



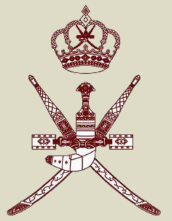
The National Field Research
Centre for Environmental
Conservation

About innovative Environment Research

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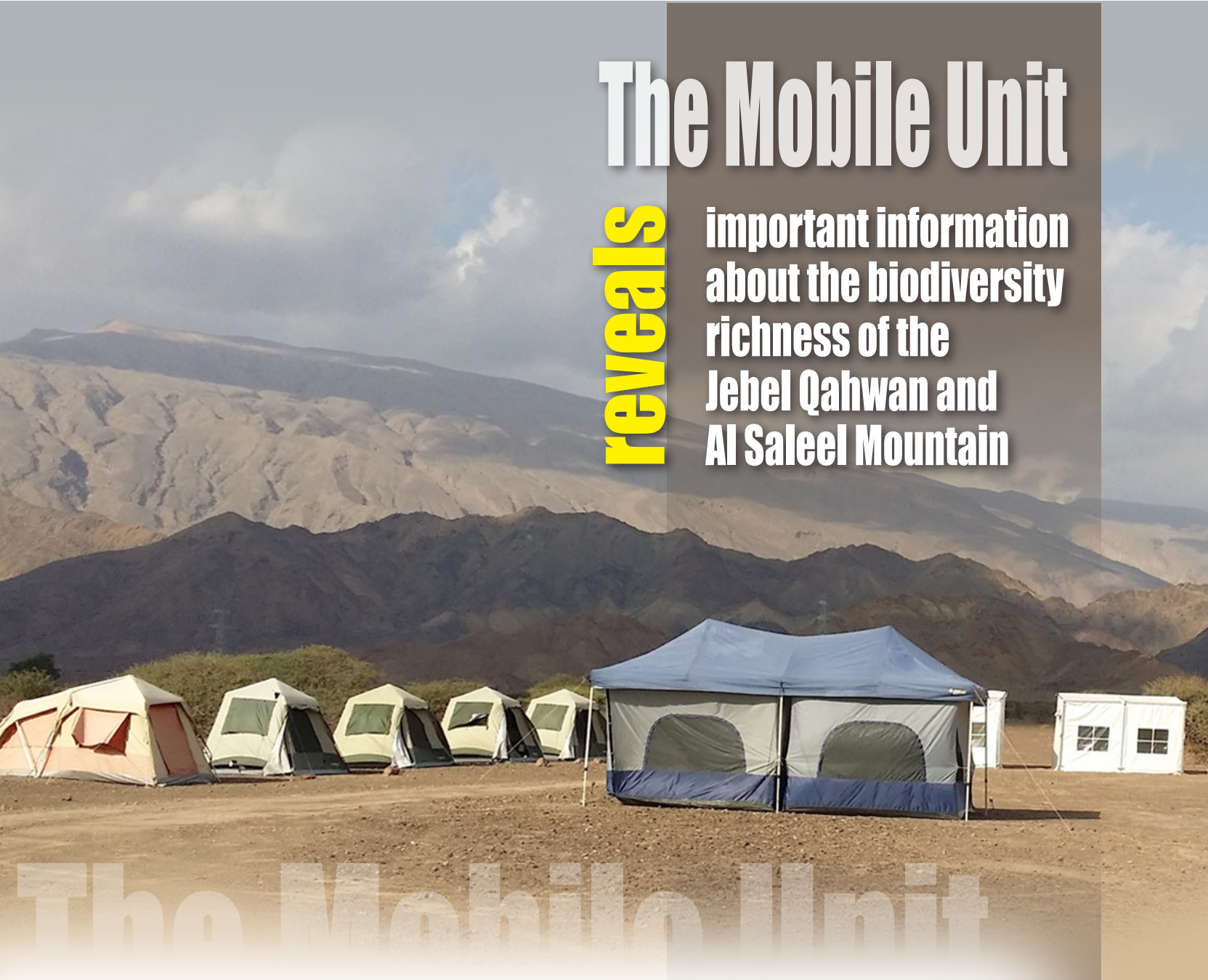
Sultanate of Oman
Diwan of Royal Court

Issue 12

The Mobile Unit

reveals

important information
about the biodiversity
richness of the
Jebel Qahwan and
Al Saleel Mountain





point of view

The Green Economy

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The discussion related to the term of “Green Economy” intensified for a long term, some of them see that it is nothing more than an economic term, invented by the advanced countries to market the products of Their big intercontinental corporations, in order to increase their profits, and to be able through this term to market its products in the countries committed to the international environmental agreements.

