



Confederation of Indian Industry
Since 1895



MM

MANUFACTURING MATTERS

Journal of Manufacturing Excellence, December 2010

Highlights

AGENDA

The Skills Imperative Pg 13

For manufacturing sector to move up the value chain, skills development and focused human capital formation are crucial areas to be focused upon

ENERGY

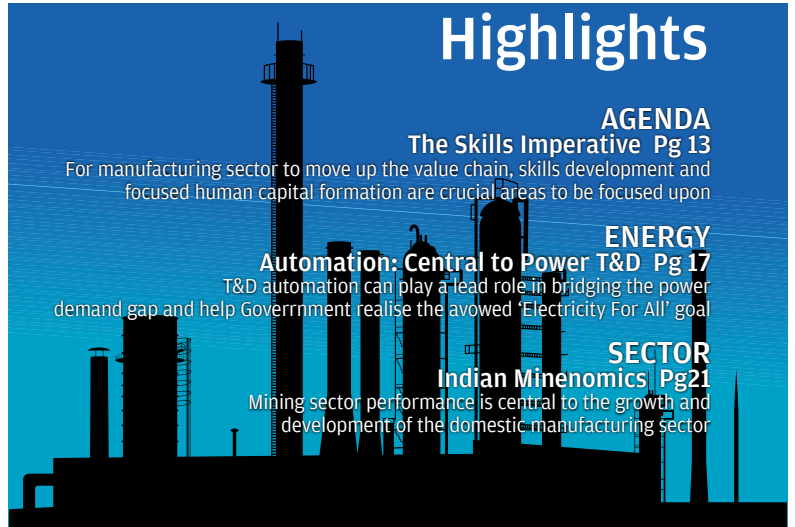
Automation: Central to Power T&D Pg 17

T&D automation can play a lead role in bridging the power demand gap and help Government realise the avowed 'Electricity For All' goal

SECTOR

Indian Minenomics Pg21

Mining sector performance is central to the growth and development of the domestic manufacturing sector



JOB CREATION: A MANUFACTURING IMPERATIVE



SPECIAL STORY:

INDIA & US: PARTNERS IN PROGRESS

Inside This Issue

CHAIRMAN'S MESSAGE Page 2
IN BRIEF Page 3
INTERNATIONAL Page 6

FOCUS Page 9
AGENDA Page 13
MANPOWER Page 15

ENERGY Page 17
SECTOR Page 21
INDUSTRY DATA Page 23

From The Chairman's Desk



Venu Srinivasan
Chairman,
CII National Council on
Manufacturing

The marginal drop in the performance of the Indian manufacturing sector in September 2010 should not devalue the strident progress that the sector has made in recent months, complementing the Government's efforts to inch closer to double-digit GDP growth. The relative strengths of the sector can be gauged from the fact that it contributes close to 15% of national GDP, accounts for nearly 50% of overall exports and provides employment for approximately 12% of the national workforce.

While the strategic importance of the manufacturing sector can hardly be overstated, employment generation will continue to be a key goal for the sector given that it provides direct employment to approximately 58 million (2008). By 2012, it is estimated that this figure will go up by another 12-13 million out of close to 89 million people who will additionally enter the workforce.

A large part of this growing workforce will comprise agricultural labour moving out of the primary sector in search of sustainable livelihood. Their training and absorption will constitute a key challenge for the manufacturing sector, even as efforts are directed toward the maintenance of labour intensity within the various manufacturing sub-sectors.

Labour intensity varies widely across different manufacturing industries. For instance, labour-intensive sectors like paper and wood products, textiles and food processing contribute less than 30% to the manufacturing output but provide over 60% employment. Reports have indicated that special focus on these labour-intensive sectors can generate additional employment of 15-20 million for every additional percentage point of growth. Needless to add, such an objective can only be met and sustained with concerted efforts from both Government and industry.

To maintain the labour intensity of manufacturing industries, a critical factor that needs to be carefully considered is the availability of trained human capital. The manufacturing sector is increasingly facing a demographic dilemma caused by a decline in a qualified, employable workforce. Industries like transport equipment, electrical machinery and petroleum which require workforce with specialised skills and qualifications are faced with a perceptible shortage on this count. The situation demands focused attention on the number

and quality of potential employees graduating from industrial training institutes (ITIs) and other vocational colleges across the country.


The ITIs will need to be further aligned with the specific needs of the manufacturing sector. CII has taken proactive steps to promote the adoption of ITIs by industries and to turn around their curriculum in a way that those graduating from such institutions are fully trained and readily employable.

In this edition of *Manufacturing Matters*, we focus on both job creation and human capital formation in the Indian manufacturing sector. We focus in this issue in particular on the mining sector which has a direct impact on national GDP. We also examine the larger question of whether India, while leading as



a producer of coal & lignite, barites, iron ore, bauxite, manganese ore and aluminum, has managed to match its productivity with manufacturing competitiveness. In this issue, we discuss recent trends in undertaken to modernize mines; steps taken to shore up the prospects of aging mines with the appropriate infusion of technology and the interventions required to monitor under-performing mines, or those with excessive cost over-runs.

We also examine, in this issue, the imperative of automation of power T&D in view of its impact on the country's development agenda. As the demand and resources available for power transmission are rather unevenly spread across the country, the objective should be to optimally utilise the national grid through automation. This is also central to the attainment of the Government's avowed goal of 'Electricity For All'.

Manufacturing Matters has continued to benefit from the feedback and suggestions that have come from you, our esteemed readers. Your participation is key to making this journal the most definitive communication vehicle for the manufacturing sector. 

Innovation is key to development: PM

Prime Minister Dr Manmohan Singh has said that innovation in conservation methods is key to solving the critical challenges in providing food, water and energy security to the people. "In India we have lived with the idea of being a resource-rich land, taking for granted the limitless bounty of mother nature. In fact, the reality is that as a nation we are not well-endowed with natural resources when measured on a per capita basis. We should, therefore, inculcate the traditional values of thrift embedded in our culture and our civilisation and saving in the use of our scarce natural resources," Dr Singh said.

The Indian government has declared the present decade

to be the 'Decade of Innovation'. Calling for support from private sector, Dr Singh said: "If we are to give meaning to our search for new frontiers in Indian science, then a much larger participation of the private sector is also essential. We have to leverage the private sector's strengths by creating high impact collaborations. Let private enterprise partner public science and technology institutions in their translation and transformational efforts. Let them join hands with our public institutions in creating new manufacturing strategies for both strategic and non-strategic applications. Let there be publicly owned and privately operated world class research and development facilities." [MM](#)

India to outpace China in 2011: Word Bank

The World Bank is reigning in its initial forecasts of 2011 growth for East Asia, where the region as a whole is expected to grow less than previous estimates. Surprisingly, this slowing growth in the region will help India attract capital and clout, as the prospect for growth there now surpasses average regional estimates and even the Chinese growth rate next year. India's 2011 GDP is expected to grow at 8.7% by the official World Bank analysis, despite the total ex-China East Asian 2011 rate being downgraded from 8.0% to 7.8%. China's is now expected to grow at 8.5% in 2011, revised down from 8.7% and contrasting a 9.5% expansion in 2010. A net importer of goods, India has the ability to sustain itself by utilising domestic demand as a driver for growth, where competing net exporting countries (such as China) are dependent on the global consumer. Much of Asia has benefited from the global downturn by increasing their exports, such as in South Korea, but India has maintained its growth in both the import and export arenas. Still, India has yet to tap the full capacity of export oriented growth, which many analysts expect may allow the economy to surpass current estimates. [MM](#)

Aerospace, defence firms make beeline for SEZ



Even as the approval from the Board of Approval is yet to come for the development of the aerospace special economic zone (SEZ) near the Bengaluru International Airport, the Karnataka government has already attracted aviation and defence majors to set up their operations there. The state government is moving forward to materialise the aerospace SEZ, which will be the second such SEZ in the state. The Karnataka Industrial Area Development Board (KIADB) has acquired 1,000 acres for the SEZ. About 55% of the land will be allotted to companies for setting up factories. Units in the SEZ will cater to domestic demand as well as the export market. The park will include aviation MRO (maintenance, repair and overhaul) activities too. This would be the second aerospace SEZ after aerospace SEZ in Belgaum district, which is already functional. [MM](#)

Manufacturing labour costs rising

Manufacturing labour costs in India have risen nearly 20% this year and will eclipse those in China as Indian workers have seen their wages increase sharply over the last year on the



back of high inflation and a recovery in domestic demand, according to IHS Global Insight in its latest 'Global Manufacturing Compensation Watch' study. China's manufacturing labour costs are expected to rise 10% this year despite a slowdown in exports to the West as a result of the recession, the study showed. Rapid growth, productivity gains and an explosion in outsourcing have put increasing pressure on wages in developing economies like India and China. For multinational companies, understanding the labour costs associated with manufacturing facilities around the globe is a key issue when making investment decisions, the study noted. India and China have long attracted foreign investments given relatively low risk profiles and their high levels of surplus labour. [MM](#)

Plans afoot to promote electric vehicles

The electric vehicle (EV) segment in the Indian auto industry holds tremendous potential for the future as it is a sector that is clearly untapped till date. Now the Government is showing greater interest in adding leverage to this category by adopting means to popularise it as an alternative means of transportation. This prospective development spells well for manufacturing firms in the domestic auto industry. The auto is likely to see some of the emerging auto manufacturing firms focusing on the EV segment. Government is working on a plan to incentivise the development and promotion of EVs. ■■■

