



Menahem Anderman: the man behind AABC

The history of what has arguably been one of the most successful conference series of the past decade is as much due to the consultancy skills and experience of Menahem Anderman as is the topicality of the shows. Lynnda Greene reports.



“The most important thing I bring to a company is a balanced understanding of both technology and business. The business people may not fully understand the technology their company may have, and the technology people may not fully understand the business end—what it takes to bring the product to market. What I offer is an ability to bring the two knowledge bases into alignment”

To a man who openly confesses he had little interest in batteries until after gaining his doctorate in his 20s, he's caught up rapidly. Menahem Anderman in the past decade has become regarded as the automotive battery expert par excellence — one of the few consultants whose visits are almost universally welcomed by car makers and energy storage firms alike.

His story begins with his childhood in the city of Haifa bordering the Mediterranean but his success has come from his adopted country, the US. Anderman's early interest in energy and material science propelled him through to high school and then college on a fast track — he finished his four years of study in three.

A scholarship took him to the US in 1979 to pursue a doctorate in physical chemistry at Cornell University in New York. But within a semester he'd transferred — on scholarship — to the University of California in Santa Barbara, where he studied material science, solid state chemistry and physics, photochemistry and electrochemistry. There he earned a PhD for his work on photo electrochemistry based on metal oxide electrodes.

Little did he know that a world in automotive batteries and energy storage awaited him.

First work

So, diploma fresh in hand, in 1983, he took his first job with WR Grace Company, a Maryland-based specialty chemical/materials conglomerate that maintained a large business in lead acid battery separators. Assigned to the electrochemical research division, he worked in what was then their most significant research effort apart from lead acid, to find new materials for batteries.

“It was an exploratory programme for hybrid electric vehicles,” he says. “We were looking at cell design, and

eventually developed electrodes separators and electrodes separator laminates for early lithium-based batteries.”

In 1988 he moved on to Acme Electric Corporation, which at that time had just taken a licence from the German company DAUG Hoppecke, a joint venture between Daimler VW and Hoppecke that had developed a Fiber Nickel Cadmium battery.

As head of the battery group, his responsibility was to transfer the DAUG electrodes technology to the US and apply the technology to aerospace military applications.

“Our largest account was Boeing's 777, whose two main batteries and chargers we designed and installed,” he says. “This 1994 design is still flying successfully on all Boeing 777 aircraft today.”

His eight years at Acme would prove prescient in ways he could not have foreseen, chiefly in that collaborating with DAUG on batteries for EV and PHEVs, in those days initially based on NiCd and later NiMH chemistries.

Management

It was during these Acme years that he learned more about the business end of the industry. Anderman was promoted from technical manager to business manager to general manager of the Aerospace Division, with full P&L responsibilities by the time he left there five years later.

“To my surprise I found I quite liked management, working with different people and bringing ideas together, and I liked the analytical side of things too, which makes a good balance with the science,” he says. “But once I gained some effectiveness as a manager, I realized I could never replace myself — so clearly I had to make some decisions!”

By the time he left Acme in 1996, he'd built a reputation for a calm, balanced approach to problems in an in-

dustry already rocketing forward into a new generation of vehicles.

That year he launched Total Battery Consulting — still his consultancy vehicle — in California, and then joined Polystor, a Silicon Valley lithium-ion battery start-up, where he spent two years as vice president of technology. Here he led a staff of 50 scientists and engineers in developing lithium-ion cells for consumer as well as HEV applications.

But by 1999 he was consulting full time, and there was no going back. “From the very beginning of my consulting career, I had an unusual mix of clients,” he says.

“One day I'd be in Silicon Valley with NanoGram, a nanomaterial start-up, helping them navigate the technology they needed to apply their materials in battery applications, and three days later I'd be talking with Boeing, a major aerospace company, helping them qualify Li-ion batteries for a space application.

“The following weekend I'd fly to Tokyo and discuss technological and market trends in HEVs with large multinational corporations such as Hitachi and Sumitomo. It was all fascinating.”