As for the other side, they see that it is highly important to apply this environmental method in all over the world for its positive and touchable effects in improving the environmental situation, and for it guarantees the continuing raise in environment health indicators, as it depends in all its directions on the best use of the environmental system and preserving it. Despite the methodological and conceptual collisions in the matter of the Green Economy, there is no doubt that it contributes in a direct way in the positive raise in the rates of the environmental growth in the countries that adopted this matter and worked on applying it, the green economy seeks finding a real twinning between all the sectors of society especially what is between the economic and commercial fields and the environmental one, so that it can conserve the biodiversity and fungal diversity, decrease the emissions of the harmful gas, runs the industrial waste in a scientific ways, and contribute conserving the whole environmental system with all its fields.

The Green economy is also considered to be the link between the three dimensions of the sustainable development, which are: the economic, social, and environmental dimension; in addition, the final document in Rio Conference for Sustainable Development that was held in Brazil 2012, assured that it is highly important that the countries adopt the Green Economy’s policy, for it contributes eliminating poverty all over the world, works on achieving the sustainable development in a way that is enough to maintain the wellbeing of the human and environment, and to develop the economic aspect of the countries. The Sultanate is one of the countries that paid attention to the concept of “Green Economy”, as there are excellent efforts in this part; still, we hope that one day there will be a real partnership between the private and governmental sectors, to crystallize the methods and visions of the green economy, also for the availability of real contributions on land by the private sector in carrying out the environmental developmental projects, where the considerations, environment systems or their social contributions in the environmental initiatives are appreciated, for achieving the Sustainable development is by applying the systems and the indicators of the Green Economy in the State.

United Nations Convention to Combat Desertification

The execution of the United Nations convention to combat desertification in the countries suffering from hard drought desertification has started in 17 June 1994, and its headquarters in Bonn – Germany. Global System countries including the Sultanate joined the convention, they reached 182 countries, and the Sultanate joined the convention of combating

desertification in 1996. The convention aims at combating desertification and decreasing the effect of drought in the countries suffering, also taking in consideration long-term integrated strategies focus on improving the productivity of land (in affected areas) and rehabilitating them, also preserving the water resources and the lands, and administrating them in a sustainable way.



Researchers Train on data collection and skills of the field work!



A number of researchers of The National Field Research Centre for Environmental Conservation participated in the internship program (Information collecting and field work skills), which is organized by the National Centre for Statistics and Information for a number of researchers from different governmental authorities; in order to get them trained on a number of statistic programs related to collecting, inserting and analyzing the scientific research data. The program aims at adding the required

skills to gather data to the participants, and to train them on the mechanics and ways of gathering. It worth mentioning that the center goes on benefitting his employees by the statistical programs. The main topics in the program were: The main used ways in gathering data with the participation of field researcher and the other with the help of computer, gathering data processes and the importance of its passage into administrative system of gathering, saving and analyzing so that its output and presentation is clear to everyone.

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Technical Review

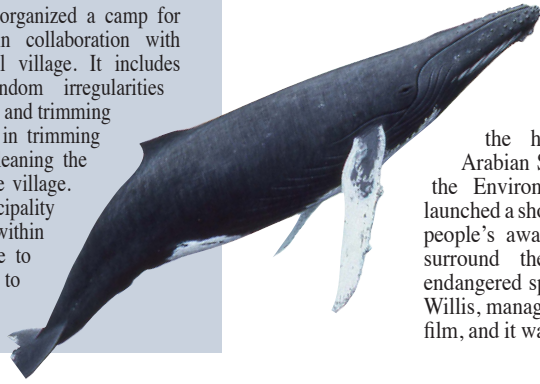
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General cleanliness camp in Wabil, Rustaq

Wabil sports team has organized a camp for general cleanliness in collaboration with Rustaq municipality in Wabil village. It includes cleaning and removing random irregularities (residues) in farms, and houses, and trimming trees. As the sports team did in trimming the palms in the street and cleaning the Falaj which passes through the village. In cooperation with the municipality and residents, This camp is within the annual plan of the village to provide tangible social services to the community.



Environmental Society of Oman launches an awareness movie about humpback whales

In the context of its continuous efforts to protect the humpback whales of the Arabian Sea in the Sultanate Waters, the Environmental Society of Oman launched a short movie in order to increase people's awareness of the dangers that surround these creatures which are endangered species. The director, Miguel Willis, managed filming and directing the film, and it was produced by Justin Kwan.

