

Programme Synopsis

- The TIFAC-SIDBI Technology Innovation Programme (SRIJAN) was launched on November 01, 2010 to facilitate scaling of technology innovations by bridging the last mile connectivity for bringing innovations from lab / prototype scale to market.
- Innovations include indigenous technology improvement in product / process / design / application across sectors resulting in higher productivity, better economics, import substitution, improved energy efficiency, environment friendly etc. towards well being of citizens.
- A Revolving Fund was created with a total sanction of Rs.30.00 crores, out of which Rs.10.00 crores was released by TIFAC to SIDBI on November 01, 2010.
- Financial support up to Rs.1.00 crore being provided as soft loan @5% interest up to 80% of the total project cost.
- TIFAC's role includes identification of innovations, techno-economic assessment & peer review for scaling, periodic monitoring & review of projects, economic scale demonstration of technology innovations through industry participation for wide scale commercialization.
- SIDBI's role includes financial appraisal and due diligence of projects and industries, signing agreement for disbursement of loan and its recovery, managing the Revolving Fund
- So far, TIFAC assessed about 66 innovations, out of which 30 are recommended by TIFAC to SIDBI and 13 innovation based projects approved for scaling by MSMEs.
- Total loan sanctioned under revolving fund is Rs.10.93 crores, amount disbursed is Rs.7.55 crores and amount recovered is Rs.1.71 crores.
- Out of 14 innovations under scaling, 4 are from national labs / academia e.g. CSIR / ICAR / IIT and 6 are developed by start-ups or incubating companies.

1.0 Background

The TIFAC-SIDBI Technology Innovation Programme (SRIJAN), a joint initiative of TIFAC and SIDBI, was launched on November 01, 2010 to promote scaling of technology innovations to bring them from lab to the market. To encourage commercialization of novel technologies by assisting existing or start-up industries through financial support in the form of soft loan, a Revolving Fund is created by TIFAC with SIDBI. The technology source could be in-house knowledge base of industries, national R&D labs, academic institutes, technology incubation centres etc. This programme would also encourage indigenization of technologies across sectors.

While championing the technology development projects, financial appraisal and operating the financial mechanism especially the disbursement and recovery of funds posed problems for primarily a technology organization like TIFAC. In this context, it has been felt that the creation of Revolving Fund, jointly with a financial institution would enable TIFAC to focus on its core strengths and mandate of technology appraisal and foresight based analysis. While the technology appraisal of the projects is being carried out by TIFAC, SIDBI is carrying out the financial appraisals and is managing the Revolving Fund through disbursement and recovery of the loan assistance at a management fee of 1% of the amount disbursed. Thus the core strength and capabilities of the two organizations are synergized.

The Revolving Fund is created as a pass through fund by TIFAC with SIDBI initially for a period of 10 years to provide financial assistance to industries as soft loan for scaling of technology innovations. The assistance from the Revolving Fund is limited to maximum 80% of the total project cost and minimum of 20% has to be brought in by the industry as their contribution.

The projects that were financially supported by TIFAC under several of its mission mode programmes and had achieved commercialization success, had returned the technology development assistance and resources accumulated in TIFAC to support new projects. These resources were earmarked to create the Revolving Fund, which would be used to support innovative projects for scaling and development.

Progress of each project under implementation is periodically monitored and reviewed by separate Project Review & Monitoring Committees comprising members from TIFAC & SIDBI and external domain experts.

2.0. Status of project proposals:

No. of Project Proposals received	:	66
No. of proposals Technically Recommended by TIFAC to SIDBI	:	30
No. of projects Sanctioned	:	14
No. of innovations successfully commercialized	:	5
No. of projects under implementation	:	8
No. of projects closed after sanction	:	1
No. of project proposals under financial appraisal by SIDBI	:	8
No. of project proposals under technical appraisal by TIFAC	:	4

3.0 Projects sanctioned under SRIJAN:

3.1 RFID tags for Solar PV Module Tracking

Implementing Agency : M/s. IAITO INFOTECH Pvt. Ltd., Kanpur (incubated at SIIC, IIT-Kanpur)

Technology Innovation:

Developed RFID based tags, necessary hardware and algorithm indigenously for traceability and identification of Solar PV Modules as per MNRE guidelines under Jawaharlal Nehru National Solar Mission (JNNSM). Presently, Solar PV cell and module manufacturers use the barcode system for identification of solar PV cells, which have certain limitations. RFID identification method relies on storing and retrieving remote data on/from devices called as Transponders or RFID Tags and better alternative to bar codes. UHF technology based RFID has been used which has many advantages over the HF technology. Multiple tags reading through RFID is faster with good reading range compared to other technologies.

