AVICENNE PROFILE
Information for Growth - Powering your company’s market strategy with in-depth research

- Creation: 1992, by Ali MADANI
- Headquarter: Paris
- Liaison Office: Japan, USA, China
- AVICENNE Energy Director: Christophe Pillot
- 4 consultants
  - A Madani
  - C Pillot
  - JP Salvat
  - A Yassari
- 3 Senior advisors
  - M Sanders
  - F Renard
  - X Zhang
- Database: >20 000 contacts in the battery value chain
AVICENNE PROFILE

Information for Growth - Powering your company’s market strategy with in-depth research

- Creation: 1992, by Ali MADANI

- AVICENNE Energy Director
  Christophe Pillot

- 3 Senior Advisors
  - M Sanders (US Market)
  - F Renard
  - X Zhang (Chinese Market)

- 2 Analysts
  - JP Salvat
  - A Yassari

Worldwide expert for the battery value chain
OUR BUSINESS STORY

1992 • AVICENNE Creation

1994 • AVICENNE advised French Industry Ministry on the European battery business

1999 • AVICENNE open its office in JAPAN

1999 • « BATTERIES » congress 1st edition in Paris

2003 • AVICENNE work on the due diligence process for the sales of SAFT by ALCATEL

2008 • AVICENNE: expert witness in the NTT-Hydro Quebec conflict

2009 • AVICENNE presented its market forecasts to industrials in Asia: CIAPS in Beijing – China, Battery Japan in Tokyo

2010 • Avicenne developed partnership with BATTERY JAPAN

2010 • 20th Edition of “The rechargeable battery market worldwide 2010-2020

2011 • AVICENNE Energy division is created

2011 • 13th Edition of BATTERIES Congress


2014 • 16th Edition of BATTERIES Congress in NICE, France

2014 • 1 month mission in China: Qinghai EV Rally, CIBF, 50 companies visited


2016 • European Community Project ALISE: Dissemination & Exploitation Work Package leader

2017 • 26th Edition of our Battery Market Survey – September 2017

2017 • 19th Edition of BATTERIES Congress in NICE, France, Oct 2017


2020 • 22th Edition of BATTERIES Congress in LYON, France, Oct 2020
### OUR METHODOLOGY

#### INFORMATION COLLECTION

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<th>Primary Research</th>
<th>Secondary Research</th>
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<td>- Company News &amp; Financials</td>
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<td>- Vendor Briefings</td>
<td>- Technology &amp; Product Specs</td>
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<tr>
<td>- Product Demos and Tours</td>
<td>- Government Data</td>
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<td>- Executive Interviews (&gt; 20,000 contacts in the battery value chain)</td>
<td>- Economic, Demographic Data</td>
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<td>- Consumer Surveys</td>
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<td>- Business Leader Surveys</td>
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#### MARKET & STRATEGIC ANALYSIS

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<td>- Technology Issues</td>
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<td>- Competitive Landscape</td>
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<td>- Profiles of Key Players</td>
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<td>- Due Diligence</td>
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**INFORMATION COLLECTION**

**Track valuable Information's**

**Strategic Analysis**

**Presentation of the results**

**Q&A with customers**

**Customer Evaluation**
METHODOLOGY: EXTENSIVE FIELD RESEARCH TO RETRIEVE & CROSS CHECK INFORMATION

- Top management contact network > 19 000 contacts
- Conferences & Exhibitions
- In Depth analysis Of applications
- Cross Check Analysis

- Battery Makers
- OEM
- Substitution technologies
- Raw materials suppliers
- Environment & recycling

- Conferences & Exhibitions:
  - Batteries Event 2020
  - BATTERY JAPAN
  - CIBF
  - Japan Electronics Show
  - CEBIT

- Top management contact network:
  > 19 000 contacts

- Conferences & Exhibitions:
  - International Battery Seminar & Exhibit

- In Depth analysis Of applications:
  - Analysis of applications
  - Cross Check Analysis

