Newspaper Clips
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Happy placements for IITs this Dec?

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Mumbai: Indian Institutes of Technology are forecasting a happy placement season this December. Pre-placement offers (PPOs) are up by 25-30%, compared to last year, and the tech colleges have witnessed a rise in companies signing up to recruit their graduates.

Seasoned companies have taken the PPO route this year, the ones that had earlier hired students as interns and now want them on the rolls. American Express India, Vodafone, Accenture Services, Visa and Capital One Financial Services are among those that have offered PPOs to several IIT-Roorkee candidates. At IIT-Kanpur, Barclays, which used to visit the campus, has offered PPOs to candidates, but has not confirmed its participation in the placement season. HUL is another such company.

"Across IITs, we have seen that PPOs are on the rise," said IIT-Madras training and placement advisor Manu Santhanam. Last year, this institute received 69 PPOs and this year it has already received 64. "We expect the number to go up. The rise in PPOs is the fallout of the internship process getting streamlined," he added.

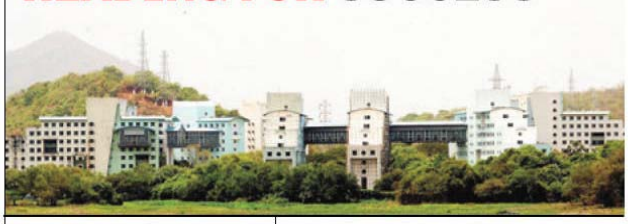
Earlier, students and their departments used to apply for internships; it is now a centralized process co-ordinated by the placement cell. The final recruitment season looks positive with 230 companies having 320 profiles registering for placements.

At IIT-Bombay, 125 PPOs have flown in, compared to 150 last year. Rakesh Patel, placement team member, said 270 companies had registered and the figure is likely to touch 320. At IIT-Roorkee, a little more than 110 "quality" PPOs have been offered and 30 are in the pipeline. That is a 30% rise from last year's 85. "These are very good PPOs, not those offered by start-ups," said placement head N P Padhy. Nearly 300 companies are expected to land up on campus for the final placement process.

IIT-BHU has seen a 32% jump in PPOs to 94, from 71 in 2015. IIT-Kharagpur has received 150 PPOs and is inching closer to its last year's mark of 170. Some new companies have confirmed participation in the placement process, said placement chairperson of IIT Kharagpur, Debasis Deb. The institute is expecting 250 companies to arrive on campus for recruitment, which begins, from December 1. Around 1,950 students are gearing up to sit in the placement process.

(With inputs from Somdutta Basu, Shreya Roy Chowdhury and Preeti Biswas)

HEADING FOR SUCCESS



Some pre-placement offers at IITs

IIT-Roorkee | American Express India, Vodafone, Accenture Services, Visa and Capital One Financial Services

IIT-Kanpur | Barclays, HUL

Number of pre-placement offers this year and last year

IITs	Last year	This year (till date)
Bombay	150	125
Madras	69	64
Roorkee	110	85
BHU	71	94
Kharagpur	170	150

"Across IITs, we have seen that pre-placement offers are on the rise. We expect the number to go up

Manu Santhanam | IIT-MADRAS TRAINING AND PLACEMENT ADVISOR

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The Carbon Hunters

An IIT startup has an unusual business model – it extracts carbon dioxide from power plant waste gases and uses it to make valuable chemicals, writes **Hari Pulakkat**

Carbon dioxide may be a dangerous waste for the planet, but for Tuticorin Alkali Chemicals it is a vital input for making soda ash. The company is dependent on a nearby SPIC fertilizer plant for this gas, but a change in technology is set to reduce the amount of carbon dioxide that it can buy in the future. Its attempts to produce carbon dioxide using a lime kiln had to be abandoned due to high costs, poor quality of lime and other reasons. Tuticorin Alkali Chemicals needed a fresh source of carbon dioxide quickly to take care of the growing demand for soda ash.

