



Environment sustainability

The environmental benefits driven from Kaizen and lean strategies are quite significant. It is a TKM goal to maximize the environmental benefits of lean by raising the awareness of the linkage between lean and the environment.

Toyota Kirloskar Motor has focused on achieving harmony between its manufacturing activities and the environment, based on the concept of 'A plant that optimally utilizes natural resources while operating in harmony with the natural environment.'

OUR ENVIRONMENT

SIGNIFICANT ACHIEVEMENTS OF ENVIRONMENT PERFORMANCE DURING THE REPORTING CYCLE

1. 100% suppliers certified for ISO 14001
2. 67% of Dealerships are ISO 14001 certified
3. Achieved 100% compliance to Toyota Global-EMS & risk minimization standards.
4. Reduction of 60% freshwater for production by enhancing recycling
5. Overall 3% reduction in energy consumption & 2.4 % reduction of logistics CO2 emissions.
6. 24.95 % hazardous waste generation.
7. 30 Acres Green belt development in by planting 47500 saplings of 51 species
8. Shared TKM's Environment best practices to 70 participants & 31 industries.
9. Environment awareness programs at 15 schools covering 1500 students
10. Received CII- ITC sustainability awards for 4th consecutive year.

VERSATILE BACKYARD DEVELOPED BY TEAM MEMBERS:

Backyard / back garden is existing in India from ancient times to the present. The concept of backyards was initially restricted only to households. This was later adopted on a large scale. TKM brought in this concept to revive team members knowledge about the advantages of growing their own vegetables that can be utilized in their kitchens and which also acts like stress buster from the daily busy routine. This article deals with success story of backyard cultivated by enthusiastic team members at TKM.

With the intension of rejuvenating the knowledge on ancient medicinal herbs &

its importance, volunteer group of team members started developing backyard in available fallow land adjacent to production areas. Various vegetables, tumors, fruits and medicinal plants are grown in this patch of land such as carrot, radish, tomatoes, papayas, bananas, pomegranate & medicinal herbs. Team members utilized their break time to cultivate these plants. The vegetables & fruits grown are distributed among the team members.

Saplings of medicinal herbs also produced in this area and any member interested in doing the same activity at their houses is supported by giving free saplings. TKM plans on expanding this initiative in a large scale.



Fruit Garden at TKM



Herbal Plant sapling distribution



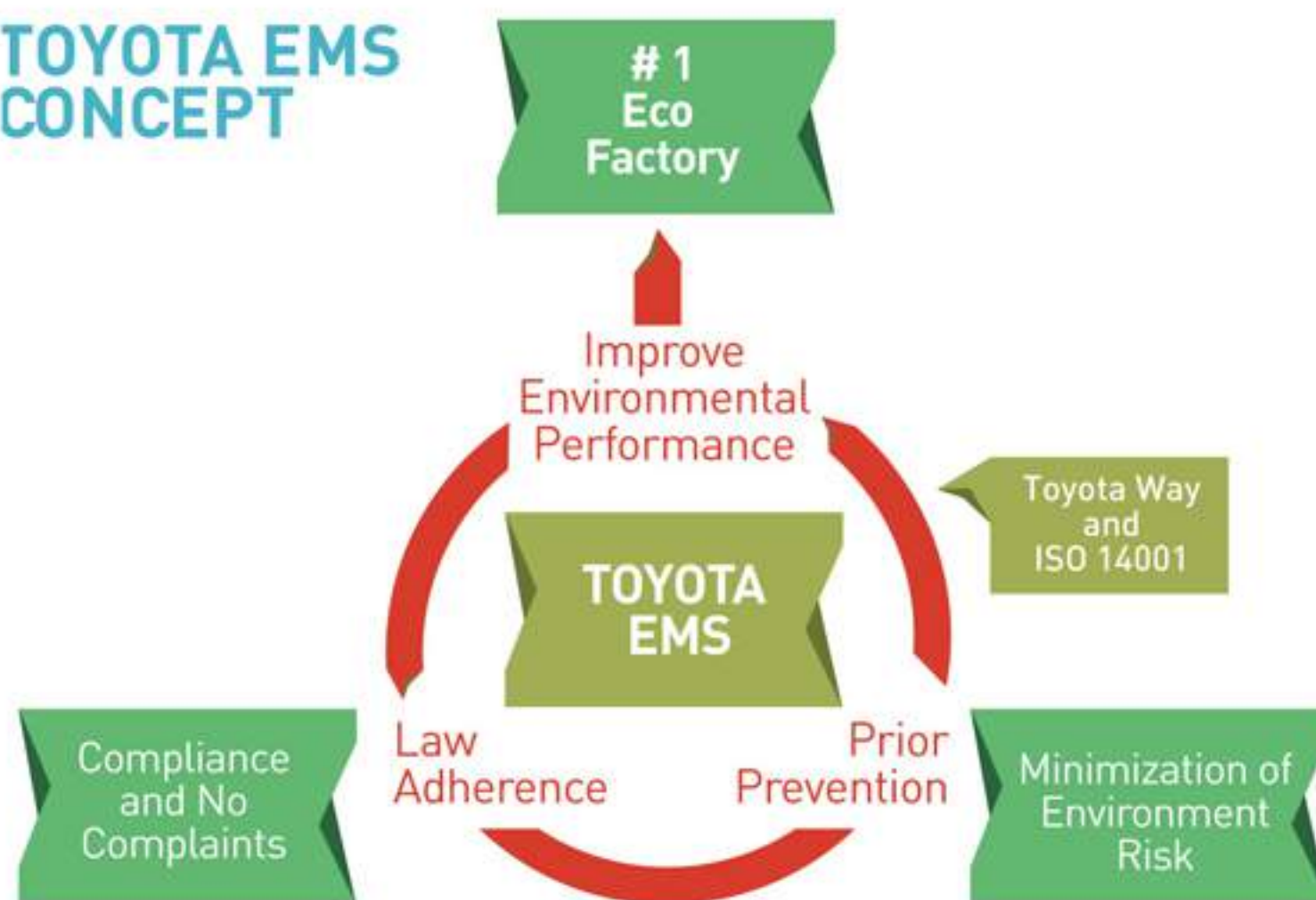
SAKURA PLANTATION: NAKA-VANA

It was one of the highlights of this year. As it was our Managing Director's dream to have a lane of Sakura tree (Cherry Blossom Tree) inside the TKM campus. Species *Tabebuia avellanedae* (Pink Trumpet) was selected to create the Sakura lane.

Plantation event was organized involving TKM's Top management where about 157 Pink Trumpet saplings were planted and this area is now known as NAKA-VANA named after Hiroshi Nakagawa, Managing Director TKM.

ENVIRONMENT SUSTAINABILITY

TOYOTA EMS CONCEPT



TOYOTA EMS CONCEPT

Toyota EMS is designed to make Toyota more Eco-friendly company. Toyota has established a Consolidated Environmental Management System (EMS) at all its affiliates including TKM.

EMS forms the backbone of all the commitment towards reducing environment impact.

TKM is one among top 4 Asia region affiliates out of 19 Asia pacific Toyota affiliates, who achieved 100% conformance to Global EMS standards. In order to achieve the objectives of environmental policy, the EMS used effectively at TKM.

ISO-14001 CERTIFICATION

TKM has been certified with ISO-14001 since 2001, through the certification agency called AJA (Anglo-Japanese American) Registrars, Thailand. The highest degree of abidance to EMS (ISO 14001:2004) by TKM including its regional facilities have been recognized and awarded with Zero Non Conformance during the year 2012.



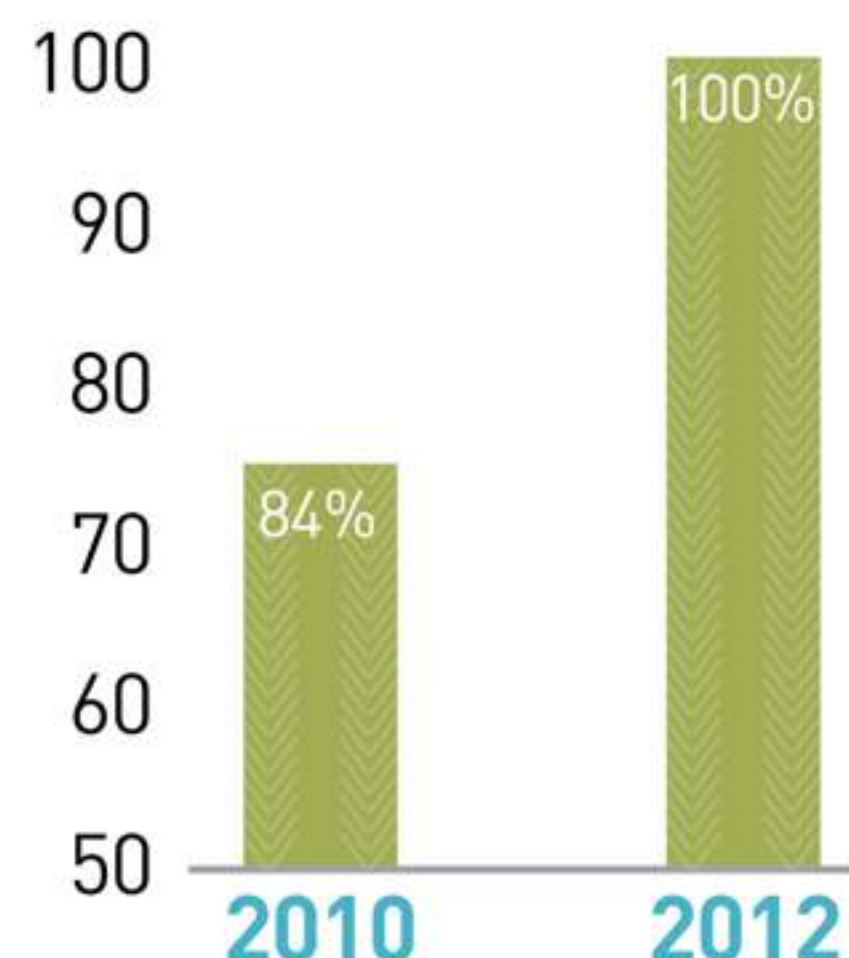
TOYOTA GLOBAL EMS

Toyota based on experience, considering issues of environmental concerns and requirements of all the affiliates formulated the Toyota Global EMS. Whereas setting up of ISO14001 system is the basis for Global EMS, achieving Toyota global requirements is the next step.

