MINISTRY OF ENERGY AND WATER RESOURCES
OFFICE OF THE CHIEF SCIENTIST

Research and Development
2011-2012

November 2012

w w w . e n e r g y . g o v . i l

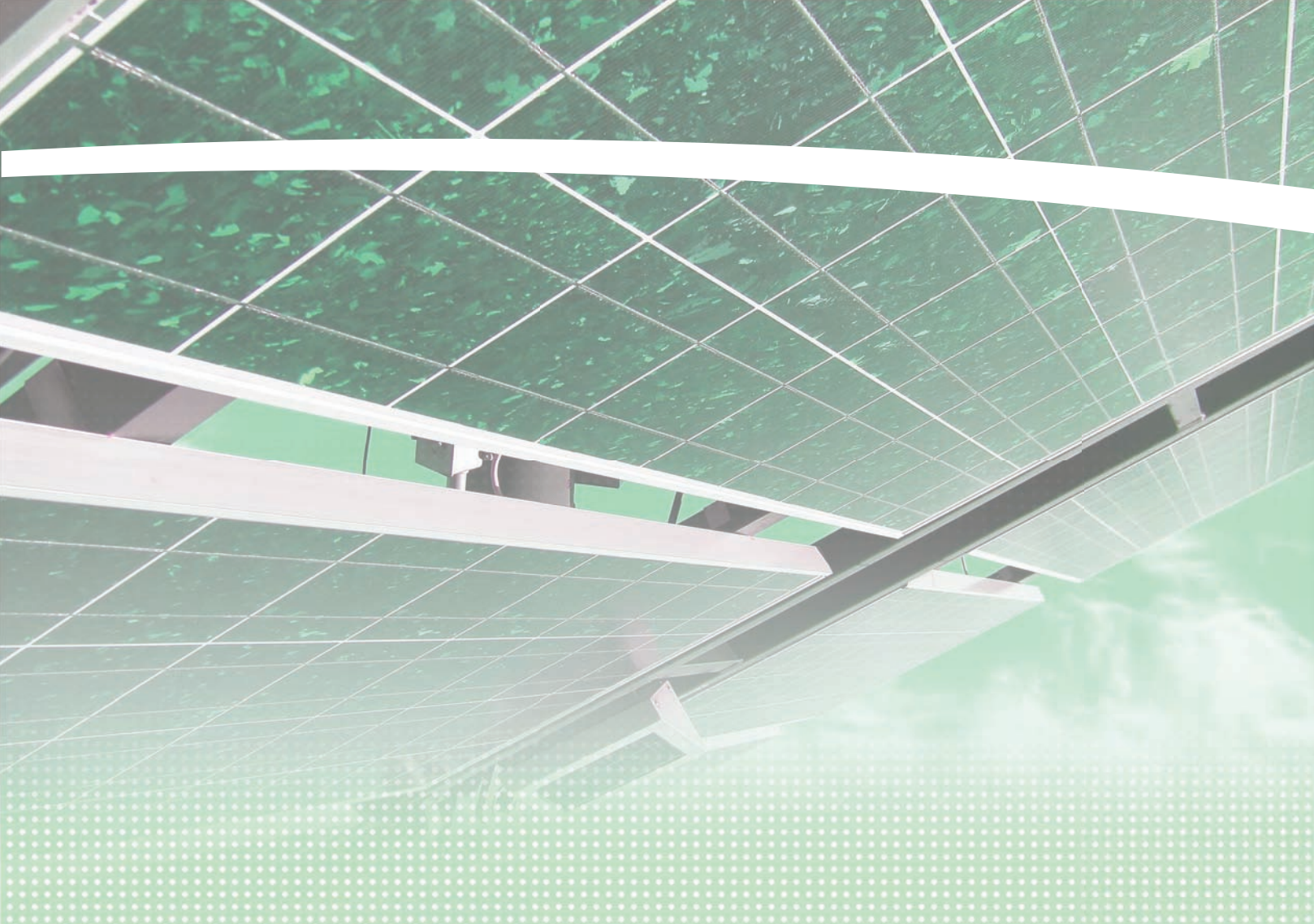


Table of Contents

Introduction

About the Ministry of Energy and Water Resources

The Ministry of Energy and Water Resources is responsible for the energy economies and national resources of the State of Israel: electricity, fuel, cooking gas, natural gas, energy conservation, water, sewer mains, oil & gas exploration, ores, earth and marine sciences and more.

The ministry supervises the public and private entities involved in these fields and acts to ensure an adequate solution to the changing energy and infrastructure needs of the national economy, today and in the future, while regulating the market and protecting the consumer and the environment.

In order to meet its objectives and allow the country to realize its goals in the energy and infrastructure fields, the ministry encourages R&D for the development of renewable energy sources, oil alternatives, smart grids and water treatment, using novel, efficient technologies.

The Chief Scientist

The office of the Chief Scientist, in the ministry of Energy and Water Resources is responsible for supplying scientific and technological support to policy and decision-making processes within the ministry. The office endeavors to collect, investigate and incorporate current information pertinent to all ministerial work, and supports research and development which contribute to the attainment of its technological objectives, and in preparing the physical and human infrastructures required for realizing these policies. The office encourages international cooperation in research and development, and promotes the generation of local knowledge centers and original technologies adapted to Israel's needs, which may contribute to its continued subsistence and welfare, today and in years to come.

