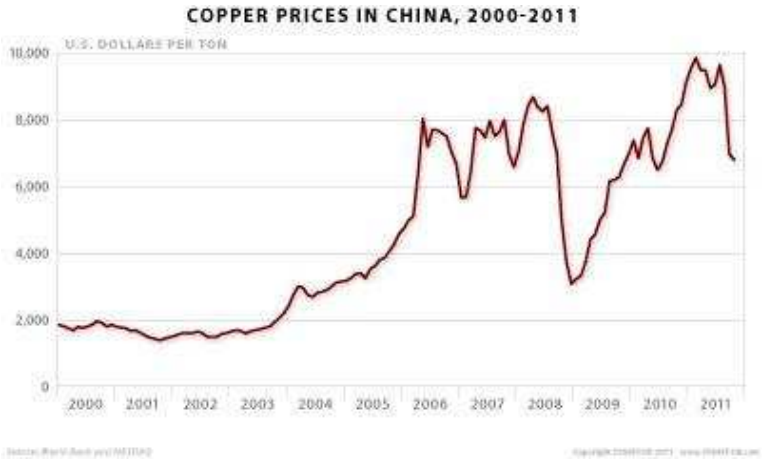
Banks and state-owned enterprises are also potentially vulnerable. A high number of SOEs have also used copper as collateral. These firms are often involved in the real estate sector – even if their primary function is not always directly linked to it – and are therefore exposed to the country's growing real estate bubble. The government would bail out the more politically favoured SOEs if necessary, but that would leave fewer resources to be allocated to the private sector that is crucially important to China's growth.

How financing with copper works

As China considers raising interest rates further and implementing other measures to tighten credit, businesses continue to use more complicated methods to obtain loans. The procedure for using copper as a financing instrument has typically gone as follows: SMEs and SOEs apply for a low-interest loan to buy copper on the international market using US dollars, deferring payment on the loan for three to nine months. The copper is imported and stockpiled in warehouses in China, and the warehouses issue the borrower a letter of credit confirming the amount of copper stored at their facility. Borrowers bring this letter of credit to Chinese banks and can exchange the rights to the copper for around 80 to 85 per cent of its value in yuan, which they can immediately turn around and invest in other sectors.

Due to the yuan's general appreciation against the dollar, the borrower is in theory virtually

guaranteed to make a profit during the initial three- to nine-month period, in addition to whatever they earn by their investment of yuan. Because of the apparent upside involved in trading assets purchased with dollars for yuan and the overall tightening credit environment in China, which makes it more difficult to secure loans through other channels, this approach has become quite popular. In fact, according to *Stratfor* sources, virtually all copper imported into China over the past three months has been used for financing.



click the image to enlarge

Potential fallout and Beijing's response

Beijing issued new regulations in late August requiring banks to place part of the original loan in a low-yielding reserve account instead of allowing it to be used to invest yuan elsewhere in the economy. But because the use of copper as collateral developed as a way to bypass lending regulations, there is no mechanism in place to track how much of the inventory is tied up in these financing deals, meaning the extent of the risk also cannot be measured. But China's copper demand was up by nearly 100 per cent between 2005 and 2009, during which time Chinese gross domestic product rose by only about a third, according to the International Copper Study Group.

There is little doubt that a significant proportion of this copper has been used for financing, given that industrial use alone does not account for the increase. Warehouses bonded to the London Metal Exchange also saw Chinese copper inventories increase 17 per cent in the first quarter of 2011, compared to a drop in the purchasing managers index manufacturing rate to 52.9 per cent during the same period, according to the China Federation of Logistics and Purchasing. That this figure only includes inventories registered on the LME again suggests that a high percentage of imported copper is being used to finance credit.

Any move by Beijing to institute new regulations to limit this activity may prove to arrive too late. Speculative tools like copper and real estate have been used in informal and formal lending, making them harder to regulate, thus increasing China's vulnerability to price

declines and financial risk. Beijing understands it needs to clamp down on copper speculation, but it is wary as this may lead to a big rise in non-performing loans at banks.