It also proved to be the foundation of yet another career, and tangentially, one of the most trusted resources in the battery industry at a time when accurate research, keen insight and a balanced approach to pending challenges were in short supply.

Dawn of the hybrid

It was about the mid-1990s that the auto and battery makers began to shift away from internal combustion engine-powered car to the early hybrids powered by NiMH batteries. Lithium battery technology, having advanced to a degree that it was commonly utilized in personal devices, was in the early stages of development for automotive applications.

By 1997, development of Li-ion cells and packs had begun at several battery companies, and some automakers were beginning to work in earnest toward hybrid and electric vehicles.

“Toyota had introduced the Prius in 1997, and while hybrids were not to catch on in the US for some years, carmakers were starting to think in terms of a whole new range of energy efficient vehicles, whether hybrid or some kind of electric car,” he says. “My thought was that, given my background and experience, I could offer a different kind of guidance than was then common.”

Granted, he says, many Total Battery Consulting services — marketing strategies, product development, sales — most companies might routinely handle in-house.

“The most important thing I bring to a company is a balanced understanding of both technology and business. The business people may not fully understand the technology their company may have, and the technology people may not fully understand the business end — what it takes to bring the product to market.

“What I offer is an ability to bring the two knowledge bases into alignment.”

Much of his *modus operandi* today derives from his earliest experiences as a young engineer, and later consultant, he says. “Talking to several car makers in that first year I realized that I had a good business model, because when you go into the plants, you can gather much more than you can by any other means, like phone, e-mail or internet research,” he says.

Assimilation

“In walking around the floor, observing manufacturing techniques and practices, talking to the workers themselves as well as the managers, I get a good sense of what’s going on,” he says. “I learn as much from what they ask me as what they tell me. So by the time I hit the parking lot, I have a lot of information.”

Over the ensuing 14 years, Anderman’s consulting clientele has grown from 30% automotive in 1999 to 65% in 2005, and since 2008 to over 85% automotive. And while he regularly consults with leaders in other fields, the automotive battery industry interests him the most.

“I get to all major car companies at least once a year for discussions with their battery people,” he says. “I get to learn of their challenges, concerns and successes. Some of the meetings are



paid consulting meetings and other are for just catching up — but in every instance, both sides learn from the exchange.”

Since then Anderman has been providing analyses and assessments of technologies and markets to over a 100 international corporate clients spanning the auto and battery manufacturing, business, law and finance, and government agencies including the US Senate, the California Air Resources Board, the National Research Council, the US Department of Energy, and others.

Way of working

Unusually Anderman works largely alone. Though his staff runs the consultancy and the AABC events, he researches and produces the reports and analyses himself. “I use different people for different assignments, or to do certain portions of work.

“Sometimes I harvest material for certain sections, and I may have someone else help with the final drafting. I delegate certain tasks, but in the end I do all the writing and compile the final report myself,” he says.

The reports are independent and provoke a variety of reactions. Many were disappointed by his reaction to the Obama administration’s award of \$2.4 billion in grants to the auto and battery industries through the American Revitalization and Recovery Act (ARRA) of 2009. Though an avid proponent of advanced vehicle technologies, Anderman criticized what he perceived to be a misguided emphasis.

He also bemoaned a “lack of synchronization” between the battery technology’s maturity and the EV market’s infancy.

“I get to all major car companies at least once a year for discussions with their battery people,” he says. “I get to learn of their challenges, concerns and successes. Some of the meetings are paid consulting meetings and other are for just catching up — but in every instance, both sides learn from the exchange.”

Especially concerning was the investment of so much money into building Li-ion manufacturing plants to supply an EV market that did not yet and might not exist for a long time. Many of the companies receiving grants to build lithium battery factories, he warned, have limited experience in mass production of Li-ion batteries and having failed to secure sufficient orders to justify their cost would face hard consequences.

And they did when his projections proved true.