- Cross Check Analysis:
  - Battery Makers
  - OEM
  - Substitution technologies
  - Raw materials suppliers
  - Environment & recycling
CUSTOMIZED & MULTICLIENT SURVEY FOR ALL THE VALUE CHAIN

Raw Materials | Materials | Cells | Pack | OEM

Raw Materials | BMS & Electronics

Batteries

Cooling Systems | Power Electronics

Source: Photo from BASF
MORE THAN 270 REFERENCES
SPEAKER, CHAIRMAN OR WORKSHOP MODERATOR

Tens of INTERNATIONAL CONFERENCES per year

- Extended Battery Life Working Group on battery technology development for mobile devices Meeting
  Taiwan, Feb 2015, Tokyo Japan, Dec 2014 & Oct Feb 2016– 1h30 Presentation
  “The battery market for mobile 2014-2025”

  Owner, chairman & speaker + 2h Tutorial
  “The battery market 2013-2025”

- ILMB 2016, Chicago
  “The Li-ion battery market 2015-2025”

- INTERNATIONAL Li-ion BATTERY SUMMIT – Dec 2015, 2016, 2019 Shenzhen, China
  “The Li-ion battery raw materials market 2012-2020”

- AABC Europe, AABC US (2012 to 2019)
  “The Lithium ion battery market and main trends”

- THE INTERNATIONAL BATTERY SEMINAR – FLORIDA
  “HEV, PHEV & EV market 2015-2025 ; Battery is the key” (From 2004 to 2019)

- EVER 2009, 2011, MONACO
  “Challenges for EV market in Europe”

  “Battery market for automotive industry”

  “Advanced battery market & raw materials worldwide”

  Chairman & speaker,
  “The battery business 2009-2020”

- EET-2008 European Ele-Drive, MOTOR SHOW GENEVA,
  International Advanced Mobility Forum – Geneva Motor Show
  (Professor Gaston Maggetto Award: C. Pillot as the best rated paper & presentation by EET-2008
  Scientific Reviewing Committee)
  “The HEV & EV market trends & main challenges”

- And many more…
AVICENNE ENERGY: RENOWNED TO HAVE REALISTIC FORECASTS

EV sold, in million units, worldwide, 2010 - 2020

Source: International Battery Conference, Fort Lauderdale 2010-2019

EV sold, in million units, worldwide, 2015 - 2030
BATTERIES 2020

www.batteriesevent.com

- 3 days congress in France (Lyon)
- October 7\textsuperscript{th} – 9\textsuperscript{th}, 2020
- 22\textsuperscript{nd} Edition (first edition in 1999)
- 500 attendees
- 40 Booths
  - Battery makers, raw materials suppliers, IC & BMS suppliers, tests, machining, coating,
- 80 international experts:
  - Researchers, industrial process, marketing, financials,
SUMMARY

A small team dedicated on the battery industry for more than 25 years

Working with large group worldwide: General Motors, Ferrari, Duracell, Energizer, BASF, Dupont, Panasonic, Samsung, LG, Sony, Bosch, Siemens, Toyota, Renault, Eramet, SQM, ...

Synthetic presentation to management & CEO of major groups

We will help and support your growth

- Expert Network
- Methodology
- Knowledge
- Flexibility
THANK YOU

Christophe PILLOT
AVICENNE ENERGY
c.pillot@avicenne.com
Phone: +33 (0)1 44 55 19 90
Mobile: + 33 (0)6 88 82 79 49
Christophe has built up considerable expertise in the area of battery market. He joined AVICENNE 20 years ago and spent 3 years in Japan making analysis on the Electronic, Mobile & Japanese battery market. Christophe gained large experience in marketing, strategy analysis, technology and financial studies for the battery and power management fields. He developed the Battery market analysis for AVICENNE which counts more than 200 customers worldwide. Christophe published several annual surveys like “The rechargeable battery market and trends 2025”. He is also the founder & chairman of Batteries congress in France since 1999. He is now Director at AVICENNE ENERGY.