A drop in copper prices appears on one hand to be a good thing, since China's demand for copper is growing faster than production. On the other hand, if the value of China's stockpiled copper collapses, the impact on those using copper as collateral has widespread ramifications. Such a collapse would result in a much worse outcome for Beijing and would parallel similar problems China faces in managing bubbles in, for instance, real estate. There are few safe investments, and the system is more stressed than it appears.

Beijing will find it hard, while installing new regulations, to achieve the contradictory goals it is pursuing – keeping the economy growing even as it tightens lending. It cannot sacrifice growth and employment, so it is unlikely to take measures to halt the copper financing practice completely.

http://www.businessspectator.com.au/bs.nsf/Article/China-copper-lending-markets-banks-yuan-loans-pd20111012-MJP5Y?opendocument&src=rss

Precious Metals

South Africa's gold miners await technology breakthrough to save them

Finance 24 | October 9, 2011

South Africa's gold mining industry is under such cost pressure, owing to gold reserves that are too deep to be mined profitably, that within a decade or two this could mean the end of the industry.

That's why there is great excitement about a promising new technology which could make deep underground mining possible and ensure the future of the industry.

(Deep underground mines are engineering miracles, but the limitations of the available technology have long been evident to South Africa's gold industry.)

The world's deepest mine is AngloGold Ashanti's Mponeng, which extends about 4 km underground. To be able to mine much deeper than this, where millions of currently inaccessible – or uneconomic – fine ounces of gold lie, would require a breakthrough.

Significantly, AngloGold was recently the first group to herald such a breakthrough with an apparently large degree of certainty.

Within three to five years the group wants to develop machines to replace mineworkers at the stope face.

This target not only involves machines that can do the work of humans at the "coalface", but also means the end of mining methods in standard use for more than a century.

AngloGold, and probably all its peers, wants to mine gold without using blasting to break up

rocks.

Technology that can replace explosives in underground mines has for decades been the industry's holy grail. There have been some premature announcements of a breakthrough.

Since the 1960s much such technology has been developed and successfully deployed in certain types of mines.

This includes a number of breakthroughs – from machines that extract coal from the underground seam to hydraulic fracking for freeing natural gas from underground shale.

For subsurface gold ore in hard rock there is unfortunately still nothing that works as well as drilling holes in the stope face and filling it with explosives.

The country's underground gold mines have for around a century used a combination of the pneumatic rock drill and dynamite.

The end of blasting operations is the primary target of the AngloGold Ashanti Technology and Innovation Consortium (AGATIC), a partnership created last year that includes a number of international capital goods manufacturers and research groups as members.

Through brainstorming sessions led by Robbie Lazare, the group's vice-president of South African operations, AngloGold wants to find ways to mine deeper.

Within 10 years it hopes to remove people even further from the front and eventually, years later, even mine from the surface and possibly employ a leaching process. That is AGATIC's "technology roadmap ".

According to Reuters, Gold Fields chief executive Nick Holland is planning to introduce mine robotic technology in the future.

Peopleless mines

Peopleless mining will remain in the realm of science fiction for at least the next 40 to 50 years, says Jeremy Green, a researcher at the Council for Scientific and Industrial Research (CSIR).

But mining without blasting could become a reality considerably sooner.

"Things that were unthinkable five years ago have become possible. Just think what the car you drove a decade ago looked like."

Green has been working together with a multidisciplinary team on the CSIR's mine robot programme since 2009. If everything goes according to plan, they should produce a prototype robot to replace blasting by 2018.

The team's first objective is to deliver, by March 2013, a prototype robot that really improves on the drilling-and-blasting method. The project has a budget of almost R40m.

Drilling and blasting as a rule involve a strict schedule of one daily simultaneous round of blasting in all of a mine's stope faces. This usually takes place late in the afternoon with the changeover from day to night shift.

The mining teams must all complete their cleaning up and drilling on schedule and vacate the mine before blasting takes place, because of the obvious dangers.