The film sheds the light on the efforts exerted by the association to preserve these whales as well as the preventive measures implemented by the corporate and public sector, in an attempt to curb the imminent threats. The film making took more than two months, working along the southern beach of the Sultanate. It also demos part of sounds and various scenes of the rich sea fortunes which Oman is full of. You can watch the full movie on the association channel on YouTube website.

At the World Water Week in Stockholm

Three thousand experts and politicians are exchanging thoughts to face water scarcity conditions



About 3000 politicians and experts from about 120 countries have exchanged thoughts to face water scarcity dangers as well as climate change during their participation in World Water Week which was hosted by Swedish Capital, Stockholm. This was under the slogan "Water for Sustainable Growth". They discussed water crises all over the world which became the biggest danger that people should face throughout the few upcoming years along with the rapid population increase and the decrease in clean water resources. Some experts warned from expected conflicts to-be in the world on behalf of the water resources decrease.

Warning Swedish Foreign Minister, Margot Alstorm said in the Opening that "The world is witnessing many conflicts and climate changes, as well as militancy, fanaticism and inequality. She warned that "the human needs have become unlimited"

. She also pointed that large numbers of people are living now in the regions of conflicts and poverty, without securing their living needs. On his side, Torgeny Holmgren, the Executive Manager of "Siwi" Organization which organize the Week, warned "without resources to depend upon to get water, the sustainable development goals would not be achieved". He added that water links not only between different sectors, but also between nations and societies. Water can be a uniting power that would make us be able to achieve progress in our future plans of the year 2030. Moreover, Chris Hester, Mayor of Stockholm spoke about the Swedish capital which is called "The City of Water"; simply as it's surrounded by a number of lakes and islands. In addition, he added how domestic policies would be implemented in order to get benefits from water as well as providing the city inhabitants with it.

Scarcity While the earth population has exceeded seven billion, and despite

the fact that two thirds of the earth is water, the percentage of freshwater in the planet does not exceed 3%. This means that 97% of water all over the earth is seas and oceans salty water, which is undrinkable for human beings.

Moreover, the remaining percentage of freshwater, i.e.: 3%, can not be accessed directly. This means that 68% of this water is being held in the form of glaciers and icebergs, and 30% is ground water. In other words, only 1% of the freshwater is surface water, and that lakes are about 87% of this water.

The Arab Forum A report from The Arab Forum for Environment and Development (AFED) refers that the average annual share for an Arab individual from renewable water is less than 850 cubic meters, in comparison with the international share which reaches 6000 cubic meters. It also classifies 13 countries as suffering from severe water scarcity with water resources less than 500 cubic meters for individual.

Warning: Sustainable development goals won't be achieved without relayable water resource.

Only 3% of the earth water is freshwater, 1% is a surface water and the rest is either frozen or ground water.

Norwegian prevents producing harmful Products to Forests

Norway has stated a Law that prevents the production or prevalence of any goods that contribute destroying forests by destroying its environmental system, in the other hand they tried finding alternative materials for manufacturing these products by researches. It is well known that many products in our daily use are made of materials that are abstracted from trees; in addition, trees are being cut to use the lands in agriculture. Many Norwegian corporations prevented manufacturing any products that involve wood materials from the forests, also prevented importing any food that contribute the elimination of vegetation exporting countries; for example, palm oils, soy oils, and read meat.

The Biggest Marine Protectorate in America

The American president, Barack Obama, announced the creation of the world biggest Marine Protectorate, in the area of Hawaii islands, he also declared that it will be four times the size of Papahānaumokuākea Marine National Monument, so that it will include a wide space of the Pacific, and its area will be 1.5 million km square. This protectorate will have seven thousand sea species, including the black coral whose colonies can live up till 45 thousand years, this site is considered to be a Federal protectorate, where the commercial fishing is totally banned.



The Study formed a Great View on Al Hajar Mountains

The Mobile Unit reveals Important information about the biodiversity richness of the Jebel Qahwan and Al Saleel Mountain

Mobile Environmental Research Unit (MERU) research a number of scientific field studies in two natural reserves: Qahwan Mountain Nature Reserve and Al Sulil Nature reserve, in order to prepare accurate scientific data base about the biodiversity in the two reserves include that field surveys showed important information about the richness small of both reserves biodiversity.



Magnificent View

The study done by the team of the mobile unit is considered to be a magnificent view on Al Hajar Mountains, the study focused on the surveys of biodiversity in different places.

The study targeted main groups of living organisms, like unvertebrates, including insects, spiders, scorpions, and all the other arthropods, the plants and the birds that spots, the study also focused on the animals playing very important environmental roles like the wild animals and small mammals that were occasionally photographed using camera traps Traps in all the sites.

