Ibnu Haitham- Tokoh Ilmuan Islam

Apabila kita mempelajari bidang sains dan teknologi, kita selalunya terdedah dengan sains dalam dunia barat. Namun, jika kita mempelajarinya secara mendalam tentang sejarah sains dalam islam, kebanyakan ilmu dan pengetahuan dalam bidang sains dan teknologi datang nya daripada ilmuan dan tokoh-tokoh islam. Nama-nama seperti Khawarizmi, Ibnu Sina, Al Jabar yang kebanyakannya sangat terkenal dengan ilmu dalam bidang perubatan dan matematik.

Salah seorang ilmuan yang penting dalam bidang Fizik ialah Ibnu Haitham. Ibnu Haitham merupakan seorang tokoh ilmuwan islam yang tidak asing lagi dalam bidang sains dan teknologi semasa zamannya. Bukan sahaja cenderung dalam bidang Fizik, Ibnu Haitham terkenal dalam bidang falsafah, matematik, astronomi dan kedoktoran. Ibnu Haitham atau nama sebenarnya Abu Ali Muhammad bin al-Hasan bin al-Haitham al-Basri Al-Misri dilahirkan pada 354 H bersamaan dengan 965 M, di negeri Basrah, Iraq. Beliau memulakan karier nya dengan menjadi pegawai pemerintah di bandar kelahirannya. Kemudian beliau merantau ke Ahwaz dan Baghdad. Di sini bermulanya penumpuan beliau dalam bidang penulisan. Penemuan beliau yang terkenal ialah "hukum pembiasan", iaitu hukum fizik yang menyatakan bahawa sudut pembiasan dalam pancaran cahaya sama dengan sudut masuk. Hukum ini dikenali dengan nama "Snell's Law" dalam dunia Fizik moden.

Selain itu, beliau menggabungkan matematik dan fizik dalam menghasilkan teori dalam bidang optik. Penyelidikannya merangkumi teori dalam gerakan cahaya, imej dan bayang-bayang. Ibnu Haitham telah menggunakan mesin lathe (larik) untuk membuat cermin kanta cekung dan kanta cembung untuk penyelidikannya. Al-Munadzir merupakan salah satu karya Ibnu Haitham yang teragung dalam bidang kajian optik. Pada tahun 1270M, Witelo telah menterjemah karya tersebut dan kemudian diterbitkan dengan nama Karya Thesaurus Opticae.

Terdapat sebanyak hampir 200 karya Ibnu Haitham yang terkenal seperti Maqalah fi Istikhraj Samt al-Qiblah(penyusunan kota), Maqalah fi hayat al-Alam(astronomi), Kitab fi al-Minasit(kamus optik), Fi al-Maraya al-Muhriqah bi al-Dawair(cermin yang membakar), Maqalah fi Daw al-Qamar(cahaya dan gerakan langit), Zawahir al-hasaq(gejala senja), Fi Kayfiyat al izlal, Fi al-Asar Allazi al-Qamar, Fi ad-Dawar, Fi al-Makan, fi al-Mulumar, Fi Misahat al-Mujassamah al- Mukafi, Fi Irtifa al-Quth. Keseluruhan karya tersebut berkisar tentang kajian ilmu fizik dan astronomi dan hampir keseluruhannya telah diterjemahkan ke dalam bahasa-bahasa Eropah dan menjadi sumber rujukan bagi seluruh ilmuan di dunia.

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MALAYSIA AGRICULTURE INVENTION SHOW 2015

Penulis : Syila Izawana Ismail, Norhayati Ahmad, Mohamad Taib Bin Miskon
Sumber : Unit Penyelidikan dan Kepakaran FKE

"Exploring Magical Agriculture" ialah tema bagi Malaysia Agriculture Invention Show 2015 (MAGIS) yang telah berlangsung pada 20 dan 21 Oktober 2015 di Hall D, MAEPS, Serdang Selangor. Program yang berlangsung selama 2 hari ini bertujuan mempamerkan pencapaian penyelidikan dan pembangunan (R&D) dengan ciptaan/ inovasi. Disamping itu, ia juga dapat memupuk budaya rekacipta dan meningkatkan kreativiti dan menjana ciptaan/inovasi baru dalam membangunkan sektor pertanian dan industri asas tani.