He has recently lead or participated in missions such as:
- Lithium ion battery suppliers’ profile
- PSA-SAFT project expert analysis
- High Si Loading LithiumIon Battery roadmap
- Additive for Lithium ion Electrolyte
- Anode market for Li-ion battery market & roadmap
- Lithium carbonate & hydroxide market
- xEV and E-bus battery market in China
- Lithium ion battery Cathode and Anode market and value chain analysis
- Lithium ion battery market beyond electronic devices & automotive: industrial batteries (UPS, Telecom, Back-up, Energy Storage systems...)
- Analysis of the flow battery suppliers worldwide: large group & start-up analysis
- Industrial battery market worldwide 2015-2025
- TESLA, BOLLORÉ analysis: battery choice, battery pack, cost curve, partnership, business model
- Lithium iron phosphate cathode market details and forecast – China Focus
- Detail profile of anode, cathode, electrolyte and separator makers
- Gel and solid electrolyte market and forecasts
- Automotive battery market related opportunities
- Opportunities in Lithium ion batteries for an US Speciality Chemical company
- SWOT analysis of 20 separator makers
- Li-ion pack makers market and business plan
- Expert Witness in the NTT DoCoMo Vs. Hydro-Quebec IP dispute negotiations
- Expert Witness in the UMICORE Vs. BASF IP dispute negotiations
- Battery pack analysis – Opportunities to integrate power electronics & chargers in the pack

Christophe is a speaker, chairman, or workshop moderator at +20 international conferences worldwide each year (BATTERIES France, IBS Florida, AABC US and Europe, CIBF China, LBIS Shenzhen, BATTERY JAPAN, INTERTEK KOREA.

Globally, he has been involved in more than 300 projects for +200 customers in the Battery Value Chain.

Before joining AVICENNE, Christophe PILLOT held key position in FRANCE TELECOM innovation division.

Degree in Chemistry & MBA in Innovation Management from Paris IX Dauphine.

His mother tongue is French, and he speaks fluent English.
Ali MADANI is founder and Director of AVICENNE.

He will bring a strategic vision to the project. He will discuss the project with the team and ask strategic questions during the project to bring an “out of the box” vision and perspective.

He has recently led missions such as:
- Due diligence for a key battery player
- Lithium carbonate & hydroxide market, 2015-2018
- Development of AVICENNE Automotive market studies
- Lithium ion battery market beyond electronic devices & automotive: industrial batteries (UPS, Telecom, Back-up, Energy Storage systems...)
- Participation to the recent AVICENNE study: The rechargeable battery market
- Li-ion pack makers market and business plan
- Battery pack analysis – Opportunities to integrate power electronics & chargers in the pack
- Battery market analysis for Automotive applications
- ...

Before creating AVICENNE, Ali MADANI held key position at DL See Consultants in Paris. Degree from École Normale Supérieure de Cachan, MBA in Innovation Management from Paris IX Dauphine University. 20 years Experience in conducting, strategic and financial studies, technology watch projects for large corporations and small companies.

He is fluent in French and English.
AVICENNE Team – Senior Advisor
Michael Sanders, Battery and Automotive expert

Mike is our US expert in Batteries and Materials. He is working at Sanders Group Enterprises, AVICENNE US Agent. He is responsible for proprietary projects supporting customers growth efforts, completing the interviews, writing the reports and mainly solicited for his knowledge on the US market.

He has recently participated in missions such as:

- Battery Show Market Presentation
- Strategy Workshop for potential entrance into Lithium Ion Battery materials
- Market connections and validation of opportunities in Lithium ion batteries for a US Speciality Chemical company
- LIB Cathode, anode analysis
- High Si Loading Lithium Ion Battery roadmap
- Anode market for Li-ion battery market & roadmap
- Business development for new clients based on his network

Before forming the Sanders Group and becoming an agent for Avicenne, he had a long career with DuPont in multiple roles. Mike has significant energy storage materials value chain understanding with an emphasis on lithium ion batteries and systems with 10 years of market knowledge and relationships. Successful program leadership experience with significant business growth in ventures and existing businesses with a proven track record leading mergers and acquisition team to enter the lithium ion battery materials market. Most recent role with DuPont was the Global Marketing Director – Energy Storage Venture where he developed significant understanding and insights for the energy storage materials market, device manufacturing and systems while leading global marketing and customer interface efforts to establish programs to enter the $20B energy storage materials market. Executed strategic and market planning for opportunity evaluation, research, and choices for entry into rapidly growing new market.

