

IMPACT

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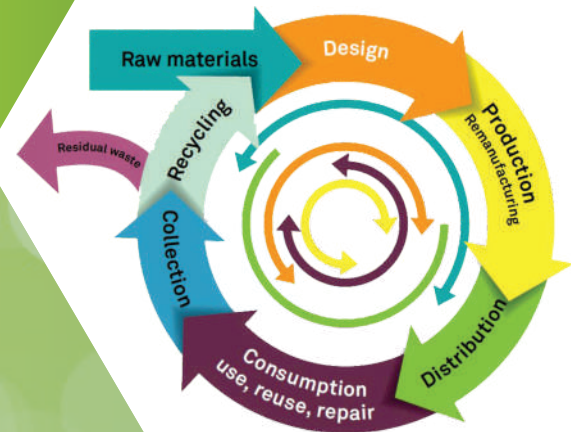
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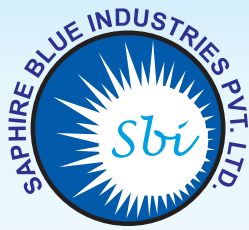
Sustainable Manufacturing through Resource Efficiency & Circular Economy

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Chairman's Message ACMA – Skilling & Mentoring

Dear Reader,

I am happy to share with you the Volume 14 – Issue 3 of **IMPACT**, with a theme –“**Sustainable Manufacturing through Resource Efficiency and Circular Economy**”.

We all have grown up hearing “what shall you sow, so shall you reap” – in the context of manufacturing, this statement rings alarm bells. In last 300 years, since entering industrial revolution and then to technological revolution, this leap of rapid transition has come at the cost of severe deterioration of environment and ecology. Today saving environment for future generations is our top priority and we must act now. Sensing this, nations across globe are uniting and working unanimously towards a sustainable manufacturing goal seeking to minimize waste and its impact on environment by adopting innovative product design and refined manufacturing processes.

Sustainable manufacturing in automotive industry can be achieved through a two-prong strategy – Resource Efficiency (RE) comprising of relooking into the manufacturing process from start to finish for sources of wastage (primary & secondary materials) as well as energy losses. By investing in innovative and technologically superior processes, RE can be achieved. Another is Circular Economy (CE) which means using more of recycled, reuse, sharing, leasing, refurbishing of existing products for conserving the existing resources. (Complete details inside magazine). Achieving RE-CE together is a huge task, as it comprises end to end solutions/ processes, for complete supply chain from OEMs to tier -2 suppliers. OEMs with deep resources and capabilities have access to innovative technologies whereas it is a daunting task for component manufacturers. Sensing this challenge, ACMA stepped in to support its member organizations, in starting sustainable manufacturing practices.

ACMA is committed to sustainable manufacturing and supports GOIs' carbon emission reduction efforts. It is with aim, ACMA, designed and started a pilot cluster program – ACMA Sustainable Manufacturing program, in October 2021. World renowned GiZ and Adelphi, are providing guidance in this program. This program aims to reduce carbon foot prints by reducing GHG, improved energy & process efficiencies, yields, reduced overall product cost.

I am confident that organizations who invest today in clean and green processes will be the preferred suppliers of future, as today the consumer has also become sensitive towards environment practices adopted by various industry members.

Apart from this, my team of technical experts, mentors and counsellors are continuously sensitizing member companies through our various programs about concepts of sustainable manufacturing. Carbon foot print reduction is a feature in all our regular programs– Foundation Cluster Program (for QCD), Advance Cluster Program (focusing Lean Manufacturing), Engineering Cluster (for advanced engineering improvements), Zero Defect Quality Cluster (for zero defect product quality), NPD programs, plastic engineering program.

I am equally happy to share that ACMA in association with Project Management Association conducted a pilot project and very soon this program will be available to automotive industry members to train their people in relevant Project Management programs for successful execution of projects.

ACMA Centre of excellence is working in close collaboration with Academia to make the Indian graduate engineers ready for the job at university level and has designed a short course making fresh engineers familiar to industry expectations. Drawing your attention to demand for training of engineering graduates in India indicates a mismatch between academic education and industry requirements and **to bridge this gap skilling and mentoring, pillar – 3 supported by ACoE has designed an Industry relevant curriculum Lean Concepts” in Manufacturing Industry** & 1st batch is just completed at IIT Pallakkad as elective subject for their higher semester students.

Tough times are also moments which make or break organizations. Smart organizations, act fast and grab opportunities that adversities throw upon them. I am sure your organization will be the smart one and will take advantage of the above opportunities and be among the first movers to reap maximum benefits.

In this pandemic infested environment, I wish you all good health and happy learning and look forward to receiving your feedback on our publication to improve it further.

Best Wishes
FR Singhvi

Need for Sustainable Manufacturing



Mr. Sunil Arora
Managing Director
Abilities India Pistons & Rings Ltd.
(Participant in ACMA
Sustainable Manufacturing Program)

Mahatma Gandhi Said that, "The earth has enough resources to meet the needs of all but not enough to satisfy the greed of even one person"

However in our greed of progressing with technology we have exploited these resources; human rights have been

compromised for profits and unethical practices have been followed.

My grandson casually mentioned that the future looks more apocalyptic rather than technological and it made me ponder over the contribution of industry on GHG Emissions. A recent study has shown that global warming is threatening a shift in the earth's axis which will bring huge disasters in most parts of the world.

Being an integral part of industry, I understand that a lot of initiatives and regulations are coming to the fore for a sustainable future such as UP Govt announcement to put forest in 33 % of total industrial land to aid in carbon offsetting; minimum 30 % of total energy capacity of a grid to be renewable.

Apart from that I am also being faced queries from customers as to what our initiatives towards sustainability are. Lots of OEMs have taken targets to be carbon neutral by 2030 to 2050 and we being more than 70% part of the vehicle have a responsibility to contribute in these targets.

Being sustainable is not only a compulsion or a regulation, it also helps in decent cost saving to an organisation.

We must ask ourselves the following questions:

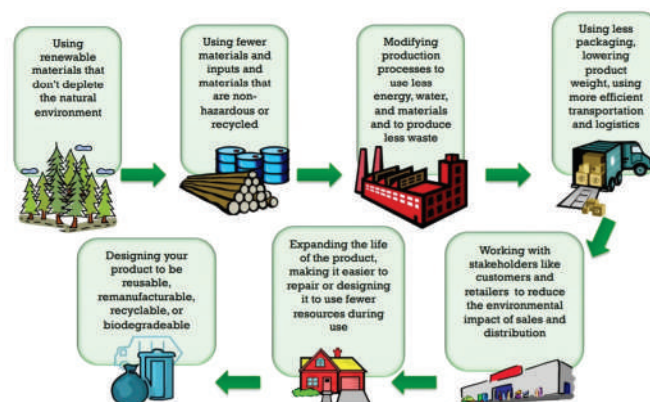
- Is your company trying to cope with increasing environmental regulation?
- Are your customers demanding better environmental performance and data?
- Do you want to lower your energy and materials costs?
- Are you interested in producing and marketing greener products?

Sustainable manufacturing has both benefits and costs, but it can help make your company more competitive.

The intersection of the environment and manufacturing is discussed in many different ways, often using terms that are not always clearly defined. These ideas can be confusing, and it may be difficult to tell how they apply to your business.

For many years, the main environmental focus with regards to manufacturing was pollution abatement; the attention has now shifted to cleaner production and pollution prevention. With cleaner production, there are many opportunities for cost savings and other financial benefits for companies.