Total project cost : Rs.66.10 lakhs
Financial assistance under SRIJAN : Rs.52.00 lakhs



RFID tags used in the solar panel



Handheld reader for reading the RFID tags in the user premises



RFID tag developed by M/s. IAITO Infotech Pvt. Ltd.

The project is completed and the start-up Company increased its turnover from Rs. 72 lakhs (FY 2011) to Rs. 264 lakhs (FY2013-14) after commercialization of the product through SRIJAN support.

3.2 Pouchable Grade Hi Sep battery separator with ribs and discrete dot configuration

Implementing Agency: M/s Raman FibreScience Pvt. Ltd., Bangalore

Technology Innovation:

An improved version of composite battery separator for flooded lead acid batteries has been developed, manufactured and tested to serve the need of export markets and higher end OEM requirements wherein the product would run completely on automatic high speed plate enveloping machine. A variety of fibres, fillers and binders are used in manufacturing process and technology lies in handling of fibres of differing densities suspended in an aqueous medium and dosing with specially designed combination of chemicals allowing for the fibres, fillers and binders to blend into a homogenous web and spread in a uniform manner giving uniform consistency and product performance. Hi Sep PGTM battery separators with ribs & discrete dot configuration would have improved properties like high resistance to electrochemical oxidation, absence of leachants, very low electrical resistance and exceptionally high resistance to temperature resulting in improved battery shelf life. The separator would be a viable substitute for existing polyethylene (PE) separator produced by leading manufacturers. The indigenously developed separators will be an alternative to imported separators at reduced cost. The product has been tested and certified by leading battery manufacturer like Exide, Amaron.

Total project cost : Rs.123.37 lakhs
Financial assistance under SRIJAN : Rs.95.00 lakhs



Battery separator with ribs



Battery separator rolls for plate enveloping Machine

The Company was acquired by Hollingsworth & Vose Co. (H&V), USA in Nov 2014

3.3 Hybrid Idler for conveyer system in steel & cement industry

Implementing Agency: M/s. Jyoti Cero Rubber, Jamshedpur

Technology know-how partner: TATA Steel, Jamshedpur

Technology Innovation:

The technology relates to a process for coating of conveyer rollers with special type of polymer comprising a unique blend of high alumina ceramic powder (Al₂O₃ -90 to 92%) and polymer. The coating provides the hybrid idler rollers high abrasion resistance properties and very low co-efficient of friction. Because of these improved properties, the rollers average life is enhanced resulting in reduced downtime of conveyer belt systems. The low co-efficient of friction will reduce power consumption and savings in power is expected to be approx. 12 - 15% compared to conventional ones. The hybrid idler would extend the life of idlers to about 3 times in comparison to conventional idlers life. The hybrid rollers have undergone extensive field trials at TATA Steel and TATA Steel has placed order for hybrid rollers on Jyoti Cerro Rubber.

Total project cost : Rs.129.70 lakhs
Financial assistance under SRIJAN : Rs.95.00 lakhs



Hybrid Idlers for conveyer systems



Winners of India small giants awards 2013-14

The company has recently got India SME giants awards 2013-14 from the Indian SME Forum in Mumbai for development of new materials in the areas of abrasion and corrosion resistance.

3.4 Commercialization of the Self-Grooving Rubber Roller in Double Roller Ginning Machines

Implementing Agency: M/s. Millennium Rubber Technologies Pvt. Ltd., Thrissur

Technology know-how partner: CIRCOT, ICAR, Mumbai

Technology Innovation:

Traditionally, the ginning rollers are made out of scrap leather tanned with chromium and during ginning, leather rollers are continuously abraded. The abraded leather rollers need re-grooving once in a week and ginning factories are dependent on trained mechanics to do this re-grooving and machine setting at the end of every week, which leads to huge down time of machines. Further, the leather rollers contains about 3-4% of chromium, which is emitted during the operation resulting in chromium contamination in the cotton lint, seed and environment. Since chromium is a carcinogen, ginning mill workers are exposed to its harmful effects like skin disorders and lung cancer.

