



Confederation of Indian Industry

**Report on**  
**Conference & Expo**  
**on**  
**Investment Bazaar for**  
**Energy Efficiency**

**18 March 2021**

**Visakhapatnam**



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**Conference & Expo on  
Investment Bazaar for Energy Efficiency**  
18 March 2021: Hotel The Gateway: Visakhapatnam

**Programme**

1000 – 1005 Hrs	Welcome Address	<b>Mr D K Mohanty</b> Chairman, CII Visakhapatnam & Director (Commercial), Rashtriya Ispat Nigam Ltd
1005 – 1010 Hrs	Address	<b>Mr D Tirupathi Raju</b> Chairman, CII Andhra Pradesh & Executive Chairman, Vijaynagar Biotech Pvt Ltd
1010 – 1030 Hrs	Special Address	<b>Ms Vineeta Kanwal</b> Director, Bureau of Energy Efficiency
1030 – 1045 Hrs	Special Address	<b>Mr Chandra Sekhara Reddy A</b> Chief Executive Officer Andhra Pradesh State Energy Conservation Mission
1045 – 1100 Hrs	Special Address	<b>Mr K Raja Bapaiah</b> Chairman and Managing Director Andhra Pradesh Eastern Power Distribution Company Ltd
1100 – 1105 Hrs	Concluding remarks & Vote of Thanks	<b>Mr P V Kiran Ananth</b> Principal Counsellor CII-Sohrabji Godrej Green Business Centre
1105 – 1125 Hrs	Tea / Coffee Break	

**Session 1: Energy Efficiency Opportunities in Industry**

1125 - 1130 Hrs	Welcome remarks by Session Moderator	<b>Mr P V Kiran Ananth</b> Principal Counsellor CII-Sohrabji Godrej Green Business Centre
1130 – 1145 Hrs	Energy Efficiency Measures Implemented by	<b>Mr K Sudhakar</b> General Manager - Operations Energy Management Department Rashtriya Ispat Nigam Ltd
1145 – 1200 Hrs	Energy Efficiency Measures Implemented	<b>Mr R Varaprasada Rao</b> Asst. General Manager – E&I KCP Ltd – Cement Unit 2
1200 - 1215 Hrs	Energy Efficiency Measures Implemented	<b>Mr Vikramsena Reddy V</b> Engineering & Projects Manager Ajinomoto Bio-Pharma Services India Pvt Ltd
1215 – 1225 Hrs	Q&A	
1225 – 1230 Hrs	Session Changeover	



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### Session 2: Financial Schemes & Case Study in Funding Energy Efficiency Projects

1230 – 1235 Hrs	Welcome Remarks by Session Moderator	<b>Mr G Srinivasa Rao, MIE</b> Director, East Coast Sustainable Pvt Ltd
1235 – 1250 Hrs	Energy Efficiency Financing Schemes & case study	<b>Mr A S Ramayya</b> Asst. General Manager Small Industries Development Bank of India
1250 – 1305 Hrs		<b>Ms Yerra Bindu</b> Deputy Manager, IREDA Ltd
1305 – 1315 Hrs	Q&A	
1315 – 1415 Hrs	Lunch	

### Session 3: Energy Efficiency Equipment Manufacturers

1415 – 1420 Hrs	Session Moderator	<b>Mr P Srinivasa Rao</b> Partner, Sree Sreenidhi Engineering
1420 – 1435 Hrs	Latest technology in Variable Frequency Drives	<b>Mr Sudesh Ajgaonkar</b> Manager – Drives Project Sales Danfoss Industries
1435 – 1450 Hrs	Latest technology in Pumping Systems	<b>Mr Gururaju</b> Asst. Manager, Grundfos Pumps India Pvt Ltd
1450 – 1505 Hrs	Energy Efficient Vacuum Pumps Solutions to save energy upto 50%	<b>Mr Ganesh Shinde</b> Area Sales Manager, Atlas Copco Vacuum Solutions Division
1505 – 1520 Hrs	Latest Technology in Thermal System	<b>Mr Vasu Deva Raju</b> Sr. Engineer, Forbes Marshall
1520 – 1530 Hrs	Q&A	
1530 – 1535 Hrs	Session changeover	

### Session 4: ESCOs based Implementation of Energy Efficiency Projects

1535 – 1550 Hrs	Address by	<b>Mr Bhanu Prakash Tutika</b> Asst. Manager (Growth) Energy Efficiency Services Ltd
1550 – 1555 Hrs	Q & A	
1555 – 1600 Hrs	Session changeover	

### Session 5: Increasing Energy Efficiency in Cements and Thermal Power Plants

1600 – 1625 Hrs	Address by	<b>Mr Ram Kumar Talluri</b> Chief Technical Officer, Ideation 3X Pte Ltd
1625 – 1630 Hrs	Q & A	
1630 Hrs	Tea / Coffee Break	

### 1630 – 1730 Hrs: Exhibition & Networking Session

1730 Hrs	Close of Conference & Expo	
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Government of Andhra Pradesh in association with Confederation of Indian Industry and Bureau of Energy Efficiency organized a Conference & Expo on Investment Bazaar for Energy Efficiency on 18 March 2021 in Visakhapatnam.