- SUSTAINABLE manufacturing focuses on both how the product is made as well as the product's attributes. This includes the inputs, the manufacturing processes and the product's design.
- Sustainable manufacturing includes things such as making products using less energy and materials, producing less waste, and using fewer hazardous materials as well as products that have greener attributes such as recyclability or lower energy use. The concept of RE (resource efficiency) & CE (circular economy) are paramount in sustainable manufacturing.
- Sustainable manufacturing practices can range from very simple process improvements to large investments in new technologies and product redesign.
- This is what sustainable manufacturing means in practice:



- Remember there is no such thing as a company with no environmental impact. There is no sustainability "destination".
- Our goal should be continuous improvement – making constant advances in our company's overall sustainability performance.

Sustainable Manufacturing through Resource Efficiency and Circular Economy



Mr. V.K.Sharma
Mentor - Clusters & Projects
ACMA

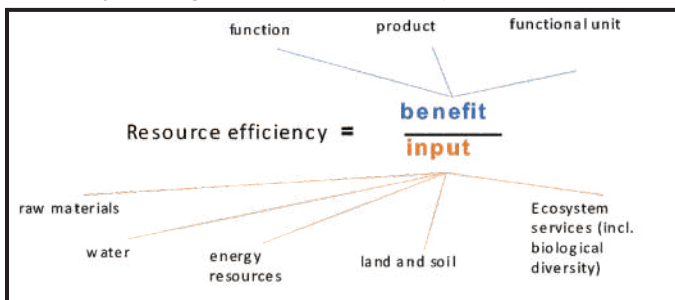
Natural resources form the backbone of any economic development. India, as one of the fastest growing economies with GDP at 2.6 trillion USD, has increased its material consumption to six times - from 1.18 billion tonnes in 1970 to 7 billion tonnes in 2015. It is estimated that by 2050 the growth in population and demand for consumer goods will require at least twice the energy and materials being used now.

However, this economic growth has been coupled with inherent cost on natural environment. The material consumption is to further increase in order to provide for economic growth, increasing population, rapid urbanization and growing aspirations.

Enhancing resource efficiency and promoting the use of secondary raw materials has emerged as a strategy for ensuring that the potential trade-off between growth, resource constraints and environmental well-being can be minimized.

Resource Efficiency

Resource efficiency has a vital role towards mitigation of climate change, land degradation and biodiversity loss. It is thus, imperative for India to charter and take the path of economic development supported with efficient use of resources and minimum negative impacts on environment, ultimately leading to sustainable development.



Resource efficiency means to create more output as products/services using less inputs. It reduces waste, drives greater resource productivity, delivers a more competitive economy, addresses emerging resource security/scarcity issues, and helps reduce the associated environmental impacts.

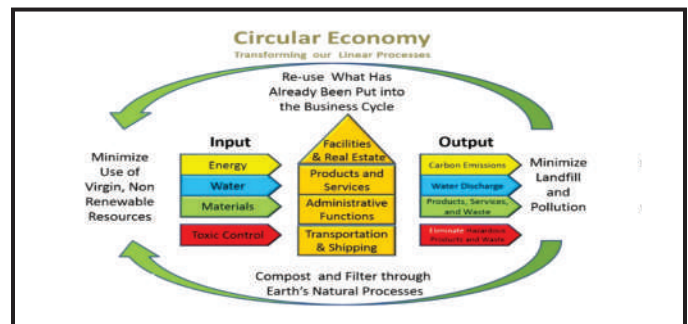
Resource efficiency offers benefits on multi-dimensional aspects of economic, social and environmental well-being. Cost savings from reduced material use, resource security, reduced conflict and displacement eg. from mining, employment opportunities in green jobs, reduced greenhouse gas emissions, pollution and ecological degradation among other benefits drive the cause of resource efficiency.

Circular Economy

Circular economy keeps resources in use for as long as possible extracting the maximum value, recovering and regenerating products and materials at the end of each service life; so as to limit the extraction of natural resources to maximum possible extent.

With its closed-loop system, a circular economy can help reduce emissions and dependence on natural resources while increasing profitability. A circular economy is described as a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling of the existing materials and products as long as possible.

Circular systems employ reuse, sharing, leasing, repair, refurbishment, remanufacturing and recycling to create a close loop systems - in contrast to linear economy, which has a take, make, use & dispose – to minimise the use of resources and creation of waste, pollution and carbon emissions.



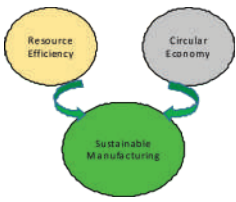
According to a research, circular economy approaches in the automotive sector can reduce the life-cycle carbon emissions per passenger km by up to 75% by 2030. A circular economy development path in India could create annual value of ₹14 lakh crore (US\$ 218 billion) in 2030 and ₹40 lakh crore (US\$ 624 billion) in 2050 compared with the current development scenario.

Sustainable Manufacturing

Sustainability is most often defined as meeting the needs of the present without compromising the ability of future generations to meet theirs. With the effects of climate change becoming more frequent and impactful, a shift in thinking about sustainability has now occurred. The earlier thinking was : We will leave this Earth as a legacy to our future generations. So we should leave it in a good condition. The current thinking however propagates : We have borrowed this Earth from our future generations. So let's not spoil a borrowed resource.

Manufacturing, including Automotive industry being a significant contributor to carbon emissions, it is incumbent upon us to make our own contribution towards mitigating climate change effects (specifically, reduction of GHG emissions).

In keeping with the above obligation, component manufacturing industry can follow sustainable practices at the factory production floors through concepts of 'Resource Efficiency' (RE) and 'Circular Economy' (CE).



Sustainable manufacturing is the creation of manufactured products through economically-sound processes that minimize negative environmental impacts while conserving energy and natural resources. Sustainable manufacturing also enhances employee, community

and product safety.

Sustainable manufacturing requires that all manufacturing organisations should aim for the following four activities that would help the environment across its entire supply chain:

- Energy use reduction
- Water use reduction
- Emissions reduction (Material use reduction, Efficiency improvement)
- Waste generation reduction

Sustainable manufacturing should integrate sustainable activities at all levels of manufacturing – product, process and system. We are familiar with the 3R as reduce, reuse and recycle that is commonly followed. This needs to be expanded to more R's, such as, reduce, reuse, recycle, recover, redesign, remanufacturing, repurpose, refurbish, refuse, etc.

Design : The reduction should always start at the source level to be more effective. Therefore, the first part of the effort should be by incorporating sustainability in the product design to account for environmental impacts over the entire life of the product. Designing products with easy disassembly help in the process of repair, reuse, repurpose and remanufacture.

Process : Manufacturing processes and systems employed should consider sustainability at every level, so that there will be comprehensive adherence to sustainability principles. All the processes used are energy efficient while maintaining requisite quality. Reduce energy intensity and emissions in all operations and the supply chain. Zero-emission (i.e. closed-loop) manufacturing views the manufacturing system as an industrial ecosystem, and requires the reuse of wastes or by-products within the manufacturing system. Manufacturing systems employed should have the flexibility for material substitution, and accommodate variations in material flows to assist in enhancing sustainability while maintaining competitiveness. To reduce the environmental impacts of manufacturing processes, it is necessary to optimise the environmental performance of the existing processes as well as develop new green processes.

Optimise the environmental performance

Most of the time, optimisation of a process is done with reference to minimising the machining time or machining cost with no consideration for the environment. The costing models considered rarely included the cost of environmental compliance.