The Chief Scientist assistance to R&D activities covers the most crucial steps in the R&D life cycle:

- **Funding academic R&D**
- **The STARTERGY fund for early stage start-up companies**
- **Pilot and demonstration projects**
- **International R&D collaboration**

The STARTERGY Fund

The Ministry of Energy and Water Resources has set itself a target to make Israel a center of excellence in the fields of alternative energy, renewable energy and energy efficiency.

As one means to achieve this objective, the Ministry has devoted resources to a start-up fund (STARTERGY), to encourage entrepreneurs in these fields. The fund helps selected entrepreneurs to achieve proof-of-concept with a grant of up to 62.5% of the approved budget (with a ceiling of 625,000₪).

Some of the projects funded in 2011:

Company: Green Power Management (GPM)

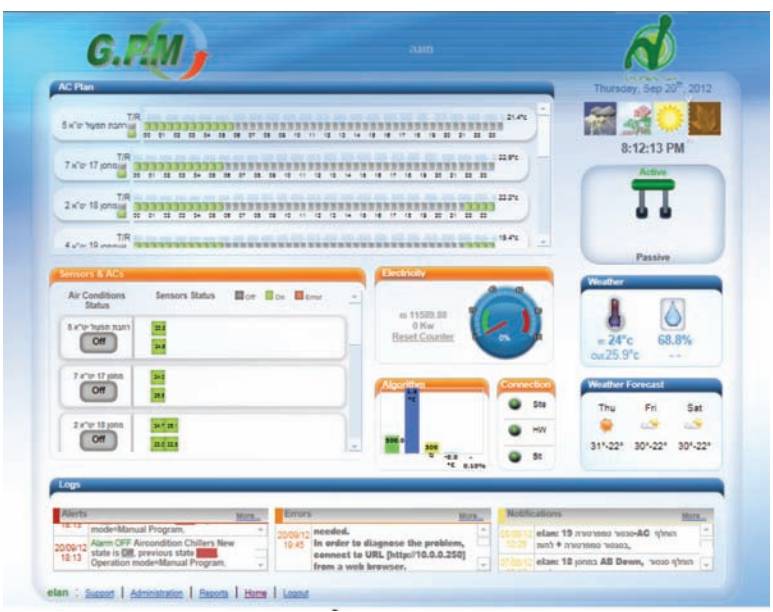
Project: GreenOS™ - The Green Operating System – Virtual Power Station

GreenOS™ in an internet operating system based on Thermal Energy Storage (TES) and Time Dependent Valuation (TDV) algorithms. It controls Heat, Ventilation and Air Conditioning (HVAC) systems and other energy consuming devices.

GreenOS™ measures and studies the thermal behavior of sites, and dynamically builds an optimized operational profile for efficient operation.

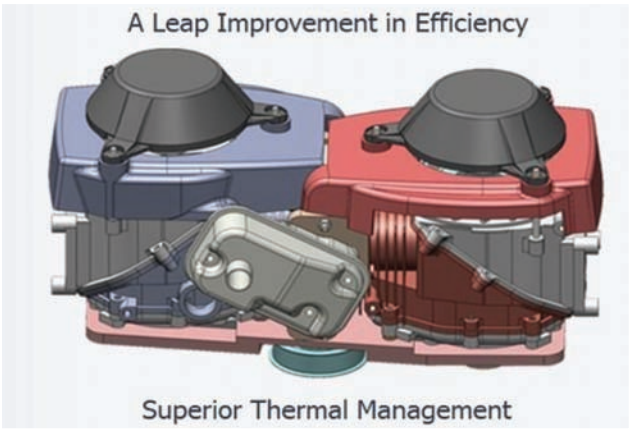
Beta site results show 25% savings on electric bills and peak demand shifting.

GreenOS™ is targeted for the commercial and industrial markets. It saves money on electricity bills and reduces peak demand. As a result, it delays the need to construct new power stations and transmission and distribution lines. It enables use of the existing infra-structure more efficiently, instead of building new ones.



Company: **Tour engine**

Project: **TourEngineTM prototype II: A split-cycle gasoline engine with improved efficiency and reduced emissions**



TourEngine™

The TourEngine™ is a novel opposed-cylinder split-cycle Internal Combustion (IC) engine, invented, patented and under development by Tour Engine Inc. (www.tourengine.com) with the potential of 30-100% efficiency gain and a substantial reduction in CO2 and Nitrogen Oxide (NOx) emissions over current IC engines. TourEngineTM has the potential to revolutionize the way IC engines are built. Notably, manufactures can relatively easy adopt
the technology as the TourEngineTM design is based on standard cylinder/piston technology and uses many carryover parts from common IC engines. Tour Engine Inc. has successfully developed the first gasoline-based TourEngineTM prototype (prototype I) that proves the feasibility of the concept.