Many of these manufacturers struggled to sell product in the first year of EV sales that were unexpectedly (some would argue over-optimistically) slow. Later bankruptcies or production hold-ups have confirmed his judgement.

“It was precisely because I wanted to see the industry succeed long term that

“It is difficult to sell customers a product that costs more and yet provides less—but this is unfortunately the story regarding EVs for many years to come”



As part of his work Anderman regularly visits all the major automotive manufacturers — here with GM last November

I voiced my criticism,” he says nowadays. “Most of the battery companies who got the money did not have a qualified product or a seed of volume business from major automakers.

“I was aware of the level of investment in battery production globally and was convinced that we would have a severe overcapacity by 2013 and that the less experienced companies, including the Detroit stimulus built factories, would suffer the most. Unfortunately subsequent events proved me right.”

Putting it together

Most companies, even car makers, agree with him, he says, because they know he draws his conclusions from leading figures in their own industries. “I speak regularly and often with all the major carmakers and battery makers too,” he says. “My reports represent an integration of observations, data and the technology at work in all these companies.”

Allowing for legitimate differences of opinion, most agree that Anderman’s criticism has been more nu-

anced than that of some other decriers, and quite often spot on.

For example in his latest reporting he grants that electric vehicle and plug-in hybrid vehicle sales will likely reach about 1.2 million by 2020. But feels hybrid sales will surpass those to reach 4.1 million.

To compile AAB’s recent 2013 X-EV Industry Insider Report, Anderman visited 45 companies (including 22 carmakers and 15 battery makers). “The report looks again at the whole picture, market drivers by region, automakers’ plans, status of battery technology and prospects for improvement in performance and reduction in cost,” he says.

“I received ample input from car makers, battery makers, and material makers regarding cell and battery design, cost performance road map, durability, reliability and safety.

The report backs up his earlier assertions that despite substantial government and industry subsidies 2012 EV/PHEV sales have not met any of the targets projected a year ago when the first vehicles began moving into

showrooms.

HEV sales, however, have consistently met targets, he says and HEV makers will increase production. Meanwhile the global EV/PHEV sales market, which he expects to hover at about 0.6% of anticipated sales through 2016, will force over-extended Li-ion battery makers to face serious consequences.

He agrees that new progress in automotive Li-ion battery technology, now facilitating the HEV’s successful transition from NiMH to Li-ion batteries, justifies a lot of hope for a more viable PHEV market by 2020.

But he still sees current EV technology as problematic and unsatisfying.

“It is difficult to sell customers a product that costs more and yet provides less — but this is unfortunately the story regarding EVs for many years to come,” he says.

The way ahead

“Yes, automakers are busy exploring new hybrid architectures including micro-2 and mild hybrids, and lithium-ion is still the preferred solution for most architectures,” he says. But he sees opportunities for chemistries such as advanced lead acid and ultracapacitors too.

“Nobody can predict the future but I’m privileged to have an insider’s view of the industry’s status, prospects and plans. Although at times I have been viewed as being too conservative, my forecasts have been relatively accurate overall, with a balance between being slightly too optimistic and too conservative.”

That’s why he anticipates what he loosely refers to as “new opportunities for large Li-ion batteries in industrial applications.

“Short term I mostly see government funded demonstration projects,” he says. “Typically that means that the large volume competitive business is not yet here. Hopefully there are enough niche opportunities to provide some business. Utility installations typically aim for a 20-30 year life, a time span a bit too long for Li-ion batteries.

“Maybe other battery technologies will capture some new market share there. Flow batteries, for example — offer equally good if not superior value in certain grid-related applications.”

What about lithium-ion batteries’ potential in electric vehicles? Surely the improvements in technology will translate into better cars and sales? Anderman reckons the potential for

“Nobody can predict the future but I am privileged to have an insider’s view of the industry’s status, prospects and plans, and this is what I see. Although at times I have been viewed as being too conservative, my forecasts have been relatively accurate overall, with a balance between being slightly too optimistic and too conservative.”

their use in the EV market will be limited — at best — for some time.

