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Immediate Release

Sembawang Shipyard 's Green Wave Environmental Care Competition For Schools 2006 Award Presentation Ceremony

Singapore, January 30 2007 - Sembawang Shipyard Private Limited, a subsidiary of SembCorp Marine Ltd, is pleased to announce the winners of Green Wave Environmental Care Competition for schools 2006 at the award presentation ceremony at the Mandarin Court, Meritus Mandarin Singapore.

Our Guest-of-Honour for this award ceremony is Dr Yaacob Ibrahim, Minister for Environment and Water Resources. Sembawang Shipyard's "Green Wave" Environmental Care Project was launched in January 2003 and is an annual competition opened to all students at Primary, Secondary, Junior Colleges and Institute of Technical Education (ITE) and Tertiary Institutions. Jointly sponsored by Sembawang Shipyard's alliance partners, Shell International Trading and Shipping Company Limited (UK) and BP Shipping Limited (UK), the competition targets at our youths, encouraging them to develop innovative ideas, plans and projects on environmental care and protection. This is the fourth year of the competition and we are very encouraged by the keen, enthusiastic interest and participation from our student population, tertiary institutions, governmental and environmental bodies. This year, a total of 275 entries were received for the competition from 1,100 students, an increase of 8% participation rate from 2005.

During the ceremony, a total of 51 awards will be presented by Dr Yaacob Ibrahim to the winning teams (See Appendix 1 and Appendix 2).

For the first time in the competition since 2003, the Top Prize for the Tertiary Competition has been won by a team from Ngee Ann Polytechnic for their innovative project entitled, 'Water Management System'. This award comes with a S\$10,000 cash prize and a one-month development attachment with a Shell associate company, Northwest Shelf Shipping Service Company in Australia. The Top Prize is jointly sponsored by Shell International Trading & Shipping Company Limited and Sembawang Shipyard Pte Ltd.

The panel of judges for the competition comprised directors and senior personnel from the Ministry of Education, Singapore Environment Council, NParks, National Environment Agency, Housing Development Board of Singapore, Senoko Power, National University of Singapore, National Institute of Education, Nanyang Technological University and Head of Departments. Special appreciation goes to the Green Wave Advisory Board for their guidance and support; whose members are drawn from leaders in related businesses and in the marine industry. The members of the advisory board include Dr Victor Savage, Associate Professor from Department of Geography, National University of Singapore and a Board Member

of Singapore Environment Council, Mr Phil Snaith, President, Shell International Eastern Trading Company, Mr Angus Davis, Regional Manager, South Asia of BP Shipping, Dr Geh Min, President of Singapore Nature Society, Professor Hew Choy Sin, Vice Chairman of Tan Kah Kee Foundation and Adjunct Professor, Institute of Advanced Studies, Nanyang Technological University and Dr John Yong, Assistant Professor, Natural Sciences & Science Education, National Institute of Education, Nanyang Technological University.

Mr P K Ong, Managing Director of Sembawang Shipyard said “We are pleased that our environmental outreach programme, Green Wave is now a key platform for our students to share their innovative green ideas on sustainable environmental care and protection. This annual competition would not have been successful without the strong support and participation from all sectors of the community, in particular, our student population, their teachers, tertiary institutions, governmental and environmental bodies. We congratulate all winners and thank all participants for making this a challenging and meaningful competition”.

The Green Wave Environment Competition 2007 is now open for registration and all students and schools are invited to participate and share their ideas on environmental care and protection. Winning teams can expect the following attractive awards:

Primary Schools	1st Prize	S\$4,000
	2nd Prize	S\$2,000
	3rd Prize	S\$1,000
Secondary Schools	1st Prize	S\$6,000
	2nd Prize	S\$4,000
	3rd Prize	S\$2,000
Junior Colleges / ITEs	1st Prize	S\$8,000
	2nd Prize	S\$5,000
	3rd Prize	S\$3,000
Tertiary Institutions	1st Prize	S\$10,000
	2nd Prize	S\$6,000
	3rd Prize	S\$4,000

The 1st Prize in the Tertiary category is jointly sponsored by Shell International Trading and Shipping Company Limited and includes a one-month attachment to a Shell associate company. The 1st Prize in the Junior Colleges / ITEs category is jointly sponsored by BP Shipping and includes a one-month work attachment to BP Singapore. Winners of the top prizes at the Junior College/ITE and Tertiary levels will also be offered attachments with Sembawang Shipyard in divisions such as Engineering, IT, Human Resources, Operations and Business.

The prize money for the Primary, Secondary and Junior Colleges and ITEs should be shared on a 60%-40% basis with 60% of the prize award going to the School fund and the remaining 40% to the student/students who are in the project team.

The prize money for the Tertiary Level will be shared by the student participants in the teams and the tertiary institutions on a 60% / 40% basis.

About Sembawang Shipyard

Sembawang Shipyard Pte Ltd is a wholly-owned subsidiary of SembCorp Marine, the marine engineering arm of SembCorp Industries Ltd. Sembawang Shipyard has one of the largest integrated ship repair facility in Southeast Asia. The shipyard's world-class reputation is based on the company's commitment to superior customer service, innovative solutions, quality, and strict Health Safety, Security and Environment standards.

With more than three decades of experience and proven track record in ship repair and offshore conversions, Sembawang Shipyard is the chosen exclusive alliance shipyard for Shell International Trading and Shipping Company Limited (UK), BP Shipping (UK), BHP Billiton (Australia) and Jo Tankers AS (Norway), for the repairs and refits of their fleets in the Far East. Sembawang Shipyard's other long-term partners include Alaska Tanker Company (USA), V Ships Group (Monaco), TESMA (Norway), ASP Shipmanagement Group (UK), Northwest Shelf Shipping (Australia), Exmar Shipmanagement (Belgium), Euronav Shipmanagement (Belgium) and TMT Ltd (Taiwan). Besides our proven expertise in the sectors of tankers, LNG carriers, bulk carriers and container / cargo vessels, we are also recognised as a specialist in niche markets such as passenger ships conversion / upgrading, FPSO conversions, offshore conversions and newbuildings, complex lengthening, damage repairs, chemical tankers, liquefied gas carriers and navy ship repairs.

In July 2002, Sembawang Shipyard became the first shipyard in South East Asia to achieve ISO14001 Environmental System Certification by Det Norske Veritas Ltd. The certification is a firm endorsement of the shipyard's commitment and efforts towards environmental preservation and protection. As such, the shipyard is pleased to be the first in its industry in Singapore to promote the environmental care and protection project for all schools in Singapore.