Green Investment Bank in the offing

Government of India is planning to set up a green bank by leveraging the Rs 5,000-crore National Clean Energy Fund expected annually through a cess on domestic and imported coal. The proposed bank will fund projects to generate electricity from wind, solar, tidal and other renewable sources, which currently contribute about 6,000 MW in India's power capacity of about 150,000 MW. India has the potential to generate 80,000 MW from non-conventional sources, according to estimates of the Ministry for New and Renewable Energy (MNRE). "Our ministry is working on a proposal to set up the green bank," Dr Farooq Abdullah, the Union MNRE Minister has said. The ministry plans to use only part of the Fund for its programmes. "A large part (of the fund) will still be available with other ministries involved in reducing India's dependence on fossil fuel and protecting our environment," Dr Abdullah said. The MNRE-proposed bank will be linked with the Indian Renewable Energy Development Agency (IREDA), a government-owned non-banking financial company. ■■■

Manufacturing: Rate hikes to impact moderately

The recent rate hikes by the Reserve Bank of India is likely to have a moderate impact on the growth and capacity addition of Indian manufacturing sector in the third quarter (Q3) (October-December 2010), shows a latest survey on Indian manufacturing sector. The survey based on 404 responses spanning across the sectors, observed that while 44% respondents felt the hike will have moderate impact on the cost of their borrowings, another 43% felt that the impact is not going to be significant. The survey noted that over 46% respondents said they plan to add to their existing capacities in the next six months as compared to 42% respondents in the previous survey. However, the sector will see some moderation in the growth as 68% respondents in Q3 compared to 71% in Q2 reported that the growth will be more vis-a-vis last year for respective quarters. ■■■

Manufacturing, key part of Indian investments in US

India Inc's investments in the US have been on the rise since the global economic downturn and the country has swiftly emerged as the second fastest-growing investor in the US, according to a report. The report 'Direct Investments in the US by Indian Enterprises' reveals that there has been a pragmatic shift in the US-India trade and investment relationship over the years. India has matured from being the largest export destination to emerge as the second-fastest growing investor in the US, after UAE. In FY09 and FY10, Indian companies made 536 outbound acquisitions globally, of which 105 were in the US. "During the first quarter of FY11, Indian companies completed 101 outbound acquisitions of which nearly one-fourth were in the US," the report says. ■■■

India Inc. business confidence level up 4%: NCAER

Slowdown blues are truly past us, says a survey conducted by NCAER-MasterCard Worldwide. As per the findings, the business confidence level in India Inc. in the April-August period has increased 4% over the previous quarter taking the total points up to 162.1, its highest ever since 1993. "The results point to continued optimism in the performance of the economy," the NCAER-MasterCard Index of Business report. The survey was based on the performance of the economy over the last five months, which included manufacturing and export growth. During the first five months of the current financial year the annual growth rate for industrial production stood at 10.6%. Despite the global downturn, overall merchandise continued its upward trend primarily on account of export diversification. During this period exports jumped 28% to \$85.3 billion compared to \$66.3 billion recorded in the same period last year. Another factor that saw business confidence increase was the healthy inflation rate which was 8.51% during the period. "It is high but a significant decline from the double-digit rates in July 2010," the report noted.

India emerging key hub for wind turbines

India, with an installed wind generating capacity of 12,800 MW, is emerging as a major manufacturing hub of wind turbines. The annual wind turbine manufacturing capacity is likely to cross 17,000 MW by 2012-13, according to a background note on the wind energy industry, prepared for the Delhi International Renewable Energy Conference 2010. The note, prepared for a session on "Wind energy: Leapfrogging into a new era", says that Indian companies are exporting wind turbines and turbine blades to Europe, the US, Australia, China and Brazil. Some of the foreign companies with subsidiaries in India are sourcing more than 80% of their components from Indian component manufacturers. The Global Wind Energy Outlook 2010, prepared by the Global Wind Energy Council, estimates the installed capacity in India to reach 65,000 MW in the next 10 years, with investment of about \$80 billion and employment of about 1,50,000 people. ■■■

Afghanistan invites Indian investments in mining, cement

Minister of Mines of Afghanistan Mr Waheedullah Shahrani, has invited participation by Indian companies to the global tender floated by Afghanistan Government for allotment of mineral concessions. The tender is open till the second week of January 2011. Afghanistan also suggested a consortium approach by Indian companies for investments in the mineral sector. He has said that Afghanistan is having sufficient mineral deposits of iron ore, copper, etc. Mr Shahrani has said that they have created a specialised Mines Protection Unit which should be a key driver for investment in the country. Mr Shahrani also sought Indian sponsorship of scholarships to Afghan nationals in the fields of geology and mining engineering. Mr Shahrani suggested that some Indian companies be persuaded to set up cement plants in Afghanistan given that raw materials like limestone and coal needed for manufacturing of cement are abundantly available there. [mm](#)



India likely to see 2.3 lakh new jobs

Six sectors including healthcare and realty are expected to create a whopping 2.3 lakh jobs in India in the last three months of 2010, according to global consultancy Ernst & Young. Boosted by strong domestic economic recovery and improved global sentiment, most local industries are expected to increase their headcount in the coming months, E&Y said. The six sectors are healthcare, real estate, IT/ITes,



education & training, manufacturing and banking, financial services and insurance (BFSI). Among them, healthcare industry alone is projected to generate 60,000 jobs in fourth quarter of 2010. Real estate and IT/ITes sector, each are expected to create 50,000 jobs. Education & training industry is projected to generate 30,000 jobs. Manufacturing and BFSI sectors would each be churning out 20,000 jobs in the 2010 fourth quarter, E&Y said. [mm](#)

NMP by year-end



The National Manufacturing Policy (NMP) is likely to be in place by this year-end. Mr Anand Sharma, Union Commerce and Industry, was quoted by the media as saying: "The draft of the policy is in the final stage of consultations with all the stake holders". He also said that encouraging the manufacturing sector was necessary to increase its share of GDP and to attract overseas investments. The minister said that the NMP, once in place, is likely to double the productivity of the manufacturing sector in the next five years, while trebling employment. The policy will facilitate integrated industrial development comprising greenfield industrial townships with infrastructure facilities like roads, power, water, effluent treatment plants, residential and educational facilities. High technology hubs will also be part of these zones. [mm](#)

Lean manufacturing, response to hyper-inflation

The prolonged hyperinflation regime has exerted maximum pressure on the country's manufacture sector. According to a study titled Indian Manufacturing in the Era of Hyper-Inflation, the continued hyperinflation has forced the Indian manufacturing sector to resort to stringent cost-cutting measures. Rising cost of manufacturing

inputs like primary products, wages and fuel as compared to that of manufactured products have been eroding the price cost margins of firms. Stimulus measures that were found helping the sector initially to cope up with this problem have lost much of their relevance owing to their withdrawal to a large extent. [mm](#)

India and US: Partners in Progress

The state visit of US President Barack Obama to India has set the stage for both the countries to promote bilateral cooperation in the manufacturing sector

Though the services sector in India has brought faster economic success, the manufacturing sector plays an important role on the plank of long-term sustainability. In 1990, after the introduction of liberalisation, privatisation and globalisation, the manufacturing sector took strident steps. This sector is critical in improving the efficiency of the Indian workforce and also serves as a potential employment generator. The growth rate of manufacturing sector in a country truly reflects its economic potentiality.

India on the trot

The UNIDO's report titled Yearbook of Industrial Statistics 2010 says India has emerged as one of the world's top ten countries in industrial production. India surpassed Canada, Brazil and Mexico in 2009 to reach the 9th position from the 12th position it held in 2008. The Index of Industrial Production (IIP) quick estimates data for April 2010 shows a growth of 19.4 per cent in the manufacturing sector as compared to April 2009. The cumulative growth during April-March 2009-10 over the corresponding period of 2008-09 is 10.9 per cent, according to data by the Ministry of Statistics and Programme Implementation. Moreover, as per data released by the Ministry, manufacturing sector posted a 16.3 per cent growth in January-March 2010.

The HSBC Markit Purchasing Managers Index (PMI), based on a survey of 500 companies, recorded a 27 month high in May 2010 to 59 from 57.2 in April 2010. A figure above 50 means



US President, Mr Barack Obama (extreme right), with (L-R) Mr Chandrajit Banerjee, Director General, CII; Ms Kiran Pasricha, Deputy Director General, CII; and Mr Hari Bhartia, President, CII.

activity is expanding. The new orders index increased to 63.7 in May from 61.9 in April 2010, on the back of strong domestic demand, according to the PMI report. It was the 14th consecutive month when new orders expanded. Exports from special economic zones (SEZs) grew by over 122 per cent to \$49.5 billion in 2009-10 as compared to 2008-09. IT, IT hardware, petroleum, engineering, leather and garments are the leading exports from SEZs.

Besides, a report by Deloitte has said that India has been ranked second, ahead of the US and South Korea, in terms of manufacturing competence globally. China, followed by India and South Korea has been ranked first, sec-

ond and third respectively in the 2010 Global Manufacturing Competitiveness Index; a result of the collaboration between Deloitte Touche Tohmatsu and the US Council on Competitiveness.

Indo-US Handshake

India has endorsed the US as its prime source of investment and an important trading partner and reposed confidence that increased spending on infrastructure along with a fresh impetus to manufacturing would take its mutual engagement to a higher plane. Cumulative US foreign direct investment (FDI) in India stands at \$8.2 billion, making it the third most important investor in the country.



US President, Mr Barack Obama, with Mr Chandrajit Banerjee, Director General, CII, at a meeting.



Mr Chandrajit Banerjee, Director General CII in discussion with US President, Mr Barack Obama, as Mr Hari Bhartia, President, CII, looks on.

Meanwhile, various reports say that India has emerged as the second fastest growing investor in the US after the UAE between 2004 and 2009. Indian FDI in the US has been growing, and totaled \$6.6 billion for the period 2000-2010. The bilateral economic relationship between India and the United States has been expanding exponentially over the last ten years. Trade in goods and services have jumped almost 300% from \$18 billion in 2000 to over \$68 billion in 2008.