During the FY 2010 TMAP has evaluated TKM based on Global EMS standards & awarded 84% conformance. Based on results & gap analysis, the TKM Environment team with the continued support and efforts of all stakeholders improved & reconfirmed the EMS system in the year 2011.

During FY 2012 the team of expert auditors from TMAP-EM audited & TKM achieved 100% conformance.

Compliance percentage



Performance Status explanation to GEMS auditors

Genchi confirmation by GEMS auditors

TKM ENVIRONMENT POLICY

As a good corporate citizen, we are committed towards the protection of the environment by minimizing impact on environment through pollution prevention, conservation of natural resources and continual improvement. To support this commitment, our policy is to:

- Proactively **promote environmental awareness** and knowledge among Team Members through continual education and job specific training
- **Ensure compliance** with legal as well as other requirements to which our company subscribes
- Establish and review environmental objectives and targets annually to ensure better **environmental performance through proactive continual improvement activities**
- Establish programmes and **conserve energy, natural resources, flora, fauna and build a green environment**, within and surroundings as a part of our policy

We recognize the importance of continual improvement in environment performance while creating economic growth and maintaining competitive advantage. We are committed to this philosophy and it is our hope that, you, our Team Members, suppliers, customers, dealers and neighbourhood share our commitment in preserving a very valuable resource – OUR ENVIRONMENT.

THE LEAN TEAM: ENVIRONMENT COMMITTEE AT TKM

Lean manufacturing involves a fundamental paradigm shift from conventional "batch and queue" mass production to product-aligned "one-piece flow" pull production. This shift requires highly controlled processes operated in a well maintained, ordered environment. This is brought about by the most efficient Lean Committee.

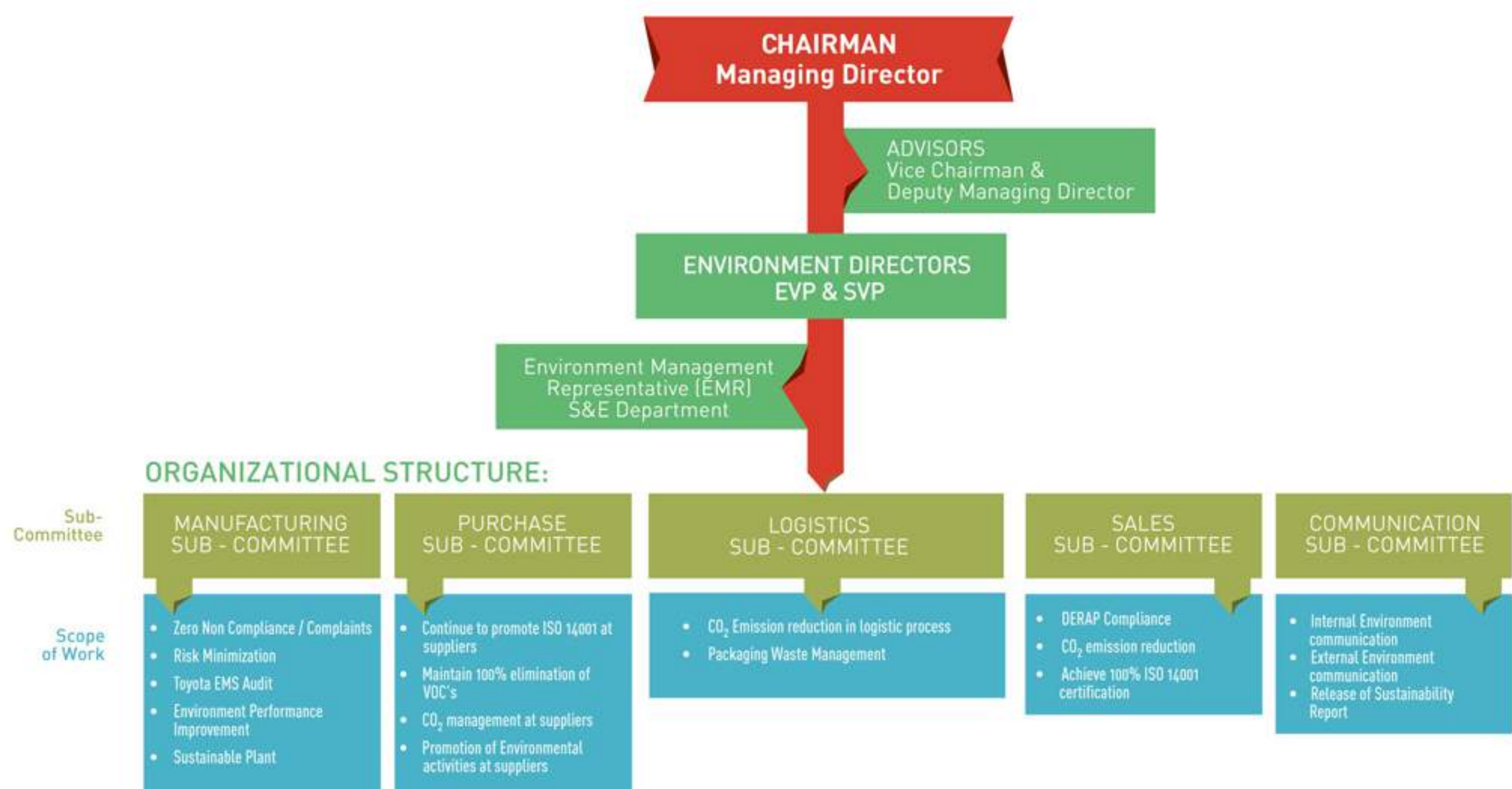
The environment committee comprises representatives from all functions across

the organization. The committee is led by our Managing Director as its Chairman, and Executive Vice President and Senior Vice President as Environment Directors who are supported by all the division heads and window persons.

The Environment team (as secretariat) headed by Environment Management Representative comprising of Environment professionals centrally co-ordinate the

progress of environment related activities through all environment sub-committees.

The performance of individual sub committee's is reviewed on monthly bases. During quarterly Environment Committee meetings results along with challenges & future actions are explained to Top management and management directions are implemented to enhance overall environmental performance.



TKM Environment Organizational Structure is designed to support all the stakeholders in terms of Environment protection.



SOWING THE LEAN SEEDS: SUSTAINABLE AND ECO FRIENDLY PLANT



A Lean plant Toyota Kirloskar Motor has come up with a unique ideology of sustainability drive in all its operations to transform into an eco-friendly plant. The Eco-factory was established with innovative technologies wherein the process & the products would cause less impact on the environment.

TKM approach towards achieving SUSTAINABLE ECO-FRIENDLY PLANT

The three dimension approach of Eco-mind, Eco-Kaizen & Eco-showcase has helped in sensitizing the employees and the community at large and thereby promotes sustainability in all frontiers of operation.

Eco-Mind aims at creating an environment conscious citizen. In other words, an employee with Eco-Mind will always think & act in the best interest of the environment and also influence their families & society towards eco-friendly behaviour.

In order to enhance the eco mind, we have adopted the methodology.

LEARN → PERFORM → DRIVE

Eco Kaizen is the continuous improvement activity at work. Eco Kaizen includes all the improvement initiatives originating out of an Eco-mind towards creating a sustainable plant and a low-carbon society at large.

Eco Showcase is an effort to promote TKM's Eco Spirit to the community and neighbourhood. The activities include social outreach activities involving external stakeholders such as suppliers, dealers, customers and the whole of the surrounding eco-system.

WORLD FOREST DAY CELEBRATION AT TKM

Each year more than 13 million hectares (32 million acres) of forests are lost worldwide. India has lost 367 square kilometers of forest cover in the past two years.

The total forest cover in the country is now at 6, 92,027 sq km. This accounts for 21.05 per cent of the total geographical area of India. To raise awareness about the importance of trees and forests, World Forest Day is celebrated on 21st March throughout the world.

At TKM, with an intension to spread awareness and impart the knowledge about the importance of forests and the need for them to be conserved, we observe this day. This is also one of our approaches towards realizing TKM vision of Sustainability to spark Eco mind and spread Eco spirit.

To symbolize this eventful day, TKM organized plantation activity. We had taken a target of ensuring

"One Plant for One Person". With an intension of promoting conservation of trees, TKM selected Sandalwood (*Santalum album*) as the species to be planted, this is the Karnataka State tree and is also recognized as a threatened species by the IUCN. And we have developed a Sandalwood Avenue in the plant premises by planting about 200 saplings.

As part of this event, using the non production hours team members planted 46 different varieties of native species. And about 15000 number of saplings were planted in 52,000 Sq.mtr of area within TKM premises.



Plantation by Top Management



Plantation by Team members

ENVIRONMENT MONTH CELEBRATION

Every 5th of June is celebrated as World Environment Day & a theme is declared by United Nations Environment Programme (UNEP) in line with the current global environmental concern. The UNEP theme for the year 2012 was **"GREEN ECONOMY: DOES IT INCLUDE YOU?"**.

As a responsible corporate, TKM celebrates the entire Month of June as Environment Month wherein all our stakeholders are involved to promote eco awareness.

TKM sets a theme based on TMC's & UNEP's guidelines. The theme for the reporting period was **"ENHANCE ECO MILAGE, OPTIMIZE ECO USAGE"**. With regard to this activities were structured aiming to promote the idea of resource conservation by creating awareness.

