



The Energy and Resources Institute



FOUNDATION  
WE CARE FOR THE FUTURE

*“I’m not sure what solutions we’ll find to deal with all our environmental problems, but I’m sure of this: They will be provided by industry; they will be products of technology. Where else can they come from?”*

— George M. Keller



# green hackathon 2018



**“A COMPETITION ON TECHNOLOGY AND INNOVATION  
FOR A SUSTAINABLE FUTURE”**

## THE GREEN HACKATHON

Youth represent creativity, enthusiasm and social change. The role of youth in sustainable development is of critical importance as they are not only the building blocks of our society - but also influential community drivers of change. While education can bring about a fundamental shift in how we think, act, and discharge our responsibilities towards one another and the planet; technology and innovation plays a critical role in expediting transition to a sustainable mode of development.

The Green Hackathon – a competition for youth encouraging them to engineer ‘green hacks’ - has been organized by the RMZ Foundation and WeRise in the city of Bangalore, each year, since 2015. The competition principally promotes innovation, critical thinking, problem solving and team management skills in students, whilst simultaneously contributing to providing environment friendly solutions to the prevailing sustainability challenges and issues faced by the city.

The intent is to draw students in to the fold; to nurture from an early age a more sustainable and mindful approach to problem-solving. In the course of this competition, students will devise solutions that are tech-based and that are aligned to this larger goal of sustainable development. We want our future citizens to be actively involved in addressing the pressing environmental issues that plague our times. RMZ Foundation and WeRise, in addition to Green Hackathon, undertake several initiatives to engage with the larger community and resolve social concerns around education, women’s empowerment, access to art and technology, as well as, social housing for the underprivileged sections of society.

This year, RMZ Foundation and WeRise have collaborated with The Energy and Resources Institute (TERI) as their knowledge partner to conduct Green Hackathon 2018 in Bangalore. TERI’s mission is to usher transitions to a cleaner and sustainable future through the conservation and efficient use of natural resources and innovative ways of minimizing and reusing waste. With its vast experience in devising sustainable solutions and its engagement in promoting Education for Sustainable Development (ESD) across the country, TERI aims to add real value to Green Hackathon 2018.

### The Green Hacks

The ultimate goal of 'green technology' is to replace practices and methods that damage/deplete natural resources with alternate environmentally benign, economically efficient and socially equitable practices that are sustainable.

Under Green Hackathon 2018, we look forward to an array of vibrant green hacks (#working #prototype models) harnessing the power of science and technology in the quest for a transition towards sustainable development. All hacks should be problem-driven, with the goal of creating and applying knowledge for sustainability. ***Hacks can be in the form of a method, process or product, and need to have science, technology and innovation at their core.*** They must be scalable, addressing issues and problems in the local context.

The issues of coverage can range from water usage & pollution, to energy conservation & efficiency, biodiversity & wildlife conservation, waste management, air quality, food & nutrition to the larger and universal issues of global warming and climate change and their associated impact.

## **THE GREEN HACKATHON 2018 - IMPORTANT POINTERS**

- **Competition theme:**
  - *Innovative Technological Solutions to Promote Sustainable Living*
- **Eligibility criteria:**
  - Junior hackers: Students from Class VIII – X
  - Senior hackers: Students from and Class XI – XII
- **Team details:**
  - Team composition: 3 students and 2 teachers
  - Number of teams per school: A minimum of one team. Schools can nominate more than one team
  - Team nomination: To be done by the school. Individual registrations will not be accepted
- **Program milestones**
  - **Registration:** 24 September to 30 October 2018  
Schools need to register their teams for the Green Hackathon 2018 with TERI. The registration form is available at this website.
  - **Ideating cluster workshops:** 5-15 November 2018  
Workshops will be organised for the registered schools wherein their hacks will be reviewed and will be provided with inputs from experts to strengthen their hacks. The workshop will also accentuate project management skills
  - **Mentoring and shortlisting:** 15-30 November 2018  
Schools will incorporate the suggestions and work closely with TERI in developing their hacks. A 2-3 minute video describing their project will be prepared and shared with TERI. Trustees of RMZ will review the videos and the top 100 hacks will be shortlisted to participate at Green Hackathon 2018 on **21 December 2018**.
  - **Preparatory workshop:** 1-5 December 2018  
A workshop will be conducted for the 100 winning entries to help them prepare and present their hacks.
  - **Green Hackathon 2018:** 21 December 2018  
On 21 December 2018 at RMZ Ecoworld, Bellandur, Bengaluru. Ms. Adhya Menda, Co-Founder of Green Hackathon will inaugurate the programme. The hacks will be displayed and their working will be demonstrated. Visitors to the program will view the hacks and simultaneously the judges will evaluate the hacks. The program will end with the announcement of the winners.
  - **Implementation of the winning hacks:** January 2019  
TERI will assist the winning schools to implement the hacks so as to demonstrate the change the Green Hackathon hacks can make to our city of Bengaluru.

