



## H2-international – e-Journal

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## NIP to Continue Until 2026: “Unique Success Story”



*GLC F-Cell in Berlin*

On Dec. 14 and 15 last year, the German federal transportation ministry, BMVI, organized its NIP year-end conference “Clean Transportation by Hydrogen and Fuel Cell” to present the successes of the National Innovation Program Hydrogen and Fuel Cell Technology. Many project partners and politicians from across the country came to Berlin for the presentation of the results and to witness a fast and seamless transition into the next decade.

NOW, the National Organization Hydrogen and Fuel Cell Technology, has supervised more than 650 individual projects and a variety of industry networking initiatives since its founding in 2008, instigating “significant” technological developments. After the ten-year program that started in 2006 came to an end last year, the managers of the around 500 projects, including the showcases Callux, CEP, CPN and e4ships, presented the results to their financial backer.

The basic sentiment of the Clean Energy Partnership was that “the findings of all working groups” were highly positive. Consequently, the members of “Europe’s largest demonstration project for hydrogen mobility,” which has so far gone through three project stages, called for an extension of the program on Nov. 30, 2016. One of the principal CEP results is thought to be the reduction in costs – a 75 percent cut for powertrains and a 50 percent one for filling stations. Additionally, the transport initiative can point to around 250 hydrogen-run fuel cell vehicles on German roads last year, double the number of H<sub>2</sub> sales from the time before.

BMVI: “The great success of the government-sponsored program means it will continue between 2016 and 2026. On Sept. 28, 2016, the Federal Cabinet decided to extend its duration.” The funds of EUR 250 million until 2019 and around EUR 1.1 billion until 2026 have been made available, and as Wolfgang Axthammer, CFO/COO of NOW, confirmed to H2-international, the approval process has been triggered to ensure that the program continues without interruption. But as the supervising organization, NOW will have to add new business fields to its portfolio: In addition to NIP and battery-electric transportation, it will be responsible for establishing the relevant infrastructure and advance the federal government’s transportation and fuel strategy.



*First-time presentation of Ford's fuel cell model Fusion*

### **Fuel cell prototype Ford Fusion**

You could see the relief in Thomas Brachmann’s face when the head of the CEP Car Mobility working group discovered that there was a Ford among the fuel cell cars made available for test drives during the conference. After all, the American carmaker had revealed little to nothing about its project. As a Ford spokesperson confirmed to H2-international, the manufacturer had – quietly – taken one of the fuel cell units which have been used in Daimler’s GLC F-Cell and integrated it during a NIP project into a Ford Fusion Energi, a car originally planned as a plug-in hybrid.

## Jules Verne, the activist



*Provided some lighthearted moments: “Jules Verne”*

After the federal transportation minister’s speech, it was time for “Jules Verne” to stand at the podium and read from “his book” about what the fuel of the future would be. Of course, it wasn’t the late author himself who addressed the audience, but an “activist” who called for the installation of a hydrogen filling station in Hanau, Germany – not in the Wolfgang industrial park, but in public space.

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## Growing H2 Infrastructure But Not All Stations Operational

After one hydrogen filling station had each been installed in Wuppertal and Ulm in summer 2016, another three went into operation last fall. As reported previously (see [Three New Hydrogen Filling Stations](#)), the H<sub>2</sub> pump at the Metzingen gas station south of Stuttgart came online on Sept. 23. Five days later, however, it had to be shut down again when a truck hit it. Its trailer had been caught in the pump, resulting in at least EUR 60,000 in damage.

Offenbach am Main had better luck: On Nov. 10, Air Liquide and Hyundai jointly inaugurated the first public H<sub>2</sub> filling station there. Installed on the local premises of the South Korean carmaker, the station has a daily capacity of 200 kilograms of hydrogen, which can be used to fill up the tanks of around 30 vehicles per day. It is French business’s second installation set up under the auspices of the CEP in Germany. Its construction and operation have been subsidized by the German federal transportation ministry with more than EUR 1 million. Other filling stations are planned to be operational within the next months, for example, in Bad Rappenau at the A6/A81 freeway, in Limburg at the A3, in Wolfsburg, in Düsseldorf and in Cologne.





*H2 station in Offenbach, © Air Liquide*

## **Emission-free driving by 2030**

Another business involved in setting up the H<sub>2</sub> infrastructure is the Westfalen Group. It began on Dec. 5, 2016, to offer hydrogen refills in Münster-Amelsbüren. Around EUR 1.5 million in subsidies went into the installation of two pumps of 350 and 700 bar (around 5,000 and 10,000 psi) in the Hansa Business Park industrial zone close to the A1 freeway. Johannes Rimmel, North-Rhine Westphalia's environment minister, said: "Our aim is emission-free driving by 2030."

Only two days later, the south of Germany received its own hydrogen filling station, whose construction was supported with around EUR 700,000 in tax money. Since Dec. 7, 2016, drivers of fuel cell vehicles have been able to fill up their tanks at the Shell gas station in Geisingen, making it possible to drive as far as Lake Constance. Manfred Becker, head of global hydrogen operations at Shell, explained: "We believe that this alternative electric drive will play an increasingly stronger role in markets such as Germany, the Benelux countries, the UK and the USA from the 2020s onward."

Based on current planning, Germany should have around 100 H<sub>2</sub> filling stations up and running between 2018 and 2019. In mid-December 2016, however, only 14 of the 25 existing locations were operational, with some of them having been shut down for maintenance. Asked about the situation, CEP replied: "The systems in Offenbach and Münster are operational and they have been approved by the TÜV, but not by all carmakers yet. This process is sometimes more time-consuming than the construction of the refueling station itself."

## H2 Mobility plans until 2018

Nikolas Iwan, managing director of H<sub>2</sub> Mobility Germany, announced during the [World of Energy Solutions](#) that at the end of 2016, he would present a plan on H<sub>2</sub> Mobility's activities over the next two years. He and his team, which has meanwhile grown to 14 staff, intend to guarantee the reliable planning and operation of additional filling stations and remove existing market hurdles. He did not want to continue the long history of unfulfilled expectations and be held to his two-year schedule instead.

One example is the setup of a toll-free 24-hour service hotline to answer questions about hydrogen fill-ups.

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## No Critical Questions Asked In Berlin



*Minister A. Dobrindt*

During the NIP year-end conference by the German federal transportation ministry BMVI last Dec. 14 in Berlin, attendees seemed to be listening to a unique “success story”: EUR 700 million in incentives, almost 700 projects and around 500 industry partners for R&D and market preparation from 2006 through 2016. The program's successes were presented by Germany's transport minister, Alexander Dobrindt, and

several managers of central NIP projects during two half days (see [“Unique Success Story”](#)). Some speakers, however, seemed to have been carried away a little by all the good news. Wilhelm Lang from oil and gas company OMV made the full-throated promise: “At the end of this year, we will have 35 hydrogen filling stations ready.” Apparently, he had not been informed that only 25 had been built at that time (see [Growing H2 Infrastructure But Not All Stations Operational](#)) and that the CEP map showed only 14 up and running during the conference.

If reporting had otherwise been honest and transparent, you could overlook certain “inaccuracies.” Unfortunately, the BMVI did not seem to leave the impression that this was wanted. Instead, the event felt more like an early election rally, at which the political opposition was granted a short time to address the audience, but no one was asked any critical questions.