For example, when estimating the cutting fluid cost, the following costs

are considered as part of the total machining cost:

- Cost of purchasing the cutting fluid including the cost of recharging
- Cost of maintaining the cutting fluid, cost of additives along with the associated labor cost
- Cost of makeup fluid, the cost associated with the volumetric loss of cutting fluid due to evaporation, leakage, etc.
- Cost of pump out of the used cutting fluid
- Cost of system cleaning, i.e. flushing the system after disposing of the spent cutting fluid

It is also possible to improve the efficiency of operating the machine tools by modifying the software. For example, in deep hole drilling when programmed with peck cycle, the tool is withdrawn at programmed intervals to clean the chips. This may not be efficient use of energy. It is possible in deep hole drilling; the power consumption can be reduced with an adaptive pecking cycle, which executes pecking as needed by sensing cutting load. Also, synchronisation of the spindle acceleration/deceleration with the feed system during a rapid traverse stage can reduce the energy consumption up to 10%.

Develop Green processes

In addition to improving and optimising the existing processes, it will also be important to develop new processes that use less harmful materials and generate fewer emissions which can then be considered as green processes. An example could be processes based on laser. Laser assisted manufacturing processes are likely to bring some environmental advantages by reducing emissions during manufacturing processes while extending the tool life because of its non-contact nature. Direct Metal Deposition (DMD) is an additive manufacturing process that is better for simple molds with a low solid-to-cavity volume ratio that will be less environmentally burdensome compared to CNC milling.

The selection of process parameters can have a significant influence on the consumed energy and resources. It is possible that the energy consumption for drilling and face/end milling can be reduced by setting the cutting conditions (cutting speed, feed rate and cutting depth) high, thereby shortening the machining time, yet within a value range which does not compromise tool life and surface finish.

Conclusion

There are a number of areas within manufacturing that can be benefited greatly by the adoption of sustainable manufacturing practices. The two major principles to be considered are – Resource Efficiency and Circular Economy.



Companies that commit to sustainability early will find themselves ahead of the pack. Adhering to the very strictest environmental compliance regulations rather than the most lenient, for example, can allow a company to release sustainable products two or three product cycles ahead of their competitors. This creates a very real competitive advantage, setting the manufacturer up to stay ahead of those competitors for years to come.

ACMA Sustainable Manufacturing Program



Mr. Sunil Mutha
Dy. Executive Director
ACMA

India has committed several NDCs (Nationally Determined Contributions) to reduce carbon emissions at the 2015 Paris agreement and at recent COP 26 Glasgow conference on climate change. Manufacturing, including Automotive industry being a significant contributor to carbon emissions, it is

incumbent upon us to make our own contribution to the NDCs (specifically, reduction of GHG emissions).

Greenhouse gas emissions by India are:

- Third largest in the world
- 2½ tons per person, which is half the world average.
- 7% of global emissions.
- Industry is a major contributor

In keeping with the above obligation, ACMA recently launched a Sustainable Manufacturing Program to help and guide component manufacturing industry to introduce sustainable practices at the factory production floors through concepts of 'Resource Efficiency' (RE) and 'Circular Economy' (CE). The program has support from GIZ, Germany and Adelphi as knowledge partners.

While establishing basic RE & CE practices will be a threshold performance driver, it is also proposed to include newer concepts like 'Alternative manufacturing technologies' and 'Alternative materials' that leave a lower carbon footprint. Light-weighting can also be included to drive reduction of manufacturing's carbon footprint.

The ACMA Sustainable Manufacturing Program (ACMA SMP), over a program period of 18 months, aims to usher transitions to a cleaner and sustainable future through the conservation and efficient use of energy and other resources, and innovations in processes and materials to minimise waste.

Key offerings of the 18 months' ACMA SMP:

1. Business Support:

- Resource Controlling & Monitoring Toolkits
- Self-assessment Toolkit
- Resource materials

2. Customized Support for Sustainable

Manufacturing:

- Development of Key Performance Indicators (KPIs) and monitoring framework
- Comprehensive assessment
- Hand holding for implementation of sustainable manufacturing activities
- 3. **Capacity building:** for workers / supervisors / managers to facilitate implementation of sustainable manufacturing opportunities.
- 4. **Awarding the achievers:** ACMA certificate to best performing companies for implementing sustainable practices.

Anticipated outcomes in 18 months:

- Reduce Carbon Footprint
- Reduce Greenhouse Gas Emissions
- Improve Energy efficiency – Reduce energy costs
- Water security – water neutral company
- Reduce Production costs
- Improve Gross Yield
- Reduce Consumables consumption
- Reduce Logistics cost per kg
- Atma-Nirbhar enterprise for continuous improvement

The ACMA SMP contributes to following Indian Government Goals/Initiatives:

- Atma-nirbhar Bharat (Self – Reliant India)
- Swachh Bharat
- National Clean Air Programme
- National Policy on Resource Efficiency
- National Solar Mission

The program also contributes to under-listed Sustainable Development Goals prescribed by UN:

- Goal 3 : Good health & Well being
- Goal 5 : Gender Equality
- Goal 6 : Clean water & Sanitation
- Goal 7 : Affordable & Clean Energy
- Goal 9: Industry Innovation & Infrastructure
- Goal 11: Sustainable Cities & Communities
- Goal 12: Responsible Consumption & Production
- Goal 13: Climate Actions
- Goal 15 : Life on land
- Goal 17: Partnerships for the goals



The pilot ASMP project has four companies from different product segments. We had a survey conducted in the industry to understand the understanding & needs of Resource efficiency & Circular Economy concepts followed by a Focussed group discussion in which various companies from automotive sectors joined along with people from OEM's. This discussion gave us a broader perspective of needs of trainings required to understand RE/ CE concepts towards a sustainable future.

GiZ and adelphi are in the process of developing a train the trainer program for the same and this program will be offered to the companies enrolled in ACMA Sustainable Manufacturing Program at no extra cost.

We are planning to launch the second batch of the program in the month of April, 2022 and hoping to get a large number of companies enrolling for the same.

Glimpses of ASMP Launches :



Launch at Wheels India Limited, EEPD, Sriperumbudur



Launch at Abilities India Pistons & Rings Limited, Ghaziabad



Launch at Sundaram Auto Components Limited, Hosur



Launch at Global Autotech Limited, Gr. Noida

ACMA Sustainable Manufacturing Program - with guidance from German (GIZ) experts

Sustainable manufacturing is the creation of manufactured products through economically-sound processes that minimize negative environmental impacts while conserving energy and natural resources - positively impacting people, planet and profits.

Key Offerings -

- ❖ Business Support
- ❖ Customized Support for Sustainable Manufacturing
- ❖ Capacity building
- ❖ Awarding the achievers

Outcomes of the Program-

- ❖ Reduce Carbon Footprint
- ❖ Reduce Greenhouse Gas Emissions
- ❖ Improve Energy efficiency – Reduce energy costs
- ❖ Water security – water neutral company
- ❖ Reduce Production costs
- ❖ Improve Gross Yield
- ❖ Reduce Consumables consumption
- ❖ Reduce Logistics cost per kg
- ❖ Atma-Nirbhar enterprise for continuous improvement

For more details,
please contact Ms. Tanu Ahuja at tanu.ahuja@acma.in

** Pilot project launched in October 2021, next project to be launched in January - February 2022.*



Features of the Program:

- ❖ Training by German experts
- ❖ Monthly Counsellors visits - One physical visit per month (If physical visit is not feasible then 4 hours digital review twice a month)
- ❖ Assessment and guidance visits by German experts at cluster company site (2~3 visits during program)
- ❖ Common Training Sessions / E-training sessions
- ❖ Mentor Review Meetings – 1 common review every two months
- ❖ Common virtual review sessions with German experts
- ❖ 2 Model Plant Visits (Virtual company visit for German company, Physical / virtual visit for Indian company)
- ❖ ACMA expert's inputs during common reviews
- ❖ “Access to Finance” support by German/Indian experts for specific sustainability projects



Focus group discussion, timelines



Mr. Tushar Arora
CEO

Abilities India Pistons & Rings Ltd.
(Participant in ACMA
Sustainable Manufacturing Program)

Our generation is probably the last generation who have lived their childhood without phones playing in mud; listening to stories from grandparents, learning to ride without the support wheels. But this also brings a huge

responsibility on this generation as we are the last generation with real opportunity to save the planet. If we do not act now, we will be at a point of no return towards a safe world rather only towards gradual destruction.

