

ELECTRIFYING VEHICLES

UQM POWER TECHNOLOGY IN MOTION

THE INTRODUCTION OF ELECTRIC DRIVE vehicles to the mass market has been anticipated for decades. It has come methodically, with gasoline-electric hybrids at the forefront of this road to electrification. Now there is real momentum for plug-in hybrids and battery electric cars as new models go on sale this year. UQM Technologies, a leading provider of electric powertrain systems, is working with many auto manufacturers in their efforts to bring electric drive to the showroom. UQM has also joined with major automotive supplier BorgWarner to jointly market electric powertrain products – like the one shown here using the UQM PowerPhase® propulsion system and BorgWarner eGearDrive® transmission – for all-electric and hybrid electric passenger automobiles.

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ENABLING TECHNOLOGIES

POWERING THE NEXT GENERATION OF VEHICLES



A CONVERGENCE OF ACTIVITIES is driving the launch of plug-in electric vehicles. The desire for clean, zero-emission mobility is as strong as ever, driven by environmental concerns and growing awareness of overdependence on petroleum. What's changed is new government regulation requiring significantly higher fuel economy vehicles in the years ahead, coupled with sizeable financial incentives for consumers who buy these vehicles and billions of dollars in federal grants and loans to companies involved in vehicle electrification.

UQM POWERS ELECTRIC CODA SEDAN

This new momentum presents substantial opportunity for companies that have invested in developing the advanced technologies that auto-

UQM'S POSITION AS AN EARLY VOLUME PRODUCER OF AUTOMOTIVE QUALIFIED AND COMPETITIVELY PRICED ELECTRIC PROPULSION SYSTEMS IS ATTRACTING SERIOUS CUSTOMERS.

makers require. This speaks to UQM Technologies' core competencies, since the company has focused on developing increasingly sophisticated automotive electric propulsion systems for the past 25 years.

"With our product line of compact and power-dense PowerPhase® motors, controllers, and power electronics, UQM Technologies is well positioned to play a growing role in the expanding vehicle electrification market," says William G. Rankin, UQM Technologies' Chairman, President, and CEO. In fact, this is already unfolding, with UQM's focus on design for manufacturability, volume production, and com-

petitively priced electric drive systems attracting serious customers.

The company has seen an increase in interest from both established international automobile manufacturers and entrepreneurial companies that plan to introduce electrified vehicles over the next several years. A prime reason for this interest is UQM's 134 hp (100 kW) PowerPhase® 100 motor and controller system that will begin volume production in the fall of 2010.

Light weight is an imperative in battery electric vehicles where range is heavily influenced by weight, efficiencies, and driving conditions. At the same time, traditional imperatives also apply since electric vehicles must provide the features that drivers expect from modern cars, including accepted levels of acceleration and performance. UQM's

highly-efficient PowerPhase® 100 electric motor fills these needs. It produces the power of a small V-6 engine but with loads of low-end torque, and does so in a compact package that's a mere 10.9 inches long and 11.25 inches in diameter, weighing just 110 pounds.

Southern California automaker CODA Automotive, which is expected to introduce its all-electric sedan to the California market later this year, selected UQM's PowerPhase® 100 propulsion system to power this zero-emission car. The CODA Sedan is a four-door, five-passenger battery-electric vehicle with a range of up to 120 miles

per charge, and is representative of the first mass-market all-electric vehicle from an American car company. The electric sedan's components and subsystems come from all over the world, with CODA working with UQM Technologies and more than 30 suppliers and partners on four continents. CODA aims to produce 14,000 vehicles in 2011 with an eye toward an annual production volume of 20,000 vehicles...all powered by UQM.

ELECTRICS LARGE AND SMALL

Personal-use vehicles represent but one facet of transportation's move toward electrification. Larger commercial vehicles are also logical applications for electric drive. To power these larger vehicles, UQM offers electric PowerPhase® motor-generators rated up to 268 hp (200 kW) and 663 lbs-ft peak torque, featuring the higher output ratings and operating characteristics required for their unique acceleration and grade climbing needs.