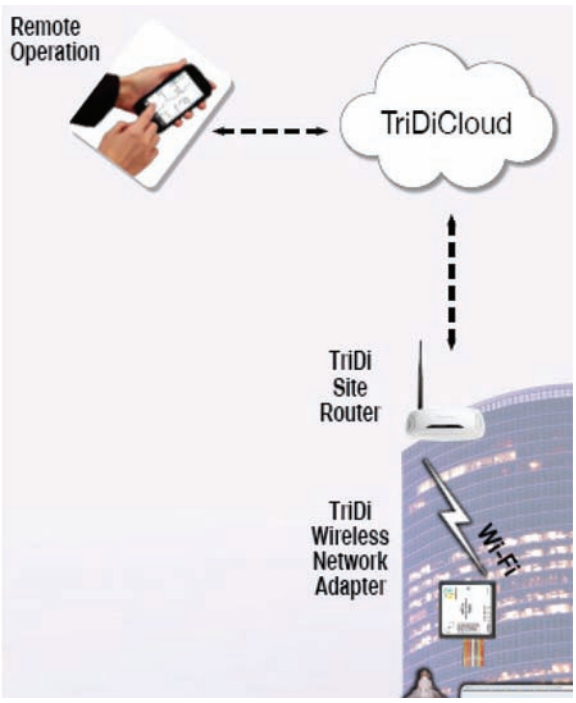
Company: **TriDiNetworks**

2011 Project: **A new generation of Wireless Sensor Networks (WSN) for energy efficient buildings**

The goal of the project is to improve energy efficiency in buildings, by the installation of a new-generation of Wireless Sensor Network using Low Power Wi-Fi standard, installable and maintainable in a simple form, by users with no technical background.

The solution – development of innovative technological solution for control system WSN based on Low Power Wi-Fi - enables the installation, configuration and maintenance by the common electrician. The installation tool (Commissioning Tool) will be implemented, using a Smartphone that will receive the installation program through the cellular network. The phone will install each of the sensors automatically and will be used as a remote control in the system through its own built Wi-Fi channel, for controlling each and every device in the system.

2012 Project: **Algorithms and Methods for Direct Monitoring of Wireless Sensors and Controllers from Cloud Computing.**



The goal of the project is to develop:

1. Routing algorithms on low-cost standard Wi-Fi routers to utilize existing Wi-Fi infrastructures, instead of usual expensive gateways.
2. Cloud-based software service without the need for local computers, enabling access to wireless control devices through mobile phones without any dedicated applications, using patented technology that consolidates design, commission, control and maintenance in one simple to use, unified system.

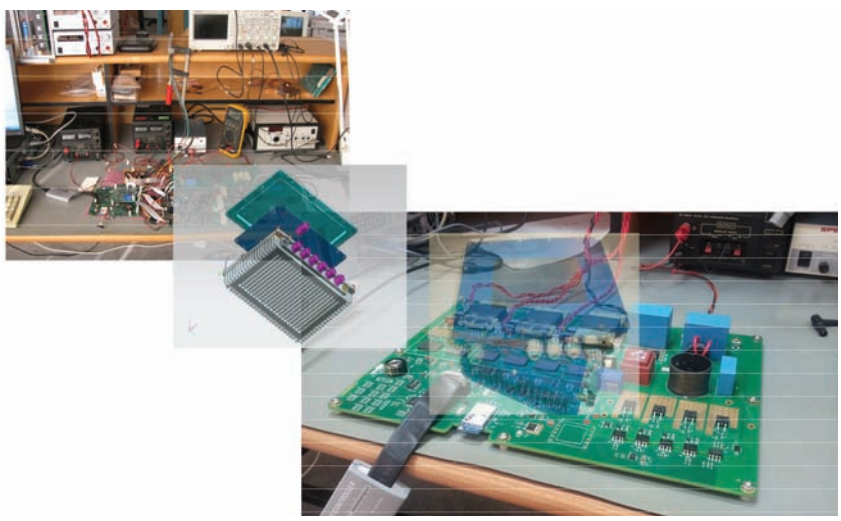
The technology is demonstrated in an energy saving Cloud based wireless lighting and HVAC control system in an office building. The development is based on a new generation of Wireless Sensor Network that was developed on 2011.

Company: **SolarBead**

Project: **Efficiency improvement of energy harvesting of solar PV systems**

SolarBead

The aim of the projects is to improve the energy production efficiency of solar PV systems, at a cost that is considerably lower compared to present solutions. This is done by two independent solutions:



InverBead

- The development of a decentralized system architecture (Microinverter), giving up the need for a central inverter;
- Conversion of the receptors/cells voltage to Grid Voltage in a decentralized and innovative way, by minimizing the exposure to the basic elements performance up to the minimum;
- Mechanical/electrical structure of wiring and conversion layout, which enables to perform installations and maintenance without being exposed to high voltage.

DCBead

- Production of energy from solar array in populated areas that suffers from partial (and variable) shading is a well known problem in the industry, which makes it difficult to plan the panels' placement.
- In the proposed system the production is made by the basic element in the panel, enabling maximal extraction through mechanism of Maximum Power Point Tracking (MPPT) from every substring.
- The system will be connected to a central inverter in a high voltage coupling, eliminating the need of aggregating a fixed number of panels to develop that high voltage.

Company: **Loginet Systems**

Project: **Energy Efficiency – "Plug & Play" Smart Consumption Products**

The goal of the plan is to develop the technology and a series of products that enable controlling electrical loads by long range, low cost radio communications. The communication link is direct without using routers and no installation or setup is required (Plug & Play).

The first product developed is an air conditioner remote control unit GreenRC™ that in addition to regular air conditioner control, can receive messages directly from the utility by radio communications, shed loads and change set-points,

The series of products enable Demand Side Management (DSM) in residential sectors.