No word about the sometimes considerable difficulties during the NOW foundation 10 years ago, the repeatedly occurring delays in central lighthouse projects or the less-than-efficient use of funds in some cases. There was deafening silence even about core issues, such as the 50 Filling Stations program, whose aim it was to have a total of 50 hydrogen filling stations built and “in operation by the end of 2015.” This statement was later changed to “during the duration of the program,” and now – after 12 months – only a third has been realized, despite more than half of the entire NIP incentives having been spent in the field of transportation.

Well, you may think, “we’ve solved the chicken-and-egg dilemma,” as several speakers concluded. A closer look, however, reveals quite quickly that the same number of 14 stations was up and running in 2013, which means not much has changed since then.

Thomas Bystry, chair of the Clean Energy Partnership, stressed the record accomplishment of six hours’ time for a building permit’s application to approval. But what he didn’t mention was what the postponement record looked like, considering the serious delays that were an essential part of almost all projects.

What exactly has been achieved? Klaus Bonhoff, chair of NOW, said that the objective of NIP had been “the acceleration of market preparation through the testing of systems in everyday use, the development of a value-added chain and a value-added share in Germany along with technology leadership and implementation of the technology.” Well. The stakeholders said these goals had been achieved. There was no discussion about whether independent observers will come to the same conclusion, and if they did, whether everything could have been accomplished faster and with a tighter budget. In short: no introspection, no recommendations on what to improve.

This begs the question of whether there has even been some follow-up – a fact-based assessment – and whether there have been any ideas on how things can be done better the second time around. This question is becoming increasingly important, as both business and politics seem to have agreed on a NIP 2 providing subsidies of EUR 1.1 billion until 2026.

A decade is a long time for things to happen. It is a long time to fail, to learn and to grow. This is why the apparent and complete lack of interest in learning from the experiences made with NIP 1 is so puzzling. It should be noted that the interest in technological advancements is there, but the one in organizational and conceptual matters is not.

Where is the platform to discuss concepts? Where was the design of NIP 2 decided? Who determines how much money will go into which industry?

Will big companies (again) make backroom deals? Companies which call for an extension of NIP and the CEP, and at the same time say that the Clean Energy Partnership is a “trustworthy and independent institution”? Independent – from whom? Certainly not from the automotive industry and neither from politics. Trustworthy? Can someone be trusted who praises the “years-long, magnificent pre-competitive collaboration” while one of its members uses NIP funds to install a fuel cell in a Ford Fusion Energi without the knowledge of the project partners and even the NOW program manager as well as the head of CEP’s Car Mobility working group?

But enough of that. Instead of getting upset, we should be happy about people still hitting the right notes when thanking their financial backers, as Daimler’s Christian Mohrdieck did: “We wish to thank the funding partners and the Bundestag.” Although...immediately thereafter, you had to bite your tongue when Mohrdieck highlighted the above-mentioned 50 filling stations program as “a model showcase.” It gets you thinking: A showcase for what model?

*Author: Sven Geitmann*

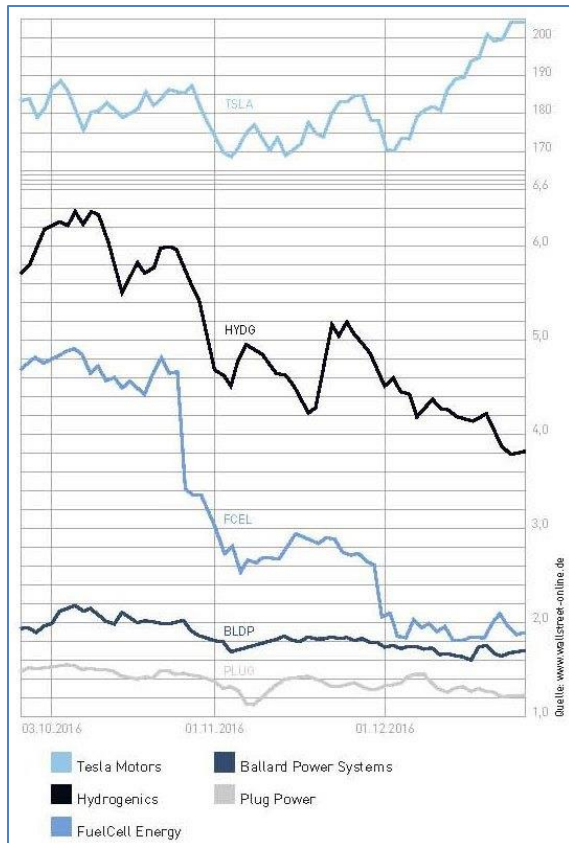
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## Plug Power Goes to China

Plug Power CEO Andy Marsh is looking to establish framework agreements with Chinese companies, as he believes the country to be a very promising market. China is said to have already invested more than USD 100 billion in fuel cell technology over the years, as it has recognized that there is large potential to tap (see [Ballard](#)). Talks with Chinese-based automotive suppliers are ongoing. In the US, Plug Power hopes that there will be other tax incentives for fuel cell vehicles. The investment tax credits have certainly been a factor in getting orders for forklift truck retrofits. Donald Trump, however, is said to be opposed to these types of incentives as much as in the wind and solar industry. But his slogan “America First” could be the basis for renewing them, since they would support the fuel cell industry in the US. There are always two sides to an issue.

As per Sept. 30, 2016, the net loss attributable to common shareholders was USD 0.07 per share, USD 0.02 worse than expected. It’s interesting to see how the company has gone from a negative gross margin of 55 percent to a plus of 5.9 percent during the reporting period, targeting breakeven and beyond.





Share price development as of Dec. 20, 2016

At the core, it seems to me as if Plug is well-prepared for the times ahead – not least because of its number of orders bookings despite partially reduced revenue growth due to certain lease agreements (Walmart). By its own account, the company is working on refinancing and “releasing” a large part of the restricted cash for use in other business areas.

[Risk warning – see page 16](#)

Author: Sven Jösting (written Dec. 2016)

## Ballard: Japan’s 2020 Hydrogen Society

A new megatrend needs time to develop. The last 15 years established the foundation for the coming breakthrough of fuel cells and a steadily growing interest in their use. Here’s why: Historically, technological revolutions often needed 15 years before a breakthrough was achieved. But once you’re past that point, everything goes very quickly, since no market actor wants to remain on the sidelines. This is exactly what’s happening to the fuel cell across all markets and applications. And the production of “green hydrogen” is becoming ever less expensive and more efficient; even infrastructure development is starting to catch up. Considering the above, I

expect the first milestone to be reached in 2020. The stock markets will anticipate the coming era by pricing it into the shares of industry stakeholders.



*Fuel cell bus production at Foshan Feichi, China, © Ballard*

Japan wants to show the world in 2020 that it is on its way toward a hydrogen society. And Apple might think about using the opportunity offered by the Olympic Games in the Asian country to announce electric car targets around the same time (in 2019?). The advantage of this strategy could be that important markets, such as California, China, France, Germany, Japan, South Korea and the UK, will have a charging infrastructure and enough H<sub>2</sub> gas stations available “across the board” by then to open up new opportunities for fuel cell plug-in hybrid use.

