

College of Engineering, Pune

&

KPIT Technologies Ltd.

Announce

Grand Prize Contest:

'Sparkle: 2015'

With a theme 'Towards Better Mobility and Energy'.

Total Prizes worth Rs. 20 Lakhs.

First Grand Team Prize:

Rs. 10 Lakhs

Second Team Prize:

Rs. 5 Lakhs

Prizes for up to five other Winning Teams: Rs. 1
Lakh

What is the contest about?

We live in an exciting world. Never before has there been so much emphasis put on innovation than in the present times. This emphasis will give us a major leap in the next 25 years. Of course, we have to work at it to solve our current problems for building a better tomorrow and we are counting on the young generation to solve them. This contest is to recognize your brilliance. Brilliance to solve interesting problems that we face today. Brilliance that demonstrates your enthusiasm, your energy, your vivacity or simply put 'Sparkle'.

Progress of humanity can be charted along the progress of mobility. Mobile species have always survived, thrived, and progressed. History of mobility is also interesting. We had horse carts in the 1800's but it created challenges. In 1898 in New York the top problem discussed in the international town planning conference was how to get rid of horse manure. We solved the challenge by creating an IC engine. However, we created new problems. Solving the mobility challenges in a clean, safe, smart, enjoyable, and in an affordable manner presents an enormous opportunity for innovation.

Our present day IC engine was designed over 125 years ago. There has not been any dramatic improvement in it. The **efficiency of energy conversion** at best is around 30%. How can one improve this?

While we continue to burn fuel and waste 70% of the energy, we also produce exhaust. We inhale all sorts of **exhaust gases** from nitric oxide to carbon dioxide. Our travel need not be synonymous with facing pollution. What can we do to improve this situation?

We also pay heavy cost since the energy efficiency is not high. Additionally, the **cost** of petrol continues to rise with no end in sight. Is fossil fuel the right choice of energy source? Could we think of better **fuels**? How can we reduce our energy dependence on few regions of the world? Can the new fuels be environmentally better? While doing all this of course, it has to be affordable.

Another way of looking at efficiency is the weight of the vehicle. The more the weight, more would be the drag and thus consumption of fuel. **Weight** of an empty vehicle depends on **materials** used to build it. These materials have to be sturdy to withstand sudden impacts and not let the passengers get affected by it. New composites are being used in airplanes. Can some similar materials be used for automobiles? Of course, while thinking about any new technology, one should also think about the **cost**.

While travelling, all of us certainly want to be safe. **Safety** includes safety of driver, passengers, as well as pedestrians. Unfortunately, the statistics for our country is not

impressive. We are number one in the world in terms of number of fatal accidents despite the fact that the USA has 800 vehicles per 1000 people as opposed to a very small fraction of it in India. How can safety be improved to prevent accidents? What methods should one deploy to ensure safe driving?

Our road condition is literally another pain area. How can we minimize bumpy ride going through ditches? How can we ensure **ride comfort** despite rough roads?

If we have to go within 15 km radius area, just think about the time involved in metro cities. As the time to commute increases, so does the consumption of petrol. One would not mind spending 15 minutes to get 15 kms of distance covered, whereas we end up spending hours due to **traffic jams**. Given any two points A and B, we would like to get there as soon as possible. This may be tricky than what you think since it would involve combination of **different modalities of transportation**. Can we think of multiple modes of transport keeping the time of journey minimum?

The number of hours we end up spending in commuting could actually be **spent** much better on something of our own interest. What do we do when we are driving for long distance? We need to be **connected**. We need to get information at all times. We need to know what is going on in the world. At the same time, we need to be entertained without loss of attention to the road. Passengers can make use of the video entertainment while driver should have good audio entertainment. How can we make information and entertainment, **Infotainment** for short, be superior and cost effective. How we can we make it novel compared to the present? How can we stitch together a multimodal journey electronically with the latest information? Our modes may include partly biking, walking, and using public transportation, or a car pool. Can all these modes still be connected by electronic stitching with a latest database?

Energy is the fundamental thing that keeps us going. Yes, our largest source of energy comes from the Sun. The Earth gets more energy from the Sun in an hour than the humanity uses in a year. But we do poor job of harnessing it, instead using unclean energy. We have problems in **converting** solar energy into useful energy and in **storing** this energy. Today, **solar cells** have **efficiency** of conversion averaging to about 17 to 23%. The rest is lost. Can this be improved at affordable prices?