Some of the Projects funded in 2012:

Company: P.V. NanoCell

Project: Nano copper ink, for inkjet printing of conducting lines on Photo Voltaic wafers

PV NanoCell Ltd (PVN), is a private-held innovative technology startup company located at the south industrial zone in Migdal Haemek. It was established in 2009 by Dr. Fernando De La Vega, who has more than 20 years of experience and 11 patents in the field. PVN is focused on the development and manufacturing of materials and technologies that will enable substantial cost reduction in the manufacturing processes of solar cells, mainly through printing with inks based on nanometric materials of the conductive layer of the cells.

The main concept of PVN is to develop a unique nano-ink for printing the conductive grid on PV wafers using Inkjet technology.

PVN is already in advanced R&D phase of a nano-silver ink, got commercial approval from several players of the industry for a first generation nano-silver product and is expecting to receive an approval for the second generation, with the completion of experiments and improvements.

Implementation of Inkjet technology in combination with the use of the nano-copper ink developed by PVN will lead to a 25% price reduction of solar electricity as a result of manufacturing cost reduction of PV cells and efficiency increase. This is a major contribution to the efforts to reach grid-parity.

Company: NewCO_2Fuels

Project: Heat exchanger for Stirling Engine

NewCO_2Fuels was founded in 2011 in order to develop solar systems for CO_2 dissociation into CO and O_2. The project is based on technology developed at the Weizmann Institute of Science during the last eight years, which has reached lab-level maturity.

The company develops an innovative technology and provides a solution for high CO_2 emitting facilities (such as power plants and cement factories), which converts the CO_2 to fuel such as CO and O_2 or liquid fuels such as methanol, using heat and electricity. The solution uses solar energy to raise the gas temperature to about 1000°C for performing the chemical processes in a highly efficient and economically applicable way. The rest of the energy needed for the gas dissociation will be provided by electricity generated by a Stirling engine driven by solar energy. In order to provide the heat required for the operation of the Stirling engine, the system will use the residual heat of the gases (CO and O_2) exiting the dissociation cells. The two gases heat transfer process to the Stirling engine requires a unique development of a heat exchanger with very high temperature durability. The heat exchanger, which is a critical part

of the system, is the subject of this R&D plan.

The main challenges in developing the heat exchanger lie in the need to deal with two different heat sources (two gases with different flow rates), particularly high temperatures, and high temperature oxidation endurance.

Company: **Solarbead ltd.**

Project: **DC BEAD**

Installation of solar panels on a determined area (like a roof) is limited by the minimal and maximal size of the string needed to feed the central inverter. The present technology does not allow connection of string fractions to a central inverter, because a partial string will not reach the entry voltage needed by the inverter. The electronic circuit that will be developed in this project will allow connection of any number of panels to the inverter, and will not be limited to complete strings. This will allow exploitation of the whole available area, as well as energy production also from panels prone to shadowing.

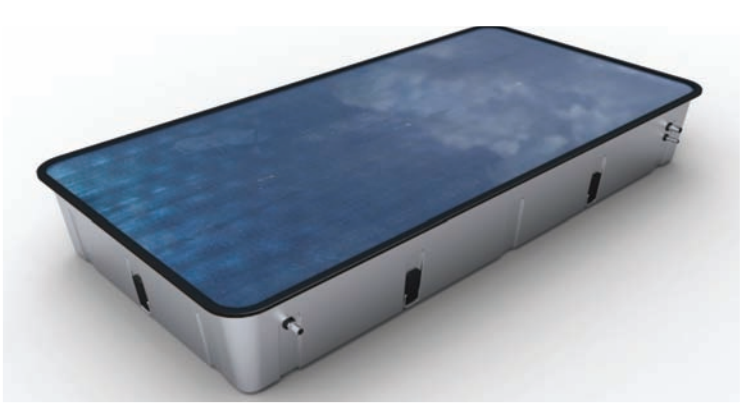
Company: **Tigi**

Project: **Storage collector based on transparent insulation technology**

The purpose of the venture is the development of a solar water heating collector, having integral storage capability. Success of the program will enable launching of an innovative product having key advantages:

- Aesthetic and compact design (the water heating system will not require an external tank, as common today)
- Significantly higher efficiency, even in weather conditions that do not enable economic use of existing technologies
- Competitive pricing.

The novel solution is enabled by the Transparent Insulation Honeycomb technology, which significantly increases the efficiency of the collector over state-of-the-art technologies.



Company: **Greenlet Technologies**

Project: **Multi-phase controller for load management in smart grids**

The project's goal is to develop a multi-phase power controller and meter, for power reduction and demand side management. The controller supports multi-phase power systems, particularly 3-phase power for the Israeli market and two-phase system for the US market, per NEMA-10-30 and NEMA-14-30 US standards. The unit is a controller and a meter, which is remotely controlled from the electric company's control center. The controller is plug & play, i.e. it is easily installed by non-professional customers (quick self deployment).

Company: **HelioFocus**

Project: **Thermal storage for solar system**

HelioFocus is developing a solar system to boost existing steam power plants. As part of the requirements for such a system, storage capacity is required to produce thermal stability and steam production.

The program goals are to develop a storage technology to enable a stable production level which will prevent from disturbances such as a passing cloud to cause loss of working temperature.

Company: **Burning Solar Ltd.**

Project: **Multi Junction, carbon based Solar Cell, with high efficiency, reaching Grid Parity cost**

Burning Solar is developing an innovative solar cell technology based on carbon, that will achieve record high energy conversion efficiency at extremely low cost.