The objective of the event was to create the awareness to industry stakeholders on different financing schemes, EE product/services, ESCO mode of implementation of EE projects. Also provide the common platform to OEMs, ESCOs, Financial Institutions, Industries to interact and discuss the investment as well as financial potential. More than 100 participants from Industries, OEMs, ESCOs, Financial Institutions were part of this event.

### Inaugural Session

The Inaugural Session of the conclave was graced by an august gathering of about 110 delegates, with eminent panelists at the dais.



**Mr D K Mohanty**, Chairman, CII Visakhapatnam Zone & Director (Commercial), Rashtriya Ispat Nigam Ltd delivered the welcome address by extending a warm welcome to the dignitaries on the dais, industry leaders & senior representatives from industry.

**Mr D Tirupathi Raju**, Chairman, CII Andhra Pradesh & Executive Chairman, Vijaynagar Biotech Pvt Ltd in his address said that CII works closely with Bureau of Energy Efficiency and Power Distribution companies for accelerating energy efficiency in industry. Industry can avail various services from CII Center of Excellence on Green Business such as Energy Audit, Greenhouse Gas Accounting, Green Building etc.

**Ms Vineeta Kanwal**, Director, Bureau of Energy Efficiency said that the major aim of the investment bazaar is to bring all the stakeholders of energy efficiency at one place to accelerate energy efficiency financing. She specifically stated that as a part of promoting energy efficiency projects, the Union Ministry of Power led by Bureau of Energy Efficiency (BEE), Government of India has been supporting major scheme Partial Risk Sharing Facility (PRSF) for energy efficiency that guarantees Rs 250 crores for energy efficiency projects (EEPs) at national level covering all states. Under the scheme, Small Industries Development Bank of India (SIDBI) provides partial credit guarantees to cover a share of default risk faced



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by Participating Financial Institutions (PFI- Banks and NBFCs) in extending loans to eligible EEPs in Andhra Pradesh and other States.

**Mr Chandra Sekhara Reddy A**, Chief Executive Officer, Andhra Pradesh State Energy Conservation Mission said that Andhra Pradesh is a pioneer in energy conservation initiatives with a dedicated agency. He also said that there is huge opportunity for everyone to invest in energy efficiency projects, run business in Andhra Pradesh. He invited investors and several other stakeholders to visit Andhra Pradesh, understand the potential the state offers and grow together. He also stated that Andhra Pradesh has lot of scope in improving energy efficiency in various key sectors, including industry, municipalities and agriculture etc to the tune of energy saving potential of around 16000 MU, out of total demand of around 64000 MU. As per an estimate, around 4500 MU energy is saved worth of INR 3000 crores through energy efficiency measures implemented in domestic, industrial, commercial, agricultural sectors etc. He also said that the Andhra Pradesh Government promotes energy efficiency to achieve energy savings, economic savings, environmental protection and employment generation.

The BEE is fully supporting Andhra Pradesh in implementing various energy efficiency financing schemes with an aim to expand and promote financing in energy efficiency projects in the State. The State government is considering energy efficiency as a powerful tool to increase energy security and most cost-effective solution to meet escalating energy demand in future and sustainable of energy sector.

The APSECM is seeking energy efficiency proposals from various stakeholders in different sectors such as industries, buildings, agriculture etc., and carry out technical appraisal of projects and appraise the same to bankers, he added in his address. The State had already demonstrated excellent performance in implementing Perform achieve and trade (PAT) scheme with full support of industries dept, GoAP by saving 2386 MU under pat cycle-1 and around 2904 MU (tentative) in PAT Cycle-2 in a phased manner. "This is the beginning towards achieving best energy efficiency in industrial sector in the State. He urged the investors and project implementers to discover great opportunities in Andhra Pradesh to invest and the energy department will fully cooperate to launch energy efficiency projects," he said.

**Mr K Rajabapaiah**, Chairman and Managing Director, Andhra Pradesh Eastern Power Distribution Company Ltd mentioned about pro-consumer services of DISCOM in providing quality power supply. He also highlighted that EPDCL is giving utmost priority for energy conservation & energy efficiency and has adopted separate action plan for Energy Efficiency activities.