Green Hackathon is available at:

<http://www.teriin.org/event/green-hackathon-2018-registrations-open-till-oct-15>

## **HACK INSPIRATIONS:**

Meeting the UN's 17 Sustainable Development Goals calls for concerted action on a number of fronts. One major action area entails harnessing and maximizing the potential of technological innovation. Green Hackathon promotes technological innovation for sustainability amongst the youth. This section shares a few examples of technological solutions to inspire and provide a brief overview of green hacks.

A few examples of green hacks from around the world are listed as under:

### **1. Smart and dynamic street lighting system**

*Concern:* Waste of electricity due to continuous operation of street lights at full capacity during the night, even in absence of any vehicular movement/person walking.

*Hack:* Automatic efficient lighting system

- Interconnected infra-red and passive infra-red sensors planted at the edges of the road at regular distance.
- These sensors are then rooted to a micro-controller that is programmed to operate the street lights at full capacity only when a person/vehicle approaches closer to the street lights.

*Outcome:* Energy efficient self-regulated street light operation

### **2. Air quality monitoring device**

*Concern:* To analyse outdoor air quality due to vehicular movement/and other activities, so that one can plan outdoor activities during the presence of better air quality.

*Hack:* Air quality monitoring device consisting laser dust sensors, single board computer, and SD cards were developed along with USB ports for data transfer. The laser dust sensor detects air pollutant quantitatively, while the single board computer is programmed to capture pollutant information (data) and store the same in the micro SD card. This data is then transferred to the server through internet, and displayed on a web-link with the geographical position of the device and vehicular movement in the neighbourhood.

*Outcome:* This device helps to study local air quality in the neighbourhood and helps in deciding the right time for outdoor visits by predicting air pollution sources.

### **3. Smart plugs**

*Concern:* Electricity wastage due to idle run of electrical appliances

*Hack:* Coded OLED and LCD devices having the power to combine operational ability of the switch with that of a mobile application is used. A mobile application having Wi-Fi connectivity helps in running these smart switches. Electrical appliances are configured with the mobile app by entering unique IDs for each of the appliances. In case internet access is not present, the device & mobile app will still be able to communicate on Wi-Fi protocol where the device will act as a Wi-Fi router.

*Outcome:* All electrical appliances can be turned off using mobile application, and this will check electricity wastage and prevent their idle run.

## **ACCOLADES**

Students stand to win exciting cash prizes, trophies and certificates. Winners will be awarded and assisted to implement their hack. Further, every participant in the competition will be felicitated with certificates. For each category, Junior Hackers and Senior Hackers three prizes each will be awarded.

1. The Green Hackers, 2018 – Winners - Cash prize of Rs. 40,000/-
2. The Green Hackers, 2018 – Runners up – Cash prize of Rs. 25,000/-
3. The Green Hackers, 2018 – Consolation – Cash prize of Rs. 15,000/-

The event will be covered in local newspapers and will provide visibility for the participating schools. As the event is being held in an IT hub, participating schools will also benefit from the pollination of ideas, pooling of technological innovations and a platform to scale smart mitigation strategies.

## **EVALUATION OF HACKS**

A panel of Environment Technology Experts will evaluate the hacks for the following criteria

- Environmental Impact
- Idea Innovation
- Technical maturity
- Scalability and replication of idea
- Business Value.