The team used many camera traps; for example, Bushnell camera that pointed out the presence and spread of more night animals like wolves and hedgehogs.

Insects' Study

During the survey -camera traps took photograph of nearly 240 species of insects; It is interesting to know that a big percentage of the kinds of insects that were photographed highly depend on Acacia trees that spread widely at Al Saleel. In fact, Al Saleel reserve is considered to be one of the biggest Acacia forests in the Middle East,

The Training

Mobile Environmental Research Unit supervised on the training of many from the Ministry of Environment and Climate Affairs, as well as participants from the Ministry of Tourism, Oman Oil Development Company, Sultan Qaboos University and University of Nizwa; in addition to Higher College of Technology in Muscat and a number of public and private schools. The participants learnt the scientific basis for field research, the scientific methods to collect data and the most important techniques of field survey.

and it is clear that Acacia trees is considered one of the main plant kinds as many other kinds depend on it for survival.

Many kinds of insects like locusts belong to the herbivorous insects, feed actively on the plant tissue, whether leaves, sap or nectar.

From 244 living organisms, there are few wild animals and pollinators, but this may represent an explanation for the time of drawing samples. It is obvious that the additional visits that are to be carried out to the site in different times in the year will reveal more secrets about the diversity on a bigger scale.

Vegetation Cover survey

The woodland surveys recognized nearly 48 different kinds of vascular plants, the poor plants only reflects the harsh and drought habitat.

Just like vertebrates survey, vegetation cover surveys were carried out in a very short period, the seasonal changes cannot be excluded, especially in the annual plants/ ephemeral plants.

survey discovered the presence of some goats, donkeys, and camels that will have harmful effect on the plant biodiversity at

Photographing with a Camera Traps

The processes of photographing were done with a Camera Traps, all the members of the national center participated. Some traps were put on some dead trees in Al Saleel, some other were on the Northern edge of Al Saleel reserve to take photos for animal Tahr. Also some traps were laid next to industrial water pot where the birds occasionally stop at.



Small Mammals

The small mammals were put to test using the way of marking and recapture, along with using Sherman traps. The method of marking and recapture is one of the efficient tools used in the environmental studies, which helps biologists recognizing the number of small mammals. By counting animals in such way, it is possible for them to get marked in way that will make them recognizable, then unleashing it.

Some of the animals that are recaptured give details regarding the behavior Generally Hajr Mountain is poor of small Mammals. however Three small Mammals were captured using Sherman traps.

As for the Cairo Spiny Mouse, it seems that it doesn't have a favorite habitat, as it has been captured in many places in Qahwan Mountain and Al Saleel area, also on the top of Jebel Al Akhdar whose height reaches 2000 meters.

In addition, Wagner's Gerbil was also hunted from the three spots; as they are small and very sensitive creatures, they got to be taken care of, in order to avoid getting shocks in their bodies. Gerbil average weight is 20g only, it has amazingly tall tail compared to the size of its whole body, which helps it achieving balance while running from the wild animals.

However, Sandoval rats were only hunted in Al Saleel area, these are bigger mammals, average weight is 100g, they are easy to tame and can be easily dealt with.

The average rates of hunting the small mammals in Qahwan mountain and Al Saleel are extremely low, as it reached about 2% in Qahwan, as only 21 animals were hunted, 17 animal in Al Saleel, It worth mentioning that there is only one Arabian fly was hunted at Qahwan Mountain, also a drown fly was found in traps. However, the hunted fly wasn't a new kind, but it is the first ever to be registered in the North of the Sultanate, which is interesting.



- ◆◆ The Unit took Photographs for 240 different species of Insects that are still under the Microscopic, Shape, and genetic Analysis
- ◆◆ The Woodland Survey Recognizes 48 different kinds of Vascular Plants
- ◆◆ The Studies prove that Al Saleel Reserve is one of the biggest Acacia forests in the Middle East

Al Saleel area Because of its rival for grazing.

Birds' survey

This survey was done in a general way, by walking in a determined route and recording what is seen of birds, using a binocular and GPS (Global Positioning System). However, nearly 30 kinds of birds were registered in Al Saleel, binocular there were also some rare birds including lulls and some eagles.