Human population is the one who always saves for their next generation but we overlook the consumption of resources and we have consumed more than we should to keep our future generations satisfied and safe,

The change begun with “I” and I am both happy and proud to announce that we at Abilities India Pistons & Rings Ltd. have taken our first step towards sustainability with support of ACMA with their ACMA Sustainable Manufacturing program.

Recently, we had an opportunity to connect with GIZ and Adelphi from Germany who are also the knowledge partner for the same program to discuss the various measures being taken or needed by industry towards Resource efficiency (RE) and circular economy (CE)

While it is true that lots of things have been going on consumption reduction of resources such as improving yield, light-weighting, etc.; we need more inputs on alternative materials such as bioplastics, organic coolants/ lubricants etc. in fact alternative materials should be looked for parts,

processes and packaging too such as reusable and sustainable packaging.

The practices towards sustainable manufacturing or RE/ CE must start with the design stage only but most of the components manufacturers are in the category of “built to print” rather than “design to build” and in this case support from OEMs is required. Similarly to use alternative materials such as bio plastics, OEM support is needed for confirming the scope and applicability of the same.

Industry also needs to reduce the process waste and to recycle the waste. We may look for measures to recycle the waste ourselves or may connect with right suppliers who take care of waste from sustainability point of view.

There are lots of schemes and partners available who finance projects on RE/ CE at very low interest rates. We should know how to identify a good project and how to make a good project report to avail benefits of the same.

To see the progress, we should create methods to quantify the RE measures taken and how to measure the effectiveness as well. Last but not the least, understanding and doing Life cycle assessment of products.

I am glad that all the above points of Resource efficiency plus the concepts of Circular economy will be taken under the Train the Trainer program by Adelphi, Germany for ACMA Sustainable manufacturing Program.

Looking forward to contributing towards a sustainable future.

Steps to Sustainability at Wheels India Limited



Mr. Swaminathan
Vice President
Wheels India Limited, EEPD
(Participant in ACMA
Sustainable Manufacturing Program)

Views on Sustainability / RE / CE :

In present scenario if John. F. Kennedy had been alive , he would have quoted this, "Ask not what environment does for you, ask what you can do for environment?". We at

Wheels India Limited with our utmost potential trying best to achieve sustainability in our processes, as we aim to provide a safe and clean environment to our upcoming generations. Our goals for sustainability are long and involve all the minds from the organisation.

Measures taken on RE / CE :

As a first step we started collecting data for carbon footprints of each and every activity which we do towards manufacturing a product. Once we have the data in our hand we will be able to focus on which areas to attack first.



Future proposals for RE/CE :

Steel is our major RM. So we are in the process of discussion with Steel Mills for optimising the Input RM sizes by which we can reduce the Input RM

wastage to a greater extent. We are also planning to shift to Renewable sources instead State Board Electricity.



Views on ACMA and ACMA Sustainable Manufacturing program :

Sustainability is a new concept for most of the developing economies in the world. Lack of alternative strategies, self-discipline as well as guidance also contribute to the above point. Hence we hope to get good guidance from ACMA to achieve the goals of sustainability.



Towards a Sustainable Future



Dr. Navnath Tarle
COO / EVP, Director-Board
Global Autotech Limited
(Participant in ACMA
Sustainable Manufacturing Program)

We at globalauto believe in continuous improvement. We have been adopting new technologies and improving processes as per the need of the hour or customer requirements.

We have a lot of focus on Lean manufacturing production system but recently we have attached Lean manufacturing with the concept of reduce, reuse and recycle. Reduction in carbon emission is both a technical need and a moral responsibility.

We have started mapping our carbon footprint after joining ACMA Sustainable Manufacturing Program.

The month of November which is celebrated as Quality month in our industry, we focused our activities on Sustainable manufacturing. Employees come up with good posters and slogans to show their concern about the global warming and enthusiasm about the program.

Although few of the projects are long term such as coming to 100 % renewable energy consumption, we have started working on low hanging fruits. Few projects have been identified to reduce specific energy consumption such as productivity improvement and elimination of some processes. Use of compressed air had been confined to only value-added processes.

We already implemented Roof Top solar capacity worth of 1.3 MW. Which is catering to our 15% of energy consumption.

We are also pursuing captive solar energy proposal to increase our renewable energy usage

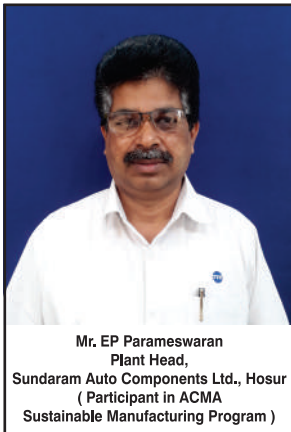
for sustainability. We have implemented green score card as KPI for each plant Mfg. to measure & improve on our overall environment commitment. Our focus is also to achieve Zero defect in product manufacturing which not only led to high customer satisfaction but also reduce the overall resource consumption.

Some measures have also been taken to reduce flashes and containment of material spillage in casting and fettling processes.

I believe with Train the Trainer Program of ACMA in association with GIZ and Adelphi will bring in new learnings and concepts of Resource Efficiency and Circular Economy. Looking forward to a greener future.



Sustainability Development



Views on sustainability

Sustainability is a key attribute of our Company Vision. At Sundaram Auto Components Limited (SACL) we strongly believe in sustainability. We define sustainability as 3 dimensions – sustainable to the environment, sustainable business and sustainable product quality. This also

means that sustainability helps us to meet our own needs without compromising the ability of future generations to meet their needs or compromising on customer needs.

India has already committed itself to achieve the targets towards sustainability. As a TVS group company, we are aligned to contribute towards this national commitment.

Our core strength is our eco system we have developed through our practices which is demonstrated by our employees. As a TQM company, Total Employee Involvement (TEI) forms the cornerstone of our business.

Measures taken on Renewable Energy and Circular economy.

As a responsible corporate, we are focused on sustainable manufacturing, through environmentally sound processes which are at the same time economically sustainable.

We are certified under Integrated Management System to ISO 14001 (Environment Management System) and ISO 45001 (Occupational Health & Safety Management System) since 2005.

We have implemented various projects to reduce our carbon footprint through Energy consumption reduction, water conservation, sourcing of energy through renewable sources and green cover improvement.

To enhance our processes towards sustainability, we

have joined the Sustainable manufacturing program by ACMA in 2021-22.

Renewable Energy

At our Hosur plant, 95% of the energy used is generated from renewable power sources from wind mill and roof top solar installations. Energy saving measures are identified as policy targets every year and actions are derived to reduce energy consumption across the company. SACL has invested in group captive mode to the tune of 6 MW wind power and roof top solar power of 1 MW. These initiatives of renewable energy resulted in CO2 emissions reduction of about 10,500 tons during 2020-21.

Circular economy

At SACL, sustainable circular economy is emphasized by designing and promoting processes and products that last and that can be reused, repaired and remanufactured. This is being done without affecting the functional value of products and customer requirements. We reuse raw materials, at levels acceptable to customers and compatible to the designed processes. We use bins made of recycled materials for parts storage and transportation. We look at every opportunity to convert one time used packing material to recycling type of packaging system.