Burning Solar's technology will allow a wide range of sun spectrum capturing. The concept is based on a controlled deposition process of carbon layers for the production of an advanced multi-junction PV cell.

Pilot and Demonstration Projects

The Ministry of Energy and Water Resources has set itself a target to make Israel the center of international excellence in the fields of alternative energy, renewable, alternative energy efficiency oil. In this framework, the ministry devoted dedicated resources to fund implementation and demonstration pilot project in the fields of of oil replacement technologies in transportation and renewable energy. The Ministry supports selected projects through participation of up to 50% of the approved budget of the developer for this purpose, when a single grant limit is ₪ 1,500,000. In cases where project is an international cooperation and international factor supplemental funding is at least equivalent to Ministry's grant rate, then, the grant ceiling for the project office is 2,000,000.

Some of the 2012 pilot and demonstration projects:

Company: Winflex

Project: Development and testing of flexible rotor wind turbines

Winflex flexible-rotor wind turbine technology allows utilization of wind energy as a real cost-effective alternative to fossil fuel energy sources for wide range of power. Winflex improves by more than twice the system's cost effectiveness and brings safety to a level not yet achieved by existing wind turbine technologies. The program's goal is testing a 132 kW pilot unit.

Winflex Turbine

Company: Dor Chemicals

Project: Motor vehicle field trial run using a mixture containing 85% gasoline and 15% methanol - M15

Dor Chemicals has been working with methanol in the past forty years, and intends to outline a practical way to use methanol gasoline fuel blends in Spark Ignition Engines.

Methanol can be produced from natural gas, coal, wood and even combustible trash, and can be burned in a more efficient and environmentally cleaner way than gasoline. Using methanol will follow the GOI's policy to find alternative transportation fuels in order to reduce world dependence on oil products.

The project's objective is to examine methanol fuel blends as an alternative to petroleum derived

fuels in existing gasoline cars. The testing process includes among others laboratories tests to examine the mixture's specifications like vapor pressure and octane number, stability of the blend and emissions at car exhaust.

In addition the testing process includes examination of cars running parameters like fuel consumption, power and torque and the logistic infrastructure which is participating in the test.

The testing fleet includes at the first stage 13 cars running on M15 and will be expended at the second year to few hundred cars. The test is supervised by the relevant governmental ministries.

The target is to prove that there are no barriers for implementation of M15 as a new gasoline grade in Israel.

Company: **Phinergy**

Project: **Aluminium-air energy system for electric vehicles**

Phinergy is a leading developer of CO_2-free, ultra-capacity, metal-air batteries. Its core activity focuses on the development of aluminium-air and zinc-air energy systems and their critical components. The company provides a very efficient solution to the EVs autonomy critical issue. Thanks to its breakthrough technology, the company has developed a range-extender allowing the common driver to drive an EV in the same driving profile as a traditional gasoline vehicle without emitting CO_2.

Phinergy's Aluminium-air Energy Systems

Phinergy's aluminum-air energy system appears to have significant advantages over state-of-the-art batteries, such as superior performance in specific energy, short refueling time, thousands of working hours life cycle, no significant degradation in performance, reduced cost and full recycling capability.

Company: **Engineuity**

Project: **Production of Diesel (Syngas) from Natural Gas (CH_4) and CO_2**

Engineuity is developing an innovative process to produce standard diesel fuel from natural gas and carbon dioxide. This is a considerably less expensive alternative to production of diesel fuel from crude oil. The program objectives are to demonstrate a novel process to produce

Enguneuity prototype reactor; yield: 1 kg/h

a synthetic diesel fuel with less than 15 ppm of Sulphur, by operating an innovative prototype reactor producing 100 kg/h of syngas. The process is more modular, more efficient and less expensive than existing ones.

Company: **Designer Energy**

Project: **Pilot plant of second generation biofuel production from municipal waste using Accelerated Bacterial Hydrolysis (ABH) technology.**

Designer Energy (DE) has developed a proprietary technology, Accelerated Bacterial Hydrolysis (ABH), using a whole-organism approach to hydrolysis of biomass into fermentable sugars. The process was designed with the aim of eliminating the use of cellulosic enzymes that currently represents the biggest cost item in any biofuel-based alternative. Studies performed in DE's lab using different types of biomass such as popular, switchgrass and sugarcane bagasse clearly indicate the efficiency of the ABH process at the laboratory scale. The ABH technology was thus successfully implemented into production of fermentative sugars from different types of pretreated cellulosic biomass. In addition, DE has developed efficient and cost-effective pretreatment approaches with the aim of decreasing the recalcitrant nature of native cellulosic biomass which subsequently increases the overall hydrolysis yield of cellulosic biomass.

Company: **V.L.V.**

Project: **Charging and vending systems for electrical scooter**

The vision of this project is a network of urban compact and automated switching stations that can be placed easily in central locations in the city (without any special infrastructure), together with easy discharging battery that will enable to easily replace an empty battery with a full battery.