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The press release is also available at our website: www.sembship.com/greenwave

Appendix 1

Winners of Green Wave Environment Competition 2006

Primary Level

Prizes	School	Title of Projects
1 st Prize \$4,000	Qihua Primary School	The water leaker transformer
2 nd Prize \$2,000	Qihua Primary School	The sparkling shoppe
3 rd Prize \$1,000	Ghim Moh Primary School	PLUSBG
Merit Award \$500	St Michael's School	A "Fine" city
Merit Award \$500	Temasek Primary School	Saving our green spaces
Merit Award \$500	Damai Primary School	Freezer Perfume
Merit Award \$500	Hong Kah Primary School	Bottles HEART & Fun with recycling
Merit Award \$500	Hougang Primary School	Life science website
Merit Award \$500	Nanyang Primary School	The ten commendments of the Environment
Encouragement Award \$200	Anglo-Chinese School (Junior)	Water saver and electricity producer
Encouragement Award \$200	Punggol Primary School	Tinted bottles: Go Green Punggolite Project (Primary 1s & 2s)
Encouragement Award \$200	CHIJ - Our Lady of Good Counsel	Play more, splash less
Encouragement Award \$200	Kuo Chuan Presbyterian Primary School	Colours in covers!!
Encouragement Award \$200	Keming Primary School	Water saver

Secondary Level

Prizes	School	Title of Projects
1 st Prize \$6,000	Raffles Institution	Revolutionizing the thorny fruit
2 nd Prize \$4,000	Bukit Panjang Govt High School	Recycling Chemicals
3 rd Prize \$2,000	Hwa Chong Institution	Biopapyrus
Merit Award \$1,000	Raffles Institution	enDANGERed by (Wildlife conservers)
Merit Award \$1,000	Raffles Girls' School	Reducing air pollution / impurities with our organic air purifier
Merit Award \$1,000	Raffles Institution	The harnessing of energy in monsoon drains
Merit Award \$1,000	Hougang Secondary School	An alternative to paper and softboard
Commendation Award \$500	Hwa Chong Institution	new AGE
Commendation Award \$500	Raffles Institution	The making of a beach survey handbook and planning an ecological tour to Labrador Park
Commendation Award \$500	Raffles Institution	Environment: An interactive role-playing game
Commendation Award \$500	Hwa Chong Institution	Biodiesel as a viable alternative fuel
Encouragement Award \$200	Xinmin Secondary School	RV battery (recycled vinegar battery)
Encouragement Award \$200	Woodgrove Secondary School	Increasing vitamin C content in Bayam plants by using discarded fruits and vegetables
Encouragement Award \$200	Raffles Institution	Restyle your life: Recycle
Encouragement Award \$200	Raffles Institution	Weaving on two wheels - Experience a brand-new feel
Encouragement Award \$200	Yishun Town Secondary School	Aquarium water self-renewal system

Junior Colleges & Institute of Technical Education Level

Prizes	School	Title of Projects
2 nd Prize \$5,000	ITE College West Dover	Solar Powered Car Air-Con
3 rd Prize \$3,000	ITE College West Dover	Water monitoring device
Merit Award \$1,000	ITE College West Dover	Aquaponics System
Merit Award \$1,000	ITE College West Bukit Batok	Self-maintained Eco Garden
Merit Award \$1,000	ITE College West Bukit Batok	Recycling spent cooking oils
Commendation Award \$500	ITE College West Dover	Solar Powered Advertising Board
Commendation Award \$500	ITE College East	Fish tank auto/recycle changing system
Commendation Award \$500	Victoria Junior College	Clean air on the go
Encouragement Award \$200	Serangoon Junior College	Overhaul of Singapore's recycling industry
Encouragement Award \$200	Nanyang Junior College	Trace elemental analyses of water spinach (<i>Ipomoea aquatica</i>)
Encouragement Award \$200	Nanyang Junior College	Trace elemental analyses of local watercress (<i>Nasturtium Officinale</i>)

Tertiary Level

Prizes	School	Title of Projects
1 st Prize \$10,000 And a one-month attachment to a Shell affiliate company	Ngee Ann Polytechnic	Water management system
2 nd Prize \$6,000	Singapore Polytechnic	Maintenance free solar irrigation system for gardens
3rd Prize \$4,000	National University of Singapore	Conserving banded leaf monkeys (<i>Presbytis femoralis femoralis</i>) in Singapore: Exploring possibilities
Merit \$1,000	Ngee Ann Polytechnic	Enhanced water broom
Merit \$1,000	Singapore Polytechnic	Mosquito free roof gutter
Commendation \$500	Nanyang Technological University	Conversion of food waste to energy
Commendation \$500	Temasek Polytechnic	Paper Multiplier
Encouragement \$200	Temasek Polytechnic	Recycling of used cooking oil to make soap
Encouragement \$200	Ngee Ann Polytechnic	Carbon dioxide removals from car exhaust gas
Encouragement \$200	Ngee Ann Polytechnic	Fuel cell powered grass cutter

Appendix 2

Green Wave Environment Competition 2006 Summary of Winning Projects

Primary Level

Prizes	School	Title of Project	Participants
1st Prize \$4,000	Qihua Primary School	The water leaker transformer	Ivy Yeo Sing Ming, Zoey Tay
Project Summary	<p>The Water Leaker Transformer consists of 2 parts: (I) the Rain Collector and (II) the Leaker Pots.</p> <p>(I) The Rain Collector</p> <p>The rain collector allows the potted plants to be kept indoors to receive rainwater which is rich in nitrogen. This way, treated water from the tap can be saved for other uses thus saving effort and expenses that went into treating the water. At the same time, the pots will not be flooded in times of heavy rain.</p> <p>(II) The Leaker Pots</p> <p>If a family wants to keep several pots of plants, they would have to prepare several rain collectors, one for each pot of plant. This is a waste of resources as more materials are needed and a problem arises when the excess rain water has no outlet. We placed green netting with tiny holes to prevent the soil from dropping into the next pot. The basket is the infrastructure to hold the soil. We used a recycled plastic bottle below to separate the different levels. Also, we cut holes at the bottom of the bottle to allow water that flowed into the bottle to flow out of the bottle.</p> <p>To conserve resources, we made the pots multi-storeyed so that the pots share the same rain collector. To allow an outlet for the excess rainwater, we made the last pot be a pot that contains water-plants. Also, to prevent mosquitoes, we kept some Mollies in the pot with the water plants.</p>		
2nd Prize \$2,000	Qihua Primary School	The sparkling shoppe	Jeslyn Tung Hwee Pin, Serene Wong Qiu Hua, Celestine Khor
Project Summary	<p>Shopping is a favourite pastime in our country. As such, many people in our country throw away things that are still in good condition whenever they wanted something new or different. This creates a lot of waste and would pose a serious problem as Singapore uses up all its landfill in the near future.</p> <p>Many people do not want to use second hand goods because they looked old or have defects. We propose to collect junk and renew them so that they look presentable and can have second life. We will then sell these goods to pupils or exchange for more junk to be recycled.</p>		
3rd Prize \$1,000	Ghim Moh Primary School	PLUSBG	Ni Yi, Cao Jing Ning
Project Summary	<p>PLUSBG is meant to reduce the use of plastic bags. This stretchable hand made nylon bag with a round handle is light and is able to take the load. This bag is to be used at the cashier's point in the supermarket. The cashier will key in the cost of the item and transfer the items into the expandable nylon shopping bag. This helps to reduce the number of the plastic bags which is being issued now a days at the supermarket. The bag can be weaved easily in a short ime. This project can be introduced to the senior citizens group and young children as a favourite pastime.</p>		