India has invited US companies to take advantage of its rapid growth and help shape the country into a world-class manufacturing hub with greater investment in its infrastructure. Just as our strategic partnership has matured and grown, Indo-US trade and investment has increased dramatically over the past 20 years, Union Commerce and Industry Minister Mr Anand Sharma has been quoted saying. It has also been reported that Mr Sharma also asked the private sectors of both countries to establish partnerships and commence new ventures that will demonstrate the mutually beneficial nature of the US-India commercial relationship. We now seek collaboration focused on investment in India's manufacturing sector and the build-out of the country's infrastructure, shaping the country into a world-class manufacturing hub, he added.

To facilitate this India is issuing a new foreign investment policy and a

new manufacturing policy document, consolidating policy pronouncements in 177 areas. Mr Sharma said India is also creating national investment and manufacturing zones to attract more foreign interest. The first of these will be in Rajasthan, alongside the Delhi-Mumbai industrial corridor. We want these manufacturing zones to be incubators of new innovations and new technologies.

During the US President Barack Obama's state visit, Finance Minister Mr Pranab Mukherjee has been quoted by the media saying: Economic policy, finance and trade constitute important planks of our bilateral relations. For us, the US remains a prime source of investment, technology and an important trading partner.

Mr Mukherjee stressed that as India makes efforts to increase investment in infrastructure, and give a fresh impetus to the manufacturing sector, the importance of our partnership with the U.S. will increase. This mutually beneficial engagement would stimulate innovation, spur job creation, and promote sustainable and inclusive growth in our countries, he said.

Apart from this, the bilateral investment treaty being negotiated with the US would improve flow of investment to India. We are now negotiating a bilateral investment treaty with the US and are committed to take further initiatives that will contribute to creating a more conducive environment for in-

vestment flows, he said.

Mr Mukherjee has highlighted the fact that India had emerged as an attractive global investment destination in that investments required in the infrastructure sector alone would total \$514 billion during the XI Plan (2007-12) and of this, nearly 30 per cent was expected to come through private sector funding. Moreover, for the XII Plan (2012-17), spending on infrastructure is envisaged at \$1 trillion and this would call for innovative financing.

The development relationship between the US and India has evolved from traditional donor-donee to peer-to-peer, according to a top US official. The partnership, announced during US President Barack Obama's India visit, is intended to be cast in the same way that the previous partnership for a Green Revolution that reached hundreds of millions of people, Mr Rajiv Shah, Administrator of the US Agency for International Development has been quoted by a news agency.

The development relationship between the two countries has already evolved to a peer-to-peer partnership and will look for opportunities where Indian innovators, scientists and entrepreneurs can create solutions that apply all around the world, the highest ranking Indian American in the Obama Administration told the foreign media. The first thing is this shift to real technical cooperation and, instead of thinking of it as a traditional development

partnership, looking at how we can work together to solve global problems, Mr Shah said.

Clean Tech

Clean energy technologies remained high on the agenda of India and the US during the Obamas visit. More than half of India's electricity is generated from thermal power using coal and nuclear and hydro electricity still accounts for much less in India's total output currently.

India is looking at alternative sources of energy to plug gaps in supply and demand for electricity which is at present about 165 gigawatts of installed generation capacity. To meet its power generation target of 62,000 megawatts by March 2012, US will help India with alternative sources like solar, biofuel and shale gas.

The two countries have agreed to set up a Clean Energy Research and Development Centre with a jointly funding of \$5 million each for the next five years and matching investment from the private sector. The deal will facilitate development of clean energy technologies and the initial priority areas will be focussing on solar energy, second general bio-fuels, and building efficiency. The agreement on shale gas calls for the US to carry out studies on resources in Indian basins. Besides, Indian personnel will be trained in assessing resources.

In the MoU for co-operation in Global Centre for Nuclear Energy Partnership both countries have also promoted initiatives aimed at strengthening global nuclear security. They will co-operate in programmes for capacity building to interested states involving technology and human resource development, education and training, and giving an impetus to research and development in nuclear science in these areas.

Under the India-US Energy Cooperation Programme (ECP) an organisation of Indian and US firms will cooperate with their governments to promote clean energy and energy efficiency business.

CII Recommendation

Rising India with 8.5-8.8% economic growth and a huge 1.2 billion people market is of great interest to the US companies. Though the US economy has been registering growth since the



US President, Mr Barack Obama, with Mr Ratan Tata, Chairman, Tata Sons and Mr Chandrajit Banerjee, Director General, CII

last five quarters, worries on account of unemployment remain. US President Barack Obama's visit to India will double American exports in the next five years and create millions of jobs. The US Commerce Secretary Gary Locke has been quoted saying that rebuilding America's economic foundation also means helping more the US companies sell their goods and services to 95 per cent of the world's consumers who live outside our borders. What is that India can get out of the Indo-US relationship is that the American's core competence lies in technology-intensive areas like manufacturing, defence, advance information technology and bio technology.

The Confederation of Indian Industry (CII) believes that a cooperative framework agreement for strengthening and enhancing the economic relations between the US and India can be immensely helpful in boosting exports, generating investments and thereby, creating more jobs. India and the US could consider launching a joint feasibility study on a Comprehensive Economic Cooperation Agreement (CECA). It would be of mutual benefit to Indian and US businesses, said Mr Chandrajit Banerjee, Director General, CII, in a statement.

The study, CII recommends, could be conducted under Joint Study Group and would undertake a comprehensive review of economic and commercial relations between India and the US. It would give its recommendations on how to

strengthen various priority sectors like manufacturing, defence and technology. The study would also focus on identifying and quantify commercial opportunity in both countries in emerging sectors like green manufacturing, which would serve as a reference point for framing future policy recommendations.

With the view to leverage mutual economic strengths, the objective of the CECA would be liberalize and promote trade in goods and services and establish business models in partnership that enhance the global competitiveness of manufacturing and services sector. The agreement could encompass issues including trade in goods and services, rules of origin, standards, intellectual property rights, e-commerce, dispute settlement, as well as movement of professionals to create a truly comprehensive trade agreement.

Mr Banerjee has emphasised that the entrepreneurs and citizens of both countries have taken the lead to create people to people relationships that fuel this dynamic bilateral economic engagement, we are asking both governments to facilitate the process of taking this relationship to the next level by making a commitment to a India-US CECA. It may be an ideal time to launch a feasibility study for an Indo-US CECA, which would mark the commitment of both governments as well as private sectors towards strengthening their economic partnership. ■■

Job Creation: A Manufacturing Imperative

Growth and expansion of the Indian manufacturing sector is key to efficient job creation in the country, which is central to the Government's goal of achieving inclusive growth

Manufacturing sector plays a decisive role in the Indian economy and has been recognised as the crucial vehicle for job creation and inclusive growth. The CII-BCG Report on Manufacturing underlines that fact that the Indian manufacturing sector has recorded an average growth rate of 6.8% between FY1998 and FY2008, which is one of the fastest growing manufacturing sectors in the world, with only China having a higher growth rate (10.3%). However, Indian manufacturing is at an important crossroad today.

In the last decade, the sector was one of the best performing manufacturing economies across the globe. Yet contribution to the overall GDP was one of the lowest signaling a strong potential for faster growth. Over the next decade, the performance of the Indian manufacturing will be crucial toward achieving India's overall growth aspirations and employment generation. According to the CII-BCG report, should the sector record about 11% annual growth, that will make India the fourth largest



manufacturing economy in the world by 2025 from its current ranking of 13th.

Importantly, if the Government has to realise the avowed goal of inclusive growth including widescale employment generation, India's manufacturing sector will have to board a higher growth trajectory.

Naukri Dot Com

The manufacturing sector has to carry the major responsibility of increasing employment opportunities in the coming decades, directly or indirectly. This is particularly valid for the unemployed coming from rural areas and agricultur-



Mr Jagdish P Nayak,
President - Operations, Larsen & Toubro

'Manufacturing sector will achieve double digit growth'

Manufacturing sector will achieve a double digit growth. However this may not necessarily translate into large scale job creation as it will primarily depend on the type of industry driving the growth in manufacturing sector. Industries which have a high level of automation like process industry will not

contribute significantly in job creation whereas hard core manufacturing industries like capital goods, automotive, light & heavy engineering industries will create large scale job opportunities.

It is necessary to revamp the existing education system, provide vocational training at very young age, encourage PPP model to build scalable for-profit vocational training institutes like National Skill Development Corporation. [MM](#)

al sectors. Growth of the manufacturing sector will provide greater support to agriculture through more intensive efforts on agro-based industries. It will create strong multiplier effects in the services sector in areas like traditional trading, financial services, transport, etc. Therefore, the overall employment effect of manufacturing includes the indirect generation of employment in the services sector.

Besides, within the service sector those of the sub-sectors that are linked to the manufacturing directly will need to be concentrated upon as they provide substantial job opportunities. It is, therefore, necessary that robust growth of the manufacturing sector is ensured for creating overall growth and employment possibilities in the economy.

The backlog of unemployment in the manufacturing sector is estimated to be more than 34 million in 2005, says a National Manufacturing Competitiveness Council report. It is expected that over the next twenty years, the total proportion of workforce involved in agriculture is likely to decline from 56% to about 40%, and this would call for finding substantial non-farm employment opportunities. While the service sector would provide high quality employment opportunities which are, indeed, essential in the growth process, it is likely to benefit only a fraction of the job seekers entering the market. From the year 1990 or so the employment intensity of the growth process of the Indian economy as well as of manufacturing has been declining. The employment elasticity for manufacturing which was at 0.59 between 1983 to 1987 had fallen to 0.38 between 1983 to 1993 and fur-

ther to 0.33 in the period 1993 to 1999. Increases in capital intensity as well as increase in labour productivity are the important causes for this phenomenon, says the National Manufacturing Competitiveness Council report.