ECO-MIND

The activities were structured to promote the Eco minds of the Team members.

- **Establishment of Eco Ohbeya:** Visualize all the environmental activities in one place for better management.
- **Wealth from Waste:** Build a useful object from the waste material generated from the shops.
- **Eco-photography:** Team members had to take photographs showing Environmental Pollution and its impact on the environment. Through this employees were motivated towards identifying environment concerns in the neighborhood & take possible measures to address them.
- **Eco Commitment - a WAKU DOKI Activity:** The employees were motivated to suggest their ideas of a Green TKM. The TKM Environment team consolidated the best ideas suggested which would be referred during the development of the future Environment strategies.

ECO KAIZEN

Employees were motivated to identify Environment improvement points in the areas of

1. Energy Consumption reduction
2. Water conservation
3. Waste management

The best kaizens were identified and rewarded by the Managing director.

ECO SHOWCASE

Environment team conducted a need assessment study with respect to environmental issues in the surrounding communities. These issues were shared companywide and Team members had to voluntarily pick up any issue according to their convenience and interest and then work as a group to mitigate the issue.

The activities such as Environmental awareness campaigns, Training programmes, Waste management system establishment, Afforestation in schools & villages were conducted.

More than 7500 native saplings were planted in 15 villages & schools by involving students, teachers & village representatives. School Eco-clubs took active part in the entire event & also responsibility of sustaining all the activities carried out during Environment month.



An Eco-model developed from waste



Eco-photography evaluated by Top Management



Eco-posters prepared by team member family



Participation of Team member families during the Environment month awarding ceremony



Eco-campaigns organized by team members at villages involving school children

ENVIRONMENT LEGAL COMPLIANCE: GOING BEYOND COMPLIANCE

TKM takes an extra leap in achieving the intent behind the regulation and not just comply as a legal requirement.

BIODIVERSITY & AFFORESTATION:

TKM is situated in the Bidadi Industrial Area, which has been earmarked by the Government as an industrial area development project. No natural biodiversity habitats are affected by the location of the manufacturing facility.

TKM has taken the initiative of creating a green belt in the plant premises and about 48,700 saplings have been planted during the reporting period.

Being a good corporate citizen, TKM believes in adherence to the law as a top priority issue.

To accomplish the stated objective of Complete Legal Compliance & No complaints, the Environment Management System is levelled up to a status which is well above the basic legal requirements. To ensure 100% compliance at all times, internal limits have been earmarked that are 20% more stringent than the legal requirements.

Any exceedance to the internal limits are considered as Internal legal Non compliance and these are addressed by Top Management to ensure TKM does not violate any legal norms & standards to face an outdoor non compliance.

To achieve the target of "100% compliance & Zero complaints" TKM has incorporated an infallible system of Monthly Legal Compliance Monitoring System. The system will include check points on changes in Manpower and processes that are likely to affect the Environment components like water consumption, wastewater generation, hazardous waste generation, air emission quality, ambient air quality, noise generation and batteries disposed etc.

TKM expanded its production capacity to 3,10,000 vehicles / annum in November 2012. All the necessary environment legal clearances are obtained on time and the new conditions given in the clearance are incorporated into the existing system.

WATER, WASTEWATER AND RECYCLING

TKM receives about 753,500 m³ of fresh water from KIADB every year. This water is utilized for both domestic and industrial purposes. TKM has 2 well planned Wastewater treatment plants designed to treat the effluent water depending on the wastewater generated at both the plants respectively. The fine Combined Effluent Treatment Plant (CETP) treated water quality is enhanced after the installation of MBR and RO. TKM has 2 in house laboratories where the treated wastewater is analyzed on an hourly basis to confirm the

efficiency of the plant and the treated waste water is sent for use.

Thus, TKM complies with all the legal compliance as it has Zero Discharge of effluents. All the wastewater is treated and utilized in the plant (Gardening & Afforestation, Domestic-Car wash, flushing, Industrial). TKM has been able to recycle over 60% of the wastewater and reducing its freshwater consumption over 60%.



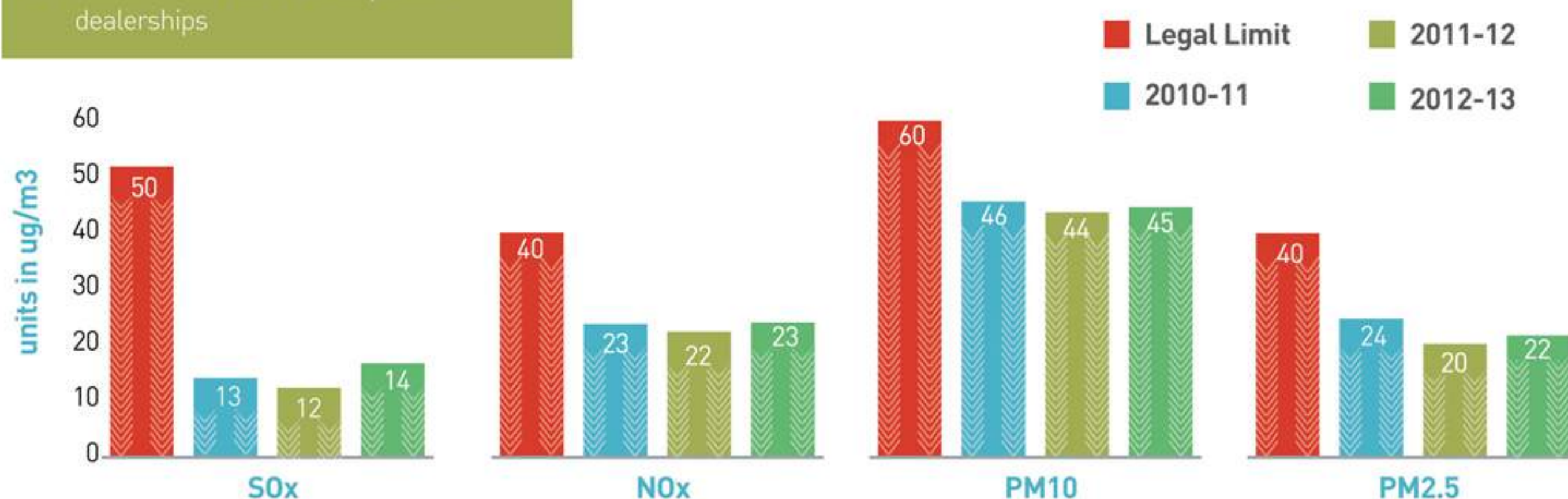
AIR QUALITY:

The main air emission sources at TKM are emissions from Paint Booth, Paint baking ovens, boilers and welding fumes. LPG is a major fuel used in the Ovens, Boilers and cooking operations.

Stack emissions and ambient air quality are monitored on monthly once and the results are reported to regulatory authorities on a regular basis.

Special initiatives to reduce air emissions

1. RTO: Regenerative Thermal Oxidizer
2. Water borne Paint
3. Three Wet Painting Technology
4. Total elimination of Furnace oil & Diesel Generator by using Central power grid
5. Usage of electrical battery operated tow motors & fork lifts
6. Promotion of water borne paint at dealerships



Ozone depleting substance

Ozone depleting substance emission is not monitored at TKM. But since the introduction of Innova, we have been using chillers' unit at paint process with R134 and thus the AC fixed in all the cars since 2005 are CFC free. However, the Air conditioners at the office side are still running with CFC AC's. TKM has been working on a plan to replace these phase wise based on the equipment condition.

Greenhouse Gas Emissions

While there's no doubt that lean manufacturing will result in lower material and labor costs and greater production revenues, it has a greater impact on the environment. TKM has been highly conscious about the climate change and its global impact. The Greenhouse Gas emissions are quantified and the process for adopting the measures to reduce these emissions are in place.

Scope I emissions:

TYPE		2012-13	2011-12	2010-11
Scope I (Fuel Consumption, Company Vehicles, Fugitive Emissions)	Specific Generation kg/ vehicle	11.6	75.26	144
	Absolute Quantity in Tons	903	5691	10850.7

Scope II emission (Purchased electricity, Steam and Heat) during the reporting year was 36591 tons with a specific generation of 444.21kg/vehicle.

TKM 5 YEAR ACTION PLAN

Based on the TMC's Environmental Action Plan provided by Toyota, TKM has drafted and established environment management plan. The actions, goals and targets are then associated to form TKM's Five Year Environment Action Plan:

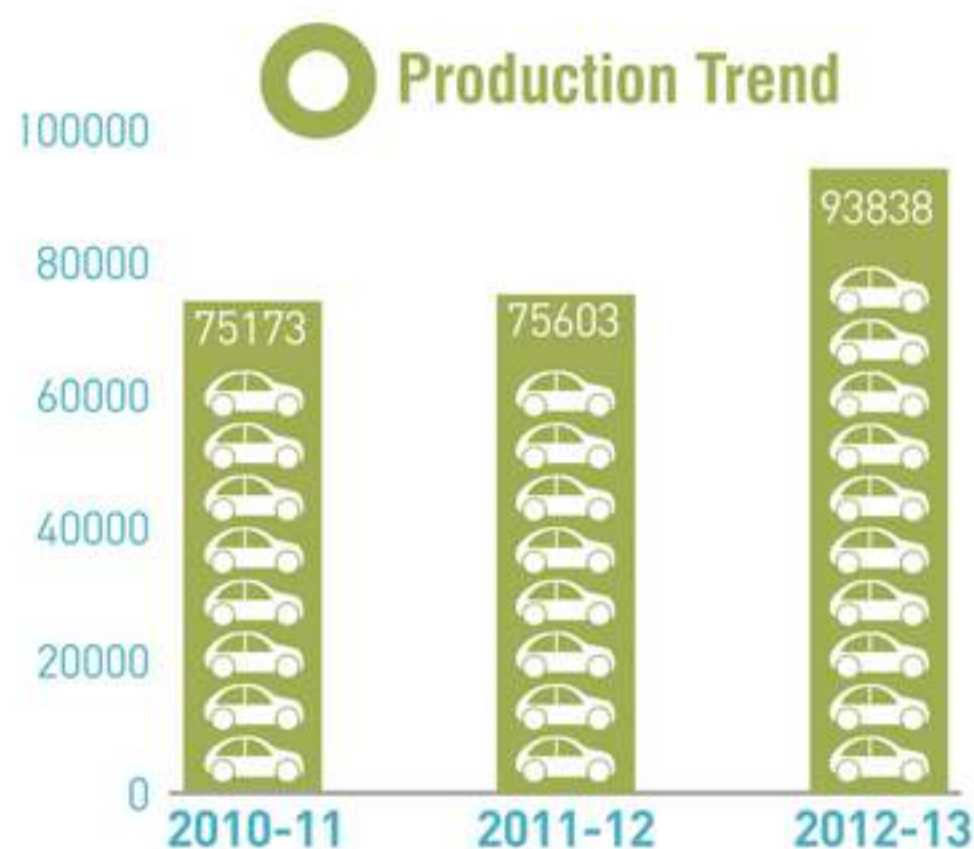
ACTION ITEM	SPECIFIC ACTION ITEMS & GOALS	5YR ACTION PLAN STATUS – FY2012	
		Target	Actual
Reduce CO ₂ emissions from production & logistics activities of each country & region.	Energy Reduction:	3% Reduction	3% Reduction
	Reduction in electricity consumption. Purchased + generated (kWh/veh) 20% based on Current year status	481 kWh/veh	481 kWh/veh
	Reduction in LPG consumption. (Kgs/veh) 20% based on Current year status	25 kgs/veh	23.95 kgs/veh
	Reduction in energy. (Total of Electricity + LPG in GJ/veh) 20% based on Current year status	3 GJ/veh	2.77 GJ/veh
	CO ₂ emission at Manufacturing areas	0.46 tons/veh	0.44 tons/veh
	Logistics: Reduction in emission of CO ₂ /unit, 15% reduction based on 2006 values	2%	2.4%
Promote the effective use of resources to further contribute to the realization of a recycling based society	Production:		
	Increase Yield ratio	72.5%	73%
	Hazardous Waste reduction (kgs/veh):	24.95%	24.95%
	Reduction in generation of Hazardous waste 20% based on Current year status (Chemical sludge + Phosphate sludge + Paint sludge)	6.15 kgs/veh	4.65 kgs/veh
	Non-Hazardous Waste Reduction:	2%	2%
	Reduction in generation of Non Hazardous waste (Miscellaneous solid waste) by 20% based on Current year status	25.4 kgs/veh	25.16 kgs/veh
Reduce water consumption	Reduction of water consumption by 10% based on current year status (m3/veh)	2%	2%
		4.9 m3/veh	4.72 m3/veh
Initiative to reduce VOC emissions	VOC reduction	40.6 gm/m2	40.82gm/m2



PRODUCTION TREND

During the reporting period, the production pattern was affected due to Forex fluctuation, severe market competition and unprecedented fuel hikes.

The non-production hours were utilized for various constructive activities like human development activities & training, cost reduction, Kaizen promotion & implementation, and Clean & Green drives in the neighbouring communities



RESOURCE CONSUMPTION (PLANT 1)

Automotive industry being a carbon-intensive sector, resource availability and efficiency plays a key role in impacting production. Globally, Toyota aims to establish a low-carbon and recycling-based society, and operating business in harmony with nature. As part of TKM's five-year plan, the objective is also aligned with TMC, aiming to utilize resources wisely and reduce waste from its operations.

Steel: TKM believes that optimum utilization of resources at its manufacturing process goes a long way in the life cycle of the steel that is used. TKM utilizes steel effectively, contributing towards cutting down on associated CO₂ emissions.

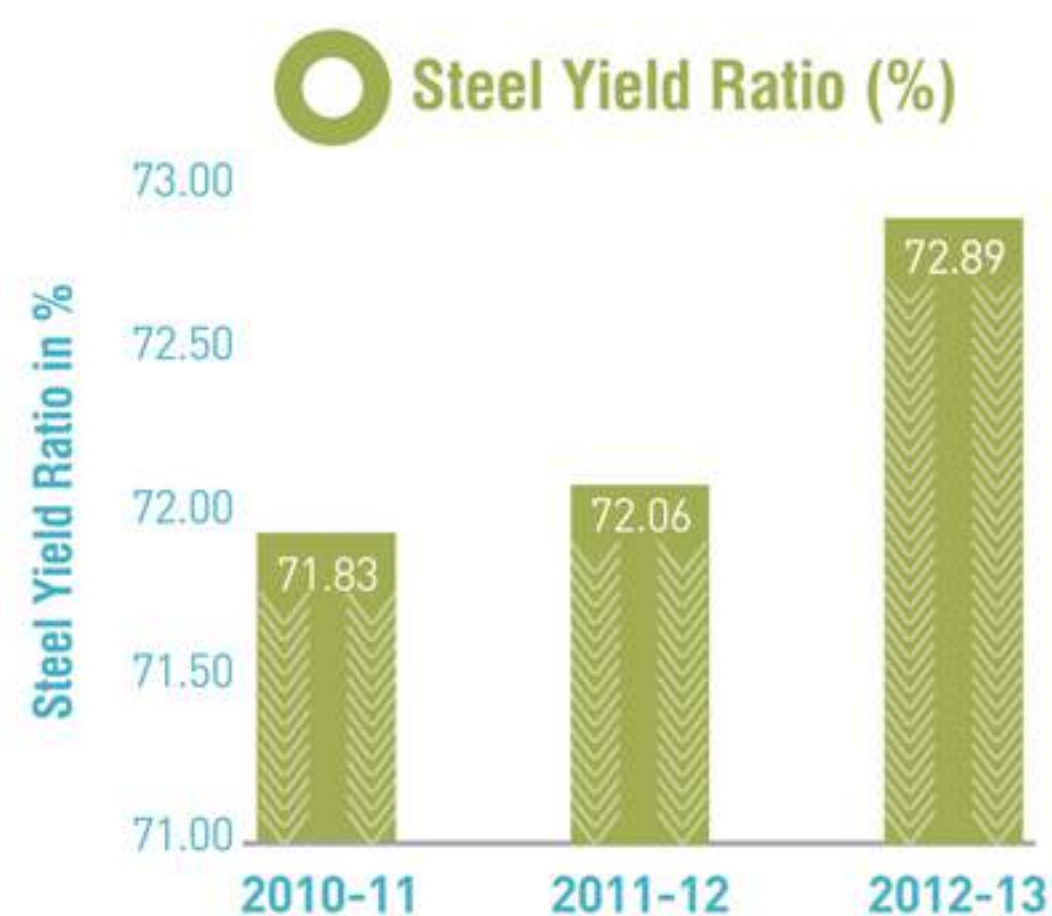
The Steel Yield Ratio is the Effective percentage of steel utilized from the total steel procured. We devised a three-tier activity to achieve one common goal - steel yield improvement. To drive this activity a special task force was created who had studied the existing utilization pattern and conducted brainstorming sessions with TKM team members, suppliers & steel manufacturer and came up many improvement ideas (Kaizen) to increase steel usage efficiency (yield ratio).

Tier 1 of the activity is executed inside TKM Press Shop. Reuse is done by stamping smaller parts of the car body by utilizing the scrap offal's.

Tier 2 of the activity is undertaken outside TKM at the steel supplier. The specific requirements are passed on the supplier after close study of his process so that he makes the necessary changes in his system to supply the steel blanks as per our requirements.

Tier 3 of the activity is carried out at the Non- Auto parts supplier where the utilization of our steel for the manufacture of non auto parts like electronic components, locks, gears etc. are analyzed.

This Kaizen has been implemented and sustained to give better results and we have achieved a increase in the steel yield ratio.



No. 1 *

Global Leader in Yield Ratio

Tier III-Non Auto

Tier II-Steel Supplier

Tier I-TKM Activity

REDUCTION OF CARBON EMISSION AT MANUFACTURING SITES:

Being an automobile company, TKM emits a lot of CO₂ with manufacturing and logistics operations. Annually TKM manufacturing unit emits about 40.33 tons/ year of CO₂ which includes Electricity, LPG, Diesel, Furnace oil and Compressed air.

Adhering to the five year environmental action plan of TKM, there is an emphasis to promote such reduction activities by motivating team members to identify improvement points that in turn brings down the energy consumption rate. The initiatives taken at each area are illustrated below.