“It is a young technology still, and we need to be looking 30 or 40 years down the road,” he says. “The challenge to the EV industry remains making the business case for this chemistry. For all the work done, it is still too expensive.”

Anderman has on occasion mused on the Chinese government’s ability to mandate stable long-term energy policies that spur the country’s expansion of clean technologies, which in recent years has been spectacular attracting billions more dollars in asset-financing and investment than the EU and US combined, China has reportedly earmarked \$738 billion to invest in developing clean energy between 2010 and 2020.

Asked what measures western governments might initiate to better support the development of clean technologies in general and auto/battery technology in particular, Anderman talks about the fine line between unwanted market interference and welcome effective support.

Instead, he turns the question around and ponders how our industry can better work with both government and investors. “Governments in free market countries cannot create an industry, with the exception of defence,” he says.

What governments can do, though, is affect external factors that make it easier for the industry to succeed, and — in this he sees the US lacking in political will to mandate even small solutions.

“The most obvious one that is missing in the US is higher gasoline taxes,” he says. “Governments should pass the social cost of burning fuels to the user, the driver, and thereby incentivize them to use less fuel. Then industry will develop the technologies that address customer desires.”

While a higher gas tax is hardly a popular concept in the US, a tax will have to come, and soon. In fact he is heartened by what he calls the Obama administration’s increasing the CAFÉ standards as one of its greatest successes.

Support needed

But increasing fuel taxes is just an obvious next step. “In addition to the fuel taxes, governments also need to support R&D and demonstration programmes,” he says. “If even half of the \$2 billion spent on building unused battery plants had been used to expedite R&D, the industry would be better off. Of course R&D takes time but

it can lead to real results. I notice that the US DOE and ARPA E are spending money more wisely now.”

Anderman’s assertion in last year’s X-EV Report that he thought North American and European battery makers would probably not be able to match the production levels of long established Asian companies remains little changed.

“The Asians, experienced from the consumer market and with a large production base, are investing large amounts of money in automotive batteries as well now,” he says, adding that we may well see Korean and Japanese producers building plants in North America and Europe.

That said, he expects to see consistent growth with HEVs and PHEVs through

2025, all based on Li-ion technology. In fact, the report projects that the associated lithium-ion battery industry will expand from \$1.4 billion in late 2012 to about \$8.5 billion by 2020.

“If any new chemistry succeeds it will likely take more than 12-15 years,” he says. “The biggest risk to the industry is visible safety incidents with Li-ion batteries. The technology can be made safe for automotive use but it will require thorough engineering and high quality manufacturing. Shortcuts can be very expensive, which is why I am an advocate of keeping the focus on safety, reliability, and durability — they are more critical than cost and performance.

“But overall,” he says, “I’m still optimistic about this chemistry.” 🚗

IT’S A SIMPLE AS AABC



The origin of Anderman’s Advanced Automotive Battery Conferences derive from his work on behalf of the California Air Resource Board (CARB) in 2000.

That year he met a variety of auto companies and battery makers to assess the status of batteries for EV applications. When the resulting analysis — eventually published as the 2000 CARB Battery Panel Report — won praise, he saw there was a clear need for balanced information.

“A year later I decided to follow the same track but this time on my own, collecting detailed information for what would become our first multi-client report, which happened to focus on the future of HEVs and HEV batteries,” he says. By the time 75 subscriptions had sold over the

next 18 months, the report had become the industry’s sleeper hit as the definitive reference book that year.

Heartened by that reception, he produced the first of what has since become a series of AABC events in 2001. “That first event took six months to organize from start to finish,” he says, “but it was immensely rewarding to see battery people from 12 international automotive companies gather in one room, and know that most of the 270 attendees had never met their colleagues before that day.”

The AABC has since repeated the conference annually and as of 2010 bi-annually — organized once in North America and once in Europe. This has been in addition to his regular industry reports and consulting work.