All employees are part of waste elimination initiatives through suggestion scheme and Quality Control Circle activities. Management focus is always demonstrated and our TEI theme for year 2021-22 is focusing on “waste elimination”

Energy efficiency

Buildings are designed with natural lightings and ventilation with daylight harvesting to conserve energy. Conversion of LED lamps in the plants has reduced lighting power consumption to 30%. Occupancy sensors with auto cut-off for fans and lighting, the auto cut-off for hydraulic motors and compressed air are implemented across the company and have resulted in energy savings. Equipment are key energy consuming areas for us. Therefore, our major energy saving initiatives are a resultant of converting conventional motors to servo motors and use of variable frequency

drives for existing machines. We also evaluate energy efficiency while adding a new equipment in our existing portfolio. These efforts have helped us to reduce energy consumption by 56% energy in last 5 years.

Waste management

To conserve water consumption in canteen, the company has introduced dish washing system, which resulted in water saving by up to 20%. Automated washing machines have eliminated the manual washing of vegetables and rice thus resulting in water consumption reduction about 45%. The industrial effluent is recycled through Reverse Osmosis and reused back in the process. The treated sewage water is used for gardening within the premises and for washrooms. There has been a 47% reduction in specific freshwater consumption when compared to 2011-12 in our manufacturing processes.

In process design, efforts have been taken to minimise the generation of waste by introduction of clean technologies. Continuous process optimization are being done in painting process by using DOE techniques and jig density optimization. Painters are trained in skill development facility to improve their painting skills. These has improved painting application, reducing wastage of paint from over spray. In Hosur plant this has resulted in paint wastage reduction by about 20%. This also improved the plant productivity and energy consumption reduction.

The company ensures that the used thinner and flushed out paint are distilled out and reused for flushing purpose. The solid wastes which are hazardous in nature viz., chemical sludge / paint sludge are used as raw material in Cement Industry [Co-processing or Co-incineration].

Sustainable Sourcing

SACL has taken many prudent initiatives to ensure sustainable sourcing. Towards localization of sourcing, the company encourages suppliers to set up manufacturing facilities closer to the company's plant locations. The suppliers in turn source their requirements from smaller producers located in nearby areas. The company has migrated to internationally recognized Automotive Quality Management System – IATF 16949:2016. Additionally, the company has

encouraged its suppliers to get IATF certification and ISO14001 certification. This will support suppliers to improve their sustainability and robustness.

Biodiversity

We have consciously set aside and developed 10 acres of our plant as green cover. We have a group of conservationists who work with us closely to restore the biodiversity. In all, 2 farm ponds support about 68 species of birds and animals. Additionally, there are approximately 140 different varieties of trees. We have established butterfly garden with more than 45 varieties of butterflies. This eco-system also attracts migratory birds. The environment is one of harmony with nature.

CSR activities

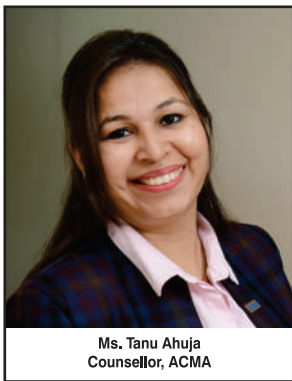
For over 20 years, Srinivasan Services Trust (SST), the social arm of SACL and other TVS group of companies has been working closely with local communities to encourage wide range of conservation measures. These initiatives include creating awareness about the challenges of climate change in rural communities, teaching farmers better methods of drip irrigation to save water, encouraging planting of trees in denuded patches, teaching households in villages about waste segregation and better sewage disposal, improving green cover in identified areas with support from government agencies.

Activities planned in the near future

- Resources must be used judiciously. This includes improving efficiency to minimize wastage and re-use waste. Technological upgradation needed to achieve such a goal.
- Spread awareness in the society to use renewable resources and minimize usage of non-renewable resources.
- Supplier localization and education towards sustainability. This will help to reduce carbon footprint generated due to transportation as well as make the supplier more sustainable.

With the support of ACMA we are confident of accelerating our initiatives on sustainability development across all our plants focusing to deliver organisation's vision, contributing to nation's sustainability mission and preserving our nature for the future generations.

Simple Approach to Sustainable Manufacturing



Ms. Tanu Ahuja
Counsellor, ACMA

For many years, the main environmental focus with regards to manufacturing was pollution abatement—preventing the pollution that has been created from getting into the environment. The attention has shifted to cleaner production and pollution prevention. With cleaner production, there are many opportunities for

cost savings and other financial benefits for companies.

It can be overwhelming to think about all the work that would be required to make your company more sustainable. However, there is a spectrum of efforts you can make towards sustainable manufacturing.

Sustainable Manufacturing is “a systematic approach to eliminating waste by optimizing use and selection of resources and technologies, thereby lessening the impact on the environment.”

- Sustainable manufacturing focuses on both how the product is made as well as the product's attributes. This includes the inputs, the manufacturing processes, and the product's design.
- Sustainable manufacturing includes things such as making products using less energy and materials, producing less waste, and using fewer hazardous materials as well as products that have greener attributes such as recyclability or lower energy use.
- Sustainable manufacturing practices can range from very simple process improvements to large investments in new technologies and product redesign



Housekeeping

Housekeeping is the simplest method of implementing sustainable manufacturing practices. Housekeeping can be as simple as better inventory

management, better monitoring and scheduling of the production process, reducing loss from leaks, spillage, and drag-out, and making sure equipment is maintained properly.



It can also involve training your employees about sustainable manufacturing for example, correcting leakages, containment of spillage of material, etc.



Process Optimization

Process optimization involves changing your manufacturing process to minimize waste, conserve raw materials, and capture and reuse waste materials. There may be simple things you can do to change your production process to become more sustainable such as process integration

Maybe you can collect metal shavings for recycling, change the steps in a painting process to use less paint, change the fixture design to hold more number of components per cycle, or rearrange your machines to minimize movement.

Raw Material Substitution

Although it is challenging, you may be able to find ways to substitute greener materials for hazardous materials, chemicals with high environmental or health impacts, materials that are non-renewable, or those that are scarce.



You may also be able to find ways to eliminate materials that are used during your production process but don't remain in the final product. For Example: use water-based solvents rather than chemical solvents.

If the materials you are eliminating are considered hazardous, this can help you avoid regulatory costs associated with storage and disposal of materials.

New Technologies

Utilizing new technologies involves incorporating more environmentally responsible technologies and equipment into your production process.

This can involve capital investments to purchase equipment that uses less energy or materials or alternative energy production.

For example, you might invest in more energy-efficient production equipment, systems that reuse heat and energy, or more advanced water treatment systems.



New Product Design

Design your product to be greener from the ground up.

This concept touches on all of the previous sustainable manufacturing concepts. It can even include redesign involving rethinking how your product is used, and may involve:

- Using recycled materials instead of new ones
- Using renewable materials
- Designing for easy disassembly, for recycling, or for remanufacturing
- Designing for improved performance
- Using less packaging and more recycled or recyclable packaging

Green product design can have the same benefits as other aspects of sustainable manufacturing, including improved resource efficiency

Logistics

Reduce costs by achieving efficient route and delivery networks

- Getting shipments to customers promptly
- Keeping delivery vehicles full
- Buying inexpensive/ green fuel
- Maintain PUC of vehicles



Simply following “clean” in lean practices can save up to 30 % of resources in your company

Defective Components	•Energy & other resources are consumed to make the defective parts •Defective parts needs disposing off
Over-Production	•Material & Energy are used to make unnecessary product •The components may spoil during storage or become obsolete
Waiting	•Material may spoil during waiting •Downtime watses energy for cooling/ heating/ lighting
Unnecessary transportation	Energy is used to transport material and produces emissions Excess transportation may damage the product
Unnecessary Processing	More energy is consumed Tool life decreases More primary & Secondary material is consumed

While we take care of these things, it is also important to mention about environmental waste due to manufacturing

Environmental waste is described as “any unnecessary use of resources or a substance released into the air, water, or land that could harm human health or the environment.”