**Mr P V Kiran Ananth**, Principal Counsellor, CII-Sohrabji Godrej Green Business Centre delivered the Vote of thanks.

During the Inaugural session, Mr K Raja Bapaiah, CMD, APEPDCL released the poster for promoting finance for Energy Efficiency projects.





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## Session 1: Energy Efficiency Opportunities in Industry



### **Mr K Sudhakar, General Manager – Operations, Energy Management Department, Rashtriya Ispat Nigam Ltd**

- The corporate structure of RINL in terms of operating units and subsidiary companies and units of Anvil are explained along with their purpose and location.
- Major accreditations of RINL such as first ISP to be certified for quality, health and safety, environment; first steel plant to get ISO 50001 certification for energy management; first steel PSE to sign Integrity Pact of Transparency International; CMMI level 3 certification for IT Systems and ISO 27001 for ISMS; first ISP to be 5S certified for the whole plant. Accreditations from ISO 14001, SIS, ISO 9001:2008 are among others.
- RINL has a capacity to generate electric power of 541.6 MW, with 63.3% of it, that amounts to 337.6MW, is generated from waste and solar energy. RINL's unique feature of green initiatives are zero discharge, high share of power generation from waste, afforestation of 5.3 million trees, making highly energy efficient, benchmark in sp. water consumption. It is determined to plant one tree for every ton of steel capacity.
- The vision of RINL is to be the most efficient steel maker having the largest single location shore based steel plant in the country by 2025. As part of energy management in the steel industry, energy mix, level of energy conservation, scale of operation, quality of raw materials, process route, process management, energy efficiency in the generation of utilities are said to be considered.
- Blast furnace is said to be consuming of the majority (55%) of the total energy consumed while losses amounts to less than 5%. Energy inputs in priority order is coking coal, boiler coal, FO, electricity import. Gases produced from various outlets are distributed to various sets of consumers.



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- Company has unveiled its energy policy in 1993 and is revised many a time, the latest being 2015. The policy conforms the energy cost accounts to 30% of the total cost of manufacturing.
- PAT (perform, achieve, trade) SEC reduction target for first cycle is set at 5% during 2012-15; whilst the same being set at 6.68% during second cycle 2016-19.
- Energy reducing methods include installation of energy conservation technologies/waste heat reducing techniques, capacity building, energy efficient procurement, waste recycling, so on and so forth. Energy conservation technologies include coke dry quenching plant, top pressure recovery turbine, etc with energy savings of 226311 (TOE) annually and reducing GHG emission by about 13 lakh tonnes annually. Energy conservation technologies in expansion resulted in 519673 (TOE) energy savings annually and about 30 lakh tonnes of reducing GHG emission.
- Process management includes using superior quality raw materials like coking coal, blending of various coals to achieve desired blend level, controlling blast humidification, oxygen enrichment of blast, etc.. Energy efficient equipment procurement includes energy efficient chillers, motors, tube lights, star rated air conditioners, etc...
- RINL commissioned 5 MW solar power plant investment for 36 crore INR, 0.5 MW roof top solar power plant at various administrative buildings. Energy conservation measures include improvement in pulverized coal injection, reduction in BF fuel rate, improvement in power generation, etc.. Energy conservation methods were undertaken during covid-19 also.
- Innovation projects implemented in 2020-21 include LD gas recovery system, interconnection of LD common ducts.
- Future plans include improving pulverized coal injection at blast furnace >150kg/tHM, augmentation in power generation by waste heat recovery system, implementation of energy audit recommendations.
- RINL received national energy conservation award - 1<sup>st</sup> prize from ministry of power 2019, CII national excellency award in energy management and national energy leader award 2020.
- The whole presentation is aimed at explaining RINL measures in installing energy efficiency features in design stage, focus on technological efficiency, harnessing waste energy, heat recovery, and capacity building.

**Mr R Varaprasada Rao, Asst. General Manager – E&I, KCP Ltd – Cement Unit 2**

- The goal of the company is to achieve the status of the “Greenest Cement Plant” among all cement units in India and become a role model.