The self-grooving rubber roller would eliminate these problems and would be more environment and user friendly. It would significantly reduce the machine down time leading to higher productivity of about 30%. It would also reduce power consumption by 10-15% due to decrease in friction during operation. TIFAC jointly with CIRCOT and the company organized a technology road show to demonstrate the product to ginners and OEMs at Ginning Training Centre of CIRCOT in Nagpur.

Total project cost : Rs.116.00 lakhs
Financial assistance under SRIJAN : Rs.92.00 lakhs



Self-grooving rubber roller



Ginning machine with rubber roller in operation

The entrepreneur is tied up with a leading ginning machine manufacturer in India and launched a new double roller ginning machine named KRANTI with the new rubber rollers.

3.5 Energy Efficient Cooling & Heating System (HVAC & R Systems)

Implementing Agency: M/s. Mech World Eco Pvt. Ltd., Nasik

Technology know-how partner: IIT, Bombay

Technology Innovation:

The project has scaled up manufacturing of indigenously developed multi-utility heat pump which includes air to water and water to water heat pumps and desuperheater for various industrial applications. The special feature of the developed heat pump includes innovative tube-tube heat exchanger developed by IIT-Bombay for application in HVAC systems. The new design of heat exchanger would enable heat pumps to provide hot or cold utility in one pass providing high delta T which would result in time reduction for heating water compared to conventional heat pumps thus would achieve better energy efficiency at lower cost. The product has been successfully demonstrated and installed at Vipasana Meditation Centre, Igatpuri, McDonalds, Infosys Training Centre, Mysore.

Total project cost : Rs.95.00 lakhs
Financial assistance under SRIJAN : Rs.75.00 lakhs



Air to water Heat Pump



Air & water to water multi – utility heat pump

Product has been successfully deployed in 90 McDonald Stores across Maharashtra and Infosys Training Centre, Mysore

4.0 Projects Ongoing:

4.1 Design, manufacturing of Inertial Navigation Sensors and autopilot

Implementing Agency: M/s. Aeron Systems Pvt. Ltd., Pune

Technology Innovation:

The company has developed an indigenous design of sensors which comprises of two unique features namely the software algorithm and structural design of orthogonal frame making the product robust even when used in low cost MEMS based sensors. The frame design would give required strength to structure of the navigation sensor. It would help in reducing misalignment errors. The company has developed a proprietary algorithm which enhances use of Kalman filter in dynamic conditions filtering the unwanted noise by the MEMS sensors. Low cost MEMS based sensors would be used to deliver equivalent performance of high cost sensor using the proprietary algorithm making it compact, cheaper and maintenance free. The sensors would find market for defence, automotive and industrial applications. The company is a start-up promoted by entrepreneurs from IIT and MIT, Pune.

Likely date of project completion	:	August 2015
Total project cost	:	Rs.97.50 lakhs
Financial assistance under SRIJAN	:	Rs.70.00 lakhs



Inertial Navigation System with GPS for UAV & other defense applications



Digital Inclinator for Industrial applications

The Inertial Navigation System with Dual frequency GPS has been approved by R&D (E), DRDO, Pune and ARDE, Pune. The Company has secured firm order from BEL Chennai.

4.2 Single Release Liner carrying Label Stock on both side of liner

Implementing Agency: M/s. HassleFree Technologies, Greater Noida

Technology Innovation:

At present, the label stocks are developed on one side of release liner which is discarded after use and cannot be recycled due to presence of silicone. Industries find it difficult for dumping the waste release liners. The technology deals with the new concept of single release liner which carries printed label stock on both side of the liner to reduce generation of liner waste by 50%. It would reduce consumption of raw material, energy and cost of transportation resulting in cost reduction of label stock by at least 20%. The technology would reduce environmental pollution load. The new product has got appreciation from leading customers like Ranbaxy and other bottling companies.