Carbon Clean Solutions was looking for a problem like this. A six-year-old startup from IIT Kharagpur, Carbon Clean Solutions was set up by two undergraduate students in 2009 to extract carbon dioxide from flue gases in power plants and use it to make valuable chemicals. It was a tough problem in economic and technology terms, but the company claims to have a method that could do the job cheaply. Tuticorin Alkali had boilers in a small thermal plant that produced flue gases. Carbon Clean Solutions set up its equipment to capture carbon dioxide, while also capturing the soot and other pollutants from coal. The thermal plant now runs cleanly. Tuticorin Alkali Chemicals gets enough supply of carbon dioxide.

Thermal plants are a major source of carbon dioxide emissions in the world. Some scientists believe that capturing and sequestering thermal plant emissions is essential to control global warming, as humanity has no choice but to use fossil fuels for a few decades or more. The captured carbon dioxide is usually buried deep underground, but it can be used to make useful products as well. According to the firm Markets and Markets, the global market for carbon capture and sequestration is expected to be $8.05 billion by 2021. The technology for carbon capture is still in early stages, and the potential market in the long run can be very big, as coal plants emit billions of tonnes of carbon dioxide every year. So there is a rush around the world to develop solutions to capture and sequester carbon dioxide, or to develop valuable products if possible. "We are innovating the carbon dioxide capture so that its price is no more a constraint for conversion to products," says Aniruddha Sharma, CEO of Carbon Clean Solutions.

Dirty Business

India now generates 186 gigawatt of coal-based power, and these plants emit 600-700 million tonnes of carbon dioxide every year. Indian thermal power plants are considered inefficient, and they emit far more carbon dioxide emitted by the most efficient plants in the world. India plans to increase this capacity substantially by 2022, which would in turn double its emissions as well in a business as usual scenario. Even with very efficient plants, Indian thermal plants will emit far more carbon dioxide than the country can afford to allow, if the world has to control rapid climate change.

Although coal-fired thermal plants are declining in developed countries, they will continue to be important in developing countries for a while. So companies and public-funded labs have been trying to develop methods to capture and sequester carbon dioxide cheaply. The early carbon capture plants have all sequestered the gas in formations underground. This itself is a challenging task, as the costs are high, but now companies are trying to use the capture carbon dioxide to make valuable products.

The world's first carbon capture and storage plant came up at Saskatchewan, Canada, in 2014. Since then, 14 more such plants have come up around the world and another seven are being constructed. Together, these 22 plants have the capacity to capture around 40 million tonnes per year, according to the Global CCS Institute, an international member-driven organisation. One coal plant produces around 3-4 million tonnes of carbon dioxide per year. An average car emits 6-7 tonnes of carbon dioxide a year. Sequestering one million tonnes of carbon dioxide a year is like taking off 1.5 lakh cars off the road.

Some scientists believe that sequestering thermal plant emissions is key to controlling global warming, as humanity has no choice but use fossil fuels for a few decades or more

In 2015, India had 171 gigawatt of coal-based power generation, and these plants emit 600-700 million tonnes of carbon dioxide every year. But Indian thermal power plants are considered rather inefficient

However, the world's coal-fired plants together emit 15-16 billion tonnes of carbon dioxide a year. So it is an enormous task to capture and sequester carbon dioxide in significant amounts. It doesn't come cheap either. The Saskatchewan plant cost $1.3 billion. Two-thirds of the cost of a plant comes from capture, which had hovered around $100 for a tonne of carbon dioxide for some time. This cost has been falling, and Carbon Clean Solutions claim to have a proprietary process that costs $30 a tonne.

Few investors would have listened seven years ago, when IIT Kharagpur classmates Aniruddha Sharma and Prateek Bumb talked about making a business out of carbon dioxide capture. This was not what Indian startups did, either seven years ago or now. The students entered a business plan competition at IIT Bombay and won the third prize. Then they won an award at the Pan-IIT conference. A mentor – yet unnamed – approached them and gave some seed money. Since IIT Kharagpur did not have the labs to do this kind of research, Bumb and Sharma started building things from scratch, outside the purview of IIT. Then they approached the Institute of Chemical Technology (ICT) in Mumbai, where they set up a small pilot plant.