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- Various milestones crossed by the company on its journey in the last decade like enhancement of kiln production, installation of solar power plant, pyro-box, lowest clinker power consumption and so on, while the latest being CII 5 star energy award in 2020. Many state-of-art technologies being implemented in cement unit for achieving low electrical power consumption, low thermal, low emissions and consistent quality are informed to the participants of the event. Specific power consumption and specific heat consumption of the clinker are compared for a period of four years. Energy performance of the same period is also compared on annual basis, taking into account the parameters of OPC specific power consumption and overall specific power consumption. PAT cycle-2 status of the company is also presented. Benchmark set and performance achieved in various plants in the financial year of 2020-21 is also shown. Through creativity and innovation, the cement mill is optimized resulted in 233.1 lakhs per annum savings. The project of reduction of DAM ring height, extension of feed chute and removal stump cone was completed on 11 July 2019, which resulted in increased coal mill output and power saving with cost saving of 17,900/- per annum.
- Under project Operational Improvement, kiln operation is optimized by conducting heat balance, mass balance, and operating in PXP mode. The investment made is 67 lakh rupees, with a payback period of 8 months. Adopting PXP technology in the place of fuzzy resulted in efficient operation of raw meal, coal, cement grinding, besides ease and stable operation of process equipment, specific electrical energy reduction, etc.,. Removal of dampers at coal mill-2, raw mill-2 and cooler ESP-2 fans inlet to reduce pressure losses at zero investment (in house modification) resulted in savings of 28 KWh that amounts to 56470/- per annum.
- Optimization of PJBFB discharge material conveying by implementing timer-based logic in PLC reduced equipment run hours from 24 to 16 hours, which resulted in 28.6 KWh with 3.73 lakhs of rupees savings per annum. The project Replaced GRR for MV VFD for raw saved an energy of 125 KWh with an investment of 41.5 lakhs that saved 39.16 lakhs per annum. The project VFD's installation for plant aux. bags filter fans with an investment of 22 lakh and return of investment in 9 months saved 133 KW that accounts to savings of 32 lakh per annum. To avoid tripping on sudden flush of materials from bag house cement mill-3 is optimized with an annual saving of 1.45 lakh rupees. Replacement of Coal Mill Fan Motor with high Efficiency TMEIC Project resulted in saving of 1.98 lakh rupees with an investment of 11.8 lakh rupees and return on investment of 72 months.
- Several such optimization techniques are presented in the event, which were rewarded by CII many times with the latest being national excellence in energy management, 2020, excellence in sustainability, 2019. Many awards from National council for Cement and Building materials were received from 2013 to 2019. Awards from BEE were also shown to the gathering.
- The road map for achieving target electrical energy of 55 KWh/T of cement by 2022-23 is explained. Also explained the target thermal energy. This includes implementation of 5S technology, organic waste digester, etc, to save energy and environment.





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**Mr Vikramsena Reddy V, Engineering & Projects Manager, Ajinomoto Bio-Pharma Services India Pvt Ltd**

- The objective of the company is to save 5% energy in financial year 2020-21 with respect to the total energy consumed in the previous financial year. Energy Kaizen agenda is shared with the participants of the events. This includes define, measure, assess, improve, control; by diagnosis, identify, scope, quantify and agree. Kaizen has looked at energy generation, distribution and use. Key focus areas are HVAC, motors, cooling and heating, renewables and MM&T ISO 50001. 31% of cost saving potential is noticed, including 43%PPA.
- There are many energy projects which are accomplished and the other are yet to be completed; the cost savings accounts to more than 2 crore rupees. HVAC is found to be having the majority of opportunities in energy saving. This is followed by PPA/GCV, while the least opportunities are found in motors and VSD's. Just do its and investigation lists are displayed.
- Quick win- standard work switch off campaign for switching off electrical equipment while in no use and motors while in no production is launched with a saving of above 16 lakh rupees. Quick win- general maintenance programme is aimed at thermographic and air leak survey of plant and others with a saving of above 18 lakh rupees. Cooling systems and cooling tower systems for process chiller, pumps and fans control respectively saved around 5 lakh rupees. Many other such schemes are explained.
- This is followed by technological improvements in various sections of the plant, specific fuel consumption. Challenges in investment are identified to be payback expected less than 2 years, capitalizing of the energy projects, GMP norms, etc,.
- Few aspects of HVAC system maintenance, HVAC GMP area optimization, HVAC GMP fresh air pre-treatment are discussed that amounts to more than 75 lakh savings. High energy efficiency motors are installed with a site- motor policy that saved a 6 lakh amount with 3.6 years payback period. Opportunities in solar energy sector is tapped with an expected generation of 452 MWh per annum. A map key is shared with the delegates that saved 27 lakh rupees. Compressed air for heat recovery and boiler improvements are further revealed. Expansion project considerations for centrifugal chillers, screw chillers, energy efficient motors, pressure booster system and their cost impact are explained.
- The administration is said to be abide by Paris agreement to set the global objective of limiting temperature rise to no more than 2°C above pre-industrial levels and to pursue efforts to limit global temperature increase to 1.5°C above pre-industrial levels. It is said that the industry is functioning to meet the global sustainable objectives like carbon net zero by 2050, zero net energy, CFC free, water conservation. The targets set to achieve are also shared with the business fraternity, with milestones at 2030, 2050, in terms of reducing water consumption, reducing energy consumption, and promoting production of climate neutral energy. The potential areas of implementing the strategies are also informed to the gathering.