Prizes	School	Title of Project	Participants
Merit Award \$500	St Michael's School	A "Fine" city	Darren Cheong Jin Yuen, Elvin Sim Jian Wen
Project Summary	<p>This game "A Fine City" aims to enhance the awareness of being caring towards our environment and not to take it for granted. The game is played by a maximum of 6 players whose aim is to reach the final destination in the quickest possible time. The players can advance by rolling the die and landing on destination cards, which educate them on the different landmarks in Singapore, like nature reserves, public parks and islands. Getting a "Gotcha" card would mean that the player would have to perform a penalty before advancing. On the whole, the creators of the game would like children and adults to get a better understanding of Singapore through playing the game, having fun and being more environmentally concerned.</p>		
Merit Award \$500	Temasek Primary School	Saving our green spaces	Donovan Kwok Ji Hao, Daryl Teo Hong Jie, Kwan Jing Yi, Goh Jia Ying, Pang Zhuo Wei
Project Summary	<p>The nature reserves in Singapore are shrinking due to rapid urbanization. The Singapore Government has gazetted some nature reserves such as the Botanical Gardens and Bukit Timah Nature Reserve. However, the nature sites in Singapore seem to be shrinking relative to its urban setting.</p> <p>This project involved identifying a possible site to be gazetted as a nature reserve. A report is presented, discussing the impact of urban growth on nature in Singapore. It also briefly examines the current situation of natural habitats and their conservation in Singapore. Taking all that into account, a proposed site, Khatib Bongsu, has been identified for conservation. Arguments put forth include benefits in the areas of research, education, health and eco-tourism.</p>		
Merit Award \$500	Damai Primary School	Freezer Perfume	Sim Jin Leong, Heng Xiang Fei, Neoh Jia En, Tan Ming Hua
Project Summary	<p>The freezer can be quite smelly especially when we put in a lot of seafood in it. We tried making this freezer perfume to remove the 'fishy' smell of the freezer. We reused a microrable plastic container and put in some lemon, lime and pomelo peel, pandan leaves, tea bag and a bit of lime juice at first. We changed the container to a cloth drawstring bag to minimize wastage in space. This allowed us to remove bad odour in an environment friendly way.</p>		
Merit Award \$500	Hong Kah Primary School	Bottles HEART & Fun with recycling	Gunjal Dilip Warade, Viren Nandakumar Rao, Ishraq Bin Haider, Illarionov Vladislav, Pai Abhijit Kottachery
Project Summary	<p>Educating the school about recycling, reusing and reducing waste through assembly talks, websites and putting up exhibits of the finished products made by the students using recycled materials. Main product recycled was the bottles. We decorated old bottles with glass paints. We also used the container for film and chicken essence bottles and used clay to do pottery art on them to create a new product. We had a competition for pupils to use recycled materials to make musical instruments.</p>		
Merit Award \$500	Hougang Primary School	Life science website	Joni Lim Xin Yi, Goh Wei Ning, Brandon Tan Zhiming
Project Summary	<p>We created a website that documents all the flora and fauna that can be found in the school. By clicking on the map of our Eco-garden, you can virtually navigate and discover the plants found in our garden. We have taken the trouble to take pictures of the plants and animals found in our garden. Even weeds and pests are included. We have over 300 species of plants that are classified into categories like herbs, ferns, water plants etc.</p>		

Prizes	School	Title of Project	Participants
Merit Award \$500	Nanyang Primary School	The ten commendments of the Environment	Justin Liu Shuang
Project Summary	The objective of my project is to educate young children about the importance of protecting the environment. If we educate children about the environment when they are still young, they will be able to help to conserve the future environment. I will be designing a webpage to teach the children how to preserve the environment using more interesting methods like comics so it will be fun for the children to learn.		
Encouragement Award \$200	Anglo-Chinese School (Junior)	Water saver and electricity producer	Walter Diong Jia Sheng, Scott Darren Khoo Shen Wei, Cavell Lim Shi Xian, Sean Thian Yoon Chang, Andre Wee Rui Ying, Timothy Lim Jun Xiong
Project Summary	The project is a machine that will collect rain water that will be used to produce electricity and the rain water will be filtered so that it can be sent to houses and the electricity will also be sent to the homes. And some water collected by 2 drains will be stored in case of droughts or fires in the future.		
Encouragement Award \$200	Punggol Primary School	Tinted bottles: Go Green Punggolite Project (Primary 1s & 2s)	Matthew Eng, Tan Kai Yang, Gregory Ler Jun Kai, Samuel See Jia Le, Khoo Xin Hui, Justyn Phoa Zairen, Iryanti Rasman, Elizer Ong De Zhi, Zhao Hong Xun, M. Kaartigha, Mohd Aizam, Evan Quek, Gene Leck, Ho Yong Le, Darryl Goh Chin Han, Gabriel Ho, Koh Tian Seng, Tan Xuan Yun, Fong Kei Sen, Goh Jun Xian, Ong Zheng Jie, Manoj Kumar, Sharnitha Arumugam, Mohamed Hisyam B Ismail, Noah Lee Yong Ler, Quek Yan Hui, Dylan Scott Low Yan Jun, Gerald Ng Xian Wei, Koh Toon Hock, Ng Wen Qi
Project Summary	The project embarked on a community through school approach to celebrate the habit of RECYCLING for the betterment of environmental conditions in terms of a sustainable waste minimization. Team members launched a whole school cum key stakeholders approach in recycling, forged partnership with NTUC Fairprice (Hougang Mall) in the provision of used Styrofoam boxes for planting purposes in the school's Ecogarden, and invited members of the public to participate in the school's RECYCLING movement on the Open House Day. On the Open House, pin badges carrying environmental messages were designed by team members and given away to members of the public who came with materials for recycling. Tinted plant holders were also created from the mass collection of plastic bottles and sold on the Open House. Proceeds from the sale were channeled to the school's Needy Fund.		