EDUCATION
Bachelor - Chemistry, University of Delaware, Newark, Delaware

AFFILIATIONS
Society of Automobile Engineers, Electrochemical Society
AVICENNE Team – Senior Advisor
Fabrice Renard, Battery and Advanced materials expert

With more than 25 years of experience in business consultancy and management of chemical and advanced materials business in Belgium, Morocco and China, Fabrice gained strong experience on strategy, M&A, manufacturing, marketing, finance and innovation on high growth new technology business. He joined AVICENNE in 2020.

He is responsible for proprietary projects supporting customers growth efforts, completing the interviews, writing the reports and mainly solicited for his knowledge on economical and industrialization of existing and future materials alongside the battery value chain.

Prior AVICENNE, Fabrice was Chief Innovation Officer of the Prayon group. Over 10 years, he was in charge of the global R&D and Innovation strategy based on sustainable major trends and declined on nutrition, water, precision farming, rare elements recovery and energy. He led various up and downstream complex high-level international negotiations and partnerships including business or technology acquisitions. One of his core focus was the development of cathode materials. In this field, he earned a strong expertise on the battery value chain and served as COO of Belife, a joint venture with Umicore and as a Director of Prayon Pulead Technology, a Chinese-based LFP manufacturer.

Additionally, Fabrice holds different positions in Belgium and Morocco for Eklo, a consulting firm for emerging new business as managing director, for IDCampus, a creative lab as CEO and for Prayon as financial controller, marketing and business development manager, process and plant manager.

He holds a Master in Chemical Engineering, a Postgraduate Diploma in Business Administration, an Executive Degree in Tax Law and an Executive Master in Management.

His mother tongue is French and he is fluent in English.
Xiaoyu is our Chinese expert in Batteries. He is working at REAL LI, AVICENNE Chinese Partner. He is responsible for completing the interviews, writing the reports and mainly solicited for his knowledge on the Chinese market.

He has recently participated in missions such as:

- Lithium carbonate & hydroxide market,
- Lithium ion battery market beyond electronic devices & automotive: industrial batteries (UPS, Telecom, Back-up, Energy Storage systems...),
- Opportunities in Lithium ion batteries for a US Speciality Chemical company
- The Chinese raw materials market for Rechargeable batteries
- xEV market & developments in China
- LIB Cathode, anode, electrolyte & separator cost analysis
- The rechargeable battery market
- Partner research in China for European Companies involved in the Battery Industry

Before joining REAL LI, he held technical position in SAINT GOBAIN R&D Quality Division. PhD in Electrochemistry in Beijing University. PhD in Material Science Université Pierre et Marie Curie, Paris, France. His mother tongue is Chinese, and he speaks fluent English and French.
Jean Philippe is our expert in the field of electrochemistry. He is responsible for completing the interviews, writing the reports and mainly solicited for his technical input. He joined AVICENNE 20 years ago. He has recently participated in missions such as:

- Lithium carbonate & hydroxide market
- xEV and E-bus battery market in China
- Lithium ion battery Cathode market and value chain analysis
- The rechargeable battery market
- Lithium ion battery market beyond electronic devices & automotive: industrial batteries (UPS, Telecom, Back-up, Energy Storage systems...),
- Opportunities in Lithium ion batteries for a US Speciality Chemical company
- LIB Cathode, anode, electrolyte & separator cost analysis
- SWOT analysis of 20 separator makers
- Li-ion pack security needs: PPTC
- Li-ion pack makers market and business plan
- Battery pack analysis – Opportunities to integrate power electronics & chargers in the pack

Before joining AVICENNE, Jean Philippe held Analyst position in DL See Consultant (3 Years) and Research Center Pont à Mousson SAINT GOBAIN (2 Years)

Degree in Material Science.

His mother tongue is French, and he speaks fluent English.