According to the CII-BCG study, the manufacturing sector employed 58 million people in 2008. By 2012, it is estimated, based on current economic projections, this sector will employ a further 12-13 million out of nearly 89 million additional people who will enter the workforce. It is well known that manufacturing provides a transition to large numbers of agricultural labour moving from low-skilled to more value added jobs. Studies have estimated that every job created in manufacturing has a multiplier effect, creating 2-3 jobs in the services sector. In a country like India, where employment generation is one of the key policy issues, this is a critical factor to consider as plans are laid out for the sector.

Toward this, the policies will have to be aligned in a manner that a balance is achieved between worker rights and flexibility and productivity imperatives of today's business environment.

Demand & Supply Curve

The manufacturing sector has an important role in creating employment for the burgeoning workforce. The CII-BCG estimates suggest that for every additional 1% point growth in manufacturing, 20-30 million additional jobs can be created.

In this regard two aspects are to be considered. On the demand side, the focus should be on those industries that will drive employment. Labour requirements vary significantly by industry. Hence, fo-



cus on labour-intensive industries like textiles, paper and wood products, and food processing can generate faster employment. These industries contribute 30% of manufacturing output but constitute over 60% of the manufacturing workforce. For every 1% point growth in labour intensive industries, 15-25 million additional jobs can be created.

On the supply side, attention could be directed towards those states that will generate surplus employable manpower. Demographic projections indicate that five states (Uttar Pradesh, Maharashtra, Bihar, Madhya Pradesh, Rajasthan and West Bengal) will account for around 65% of the additional workforce in the next decade.

Other than Maharashtra and Uttar Pradesh, none of these states are cur-



'Power deficit, archaic labour laws need to be addressed'

Mr T Kannan,
Managing Director, Thiagarajar Mills Pvt Ltd

For sustained manufacturing growth, three key areas need to be addressed, namely, power deficit, archaic labour laws and draconian laws. Power should be uniformly available and at uniform rates in all states. Further, there is need for more flexibility in the labour laws that creates a win-win situation. And, the problem of land availability for putting up manufacturing units

should be tackled by creating large land banks.

With regard to skills development for the sector, a PPP approach to revitalise the numerous polytechnics and other technical institutes in the country will prove beneficial. However, the current steps to adopt ITIs are still at a nascent stage.

Also, manufacturing units should not get concentrated in the peripheral areas of cities. The interiors should be developed as manufacturing hubs. This will promote balanced development and check urban migration. MM



rently among the top contributors to manufacturing employment. Focused efforts to build labour intensive industries in these states can go a long way in addressing this situation and creating employment opportunities.

Consistent Labour Policies

A productive, effective and engaged labour force is critical to support manufac-

turing growth in any economy, particularly so in India. India's low labour costs have been a key source of competitive advantage over the last decade and will continue to be important. Most industry observers say that the current labour policy framework introduces rigidity in the labour market, encouraging use of widespread informal work forces and thereby disincentivising skill development.

If the Indian manufacturing sector has to achieve the growth aspirations, it needs to focus on three imperatives as regards its labour force: (i) rapidly increase employment and mobility opportunities for people joining the workforce; (ii) improve productivity and flexibility to enhance competitiveness; and (iii) have a robust policy framework to protect worker rights.

Robust Labour Policy

Indian industry has always enjoyed strong labour relations. However, it is widely held that Indian workers have not reaped proportional benefits from the overall economic growth in India over the last two decades manufacturing wage rates in India have grown slower than the overall increase in household income in the country. Besides, the modern Indian worker is more aware of the world around him, expects more

and has larger ambitions.

India needs to protect worker rights, which becomes even more important given that there is no social security net. However, this does not mean that India should not put in place a flexible, efficient labour market to optimise operations and improve efficiency. This becomes more critical as given the increased volatility in the external environment, rigidities in the labour market imply lower flexibility in operations and invariably higher costs.

India needs a much higher level of formal employment as its workforce grows rapidly. The manufacturing sector will necessarily have to play a key role in this. There are many labour policy levers that can be implemented quickly, like simplification of labour laws, worker training and effective employment exchanges, while other policy measures will have to be debated among all stakeholders and aligned and consensus arrived at. Without this, it would be difficult to meet the ambitious growth targets for the manufacturing sector and drive employment.

Laws Galore

At present, there is a multitude of labour laws in the country with 45 Central Acts and 16 associated rules that directly




Mr Kartik Bharat Ram,
Dy. MD, SRF

'Too many hurdles in the way of double digit growth'

While the India Story looks exciting, there seem to be too many hurdles coming in the way of the double digit growth that one hopes for. We keep talking about rapid development in the infrastructure sector which is critical for the growth of the manufacturing sector. However, the reality is that the infrastructure growth usually lags behind the manufacturing sectors needs. High quality access to plants in various parts of the country and uninterrupted power are still a dream that we look forward to. I won't even get into the poor quality of logistics, ports etc. in our country. As a result of this I believe that job creation will be there but not at the high growth rates that one would hope for. There is a possibility that the infrastructure industry would in fact hire a lot more man power. One other fact to keep in mind is that industry in order to remain competitive

is looking at automation in a progressive manner which indirectly means fewer jobs for people.

As regards HR, while there are a large number of graduates/semi-skilled labour available in the country, the question that needs to be asked is how many of them are really employable. I think efforts should be made at worker level to have the likes of ITIs collaborate with industry in coming up with industry specific development program. In fact industry should work along with ITIs through PPP model. A more focussed vocational training is the need of the hour. At an officer level while plenty of graduates are available, their actual skill are questionable. Numerous private colleges churn out graduate engineers and MBAs who end up in jobs far below than those from good colleges. Communication skills too are a hindrance for these people. Reality is that there needs to be better accountability with various educational institutions to provide resources that industry can actually make use of. 

deal with labour. In addition, there are other acts that deal indirectly with labour. There is a need to harmonise rules across all these acts. The key policy agenda for the government would be to simplify and refine the labour laws keeping the need for flexibility and efficiency of the manufacturing sector, while at the same time protecting and managing the interests of the labour. At the same time, existing labour laws are seen as outmoded and many experts claim that they have adversely impacted labour productivity by discouraging large-scale operations and encouraging use of less productive informal workers.

Indian manufacturing on the other hand has sustained extremely low nominal wage rates; in fact, on inflation adjusted basis India's real wage rates have decreased in the same period. Of course, it is important to realise that this wage rate is a blended average across industries hence while wage rates might have increased in individual industries, the workforce mix could have shifted more towards lower wage rate industries.

Focus on Higher Productivity

India needs to focus on higher productivity, recognising the fact that wage costs will also need to grow at a faster pace to attract and retain a more skilled workforce further exacerbating the need for an increase in productivity. The productivity challenge will have important implications on Indian manufacturing's employment and workforce requirements. Manufacturing industries will need to proactively develop, attract and train relevant skilled workers already an important gap in India's talent pool today. At the same time, growing productivity to drive competitiveness would mean lower overall incremental workforce require-

ments. Manufacturing would, therefore, need to grow at an even higher pace in order to generate more employment opportunities and address India's overall employment challenge.

Several situations will shape the future of competitiveness in the years to come increased volatility in factor costs, shifting demand patterns and a more aware and educated labour force. Labour forces are becoming more discerning and with rising education and awareness levels, individuals are more conscious of their options, aspirations and rights. Labour unions have become more demanding than ever before. Workers, driven by an increased awareness of their own rights as well as rapidly growing aspirations for themselves and their families, are less willing to settle for management driven decisions.

In the manufacturing sector India holds a comparative advantage in many respects with its experienced work force, large pool of scientists, engineers and managers, reasonable endowment of natural resources. And India has the potential to emerge as a major manufacturing hub for the global market. This can materialise quickly only with improvement in the competitiveness of its Industry. Rising productivity is the key to maintaining and improving competitiveness of manufacturing.

Skillful Moves

However, the situation of the manufacturing sector in India is a cause of concern especially when seen in the context of transformation registered in this sector by other Asian countries in similar stages of development.

While the dramatic shifts in global manufacturing bases over the last four decades have brought these economies in focus, India has not been able to fully

leverage the opportunities provided by the dynamics of the world economy.

Isolation of education (even training) from the production sector is the basic flaw of the Indian system. A serious mismatch is observed between the needs of the Industry and the availability of skilled engineers and technicians for manufacturing industry. In spite of surplus graduates in popular engineering streams, deficits were witnessed in computer, metallurgy, mining, sugar, paper, leather and rubber technology between 1997 and 2002, says the report by National Manufacturing Competitiveness Council. Skill development is important especially for the manufacturing sector. Strengthening education & skill building need the attention of both the government as well as the industry in association with the academia.

If India wants to change the trajectory of growth of its manufacturing sector and achieve its aspirations, government support will have to play a crucial role in the form of solid manufacturing policy initiatives.

Conclusion

Indian manufacturing has grown at a robust rate over the past 10 years and the country has been one of the best performing manufacturing economies. Indian manufacturing has the potential to be a major employment hub. However, for that it requires strong commitment, careful planning and willingness to make bold moves from both governments and industry. They alike will need to acknowledge the constraints holding back the sector and take joint responsibility for driving the important agenda. It will enable India to enter the next growth orbit and squarely place itself as a leading player on the global manufacturing spectrum. ■■



'A holistic approach needed'

Mr Sachit Jain,
Executive Director, Vardhman Textiles Ltd

A holistic approach to manufacturing is the need of the hour. This is particularly true in the case of textiles. Currently, the export norms apply differently to different segments of the industry, such as, on cotton and yarns. This creates imbalance. On the HR front, the disincentives for

employment in the manufacturing sector should be ironed out by revisiting social programmes like NREGA that tend to draw the labour away from this sector. If this is not addressed, manufacturing firms will increasingly opt for labour-saving automation. ■■

The Skills Imperative

For manufacturing sector to move up the value chain, skills development and focused human capital formation are crucial areas to be focused upon. Both Government and industry endorse the PPP model to step up skills development initiatives in this sector



If Indian manufacturing has to grow at around 12% per annum, it will be necessary for the education and training system to produce at least 1.5 million technically skilled workers every year. According to the CII-McKinsey report 'Made in India', the country will have an incremental requirement of about 20 million skilled technicians by 2015. As the country moves up the technology ladder and begins to produce more complex products in greater volumes, manufacturers will require workers able to use judgment and other thinking skills in the operation of advanced manufacturing processes and in the maintenance and repair of complex production equipment. Hence, qualitative growth in skilled manpower is essential.