Seramai 12 orang pelajar diploma dari Fakulti Kejuruteraan Elektrik UiTM (Terengganu) yang membentuk 4 kumpulan pelajar telah menyertai pertandingan ini. Produk pelajar ini merupakan di antara projek terbaik yang telah dipertandingkan di Electrical Engineering Innovation Exhibition and Competition (EEIEC) dan Educational Project Innovation and Competition (EPIC 2015). Berikut ialah senarai projek yang terlibat dan anugerah yang dimenangi:

Bil	Nama Projek	Pertandingan	Pingat	Penyelia
1	Manggo Collecting System	EEIEC 2015 EPIC 2015 MAGIS 2015	Emas Emas Gangsa	En.Mohamad Yusof Bin Mat Zin
2	Automatic Quail's Eggs Detector	EEIEC 2015 EPIC 2015 MAGIS 2015	Emas Emas Gangsa	En.Mohamad Yusof Bin Mat Zin
3	Automatic Bagging Soil Mixture	EEIEC 2015 EPIC 2015 MAGIS 2015	Emas Emas Gangsa	Pn.Norhidayatul Hikmee Binti Mahzan
4	Pet Urine Detector	EEIEC 2015 MAGIS 2015	Emas Gangsa	En. Aldrin Ali

Written By:
ABDUL HAFIZ BIN KASSIM
AHMAD IZZAT BIN MOD ARIFIN
MOHD SAIFUL NAJIB BIN ISMAIL@MARZUKI

THERMAL ENERGY STORAGE (TES) SYSTEM

Thermal comfort is normally the main reason of having an air conditioning system for a building. Other purposes include air circulation or ventilation, air purifying and dehumidifying or humidifying. An air conditioning system will consume energy and for a building in a hot and humid climate like Malaysia, the energy consumption takes up very high percentage relative to the overall energy usage.

A TES unit generally consists of a heat exchanger system of helical coils (metal or plastic) placed inside an insulated storage tank, a refrigerant tank, a refrigerant pump, and an air-cooled condensing unit. Being well insulated, these storage tanks (ice cell) can normally be located anywhere, either indoors or outdoors.

TES system is designed to work with the existing building's cooling system (a chiller), which chills either water or an ethylene glycol solution for the heat-exchange air conditioning of the building. The system simply uses the chiller to make ice or chilled water during off-peak hours and stores it in the insulated storage tank.

Figure 1 shows the diagram of the plant where AHU is air handling unit, FCU is fan coil unit, CT is cooling tower, PHX is primary heat exchanger and SHX is secondary heat exchanger.

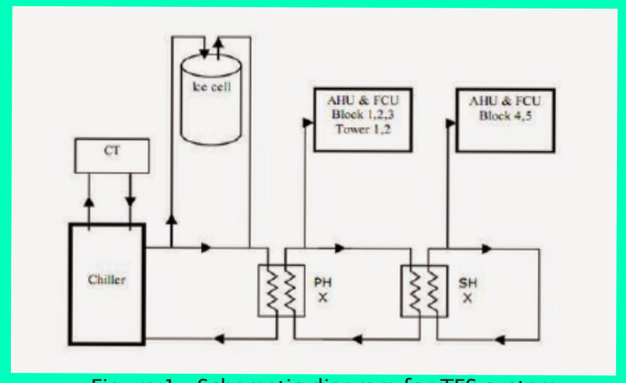


Figure 1: Schematic diagram for TES system

OFF-GRID SYSTEM

The standalone PV system which is also known as an off-grid PV system is one of the types in the photovoltaic system. The characteristic for this type is its independence of grid supply. Usually the system is installed in remote area.

Many PV systems are used to energize remote homes, facilities, and devices. An example of an off-grid system includes a remote solar home. Military communication units with supplemental solar and wind are also off-grid. Monitoring or communications devices are also of off-grid type. Energy is gathered from solar modules and is directed into energy storage devices for use when needed. These systems often supply the entire amount of energy required.