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### Session summary:

This session dealt with various energy efficient measures that are being undertaken by prominent industries, explained by corresponding representatives to all the stakeholders of the event. Corporate structure and business model of the companies are also put in front of the delegates, besides giving information on many awards received by industries for such measures from various distinguished organizations. Growth plans and expansion strategies also presented to the business fraternity.

### Session 2: Financial Schemes & Case Study in Funding Energy Efficiency Projects



#### Mr A S Ramayya, Asst. General Manager, Small Industries Development Bank of India

- **Mr A S Ramayya** addressed the gathering on the initiatives by SIDBI in funding the energy efficient projects by various enterprises. She informed the background of the bank like its establishment date, and its current status and their schemes. She explained the concept of partial risk sharing facility. Then a range of services being offered by ESCOs in energy efficiency and energy savings are dealt with, together with the barriers in implementation.
- The operations of financial sector banks like inducing liquidity into the market, along with the possible risks are shared. The facility at SIDBI to alleviate perceived risks are informed. They aim at better accessibility to finance, mobilize commercial financing, so on for making energy efficient investments across various demand side sectors, thereby triggering large scale energy efficient market transformation.
- The key players in implementation of such scheme is identified to be ESCO, host or project owner, bank/ NBFC, PRSF. An interconnected diagram is shown. The objective of PRSF is to assist India in achieving energy savings, with mobilization of commercial finance and participation of ESCO's, to kick start Indian ESCO market,



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encourage banks and alike. The facility structure of PSRF is explained, along its interconnections with various similar organizations.

- Many models available at ESCO are informed to be shared savings model, guaranteed savings model, deemed savings model. They are explained in detail. Sectors eligible for PRSF are said to be large industries (excluding thermal power plants), municipalities, etc.,. The risk coverage available for the sectors are shared with the business community.
- Enterprises with an investment of 1, 10 and 50 crore rupees and with a turnover of 5, 50, 250 crore rupees are now defined as micro, small and medium enterprises respectively. The norms of objective, maximum amount, eligibility criteria, OEM, funding, security, interest rate, repayment, charges for purchase of equipment are listed and are detailed. List of OEM that SIDBI has signed an MoU with are around 29 in number. Few of them are Jyoti CNC, ACE, HAA, HURCO.
- The norms of objective, eligibility criteria, interest rate, purpose, repayment period, collateral security, extent of finance for roof top solar PV plants are enlisted. Also listed are such norms for the retail trade finance- to provide medium to long term finance to well performing traders.
- Participants of the events are given awareness of the software for restructuring applications, developed by SIDBI in association with ISRAC. This is aimed at helping MSMEs to easily apply for restructuring the loans to their respective banks. This works under one time restructuring scheme announced by RBI. The software is said to be free to use.

#### **Ms Yerra Bindu, Deputy Manager, IREDA Ltd**

- **Ms Yerra Bindu**, on behalf of IREDA explained financial schemes of the agency. The benefits of the energy efficiency and conservation are identified to be lower energy bills, opportunity to expand operations, higher productivity, improving brand image, lower per capita emission levels, etc.,. The possible business models for financing energy efficiency projects are explained.
- They are direct user / lease based, performance guarantee / shared savings, vendor ESCO financing, SPV arrangement, GENCO financing. All the schemes are presented to the delegates in detail.
- Sectors being financed under IREDA are wind, hydro, biomass, co-generation, solar, waste to energy, energy efficiency, alternate fuels. Other activities include line of credit to NBFCs for on-lending, short term loans to RE developers / suppliers, discounting on subsidy / GBI / energy bills, implementing agency for GBI scheme of MNRE, refinancing.
- Financing schemes include project financing, equipment financing, finance for equipment manufacturing, short term loan assistance to RE/EE developers/suppliers, securitization against future receivables. Financial terms are



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also presented during the talk. Structured repayment, loan syndication under consortium, non-recourse financing, concessions for special category states & entrepreneurs are initiatives by the agency.