I think by 2020, China will see the first signs of a boom for fuel cell use in buses, cars, trucks and other vehicles, e.g., trains and streetcars. The one profiting from these developments will be Ballard Power. Additionally, the U.S. military has begun to discover the enormous potential of fuel cells. Here, it is again Ballard – through its subsidiary Protonex – which will benefit from market development, as the subsidiary has important expertise in this field (see below).

### **Progress made**

At the end of 2016’s third quarter on Sept. 30, Ballard had grown revenue by 29 percent to USD 20.6 million compared to the same quarter the year prior. The gross profit margin jumped to 31 percent, an increase by over 6 percentage points, and compared to all of 2015, it rose from 17 to 27 percent. This means that the first nine

months saw Ballard's revenue surge by more than 50 percent to USD 54.6 million. Third-quarter cash flow added up to an impressive USD 68.1 million, with no debt to repay.

Additionally, it was expected that Toyota Tsusho would announce details about the existing agreement (bookings?) at around the same time, something that only the Toyota subsidiary could do. Ballard had signed a three-year distribution agreement with the Toyota-owned business (revenue: USD 76 billion), although there haven't been any order bookings yet. I believe that Toyota, through Tsusho, will use Ballard's know-how, for example, to integrate fuel cells into forklift trucks (see Plug Power). And the bus stacks that Ballard partner Synergy manufactures in China could be delivered to Toyota through Ballard. We will see. In any case, the partnership will be sure to produce some more positive news and announcements.

### **USA – China – Japan – World**

The views of the new president of the United States, Donald Trump, could make for a lot of troubling times ahead. There is the planned border wall, which would put U.S. businesses operating in Mexico at a serious disadvantage. Costs for serving the North American market would go up if the project were realized. Ballard Power has a production facility in Mexico, although I think as a Canadian company, it would have less to deal with than an American business.

As protectionism is on the rise in the United States, Ballard's strategic focus on Asia is becoming increasingly relevant. Ballard can not only benefit from lower production costs in China, but ship its fuel cell technologies from there to other markets like Europe. Despite the looming uncertainty on the North American market, the company stands to benefit from the developments in the States, as the defense budget is said to be increased. The U.S. Army is one of America's biggest energy consumers and fuel cells would be an efficient solution for combat applications. Through Protonex, Ballard has been touting the use of fuel cells for drones, something that could garner support from the new American government.

Recently, Ballard received its first booking based on a partnership agreement. The order by Polish bus manufacturer Solaris entails stacks for 10 fuel cell buses and is expected to be the first of many bookings from Europe. London's mayor announced at an industry conference that the city government intends to pour a lot of money into this field. Ballard is also a serious contender in several European bid invitations, albeit the number of stacks will be pretty "tame" compared to orders from China. But it's a way for the company to show its global ambitions and find the perfect market position.

*"We are at an inflection point. The demand for fuel cell buses and modules that go into them is about to explode."*

*Christopher Johnson, Ballard's North American sales manager*

In short: Ballard has laid the foundation for sizeable growth in the future. The first positive effects will have been felt at the end of 2016. The collaboration with Synergy had already raked in more than USD 150 million in firm bookings for five years – a

number that could very well continue to rise. In 2017, I expect Toyota Tsusho will place its first orders, the U.S. Army will do so with the Protonex subsidiary (for drones, etc.) and Chinese CRRC will request railroad vehicle units. The scenario has all the ingredients for a stock market success story.

[Risk warning – see page 16](#)

*Author: Sven Jösting (written Dec. 2016)*

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## Tesla's Many Areas Needing Improvement – SolarCity Takeover



The persuasiveness of Tesla head Elon Musk resulted in more than 90 percent of Tesla and SolarCity shareholders following his recommendation and approving the takeover of the latter. Now, Tesla will expand its electric car portfolio by offering solar roofs. The impact of the merger on Tesla's financials will show as early as the fourth quarter of 2016, when SolarCity's results are added to the corporation's balance sheet. The most important factor is the around USD 3 billion in debt. But there could be other contractual obligations for SolarCity from contracting projects, such as the long-term sale of solar power and the solar plant investment. In any case, the USD 3 billion are now Tesla's to cope with. A thorough evaluation must additionally include the 13 million new Tesla shares as a buyout price. And there are some legal arguments to make, which could be done parallel to or after the merger and which may – based on the ruling – add to the price tag. I have not yet figured out where all the synergy potential has gone off to.

### **Model 3 only in late 2018?**

Tesla aficionado and analyst Adam Jonas from Morgan Stanley has recently lowered his price target by a mere USD 4 to USD 242. He described the takeover of SolarCity as having "added zero value" to Tesla. Moreover, he expects that Model 3 will not be available on the market before the end of 2018, meaning with a delay of more than one or even two years compared to Musk's plans. What conclusions will the market or the stock exchange draw from this assessment? You may think Tesla uses analysts like Jonas to "control" the mood toward businesses. What is clear is that a one-year delay means another sizeable investment is required. The competition will meanwhile have put a variety of battery-driven models on the market. They will be less costly and offer the same or even a higher range than Tesla cars. Will the 400,000 preorders – the number may have even fallen to this day – remain or will much of them get cancelled?



I would like to paraphrase Bob Lutz, former GM executive, by saying that Tesla will someday be the past when all of Musk's full-throated promises have been left unfulfilled. And, there are rumors about Model 3 to be priced at USD 40,000 to USD 50,000 instead of around USD 35,000 if you want more than the basics.

### **This is not what operating income looks like**

The latest quarterly figures from Oct. 31, 2016 showed a plus of USD 22 million. However, if you subtract the more than USD 130 million Tesla has received in tax credits, the balance will move into the red. The federal incentives for each vehicle are USD 7,500 and a few states have their own subsidies available. Including state support, financial incentives added up to as much as USD 150 million during the reporting period. Companies like Tesla even seem to have the option to decide on their own when – i.e., in which quarter or even fiscal year – they recognize the incentives received.

The SEC had reportedly called on Tesla several times to explain its balance sheet methods. In my opinion, the corporation is using a “very creative approach” to accounting and management commentary. It'll be some news cycles worth should the authorities start increasing the pressure and demand a better explanation.

### **More funds needed**

Both the manufacturing capacities for Model 3 and the construction and expansion of the Gigafactory for battery production will require more money. The next capital increase is only a matter of time, and I could very well imagine to see one before the publication of 2016's total figures or the numbers of the fourth quarter – meaning in the first quarter of 2017.

### **Tesla and Trump**

Elon Musk may have been better off not making some of his remarks about the new President Donald Trump, whom he reportedly has been quite dismissive of. Trump is said to be suspicious of government incentives and subsidies for renewable energies, such as solar and wind, but also of electric transportation and he may cut some of them or demand more free-market engagement. You can probably expect stronger opposition from the new government. The stock market has a lot to do with psychology.

### **Automotive industry's CCS initiative**

Finally, you may think, the automotive industry is about to set up a charging infrastructure in Europe with reportedly universal standards. Fast-charging in five to 15 minutes, 80 percent capacity and seven times faster than normal charging points. The Combined Charging System is based on standard plugs, but Tesla could take a backseat with its own infrastructure being turned into an insular solution. Will Tesla even have to make its charging stations accessible to other electric carmakers because of EU regulations?