For electricity storage we use either batteries or capacitors. Yes, we have batteries with high energy density and we also have super capacitors for fast storage. However, some of the fundamental ways of designing batteries have remained the same for centuries. Can we think about something faster, better and cheaper for energy **storage**?

Energy is not necessarily used where it is generated. It has to be transmitted and lot of it is lost in transmission. How can we increase the efficiency of transmission either by **decentralized generation** or by **better transmission** – both in an **economical** way?

To answer all such questions and to push technology ahead in the outlined areas, we have come up with a unique contest. We, Indians, can bring a fresh perspective to these problems and thereby evolve a better solution. Surely this is a wide area where your innovative mind can be brought into play to come out with a solution. Such solution should be attractive from not only technology point of view but it should also be **cleaner, safer, greener, and cheaper**. Take any challenge related to transportation and energy. Focus on one area and propose your solution.

This is not a contest for just ideas or dreams. Your solution matters a lot. We want dreamers who would convert their dreams into reality. Read a lot to find out existing methods to solve the problem you are trying to solve. Find out existing cost. Calculate the cost of your end product to consumer. Your solution has to be better in every respect – efficiency and cost.

No problem is too small to solve. However, the impact of your solution matters. Thus, pick any problem where you would come up with a cost effective solution and make maximum impact. Your solution should result in a **working prototype** to demonstrate innovation. Write all this in your report and of course let us know why the new way of doing things is better.

Intentionally, we have not given a readymade problem statement for you to solve. You choose the problem from the wide spectrum and create your own solution. We want you to show your ability to think freely. The canvas is wide open waiting to be painted.

So go ahead and make an impact and show how our lives are going to be better off with your innovation and how it would make an impact for the next 25 years.

Rules:

- This is an individual or a team project. All participants should be students of an engineering college/institute.
- There will be two rounds. Prequalification round and the final round.

Prequalification round:

- 1) The problem worked on should be related to the announced theme.

- 2) Your nomination form should be filed on the KPIT portal. The link would open shortly.
- 3) Your application should include a) a nomination form b) a proposal.
- 4) Your proposal should cover the following points:
 - a) What is the problem you are trying to solve?
 - b) What is your solution? Give as many details as possible.
 - c) Which are the existing solutions to solve the same problem? What are their limitations?
 - d) Why and how is your solution different / novel?
 - e) What is the tentative cost of your solution? What is the cost of the existing solution if any? Is your solution cost effective?
 - f) Tentative plan for building a prototype. Give all the steps, dates for completion of each of the steps. At this stage you do not have to provide a prototype.
- 5) Top 50 entries would qualify for the final round. All 50 teams qualifying for the final round would be given a participation certificate.
- 6) Date of submission for the prequalification round is Sept. 1, 2014.

Final Round:

- 1) Only the top 50 teams would qualify the final round.
- 2) You are required to have a working model ready to be qualified for the final round to be held in Mar 2015.
- 3) All copycat solutions would be barred from the contest. If the solution exists and you have read and copied from internet or similar sources, they would be barred.
- 4) Evaluation would be based on novelty, utility, and non-obviousness
- 5) Your solution should be low cost.
- 6) The solution should make an impact on solving existing problems.
- 7) The solution should be useable in a real life scenario.
- 8) All decisions of the judges would be final.

Selection Process and Award Ceremony:

All ideas would be evaluated by experts in the field of mobility and energy. About 50 entries would be selected in the prequalification round. These 50 teams would start working towards the final proof of concept or a working model. All teams entering into the finals have to submit a video of their working model 10 days before the contest day. The contest would be held sometime in mid-March 2015. Judges would evaluate each project

on the day of the contest. At the end of the day, winners would be declared. Award ceremony would be followed in the evening on the same day.

Prizes:

We have exciting prizes for this contest. They are:

All winning team members would get certificates during the award ceremony.

First team Prize: Rs. 10 Lakhs and a grand trophy.

Second team Prize: Rs. 5 Lakhs and a trophy.

Five winning teams reaching the finalist round: Rs. 1 Lakh and a trophy.