ELECTRICITY CONSUMPTION

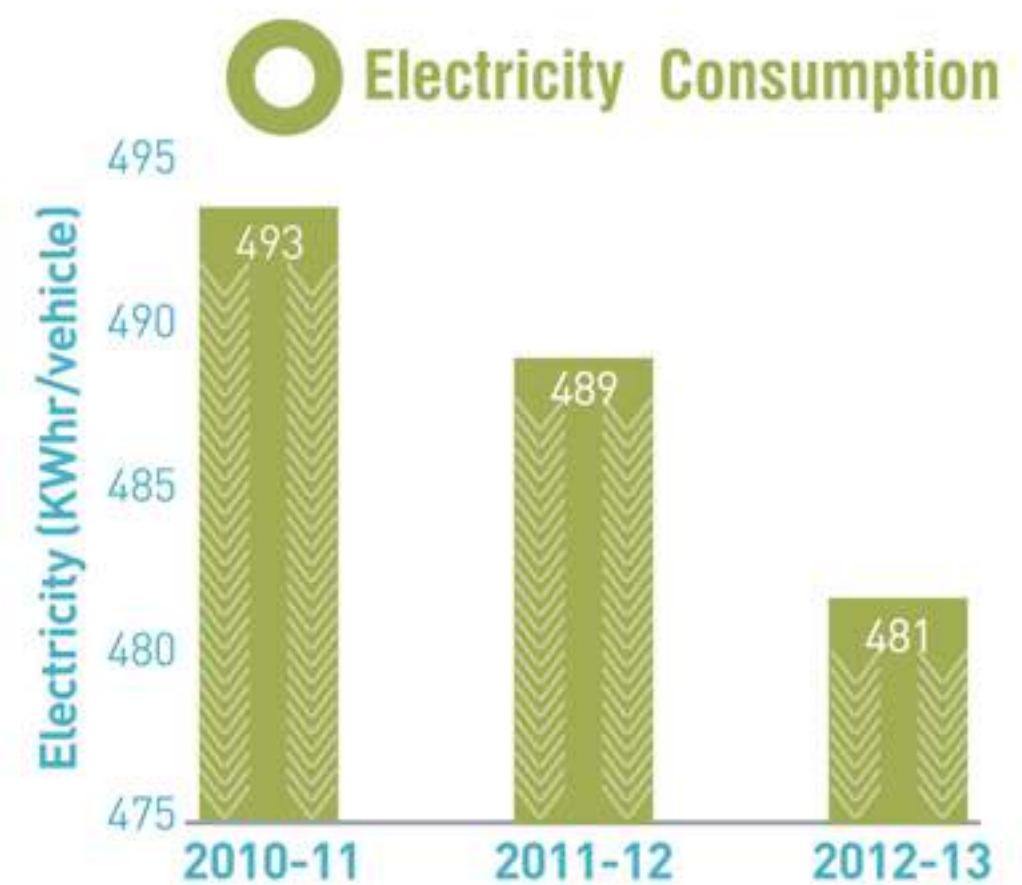
TKM have been achieving good results in electricity consumption reduction with its continuous efforts. TKM achieved a reduction of average per vehicle consumption of electricity from 489 to 481 KW hr (about 1.6% reduction) during the reporting period.

Various initiatives to reduce energy consumption have been promoted:

- TKM focused on energy saving activities along with optimum plant capacity utilization by initiating Kaizen-theme based activities.
- Standardization of electrical equipment usage timings
- Promotion & implementation of Energy Kaizens under Environment Month Activities
- Promotion & implementation of quarterly Environment Kaizen competition for team members.



Weld Shop



WATER CONSUMPTION

TKM's manufacturing units get their supply of water from Karnataka Industrial Area Development Board (KIADB), catered by River Kaveri. TKM does not depend on any other source for its water demand.

Water and wastewater handling systems, takes utmost care in conserving the precious natural resource - water. We are proactively promoting re-use and optimal use of water.

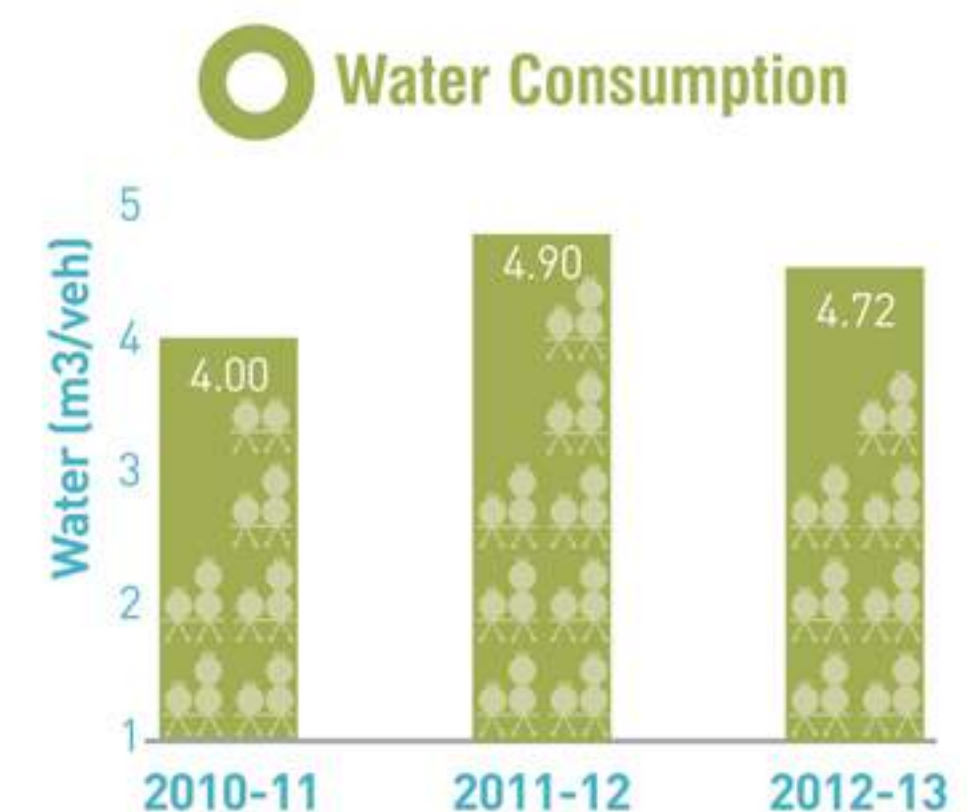
Steps taken to strengthen water management:

- Establishment of water and wastewater Ohbeya to enhance the water management.
- Pursuing Kaizen-led ideas & enhancing Team Members skill through establishment of Energy & resources doujou [kaizen idea demonstration centre].
- Affiliate benchmarking to gather best practices in water reduction.
- Review involving cross functional teams and Top management.



Reverse osmosis unit

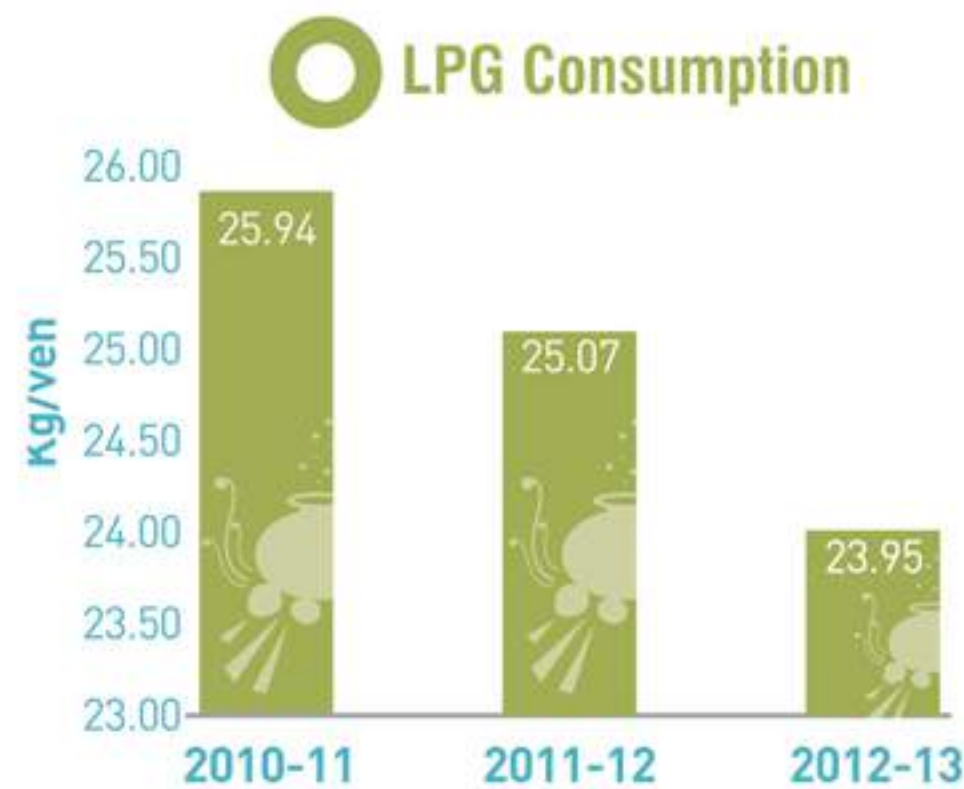
The state-of-the-art Combined Effluent Treatment Plant (CEPT) is equipped with MBR (Membrane Bio-Reactor) and Reverse Osmosis for enhancing the re-usability of the water. Thus, TKM has been able to recycle 60% of the treated wastewater back to the process, at the same time reducing its freshwater consumption by 60%.



LPG CONSUMPTION

Liquefied Petroleum Gas (LPG) is the primary energy source as it is used for heating ovens and boilers at TKM. However, with new and innovative Kaizens, TKM has been able to maintain a decreasing per unit consumption trend.

The initiatives such as sequential oven switch off, oven and booth temperature control optimization are some of the improvement points adopted to reduce LPG consumption.