India's comparative advantage lies in its large workforce. About 800 million persons

will be in the productive working age group of 15-59 by 2015, with about 12 million persons expected to join the workforce every year, says a report by the Ministry of Commerce & Industry, Government of India. Over the last few years, however, industry has encountered shortage of personnel with shopfloor skills. Industry estimates have shown that only about 50% of the students from various technical and vocational streams are actually employable. This is now emerging as a major constraint to industrial expansion and growth.

With this learning and keeping the objective of developing the Indian manufacturing sector to reflect its true potential, the Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry, has embarked upon creating a policy environment

suitable for the manufacturing sector to flourish in India.

Manufacturing Policy Initiatives

Greater availability of technically skilled personnel can only be achieved by involving professional institutions where necessary training and skills building infrastructure is available or where they can be created at an incremental cost. Upgradation of the Industrial Training Institutes (ITIs) can be ensured through a well designed public-private partnership.

In view of this, Government has initiated schemes for upgradation of ITIs through their adoption by industry; setting up of new ITIs and skill development centres in the public-private partnership mode. Government has also set up the National Skill Development Corporation as a Public-Private Partnership

initiative to undertake projects in this area.

The special purpose vehicle (SPV) for the National Manufacturing & Investment Zones (NMIZ) will continuously review the requirement of skilled manpower and take necessary steps to meet the demand for skills at three broad levels—a very large pool of minimally educated human resource, a large pool of skilled persons, and a small yet significant pool of personnel with highly specialised skills.

A training centre for the zone would be set up as a public-private partnership initiative with courses being tailored to the demand of specific industries in the zone. Trained personnel would then be placed suitably in these units. Appropriate technical assistance tie-ups for the centre with agencies abroad would be facilitated for state-of-the-art training infrastructure and curricula.

Skill-building among the minimally educated workforce: Skill-building in this segment would include 'farm to work', and 'school to work' programmes targeted at the minimally educated workforce entering the non-agricultural sector for the first time and seeking seasonal employment.

The group will be taught generic skills such as skills of basic operations on the factory shop-floor, basic machine operations, and compliance with safety and quality requirements. Skill-building will also cover behavioural aspects, such as those pertaining to work culture—timeliness, reporting, and ability to work in an organised set-up.

Efforts towards enhancing employability of the skilled workforce: It would cover aspects such as certification of prior learning, providing modular training for manufacturing and service sectors such as stitching skills for those involved in garmenting, CNC machine operations for operators seeking employment in an engineering set-up, training shop-floor executives in retail and imparting selling skills for executives involved in sales of financial products.

It would include such initiatives as upgrading the technical and vocational curriculum, job-oriented training programmes, maintaining a skills registry to ensure market linkages, and building additional capacity. Skill-building initiatives should be performance-oriented and outcome-based.

Building specialised skills: Initiatives in this area would include setting up of institutes of specialised learning such as



a specialised institute for the automobile sector, or an institute focused on high-tech manufacturing and semi-conductors for the electronics sector, or one that fosters innovation and product development in the IT/ITES sector. These institutes would be a crucible for specialised skills in the workforce at an entry level as well for upgrading skills in the existing workforce.

According to the discussion paper published by Ministry of Industry & Commerce on National Manufacturing Policy, Government will ensure that these endeavours by the SPV will contribute to national goals by ensuring that the building blocks of the solution rest on the following aspects:

- **Ensuring inclusivity:** Skill-building initiatives should be inclusive and cover all sections of the human resource supply pool, that is, those from varied socio-economic backgrounds. Government, industry, and educational institutions would have to play an active part in these measures.
- **Driving alignment:** The need is to align interventions of various stakeholders, namely Central and state governments, industry, academia, and others spearheading skill development measures. The alignment would stem from national and regional-level objectives and boil down to the specific requirements of the zone. Possible ways of integrating some of these measures with existing schemes, will be explored.
- **Focusing on standards:** The curriculum would focus on developing a set of standards that are recognised by employers. Standardization in areas such as accreditation, testing and certification to ensure skill-building activities will be supported by

linkages with existing government and private agencies.

- **Linking incentives to outcomes:** Outcome-based measurements should serve to evaluate the effectiveness of skill-building programmes and serve as an input to course correction. Outcomes will be measured to provide appropriate incentives for such skill-building programmes.

Industry Leadership

Any effort to improve human capital has to take into account the needs of not only the domestic market but also the increasing opportunities in the global market. It can be done only when the technical personnel are equipped to produce products of global standards. The upgradation of the Industrial Training Institutes should therefore be pursued vigorously through public-private partnerships, with training authorities de-linked from certifying ones.

The private sector should be encouraged to establish and operate demand driven technical training centres through financial and other incentives, under a carefully designed industry-managed, and government supported, quality control and accreditation system. According to a study by National Manufacturing Competitiveness Council, there is a need for developing a comprehensive National Vocational Education Qualification System and setting up a vocational education & training institute in each state. Large private sector manufacturing organizations must be encouraged to adopt vocational education institutes through appropriate schemes.

In pursuant of these goals, Government is extending financial support for the upgradation of ITI's through Public - Private Partnership. 1396 Industrial Training Institutes (ITI) have been proposed to be upgraded into Centers of Excellence in specific trades and skills under PPP. Under the proposed scheme, the State Government, as the owner of the ITI, continues to regulate admission and fees while the new management will be given academic and financial autonomy and the Central Government will provide financial assistance by way of seed money.

With CII's mission of "Making India the Skills Capital of the world" the upgradation of ITI has become a movement of 237 ITIs with 138 members. In addition, CII members have taken up the responsibility of ensuring that this scheme is a success and all stakeholders participate actively and responsibly. ■■■

Manufacturing Managers

Key HR challenges faced by the manufacturing sector are production and workforce efficiency and skill deficit.

India is fast emerging as a global manufacturing hub as it has all the requisite skills in product, process and capital engineering, thanks to its long manufacturing history and higher education system. Manufacturing sector contributes around 15% of national gross domestic product (GDP). Further, India exports manufactured products worth about \$50 billion, and a study on Indian manufacturing industry has forecast an annual growth of 17% by the end of year 2015. And India's manufacturing exports is predicted to cross the \$300 billion mark in the same period. Besides, according to the first national-level household survey conducted by the Labour Bureau under the Labour and Employment Ministry, out of 1,000 employed 89 are employed in the manufacturing sector.

Role of PSU

Public sector enterprises have played a significant role in contributing to India's economic growth right from post-independence to this era of liberalisation. According to the study Strategies for Attraction and Retention of Talent in CPSEs by Confederation of Indian Industry (CII)-Hewitt Associates, as on March 2008 there were as many as 242 centre public sector enterprises (CPSEs) with a total investment of Rs 4,55,409 crore. The contribution of public enterprises can be gauged from the fact that they contribute 11.12% of India's GDP at market prices and have close to 27% contribution to the total industrial output. The



performance of PSEs has ensured a sustained growth in business.

However, the post liberalisation era has also brought about various business challenges for the CPSEs, as there has been increased competition from private and multinational players which has impacted market share. The way forward to stay afloat in tight global market and to increase its contribution to GDP is to optimise the return in the workforce investment, and also ensure that the investment made is driving the expected output. People are the biggest assets has become the buzzword for all organisations and how these great assets managed remains a million-dollar question.

HR Challenges of PSUs

According to the CII-Hewitt Associates study, most of the CPSEs have faced the fallout of these changes in the employment market both from attraction as well as retention of talent perspective. The report reveals, CPSEs today employ close to 15.7 lakh employees, excluding casual labour, and this number has been steadily decreasing over the last few years due to superannuation, employees opting for VRS and attrition. With the increase in business activity and the effort to fill up the vacancies created, the recruitment activity has also seen a gradual increase over the past few years. However, this has mostly been at the entry level given the compensation constraints



faced by CPSE at higher middle management level onwards.

The CPSEs are already getting impacted with succession issues given the top management is nearing retirement and the second line is either not ready or has not been identified. The challenge is accentuated with the growth expected in the next few years, which will require more leaders and decision makers within the organisation. While the degree and complexity of challenge is different for various CPSEs in the sectors, HR is undoubtedly one of the most critical variables in the growth of business.

HR Challenges in Manufacturing Sector

According to the study, key challenges faced by the manufacturing sector in term of HR management in employment market are: production and workforce efficiency and skill deficit.

With the recessionary conditions that are prevailing in most of the western countries there will be an attempt to dump the Indian market. The Indian companies need to respond with greater consciousness towards maintaining the cost advantage and focusing the energies on improving efficiencies. Besides, India is seen as a vast pool of talent with great diversity and with a demographic advantage. However, the industrial sector faces acute shortage of skills. The swiftness with which this skill deficit is

bridged will be critical in determining whether India can move up the value chain in manufacturing.

HR Priorities of Manufacturing PSUs

Succession Planning & Leadership Development: According to CII- Hewitt Associates report, many of the organizations have not been recruiting for many years and this is now coming back to haunt with the lack of availability of a second line.