## Elon Musk as “most innovative company leader”

Elon Musk has already received several awards for being a positive influence in the electric transportation industry, with the latest award for being the “Most innovative business leader.” But the company’s current situation needs to be evaluated independent of these prizes. This will prompt a range of question about the future funding of his ambitious plans. What if Tesla, and with it Elon Musk, fails? Awards are for honoring past achievements. In stock market terms, an evaluation needs to include current and projected developments as well as the SolarCity takeover and its impact on Tesla’s balance sheet. There is no doubt that Elon Musk has positively disrupted the entire automotive industry and set in motion the development toward electric transportation. I applaud him for that.

## Conclusion

Markets that will show strong growth in the future are the health care market and in particular, renewable energies and technologies that can produce and convert energy in a clean and efficient manner. The fuel cell will continue to be part of the latter. When it comes to shares and the stock market, the rule is that 80 percent of the success is owed to strategic decisions, 10 percent to timing and 10 percent to stock exchange methods. Each investor needs to a) follow a clear strategic path, b) thoroughly analyze the markets, c) be aware of the risks and d) have the necessary discipline – panic and fear are no solutions. And I’d like to add another point about the fuel cell shares mentioned here: Please be patient. In my opinion, the next three years will see the breakthrough of the fuel cell and the establishment of a new megatrend after 15 years of laying the foundation for success.

Stay tuned. Nothing is more powerful than an idea whose time has come.

[Risk warning – see page 16](#)

*Author: Sven Jösting (written Dec. 2016)*

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# FuelCell Energy: High Stakes? Exaggeration!

FuelCell Energy’s stock went into free fall: Within a few days, the company’s shares had lost half of their value. Management didn’t even see the need to comment on the price drop for some time. On Dec.1, 2016, the Canadian business finally broke its silence and announced in a business update that it was letting go staff to adapt to new and lower projections of annual megawatt power closer to 25 than 50 MW. The move is reported to cut costs by USD 6 million each year.

Many of the projects that FuelCell Energy bid on will apparently be realized only this year or be ready for signing. Revenue was expected to total USD 108 million in 2016. A look at the financials reveals that the current stock market cap of below USD 70

million heavily underrates the business's liquidity of USD 118 million, with USD 84 million not being tied up in any project or even being restricted. This number shows that "something can't be right." Additionally, FuelCell Energy has over USD 30 million available in credit facilities to finance projects.



*DFC3000 in San Diego, © FCES*

Could all this be related to the unnamed investor which had funneled USD 37.3 million into the business not too long ago, at a share price of around USD 5.75? The investor could be a hedge fund, which does provide "fast money," but may have exercising options and short-selling in mind (sells short to recoup investment and makes large share purchases at low price). Seen that way, I don't quite understand why shares fell in only one day of trading from above USD 5 to around USD 3 after it had been announced that the decision on the large Beacon Falls project would be postponed to 2017. FuelCell Energy is still in the race, so that the price drop makes little sense. And it's not the company's only project or bid either.

### **Oil shale solutions**

There are, however, other good news to report about the company's technologies. For instance, they will make it possible to use carbon capture to convert the enormous CO<sub>2</sub> emissions produced by oil shale processing in Canada into energy and yield. It's a perfect example of how technology can mitigate serious risks to the environment. It will only be a matter of time before there are new orders in Canada based on the advancements made – especially considering the new Canadian government's commitment to renewables. During the third quarter, the company was able to conclude a joint project with Pfizer. And business partner ExxonMobil is working on its own first pilot.

Conclusion: I think FuelCell Energy's prospects are much brighter than the current share price indicates. Fuel cell technologies have matured enough, as is evident by the number of order bookings and projects. Partners such as ExxonMobil will gradually turn into large users and customers of the technology after test runs. The current market evaluation could spark the interest of organizations specializing in takeover bids, as FuelCell Energy is a financially healthy company with enough bookings to go around. Buy on bad news would be the logical conclusion and my recommendation for long-term investors.

[Risk warning – see page 16](#)

*Author: Sven Jösting (written Dec. 2016)*

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## Hydrogenics Amasses Order Bookings

Despite a higher-than-expected net loss of USD 1.9 million in the third quarter and only USD 6.7 million in revenue – down 30 percent from the same period the year prior – Hydrogenics could report a record USD 106.2 million in order bookings, of which USD 30 million should be realized within the next 12 months. One of the customers that had placed new orders was E.ON, and the integration of fuel cell stacks with trains and streetcars in collaboration with Alstom is turning out to be a success.

My assessment: Like all the others in this business, Hydrogenics is heading toward times of substantial growth. The stock price paints an accurate picture of current business development. I see Hydrogenics as a candidate for a takeover or merger within the industry, since the organization has a lot of expertise in fuel cells and electrolyzers, but is too small to serve markets without a strong partner at its side.

### [Risk warning](#)

[Investors must understand that buying and selling shares is done at their own risk. Consider spreading the risk as a sensible precaution. The fuel cell companies mentioned in this article are small and mid-cap ones, i.e., they do not represent stakes in big companies and the volatility is significantly higher. This article is not to be taken as a recommendation of what shares to buy or sell – it comes without any explicit or implicit guarantee or warranty. All information is based on publicly available sources and the assessments put forth in this article represent exclusively the author's own opinion. This article focuses on mid-term and long-term perspectives and not short-term profit. The author may own shares in any of the companies mentioned in this article.](#)

*Author: Sven Jösting (written Dec. 2016)*

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## Proton Motor Board Undergoes Another Change



The German fuel cell manufacturer Proton Motor based in Puchheim had already experienced major management changes last summer, with Achim Loecher leaving his executive position at the end of July, and Thomas Melczer stepping down from both his executive and non-executive role in the company. Melczer became director of business development and investor relations at parent company Proton Power Systems in December 2010 and temporarily assumed the role of Proton Motor Fuel Cell's CEO. In 2007, he founded SPower Holding, which specializes in fuel cell UPS systems. It was taken over by Proton Power in 2013 and was later integrated into the German subsidiary. Loecher was CFO of the German business from 2007 to 2016 and remains a non-executive director on Proton Power's board of directors.

As it has not been clear yet who will succeed Melczer and Loecher, the German subsidiary is being managed by Proton Power CEO Faiz Francoise Nahab and Chair Ian Peden for the time being. In August 2016, however, British-based Proton Power Systems announced further restructuring efforts. It intends to create three divisions for its business activities – maritime, mobile and stationary – to allow each business unit to focus more intensively on its field of activities as soon as the market picks up. Alliance News reported that Proton Power Systems had had to cope with a larger-than-expected loss in the first half year of 2016, but remained confident about market prospects.

After Heliocentris and SFC, Proton Motor is the third fuel cell business whose shares dropped by more than 90 percent compared to their price on the issue date. At Heliocentris, who files for bankruptcy in October 2016, the uncertainty surrounding the future of the Berlin company likewise drew sharp criticism from employees of FutureE, which Heliocentris took over in 2014. "Bad management decisions" were the reason for the current dilemma, they said, and the issue of "rejecting investors." The present danger was that professionals may think about emigrating, which would benefit the competition. There is much disappointment, particularly because there were said to be orders, e.g., for BOS locations planned as part of NIP 2. Contracts were ready to be signed. It's now anyone's guess what will happen to the BOS Digital Radio Network sites at which fuel cell-based emergency power systems were planned to be installed.