One of possible battery-swithing concept

Company: **Sunboost**

Project: **Pilot plant for the demonstration of optical boosters in front of PV modules**

The Sunboost installation comprises optical boosting using proprietary static, glass or plastic, add-on panels that are set in the gaps between rows at opposite tilt to the PV panel row to redirect the light insolating the gaps onto the adjacent PV modules. These boosters

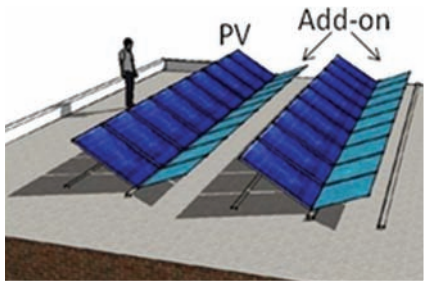


Illustration of Sunboost concept

provide balanced boosting at angles higher than 120 degrees between booster and module and mitigate boosting non-uniformity issues, compared to specular or diffusive reflectors that were considered in the past.

The system can be incorporated in new installations or retrofit in existing installations such as commercial flat rooftops installations. The system can be used to compensate for systems aging in older power plants.

Company: **HelioFocus**

Project: **Solar boosting for cc power plant of 10-12 MW equivalent electricity**

Solar boosting an existing steam power plant can provide a very high temperature steam and achieve maximum efficiency. The project represents the first commercial project of HelioFocus, using unique and exclusive technology that implements high temperatures to achieve maximum efficiency.

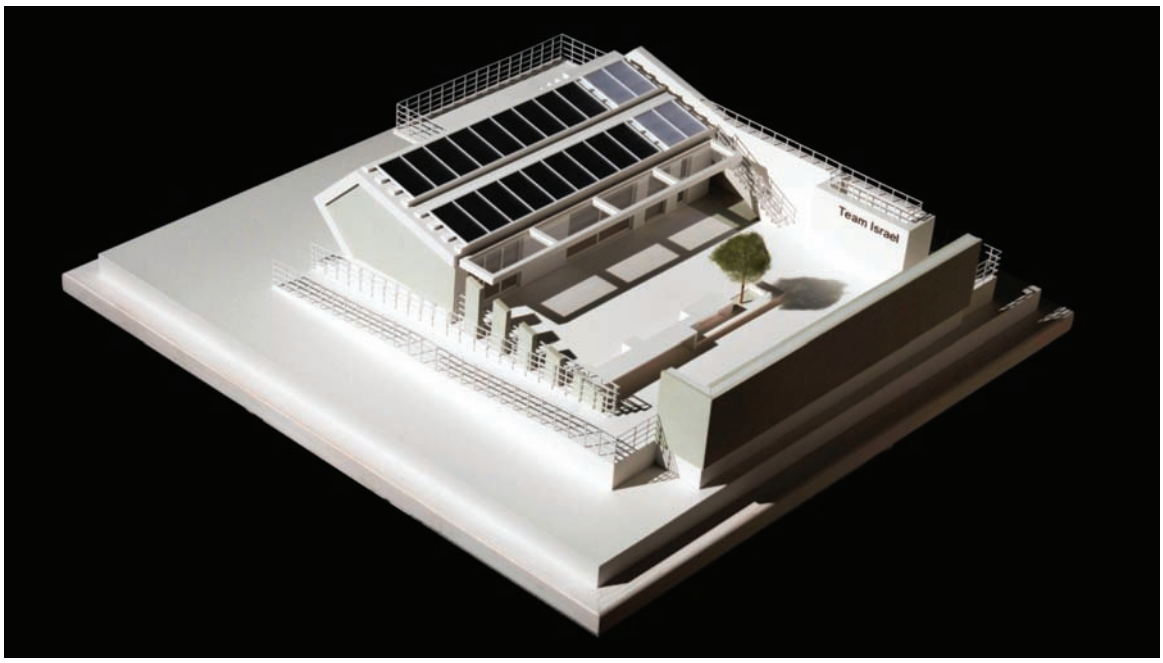
HelioFocus is the world's only company that uses concentrated dish technology - using air at very high temperatures.

The uniqueness of the project is in the dish technology and the solar field which produce supercritical steam parameters, as well as the world's first application of existing power plant integration to the main steam line of the power plant.

Company: **Alfa sustainable Projects**

Project: **Solar Decathlon China 2013- Team Israel**

Solar Decathlon is an international competition of leading academic institutions and industry, to design, build and operate a **Net Zero Energy building**. The Israeli Team is a joint venture of Shenkar College of Engineering and Design, College of Management Academic Studies (COMAS), Tel Aviv University, and Neri Bloomfield School of Design, reinforced by some of the leading manufacturing and consulting firms in Israel, and will be Israel's most advanced attempt to succeed in implementing such a concept. The team developed a prototype of an 80 sq.m residential home which will integrate some innovative Israeli Cleantech products to achieve a super energy efficient building which will produce more energy that it consumes. Team Israel's prototype is planned to be shipped back to Israel for permanent exhibition after the competition.



Company: **EB Clean Energy**

Project: **Demonstration of Production of Biocoal from Municipal Solid Waste, as a Replacement of Coal, for Generation of Green Electricity in Coal-fired Power Stations**

E.B. Clean Energy (EBC) has developed a novel technology for the conversion of any biomass into biocoal. Biocoal has a number of advantages over biomass: logistics, operation, safety and cost-effectiveness. EBC's pilot plant produces biocoal at 1 t/h rate. EBC has showed that it can produce biocoal from municipal solid waste (MSW) by torrefaction, and that this biocoal is also suitable for co-firing in coal-fired boilers.