Performance Management System: The performance management system has been following the ACR route which is very transactional in its design and approach. The report says the focus has to be across the key elements of the process including performance planning, performance review, performance differentiation and linkage with rewards.

Increasing workforce productivity: The manufacturing sector is labour intensive and hence staff cost is a critical line item in the cost structure of the organisation. There is a need to focus on planning work around business expectations. Workforce productivity is gaining significance in the current context of increasing cost pressure.

Career Progression: Slow career progression and the lack of system around it have been identified as the key constraints in attracting and retaining talent. The attrition during the first few years of joining the organisation has been noted to be high, and the key reasons given for leaving

has been attributed to career progression.

Way Forward

The study Strategies for Attraction and Retention of Talent in CPSE's has drawn roadmap to retain the human resource talent and embark on the growth plan for the manufacturing sector.

Develop Leadership Pipeline: The manufacturing sector has some of the oldest CPSE's and also has one of the highest prevalence of an ageing workforce. A lot of senior executives and middle management executives are superannuating each year and the trend is likely to continue in the near future. Almost all of the recruitment is happening only at the entry level which does not give a solution to the problem at hand. In this context developing a second line assumes a lot of importance.

Strategic Workforce Planning: The elements of long-term workforce strategy should highlight manpower numbers and skills for each function based on business plans. A strategy then must be put in place to achieve that state through tactical measures of a targeted VRS, redeployment, lateral hiring, outsourcing and profile alteration. Besides, graduate trainee programmes should be seen as a strategic initiative to build a talent pipeline, not means to fill in current vacancies.

Build the Organisational Fundamentals: Manufacturing organizations in CPSEs on an average have 12 to 15 levels between the junior most employees and the CEO. However, the study says that in most of the cases promotions are a mere change of designation as the job does not significantly change from one level to the other. There is merit in re-visiting these bands and identify means to cluster these designations into bands across the junior, middle and senior management.

Performance Oriented Organization: Most of the CPSEs today have MoUs signed with the government. This is a great opportunity to closely align the rest of the organisation to these performance measures. The MoU practice is based on balanced scorecard principles and hence should have a proper representation of measures to track HR effectiveness as well. ■■■

Contact CII for the full version of the report "Strategies for Attraction and Retention of Talent in CPSEs"

Automation: Central to Power T&D

T&D automation can play a lead role in bridging the power demand gap and help Government realise the avowed 'Electricity For All' goal

Power losses in transmission and distribution are endemic to the sector. Reports say that power T&D loss in India accounts for 30-35% of the total power transmitted from the power plants. This is very high compared to that in the European countries. Technological obsolescence is cited as the root cause of T&D losses.

Hence, the power industry needs to renovate and modernise its power transmission modules. Over the last few years, automation technologies have been explored to find a suitable solution. Automation of power transmission and distribution needs to be effectively implemented for total distribution automation, urban power distribution automation, electric supervisory control and data acquisition (SCADA), and distribution management systems (DMS) for power utilities. Automation systems can be also implemented to monitor power transmission lines for fault detection and load demand.

The plant load factor (PLF) is another important factor which needs to be understood better, and controlled and optimised according to the individual requirements of power stations. In a power plant or a power generation facility, proper monitoring and control of the PLF can play a significant role in rectifying the problem of power generation and increasing the efficiency of the power plant.

Automation and control systems can play a significant role in bridging the demand and supply gap the Indian power industry faces in terms of power generation and T&D. While automation systems play a great role in optimising resources at a power plant and enhancing the efficiency



Mr S K Chaturvedi, CMD, Power Grid Corporation of India Ltd addressing the audience

of power generation, the integration of automation systems with power plants needs equal attention.

Automation plays a major role in integrating all the mechanical components of a power plant and monitoring operations at all the sections to ensure that the power supply does not vary much. An automation system integrates boiler control, turbine control and generator control logics seamlessly in a single unit. From the hardware and software aspects of an automation system, a distributed control system (DCS) is employed for the purpose of executing control over the units, namely, the boiler or steam generator, steam turbine and electricity generator.

At the National Seminar on Challenges

in Transmission & Distribution - And Role of Automation organised by Confederation of Indian Industry (CII) in New Delhi recently, Mr Gireesh B Pradhan, Additional Secretary, Ministry of Power, Government of India, said that while capacity addition in the power sector is the glamorous side of business, efficient T&D is what will make a bigger difference to industry and people across the country. He said that while demand for and resources available for power transmission are rather unevenly spread across the country, the guiding objective lies in the optimal utilisation of the national grid through automation.

Mr Pradhan said that keeping in view the critical role of the power sector in promoting the overall development of

the country and consequent poverty alleviation, the role of automation in power transmission and distribution is key to furthering the goal of Electricity For All and in reaching electricity to the unelectrified villages.

While automation has found application in the power T&D segment, he urged the industry to adopt automation on a wider scale to take full benefit of the opportunity. In this, technologies like GIS will prove to be useful, he said.

Standardisation of processes and practices will be equally important for the sector, he said, adding that all states should seek to follow specific industry standards while pursuing the power T&D programmes.

Mr Pradhan said the power ministry is keenly focused on enhancing the domestic content of equipment and services employed in the sector. Excess reliance on overseas suppliers is seen to lead to bottlenecks in the after-sales services, availability of spares, etc.

He said that Right of Way is another big challenge for the sector. He said the way out would be to increase compensation or, better still, augment capacity and utilisation through automation.

A smart grid will be of essence to the industry. The power ministry has constituted a task force as well as a smart grid forum to address the issues pertaining to this. In building the smart grid, Mr Pradhan said that the stakeholders should not lose sight of the entire chain of T&D.

With the entry of renewables, there will be greater challenges in power T&D which he said can be addressed with the adoption of appropriate infotech applications.

He also focused attention on the issue of skills deficit, stating that a large trained manpower base should be developed to complement the modernisation of the sector. The ministry has encouraged the adoption of Industrial Training Institutes (ITIs) for developing a cadre of appropriately skilled manpower for the industry. He urged the power sector players to adopt or create ITIs that can provide the critical manpower for the sector.

Earlier, Mr Vimal Mahendru, President, Indian Electrical and Electronics Manufacturers Association (IEEMA) & Executive Director, Indo Asia Fusegear Ltd, said in his address that major events like ELECRAMA have demonstrated the robust character of the power industry. The growing use



of gensets, voltage stabilisers, and other electrical appliances is an endorsement of the vibrancy of the sector.

The challenge lies in ensuring 24x7 quality power supply to all, he said, while adding that over the next two decades, the Indian power sector will occupy the centre-stage of development and attract the world's attention.

Mr S K Chaturvedi, Chairman and Managing Director, Power Grid Corporation of India Ltd. (PGCIL), in his address said that the focus on sustainable development will pose both challenges and opportunities for the power sector.

He said that the sector is coming under increasing pressure with regard to obtaining various clearances for projects. At the same time, getting land for projects from administration is also getting more difficult. He said that adoption of appropriate technologies and designs will help the industry to overcome these barriers. Automation is key to the solutions.

Among the other issues that he touched upon, Mr Chaturvedi directed attention on the need for proper identification, development and retention of talent for the industry, robust communication with all stakeholders, enhanced customer service standards and commercial viability of projects.

Mr Ramesh Chandak, Chairman, CII Transmission Line Division & Managing Director, KEC International Ltd, said in his welcome address that for India to become a major powerhouse in the global economy, the power sector will have to become the powerhouse of the economy. In terms of power transmission, he said that bulk transmission has increased from 3,700 ckt

km in 1950 to over 165,000 ckt km, which is a 40-fold growth.

From 3,000 electrified villages in 1951, there are 498,000 electrified villages today, which demonstrates the government effort for rural electrification through various schemes including Rajiv Gandhi Grameen Vidyutkaran Yojana.

In relation to T&D, he said the key challenges are (i) non-availability of price preference to domestic industry in domestically funded projects having international competitive bidding; (ii) bunching of orders leading to sub-optimal utilisation of manufacturing capacities; (iii) lack of standardisation in technical specifications; (iv) absence of price variation clause; (v) lack of adequate cold-rolled grained oriented steel manufacturing capacity; (vi) lack of adequate testing facilities; (vii) limited trained manpower base; (viii) taxation related issues; and (ix) barriers to use of automation.

Mr K Nandakumar, Chairman, CII Instrumentation & Automation Division &

Managing Director, Chemtrols Industries Ltd, said in his closing remarks that the industry would greatly benefit if bank guarantees are provided against release of funds upon completion of projects. He expressed hope that the Government will address the issues pertaining to payment terms in financing of projects.

There are challenges galore. The benefits of automation systems for the power industry notwithstanding, their applications are hindered due to high installation costs. But, with the power industry reaching an inflection point, automation of T&D is perhaps the only way forward for the industry to meet its growth and development goals. ■■

'Automation can address the issues of congestion, bottlenecks and blackouts'

Mr Ramesh Chandak, Chairman, CII Transmission Line Division & Managing Director, KEC International Ltd, talks about the multiple dimensions of automation of power T&D in an exclusive interview. Excerpts:



Mr Ramesh Chandak

Chairman, CII Transmission Line Division & Managing Director, KEC International Ltd

How critical is of power T&D in the context of India's overall power needs?

Automation technologies have a wide variety of use in transmission and distribution system. They can be in the form of Intelligent or Smart Grid, Sub-station Automation or use of large control systems like SCADA, Geographical Information System (GIS), Automated Meter Reading (AMR).

Automation can address the issues of congestion, bottlenecks and blackouts. By using the Smart Grid, there is security, sustainability and efficiency of supply. Automation is one of the key elements in the area of FACTS, HVDC, SVC used for more

efficient, reliable and high quality power transmission and distribution.