Likely date of project completion : May 2015
Total project cost : Rs.147.60 lakhs
Financial assistance under SRIJAN : Rs.100.00 lakhs



Both sided label stock on single release liner

4.3 Value added products from sea weeds for application in agriculture, animal husbandry and human consumption

Implementing Agency: M/s Aquagri Processing Pvt. Ltd.
Mana Madurai, TN

Technology Know-how Partner: CSIR-CSMCRI, Bhavnagar

Technology Innovation:

Production of Carrageenan (hydrocolloids) and liquid plant nutrients from *Kappaphycus Alvarezii*, sea weeds, through a process of using freshly harvested sea weeds instead of dry weeds. This would reduce the requirements of water in processing and in turn would reduce the effluent discharge as well. The project would also bring further value addition to liquid bio-nutrient by way of concentrating the nutrients present in the seaweed extract. This would have better market value. In conjunction with the separation and concentration of nutrients the project will also explore the possibility of producing potable water as a byproduct. The project is expected to achieve a manufacturing process protocol with zero discharge.

Likely date of completion	:	June 2015
Total project cost	:	Rs.1072.10 lakhs
Financial assistance under SRIJAN	:	Rs.100.00 lakhs



Kappaphycus Alvarezii-Sea weeds



Existing facility at Mana madurai

4.4 Table top automatic multiple variant dosa making machine

Implementing Agency: M/s Mukunda Foods Pvt. Ltd., Chennai

Technology Innovation:

The project aims at scaling of table top portable dosa making machine of size 500*400 mm with a capacity of making 1 dosa /minute. The machine has the innovative design of stationary plate with moving mechanical spreader instead of moving plate in existing bigger size machines developed by CSIR-CFTRI. This would result in reduced power consumption. The machine has minimum human intervention thus delivering clean dosa. Initially crude prototype developed which further refined to an automatic marketable product. The table top machine would find marketing in quality service restaurants, retail outlets and catering services or even at home. The innovators just after passing out of engineering college launched a start-up company to manufacture this innovative product. Indian Angel Network has also invested in the company.

Project Status	:	Agreement signed
Total project cost	:	Rs.150.00 lakhs
Financial assistance under SRIJAN	:	Rs.50.00 lakhs



Automatic table top dosa making machine at customer's premises

The Innovation got DST-Lockheed Martin India Innovation Award 2015

4.5 Upgradation of ROBOPLAZMA Structural cutting system

Implementing Agency: M/s Plasma Technologies Pvt, Ltd, Pune

Technology Innovation:

The company has developed high quality plasma cutting system combined with Precision Robotics ,integrated with simple, high speed "Roboswift" programming software provides 2D and 3D cutting capability that enables a variety of jobs to be processed with one system. They have replaced the touch sensor with robotically controlled non-contact laser sensor measuring device. Special job capability for I Beam- close cope, mouse hole, marking stiffener and square tube -straight cut, slot cut, bevel cut, notch cut, compound miter etc on all 4 sides are possible with under cuts. Whereas the existing machines which uses fixed base of robots with limited work envelop and limited reach does not allow cutting of profiles underside. In M/s Plazma machine, a single robot can cut for all types of profiles while existing machines use two robots instead of one for above and below cutting profiles. This faster, smarter, and cheaper solution gives unique flexibility for users to meet multiple customer needs simultaneously.

Project Status	:	First installment disbursed
Total project cost	:	Rs.125.00 lakhs
Financial assistance under SRIJAN	:	Rs.100.00 lakhs



Robo Plazma cutting machine

Cutting profile

4.6 Metal recovery from electronic waste using thermal decomposition

Implementing Agency: M/s. Revive Electronic Waste Pvt. Ltd., Navi Mumbai

Technology Innovation:

Innovative process aims at recovering non-ferrous metals from obsolete printed circuit boards and associated plastics. The customized design of the pyrolysis plant would simultaneously produce energy in the form of hydrocarbon oil and vapor as by-products. The hydrocarbon oil recovered from the pyrolysis process could be blended with furnace oil and thermal energy of exhaust gases could also be deployed to pre-heat the raw material. The energy would also contribute to the total energy requirement of the whole process for metal recovery thereby minimizing our external energy consumption. The residue obtained in the reactor would be metal rich and further smelted to form a copper rich metal ingot which is 98% pure Copper. The metal ingot recovered from the process would also contain precious metals like gold, copper, silver, etc. The customized process design done indigenously would scale down the modular pyrolysis plant to operate on much lower capacity of 500 Kg of e-waste / batch compared to the conventional pyrolysis unit of 5 tons / batch capacity.