In addition to the above, an evaluation of the process, i.e. the manner in which the schools work will be monitored and evaluated by TERI.

## **INNOVATIONS AND WINNER OF THE GREEN HACKATHON, 2017**

*Efficient use of water through Automatic Irrigation System - Hacked by Amber Valley Residential School, Chikmagalur*

The system consists of a sensor, a real time clock, two promoters, a solenoid valve, and a SD card module with Arduino. Operational instructions will be fed into SD card and Arduino will enable these instructions to operate i.e. motor to turn ON/ OFF automatically. Further, signals are sent to solenoid valve which will regulate water flow. Finally, sensor will calculate and give out water irrigation data.

*Design and development of Smart Shower - Hacked by Sri Kumarans Children's Home, ICSE*

Smart shower is a solution to tackle the excess usage of water while having a bath. Smart shower technology allows water to flow only when a person stands in front of the shower and further, it would beep when excess water is being used during the shower.

*Real-time detection of potholes on road and communication to authorities – Hacked by School of India*

The pothole detection mechanism is to check & develop a compact system (device) which will detect & identify potholes and report the same to the concerned authorities. The device is inserted into the vehicle meant for pothole detection. The idea employs a distance sensor which is economical and capable of measuring the height of potholes/bumps on road while riding. A SMS is also sent to the authority.

The past years details can be viewed at ([www.rmzfoundation.org](http://www.rmzfoundation.org))

### **About TERI**

The Energy and Resources Institute (TERI) is a not-for-profit institution engaged in research and awareness generation activities on energy, climate change, biotechnology, biodiversity and education. The Environment Education Area at TERI is mandated to carry out intensive work in the field of Education for Sustainable Development (ESD) across India as well as internationally. It has been working relentlessly on educating young people on environmental issues in relation to the existing social structure, cultural norms, economic realities and global trends of present times. It works in close cooperation with government bodies, UN agencies, multinational corporations and international youth organizations and networks. For more details log onto: [www.teriin.org](http://www.teriin.org)

### **About WeRise:**

WeRise, is a social enterprise committed to effectively integrating efforts into generating sustainable, inclusive futures. Central to WeRise's ethos is the synergy of social and environmental sustainability. Founded on a three-pronged approach of "Build-Inspire-Educate", WeRise is engaged in catalyzing sustainable social change in housing, women empowerment, youth empowerment, education and green technology. Built on five pillars: Technological Empowerment, Financial Inclusion, Sweat Equity, Sustainability and Communities, WeRise provides the marginalized populace with the means to build their own homes. WeRise is the brainchild of Adhya Menda, a student of Mallya Aditi International School. An environmentalist at heart, Adhya wants to invigorate efforts towards spreading awareness on sustainable living and adoption of green technologies by individuals and organizations at all levels. Adhya is also an art aficionado and an avid photographer. For more details log onto [www.werise.co.in](http://www.werise.co.in)

### **About RMZ Foundation**

RMZ Foundation was established to promote the well-being of humanity throughout the country, working at the intersection of three pillars of change – Sustainable Development, Resilient Communities and Urban Innovations - to pave the way ahead by unlocking new possibilities. The Foundation has empowered communities through social housing, public art, and has enabled some of India's brightest young achievers and innovative solutions that have changed the way communities live and interact. It aims to create equitable and inclusive growth so as to build resilient communities by actively contributing to their social and economic development and thereby building a better, sustainable way of life for the weaker sections of society. At its core, the Foundation is about creating real, transformative change. For more details log onto [www.rmzfoundation.org](http://www.rmzfoundation.org)

### **For more information, please contact**

Ms. Saltanat M Kazi

*Fellow*

The Energy and Resources Institute (TERI)

Southern Regional Centre,

4th Main, 2<sup>nd</sup> Cross, Domlur II Stage, Bengaluru, Karnataka 560071

Tel: 080 2535 6590

Email: [thegreenhackathon@gmail.com](mailto:thegreenhackathon@gmail.com),

[saltanat@teri.res.in](mailto:saltanat@teri.res.in)

Website: [www.teriin.org](http://www.teriin.org)