Company: **Matalon**

Project: **Photo-voltaic facility with tracking and concentrated sunlight.**

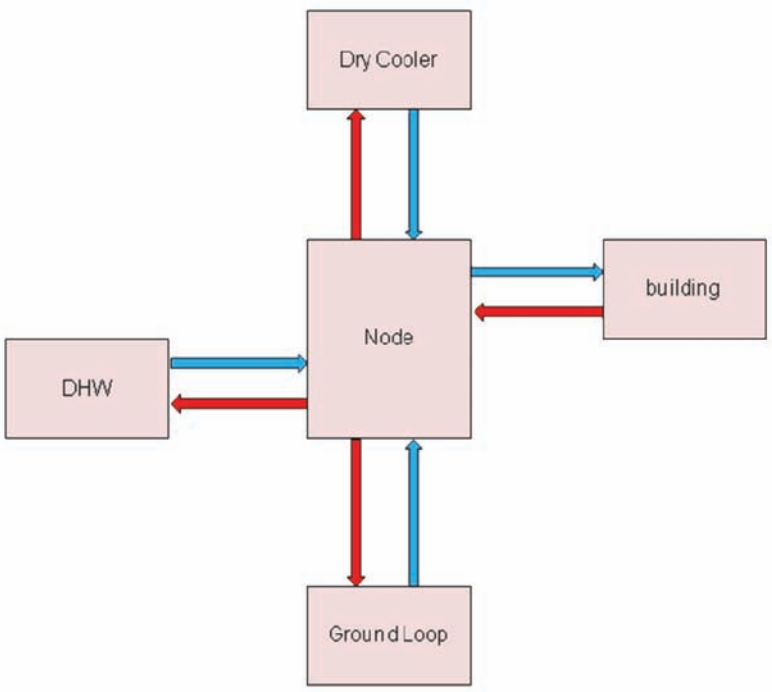
This project combines two systems. The first system concentrate light into photovoltaic cells arranged in a panel, in a simple, yet effective way, that does not requires cooling the cells, and uses moderate concentration.

The second system is a tracker, based on solar cells, that requires no use of battery or micro-processor, but generates its power. These combined methods of tracker and moderate CPV panel can generate better output at lower costs.

Company: **Geo-energy**

Project: **Hybrid Geothermal Air Conditioning**

This program will demonstrate the application of a hybrid ground-source heat pump (HyGSHP), suitable for buildings with an unbalanced air conditioning load (buildings which require mostly cooling or mostly heating throughout the year), as an energy-efficient air conditioning system.Taking advantage of the ground's moderate temperature, the system is designed to utilize ground and air condensers, transporting energy in the most efficient way between the building, ground, air and hot water consumers. The program is expected to prove a 40% - 50% reduction in energy use compared to other state-of–the-art' AC systems available, and a payback time of two to four years.



Company: **Solaris Synergy**

Project: **50kWp demonstration plant for solar electricity generation, based on a novel floating CPV technology**

Solaris Synergy has developed a new solar energy technology, using a low-cost concentrating photovoltaic (CPV) concept designed to float on water surfaces, utilizing inexpensive, easy-to-manufacture platforms, based on a unique, patent pending cooling technology. This technology has two key advantages:

- Significant reduction of the installed cost of the system compared to existing systems;
- Secondary use of “industrial” water surfaces, freeing up valuable land resources, while simultaneously preserving water quantity and quality by reducing evaporation and inhibiting algae growth.

Floating 50kW solar system

Organization: **Hura Municipal Council**

Project: **Wadi Attir – Integrated solar energy technologies**

Project Wadi Attir is a Bedouin community-based enterprise in the Negev desert of Israel. The project seeks to develop and demonstrate a breakthrough model for sustainable, organic farming, adapted to an arid environment. It is designed to combine Bedouin aspirations, values and experience, with sustainability principles and cutting-edge approaches to renewable energy production, resource recycling, arid land stewardship, and community development.

Project Wadi Attir site will demonstrate and apply an innovative technology for solar energy production and use. The proposed integrated solar energy technologies will be used to support the various activities on project Wadi Attir site.

The proposed integrated systems solar energy facility, based on Z20 technologies of the Israeli start-up company Zenith Solar, is one element out of six infrastructural systems that will be operating on site.

Company: **SolarPower Israel and Eternegy**

Project: **Usage of a dual axis tracker for solar utility scale solar power**

Eternegy has developed a dual-axis tracking system, based on innovative technology, for utility-scale photovoltaic plants. The project main goal is to prove that the usage of the new system is applicable on a commercial scale.

As a result of this project implementation Eternegy will gain the option to sell the system commercially in the international market, and SolarPower shall gain the knowledge and edge advantage in comparison with other international Solar EPC companies at the field of solar energy. Scientific measurements and research shall be conducted by Rotem Indistries.

Eternegy's ETracker concept

Company: **Emefcy**

Project: **Virtually Zero Energy Consumption Treating Wastewater with SABRE (Spiral Aerobic Bio-Reactor) Technology**

Wastewater treatment is an energy intensive process consuming 2% of global energy production. Emefcy has developed a technology to reduce the power consumption of biological wastewater treatment by more than 95%, or in other words – by a factor of more than 20. A product based on this technology has been labeled SABRE – Spiral Aerobic Bio-Reactor and has reached the pilot stage. Emefcy is gradually scaling up the piloting and demonstration activity in order to validate the technology for itself and for the market. In addition, Emefcy's team has developed production capabilities for full scale products that it needs to test and optimize.