Environmental Waste includes:

- Any energy, water, or other materials used that are more than what is really needed to meet the customer's needs
- Hazardous materials and substances
- Pollutants, residuals, and other material wastes released into the environment (air emissions, wastewater discharges, hazardous wastes, solid wastes)

As mentioned previously, adding “clean” to lean can result in significantly greater returns for your company.



Energy Management



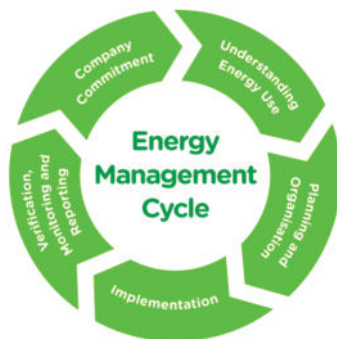
“Energy and Raw material” these are the two elements which contribute most to the cost factor.

Energy management

Energy management includes planning and operation of energy production and energy consumption units as well as energy distribution and

storage. Objectives are resource conservation, climate protection and cost savings, while the users have permanent access to the energy they need.

To make things simple, we can define Energy management as a process that involves optimization of energy use for the best possible outcomes and taking steps for its conservation. It also includes planning related to the production of energy and its storage for future usage. So, the ultimate aim of this process is not only to save the cost but also to achieve complete environmental sustainability.



Why is Energy Management Important ?

1 KWH of electricity generates 0.85 kg of CO₂ that contributes to GHG emission. Energy management is today's need of the hour. It aims to conserve energy turning into cost savings.

There are following reasons to show its importance-

- Energy Management saves costs
- Reduces the risk of energy scarcity
- To reduce greenhouse gas emissions
- To maintain energy price
- To meet statutory compliance
- Managing energy also saves water

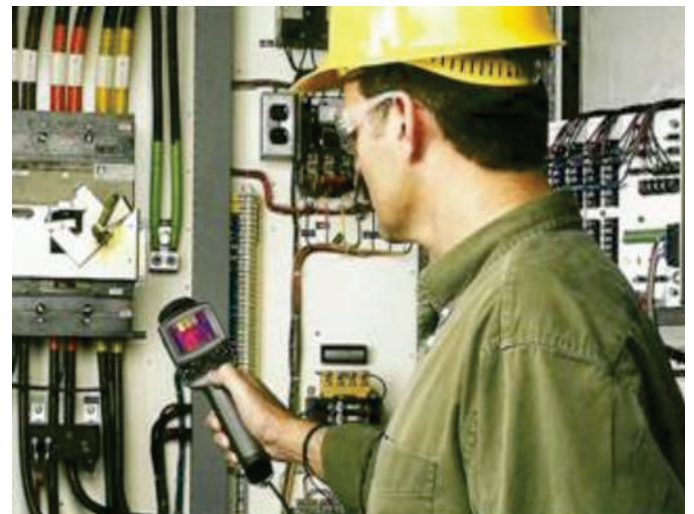


You can't manage what you don't measure.

We should start measuring the electricity consumption of articles/equipment such as machines, chillers, air compressors, boilers, lightings, etc.

Some of the measuring equipment are given below -

Infrared measurement equipment



Metering devices



Flow meter



The bucket engineer



Benefits of energy monitoring

- Greater awareness of energy consumption
- Better understanding of energy use behavior
- Better understanding of equipment efficiency
- Better control and management of appliances and lighting
- Better basis for peak load management
- Better comparison and benchmarking, creating best case “use scenarios” for replication

This makes monitoring the basis for implementation of energy and cost saving measures.

To improve energy efficiency for the above-mentioned articles we should start monitoring energy leakages.

Energy Efficiency in Specific Areas

1. Motor–

Motor efficiency and Energy can be saved by Monitoring

- Motor losses
- Motors loading
- Motor sizing

- Power factor Improvement
- Power quality (Voltage and current balancing)
- Repairing/Rewinding
- Variable Speed Operation

2. Air Compressor –

- Avoid nonsense and dangerous use
- Check for leakages
- Ensure it is a closed loop system
- Avoid too many angles / turns in the pipeline
- Minimize the diameter changes in the pipeline

3. Heat Recovery –

- “Dumped” heat can be reused
- “Value” (quality) is more important than quantity
- Waste heat can be used as fuel
- Avoid heat loss in flue gases, vapor streams, cooling water
- Avoid convective & radiant heat lost from exterior of equipment
- Avoid heat loss that is stored in products leaving the process
- Have proper insulation in boilers, furnaces etc.
- Latent heat can be recovered from vapor / steam

4. Cooling Towers –

- Follow manufacturer's recommended clearances around cooling towers and relocate or modify structures that interfere with the air intake or exhaust.
- Optimize cooling tower fan blade angle on a seasonal and/or load basis
- Periodically clean plugged cooling tower distribution nozzles
- Consider energy efficient FRP blade adoption for fan energy savings
- Control cooling tower fans based on leaving water temperatures especially in case of small units
- Install interlocks to prevent fan operation when there is no water flow

5. Lightings –

- Use of LED lamps for indicating lamps will reduce the energy consumption.
- Use of compact fluorescent lamps in place of incandescent lamps, reduce the lighting energy by 70%
- Use of mirror optic fluorescent lamps increases the lighting level considerably.
- As the lighting level is inversely proportional to square of the distance, optimizing the height of lamp will aid in reduction of lighting energy.
- Installation of auto cut-off switch to put off lights during lunch hours at the office buildings will reduce the lighting energy.

7th ACMA Technology Summit & ACMA Atmanirbhar Excellence Awards 2021 (Hybrid)

Theme-'Advanced Automotive Technologies for Creating a Globally Competitive Automotive Value Chain in India'

On behalf of the Automotive Component Manufacturers Association of India (ACMA), the apex body representing the interest of the Indian Auto Component Industry. ACMA is pleased to inform you that the **7th ACMA Technology Summit & ACMA Atmanirbhar Excellence Awards 2021**, the most awaited event of the automotive industry, is scheduled for Friday, 25th February, 2022 at Hotel J W Marriott, Aero City, New Delhi. The event will be held in Hybrid Mode (Virtual + Physical).

In accordance with our national priorities of energy security, climate change & environment, the recent Production Linked Incentive Scheme (PLI) for the Auto/Auto Components industry & for Battery/Advanced Chemistry Cell (ACC) announced by the Government of India envision the creation of an 'Atmanirbhar' (self-reliant), globally competitive and future ready Indian automotive sector. Thrust on incentivising new age technologies will facilitate creation of a state-of-the-art automotive value chain in the country and give a much-needed impetus to manufacturing of cutting-edge automotive products in India.

It is in this backdrop, the 7th ACMA Technology Summit is aimed at creating a platform to gain insights on advanced technologies and capabilities that will catapult our industry into the league of globally competitive industries and has been aptly themed as '**Advanced Automotive Technologies for Creating a Globally Competitive Automotive Value Chain in India**'.