Carbon capture is a very difficult process, because the gas is already in a low energy state. So you have to supply energy to make it react with something, which drives up the cost. People used two kinds of compounds to absorb carbon dioxide: amines and salts. Sharma and Bumb developed a proprietary solvent that could dissolve carbon dioxide using a proprietary catalyst, and tested it at ICT. It turned out to be good, and could remove 90% of the carbon dioxide from flue gases. "They had a low cost process," says PD Vaidya, associate professor at ICT. "We found that it was better than other solvents." Carbon Clean filed for a patent.

Investor Interest

The company then went abroad for testing and expanding its business. They got more angel investment from India and Europe, and $6 million from the UK Department of Energy and Climate Change for technology demonstration. The US government gave them money too, for demonstration in a pilot plant. Last year they raised $5.7 from private equity firms. Its technology was tested at the Netherlands Organisation for Applied Scientific Research, called TNO in Europe.

TNO had special expertise in carbon capture technologies, and its scientists were impressed with the new process. "They made a breakthrough in energy consumption," says Earl Goetheer, principal scientist at TNO. Pilot plants came up in the UK and US. The first commercial customer was in India. Getting Tuticorin Alkali Chemicals was a big breakthrough for the company, as Carbon Clean Solutions had been propounding the utilisation of carbon right from the beginning.

Sharma believes that a variety of chemicals can be made economically using captured carbon dioxide as an input. Sodium carbonate, or soda ash as it is known, is a large and growing market. Carbon dioxide can be an input for making plastics, cement, urea, or even fuel. Some of these sequester carbon for some time, and some others for a long time. Plastics, for example, offer no sequestration if burned later. Cement on the other hand can sequester carbon for a long time. In fact, the cement industry is one of the largest producers of carbon dioxide, and so a carbon capture and utilisation plant can work very well along with a cement plant.

There are experts who believe that carbon capture and utilisation is not enough, as it can utilize not more than 10% of the carbon dioxide emitted by power plants. It may not even work in large plants. "There is a business case for small plants," says Goetheer, "but I will not hold my breath for large-scale utilization." The only option then is to store the gas underground, hoping that it will not escape. It may not be impractical, as the cost of capture starts coming down. If the technology works cheaply and safely, we may not need to worry too much about India's increasing emissions from coal.

The benefits of research

http://www.thehindu.com/todays-paper/tp-features/tp-metroplus/the-benefits-of-research/article9292611.ece

Do you know about the contributions of IIT-Madras' Research Park to our everyday lives? GEETA PADMANABHAN lists a few

During the floods last year, the IIT campus went without power for four days. Even after the gen-sets failed, one home glowed like a beacon. Thanks to a 125-watt solar panel. The office-table-sized solar panel brought in DC power to run lights, fans and laptops, and charged mobile phones. "DC-Solar runs lights, fans, computers… everything in this office!" says Prof. Ashok Jhunjhunwala, Department of Electrical Engineering, IIT-Madras.

IIT-Madras' tech successes have helped push Chennai into a new age of research and innovation. And, IIT's Research Park tops that list. An incubation hub where 100-plus companies enjoy facilities for R&D work, the Park is now moving into a second building with an innovative cooling system. "While Bangalore and Hyderabad were taking the cream of the talent, Chennai was being relegated to third spot. We needed to get back the mojo," says Prof. Jhunjhunwala.

WLL

The audience at the Science Congress held in Chennai in January, 1999, sat up at what looked like a miracle then — a low-cost wireless system created by IIT-M that provided high-speed Internet access, while leaving the telephone line free to place/receive calls. Based on IIT's Wireless-in-Local-Loop (WLL) technology, it used radio-frequency waves instead of cables to send/receive signals. Calls from Internet subscribers terminated at the remote access switch (RAS) at the subscriber's exchange. This reduced congestion and making/receiving calls became possible even when the Net was being accessed. It ensured high-quality phone/fax services in Chennai, was cheaper than wired lines, connected the PC directly to the WLL subscriber terminal, gave 35 kilobytes/second (KBPS) Internet access (upgradable to 70 KBPS). "We first installed it in a establishment in Besant Nagar," says Prof. Jhunjhunwala.