Company: **Diffusaire**

Project: **Energy saving technology for aeration systems in wastewater treatment plants**

Diffusaire is developing an aeration technology for liquids that will enable supplying aeration to aerobic treatment processes in which the oxygen requirement is higher than the natural rate. The system is applicable for wastewater treatment plants (WWTP), fish farms and water treatment facilities and will offer substantial energy savings (above 50%) in the energy costs allocated towards aeration.

Diffusaire's ventilation column

Example of International Activities

BIRD Energy

BIRD is an acronym for Israel-U.S. Binational Industrial Research and Development. The BIRD Foundation's mission is to stimulate, promote and support industrial R&D of mutual benefit to the U.S. and Israel.

BIRD's activities include matchmaking services between Israeli and American companies in the field of Research and Development. It supports approximately 20 projects annually. The cumulative sales of products developed through BIRD projects have exceed $8 billion.

"BIRD Energy" is a program for U.S. - Israel joint renewable energy developments funded by the U.S. Department of Energy (DOE), the Israel Ministry of Energy and Water Resources and the BIRD Foundation.

For more Info visit the website: www.birdf.com

Examples of funded 2010-2011 projects:

- HCL CleanTech Ltd., Tel Aviv, Israel and Virent Energy Systems, Madison,Wisconsin: will develop and test a process to produce biogasoline from cellulosicnon-food sources.
- IQwind Ltd., Bazra, Israel and Ricardo, Inc., Detroit, Michigan will design, testand commercialize a variable ratio wind turbine gearbox.
- OMAT Ltd., Jerusalem, Israel and General Dynamics Ordnance and Tactical Systems, Inc., Scranton, Pennsylvania will develop and implement a system to monitor, control, and economize energy consumption in metal machining industries.
- Panoramic Power, Ltd., Kidron, Israel, and Mazzetti Nash Lipsey Burch and (MNLB), San Francisco, CA will develop and pilot self-powered, wireless current sensor that will facilitate load management strategies in commercial buildings.
- Ram Power, Ltd., Herzliya Pituach, Israel and Turbine Air System (TAS),Houston, TX will develop, engineer, and commercialize an integrated cycle power block that will improve the efficiency of solar thermal power plants and reduce the need for water cooling.

BSF Energy

The United States-Israel Binational Science Foundation (BSF) promotes scientific relationships between the two nations, by way of supporting joint research projects in various fields of basic and applied science, with non-profit and peaceful intentions. The BSF-Energy program focuses on Energy research.

Since its establishment in 1972, the Foundation has awarded $500 million to more than 4,500 quality research projects, many of which have led to scientific, medical and technological breakthroughs, with wide-ranging practical applications, including 39 Noble laureates that started their work with the BSF support.

For more info visit the website: www.bsf.org.il

Examples of funded 2010-2011 projects:

- Biofuel Producing Fungi Tolerating/Degrading Inhibitory Compounds Generated via Pre-Treatment
  Prof. Oded Yarden, Hebrew University of Jerusalem
  Prof. Yitzhak Hadar, Hebrew University of Jerusalem
  Prof. N. Louise Glass, University of California – Berkeley
- The Entropic Grid: Stability by Design for Distributed Power Markets
  Prof. Ramesh Johari, Stanford University
  Prof. Shie Mannor, Technion - Israel Institute of Technology
  Prof. Sean Meyn, University of Illinois - Urbana-Champaign
- Modular Topologies of Photovoltaic Systems
  Prof. Sigmund Singer, Tel Aviv University
  Prof. Keyue Smedley, University of California – Irvine
- Relaxation, Polarization, Energetics, Design and Efficiency in Ordered Organic Photovoltaic Systems
  Prof. Abraham Nitzan, Tel Aviv University
  Prof. Mark Ratner, Northwestern University
- Novel Thermoelectrics for Harvesting Waste Heat Energy
  Prof. Yoed Tsur, Technion - Israel Institute of Technology
  Prof. Gerald Mahan, Pennsylvania State University
  Prof. Clive Randall, Pennsylvania State University
- Ionomer and Catalyst in AMFC
  Prof. Yair Ein-Eli, Technion - Israel Institute of Technology
  Prof. Michael Hickner, Pennsylvania State University

Contact Chief Scientist

Address: 216, Yaffo St. POB 36148, Jerusalem 9136002, Israel.

Phone: 972-2-5316127

Fax: 972-2-5316017

Person Name	Role	E mail
Dr. Shlomo Wald	Chief Scientist	shlomow@energy.gov.il
Dr. Einat Magal	Manager of Marine and Earth Science research	einatm@energy.gov.il
Dr. Igor Derzy	Manager, Technologies and Renewable Energy	igord@energy.gov.il
Dr. Bracha Halaf	Senior Manager, Oil Replacements	brachah@energy.gov.il
Dr. Yoel Cohen	Manager, R&D projects	yoelc@energy.gov.il
Mrs. Sara Mizrahi	Chief secretariat	smizrahi@energy.gov.il
Mrs. Revital Aganzi	Coordinator for research contracts	raganzi@energy.gov.il
Mrs. Sarale Cohen	Senior coordinator for research contracts	scohen@energy.gov.il
Mrs. Nurit Groisman	Librarian	ngroisman@energy.gov.il