SFC Energy isn't doing much better. When H2-international reported about an 80 percent drop in last year's December issue, the share price hadn't hit rock bottom yet. At the end of September 2016, it suddenly lost another 10 percentage points,

when the Brunnthal-based business changed its revenue forecast and announced that a large scheduled defense project would not be realized until the year was over. In mid-October, however, SFC managed to secure a bond with warrant from a private Singaporean investor. Although the new cash infusion improved liquidity, analysts continue to recommend: “Reduce.” What they did view as a positive sign was that the fuel cell manufacturer managed to get EUR 2 million despite the difficult situation it is in.

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## Energy Saxony: New Management



*M. Schipke, © Novum*

In early December 2016, Energy Saxony elected a new board during its general assembly meeting. The state energy technology association is now headed by Mandy Schipke, CEO of Novum engineering, and Frank Arnold, manager at Energie Sachsen Ost and Stadtwerke Dresden. The other newly elected members to the board were Dietmar Lauter, WISAG, Mareike Wolter, IKTS, and Thilo Bocklisch, professor at TU Dresden. They succeed Christian von Olshausen, sunfire, Christian Wunderlich, IKTS, Andreas Frömmel, FuelCell Energy Solutions, and Sebastian Hesse, NARVA. Schipke described Energy Saxony as “the place where Saxony’s energy industry, science and politics meet,” with a new, extended focus not only on stationary fuel cell applications, but also other parts of the industry. Von Olshausen: “After four years of successfully establishing Energy Saxony, it was time to let a new board take over.”

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## ISE Says Farewell to Weber



*E. R. Weber, © Fraunhofer ISE*

Professor Eicke R. Weber stepped down from his position as director of the Fraunhofer Institute for Solar Energy Systems in late 2016. He reportedly did so for age-related reasons, although a successor has not been named yet. Since 2006, Weber had been head of the Freiburg-based institute and professor of physics/solar energy at the University of Freiburg.

In his honor, the institute organized a farewell symposium about the Global Energy Transformation in the Freiburg Concert Hall on Nov. 11, 2016. High-profile speakers addressed the audience, American futurist Jeremy Rifkin paid tribute to Weber's accomplishments in the energy industry by video message. He stressed Weber's strong commitment – scientifically and politically – to the energy transformation and his vocal advocacy for solar research in Germany. During his tenure at the Fraunhofer ISE, the institute has doubled in size to the 1,100 staff it has today.

Weber, who wrote his PhD thesis in 1976 in Cologne, primarily worked in the solar and semiconductor industry. His research took him to places such as California, Japan and Sweden, and – in addition to numerous other awards – he received the Humboldt Prize in 1994 and the Order of Merit of the Federal Republic of Germany in

2006. He was one of the driving forces behind the founding of the German energy storage association BVES (see [New Location for Energy Storage Conference](#)) and was elected president of the Association of European Renewable Energy Research Centers in Brussels in 2015.

Weber retired from his job as BVES president last March after he had asked to no longer be considered for the post. Thomas Speidel, managing director of Ads-Tec was elected with no opposing votes as his successor. Weber, who will continue to support the BVES as honorary president, explained: "I appreciate having been able to support the storage industry in a big way by helping to found the BVES. The growth of the association over the last years underlines the importance of storage solutions for a successful energy transformation." As he said himself, Weber is likely to be teaching at a foreign university in the future, maybe again at California's Berkeley.

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## Three New Board Members at Hydrogen Europe

The changes on the Hydrogen Europe board are not over yet. At the assembly in Brussels on Nov. 24, 2016, the association's members elected Nils Aldag from sunfire as energy chair, Denis Thomas from Hydrogenics as membership and joint undertaking commitment chair and Werner Diwald from the DWV as association pillar chair. Aldag replaced Katharina Beumelburg from Siemens and Thomas succeeded Thomas Melczer, who used to work at Proton Motor (see [Proton Motor Board Undergoes Another Change](#)). This was the second change in the makeup of the board after June 2016, when Raphaël Schoentgen became chair of the association and two other positions had been filled (see [New Hydrogen Europe Board](#)).

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## Charging Infrastructure Underway

Was that the signal so many had waited for? On Nov. 29, 2016, BMW, Daimler, Ford and Volkswagen announced the establishment of a joint venture in the electric transportation sector. They explained in a memorandum of understanding that they would join forces and equally share responsibilities for advocating the deployment of a "high-powered DC charging network for battery-electric vehicles covering long-distance travel routes in Europe." Their plans specify a Europe-wide DC network of 400 Combined Charging Systems to recharge electric car batteries with a capacity of up to 350 kW, which is reported to lead to a significant reduction in charging times as well as a range increase. Construction at freeways and highly frequented highways is said to start in 2017.





*Which plug should it be? Combo, Type 2 or CHAdeMO?*

When Porsche CEO Oliver Blume was previously asked during an interview with *Automobilwoche* whether his company would compete with Tesla on its own if necessary, he replied: “We prefer a joint strategy. It is in the interest of all carmakers.” Professor Stefan Bratzel from the FHDW Bergisch Gladbach shares Blume’s opinion. He told *rp-online.de*: “In essence, it’s an alliance of the most important German manufacturers against Tesla. They intend to push through a system which would isolate the corporation and its network of fast-charging stations.” While Tesla models have Type 2 connectors, the other carmakers favor CSS.

Ford President Mark Fields: “A reliable, ultra-fast charging infrastructure is important for mass consumer adoption and has the potential to transform the possibilities for electric driving.” Audi’s chair of the management board, Rupert Stadler, added: “We intend to create a network that allows our customers on long-distance trips to use a coffee break for recharging.”

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## eCarTec Is History

The eighth and last eCarTec took place in Munich, Germany, on Oct. 18 to 20 last year. There will be another conference about electric transportation in fall in the Bavarian state capital, but its new name is “eMove360°” and it will offer a wider variety of topics about “Transportation 4.0” (electric transportation, connected and autonomous driving, materials and design).

The reason for the name change has been a behind-the-scenes, months-long legal battle about the rights to the eCarTec name. Confusion had already settled in prior to

the eCarTec 2016, when MunichExpo Veranstaltungen GmbH seemed to announce a “change in name,” but the conference that followed was still called eCarTec (see [eCarTec Keeps Its Name – For Now](#)). The back and forth was a result of the name having been trademarked in November 2008 by Sieghard “Simmy” Schnabel, who later fell out with the organizer, MunichExpo, over the conference topics and trademark use.



After Robert Metzger, CEO of MunichExpo, had been successful in trademarking “eMove 360” in August 2015, he announced the eMove360° as a new “trade show concept” in April the following year. Even back then, he declared: “The eCarTec is history.” But he later changed his statement by saying that in 2016 “the eCarTec and eMove360 will take place at the same time.” Thus, the eighth eCarTec was basically the first eMove360, something most attendees probably won’t have noticed.

In November 2016, Metzger told H2-international about the plans for 2017: “We no longer organize an eCarTec.” He said that the eMove360° was a new tradeshow which “combines all topics (electric – connected – autonomous)” under one roof. He could or would not say what will become of the eCarTec, except for: “There certainly won’t be an eCarTec in Munich.” This was confirmed by Messe München: “There are no plans to organize another eCarTec on the premises. Our contract partner is Mr. Metzger.”

In the meantime, Simmy Schnabel has been looking to find a “large trade show organizer” for his eCarTec. As he put it: “I designed that conference.”