Project Status	:	First Installment released in April 2015
Total project cost	:	Rs. 200.00 lakhs
Financial assistance under SRIJAN	:	Rs.100.00 lakhs



Copper recovered from PCB's



Gold recovered from PCB's

4.7 Production of Low Lactose milk

Implementing Agency: M/s. Madhumita Diary Products (P) Ltd., Bangalore

Technology Innovation:

Lactose intolerance in people particularly during early adulthood and old age is a prevalent problem causing pain in stomach, gas, loose motions etc. India is the second largest number of lactose mal-digesters with about more than 80% in south and 50% in north and north east suffering from lactose intolerance. However, no lactose free cow milk is available in Indian market other than soybean milk. The low lactose milk made from cow/buffalo milk will be a better substitute for soya milk in terms of nutrients and calcium content as well as taste. The company optimized process based on open domain knowledge for reducing lactose content in cow or buffalo milk from 5% to < 0.1% by hydrolysis process using lactase enzyme under controlled conditions for commercial production. The company will make pasteurized LF milk in pouches with shelf life of 3 – 4 days under refrigeration. Subsequently, they will make Ultra High Temperature (UHT) Lactose free milk by flash sterilization and sterile (aseptic packaging) packing with one month shelf life at room temperature.

Project Status : Waiting for product approval from FSSAI

Total project cost : Rs.210.00 lakhs

Financial assistance under SRIJAN : Rs.100.00 lakhs



Existing facility at Krishnagiri

4.8 Development and commercialization of Biodegradable Soluble Cutting / Coolant Oil

Implementing Agency: M/s. Ecocare Biolube India Private Ltd, Coimbatore, TN

Technology know-how partner: CSIR-IIP, Dehradun

Technology Innovation:

Conventional metal cutting oil is derived from mineral oil and manufactured by leading oil companies, which after several round of recycling is discarded resulting in environmental pollution. The project aimed at scaling the manufacturing of new biodegradable soluble cutting/coolant oil derived from non-edible vegetable oil through suitable processing under controlled conditions. The product would be a clean and eco-friendly alternative to conventional cutting oil. One of the biggest advantages would be its excellent lubricity as it contains 65-70% oil content which would extend tool life. Several batches of the product were made in the process plant based on the technology developed at lab scale by CSIR-IIP.

Systematic field trials have been carried out in actual metal cutting industries. Initially several problems were faced like rusting, stickiness, phase separation, foul smelling etc. Extensive field trials were carried out with the modified formulation provided by IIP Scientists using industrial grade additives. The product still encountered problems like color change, deteriorated with bacterial growth, biodegradability and poor emulsion stability. The field trial results did not corroborate with the lab test results of IIP. So the promoter desired to abandon the project due to uncertain Scenario which has consumed a lot of time and money.

Total project cost : Rs.84.60 lakhs
Financial assistance under SRIJAN : Rs.64.00 lakhs



Processing facility at M/s Ecocare, Coimbatore



Field trials under progress

Product faced technical issues during field trials

5.0 Projects technically recommended by TIFAC and under financial appraisal by SIDBI

5.1 Methanometer and LPG gas leak hunter and Manhole gas detector

Implementing Agency: M/s Synchro Electronics, Kolkata

Technology Innovation:

Three new products developed namely 1)Methanometer: A portable handheld low cost methane gas measuring unit which is capable to detect the methane gas in hazardous area and display the concentration of gas in ppm level;2)LPG Leak Hunter: A portable handheld low cost LPG leak measuring unit which is capable to detect the leak of LPG cylinder and pipe line in kitchen and 3)Manhole Gas Detector: A portable manhole gas detector which is capable to detect the gas component in manhole or confined space and raise alarm if the gas component is beyond its threshold limit. The sensors are high sensitivity MOS sensors and no chemical sensor is used. Imported devices are presently available at around Rs.40K-50K which is way above the affordability of Indian population. The company proposed to sell such gadgets at much lower cost.