Prizes	School	Title of Project	Participants
Encouragement Award \$200	CHIJ - Our Lady of Good Counsel	Play more, splash less	Choo Jia, Lee Qin Zhen, Tiffany Gwee, Caroline Quek
Project Summary	<p>We are aware that water is a precious resource and we need think of ways to get this message across to many of our schoolmates. After much brainstorming, we thought that it would be most effective to educate our fellow schoolmates through fun. Hence, designing a game for them seems appropriate, as we will be able to kill two birds with a stone. Our friends will be able to learn ways to conserve water and have fun at the same time! We will be designing a board game for the pupils to play during their free time at the Recycling Corner. We are also looking into the possibility of designing an on-line game where more people, especially children, can benefit from it.</p>		
Encouragement Award \$200	Kuo Chuan Presbyterian Primary School	Colours in covers!!	Maanasa Sri Ganesh
Project Summary	<p>In our school, my form teacher taught us about using less plastic as they will lie on earth and not go away at all. Instead she asked us to use paper as it can be re-used.</p> <p>In this project, I have used different colourful paper posters and thick advertisement papers that come with newspapers as wrappers for my books. The colourful covers not only make my books nice to look at, but they also help me to identify the books easily. For example, if I cover my Maths book with a zebra poster, every time I look at the zebra, my mind will immediately know that it is the Maths book. My brother covers some of his text books with the posters of his favourite football heroes.</p> <p>You know something? This year we used papers and posters as wrappers. So we did not buy the plastic wrappers. This saved my parents \$10. I got a 'Geronimo Stilton' book with that money. If all the children use papers as wrappers, then they can save a lot of money too! I am happy doing this project as I can use less plastic and more paper. I make my books beautiful and attractive. It also makes the earth more safe.</p>		
Encouragement Award \$200	Keming Primary School	Water saver	Nur Hasinah Bte Handongfiah, Chelsea Lin Si Hui, Yeo Wei Song
Project Summary	<p>Water wastage has been a major concern in many schools. This project is based on water management. It focuses on how best to save water when watering potted plants. Pupils brainstormed solutions and choosing the best solution, and investigate the feasibility of this solution and verify the results of their investigation.</p> <p>The pupils decided to use recycling objects that can be found in school. An old trash bin lying around and that gave a great idea for container. And we managed to get a trolley. This bin is then modified to put a pipe at the bottom of the bin. The pupils then placed the bin onto the trolley and tie the bin securely to the trolley.</p> <p>The bin is then filled with water and together with a watering cans, this 'water saver' can be</p>		

	<p>pushed easily to the designated area to water the potted plants. Water is scooped out from the bin using the watering can and water directly into the pots. This way, we do not spill any drop! The excess water can drain out through the pipe attached.</p>
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Secondary Level

Prizes	School	Title of Project	Participants
1st Prize \$6,000	Raffles Institution	Revolutionizing the thorny fruit	Ong Wen Chong, Paul Ng Kwok Yang, Victor Lim Jian Hong, Benjamin Wong Yong Quan
Project Summary	<p>Our project is a study investigating the possibility of turning woody and fibrous fruit peels into paper. The study encompasses knowledge of environmental conservation, creative problem-solving, hands-on kinesthetic learning, as well as awareness of recycling. In a world with increasing demand for paper, our project explores the feasibility of integrating fruit peels, in our context durian husks, into the process of manufacturing paper, thereby reducing the fruit peel waste generated each year. After much research and experimentation, we present the fruit of our labour – a manually-operated paper-making machine accompanied with a guide for its usage. Our project serves as a platform from which further extensions could be made with appropriate technologies to better the local recycling scene.</p>		
2nd Prize \$4,000	Bukit Panjang Govt High School	Recycling Chemicals	Low Hong Wei, Yen Jia Min
Project Summary	<p>The main idea of our project is to recycle the waste chemicals produced by students during chemistry practical sessions. We aim to make chemical waste in laboratories environmental-friendly. Chemistry practical are carried out in hundreds of secondary schools which will generate huge amount of chemical wastes such as potassium nitrate and metal hydroxides. We aim to reuse these chemicals instead of throwing them away. These chemicals are expensive but yet many are lacked by plants and therefore we can recycle it into chemical fertilizers for plants. We will be developing different samples to suit all plants.</p>		
3rd Prize \$2,000	Hwa Chong Institution	Biopapyrus	Ng Mingwei, Chiang Cheng Hsien, Im Zhen Jie, Seah Yi Yuan
Project Summary	<p>Paper is obtained conventionally by the means of logging down timber and processing them into paper pulp before finally becoming paper through stages of chemical processing. However, the excessive use of paper has led to an exponential increment in the rate of logging, contributing to deforestation and global warming. The chemicals used in the production of conventional paper also lead to pollution in the rivers and other water bodies.</p> <p>Through creating Biopapyrus, we hope to be able to reduce the rate of deforestation and pollution. In the process of producing Biopapyrus, no timber or chemicals are being used. Biopapyrus is produced using the bacteria <i>Acetobacter xylinum</i> and (Bacterial Biopapyrus) the stages in processing do not involve the use of chemicals. Biopapyrus was also produced by recycling expired Nata de Coco (Recycled Biopapyrus) and reconstituting it into paper. Biopapyrus however cannot replace all the uses and purposes of conventional paper.</p>		