The salient features of the event include:

- Deep insights from pioneers in the Auto sector, renowned thought leaders and policy makers on Automotive Technologies of the Future;
- Power packed panel discussions on creating sustainable and globally competitive automotive value chain through advanced automotive technologies;
- Celebrating success and acknowledging winners of the ACMA Atmanirbhar Excellence Awards 2021
- Networking opportunities with the best minds and entrepreneurs in the automotive industry
- Opportunities for promotional activities and branding
- Announcement of 1st Certification of ACMA Capability Maturity Model (ACMM)
- Over 1,500 delegates expected to get connected (Virtual + Physical) from business and technology domain

Use this link <https://forms.gle/57keSQx5D7MPMXHB8> for delegates registration.

Do kindly respond to us at the earliest for blocking your seats. Confirmation for paid delegates will be made through registration form.

1. Physical Participation: Registration fee per person – INR 7000/- plus GST (Limited seats available – 100 registrations will be accepted on the first come first serve basis)

2. Virtual Participation: Registration fee per person - INR 2000/- plus GST.

Note: 10% extra charges on registration fee will apply for ACMA non-Members.

Details of sponsorship/branding options is mentioned below. The delegate registration form / sponsorship registration form or any other details related Summit may be obtained from **Ms. Raginee Singh at +91 9999197693 or write her at raginee.singh@acma.in.**

ACMA is eagerly looking forward to your presence and participation at the 7th ACMA Technology Summit and ACMA Atmanirbhar Excellence Awards 2021.

ACMA Centre of Excellence Programs

An initiative of the ACMA, the Centre of Excellence has been entirely developed by Automotive Component Manufacturers Association of India. The state-of-the-art facility i.e a Mechatronics lab and another Design lab. The two labs were inaugurated in 2018 for use by ACMA members at its Centre of Excellence (ACoE) – SAKSHAM which is located inside the extended campus of Indian institute of Technology, Delhi situated in Sonapat (Haryana).

ACMA Centre of Excellence is front runner in leveraging world class technology and aligning delivering of training in the field of future technology and processes to drive business value and bring about tangible outcomes.

The ACMA Centre for Excellence set-up at a total cost of approx. Rs. 8 crore, the **Mechatronics lab** is focused on imparting skills in the domain of automation and Modular Production Systems (MPS) while the **Design lab** aims to enable auto component MSMEs for designing and developing new products.

The Mechatronics Lab of ACoE impart skills and knowledge on Modular Automation Production Systems ranging from basics of low-cost automation, to PLC (Program & Logic Control) to SCADA (Supervisory Control & Data Acquisition) systems. The participants are trained on the Modular Production Systems (MPS) which gives trainees insights into industrial production process. **The mechatronic lab includes work stations for training in Servo Motor Drive Systems Sensors for “object detection”, PLC & Human Machine Interface (HMI), Electro Hydraulic and Basic & Advance Electro-pneumatic. It also has a Six-Station MPS, a Robot Station and an Industry 4.0 station.**

The **Design Lab** of the centre aims at facilitating the auto component industry, especially Tier-2s and Tier-3s, in designing and developing new products, the Design lab is equipped with 16 high-end Workstations, a 3D Scanner and Design Software. The Dassault 3-D Experience Software, the most advanced and widely used design software includes modules for New Product Development, Tooling Designing and Reverse Engineering.

Whilst the Centre of Excellence, since its inception used for domestic short-term skilling and capability building programs as well as international training vents where altogether more than 15000+ industry professionals are trained.

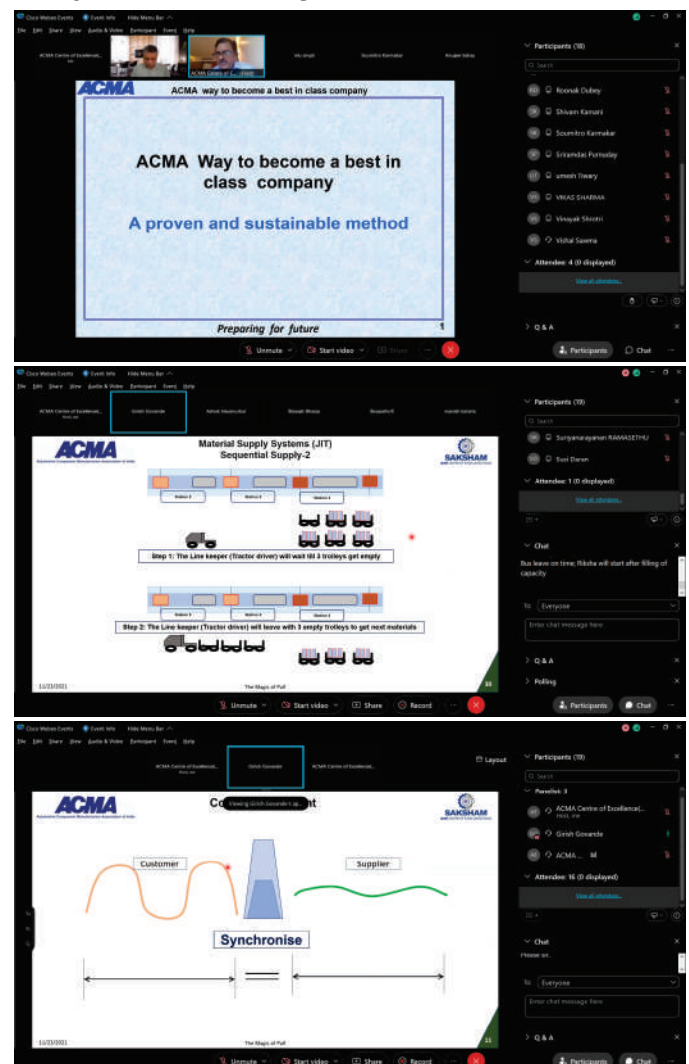
REASON TO GET ENROLLED WITH ACoE

- Unmatched programs on future technologies
- ACMA's In- house pool of Industry veterans
- Tie ups with unmatched training providers across the world
- Best-in-class infrastructure and state of art training machines/ hardware and software's
- Knowledge partnered with world renowned organization
- Cutting edge & customize solutions through various training and hand-holding
- Believes in delivering Future-ready talent to the industry
- Convenience to enrol for programs and easy to pay
- Extremely supportive team to assist.

Trainings held in ACoE

- Learn to implement KANBAN on 23rd Nov. 2021
- A to Z of Manufacturing - Creating Champions on 24th Nov. 2021

Glimpses of ACoE Programs





Mr. Urvaksh Aga
(GSSG CEO)

Message from CEO

Low Cost Automation was an opportunity to advance with the present industry standards through sharing the knowledge, best practices, best ideas, technology and learning in the areas of Value Stream Mapping, Cell design & Flow Manufacturing, Advance 5SX6M. The cell redesign, Value stream mapping implementation, Low Cost Automation concepts are the major break even achievements of the program. Upgrade the work standards with updated knowledge with ACMA LCA project.

Feedback from Company MD / Project CEO

Sr. No.	Particulars	Score (on a scale of 10)
1	Counselor Visits	10
2	Training hours provided	10
3	Training topics coverage	10
4	Delivery as per plan (roadmap)	10
5	Learning from MRMs	9
6	Learning from model plant visits	10
Total score (out of 60)		59
Score in % (Out of 100)		98%



1. Manually sleeve insert & rubber strip take more time
2. Both operation done at different location handling time is more



1. Manually sleeve insert by on designed rod
2. Made one fixture with merge 2 operations



1. Manual setting of length
2. Length variation
3. Customer complaints
4. Productivity- 6000 parts / SHIFT with 2 manpower



1. Single shot cutting
2. Length variation problem is solved
3. Productivity by - 6600 parts/SHIFT With 1 manpower
4. 'Zero - Customer complaints.