If a mining team does not have its blasting materials ready on time, it loses that day's chance of making progress on the stope face.

This, says Green, often happens and such lost rounds regularly number up to one-third of all blasting opportunities. Technology to lessen this problem could in some cases therefore improve both gold production and turnover by as much as a third.

The CSIR is developing a robot that can smooth the running of this cycle.

After blasting one has to wait for one to four hours for the gases and dust to ventilate and for seismicity to settle before it is safe for people to return to the stop face. Then someone has to do the "most unpleasant job on earth" to determine whether it is really safe, says Green.

This inspection currently involves someone tapping the drive roof with a pole, testing for loose rocks. Then starts the work to make it safe, clearing up the blasted rock and ore and preparing for the next round of blasting.

The proposed robot will enter the drive and inspect it during the waiting period. It will first give returning workers a three-dimensional thermal representation of what lies ahead and possibly also tap the roof and interpret the looseness of rocks based on resonance.

The concept rests on the small temperature differences between loose rocks and solid rock face. With this information, mine workers can approach the stope face with a good idea of what lies ahead.

The business model for the project looks to shorter inspection times and therefore fewer missed rounds of blasting, as well as the combating of fatal accidents, which can bring a mine to a costly halt. Rockfalls in the stope are the commonest cause of injury and death in mines.

The CSIR's Centre for Mining Innovation in Johannesburg, where Green works, is developing this robot's "eyes".

Other CSIR divisions are developing the "body" and the "brain" which, among other things, will allow the robot to navigate around people and objects while doing the inspection. The teams hope that by next year they will be ready to put the three elements together.

“We are aiming at improvements in the current drilling and blasting method using a modular model that can be adapted for other purposes,” says Green.

The CSIR’s own technology roadmap first involves an inspection robot which, with modifications, could lead to a mine-rescue robot and thereafter to a team of robots to do the mining themselves.

The expectation is that at that stage, between 2016 and 2018, a workable alternative for breaking rock will be ready.

There are several candidates for a technology such as this, but none is so far commercially viable, says Green.

The CSIR is focusing on electro-breaking. This involves sending a high-frequency alternating current of electricity through the rock using electrodes.

“This breaks the rock, but we are not sure why,” says Green. It's related to what is within the specific rock and how these elements react to the alternating current. “Is it water that boils or metals that expand from the heat?”

The AngloGold Ashanti Technology and Innovation Consortium (AGATIC) is apparently working towards a mechanical rock-breaker while other possibilities include thermal breaking, hydro breaking, microwaves, injections of expanding foam and, even later, laser drilling.

The CSIR project specifically targets South African gold mines that suffer a very particular problem other than depth.

The deep underground gold reefs being mined here are generally only 30cm from top to bottom and blasting a drive around it that will accommodate mineworkers involves the mining of a great deal of very worthless rock as well.

Gold Fields’s South Deep Mine has been mechanised to a far greater degree than any other local underground gold mine, as it contains enormous reefs. This justifies drives that can accommodate not only people but enormous drilling machines and trucks.

This is proven technology which is used in most other mining countries because of its relatively low labour-intensiveness.

The CSIR and AGATIC’s projects aim at tiny machines rather than the manned colossi working in South Deep. The CSIR robot will be 40cm x 40cm, and 20cm high. In this way, it is hoped, nothing more than the gold reef will be mined, immediately doubling local gold mines’ effective ore grades.

http://www.fin24.com/Companies/Mining/Gold-industry-awaits-breakthrough-20111009

Solar Energy

Solar Energy: The Quest for Cheap

The Big Question October 13, 2011, 5:29 PM EDT

As the price per watt falls, the tipping point for solar energy to become truly competitive is only a few years away

By Joel Stonington

The big number is 50. When companies can produce solar photovoltaic modules for less than 50¢ per watt, solar energy will be able to compete directly with coal. Right now, the cheapest solar cells are being produced for as little as 70¢ per watt. They are selling for about $1.26 per watt, with prices expected to drop to $1.17 next year. Most anticipate they will hit 50¢ per watt within four or five years.