Prizes	School	Title of Project	Participants
Merit Award \$1,000	Raffles Institution	enDANGERed by (Wildlife conservers)	Deshawn Tan Chong Xuan, Leong Wai Sum, Li Yuanwei, Andy Neo Jun Xiang
Project Summary	<p>Our project is about designing a brand new board game, incorporating the ideals of protection and conservation of endangered animals. Creatively designed, this game would especially target primary and secondary school students with impressionable minds, nevertheless, this is a game that will bring hours of fun and excitement to the whole family. With novel ideas like the "Terrain Dice", and the jigsaw-like detachable board, our group will convey information about how the actions of mankind, and other environmental factors, can cause the endangerment of the precious wildlife in various habitats of the world.</p>		
Merit Award \$1,000	Raffles Girls' School	Reducing air pollution / impurities with our organic air purifier	Os Agarwal, Indera Arun, S. Bhuvaneswari, Sorna Rosalind Graetz
Project Summary	<p>We aimed to develop an organic air purifier that is environmentally friendly unlike most of the products available in the market, either because of electricity or chemicals. We'd therefore help cut down the use of energy and non-biodegradable materials.</p> <p>We researched on the disadvantages of the present air fresheners and then found a substance that would be environmentally friendly and at the same time purify the air. We then tested the effectiveness of the substance and then developed our prototype.</p> <p>Our main finding was that charcoal is very good at adsorbing odors, would be suitable for our project. Attaching a fan to our product would increase its effectiveness by circulating the air.</p>		
Merit Award \$1,000	Raffles Institution	The harnessing of energy in monsoon drains	Koh Wei Chee, Sia Bing Xi, Lucas Lee Zhi Hao, Yeong Chee Cheen
Project Summary	<p>The project aims to harness energy through the use of a turbine in monsoon drains. In Singapore, due to the constraints of land, there are few energy resources like fossil fuels and it is impractical to build huge dams or wind farms. Thus, the government purchases energy resources to keep the country going. Our product is small and inexpensive, able to generate a significant amount of energy. Through this, we aim to promote awareness among people of the conservation of energy.</p> <p>Our product is a water wheel consisting of 6 bendable light aluminum 'fins' attached to a 2.4W 6V bicycle dynamo, attached to the sides of the drain with a metal rod as its axle. Due to the difficulty of turning the dynamo, we decreased the torque by increasing the distance from the pivot (the length of the 'fins') and the surface area of the paddles. The minimum height of falling water is 0.5m for our product to generate electricity to power up the LEDs. Also, a constant flow of water is required. A wire mesh is required to block up excess litter. Our product can be put in any drain as long as these criteria are met.</p>		

Prizes	School	Title of Project	Participants
Merit Award \$1,000	Hougang Secondary School	An alternative to paper and softboard	Chong Ren Yi, Bryan Tan Si Yuan, Ong Zheng Jie, Ang Xiao Li, Tan Wei Ren, Tan Yu Chuan
Project Summary	<p>Due to the constant need for wood products, the existences of the world's remaining rainforests are being threatened. Paper is perhaps one of the most used materials as it has many uses such as writing papers or newspaper. Softboard is also widely used as notice boards in many places. Therefore our group decided to create an alternative to paper & softboard in order to reduce the amount of destruction to our precious, remaining rainforests.</p> <p>After doing a lot of research, our group decided to use dried leaves from trees to create usable paper. In order to allow the fibers to stick together, we combined tapioca flour and boiling water to act as a binding agent for the fibers.</p>		
Commendation Award \$500	Hwa Chong Institution	new AGE	Alexander Chan Ho-Young, Desmond Chong Sheng Liang, Cai Yong, Lim Jiawei
Project Summary	<p>Global warming. Greenhouse effect. Sea level rises. Temperature increases. This is just the start of an environmental crisis and something must be done quickly. With that thought in mind, the team set out on a mission to bring Earth into a new AGE. New AGE is one big package consisting of several phrases in an attempt to raise environmental awareness to our society.</p>		
Commendation Award \$500	Raffles Institution	The making of a beach survey handbook and planning an ecological tour to Labrador Park	Li Kexin, Soh Ming Quan, Mark Cheok Jia Rui, Yeo Wee Jin
Project Summary	<p>This project aims to raise awareness of beaches in Singapore, as to promote conservation of these beaches, which are under threat, due to pollution people have caused. It includes a handbook, analyzing each of the major beaches, such as Labrador Beach, Punggol Beach and Changi Beach, all of which have some part of Singapore's natural coastline intact. It also includes a planned eco-tour to promote these breaches</p>		

Prizes	School	Title of Project	Participants
Commendation Award \$500	Raffles Institution	Environment: An interactive role-playing game	Yeong Li Qian, Marcus Tan Zi Liang, Samuel Tho Jun Wei, Dominic Seet Ming Wei, Remus Whang Yi Xiang
Project Summary	<p>It is an interactive role-playing computer game built on a Flash MX platform. It combines elements of Geography and Environmental Science, kinesthetic self-learning and creative exploration to impart topics of environmental degradation and environmental conservation to students through an engaging ploy and a fresh approach to computer-based learning. Instead of present educational interactive game titles which merely convey information or utilize mainly quiz-based assessments, our project also aims to find new ways for geography to be taught, assessed and applied, creating room for application in real life situations which are constructively simulated on a virtual gaming platform. Our game will also be complemented with lesson plans, worksheets, and guidebooks to enhance the value and effectiveness of the teaching package.</p>		
Commendation Award \$500	Hwa Chong Institution	Biodiesel as a viable alternative fuel	Teo Chao Tong, Ang Jia Jun, Tay Kai-Xian, Sim Shi Xian
Project Summary	<p>Biofuel technology is uniquely appealing to Asian governments interested in decreasing fossil fuel dependence in the transport sector. Unlike fossil fuels, the combustion of bio-diesel produce less pollutants such as particulate matter and sulphur dioxide, thus sparing our environment from further pollution. Production of bio-diesel engages the agricultural industries such as coconut and oil palm plantations to devote crops for the sole purpose of manufacturing bio-diesel.</p> <p>However, what sets our project apart from current biofuel technology is that we are using waste vegetable oil to manufacture bio-diesel that is of similar quality to diesel, instead of growing corps just for the production of bio-diesel as the demand for fuel outstrips the amount of available arable land on earth. Our project also determines the most efficient ratio of biodiesel to diesel mixture through experiments such as determination of cloud point and heat of combustion.</p>		

