MelRok is seeking patent protection in early stage energy Internet of things industry
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MelRok LLC, the energy Internet of things startup developing software to allow utilities and buildings to efficiently monitor, communicate and control multiple energy systems and devices, recently received a new patent focused on solar energy systems, and is looking for a CEO who can lead it to profitability in the next six months to a year.

Santa Ana, California-based MelRok has spent more than $20 million developing its energy IoT platform. The company spends at least $1 million a year on research and development including a substantial amount on prosecuting its patents.

Much of MelRok's R&D work was conducted with the assistance of the Lawrence Livermore Berkeley National Labs. The company also has worked with the Advanced Power & Energy Program at the University of California in Irvine, California, the U.S. Green Building Council, Sempra Energy, LVR Energy and Mechanical and Federated Services Solutions.

In addition, MelRok is participating in a joint collaboration on energy demand response protocols between the Department of Energy and its counterpart in China. The University of California at Irvine and Pomona College have tested and still use MelRok's energy IoT platform. Most recently, MelRok said signed up its first utility client Sempra Energy's San Diego Gas and Electric.

Wesley Jones, a spokesman for San Diego Gas & Electric, said the utility has contracted with MelRok on an over generation pilot project. "We cannot comment on the services at this time."

Energy IoT provides real time, secure and robust communication, analysis and control network of all energy devices with control and response times of less than 1 second. Such energy devices include air condition units, pumps, fans, compressors, lighting, solar panels, batteries, etc.

MelRok's patented energy IoT technology and platform as a service (PaaS) are designed for commercial and industrial enterprises, energy service companies (ESCOs), OEMs and

utilities. The company has had venture backing from Alan Boyce's Energy Transformation Investors and other high net worth individuals.

Boyce, who sits on MelRok's board, is co-founder and a director of Adecoagro (AGRO), a food and renewable energy-producing company in Argentina, Brazil and Uruguay. He also is executive chairman and co-founder of Materra, a California and Arizona based agricultural production company. In addition, he also was the co-founder and CEO of Westlands Solar Farms, which developed and built a 23MW solarPV facility in western Fresno County.

Previously, Boyce served as director of special situations at Soros Fund Management. Before joining Soros, he served as managing director at Bankers Trust, in charge of fixed income arbitrage, the bank's mortgage portfolio and compliance with the Community Reinvestment Act. Prior to that, he worked for the Federal Reserve Board in Washington, D.C. He holds an MBA degree from Stanford University and a Bachelor of Arts degree in Economics from Pomona College, where he graduated magna cum laude.

Until recently, MelRok was led as CEO by Dr. Michel Kamel, though he is transitioning to become chief technology officer after a new CEO is named. Previously, Dr. Kamel helped found and was chief operating officer and chief financial officer of Space Launch Corp., a defense contractor focused on the development of micro satellite launch vehicles. Prior to that he was a senior propulsion engineer at Rotary Rocket Co. He helped found MelRok in January 2009 as a software company focused on the energy IoT business and has become an expert in energy systems and analytics.

MelRok offers two different energy IoT systems, the Touch and the Touch Pro.

The Touch allows communication with Energy Management Systems, Building Management Systems, Utility smart meters, Energy meters, Lighting control systems, Direct load controllers and SCADA historians. MelRok describes the Touch as a universal energy IoT router that communicates simultaneously with more than 100 energy devices over multiple physical interfaces and via multiple protocols.

MelRoK describes the Touch Pro as a platform as service that simultaneously collects data from multiple IP-based energy meters, IP-based sensors, three voltage lines and 24 current transformer sensors (CTs). All the data collected by the Touch Pro is streamed to the cloud. The company also offers energy cloud services to provide a robust, scalable, secure and real time fast cloud storage and search infrastructure, to built-in real time analytics, reporting and alert engines.

MelRok's earliest patents were about a device or system that would allow various energy systems to communicate with each other.

"It was like the Tower of Babel," Dr. Kamel said. "The different devices and systems couldn't communicate with each other because they didn't use the same method of communication. We designed a platform to speak every device's language."

The platform can communicate with each of the devices and send various control messages back and forth. All this was made possible by cloud computing, which offered unlimited bandwidth and storage capacity.

MelRok currently has four U.S. patents and one each in China, Canada and Japan. The U.S. patents are U.S. Patent Nos. 9,052,216, 9,014,996, 9,909,901 and 9,727,068. It also owns Canadian Patent No. 2833781, Chinese Patent No. ZL20128006839.1 and Japanese Patent

No. 6, 258,861. MelRok also has 3 patents pending in the U.S. and 3 pending in international jurisdictions.

Perry Oldham, a partner with Knobbe Martens, who has helped MelRok through the patent application process, describes MelRok's patents as breaking new ground in what appears to be a growth sector of the economy: more efficiently managing energy usage.

"The energy industry is going through a major transition" with states such as California requiring solar panels to be installed in new construction, Oldham said.

Oldham said that the energy IoT industry still is in its infancy and that MelRok is leading the way.

"In a few years there may be companies that try to duplicate what MelRok is doing," he said.

In the meantime, he said the company is filing patents mainly to protect its freedom to operate as well as its innovations.

The company's latest '901 patent, was invented by Dr. Kamel and Paul Donahue, and is entitled "Systems and methods to manage and control renewable distributed energy resources." The renewable distributed energy resources means solar energy generation and storage.

"Our patent covers the use of our platform to manage solar storage and shedding and generation," Dr. Kamel said.

According to the abstract, the '901 patent describes a system for analyzing energy usage measures by monitoring one or more parameters indicative of energy usage for a plurality of sub-circuits. The system is designed for situations where the sampling rate for the measuring is substantially continuous. The system automatically transmits information related to at least one of the measured parameters at a rate that enables monitoring of current energy usage.

It further detects a significant change in a measured parameter, determines whether the significant change in the measured parameter is caused by a change in energy usage, and automatically transmits information related to the significant change in the measured parameter caused by the change in energy usage after detecting the significant change.

The '901 patent has been cited 70 times in patent applications by such companies as Schneider Electric USA Inc., Infineon Technologies Austria Ag, Siemens Industry Inc., LG Electronics Inc. and International Business Machines Corp.

The '901 patent also may be a solution to the problem of over generation of solar power in California created by the state's decision to require solar panels be installed on all new construction by 2020.

The unintended consequences of the requirement may be that the existing grid is unable to handle the increase in electricity generated by solar. In 2017, California paid Arizona to take the excess electricity. MelRok says its energy IoT solution will allow utilities to better manage utility and building energy needs to meet the different loads required throughout the day by turning on or off devices when usage is lowest and highest. MelRok has already pitched its new enhanced platform to such household industrial companies as Siemens,

Honeywell, Schneider and Mitsubishi, which Dr. Kamel and Boyce described as the capillaries that lead to the utilities.

"Utilities are big slow moving beasts," Boyce said. "We prefer working with their contractors. It's better for us to use the capillaries."

MelRok's strategy is to make its mark as the leading innovator in the field of energy IoT. To do that, it plans to continue to develop innovative solutions to its clients problems. As it does, the company hopes to develop a war chest of patents that can be licensed to clients who want and need those solutions.

"There are people who don't offer any solutions and they're called trolls," Boyce said. "I don't ever want to be called a patent troll. We have an elegant solution. It's like chocolate and peanut butter. We're making Reese's Peanut Butter cups!"

Boyce and Kamel agree that the best outcome for MelRok and its investors is a sale of its business and technology to a larger industrial company or the establishment of a rigorous technology and patent licensing business.