VOC EMISSION REDUCTION

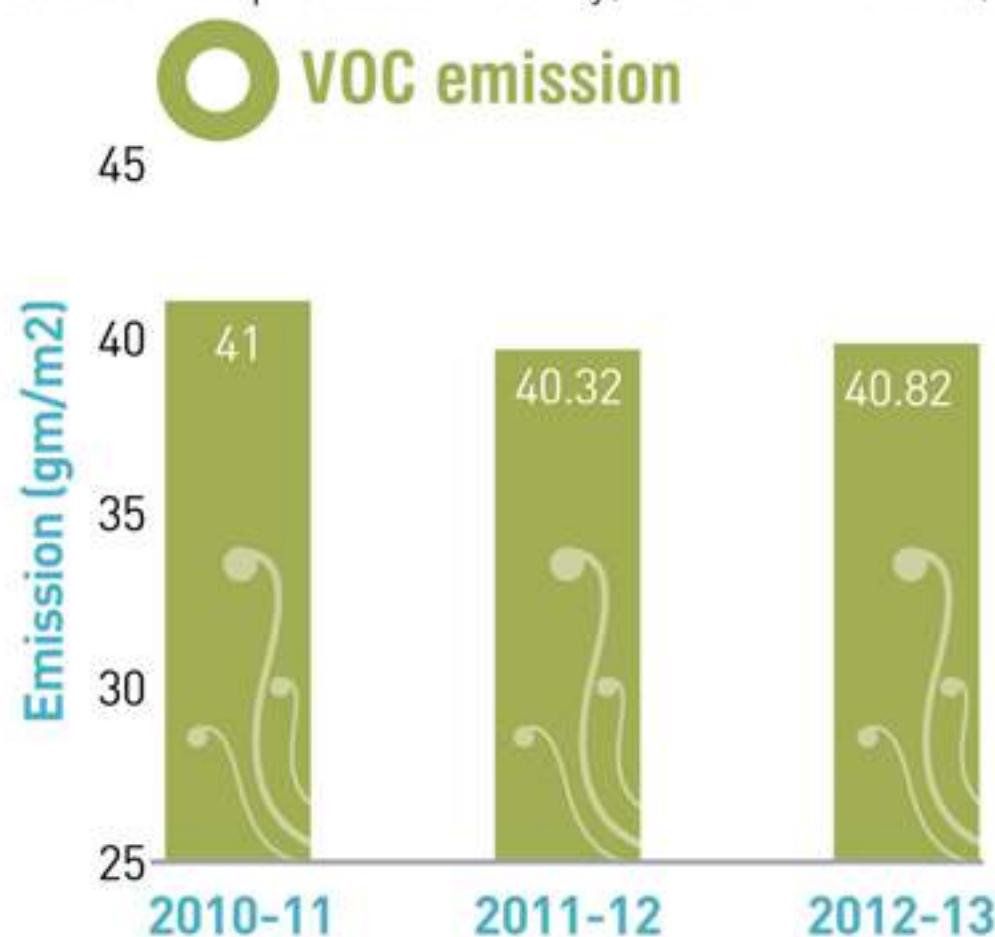
Volatile organic compounds are emitted during the painting activity which has the tendency to cause a photochemical smog in the environment.

Even though there is no mandatory legislation for mitigation of VOC emissions, it has been a part of Toyota's global environment policy to reduce VOC emission from the painting process.

TKM has introduced waterborne paint technology at the new production facility, Plant II. Further,

the use of Regenerative Thermal Oxidizers (RTO) ensures destruction of VOCs emitted from painting operations. VOC emission data's are measured based on the raw material used.

TKM is best among the Toyota affiliates in VOC emission reduction for car manufacturing using solvent based paints. During the reporting period the VOC emissions have increased slightly due to the change point from 90 K to 100 K.



HAZARDOUS WASTE

The hazardous waste generated are in the forms of paint sludge, phosphate sludge, and chemical sludge, waste & used oil and contaminated rejects. TKM doesn't treat any hazardous waste on-site but the waste generated is sent for further treatment to authorized vendors.

Aligning TKM's goals with the Toyota Earth Charter, the Company aims to achieve zero hazardous waste to landfill. TKM sends hazardous wastes to co-process at the

cement plant to realize the philosophy of "zero hazardous waste to landfill". Other initiatives towards hazardous waste reduction include the establishment of sludge drying facility (a Standardization Process) to reduce excess moisture content in hazardous wastes. In addition to this, various Kaizens are being implemented to reduce moisture content at the source.



Waste Generation: Production



CATEGORY	WASTE DESCRIPTION	MODE OF DISPOSAL
Non-hazardous waste	Paper, Plastic, Cotton, Glass Wood, Steel, Dust	Recycling
	Paint sludge Oil & Paint contaminated residues Waste oil, Sealer waste	Incineration
Hazardous waste	Chemical sludge Phosphate sludge	Co-processing
	Used oil, Spent solvents	Reprocessing
	Paint Containers	Recycling
E-Waste	Bulbs, computer hardware etc.	Recycling
Bio-sludge	Bio-sludge	Composting

TKM strictly complies with the legal requirements restricting on trans-boundary movement of hazardous wastes. We do not treat any waste in the plant but send it to authorised vendors situated in Karnataka.

TKM has no history of accidental spills and did not have any significant oil spills in the reporting period. TKM's robust Environment management system with regular assessments done against ISO 14000:2004 International standards, there has been no instance of any non-compliance with environmental legislation during the reporting period.

RESOURCE CONSUMPTION (PLANT 2)

TKM believes in continuous improvement and more emphasis is given on improvement in terms of environmental KPIs. With the establishment of plant 2, the company has brought in the concept of Eco Factory with new technologies with respect to energy conservation and VOC emissions like Servo Machines at Press shop, Global body line at Weld shop and water borne paint implementation at Paint shop.

With the Eco factory in its stabilization phase, we have been observing the difference in terms of energy reduction and the results achieved in the year 2012-13 and targets for 2013-14 are given below:

KPI	ACTUAL CONSUMPTION DURING 2012-13	TARGETS FOR 2013-14
Electricity (KWhr/ Veh)	371	479
Water (m3/ Veh)	3.73	4.16
LPG (Kg/ Veh)	17.9	21.4
VOCs (gm/m3)	23.5	23.1
Hazardous waste (Kg/ Veh)	5.55	5.69

Targets for FY2013 have been established and the facility capacity has been increased from 100K to 210K.



CARBON EMISSION REDUCTION IN LOGISTIC OPERATION

TKM has constantly striving to reduce CO₂ emissions from all its activities as part of our greenhouse gas emissions abatement initiative so as to ensure a sustainable future for tomorrow. The main criteria concerned for reduction of CO₂ in the logistics activity are distance reduction,

fuel efficiency improvement, loading efficiency optimization, mixed logistics, Milk run, and periodic assessment, volume efficiency improvement, driving skill enhancement, alternate fuel & alternate equipments.

TKM has identified 3 different areas of CO₂ emission in its logistic operations:

- External Logistics
- Internal Logistics
- Vehicle Logistics



Based on this, TKM is working towards reducing its CO₂ emissions and some of the examples are:

Alternate Mode of Transportation:

CO₂ emission reduction: 50.5 tons / Year

Parts dispatch by Train: Earlier, the transportation of parts from north suppliers to TKM was by trucks which would travel from Bangalore via Kolkata, resulting in high CO₂ emission and at present TKM implemented Train dispatch Kaizen through which we observed CO₂ reduction of about 50.5 tons/year. The parts are dispatched thrice on a weekly basis which in turn has proved this Kaizen to be time efficient.



Transportation of parts by Train

Import Parts Container efficiency optimization:

CO₂ emission reduction: 448 Kg /month

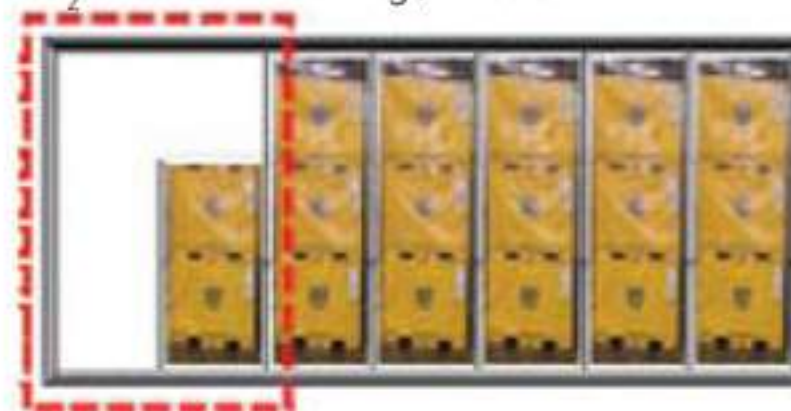
TKM imports its major parts from Indonesia. TKM's shipment operations are the major contributors for the CO₂ emission. Logistics team of TKM identified that the Efficiency of import containers not meeting the standards (= 100% efficient). Loss of efficiency is resulting in excess containers receipt every month which in turn leads to more shipments every month.

An expert committee from TKM identified that number of shipments can be reduced by utilizing container space to the maximum. In the previous condition vaning was done based on order dates and shipment was carried out even with vacant

spaces. After studying the process completely and understanding the scope of improvement, the committee has enhanced the system by filling up the vacant space of the container with the carryover parts. So that 100% container efficiency is achieved.

Before Kaizen:

Avg efficiency per container: 82%
40 Containers / month
CO₂ emission: 497 Kg / month



After Kaizen:

Avg efficiency per container: 100%
36 Containers / month
CO₂ emission: 448 Kg / month