Prizes	School	Title of Project	Participants
Encouragement Award \$200	Xinmin Secondary School	RV battery (recycled vinegar battery)	Song Keang, Seng Sykeath, Tech Chanphearum
Project Summary	To make a battery from everyday recycled materials like vinegar, aluminum can, plastic water bottle, plastic container and steel wool. All these are recycled products (except vinegar) which can be easily obtained. The voltage produced is high enough to light up a light bulb. Although this is a primitive method of producing electricity, it is still useful for people who do not have a constant electricity supply at night. Not all countries in Asia enjoy a privilege of having a constant supply of electricity as in Singapore. The battery reduces land pollution on Earth by making use of recycled materials.		
Encouragement Award \$200	Woodgrove Secondary School	Increasing vitamin C content in Bayam plants by using discarded fruits and vegetables	Angeline Kuan Yiwei, Brenda Ang Xiang Mei, Toh Cheng Sian, Nur Hidayah Bte Ariffin, Sharon Wong Hui Sian, Ivan Lim Zheng Yan
Project Summary	The aim of this research study was to enhance the amount of vitamin C in Bayam plants naturally using damaged and discarded fruits and vegetables. This experiment is done without using genetic manipulations which is the common method used. We chose the fruits based on their vitamin C content as well their availability in the market. Limes, oranges, lemons, amla, tomato and spinach were used. Distilled water was added to the control sets. Titration tests were carried out to determine the amount of vitamin C present. It was found that the extracts were effective increasing the vitamin C content. They are an effective and environment friendly solution to increase vitamin C in plants.		
Encouragement Award \$200	Raffles Institution	Restyle your life: Recycle	Khoo Seng Teck, Chew Guan Yu, See Yong Feng, Loh Zhi Wen, Benedict Tay Yuan Hong
Project Summary	Although recycling has become an important part of our waste management in recent years, Singaporeans are not doing enough recycling. Statistics show that we recycle less than 50 per cent of all recyclable materials. Acute concerns have surfaced over the environmental problems brought about especially by the overwhelming amount of rubbish produced. A literature review provides alternative modes of recycling elsewhere in the world whilst a survey provides a deeper understanding of the public's view on recycling. By studying the information, the group puts forth a recycling campaign to drive home the point of active recycling. At the same time, a prototype of a recycling chute was developed to help make recycling more convenient such that it becomes a way of life for Singaporeans.		

Prizes	School	Title of Project	Participants
Encouragement Award \$200	Raffles Institution	Weaving on two wheels - Experience a brand-new feel	Men Yi Fei, Gerald Koh Gao Han, Goh Shih Ee, Tan Weiren, Jasper Wong Chun Yin
Project Summary	<p>The project focuses on developing cycling as a form of recreation and alternative short distance transport option in Singapore. The central theme of the project revolves around environmental care and cycling being a truly 'green' mode of transport. In a society with increasing car usage and ownership, the project aims also to encourage more Singaporeans to take up cycling by highlighting the various amenities (albeit less well known ones) made available for cyclists in Singapore. To this end, a guidebook titled "Weaving on Two Wheels" was created to get the public put on their bicycle helmets and be ready to explore Singapore on their two wheels. Among the routes suggested is the "Eastern Eclipse" which covers the HDB towns in the east. The project is positioned to be a springboard for a comprehensive cycling guidebook which is currently lacking in Singapore's context.</p>		
Encouragement Award \$200	Yishun Town Secondary School	Aquarium water self-renewal system	Chan Hin Hiang, Wang Yanni, Ng Ai Zhi, Lim Liyi
Project Summary	<p>To develop an "Aquarium Water Self-Renewal System" for our school's aquarium. This project uses cheap and readily available equipment from the market to purify aquarium water, applying physical, biological and biochemical methods to keep the water free of toxic substances produced by fish dropping, urine and foods waste, such as ammonia and nitrite. Minimum maintenance of the aquarium is needed. With the help of timed "food feeder", the aquarium needed to be inspected only once every few days.</p> <p>Our project required only \$341 to set up and could be further reduced to make it affordable to most aquarium hobbyists to help conserving water in Singapore.</p>		

Junior Colleges, Centralised Institutes & ITEs Level

Prizes	School	Title of Project	Participants
2nd Prize \$5,000	ITE College West Dover	Solar Powered Car Air-Con	Fong Tat Choy, Kew Kian Chong
Project Summary	<p>The proposed device is an “electronic” air-conditioner. When the interior temperature of a car, which is parked under the hot sun, reaches a certain level, the “air-con” would deliver cool air to reduce the heat of the passenger compartment.</p> <p>It does not draw any power from the car power sources, such as battery or car engine, it has its own solar panel to charge up the stand-alone battery source.</p> <p>The device is not meant to take over the car air-conditioning system, it is to provide cooling effect to car interior during the time when the car is not used and parked under the hot sun in the parking lot.</p>		
3rd Prize \$3,000	ITE College West Dover	Water monitoring device	Lew Kee Wan, Li Jun Hao, Lee Tian Xi
Project Summary	<p>This project is about designing and developing a device to provide real time monitoring on the cost of water usages at home. This project is a light and compact device. It is simple to install and only operated on 9V dc supply. It comprises of a flow sensor installed in line with the water pipe together with a micro-controller and a display panel. The display panel will display the cost of water usage according to the flow rate. It provides the cost of daily usage and also the accumulative cost on weekly and monthly basis.</p>		
Merit Award \$1,000	ITE College West Dover	Aquaponics System	Wilson Widjijanto, Stuart Tan Tian Phong, Ding Jun Hong
Project Summary	<p>Our project unions fish rearing and vegetable cultivation. We make use of two tier tanks where fishes are kept in the lower tank while the vegetation is grown in upper tank. We utilize the discharge of fishes as fertilizers for the vegetables. The generator is driven by the water from the upper tank. Water level switches will be used to automatically control the water level in lower tanks. PH sensor will be used for replenishing dirty water from the fish tank. Plant/vegetable grown will be healthier without those harmful chemical. Both fishes and plant can be sold to markets.</p>		
Merit Award \$1,000	ITE College West Bukit Batok	Self-maintained Eco Garden	Ng Kian Wei, Neo Jinhui, May Tay Hui Fang
Project Summary	<p>The projects develop a self-maintained Eco Garden with fully auto-control of watering. This is an earth friendly concept with everything self contained & run by itself – a totally independence system. It collects rain water from roof top stored into a tank and to water the garden. The control circuit is powered by the battery, which is charged by a small turbine driven by the extra rain water when the tank is overflow and discharge into underground water tank. When water level is low the power will come from the solar panel and pump water from the underground water tank. It will save water, regulate watering to plant by a self-power control system.</p>		