Proterra's EcoRide BE35 presents an excellent example of UQM electric drive in an advanced, next-generation battery electric transit bus. This zero-emission bus uses a light-weight composite body and all-electric components

to reduce energy usage, with a fast-charge capability allowing re-charging in just 10 minutes. It's powered by a PowerPhase® 150 propulsion system offering a regenerative braking capability that can recapture over 90 percent of the vehicle's kinetic energy available during braking to extend range.

Companies like ZeroTruck and Electric Vehicles International have selected UQM propulsion systems to power their commercially available, all-electric medium-duty trucks and walk-in vans now on sale to fleet customers. Prototype heavy vehicles being developed by a number of other manufacturers also incorporate the company's powerful PowerPhase® propulsion systems.



MOTIVATED

TO LEAD THE FIELD

UQM TECHNOLOGIES' LONG HISTORY of developing compact and energy dense motors, power electronic controllers, and control software finds the 43 year-old company ideally positioned as a key supplier of advanced electric propulsion systems. Its continuing internal development work, along with research and development funded by the military, enables UQM to maintain its edge in advanced technologies that can be applied to commercial products.

GEARING UP FOR THE FUTURE

Although best known for its advanced propulsion systems, UQM also supplies customers with auxiliary motors and a variety of power electronic converter and inverter products for use in electric and hybrid electric vehicles. The company developed and supplies small, lightweight, and highly efficient DC-to-DC converters to automotive Tier 1 supplier Eaton Corporation for use in commercial hybrid trucks produced by Freightliner, International Truck and Engine, and PACCAR. Recently, UQM introduced a new DC-to-AC inverter to allow the powering of standard 110 volt plug-in devices from power sources on board electric and hybrid electric vehicles.

A major step toward expanding the company's production capacity was taken this year with the acquisition of a 130,000 square foot manufacturing facility and corporate headquarters in Longmont, Colorado, just north of Denver. This new facility will house the volume manufacturing of PowerPhase® 100 propulsion systems for CODA Automotive and other customers, and provide available capacity for expected production launches of additional advanced products for a growing client base. The move is a strategic one, according to the company.

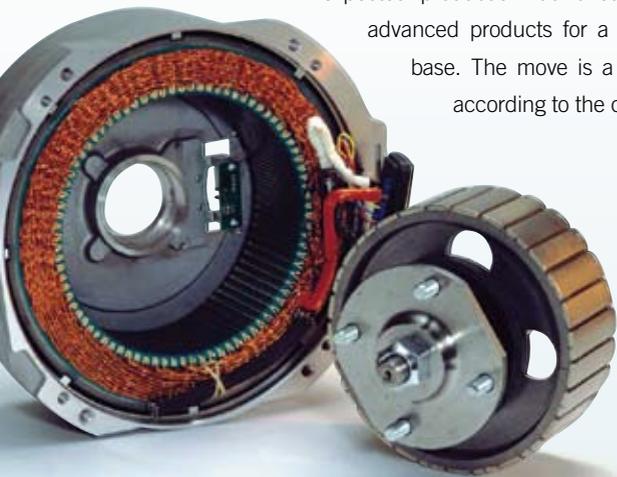


The company was recently awarded a \$45.1 million grant as part of the Department of Energy's efforts to stimulate electric vehicle component manufacturing. UQM was one of only seven awardees

UQM ACQUIRED A 130,000 SQ. FT. FACILITY IN LONGMONT, COLORADO TO MEET EXPECTED GROWTH IN MANUFACTURING OPERATIONS.

and the only small business selected. The grant provides funding for production engineering activities and infrastructure associated with the launch of volume manufactured products for electric drive vehicles. This grant, along with \$32 million recently raised in the equity market, makes the company well capitalized for growth.

"We believe that the launch of high volume manufacturing of our PowerPhase® 100 kW electric propulsion system for CODA Automotive later this calendar year will give us a substantial 'first-mover' advantage as a Tier 1 supplier to the clean vehicle market," points out UQM's Bill Rankin. Indeed, by all indications the company is on track to achieve just that.



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