More than 20 years ago, Simmy Schnabel founded the German fuel cell association BZV-D, of which he has been vice chair ever since. However, the association – which presumably has around 20 members – had never been much in the public eye, Chair Norbert Nicoloso confirmed. Today, it seems to exist only on paper and in the email signature of Schnabel.

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## New Location for Energy Storage Conference

The Energy Storage Europe is entering its sixth year: From March 14 to 16, 2017, the German city of Düsseldorf will again be host to several industry conferences and a trade show. As always, the three-day International Renewable Energy Storage and Energy Storage Europe conferences will be accompanied by the VDE Financial Dialogue on the second and OTTI’s Power-to-Gas Conference as well as a Storage Day by Solar Allianz on the third day. New chair of the ESE is Andreas Hauer, head of the energy storage division at ZAE Bayern, who took over conference management from Eicke R. Weber in 2016.



*Hauer (r.) and canadian ambassadress M. Gervais-Vidricaire 2016*

Based on last years' experiences, the organizers expect another increase in size to 180 exhibitors, 240 speakers and 3,900 visitors. The growing space requirements have made it necessary to move the event from the Congress Center Düsseldorf to Hall 8b at the North Entrance of the trade show premises. The new location offers direct access to the subway.

Hydrogeit Verlag will again be offering free tickets to our readers. Simply email the H2-international editorial team with the subject line "ESE Tickets."

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## We Need the Market

Between Oct. 10 and 12 last year, the 16<sup>th</sup> World of Energy Solutions took place on Stuttgart's trade show premises – which was good news, considering that Landesmesse Stuttgart and e-mobil BW had previously done little to nothing to support a 2016 implementation. It made the reduction in the number of exhibitors and attendees seem less important and easier to bear. After many long faces on the first day, the mood did improve on the second thanks to an increased interest in the event.

Traditionally, the WES is not one for stunning product showcases. The focus of the Stuttgart event is rather on talks with professionals and colleagues during conference breaks – either at trade show booths, in the hallway of the exhibition area or at the

counter of the coffee bar. Wherever you went, you could hear over and again how unfortunate it was that fewer attendees were coming to the International Congress Center in Stuttgart. But almost everyone agreed that one or two professional conversations could justify the – sometimes – considerable effort of a trip to or the installation of an exhibit on the premises.

Additionally, no one seriously doubted the importance of an international fuel cell conference. Just the opposite: For industry stakeholders to be meeting in Stuttgart each fall, the f-cell has had such a long history that hardly anyone would want to see it disappear. It's no wonder that the event again boasted more than 125 presentations last year.

### **Beware of “overpromising”**

Another central issue during the WES was an idea that had been suggested in political circles shortly before the event started: to ban fossil fuel engines in new cars starting in 2030. Winfried Hermann, state minister for transportation and infrastructure in Baden-Württemberg, alluded to it during his press conference when he said: “I take this as a wake-up call that we need to increase our efforts.” But he also admitted that his state had abstained from voting during the Bundesrat meeting. He explained that even combustion engines powered by biogenic fuels or renewably generated methane had a promising future, but added that the WES presented “today’s technologies for tomorrow.”

Franz Untersteller, the state’s environment minister, promised in his opening speech at the start of the conference: “We have a clear lead in hydrogen and fuel cell technology development and need to take advantage of it.” Conversely, Franz Loogen, chair of e-mobil BW, urged all stakeholders to be more careful when communicating objectives. He warned against “overpromising,” since that would only generate expectations too high to be fulfilled. He said that you could only speak of “market maturity” if availability was almost at the maximum. Else, disappointment might tarnish a brand’s image and drive consumers away.

“Right now, we’re not on a path to save the environment. This is why I call for a transformation of the energy and transportation industry. [...] We can do it, but the question is how fast we want an implementation. [...] In the end, however, the citizens of this country will judge the new offers, be it as car buyers, consumers or road users.”

### **German-American collaboration**

The mood was much more optimistic among employees of the Fraunhofer Institute for Solar Energy Systems. During the World of Energy Solutions, Christopher Hebling, director of the hydrogen technology division at Fraunhofer ISE, put his signature under a cooperation agreement with the American National Renewable Energy Laboratory. The goal of this German-American venture is to intensify joint research activities in H<sub>2</sub> and fuel cell applications in the hopes of providing considerable impetus to advancements particularly in electrolyzers, H<sub>2</sub> infrastructure, H<sub>2</sub> systems integration with energy grids and stack development.





*Establishing the ISE-NREL cooperation*

The people at the booth of the German Aerospace Center were similarly confident about technological prospects. Professor Josef Kallo reported on the initial flight of a four-seat passenger airplane called HY4, which is powered by fuel cells (see [Launch of Emission-Free Passenger Aircraft Hy4](#)). Norbert Witteczek from Smart Testsolutions was looking forward to his first-time presentation of HiL (Hardware in the Loop) for the virtual testing of fuel cell systems. Shortly before the conference, the system by the Stuttgart-based specialist in trade show technology had been enhanced to simulate individual cell voltages of a fuel cell stack in addition to relevant environmental parameters. Witteczek explained that an operator was now able to manually intervene during a test run and perform fault insertion. The head of Smart's test system department said that this was an important step forward, since "automating fault insertion for different test scenarios is comparably time-consuming."

### **f-cell award**

The new and remarkable thing about last year's f-cell award ceremony was the high number of foreign applications: Half of the 24 submissions did not come from Germany. Thus, it's no wonder that Solaris Bus & Coach, a Polish business, won first prize in the category "products & market." The award was for the first electric low-floor bus designed in Europe, the Urbino 18.75 electric, which is equipped with a fuel cell (101 kW; manufactured by Ballard) to extend its range. Two units have already been in use on the Innovation Line 109 of Hamburger Hochbahn since December 2014 (see [HZwei issue from January 2015](#)). During the IAA Commercial Vehicles 2016 in Hanover, the model was awarded Bus of the Year 2017. In October 2016, Solaris signed a contract for the delivery of ten low-floor 18.75 trolley buses that are to be equipped with a fuel cell to extend their range.

Panel member Matthias Altmann explained: “The electrification of vehicle fleets of large city-owned transportation companies is being slowed down by the few commercially available zero-emission city models. Hamburg and Berlin intend to buy 200 emission-free buses each year from 2020 onward – which offers all manufacturers great opportunities.”

First place in the category “research & development” went to the Jülich Research Center. Its PRECORS project laid the foundation for reducing the size of fuel cells by 60 percent and their weight by 80 percent. Vitali Weißbecker, one of the award winners, told H2-international: “Our team of six at the Institute for Energy and Climate Research is working on a new type of coating design for metallic bipolar plates used in NT PEFCs. It involves a modified protective layer of carbon and vacuum-free and scalable application.” In the first half of 2017, Weißbecker and Klaus Wedlich seek to establish their own Jülich Research Center spin-off to continue developing their idea. Talks with potential partners and investors are underway.

### **EVS30**

The next World of Energy Solutions will take place together with the 30<sup>th</sup> International Electric Vehicle Symposium from Oct. 9 to 11, 2017, in Stuttgart. EVS30’s call for papers has already started and ends on Jan. 20, 2017.

[www.evs30.org](http://www.evs30.org)

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## **Thoughts About WES Location**

There were many long faces at the start of the World of Energy Solutions on Oct. 10 last year, after attendees arriving in the morning at the International Congress Center Stuttgart, Germany, discovered that considerably fewer exhibitors were present than in past years and even the inauguration event of the symposium had as little as 80 attendees. But as it got more crowded on the second day, the organizers remained confident about 2017, when the Electric Vehicle Symposium, the biggest trade show and conference on electric transportation, will take place at the same time as the 17<sup>th</sup> WES.