Prizes	School	Title of Project	Participants
Merit Award \$1,000	ITE College West Bukit Batok	Recycling spent cooking oils	Yang Wei Hao, Alan Loh Kok Loong
Project Summary	<p>The objective of this project is on converting spent cooking oils generated by the institute's canteen food stalls into biodiesel by transesterification chemistry, minimizing waste generated by the institute.</p> <p>An optimization study was carried out during this study to determine the least amount of sodium hydroxide needed in an excess ethanol reaction environment to produce biodiesel. An average yield of 72% was achieved in the reaction. The biodiesel obtained was subjected to two different ASTM (American Society of Testing and Materials) tests (flash point and kinematic viscosity) tests to determine purity. The process was scaled up using 1 litre of spent cooking oil as the starting material and a biodiesel yield of 78% had been achieved. Finally, work is progressing to manufacture more biodiesel with the aim of blending it with normal diesel for use in the department's boiler that is used to generate steam.</p>		
Commendation Award \$500	ITE College West Dover	Solar Powered Advertising Board	Yoong Jian Ru, Chua Zong Yi, Soh Chen Yen, Lu MinQuan
Project Summary	<p>We have built an environmental friendly project called the "Solar Power Advertising Board". This display panel is designed to scroll a stack of posters at regular interval endlessly. A stack of posters is placed in the display compartment for the viewers to view from the front. The pull-up mechanism comprises rollers, motors and guides. Sensors are added to the machine to synchronize the paper movement. After a predetermined interval, the displayed poster would be pulled up and placed at the back of the stack of posters, hence another new poster appears. The process is continues and the displays are endless. To ensure that is environmentally friendly, the operation is powered by battery and it is constantly being charged by solar panel attached at the top of the display.</p>		
Commendation Award \$500	ITE College East	Fish tank auto/recycle changing system	Muhammad Shauqi Bin Ibrahim, Muhammad Fathi Bin Kasmadi, Joshua Ching Puay Guan, Muhd Samsul Ariffin Ismail, Tong Jingkai, Navin Joelle
Project Summary	<p>The projects harness the microcontroller and sensor technology to minimize the water consumption for aquarium enthusiasts. A light sensor is used to monitor the water cloudiness and activate the changing process as and when necessary. The triggering level is preset by the users and the controller will ensure the required water condition is achieved with minimum amount of water to be topped up. The system also allows the disposed water be retained for other uses, like water plants, flushing toilet or hydroponics application.</p> <p>With the automatic features and other commercial pet devices, the system is ideal for those frequent traveler fish enthusiasts. With the help of low-cost technology, unlike the manual process that based on random judgment or rules of thumb, the system systematically keep track of the tank cleanliness with minimum of tap water.</p>		

Prizes	School	Title of Project	Participants
Commendation Award \$500	Victoria Junior College	Clean air on the go	Marianne Chin Yu Jie, Samuel Ng Tianci, Nicole Lee Xun Qi
Project Summary	<p>Our proposed project targets to purify air by filtering off smoke and dust particles. Unlike commercial products, our product will be portable and noise free, allowing usage at public places. With increasing air pollution, there is a greater need for air purifiers to be carried by asthmatics, especially useful at bus-stops and dusty construction sites. We experimented on the cotton filter and found it to be effective in filtering off smoke and dust particles. Thus, we decided to incorporate it in our product. In order to increase the efficiency of it, we maximized the surface area of the cotton filter by wrapping it around the negative ion generator.</p> <p>Our device works by passing the polluted air through it, whereupon it gets ionized and then filtered as it leaves the device. This traps unwanted particles and pollutants, removing it from the air.</p>		
Encouragement Award \$200	Serangoon Junior College	Overhaul of Singapore's recycling industry	Jasper Tan Jie Peng
Project Summary	<p>The Germans have a nation-wide system of recycling bins where residents can conveniently dispose their recyclable materials with no confusions. This system contributes significantly to a flourish recycling industry in Germany. The "sort-and separate" system could be implemented in the HDB estates in Singapore too. First, rubbish chutes could be separated into colour-coded sections, such that people can dispose their rubbish by different categories. Next the articles collected at each block can be sent to designated destination for recycling. The aim of this project is to facilitate the recycling processes, as well as to initiate the recycling mindsets in our people.</p>		
Encouragement Award \$200	Nanyang Junior College	Trace elemental analyses of water spinach (Ipomoea aquatica)	Lit Pei Wen, Nurashyura Bte Ishak
Project Summary	<p>The objective for this study is to investigate the concentrations of elements As, Cu, Cd, Pb and Zn in water spinach (Ipomoea aquatic), known locally as "kang kong". 13 samples of water spinach were collected island-wide and prepared for digestion. The concentrations of the elements were determined by ICP Spectrometer. Half of the samples exceeded the FAO/WHO permissible limits of 1 ppm, 0.3 ppm, 62 ppm for As, Cd and Zn respectively, dry weight basis. Generally, no samples exceeded the limit of 40 ppm and 5 ppm for Cu and Pb respectively. The basal levels of those elements were also investigated based on GAP samples cultivated in the laboratory.</p> <p>The accumulating properties of Ipomoea aquatic can be used to phytoremediate Zn-polluted areas or even be integrated to cleaning up factory wastes before discharging the wastes to the sea or the sewage system. An important overall conclusion from the project is that the quality of vegetables we consumed is very dependent on the environment.</p>		

Prizes	School	Title of Project	Participants
<p>Encouragement Award \$200</p>	<p>Nanyang Junior College</p>	<p>Trace elemental analyses of local watercress (Nasturtium Officinale)</p>	<p>Ang Xiang Ling, Chai Chia Leng</p>
<p>Project Summary</p>	<p>The objectives of the project were to determine the concentration of metalloid As and other heavy metals, such as Cd, Cu, Pb and Zn in local watercress from different sources and to investigate the distribution of the metalloid – As and heavy metals in the roots, stems and leaves of watercress.</p> <p>It was found out that the As concentrations in the residual water decreased steadily from day 0 to day 12. This is because As content in the water supplied is taken up by watercress or As is volatile and thus can evaporate into the air, decreasing its concentration in residual water.</p> <p>In conclusion, for this spiking experiment, the environment does influence the concentration of element in watercress. Therefore measures have to be taken to ensure a clean farming environment so that the vegetables we eat are clean and safe from contamination.</p>		

Tertiary Level

Prizes	School	Title of Project	Participants
1st Prize \$10,000 and a one-month attachment to a Shell affiliate company	Ngee Ann Polytechnic	Water management system	Goo Chee Tiong, Nguyen Son Tung
Project Summary	<p>Water is precious national resource. Therefore, it is vital that we use water wisely and should explore ways to ensure there is no water wastage either through public negligence or poor water system maintenance.</p> <p>The project looks into two categories of water consumers. First the domestic and second the industrial category. Both systems primarily attempts to arrest water wastage. For the domestic system, the user would be able to detects water leakage easily and arrest water wastage. Avoid costly replacement of household items as a result of burst water pipes in an unattended house. Low cost investment under S\$10 for a basic system. For the industrial system, the user would be able to: Monitor trends in Water utilization. Deter careless users who waste water deliberately. Arrest undetected broken underground pipes. Stop illegal tapping of water.</p>		
2nd Prize \$6,000	Singapore Polytechnic	Maintenance free solar irrigation system for gardens	Augustine Ashley Santhanam, Thong Jie Ying, Ho Chia Yen
Project Summary	<p>Singapore is a garden city. Time, labour, water and resources have been expended in to make it green and attractive to visitors and a conducive living environment for all Singaporeans. It is the innate nature of many Singaporeans to play their part in beautifying their living environment. Many have tried their hand on keeping plants at their premises. Some were not able to sustain the daily routine of watering the plants. Some gave up due to their committed short stints overseas. Some have problems keeping the plants in a healthy state when the whole family go for a holiday. Our solar irrigatioin system is designed to address all these issues. It is specially designed with the Singaporean urban situation in mind, thus it requires as little set up labour and maintenace as possible. The system is both maintenance-free and environmentally friendly. Energy is tapped from the sun by using small solar panel and stored the energy in the lead acid battery. A DC pump is then used to pump the water to water the plants. The plants will be watered in the prescribed manner; specific times of the day and specific duration of watering.</p>		