The existing heterogeneous communication networks varying in capacity and bandwidth can transform into homogeneous Smart Grid communication network with IP/ Ethernet connectivity between all components. The use of complex personal intensive engineering and operating can be a thing of the past with the sub-station automation.

Through all these automation technologies, there could be vast improvements made in the T&D system in India

Is automation of power T&D prohibitively costly for the companies?

A look at merely the cost element of automation would imply that it is does not come cheap and these technologies are costly. However, one has to take a more holistic and integrated approach and look into a cost benefit analysis to arrive at a solution. Most of the automation technologies like the Smart Grid, SCADA, sub-station automation have long-term benefits which would accrue over a long period of time.

Is the current manpower geared to handle new processes pertaining to automation of T&D?

The shortage of skilled manpower in the power sector is one of the serious obstacles in Union Government's efforts to ex-

pedite the pace of power sector reforms in the country. The requirement of different skill sets for generation, transmission & distribution further complicates the issues.

State utilities have the need for higher levels of automation in the T&D segment. These utilities will need to adapt the new technologies as well as train their manpower in these technologies and processes. While currently they may not be geared to handle such new processes, they will in time have to gear themselves to handle such situation.

Will automation have a bearing on the supply of green and clean energy in the country?

The automation in T&D being talked today is being done, keeping in mind the need for green and clean energy. Any efforts made for conservation of energy, reduction of losses, use of non-conventional energy resources will all add to supply of green and clean energy. The use of HVDC system, multi-circuit lines, GIS sub-stations will improve efficiency and in turn reduce losses. Similarly, use of better technology in coal generation through 660MW super-critical power plants will improve plant productivity with lesser emissions.

Is financing a bottleneck in the adoption of automation in T&D?

Most of the T&D utilities in the country are



plagued with high T&D losses and commercial losses. Most of these T&D utilities are entities unbundled from existing state electricity boards and carry past liabilities due to which they are not very profitable. Given the low financial viability of these utilities, financing could be an issue for state-run utilities. It has been observed that where there is existence of private distribution utilities (in places like Mumbai, Delhi and Ahmedabad), there is quicker adaptability to automation and finance does not appear to be a bottleneck.

Is the domestic content of power equipment in the country rising? What steps are needed to promote this?

The domestic T&D industry has expressed concern over the increasing penetration of Chinese suppliers in the Indian market in the recent years. The annual value of imports of electrical equipment in India has grown at a CAGR of 23% since 2001. The share of China in the imports of T&D equipment has grown from 7% in 2001 to over 26% in 2009. The steps needed in these regard are:

Several manufacturers have reported of dumping of power equipment by foreign suppliers, especially Chinese manufacturers. The Government of India should institute a mechanism to deal with such unfair trade practices.

Need for manufacturer to proactively engage with the CEA and utilities to understand the requirement of different power equipment in the coming years and undertake capacity additions on a proactive basis. Also engage with CEA to understand emerging technologies and those which

would be required in the Indian context and undertake acquisition and development of such technologies.

There is a need to collaborate with technical institutions to provide industry-specific vocational courses to upgrade technical knowledge.

Recently, the finance ministry has turned down the proposal by power ministry to impose 20% duty on imported power generation equipment, saying domestic capacity was far short of demand and the proposed move would make electricity more costly.

What is your assessment of the right of way and its impact on the sector?

The right of way is one of the major issues plaguing the transmission sector. Inordinate delays have led to the backlog for achievement of the XI Plan estimates. The right of way includes a host of issues like ROW in forest, railways, roads, coordination on crop compensation, land disputes, etc.

In the transmission line sector, keeping in mind the need for conservation of right of way, the utilities are using bulk power high capacity lines of HVDV, 765 Kv and more recently looking at 1200 Kv lines.

Alternate line constructions like multi-circuit, double circuit lines are being designed. The use of very high tower structures, compact structures like Delta configuration and use of high temperature conductors are examples of use of technology keeping the environment in mind. Similarly, the use of Gas Insulated sub-station (GIS) would require only 30% of the land required in normal air-insulated sub-station, thus minimising requirement of land and

leading to conservation of ROW.

Will the entry of renewable alter the way power T&D is managed?

The National Solar Mission of the GOI talks of deploying 20,000MW by 2022, with ramp up capacity of grid-connected solar power generation to 1,000MW by 2013; an additional 3,000MW by 2017. There are a large number of wind farms that are connected to the grid, especially in states of Tamil Nadu, Karnataka, Maharashtra and Gujarat.

Renewable energy, especially wind and solar, have low capacity, are infirm in nature and need to be transmitted from remote areas to demand centres. This coupled with smart meters and other demand management practices will be required to allow the integration of renewable. There are cost implications for grid connectivity to such remote areas and also issue of capacity utilisation of such lines as the renewable sources do not necessarily run on full capacity.

In view of large infirm capacities of renewable energy being introduced in the grid in the coming years, there is need to look at concepts like DGDBF that is Distributed Generation-based Distribution Franchisee where the small generations through renewable should be distributed in the surrounding areas, so as to not require large expansion of grid capacity for such kind of infirm power.

Are the policies adequately geared to promote automation?

The Central Electricity Authority (CEA) has time and again initiated a number of studies to understand the technological advancements in the power industry. Presently, there is no regulatory policy or order which makes it mandatory for utilities to adopt automation technologies. Given the fact that large numbers of rural areas are yet to be electrified and also that the tariffs of residential and agricultural tariffs are subsidised, the Central and State Commission may be hesitant to introduce such automation measures. However, given the fact that the Central Electricity Regulatory Commission (CERC) needs to promote efficiency and economy and promote investments as well as enforce standards for quality, reliability of service, it must in coordination with the CEA look at options to ensure that these automation measures are implemented and also encouraged by the T&D utilities. ■■■

Indian Minenomics

Mining sector performance is central to the growth and development of the domestic manufacturing sector



1



2

Since Independence, there has been a pronounced growth in domestic mineral production both in terms of quantity and value. According to a Ministry of Mines report, India produces as many as 86 minerals, which include 4 fuels, 10 metallic, 46 non-metallic, 3 atomic and 23 minor minerals (including building and other materials). The contribution of mining sector to GDP at present is about 2-3% and is expected to contribute about 5% by 2020. While minerals accounted for 20% of exports, employment in the minerals industry was estimated at 4.5% of total the employed labour force.

Production Scenario

The wide availability of the minerals in the form of abundant rich reserves made it very conducive for the growth and development of the mining sector in India. Based on the overall trend so far the index of mineral production (base 1993-94=100) for the year 2009-10 is estimated to be 189.90 as compared to 175.96 for 2008-09 showing a positive growth of 7.92%.

The Ministry of Mines data says that the total value of mineral production (excluding atomic minerals) during 2009-10 is estimated at Rs 1,27,921.42 crore, which shows an increase of about 4.61% over

that of the previous year. During 2009-10, provisional value for fuel minerals account for Rs 79,602.69 crore or 62.23%, metallic minerals is Rs 27,571.16 crore or 21.55% of the total value and non-metallic minerals including minor minerals is Rs 20,747.56 crore or 16.22% of the total value.

2: Mr Partha Bhattacharya, Chairman, Coal India, speaking at the inaugural Session of Global Mining Summit 2010.

India has a long history of commercial coal mining covering nearly 220 years starting from 1774 of East India Company in the Raniganj Coalfield along the western bank of river Damodar. However, for about a century the growth of Indian coal mining remained sluggish for want of demand but the introduction of steam locomotives in 1853 gave a fillip to it. With the advent of Independence, the country embarked upon the 5-year development plans. Setting up of the National Coal Development Corporation (NCDC), a Government of India undertaking, in 1956 with the collieries owned by the railways as its nucleus was the first major step towards planned development of Indian

coal industry. Right from its genesis, the commercial coal mining in modern times in India has been dictated by the needs of the domestic consumption.

India is a globally leading mineral producer endowed with a rich resource base of several major minerals like coal, iron ore, bauxite, etc. It offers an unmatched opportunity to both domestic and global companies. It has been viewed that to support and sustain high economic growth, the country will need investments to the magnitude of \$11.5 billion in the mining sector. As India gets ready to ramp up investments in the mining sector, the world mineral scenario is also fast-witnessing significant changes.

The Government of India is actively engaged in policy debates, taking policy liberalisation process far beyond allowing 100% foreign direct investment in the sector. Industry is of the view that it needs to address specific challenges in policy;

coal industry. Right from its genesis, the commercial coal mining in modern times in India has been dictated by the needs of the domestic consumption.

India is a globally leading mineral producer endowed with a rich resource base of several major minerals like coal, iron ore, bauxite, etc. It offers an unmatched opportunity to both domestic and global companies. It has been viewed that to support and sustain high economic growth, the country will need investments to the magnitude of \$11.5 billion in the mining sector. As India gets ready to ramp up investments in the mining sector, the world mineral scenario is also fast-witnessing significant changes.

The Government of India is actively engaged in policy debates, taking policy liberalisation process far beyond allowing 100% foreign direct investment in the sector. Industry is of the view that it needs to address specific challenges in policy;



procedures for permits, clearances, licenses and land acquisition; infrastructure; funding; technology and environment.

The Global Mining Summit

The 10th International Mining and Machinery Exhibition and Global Mining Summit, organised by Confederation of Indian Industry (CII) in November in Kolkata, mainly focused on investments in exploration, policy frameworks, best practices for achieving high growth in mining, R&R, the role of financial institutions for developing the mining sector, environmental and safety issues, etc.

Mr Chandrajit Banerjee, Director General, CII, said that during the last few years, several initiatives have been taken for making the mining sector more effective for rightful utilisation of natural resources, creating at the same time a platform for sustainable growth, job creation, addressing of infrastructure needs.