Of course, the number of exhibitors or attendees is only one indicator of a successful event. A bigger factor in what makes the rent of an exhibit or the attendance at a symposium worthwhile is the content offered. Still, the bare numbers provide important information about trends and developments.

In 2016, they showed that in the end, more exhibitors came to the Stuttgart premises than were expected at first, although 96 organizations meant 24 fewer than in 2015. The conference also had to cope with fewer attendees – a 30 percent drop to 350 registrations – and there was indeed some criticism of the program here and there. But all in all, most sessions drew a large enough audience.

The exact reasons for the decrease in numbers can only be speculated about: Some say, there just aren't enough novelties to present. Others explain that they want to focus their attention on the EVs. Some say the conference is becoming less scientific, while others praise the variety of topics offered, but would wish for presentations to go into more detail.



*Minister Untersteller*

One positive thing that cannot be stressed enough is that Peter Sauber Agentur Messen und Kongresse had considered carrying out this meeting of industry stakeholders at all – despite considerable difficulties – and assumed all the risk. Both Landesmesse Stuttgart and e-mobil BW had announced beforehand not to co-organize the event anymore and rather spend two years on preparing for the EVS30. Peter Sauber, who has organized the fall event in Baden-Württemberg's state capital for 16 years, insisted on the date and delivered – despite considerable financial pitfalls – the usual professional conference experience.

The future of the WES is now secure – at least, for the time being – since a great many attendees will pour into Stuttgart in 2017 to celebrate the 30th anniversary of the EVS from Oct. 9 to 11. Because of space requirements, however, the event will no longer take place in Stuttgart's congress center, but in Hall 1 of the tradeshow premises. The World of Energy Solutions will then be combined with the f-cell and the Battery+Storage into an international symposium on electric transportation under the management of Landesmesse Stuttgart. The third part of the WES, however, the e-mobility solutions, will “be integrated into the EVS,” e-mobil BW announced.

Peter Sauber, who was asked again by Landesmesse Stuttgart to organize the conference, is already planning beyond 2017. He would like to put the spotlight more on the f-cell, but that would require several unmistakable signals from the industry. Lately, important sponsors – even large companies based in Stuttgart – had

withdrawn their support from the event, creating gaps in financing and limiting the variety of speaker topics and attendee interests. Clear statements by the industry that it had realized the great importance of such a regular meeting each fall would provide a sense of planning security – not only for the organizer, but for the community as a whole.

Whether the f-cell will still take place in 2018 on the trade show premises or, for instance, in the House of the Economy, is a matter of secondary importance. To put the fuel cell symposium in the limelight, you may need to remember the old days, where a large, international conference took place in a relaxed atmosphere in the middle of Stuttgart. Attracting several hundred exhibitors to a fuel cell and battery trade show should be considered a failed idea, even if energy storage is becoming a centerpiece of the competition in Düsseldorf and Munich.

The already existing fuel cell products will become an increasingly important factor on relevant consumer shows, so that an f-cell symposium taking place each fall in Stuttgart remains essential – both for advancing these products and for sharing knowledge among researchers.

*Author: Sven Geitmann*

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read more: [www.h2-international.com](http://www.h2-international.com)



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## Events

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- February 7<sup>th</sup> to 9<sup>th</sup>, 2017, **E-world energy & water**, in Essen, Germany, [www.e-world-essen.com](http://www.e-world-essen.com)
- February 16<sup>th</sup>, 2017, **Fuel Cells for Stationary**, in San Francisco, CA, USA, [www.knowledgefoundation.com](http://www.knowledgefoundation.com)
- March 1<sup>st</sup> to 3<sup>rd</sup>, 2017, **European Fuel Cell Car Workshop**, EFCW2017 is an output of SMARTCat – a FCH-JU project, in Orleans, France, <https://efcw2017.sciencesconf.org/>
- March 1<sup>st</sup> to 3<sup>rd</sup>, 2017, **International Hydrogen and Fuel Cell Expo**, at Tokyo Big Sight, Japan, [www.fcexpo.jp](http://www.fcexpo.jp)
- March 14<sup>th</sup>, 2017, **Hydrogen & Fuel Cells into the Mainstream**, The 13th International Hydrogen and Fuel Cell Conference #CCSHFC2017, NEC, Birmingham, United Kingdom, [www.climate-change-solutions.co.uk](http://www.climate-change-solutions.co.uk)
- March 14<sup>th</sup> to 16<sup>th</sup>, 2017, **Energy Storage Europe - IRES**, in Düsseldorf, Germany, [www.energy-storage-online.de](http://www.energy-storage-online.de), [www.eurosolar.de](http://www.eurosolar.de)
- March 15<sup>th</sup>, 2017, **6th Conference Power-to-Gas**, at Messe Düsseldorf, Germany, [www.otti.eu](http://www.otti.eu)
- March 22<sup>th</sup> to 26<sup>th</sup>, 2017, **eMOBILITY WORLD**, Friedrichshafen, Germany, [www.e-mobility-world.de](http://www.e-mobility-world.de)
- April 20<sup>th</sup>, 2017, **Klimamobility**, Fiera Bolzano, Italy, [www.fierabolzano.it](http://www.fierabolzano.it)
- April 24<sup>th</sup> to 28<sup>th</sup>, 2017, **Hydrogen + Fuel Cells + Batteries Group Exhibit**, part of HANNOVER MESSE, in Hannover, Germany, [www.h2fc-fair.com](http://www.h2fc-fair.com)
- May 10<sup>th</sup> to 11<sup>th</sup>, 2017, **Electric Vehicle**, in Berlin, Germany, [www.idtechex.com](http://www.idtechex.com)

read more: [www.h2-international.com/events/](http://www.h2-international.com/events/)

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## Companies

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### Electrolyzers

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#### **Diamond Lite SA**

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### Energy Storage

- **GKN Powder Metallurgy**, GKN Sinter Metals, PO Box 55, Ipsley House, United Kingdom – Redditch B98 0TL, Worcestershire, [www.gkn.com/sintermetals](http://www.gkn.com/sintermetals)



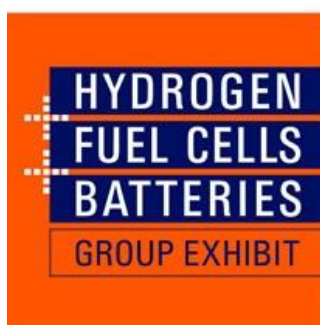
- **Hydrogenious Technologies GmbH**, Weidenweg 13, 91058 Erlangen, Germany, Phone +49-(0)9131-12640-220, Fax -29, [www.hydrogenious.net](http://www.hydrogenious.net)



- **MicrobEnergy GmbH**, Specialist in Methanisation, Bayernwerk 8, 92421 Schwandorf, Germany, Phone +49-(0)9431-751-400, Fax -5400, [info@microbenergy.com](mailto:info@microbenergy.com), [www.viessmann.co.uk](http://www.viessmann.co.uk)