To get a sense of just how much prices have declined, one of the biggest manufacturers, Tempe (Ariz.)-based First Solar (FSLR), was selling solar power panels for $3 a watt in 2005.

As prices fall, demand is growing. Total solar installations in the second quarter grew by 69 percent over the same period in 2010. The number of Americans working in the solar industry more than doubled, to 100,000, from 2009 to 2011, according to the Solar Energy Industries Assn. That's considerably more than the 80,600 coal miners working in the U.S., according to the Bureau of Labor Statistics.

"At the point where you say, 'It's cheaper to use solar than natural gas or coal,' that's when you'll really see a rush," says Jeff Siegel, managing editor of Green Chip Stocks, a research firm that focuses on alternative energy.

Carnage Amid Lower Costs

Behind the price drops are cheaper manufacturing costs, lower costs for such crucial raw materials as silicon, and rapidly improving technology. Cheaper photovoltaic cells manufactured in China and misplaced bets on more-expensive technologies and materials have battered stocks and created corporate wrecks like now-bankrupt Solyndra and the less-well-known but no-less-bankrupt Evergreen Solar (ESLRQ) and SpectraWatt. Others are anticipated to follow.

"Solar is still a very young industry, it's in enormous turmoil," says Frank van Mierlo, chief executive officer of 1366 Technologies, a Lexington (Mass.)-based manufacturer of silicon photovoltaics. "The largest solar company has been different every year for the last six years. This is a young market where things are getting flushed out. Fundamentally—for us as a country—this is really good news. You want solar to be cheap."

Dozens of startups in the U.S. have potentially transformative ideas. The question is which can come out on top. The wide variety of companies developing competing technologies to capture and distribute solar power underscores the market's immaturity. Currently, researchers are experimenting with materials ranging from silicon to gallium arsenide to cadmium telluride, basing cost projections on disparate technologies that create solar cells.

The goal is to build one that competes without government subsidies. SunShot, an initiative from the U.S. Energy Dept., has since 2007 spent $59 million to help attract an additional $1.2 billion in private solar investment, with the stated goal of a 50¢ module.

Can the U.S.Fend Off China?

Notwithstanding competition from China, costs are most likely to fall because of technological advances. “This is an industry where we can win,” says 1366 Technologies’s van Mierlo. “We can win and we can compete. We have to do it based on technology. The good news is we have a technology lead.”

A promising startup is Alta Devices in Santa Clara, Calif. With 80 percent of the market dominated by silicon solar cells, Alta Devices is attempting to break in from the outside, using gallium arsenide, a material usually considered too expensive for anything other than use by the likes of NASA.

The advantage of gallium arsenide is that it is highly efficient and works better than standard silicon in low light and at high temperatures. The foundations of Alta’s manufacturing process were patented back in 1979 but shelved until it became cost-effective due to advances in chemical availability. Because the material is so thin, Alta’s solar panels can be embedded into roof shingles or rolled out like carpets.

http://www.businessweek.com/technology/solar-energy-the-quest-for-cheap-10132011.html

Biofuels

Don’t Smoke That Fuel: ARPA-E funds energy research in tobacco, turpentines, camelina

Jim Lane | October 14, 2011

Transformative yields for terrestrial plant oils of up to 4,000 gallons per acre are the goal of new research awards from ARPA-E.

In Washington, the Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E), today announced 60 cutting-edge research projects aimed at dramatically improving how the U.S. produces and uses energy. 10 awards for $36 million went for biofuels-related projects.

ARPA-E is the DOE’s most far-reaching, ambitious R&D program. Modeled after the Defense Department’s Advanced Research Projects Agency, which fostered stealth technology, the internet and the GPS global positioning system (among other successes), ARPA-E aims at high-risk, high-reward transformational technology platforms.

The projects announced this week are for the Plants Engineered to Replace Oil (PETRO). If successful, PETRO will create biofuels from domestic sources such as tobacco and pine trees for half their current cost, making them cost-competitive with fuels from oil.