5.2 Extraction of Green Silica from Rice Husk Ash

Implementing Agency: M/s Bridgedots Techservices Pvt. Ltd.Noida UP

Technology Innovation:

The company has developed a technology to extract advanced dispersible grade silica from rice husk ash generated from biomass power plants. The dispersible grade of silica is used as filler in tyres, which can reduce the rolling resistance of tyre resulting in improving the fuel efficiency of vehicles. Presently the rice husk ash is a waste material and is dumped mostly for land filling purpose which has negative impact on environment. Such technology would utilize the waste material to produce value added product.The R & D validation of silica product samples provided by the Company have been tested by Goodyear Tire Company, USA and Goodyear has given positive feedback to use such silica in their tyres. The process will also produce calcium carbonate and activated carbon as by-product, which would enhance economics of the technology.

5.3 Commercialization of Standard Rack Mountable, SMPS based Precision Regulated High Voltage Power Supplies

Implementing Agency: M/s IONICS Power Solutions Pvt Ltd, Hyderabad

Technology Innovation:

The company has developed an indigenous Switch Mode Power Supply (SMPS) system based on in-house design for precision regulated high voltage power supplies with a switching frequency of ~25 to 100 kHz compared to 50 Hz for conventional power supply. The development is aimed at import substitution with some novel features. It is a rack mountable compact systems which significantly reduce the weight and size of the unit and ensures high efficiency as well as reliability. Indigenous SMPS based systems are available only for Low Voltage power supplies. At present SMPS based high voltage power supplies are being imported. The product developed is at par with the imported products. The product would find applications in high end research, XRD, XRF, Plasma research, Medical equipment's, Electron Beam Welding, Electron Beam Melting, as well as diverse Industrial applications.

5.4 RO-BOAT-unmanned river surface cleaning equipment

Implementing Agency: M/s. Omnipresent Robot Technologies Pvt. Ltd., New Delhi

Technology Innovation:

A semi autonomous robot called RO-BOAT has been developed at prototype stage for cleaning surface river trash in more effective and efficient way. It would be an unmanned surface vehicle with no submersible parts and capable of detecting and collecting trash floating on water. It could also work round the clock with a gimbaled camera that provides ultra stable and high definition video, useful for surveillance. It would be capable of semi-autonomously cleaning up surface waste in the river both far and near the river bank. The other novelty would be in the vision based location of slush / waste as well as obstacle avoidance.

The equipment is short listed as potential technology by National Ganga Action Plan

5.5 Development and manufacturing of Unmanned Aerial Vehicles (UAVs)

Implementing Agency: M/s. Sree Sai Aerotech Innovations Pvt. Ltd., Chennai

Technology Innovation:

Indigenously developed 'any one can fly UAV prototype' with EASYPILOT would be customized for UAV's deployed in specific applications like agriculture, Industrial Inspections, film industry, Wild Life conservation, GIS Mapping, Defense application etc. EASYPILOT (Autopilot) architecture along with algorithms would use first time Quad Core system of micro controllers to convert any drone into a user friendly Gadget around which various APPS could be developed in future. The company would manufacture easy-to-use UAV Controllers and market it to OEMS. The developed architecture may lead to indigenous manufacturing of low cost UAV's in future at in comparison to leading drone manufacturers. The indigenously developed autopilot controllers and fully operational systems with precision capabilities are rare and the proposed products would be in this direction. The proposed product may find its applications in civilian use wherein there could be many end users both in government and private sectors.

5.6 Long fiber reinforced thermoplastics (LFT) compounds and advanced composites such as UD tapes, organo-sheets for injection/compression molded applications

Implementing Agency: M/s. Mans Composite Pvt. Ltd., Pune

Technology Innovation:

The indigenously developed technology of long glass fiber reinforced thermoplastic compounds lies in design and working of impregnation die so as to make sure that every single fiber is impregnated (wetted) with polymer matrix in order to achieve the product with best quality and performance. Innovation is also spread in the downstream equipments especially chiller / shaper and cutter to achieve the length of pellets without generating any tails or long ends to reduce wastage. The challenges of opening up of individual glass fibre strands in the roving within the die for complete impregnation with polymer melt would be the core of die- design. There would be many new opportunities for reinforced thermoplastics like LFT to replace metals in (Semi-) Structural Parts especially in the Automotive & Transportation (Passenger Cars: front-end-carriers, Crash System, Hang-on Parts, Seats, Air Bag Containers, Brake Pedals, Floor Pans, etc., Commercial vehicles: beams, panels, etc.), Building & Construction (beams, connections), Oil/gas Industry, Industrial Machines, Sports industry (bicycle frames).