### Event Organizers

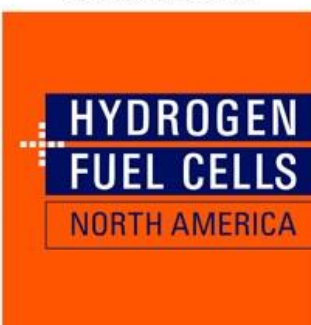
#### HANNOVER MESSE



**April 24-28  
2017**

Hall 27, C66  
Exhibition Grounds  
Hanover, Germany

#### SOLARPOWER INTERNATIONAL



**September 10-13  
2017**

Mandalay Bay  
Convention Center  
Las Vegas, NV, USA

- **23rd Group Exhibit Hydrogen + Fuel Cells + Batteries**, HANNOVER MESSE 2017, April 24 – 28, Tobias Renz FAIR, Tobias Renz, [tobias@h2fc-fair.com](mailto:tobias@h2fc-fair.com), [www.h2fc-fair.com](http://www.h2fc-fair.com)



- **European Fuel Cell Forum**, Obgardihalde 2, 6043 Luzern-Adligenswil, Switzerland, Phone +41-4-45865644, Fax 35080622, [forum@efcf.com](mailto:forum@efcf.com), [www.efcf.com](http://www.efcf.com)



- **Peter Sauber Agentur Messen und Kongresse GmbH**, World of Energy Solutions, Wankelstr. 1, 70563 Stuttgart, Germany, Phone +49-(0)711-656960-55, Fax -9055, [www.world-of-energy-solutions.de](http://www.world-of-energy-solutions.de)

## Fuel Cells

-  **FuelCell Energy Solutions**  
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Phone +49-(0)351-2553739-0, Fax -1, [www.fces.de](http://www.fces.de), Stationary fuel cells for  
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## Fueling-Recirculation and Air-Supply



- Gebr. Becker GmbH**, Hölker Feld 29-31, 42279 Wuppertal, Germany, Phone +49-(0)202-697-255, Fax -38255, [info@becker-international.com](mailto:info@becker-international.com), [www.becker-international.com](http://www.becker-international.com)



- Busch Clean Air S.A.**, Chemin des Grandes-Vies 54, 2900 Porrentruy, Switzerland,  
Phone +41-(0)32-46589-60, Fax -79, [info@buschcleanair.com](mailto:info@buschcleanair.com),  
[www.buschcleanair.com](http://www.buschcleanair.com)



### Gas Diffusion Layers (GDL)



- **MeliCon GmbH**, Metallic Lightweight Construction, Porschestr. 6, 41836 Hückelhoven, Germany, Phone +49-(0)2433-44674-0, Fax -22, [www.melicon.de](http://www.melicon.de)



- **SGL Carbon GmbH**, Werner-von-Siemens-Str. 18, 86405 Meitingen, Germany, Phone +48 (0)8271-83-3360, Fax -103360, [fuelcellcomponents@sglgroup.com](mailto:fuelcellcomponents@sglgroup.com), [www.sglgroup.com](http://www.sglgroup.com)

### Hydrogen Distribution



- **Hydrogenious Technologies GmbH**, Weidenweg 13, 91058 Erlangen, Germany, Phone +49-(0)9131-12640-220, Fax -29, [www.hydrogenious.net](http://www.hydrogenious.net)



- **Wystrach GmbH**, Industriestrasse 60, Germany – 47652 Weeze, Phone +49-(0)2837-9135-0, Fax -30, [www.wystrach-gmbh.de](http://www.wystrach-gmbh.de)
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### Membrane and Separator



- **FUMATECH BWT GmbH**, Carl-Benz-Str. 4, 74321 Bietigheim-Bissingen, Germany, Phone +49-(0)7142-3737-900, Fax -999, [www.fumatech.com](http://www.fumatech.com)

- 
- **PLANSEE**  
**Plansee SE**, Bipolar Plates, Interconnects and Metal Supported Cells, 6600 Reutte, Austria, Phone +43-(0)5672-600-2422, [www.plansee.com](http://www.plansee.com)

### Organization

- 
- **Deutscher Wasserstoff- und Brennstoffzellen-Verband**  
**German Hydrogen and Fuel Cell Association**, Deutscher Wasserstoff- und Brennstoffzellen-Verband e.V. (DWV), Moltkestr. 42, 12203 Berlin, Germany, Phone +49-(0)30-398209946-0, Fax -9, [www.dwv-info.de](http://www.dwv-info.de)
  - **hySOLUTIONS GmbH**, Steinstrasse 25, 20095 Hamburg, Germany, Phone +49-(0)40-3288353-2, Fax -8, [hysolutions-hamburg.de](http://hysolutions-hamburg.de)

- 
- **Nationale Organisation Wasserstoff- und Brennstoffzellentechnologie**  
**National Organisation Hydrogen and Fuel Cell Technology (NOW GmbH)**, Fasanenstr. 5, 10623 Berlin, Germany, Phone +49-(0)30-3116116-15, Fax -99, [www.now-gmbh.de](http://www.now-gmbh.de)

### Reformers

- **WS Reformer GmbH**, Dornierstrasse 14, 71272 Renningen, Germany, Phone +49-(0)7159-163242, Fax -2738, [www.wsreformer.com](http://www.wsreformer.com)

### Research & Development

- **Fraunhofer ICT-IMM**, Reformer and Heat Exchanger, Carl-Zeiss-Str. 18-20, 55129 Mainz, Germany, Phone +49-(0)6131-9900, [info@imm.fraunhofer.de](mailto:info@imm.fraunhofer.de), [www.imm.fraunhofer.de](http://www.imm.fraunhofer.de)

**ISE**

- **Fraunhofer ISE**, Heidenhofstrasse 2, 79110 Freiburg, Germany, Phone +49-(0)761-4588-5208, Fax -9202, [www.h2-ise.de](http://www.h2-ise.de)

### Suppliers

- **Anleg GmbH**, Advanced Technology, Am Schornacker 59, 46485 Wesel, Germany, Phone +49-(0)281-206526-0, Fax -29, [www.anleg-gmbh.de](http://www.anleg-gmbh.de)



- **Borit NV**, Bipolar plates and interconnects, Lammerdries 18e, 2440 Geel, Belgium, Phone +32-(0)14-25090-0, Fax -9, [contact@borit.be](mailto:contact@borit.be), [www.borit.be](http://www.borit.be)



- **ElectroChem Inc.**, 400 W Cummings Park, Woburn, MA 01801, USA, Phone +1-781-9385300, [www.fuelcell.com](http://www.fuelcell.com)



- **HIAT gGmbH**, Schwerin, Germany, CCMs / MEAs / GDEs for PEFC, DMFC & PEM-Electrolysis, [www.hiat.de](http://www.hiat.de)



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### System Integration



- **Areva GmbH**, Paul-Gossen-Str. 100, 91052 Erlangen, Germany, Contact: Mrs. Gemmer-Berkbilek, Phone +49-(0)9131-90095221, [www.areva.de](http://www.areva.de)



- **Deutsche Zentrum für Luft- und Raumfahrt (DLR) / German Aerospace Center**, Institute of Engineering Thermodynamics Energy System Integration, Pfaffenwaldring 38-40, 70569 Stuttgart, Germany, Phone +49-(0)711-6862-672, Fax -747, [www.dlr.de/tt](http://www.dlr.de/tt), [www.dlr.de/tt](http://www.dlr.de/tt)

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