Prizes	School	Title of Project	Participants
3rd Prize \$4,000	National University of Singapore	Conserving banded leaf monkeys (<i>Presbytis femoralis femoralis</i>) in Singapore: Exploring possibilities	Anbarasi Boopal
Project Summary	<p>The proposal to conserve the critically endangered Banded Population Monkey found in Singapore, by augmenting the present small population with more individuals and captive breeding. The principal issues like non availability of habitat, low population numbers have been addressed in the proposal. Evaluation of already existing sites and identification of new sites have been done. Setting up of a banded leaf monkey centre, human assisted translocation of monkeys between two populations, use of assisted reproductive technologies have been proposed and discussed in the report.</p> <p>Identification of new sites as habitats, human – assisted translocation between subpopulations to maintain genetic diversity, use of assisted reproductive techniques to support captive breeding and consider female-biased selection.</p>		
Merit \$1,000	Ngee Ann Polytechnic	Enhanced water broom	Marhayah Binte Jamaluddin, Desmond Choo Zhi Yuan
Project Summary	<p>The Enhanced Water Broom was fabricated to lighten the users work load while washing the floor. The function of the water broom is to spray wash the floor as well as brushing the floor at the same time. Normally, people will use water jet to spray the floor and use plastic broom to brush the floor after that. We believed that by using a normal water pressure through tiny openings are enough to bring out most of the dirt on the ground. The key features of the water broom are: Waterjet without electricity. Side guide to control and contain the debris for easy disposal. Rollers to make the broom as mobile as possible. Ability to dismantle the broom and keep away when not in use. Brushes to scrub the floor. Low cost in production.</p>		
Merit \$1,000	Singapore Polytechnic	Mosquito free roof gutter	Ang Kay Khim, Lim Boon Teck, Ivan Tay Chin Boon
Project Summary	<p>Mosquito breeding grounds are often associated with the maintenance and stagnant water found in choked roof gutters. This project aims to study the maintenance and water stagnation problems in existing roof gutters and find solutions to reduce the environmental health hazards of mosquito breeding in roof gutters. We have explored some innovative ideas to make the gutter easier to maintain and more importantly, free of water stagnation. We hope our mosquito free roof gutter could one day replace all the existing gutters, change the way these gutters are maintained and help to further reduce the numbers of mosquito breeding grounds for the environment protection.</p>		

Prizes	School	Title of Project	Participants
Commendation \$500	Nanyang Technological University	Conversion of food waste to energy	Vu Thu Trang, Huang He
Project Summary	Accounted for 20% of the overall disposed waste in Singapore, however, only 7% of the waste was recycled while the rest was incinerated. To reduce the environmental problems caused by the incineration of food waste and to develop a new source of energy, the objective of this project was to develop a system which can convert food waste to fuel energy (biogas) in Singapore. The conversion process is done using the operation system developed in Nanyang Technological University, called the hybrid anaerobic solid-liquid reactors (HASL system). In the HASL system, methane production is enhanced and pollution is eliminated.		
Commendation \$500	Temasek Polytechnic	Paper Multiplier	Aldwin Su Duwen, Yip Yong Seng, Hee Zhen Zhen Lina
Project Summary	<p>The Paper Multiplier is a simple, low cost, hand-operated machine that recycles writing papers directly into paper towels. It uses a pair of specially designed rollers to perforate and wrinkle a piece of paper to increase its surface area in order to absorb water or other liquid.</p> <p>It is portability allows it to be used anywhere and anytime, for example at home, offices, industries and workshops.</p> <p>This useful device saves the environment by reducing the paper wastage. It ensures that a piece of writing paper is fully utilized before being discarded.</p>		
Encouragement \$200	Temasek Polytechnic	Recycling of used cooking oil to make soap	Varinder Singh Bal, Toh Yi Da
Project Summary	The improper treatment of used cooking oil from the catering industry can lead to water and soil pollution. This project aims to recycle used cooking oil to make soap. This would minimize waste treatment and disposal costs and conserve resources. The soap making process is environmentally-friendly as it utilizes used cooking oil as its raw material. This process would also reduce the detrimental impact of used cooking oil disposal to the environment. A pilot project was carried out in Temasek Polytechnic to collect used cooking oil from its canteens and convert them into liquid soap for use in dishwashing and floor cleaning.		
Encouragement \$200	Ngee Ann Polytechnic	Carbon dioxide removals from car exhaust gas	Benedict Quah Chin Teck, Keith Fong Ri Sheng, Eugene Ng Pei Yong, Lim Wei Jin
Project Summary	One of the main environmental challenges today is the avoidance of an anthropogenically induced climate change which can cause harm to human and the ecosystems. To prevent this from happening, it was recommended that before 2100, the concentration of CO ₂ should be stabilized at 450 ppm. Fossil fuels account for 85% of world energy supply and it is used widely in the automobile. Therefore the aim of this project is to put forward a solution to remove or slow down the CO ₂ emission from car exhaust system.		

Prizes	School	Title of Project	Participants
Encouragement \$200	Ngee Ann Polytechnic	Fuel cell powered grass cutter	Shafiq Bin Sanip, Soe Min Htet, Brian Seah Chin Leong
Project Summary	<p>Our project is an attempt to exploit a number of technologies including solar, electrolysis, hydrogen storage and fuel cell which is known as in a renewable energy fuel cell system. This project uses hydrogen which is eventually used through fuel cell technology as an electricity source. The hydrogen in metal hydride cylinders are used to run the fuel cell. The fuel cell electrochemically converts hydrogen and oxygen from the air into water and electricity which is then used to power the lawnmower/grass cutter. The whole system does not depend on fossil fuel but hydrogen which is inexhaustible and renewable. It is also pollution free and environmentally friendly or "Green". Fuel cell will likely be a popular energy solution in the future.</p>		