5.7 Coil Edge Protector

Implementing Agency: M/s. Jyoti Cero Rubber, Jamshedpur

Technology Innovation:

The wire rod coil mills are spread throughout India & different manufacturers are adopting different practices for packaging, depending upon availability of skilled labour & packaging materials together with statutory rules & regulations prevalent in that area. The coil edge surface damages of wired rod mills during transportation via Rail or Road leads to rejection of approx 13% material in the existing packaging practices being followed in the steel industry. A novel polymer based packaging protector with unique design would impart advantages like strength, best gripping, vacuum holes to trap the air for cushioning and enhance the strength and load capacity of Coil Edge Protector. The Coil Edge Protector developed would help to minimize surface damages of Wire Rod Mill coils during transport. The novel protector developed by the Company in collaboration with TATA Steel has undergone field trials for dispatching wire rod coils with satisfactory performance. The developed packaging material would be costing around Rs. 20/- per piece and innovative packaging would replace wood which is currently being used and thus would lead to saving of carbon footprint.

5.8 Resource recovery from Lithium, Lithium ion and Nickel Metal Hydride batteries by environmentally sound recycling technology

Implementing Agency: M/s. E - Parisaraa Pvt. Ltd., Bangalore

Technology Innovation:

A new process has been developed for resource recovery of precious metals from discarded batteries like Lithium Polymer, Lithium Ion, Nickel Metal Hydride, Nickel Sodium etc. and at present there are no recycling options for these spent batteries within the country apart from some informal sectors engaged in unscientific and hazardous backyard operations. The spent batteries are generally exported to M/s. Umicore, Belgium with the approval of Ministry of Environment and Forest, Government of India. The process of dismantling and segregating of different components of a lithium ion battery has been developed and electrolytic recovery of cobalt from these batteries has also been demonstrated. The electrolytic Cobalt was recovered using steel plate as cathode and graphite plate as an anode. The another unique feature of the process would be the value added products such as Cobalt Chloride and Cobalt Nitrate extraction instead of recovering Cobalt from the solution rich in Cobalt. These products would find commercial applications in the production of ceramics, glass and also in inorganic qualitative analysis. A commercial processing plant with a capacity of 500 kg /day of spent mobile phone and laptop batteries would be set up under the project for resources recovery for the first time in the country.

6.0 TIFAC Team:

Shri P.R. Basak, Scientist-F
Dr. Brajeshwar Chandelia, Scientist-C
Ms. Sujatha Ramasamy, Scientist-B

7.0 Composition of various committees

a. High Level Committee:

Name	Designation
Chairman, TIFAC Governing Council	Chairman
Representative- SIDBI	Member
Secretary-TDB	Member
Head, PPD, CSIR	Member
Ms. Padmaja Ruparel, Indian Angel Network	Member
Executive Director-TIFAC	Member Secretary

b. Project Approval Committee (PAC):

Name	Designation
CGM, SIDBI (Sh. AK Kapur)	Chairman
Shri Sanjay Singh, Scientist 'G', TIFAC	Member
Shri P.R. Basak, Scientist 'F'-TIFAC	Member
Sh. Rajeev Kumar, DGM, SIDBI	Member Secretary

3. Project Recommending Committee (PRC):

Name	Designation
Executive Director, TIFAC	Chairman
Dr. D. Yogeswara Rao, Ex Adviser, Office of PSA to GOI	Member
GM, SIDBI (Sh. U.C. Gaur)	Member
Shri Nirankar Saxena, Sr. Director, FICCI	Member
Dr. V Premnath, Head, NCL Innovation Centre, Pune	Member
Sh. P.R. Basak, Scientist 'F', TIFAC	Member Secretary
External sectoral experts	Invitees

8.0 Fund Status (as on March 31, 2015) : (Rs. Crores)

Sanctioned Fund	:	30.00
Fund released by TIFAC to SIDBI	:	10.00
Loan Sanctioned	:	10.93
Amount disbursed	:	07.55
Amount Recovered	:	01.71
Position of Revolving fund	:	04.46