DC HOME

A model of a DC Home is now a permanent exhibit at the Research Park. The message it's putting out — DC-powered buildings are green. LEDs are best powered by DC, all e-appliances need DC power. It's not smart to take solar power to the home-grid through multiple conversions and then convert it to DC to activate devices. So, IIT-M set up a DC home-microgrid with a solar PV, a battery, and an incoming AC grid to drive DC loads. A solar DC microgrid assures uninterrupted power supply to homes already on the power grid, but who experience load-shedding. Power bills plummet when you do away with inverters, when the meter records less consumption, and when the solar panel produces DC power at a cheaper rate and keeps conversion loss to a minimum.

UNIPHORE

In Uniphore at IIT's lab, a handful of geeks developed a globally-accepted voice engine that speaks and responds to 16 Indian languages. Its cutting-edge speech-recognition software allows people to access the Internet in their own language — all they need are basic phones and voice biometrics. It means someone who can't read or write can perform financial transactions through the Jan Dhan Yojana scheme by speaking into his phone in a language he knows.

Farmers use it to locate good markets and the right price. About 10,000 farmers have been counted as users of Indian voice engines to listen to Q&A programmes. Others use it to learn English and correct their pronunciation, says Umesh Sachdev, founder, Uniphore. In Chennai, the Election Commission adopted it for roll upgradation, says Prof. Jhunjhunwala.

HTIC

At the Healthcare Technology Innovation Centre, Prof. Mohanasankar Sivaprakasam and his team have been putting together accessible, affordable, scalable solutions for problems in healthcare. The Centre's Mobile Eye Surgical Unit (MESU) can roll into the remotest rural area, ready to perform high-quality cataract surgeries in a controlled, sterile environment. "The unit uses the first-of-its-kind technology in the country," says Prof. Mohanasankar. "It has performed 3,300 surgeries with no post-op complications in places with no basic amenities. It has won GOI approval."

NEO-NATAL AMBULANCE

In collaboration with EMRI, the largest emergency service provider in the country, and the Tamil Nadu Government, HTIC developed a neo-natal ambulance design and technical specifications for neonatal ambulances in the State. Around 65 neonatal ambulances for Tamil Nadu were developed based on this new design and deployed for public service.

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New IIM campuses struggle to find takers for seats

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New Delhi: After the initial hiccups, management aspirants seem to have started opening up to the idea of seeking admission in new Indian Institutes of Management (IIMs). While the number of admissions in the six new institutes has gone up from last year, the institutes are, however, still not able to fill seats to their full capacity.

Last year, 254 students took admission in the six new IIMs including — Amritsar, Vishakhapatnam, Sirmaur, Bodh Gaya, Sambalpur, Amritsar and Nagpur. This year, 354 seats have been filled up in the new IIMs, and IIM-Amritsar has shown the highest jump, where the number of admissions has increased from 50 students last year to 120 students in 2016.

IIM Bodh Gaya has also made progress from 30 students last year to 54 students this year. The institute, however, is still not able to fill seats to its full capacity of 60. "The reason the number of admissions increased this year is because people are now getting aware about the new IIMs. They find it better to go to an IIM, which is a government institute than taking admission in a private management institute," said Alok John, Assistant Manager Programme at IIM Bodh Gaya. IIM Bodh Gaya is being mentored by the IIM Calcutta and the students are being by the faculty members of IIMC.

Situated in the hills of Himachal Pradesh, IIM Sirmaur is still struggling to fill up the seats. Only 22 students took admission in the institute last year, this year the number has gone up to 42, but the institute has still not been able to utilise its full strength of 80 seats.