Specifically, the project focuses on transformation of plant-based oil production, rather than sugar for fermentation, or total biomass for pyrolysis or gasification.

Oilseeds – can't make 'em fast enough

The limits on oilseed productivity are well understood by anyone who ever sat through a presentation on micro algae, because the potential to produce 3,000-5,000 gallons of oil per acre is universally compared with productivities like 600-800 gallons per acre for palm, 400 gallons per acre for jatropha, 80 gallons per acre for camelina, and 40-60 gallons per acre for soybeans.

Bottom line, it's tough for the farmer to make a living growing oilseed crops for biofuels, though its easier where it works as rotation crop, such as wheat-camelina or soy-corn, and especially for the temperate plant oils.

Also, generally there's a theme of researching the possibilities of the turpines, a class of molecules perhaps best known for turpentine, but also the base of C5 (and a lot, lot higher, like C21, or C30) molecules which confer many of the fragrances and favors in foods and perfumes, pine pitch, most of the flavors of beer, not to mention synthetic rubber, steroids, diesel and jet fuel. Terpenoids are the source of cinnamon's scent, ginger's bite, and even the dread THC, the psychoactive agreement in marijuana.

Well, you shouldn't smoke fuel, anyway.

Some of the projects have fairly algae-esque oil production goals. For example, a University of Florida project that, it outlines, could increase oil production to as much as 4,000 gallons per acre from pine trees.

And a lot easier to aggregate than micro algae, you can take that to the bank.

The three bottom lines

In this round, ARPA-E is keying in on a few areas that deserve a note.

1. Improving the efficiency with which plants use carbon. Oil plants are notoriously busy using (or failing to use) carbon in ways other than we would like, do not use light as efficiently as we would like, and devote energy to oil production less efficiently than we would like. The nerve.

Amherst, UCLA, Texas Agrilife Research, the Donald Danforth Center and the Lawrence Berkeley Lab have come up with projects to reengineer crops to enhance carbon uptake, and optimize light utilization. With all the focus on camelina, no surprise that several projects will work on that platform. But a project from Lawrence Berkeley focuses on North America's original cash crop, tobacco.

2. Getting plants that produce sugars, to directly produce oils. A continuing theme of advanced biofuels research is to get the plant to do more of the processing work while still in the ground, thereby dramatically reducing the cost of post-harvest processing.

In the alcohol-to-jet programs, for example, plants or other carbon sources have to be harvested for their carbon, fermented or otherwise processed into alcohol, then upgraded into fuel oils like kerosene.

In this round of research, Arcadia Biosciences will modify a number of genes involved in oil biosynthesis to induce grasses to produce vegetable oil. A University of Illinois, Urbana-Champaign team will engineer sugarcane and sorghum to produce and store oil instead of sugar. Chromatin will lead a team to engineer sweet sorghum to produce up to 20% of its biomass as farnesene, a diesel-esque molecule which will accumulate in the sorghum plants similar to the way in which sugarcane accumulates sugar.

3. Maximizing oil storage in perennial plants and woody biomass.

In this round, a University of Florida project will increase the turpentine storage capacity of the wood and to increase turpentine production from 3% to 20%.

And, the envelope please – the 10 winners

University of Massachusetts, Amherst

Development of a Dedicated, High-Value Biofuels Crop – $1,482,264

The University of Massachusetts, Amherst will develop an improved oilseed crop that uses carbon more efficiently than traditional crops. The plant will incorporate features that significantly improve photosynthesis and also allow the plant to produce useful, high-energy fuel molecules directly within leaves and stems, in addition to seeds. This will allow a substantial increase in production of fuel per acre of planted land.

University of California, Los Angeles

Energy Plant Design – $2,206,614

The University of California, Los Angeles, will re-engineer plants so that they use energy more efficiently. The team will streamline the process by which green plants convert carbon dioxide into sugar or biofuels. This technology could then be applied broadly, for example to crop plants, to improve yields of grain and biomass.