- IREDA financing norms for loan, interest, repayment, moratorium are explained to the gathering. All projects which improves specific energy consumption through energy efficiency and / or energy conservation are considered to be eligible and large industries, MSME, buildings, agriculture demand side management, municipal demand side management, discoms are the sectors identified to be included. IREDA is also the fund handler for Partial risk guarantee fund of bureau of energy efficiency and Participating Financial Institute for Partial Risk Sharing facility of SIDBI/ World Bank.
- Process up gradation/modification, Retrofitting inefficient equipment, Projects based on ESCO mode, Waste Heat Recovery Based Projects, Demand Side Management Projects Energy efficient equipment are the types of projects said to be undertaken by IREDA.
- Financial mechanism includes Dedicated cash flow to service debt, Strong contractual protection to ESCOs for computation and payment of receivables from project sponsors, Proceeds of earmark collections: irrevocable for payment to lenders, and Sound Payment & Security Structure.
- Security conditions are mortgage of immovable assets, hypothecation of movable assets, guarantees by promoter companies / promoter directors, post dated cheques / nach mandate, payment security mechanism - TRA / escrow / default escrow, additional security as may be required - bank guarantee / FDR / collaterals. IREDA loan cycle is explained.
- Challenges in financing energy efficiency in terms of security, experience, revenue realization, implementation and policy are explained. New initiatives in partial risk sharing facility and partial risk guarantee fund are detailed. This is followed by the future plans like addressing implementation risks to avoid bad loans, promote ESCO mode of implementation for projects on EEC, etc.

### **Session summary:**

Financial schemes available for funding energy efficient and energy savings plans are well familiarized to the agents of industries who took part in the event. Terms and conditions of each of the proposed scheme are also addressed. Their present network with industries across the nation are also informed. Delegates are invited to make better use of financial assistance for energy efficient projects.





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### Session 3: Energy Efficiency Equipment Manufacturers



#### Mr Sudesh Ajgaonkar, Manager – Drives Project Sales, Danfoss Industries

- **Mr Sudesh Ajgaonkar**, in his talk on energy efficiency equipment manufacturing detailed the solutions of Danfoss VFD drives. As an introduction, background details like establishment year and current status across the globe were presented. It is understood that there are four segments named Danfoss power solutions, Danfoss cooling, Danfoss drives, Danfoss heating.
- Various sectors which are employing Danfoss products are also mentioned in the talk. Oragadam campus of Chennai is said to have 1.12 MW of in-campus solar power plant, campus meeting 90% of the demand from renewable sources, etc.,. Two strong global products are VLT and VAGON. Robust, reliable, long lifetime and efficient products from the leader in AC drives innovation with the broadest range of VSDs to meet all mine site and processing facility application requirements. Backed up by local dedicated drives support and service. Proven mining and mineral processing application and installation knowledge and references at the lowest total cost of ownership.
- Various kinds of VSD and VAGON products are shown. It was said that design, solution and engineering center in Asia, Pacific and India is a global center for excellence showcasing technical competences on applications and product excellence. The industry is partnering with stakeholders and global network of drives specialist for pre and post sales support. Center of excellence is intended to cater to heavy industries the dedicated drive lab with testing capacity up to 1MW, EMC precompliance test, IP test for IP 54, brake test up to 700KW. This is certified by Bureau Veritas, UL witness test data program.
- It is informed that 20% of the world's energy consumption is electrical energy, while 50% of that is consumed by electrical motors. AC drives control power supply to electric motors and typically save 15-40% of energy consumed. Today 75% of AC drives are used on pumps, fans and compressors – Variable Torque Loads. AC drives have the potential to save 8% of global electricity consumption by 2040. The





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industry is said to have the commitment, passion, and dedication and the quality, application-optimized products to bring this vision to reality. A VFD controls electric motors so they only run at the speed necessary to obtain the desired effect, reduction of speed by only 10% will give energy savings of 27%.

- Energy efficient technologies in variable frequency drives include true 12- pulse, improved supply voltage management, Danfoss Drive Sync, Danfoss front end solution, Danfoss hot standby, intelligent heat management / back channel cooling concept, compact design and innovative heat management, etc are explained in detail. Danfoss offering, customer benefits, costumer value are listed for each of the proposed technologies.
- With the induction of technologies, energy saving calculations for few drives are presented to the delegates. It is said that Danfoss drives can be installed wherever it best suites the application- close to the motor, located centrally in an electric panel or outdoors. Available classes and operating temperature are also mentioned. It is also informed that conformal coating and ruggedization for harsh conditions are also performed. This technology also reduces installation and maintenance costs. An overview of harmonic mitigation technology is also presented to the delegates.
- Energy savings is attained by regenerative braking of motors with less investment and low ROI.  $PF > 0.99$ , harmonics  $< 5\%$  compiles IEEE 519 standards, low spares cost, bump-less transfer to bypass option are also assured. Innovative AEO is proposed that ensures 3 to 5% of further energy savings, improves dynamics and increase start-up torque. Line sync solution, hybridized energy storage, industrial DC back-up are also proposed.
- ESCO innovative business model is presented, that is categorized into identify, justify, apply, validate, maintain. It is claimed that the solution offered is innovative with savings in power, reduction in CO<sub>2</sub>, tax savings through accelerated depreciation, zero investment, and turnkey solutions.