Professor Ajay Dutta from IIM Sirmaur attributes this to the location of the institute. "Because of the location of the institute, students who come here would want residential space in the campus, which is a problem for us right now. The institute itself is functioning out of a rented building. So, making arrangements for student accomodation is a problem. However, we are trying to arrange for alternate options."

IIM Sambalpur in Odisha also struggled to fill seats as only 45 students took admissions this year. According to the existing and well-established IIMs, the lack of infrastructure and location of the institution is one of the reasons why not many students have sought admission at IIM Sambalpur. As of now, the institute functions on a rented floor and three classrooms. The institute is also facing lack of permanent faculty members for the last one year.

For the academic session 2015-16, 55,000 students had qualified the Common Admission Test (CAT) and were eligible to get admission in various IIMs. However, only 39,000 chose to take admission.

NUMBER OF ADMISSIONS IN ACADEMIC YEAR

	2015-16	2016-17
Sirmaur	22	42
Bodh Gaya	30	54
Sambalpur	49	45
Amritsar	50	106
Vishakapatnam	54	52
Nagpur	55	55

POOR INFRA

According to the existing and well-established IIMs, the lack of infrastructure and location of the institution is one of the reasons why not many students have sought admission at IIM Sambalpur. As of now, the institute functions on a rented floor and three classrooms. There is no permanent faculty

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'We're far from using data for reforms in education'

Government schools are churning out hundreds of pass-outs every year but quality leaves a lot to be desired. Selection of teachers is often on criteria other than merit. In this environment, is there any real movement on the ground? Central Square Foundation (CSF) is involved with the government's efforts to improve the quality of primary- and secondary-level education. In an interview with Anjuli Bhargava, CSF's founder and chairman, **ASHISH DHAWAN**, tells what has been done and what remains undone in the education sector. Edited excerpts:

Q&A

ASHISH DHAWAN
Founder and chairman, Central Square Foundation

Does the central government seem serious about trying to improve primary and secondary education?
The government is serious about improving quality of education. They get the message that access and equity have been solved.

Another important message they have got is what is measured is done. How can you improve what you refuse to measure? Ten years ago, there was an anti-assessment lobby. Why should our children be tested at all?

The whole needle has turned dramatically, where bureaucrats are saying that we need to know how children are faring before we try to change or improve it. Credit also needs to go to ASER (the Annual Status of Education Report) for holding up a mirror for all to see for 10 years now.

The Centre has now created a budget for states to roll out assessments. States are trying out their systems. Some states have taken the lead in this. Delhi, for instance, is clubbing students based on their grade levels, rather than grade for remedial sessions. AAP (the Aam Aadmi Party) is doing a good job in this area. Haryana is doing a monthly summative assessment. Tamil Nadu and Andhra [Pradesh] are using data very effectively. The Centre is giving them money to do this. In Andhra [Pradesh], for instance, we have helped them create a vision document.

Over the next few months, the Centre will roll out a census assessment. We are working closely with NCERT (the National Council of Educational Research and Training) to develop this new assessment census. Every child in India will be assessed (government schools to start with) and that data will then be used to improve outcomes. This realisation – that you must measure before you try to improve – has come at a macro level. At least the train has left the station. We are still far from using the data coming out of these assessments, barring Tamil Nadu which is doing a commendable job.

How is Tamil Nadu using data?
They are using the data and customising their teacher training based on their findings. We know our children are struggling with division of fractions. Let's retrain our teachers on how to teach division of fractions.

They know which districts are performing well and accordingly they know where to concentrate. Eventually, the data need to be used at the school-level, where a teacher looks at the data and can figure areas of lacunae among their students.

Is the central government taking a more pro-active role in getting states to take responsibility?
The Centre is actively trying to get states to compete with each other. We are creating an index with the HRD (human resource development) ministry and some others to assess states. Through this index, one can see which states are doing well and which are lagging behind, codify the best practices and eventually incentivise states to perform better. The Centre has realised its role; its budget is small; it's jurisdiction is limited, it can't do it on behalf of the states but an instrument has been created to celebrate states that make the effort.

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