ECO SHOWCASE

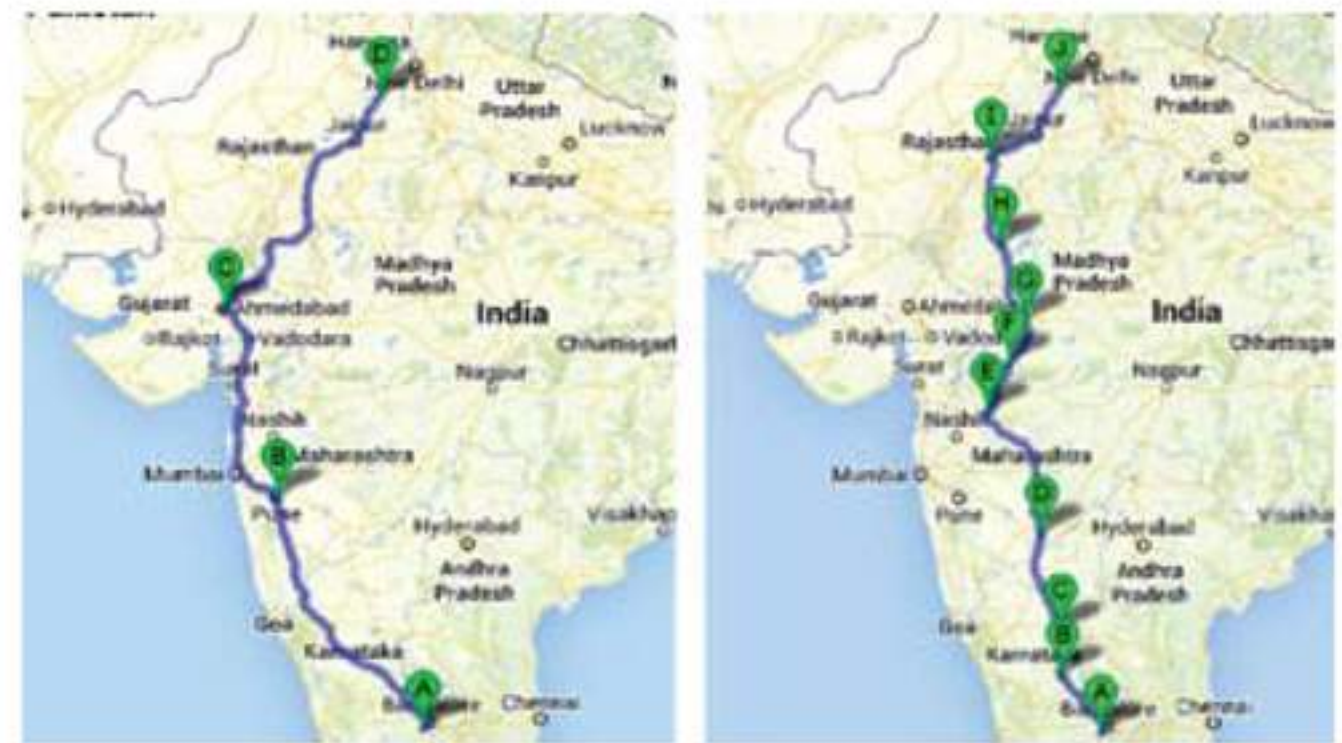
Resource Reduction initiative at the Canteen

- Reduction in consumption of electricity in centralized kitchen**
Initiative: Introduction of bed switches for tube lights.
Result:
 - Reduction in Tube lights usage hours
 - Saving 0.230 Kw /day
- Reduction in water Consumption in centralized kitchen**
Initiative: Introduction of Shower for Utensils wash at pot wash area.
Result:
 - Reduction in Water usage - 12480 ltr/day
 - Water saving is 12.5 Cum /day
- Afforestation programme:**
An afforestation programme was conducted for the TKM and Sodexo members. Around 250 members participated and 4000 saplings were planted.

Route standardization:

CO₂ emission reduction: 207.6 tons /year

Previously, the route engaged in the distribution of parts to northern regions was via Pune, which was about 5010 kms from Bangalore. The logistic team made a thorough study and came up with the proposal of changing the route that is via Madhya Pradesh. This resulted in distance reduction from 5010 Kms to 4552 Kms (to-and-fro from Bangalore to Delhi). This in turn helped in reducing CO₂ emission by 207.6 tons/year.



Before condition: from Bangalore Via Pune to Delhi

After condition: from Bangalore via Madhya Pradesh to Delhi

ECO-DRIVE BY EMPLOYEE COMMUTATION TEAM

With the raising awareness about the CO₂ emission reduction, the TKM commutation department took up initiatives to reduce fuel consumption:

- Service Providers Garage-near TKM:**
Previously TKM commutation vehicles had to travel all the way to the city garages for servicing and repair which was about 30 Kms from the source. Observing this, TKM initiated and advised its vendors to shift or to establish a garage facility near to TKM, exclusively for TKM and Bidadi Industrial Services.
- Alternate Route Utilization:** Some vehicles were taking a longer route though there were no pickup points after a certain area. Thus to reduce this, we identified all the connecting routes between different areas of Bangalore and TKM and implemented usage of shorter routes that in turn saved a lot of time and the

total travel distance of the vehicle also came down.

- Route Rearrangement- based on parking garages:** TKM has three parking garages situated in different localities of Bangalore city. TKM identified the nearby pickup points from the parking garages and assigned these nearby slots as the vehicles' starting points to reduce unnecessary movement of vehicles.
- Optimum Capacity Utilization:** TKM has been monitoring the capacity utilization of vehicles. As a result each vehicle had been allotted a particular route based on the number of travellers wherein it would also cover other pickup points on the way to TKM, depending on the seat availability.

In order to reduce the fuel consumption and CO₂ emission, TKM has adopted the above measures and as a result we have achieved a great success and the reduction rate is as follows:

CO₂ Reduction During 2012-13



CO₂ Reduction Status per Employee: 2010-2013



RISK MINIMIZATION ACTIVITIES BY PRIOR PREVENTION:

These measures include activities in co-operation with overseas assistance to monitor & prevent environment risks involved through:

- Continuous information sharing of overseas near-miss environmental incidents
- Evaluation of toxic chemical & underground tanks for appropriate storage conditions aimed at prevention of sub-surface water & soil contamination
- Installation of monitoring wells for groundwater monitoring in high potential areas

To prevent any kind of hazard occurrence, TKM has a risk minimization activity in place that would help in reducing the impact of the hazard.

TKM has well resourced gauges that help to maintain and control a mass balance, regular monitoring of the underground tanks and pits by using dip rod check method. Monitoring wells have been installed at the boundary for monitoring groundwater level and quality. Regular examination is conducted on a yearly basis, a report is prepared and sent to TMAP-EM. A periodic auditing is carried out by TMAP and as on today, TKM has achieved 100% compliance.



CASE STUDY 1

CLEAN AND GREEN TKM THROUGH “MY AREA CONCEPT”

TKM has been certified with ISO 14001 since 2001 from external auditors AJA (Anglo-Japanese American) Registrars, Thailand. AJA visits Bidadi campus to monitor the plant performance with respect to the environment KPI's every year. In May 2012, the auditors identified a minor non-compliance related to waste disposal from project areas. It was observed that there was no system of controlling unscrupulous waste outside the production area. In order to overcome this, the environment team came up with the “MY AREA CONCEPT” as a solution for waste management.

Inside TKM, unused area's were identified and assigned to the division heads of the adjacent shops and made them responsible for maintaining 4S (Seiri- Sort, Seiton- Simplify, Seiso – Clean up, Seiketsu – standardize). The waste generated at each shop is collected and sent to value yard for further segregation. At value yard, the wastes are segregated and transported to recycling / reprocessing vendors. Based on the waste material size, a facility is provided to cut down the bigger sized waste into smaller bits to make packing & transportation easier from the generation point to the disposal units. Along with this, the contractors and the Team Members were educated about the consequence of proper waste segregation and disposal.

The implementation of the concept took a span of 3 months including the trial runs during non-production time in August 2012. The concept was standardized in all shops during the major shutdown in November 2012. As a result, zero abnormalities were reported and this initiative proved to be both successful, and beneficial.

TKM is one among the few automotive industries to have implemented robust waste disposal system on a large scale.



4s activity during non-production hours



4s activity during non-production hours

CASE STUDY 2

PACKAGING MATERIAL: WASTAGE & COST REDUCTION

As we are aware, today Environment Conservation is taken as one of the highest priority of mankind for sustenance of Life on this Planet. For this, one of the fundamental approaches is to "Reduce Wastage".

In addition to the above cause, in the current economic scenario and highly competitive market, price increase is an option that is almost ruled out. At this juncture for optimising the profit, the highest focus is brought onto cost reduction. Along with these effects, the disposal of packaging material is a hard task and acts as a contributor to the environment pollution.

Packaging plays an instrumental role in ensuring that the products delivered are devoid any damage till it reaches the end customer. It also plays a significant role in establishing the brand image of the company.

Packaging by nature adds to the direct cost of the product, but is finally scrapped at the end customer as it hold no value

once the product reaches the end user. Considering this, it is very important to blend Quality, Cost & Brand into an optimised packaging solution across Supply Chain.

For this challenge, the basic approach by TKM is

Approach for Packaging Cost & Waste Reduction

Innovative Design

Usage of Returnable Boxes

Material Specification Change

Key Performance for 2012 ~ 2013

1. Material wastage reduction of 60 tons, Saved more than 1000 Trees.
2. Overall cost reduction of INR 9.4 Mn.

ENVIRONMENT FRIENDLY PRODUCT DESIGN

Along with these facilities a Q service kit is given out to the customers during the time of vehicle delivery which includes **Safety Book, Toyota Value Pack [AMC], Q-Service features and Know Your Vehicle Book.**

Know Your Vehicle Book contains basic information to take care of frequent customer queries on comfort. It also contains product guidelines such as AC, handling of audio etc and General Usage Guidelines which would assist to increase the life & performance of the vehicle & accessories.



Applying the lean business model across the board would lead to immense productivity improvements and create an environment of deflation (a deflationary economy) and very significant wealth creation.

Toyota philosophy is a collection of thoughts & ideas based on an interrelated development of individuals, society & the environment. Hence when we build our products, we make sure to build it around the philosophy of growing together and not as an individual unit. Keeping the same philosophy in mind, in August 2012, we launched the new Camry. The new Camry comes with a special feature - The eco drive indicator, which gives you real time updates of your driving. In other words, it encourages environment considerate driving. This aims at increasing the fuel efficiency & thereby lowering Carbon di oxide emissions. And we are proud to say that such a feature is also part of our Corolla.

Also all our products are **OBD-II** Complained, which ensure lower emission rates.

We combine the principle of Reduce, Reuse & Recycle with the Toyota philosophy of Kaizen (continuous improvement). The process is initiated right from the design stage. They go through many cycles of improvement until the desired standard is achieved. They are also classified at the beginning itself based on their recyclability to facilitate easy identification later.

We also follow a strict policy on **SoC's (Substances of Concern)** such as Lead, Mercury; Cadmium & Hexavalent Chromium as these causes a serious impact on the environment. These materials are either prohibited or used in bare quantities. TKM has voluntarily adopted this since 2006, even though there is no such regulation in India. As we head into the future, we look forward to developing many more hybrids & other alternative fuel vehicles.