#### **Mr Gururaju, Asst. Manager, Grundfos Pumps India Pvt Ltd**

- **Mr Gururaju**, from Grundfos Pumps India Pvt Ltd explained various latest technologies, e- pumps and solutions in pumping systems in the corresponding industry. The agenda is to introduce MGE motors and e-pumps, key features and benefits of e-pumps, applications of e-pumps. An e-pump is defined as pump+ VFD+ cabling+ controller+ programming. The benefits of the technology are also explained to the gathering. IE5 efficiency class, built in drive with smart PI controller, programmable control modes/ functions are being implemented as part of schemes. IE 5 is said to be the highest energy efficiency class world wide for electrical motors. They achieve 10% energy more savings and 25% reduction in payback compared to that of the IE3 motors. Grundfos introduced a new MGE motor with HMI 300 display up to 11 KW. It is observed that permanent magnet synchronous motor enables to attain high efficiencies by minimizing losses.



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- Grundfos has induced a technology for smart communications by GENibus communication as default bus communication language. Later, the business fraternity is introduced to the MGE motors inputs and outputs. It is programmable to provide high/ low pressure protection. The product functioning is explained with an example of cooling tower application. The unit is said to have various control options to work for one or few or all of constant pressure, constant temperature, constant differential pressure, and few other. Display options available on the digital screen are also made aware of; maximum four parameters can be displayed per pump. CIM module family for MGE is also explained.
- Benefits due to e-pumps with MGE are said to be low installation cost, no additional space requirement, no shielding motor cables, lower CO<sub>2</sub> emissions. This can be used for easy commissioning matching system design criteria. The benefits are said to be autonomously optimized system performance, lowest operating cost, easy commissioning, and improved reliability. Various technologies that Grundfos has invented right from its inception are also informed to the gathering. Various MGE Grundfos products are also presented.

#### **Mr Ganesh Shinde, Area Sales Manager, Atlas Copco Vacuum Solutions Division**

- **Mr Ganesh Shinde**, from Atlas Copco Vacuum Solutions Division detailed about the energy efficient vacuum pumps. This technology is claimed to be a disruptive. Various fields wherein this technology can be incorporated are explained at first. It was mentioned that thinking out of the circle is an important task for such an innovation. The disruptive technology is the one that displaces the established technology and shakes up the industry or a ground-breaking product that creates a completely new industry.
- Atlas copco screw vacuum pump is claimed to be one of such disruptive technology. Oil injected screw vacuum pumps GHSVSD+ series could make it possible to centralize multiple small vacuum pumps. It is also claimed that 50% of energy could be saved.
- Few case studies like replacement of liquid ring vacuum pump with Atlas copco GHSVSD+ screw pump, replacement of 11 no.s liquid ring pumps with 6 no.s screw vacuum pumps, extrusion degassing PVC pipes are explained to the gathering. Applications in JABIL PCB circuits, Sanmina PCB circuits are also presented with details of power savings and rating of equipment needed.
- The industry has received innovative and energy saving product of the year 2020 by CII. "Intelligent" liquid ring vacuum pump LRPVSD+ is informed to record 50% of energy savings, 30% of water savings and space savings, better productivity, and compatibility. Various parts of the pump are explained. A case study of replacing steam ejectors is also presented. Vacuum pumps are designed to be operated using smart phone and resulted in energy cost reduction through process optimization.



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### **Mr Vasu Deva Raju, Sr. Engineer, Forbes Marshall**

- **Mr Vasu Deva Raju**, from Forbes Marshall explained the latest technologies in thermal systems in their industry. Forbes Marshall is understood to be a leader in process efficiency and energy conservation for process industry. Their long and deep customer relationships have enabled develop products and services that help save energy, improve process quality and throughput, and run a clean and safe factory.
- Costumer priorities, ENCHON approach, and FM actions, taking into the consideration the energy savings, maximum productivity- minimum downtime, stop wastage, capacity enhancement in chemical and pharma industry are explained to the gathering. Gaps and energy saving opportunities in steam systems are shared. Energy savings potential is noticed to be 25%, by improving steam to fuel ratio and reducing process steam consumption.
- Costumer priorities, ENCHON approach, and FM actions, taking into the consideration the decisions took immediately and are implemented now, in textile industry are explained to the gathering. Energy savings potential is recorded to be 26%, by improving steam to fuel ratio and improving specific steam consumption.
- Opportunities, challenges and priorities are listed for higher productive, minimum down time. Condensate evacuation from driers from low pressure zones running variable speeds and a few others are discussed. Variation in fuel consumption potential is observed to save 37 % in paper industry.
- Several hook ups with proposed scenarios, along with benefits are shared with the participants. Energy savings, productivity, reliability, sustainability for various schemes are also shared. Case studies in pharma company, vizag, formulation unit, baroda, paper mill, pune, textile factory, tamilnadu are also explained in detail, textie factory, tamilnadu. Various observations, recommendations and potential areas are also informed to the gathering.
- Energy savings- zero leak zero discharge for various applications are shown. Condensate recovery in various sectors are depicted. MEE economy and Mee mac are also addressed to the gathering.