The mining sector in India is running below potential because of poor infrastructure development, said Mr Shrinivas V Dempo, Chairman, CII National Committee of Mining, adding that requirement for statutory clearance for mining projects in India is a major obstacle. He also threw light on the need of creating efficient manpower especially geologists and mining engineers in this sector.

India has abundant reserves of several important minerals wherein Eastern region comprising states like Orissa, Chhattisgarh, Andhra Pradesh and Jharkhand together contribute about 40 % of total mineral production in India, said Mr Rajive Kaul, Chairman, CII Trade Fair Council.

Coal is one of the major energy security providers in India whose share from the current 53 % has been estimated to come



3: Mr V R S Natrajan, Chairman and MD, BEML speaking at the Valedictory Session of Global Mining Summit 2010

4: Release of 'The Study on Mapping of Human Resources, Skill for the Mining Industry in India'. (L-R): Mr Chandrajit Banerjee, Director General CII; Mr Rajiv Kaul, Chairman, Eastern Region CII Trade Fair Council; Ms Justine Elliot, MP Parliamentary Secretary for Trade, Australia; Mr Wahidullah Shahrani, Minister of Mines, Islamic Republic of Afghanistan; and Mr Partha Bhattacharya, Chairman Coal India

down to 51 % only in 2025. Till 2007-08, demand of coal in India was growing at 5.5% per annum. Mr Partha Bhattacharya, Chairman, Coal India Ltd, said that 53% of coal production in India is done for primary commercial energy and 66% of total power generated units in India are coal based. However, he mentioned that from 2007 to 2010 there has been a capacity addition in power sector of 22,000 mega watts where the growth rate of coal demand has risen to 9-10% per annum. To meet this demand, India has to largely depend on coal which was 49 million tons in 2008, rising to 80 million tons this year and has been estimated to increase up to 200 million tons by 2015.

Mr Bhattacharya emphasised on efforts to find out various ways to overcome the impediments to coal production in India like environment issues, government clearance, etc. He opined that contractual block mining should use high technology, ecology caring, machineries and equipment for sustainable mining.

Mr Wahidullah Shahrani, Minister of Mines, Islamic Republic of Afghanistan, said that the mineral industry of Afghanistan is worth an estimated value of about \$3 trillion and has a huge potential of further exploration. Rich in minerals like iron ore, copper, graphite, lithium, cobalt, gold, oil & gas and many more, Afghanistan so far has not been explored to its optimum potential.

According to Mr Shahrani, proper infrastructure development has been the

greatest hurdle in this regard. He said that the country has given priority to major infrastructure development to add value to the country's assets and attract better investments. Sustainable mining and corridor programmes for taking advantage of national and regional resources is also on the priority list.

Ms Justine Elliot, MP, Parliamentary Secretary for Trade, Government of Australia, opined that India plays an important role in Australia's mining trade and cited energy security partnership as one significant area of challenge.

Canada shares a dynamic relationship with India in regard to commercial exchange in almost every key sector, mentioned Mr David O'Toole, Deputy Minister, Ministry of Northern Development, Mines and Forestry, Government of Ontario, Canada. The year 2010 has been marked as the Year of India in Ontario, Canada, validating India's importance in the country's economy. Mr O'Toole informed that India is one of the top 5 trading partners of Ontario. He also informed that in July, 2010, the Government of Ontario and the Mining Ministry of India have signed memorandum of understanding MoU on various aspects of mining. He opined that India has an investor friendly mineral policy and Ontario endeavours to keep a fine balance with it.

The mining sector is at the threshold of major modernization of mines, which will have a positive impact on the manufacturing sector in particular and the Indian economy as a whole. [www](#)

Key Growth Drivers

IIP

The Quick Estimates of Index of Industrial Production (IIP) with base 1993-94 for the month of September 2010, released by the Central Statistics Office of the Ministry of Statistics and Programme Implementation, show the General Index stands at 325.6, which is 4.4% higher as compared to the level in the month of September 2009.

The cumulative growth for the period April-September 2010-11 stands at 10.2% over the corresponding period of the previous year.

The Index of Industrial Production for the Manufacturing sector for the month of September 2010 stands at 355.2, with the corresponding growth rate of 4.5% as compared to September 2009.

The cumulative growth during April- September 2010-11 over the corresponding period of 2009-10 in the manufacturing sector stands at 11.0%.

In terms of industries, as many as fourteen out of the seventeen industry groups (as per 2-digit NIC-1987) have shown positive growth during the month of September 2010 as compared to the corresponding month of the previous year.

The industry group `Leather and Leather & Fur Products` has shown the highest growth of 26.8%, followed by 21.6% in `Transport Equipment and Parts` and 13.7% in `Rubber, Plastic, Petroleum and Coal Products`.

On the other hand, the industry group `Other Manufacturing Industries` has shown a negative growth of 3.1% followed by 2.6% in `Metal Products and Parts, except Machinery and Equipment`.

As per Use-based classification, the sectoral growth rates in September 2010 over September 2009 are 3.5% in Basic Goods, (-) 4.2% in Capital Goods and 10.3% in Intermediate Goods.

The Consumer Durables and Consumer Non-Durables have recorded growth of 10.9% and 2.5%, respectively, with the overall growth in Consumer Goods being 5.2%.

Along with the Quick Estimates of IIP for September 2010, the indices for August 2010 have undergone the first revision and those for June 2010 have undergone the second (final) revision in the light of the updated data received from the source agencies.

It may be noted that revised indices (first revision) in respect of July 2010 have already been released in October 2010 and these indices shall undergo final (second) revision in December 2010.

Industrial output slows further in September

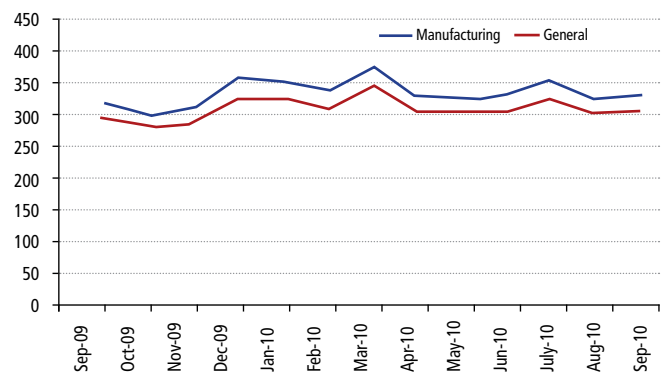
India's industrial output slowed further in September from the previous month to touch a 16-month low, sending stocks and the rupee down while bonds rose. The data is bound to put the policymakers and the central bank in a fix as they grapple with erratic statistics on the one hand and high inflation on the other. Industrial output, as measured by the index of industrial production (IIP), grew by a paltry 4.4% in September 2010 versus

8.2% in the same month last year, the Commerce & Industry Ministry said. IIP for September 2010 had been forecast to grow by 6-7% on average.

August's IIP growth was revised to 6.92% from 5.6% estimated earlier. IIP had expanded by an impressive 15.2% in July. Industrial output growth during the first six months of the current fiscal year (April-September 2010-11) stands at 10.2% versus 6.3% in the corresponding period of the last financial year.

The IIP General Index in September 2010 stood at 325.6 versus 312 in the

BCI of SMEs: Major Outlook Indicators



same month last year. August's IIP index was revised to 323.0 from a provisional estimate of 309.1. One has to keep in mind that the September 2010 IIP data is Quick Estimates and is therefore subject to a revision.

The Manufacturing sub-segment of the IIP grew by 4.5% in September 2010 versus 7.5% in the previous month while Mining output expanded by 5.3% versus 6.6% in August 2010. Electricity output for the month improved to 1.7% versus 1% in the previous month.

The recomputed IIP data indicates the similar movement of manufacturing index and general IIP index in the period September 2009 and September 10 (quick estimates).

two sectors were in the moderate growth category while five reported negative growth.

The Survey further cited that the manufacturing sector is expected to maintain buoyant growth levels in the quarters July-September 2010 and October-December 2010. Out of 110 sectors covered, 27 sectors are expected to register excellent growth rate of more than 20%, 30 sectors are expected to record high growth rate of 10-20%, 42 sectors are expected to record moderate growth rate of 0 to 10% while 11 sectors are expected machine tools are also expected to perform fairly well in the next two quarters. [www.cii](#)

Contact us

For suggestions or to advertise with us, contact: Surbhi Mathur, Confederation of Indian Industry, 23, Institutional Area, Lodhi Road-110 003, New Delhi; Direct Tel: 91-11-24625260, Tel: 91-11-2462 9994-7 Ext 451; Fax: 011 2462 6149; Email: Surbhi.Mathur@cii.in

© CONFEDERATION OF INDIAN INDUSTRY







DISCLAIMER: Information contained in this edition of Manufacturing Matters is accurate to the best of our knowledge. Confederation of Indian Industry (CII) will not be liable for any omissions, inaccurate data or subjective views and opinions expressed in the content.



New Nokia N8

It's amazing technology.

What will you do with it?

-  3 Personalised Homescreens
-  12MP Camera - capture, edit and project HD quality video
-  Share your images & videos with your social network
-  Push mail
-  Download upto 40 lakh songs with Ovi Music Unlimited
-  Scratch-resistant touch screen



NOKIA

Nseries

© 2010 Nokia. Data charges applicable. Please check with your service provider for details. EMI option available in select cities only.

Available at



www.nokia.co.in/n8



Available at: 

 **NOKIA Care** 30303838*

To know more about your Nokia, register at www.nokia.co.in/my Nokia

Always insist on original Nokia India Warranty to safeguard against buying used, refurbished or tampered phones. Nokia India Warranty is applicable only for phones imported/manufactured by Nokia India Pvt. Ltd. #For assistance on Nokia products and services, call Nokia Care. Add STD code when dialling from a GSM connection.