Decline of Solar Panels cost promotes more Clean Energy

The cost of the renewable energy is oriented to decrease through the coming decay, in a way that promotes the economies with more clean energy. According to "Bloomberg" newspaper, it is expected that the average cost of electricity generated from solar energy to decrease 59% by 2025, these are according to a report issued from the International Renewable Energy Agency. (IREA)

Overview on Future

International Renewable Energy Agency expects that solar energy stations will be cheaper by 40% by the half of the next decay, it also expected that through the next decay the costs of producing sea wind energy will decrease by 35%, followed by coastal wind energy that will decrease by 26%, in addition to the decrease in the cost of building renewable energy facilities with projects of solar energy by 57% by 2025, in compare with how much was it in the past year; the international renewable energy agency refers the decrease to the technological improvement and the wider the transformative industries got.

Big Achievement

For the first time ever, the solar energy is on its way to contribute more electricity in the United States of America with higher percentage than any other source of energy, this for economic considerations many of them are environmental; the cost of electricity produced from solar panels that are wide spread in United States are now nearly the same price and maybe cheaper of the cost of burning Natural Gas to produce electricity, even without incentives that aim at encouraging the non-pollutant energy resources.

The industry of solar energy in its early starts depended on installing panels above the roofs of houses and corporations, these installations were limited and highly expensive, it also required big incentives to make it tempting for the families, but now it is overwhelming. It is expected that these facilities will contribute more than 70% of the new solar energy, which are being added to networks this year, according to the data of GTM Research Corporation.

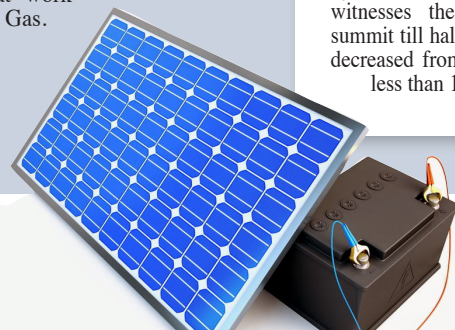
The Success of the Solar Energy use risen up with many questions about the efficiency of keep providing incentives to install solar panels above houses, though it is still expensive in compare to other electricity generating resources.

A study conducted by Lazard Investment Bank states that during the past year, the unsubsidized solar energy that was generated on a large scale cost was between 50 to 70 dollars Megawatt/hour (Which means 5 to 7 cents Kilowatt/hour), in compare to 52 to 78 dollars in the most efficient stations that work by Gas.



Expectations for Arabian Growth in the Field of Renewable Energy

International Renewable Energy Agency (IRENA) expected a large growth in the field of the Renewable energy and promotion in the commercial aspect behind the diversity of energy resources in the area, this is due to the decrease in the costs of solar energy, in a parallel line with what the Middle East witnesses of seeks to achieve the ambitious targets of sustainability. The agency assured in the occasion of the announcement of Abu Dhabi for "International Summit for Future Energy 2017" that will be held in Abu Dhabi between next January 16th and 19th that the cost of generating electricity through solar panels by big photovoltaic panels in United Arab Emirates decreased by 75% between the year 2008 that witnesses the launch of the first summit till half the year 2014, its cost decreased from 7 dollars per Watt to less than 1.5 dollars.



An Absorbent Plant to Oil spills in Seas

Occasionally, chemical substances and some other kinds of Bacteria are used to clean the seas from the oil spills that leak from tankers; however, scientists agree that the harm of these processes on the marine environment is even more harm than the oil spills itself!

Researchers from Karlsruhe Technical Center in Germany discovered that a natural sea plant from the fern species has the ability to absorb as oil spills in a great way, and that these plants are easily gathered where after.

Scientists experiments involved *Salvinia* fern floating plant, it is known with the quickness of its growth and spread on a wide space on sea surface; in addition, it afflicts the environment, as it forms a layer that prevent the entrance of Oxygen and sun beams to the water, therefore it needs to be lifted of water as soon as absorbing the oil spills.

Germany converts carbon emissions into raw materials

Eight industrial companies in Germany in collaboration with Max-Planck-Institute, and Fraunhofer-Gesellschaft, and number of German universities develop internationally valid solutions to convert carbon dioxide gas emissions into raw materials, such as coal, plastic, chemical fertilizers. This conversion needs Hydrogen which can be produced by the electricity surplus from the renewable energy stations.

The project is called "carbon fixation", its main aim is to exploit 20 million tonnes of carbon dioxide emissions annually, which means 10% of the annual volume of emissions in the country. According to "Paris Agreement" stated on December 12, 2015, the world is committed on working on prevent the raise of global warming more than 1.5 Celsius until the middle of this century; provided that they decrease the emissions of carbon dioxide to some extent its stopped permanently starting from the second half of the century. That's why industrial sectors must search for solutions for this emission which cause the increase in the global warming.