### **Session summary:**

Various innovative technological solutions that are invented by the respective industries are introduced to the business community that took part in the event, aiming at energy savings and optimized functioning of industries. The current status of those inventions are also informed to the gathering, apart from the advantages that could be entertained with induction of such novel technologies.



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## Session 4: ESCOs based Implementation of Energy Efficiency Projects



**Mr Bhanu Prakash Tutika**, Energy Efficiency Services Ltd

- Mr Tutika introduced energy efficient appliances and technologies are claimed to save 53 billion KWh annually in the nation. The company is understood to enter a joint venture with 4 PSUs- power grid, REC, NTPC, PFC.

- Various EESL initiatives like UJALA, SLNP, SMNP, etc are listed. Under street light national programme, 1.14 crore LED street lights resulted in 7.67 BU savings, 1280 MW load reduction, 5201 crore monetary savings, with benefits like affordable financial modelling, easy repayments, better

illumination, reduced O&M expenses, so on and so forth.

- UJALA programme, launched by prime minister of india, is explained in detail.
- ESSL business model is also explained, that take upfront risk of investment and performance for end consumers, assure end users pay as you save model, aggregate demand by including incentives for all stakeholders, etc,.
- Convergence energy services limited, a wholly owned subsidiary of EESL is formed in 2020. A future ready clean energy idea is proposed. The energy sector is seeing rapid changes as new technologies and climate concerns take center stage. The talk includes few aspects of renewable energy, electric mobility, cooling, climate change. Many projects under execution in the fields of solar energy, electric vehicles, EVCI, convergence and battery storage are dealt in the presentation. It is said that revenue streams from multiple uses can help make batteries a viable solution for India.
- Trigeration is a technology wherein both heating and cooling is generated simultaneously along with power and repayments to be done from savings. The achievements as on date are also listed.

### Session summary:

Initiatives in energy efficiency projects, by respective companies, are addressed to the business fraternity. Various accomplishments abided by ESCO terms for such measures are also informed. The delegates are shared with the business strategies for innovative solutions. Policies for advancements in various sectors are proposed.





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## Session 5: Increasing Energy Efficiency in Cements and Thermal Power Plants



**Mr Ram Kumar Talluri, Chief Technical Officer, Ideation 3X Pte Ltd**

- **Mr Talluri** talked on increasing Energy Efficiency in Cements and Thermal Power Plants. The talk included alternate fuels, upgradation of coal, coal / coke catalyst for steel, cement and power, FGD- DSI- AB regeneration. Replacing fuels with environmental friendly fuels and plasma arc coal combustion are dealt under start-up fuel. Few benefits of upgradation of coal are listed to be better quality of coal, reduced specific consumption of coal, reduction in pollution levels, etc,. The process of upgradation of coal is explained in detail.

- Problems faced by coal burning plants are high fuel costs, emission regulations, etc,. A solution is proposed to reduce emissions, reduce fuel costs, and improve efficiency and reliability are also discussed.
- For better and faster combustion catalyst speeds up chemical reaction by lowering the amount of energy needed to get one going, without being consumed. Single bin applicator, double bin applicator are shown as implemented. The process and results of catalyst are explained. Emissions of various particles and improved reliability are shown.
- FGD processes are broadly classified into wet and dry. Various sub- classifications of the processes are also included in the talk. Conventional limestone based process is explained in detail. Cost of conventional system and its comparison with direct sorbent injection is also presented to the business fraternity.
- DSI based system, multiple to single AB generation are also explained to the gathering. DSI with sodium bicarbonate regeneration is said to have low operating costs, ultra-low emissions, and low capital costs. RE generation hub is also dealt in the presentation. All the solutions are informed to be implemented in DBFOT/ ESCO financing model by US.

### Session summary:

This session managed to deal with energy efficient methodologies being implemented in cement, thermal and steel plants. Delegates are well informed with various new measures, their advantages and compared to the traditional methods.





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The conference was well attended by more than 100 participants from different Industries like OEMS, ESCOs and Financial Institutes. The participants were actively interacted and raised so many queries regarding latest technologies, financing schemes explained in the conference and got cleared by speakers.