Team



Mr. Sunil Mutha
Dy. Executive Director
(Project Mentor)



Mr. S. B. Dokey
Expert Cluster Program
(Project Counselor)



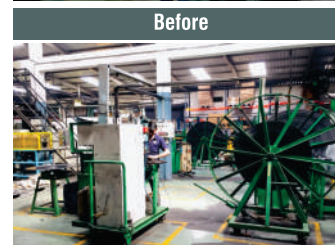
Mr. Rajesh Chauhan
Plant Head
(Project CEO)

Net Savings in Lacs

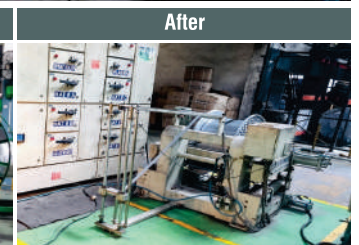
Parameters	Savings during cluster
Red Tag	2.57
Energy / Toolings	9.81
Kaizen	1.42
QCC	8.67
Productivity	44.35
Quality	10.20
Total Savings in Lacs	77.02



LCA MACHINE DESIGNED



1. Line stoppages and productivity loss
2. Rejection generated and man hours loss



1. Continuous line run
2. Eliminated material loss & very less human intervention

ACMA Programs on offer - 2022

Futuristic / Upcoming ACMA Programs

S. No.	Cluster / Project Name
1	Industry 4.0 / AI
2	Special Program on Robotics & Automation - Maintainability & Optimization
3	Enhancing Innovation
4	Electric Vehicle Support Program

List of ACMA Cluster Programs

S. No.	Cluster / Project Name
1	Advance Cluster - Lean
2	Engineering Excellence Cluster
3	Zero Defect Cluster
4	New Product Development Foundation Cluster
5	New Product Development Design Cluster
6	Human Resource Cluster
7	Zero Defect Plus Cluster - Zero defect in NPD process
8	Tool Engineering Cluster
9	Sustainable Manufacturing Cluster - Carbon Footprint reduction
10	BFZ SINADE - TVET Skill Development Cluster
11	Low Cost Automation Cluster
12	Rudimentary Framework Program

List of ACMA Projects

S. No.	Cluster / Project Name
1	Daily work Management Program
2	Deskilling of Manufacturing Activities
3	Special Lean Process Engineering for Polymer Industries
4	Special Lean Process Engineering for Forging Industries
5	Special Lean Process Engineering for Foundry Industries
6	Special Lean Process Engineering for Fabrication Industries
7	Uptime Improvement
8	Lean implementation Program
9	Special Projects on Zero Defect
10	Asset Turn Ratio Improvement Project
11	Productivity Improvement Project
12	Quality Adherence Project
13	Breakeven Point Reduction Program
14	New Plant Initiation Project
15	Material Flow Cost Accounting - MFCA program
16	Management By Objective - Improvement Project
17	Paint shop Optimisation & Modernization Project
18	Through Put Rate Improvements Project - Bottleneck Management
19	Working Capital Improvement Project
20	Performance Enhancement Project
21	Employee Participation, Involvement and Engagement Project
22	Manufacturing and Process Engineering Project
23	Safe Working Culture development program
24	Engineering Improvement Project
25	Inventory Improvement Project

Recent Launches of ACMA - UNIDO Programs

- Launch in 7 companies of "IP RINGS" was done at Chennai on 9th September 2021.
- Program for "JK Fenner HYD -2 Suppliers" was started at Hyderabad on 21st September 2021 for 13 suppliers companies.
- The Program was launched at the company M/s. Sandhu Enterprises at Rudrapur on 1st October 2021.
- The Program was launched at the company "M/s. Surin Auto" at Alwar, Rajasthan on 10th October 2021.
- The suppliers of "Jumps Auto Industries Ltd." were launched at the company "M/s. Barkat Udyog" at Faridabad on 16th November 2021.
- The suppliers of "Jumps Auto Industries Ltd." were launched at the company "M/s. G R Industries" at Faridabad on 3rd Dec 2021.

ACMA Lean Process Engineering Program for Fabrication Industry

Duration : 18 Months

This Program primarily focuses on applying concepts of Lean Manufacturing along with Fabrication Engineering.

Objectives-

- * Face the future challenges & grab the opportunities to become globally competitive.
- * Sustain the growth of the organisation & retain profitability.
- * Respond to favourable and unfavourable market conditions competitively.
- * Provide better service to customers in terms of QCD.
- * Improve technological, managerial and operational capabilities through building competence in people & creating World Class Workplace.

Topics to be covered-

- * Total Employee Involvement & Basics of Fabrication
- * Welding Technology (WT)
- * Lean Fixture / Tool Engineering
- * Product Quality (PQ)
- * Process Change Configuration (PCC)
- * Re-Training

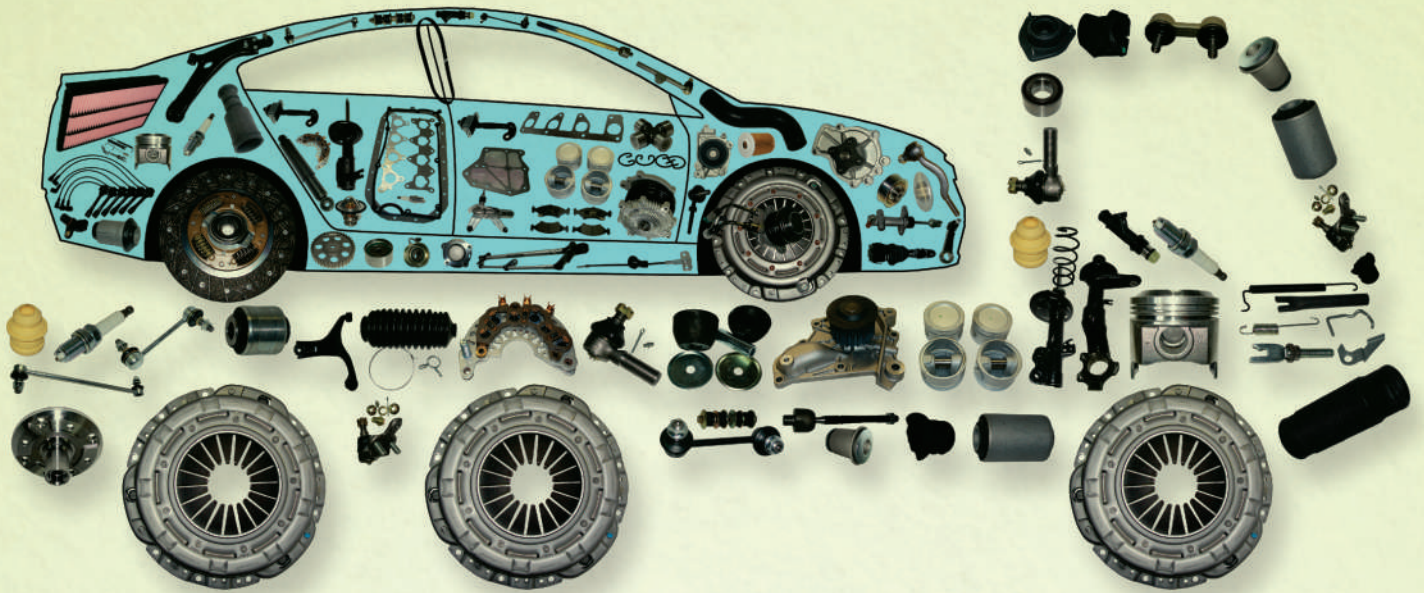
Features of the program:

- * Training
- * Hand Holding
- * Guidance and Mentoring



**'For more details, please contact
Ms. Sangeeta Sharma at sangeeta.sharma@acma.in'**

Supply Chain & Logistics Leaders in Indian Automotive Industry



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