Donald Danforth Plant Science Center

Center for Enhanced Camelina Oil (CECO) – $5,524,832

The team led by the Donald Danforth Plant Science Center will develop an enhanced variety of the oilseed crop Camelina that produces more oil per acre. Camelina will be engineered

with several genes that allow the plant to use light more efficiently, increase its carbon uptake, and divert more energy to the production of oil, which is stored in seeds and is convertible to fuels. The goal of this project is to combine all of these genes into one engineered variety of Camelina, and to prepare it for field trials.

Texas Agrilife Research

Synthetic Crop for Direct Biofuel Production through Re- routing the Photosynthesis Intermediates and Engineering Terpenoid Pathways – $1,877,584

Texas A&M University will address a major inefficiency of photosynthesis, the process used by green plants to capture light energy. Specifically, the team will redirect otherwise wasted energy in plants into energy-dense fuel molecules. The fuel will be readily separated from the plant biomass through

Lawrence Berkeley National Lab

Developing Tobacco as a Platform for Foliar Synthesis of High-Density Liquid Biofuels – $4,839,877

The Lawrence Berkeley National Laboratory and its team will develop tobacco plants with leaves that contain fuel molecules. The team will engineer tobacco with traits conferring hydrocarbon biosynthesis, enhanced carbon uptake, and optimized light utilization. The tobacco will be grown using advanced cultivation techniques to maximize biomass production.

Arcadia Biosciences Inc.

Vegetative Production of Oil from a C4 Crop – $947,026

Arcadia Biosciences will modify a number of genes involved in oil biosynthesis to induce grasses to produce vegetable oil. Oil is one of the most energy dense forms of stored energy in plants, and it is a liquid that can be extracted readily, separated, and converted into biodiesel fuel. Arcadia's technology will yield biomass comprised of 20% oil and can be transferred into highly productive energy crops such as sorghum and switchgrass.

University of Illinois

Engineering Hydrocarbon Biosynthesis and Storage Together with Increased Photosynthetic Efficiency into the Saccharinae – $3,250,000

The University of Illinois, Urbana-Champaign team will engineer sugarcane and sorghum to produce and store oil, a biodiesel fuel, instead of sugar. The team will optimize the intensity of the leaf color to more efficiently capture and use sunlight, improving energy yields by up to 50% compared to conventional crops. The team will also crossbreed these crops with the energy grass Miscanthus to increase their geographic range of cultivation.

North Carolina State University

Jet Fuel From Camelina Sativa: A Systems Approach – $3,734,939

North Carolina State University will engineer the oilseed crop Camelina with traits that increase the yield per acre of biodiesel. The project incorporates both an alternative way to capture carbon from air and features that allow the plant to accumulate larger quantities of vegetable oil and other fuel molecules in oilseeds. When combined together, the fuel molecules plus vegetable oil isolated from the plant can be converted into a fuel mixture that is comparable to diesel or jet fuel. This variety of Camelina is expected to produce more fuel per acre of land than other conventional biofuel crops.

Chromatin, Inc

Plant-Based Sesquiterpene Biofuels – $5,769,590

Chromatin will lead a team to engineer sweet sorghum, a plant that produces large quantities of sugar and requires less water than most crops, so that it can accumulate the fuel molecule farnesene. Genes from microbes and other plants will be incorporated into sorghum to allow the plant to produce up to 20% of its biomass as farnesene, which can be readily converted into a type of diesel fuel. Farnesene will accumulate in the sorghum plants similar to the way in which sugarcane accumulates sugar.

University of Florida

Commercial Production of Terpene Biofuels in Pine – $6,367,276

The University of Florida project will increase the production of turpentine, a natural liquid biofuel isolated from pine trees. The pine tree developed for this project is designed both to increase the turpentine storage capacity of the wood and to increase turpentine production from 3% to 20%. The fuel produced from these trees would become a sustainable domestic biofuel source able to produce 100 million gallons of fuel per year from less than 25,000 acres of forestland.

http://biofuelsdigest.com/bdigest/2011/10/14/dont-smoke-that-fuel-arpa-e-funds-energy-research-in-tobacco-turpentines-camelina/