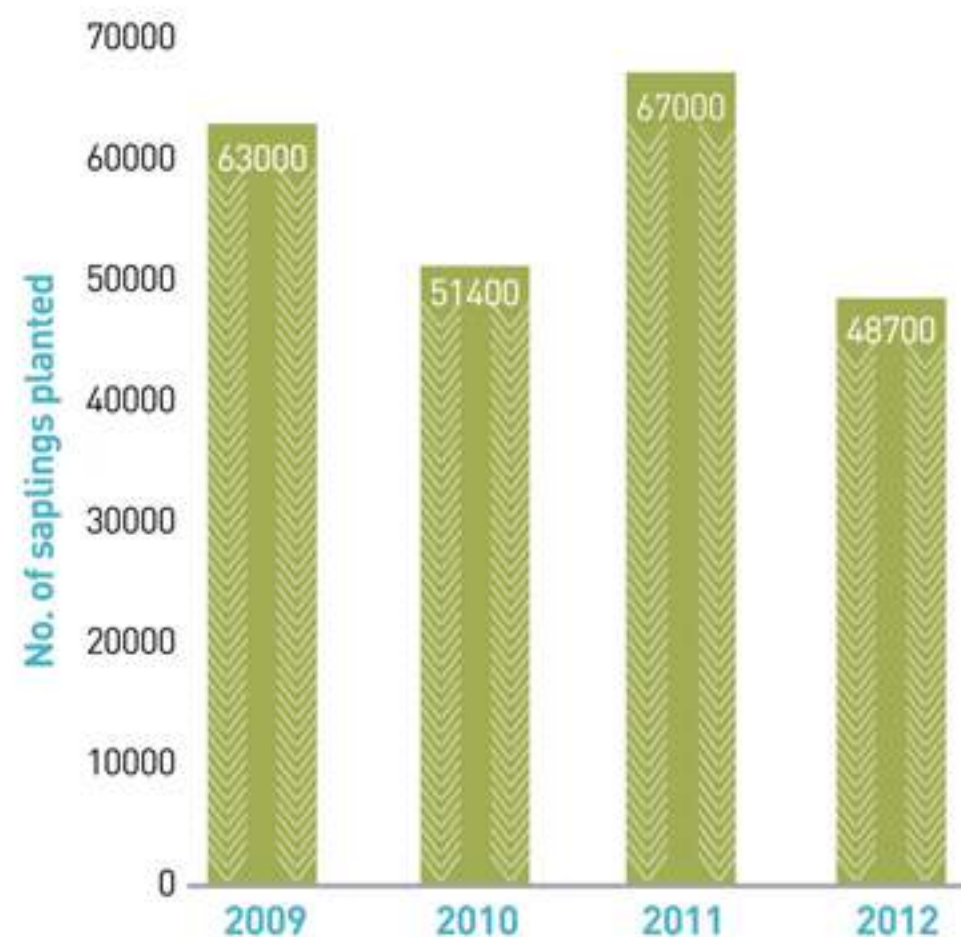
Hybrid vehicles are a significant part of the technological evolution and have a prominent presence in the automotive landscape. After the Prius, Toyota is bringing its second hybrid car in CAMRY platform. Toyota is planning on giving a wider publicity to HV as it promises to give better results in terms of energy efficiency and environmental aspects. TKM aims at introducing its first locally produced Hybrid model in India.



CASE STUDY 3

GREENBELT DEVELOPMENT

Toyota always believes that the future of a mobile society is "Living in Harmony with Nature". TKM has adopted many Eco-initiatives in its journey towards creating an eco-friendly company in harmony with nature and society. TKM has promoted many such initiatives with the involvement of Top management, employees & all other stakeholders.

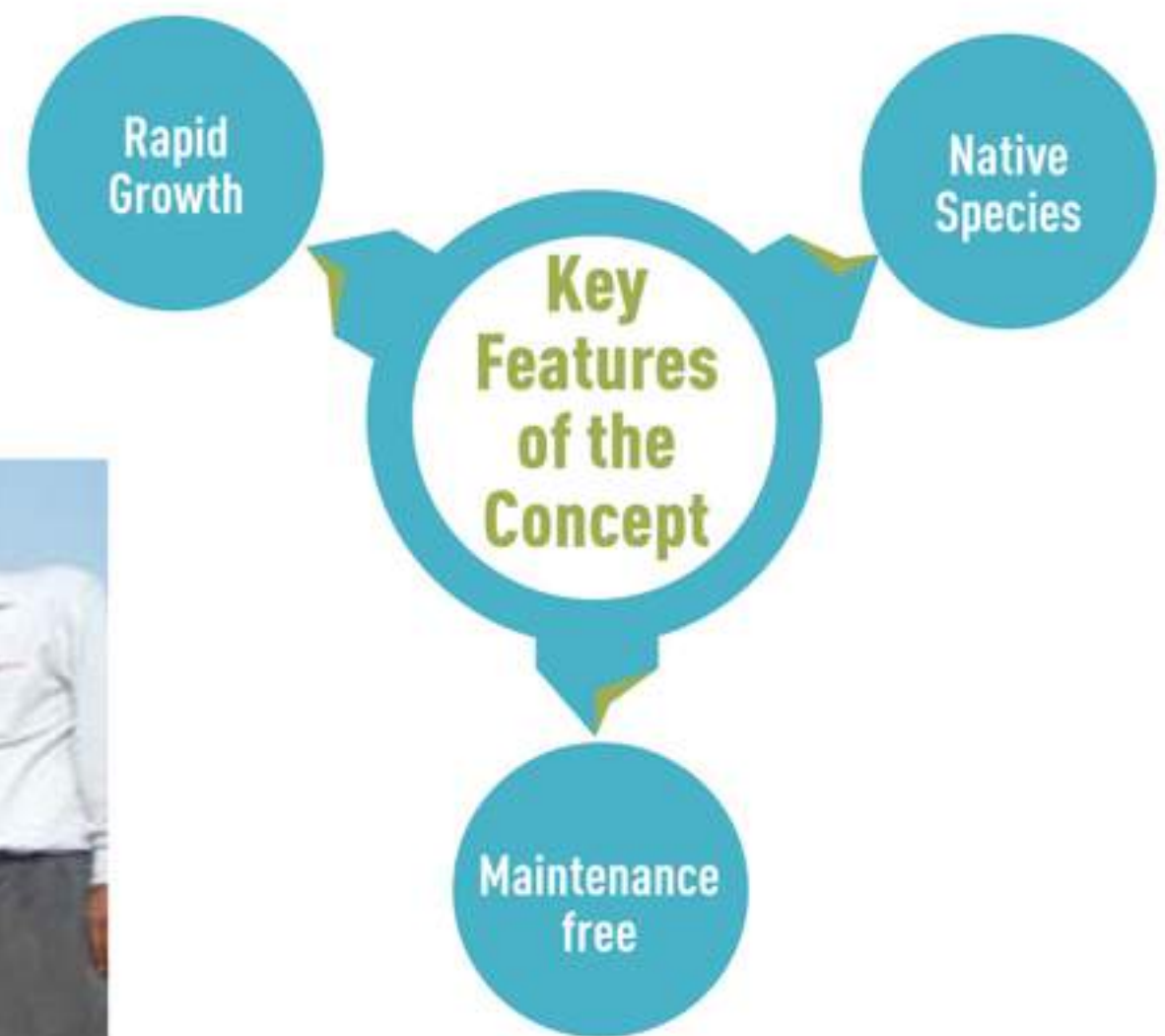


Afforestation is one of the major Sustainable Plant initiatives at TKM. The aim is to address challenges that our forests are facing today and promote a sustainable society through Afforestation.

The entire initiative is based on the 'Dr. Miyawaki Method' to restore and reconstruct forests based on the concept of "Potential Natural Vegetation", which helps in creating the "perfect forest" by planting native species so as to create biodiversity and aid food chain.

TKM has reserved 33% (142 acres) of total land area (432 acres) to develop greenbelt inside premises. The TKM's greenbelt development plan aims at overall improvement in the environmental conditions.

A detailed study of native ecosystem was carried out to understand the species distribution pattern. The greenbelt development team visited a botanical garden at GKVK campus & also Lalbagh in Bangalore to understand the growth pattern of various native species. Forest & Horticulture experts from Agriculture universities and the State Horticulture Department have been involved for their advice and expertise. More than 50 native species were selected & planted under the green belt area. During the reporting period more than 30 acres of land was developed under this programme. Team members were involved during planting activity to trigger Eco consciousness among them.





2009

- 5800 people including TKM members, their family, suppliers and dealers, school children, neighbouring industries, local community and government officials joined hands with TKM for this noble cause.
- 32,500 saplings planted within a short span of two hours.



2010

- About 1200 team members enthusiastically participated in afforestation programmes during the period of April 2010 - March 2011.
- Extended the initiative to Regional Man power Excellence Centre (RPMEC)- Pune
- 11200 saplings were planted by involving volunteer team members, government officials and school child.



2011

67000 native plants were planted inside TKM and also in the local community by involving employee volunteers and school children through the celebration of environment commemorative days.



2012

- During the celebration of World Environment Month, Team member volunteers planted more than 7500 saplings in schools & villages.
- The company has been promoting Afforestation among local community, schools & to its business partners.

The greenbelt is designed to enrich biodiversity at TKM and also in the surrounding area.

Steps involved in Development of Green belt are as follows

1. Detailed investigation of soil
2. Selection of native species keeping in view of conservation & aesthetic value
3. Sourcing of quality planting material
4. Designing of planting plan
5. Preparation of pit & planting media
6. Planting & mulching
7. Watering & periodic maintenance

The benefits from Greenbelt development are

- Retention of native habitat
- Prevention of land degradation during construction phase
- Enhancing the tree cover to increase the biodiversity
- Enhancing the ecological equilibrium of the area
- Decreasing Rain water runoff & Increase in water percolation
- Create a habitat for endemic birds & fauna
- Providing aesthetic value to the area & ultimately providing a comfortable work environment.