Usually the standalone system shown in Figure 1 consists of 4 main parts which are the PV module, the charge controller, the battery storage and the load. Not all the standalone systems require the inverter. The inverter converts the DC voltage into the AC voltage. The inverter depends on the load. If the AC load is used in this system, the inverter is also needed in this system or vice versa.

This system can be classified further into two types of standalone PV systems which is shown in Figure 1 and hybrid PV system whch is shown in Figure 2. Basically the standalone system is small in size and battery-operated. Hybrid system is of medium size and has PV module and Generator set or other power generators.

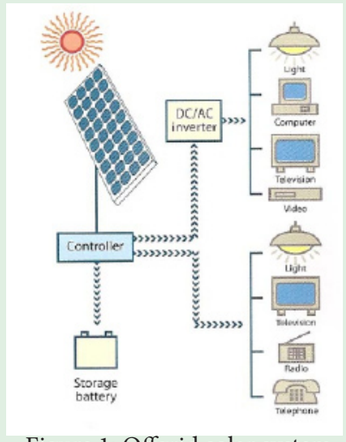


Figure 1: Offgrid solar system source: affordable-solar.com

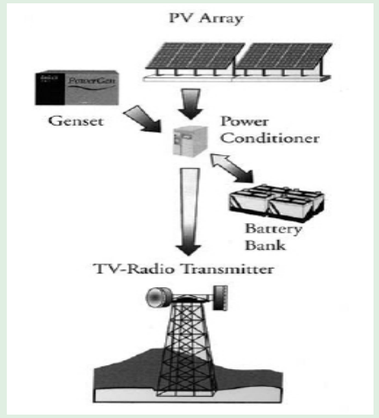
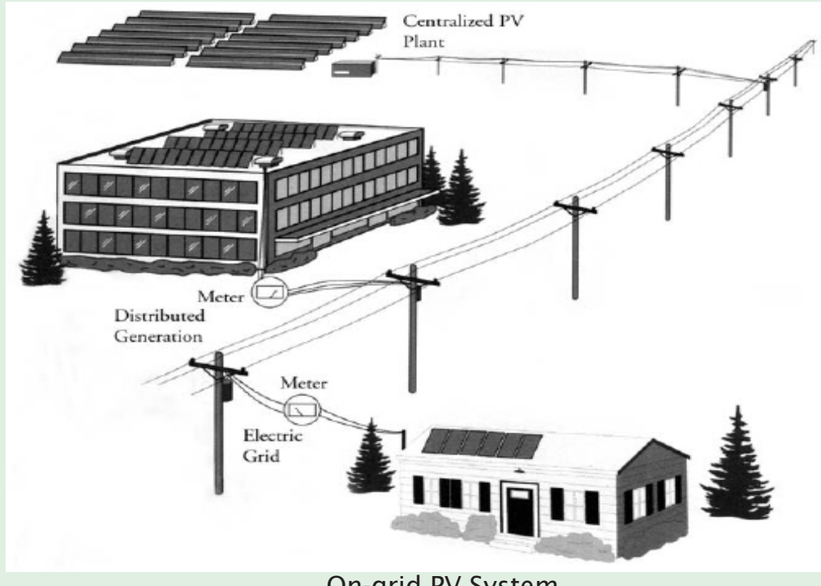


Figure 2: Hybrid Off-Grid PV System Schematic

ON-GRID PV SYSTEM

In general on-grid PV system has its own characteristics. Most modern PV systems are grid-connected as shown in the figure below. The electrical energy is directed into the existing municipal power grid. Energy is effectively stored in the grid. When a grid-tie system generates more than energy needed, the electrical meter turns backwards. Many large arrays are intended solely for use as power plants, as well enhancing or supplanting the need for conventional power plants. The grid application systems do not need large batteries. The PV grid-connected system is also called grid-interactive, grid-intertie, utility connected which is built onto your building that transfers DC power from the PV array to the utility supply (TNB) through grid-inverter.



On-grid PV System