N°2 - July 2012

shareholder newsletter

A word from the CEO

Dear shareholders,

Following the considerable success of the first CARMAT Shareholder Newsletter*, I am pleased to be able to address you again in this second issue. The summer period provides an excellent opportunity to present our activity over the first six months of 2012 through interviews with some of our partners and staff, in order to help you learn more about the stakeholders of this unique project.

I would thus like to address some fascinating technical topics such as the fuel cells developped by our partner PaxiTech for our new generation of power supplies, the CARMAT intellectual property created in bioprosthesis manufacturing and the clinical development supported by our partner and shareholder, the Centre Chirurgical Marie Lannelongue hospital.

The clinical side is, quite logically, the aspect that arouses the most interest in your community, as its success validates the past 20 years of research devoted to this project. However, as in marathon, it is always the final steps that are the most difficult ones. Today, we are in the middle of a key stage of the preclinical phase, associated with the completion of endurance trials on our test benches. These endurance trials are progressing in line with expectations, but we prefer to be deliberately cautious. As announced in our recent press release, the *Agence Nationale de Sécurité du Médicament et des produits de santé* (ANSM, France's national agency for drug and health product safety) requires our prostheses to undergo four months of continuous in-vitro operation, and so far one CARMAT heart has already accumulated over five months of operating time.

So that nothing is left to chance, we have also validated the surgical procedure and the smooth running of the prosthesis by successfully carrying out a number of in-vivo transplants on animals.

All of the above have further fostered our confidence in the project. However, if I may quote Professor Carpentier, who is behind this amazing project: "haste hinders good counsel, and our goal is not to transplant an artificial heart but to save the lives of thousands of people."

On behalf of the CARMAT team, I would like to thank each and every shareholder, longstanding and new, who has chosen to support this revolutionary project, as well as the men and women who strive each day to bring this project to fruition.

I hope you all have an excellent summer, and look forward to addressing you again in the next Shareholder Newsletter!

Marcello Conviti
CEO

** Readers are invited to consult the caution note included in the Company's press releases*

H1 2012 key events

January	Publication of the 1st CARMAT Shareholders' Newsletter Ongoing endurance testing
March	2011 annual results in line with expectations and sound cash position of €29.4 million
April	Shareholders' general meeting
June	CARMAT wins the "Best Technology" category at the European Mediscience Awards
July	Satisfactory in-vivo implants and encouraging intermediary results for the endurance testing added to the ANSM file

Contents

HEART FAILURE
facts & figures

A progressive disease affecting 2% of the overall population[1,2], i.e. some 15 million Europeans[3,4] and 6 million Americans, and as much as 12% of people over 60[5].

550,000 new cases a year in the United States[6].

2% of patients affected reach the terminal stages of this illness each year[7].

Only 341 heart transplants were carried out in Germany in 2011, a country with 82 million inhabitants[8].

Over 40% of patients die within the twelve months that follow their initial admittance to hospital[9].

A heart transplant costs $997,000 in the United States[10].

1 Cowie MR, et al. *The epidemiology of heart failure.* Eur Heart J 1997 ; 18:208–225.

2 Davies MK et al. *Prevalence of left ventricular systolic dysfunction and heart failure in the Echographic Heart of England Screening Study: a population based study*. Lancet 2001 ; 358:439–444.

3 Remme WJ et al. *Public awareness of heart failure in Europe : first results from SHAPE*. Eur Heart J 2005 ; 26:2413–2421.

4 McMurray JJ et al. *ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012. Eur Heart J 2012 ; 33:1787–1847* (nombre incluant les 51 pays adhérents de la Société Européenne de Cardiologie).

5 Saudubray T et al. *Prévalence et prise en charge de l'insuffisance cardiaque en France : enquête nationale auprès des médecins généralistes du réseau Sentinelles* La revue de médecine interne 26 (2005) 845–850

6 Heidenreich PA et al. *Forecasting the future of cardiovascular disease in the United States: a policy statement from the American Heart Association.* Circulation. 2011 Mar 1 ; 123(8):933-44

7 Jhund PS et al. *Long-term trends in first hospitalization for heart failure and subsequent survival between 1986 and 2003: a population study of 5.1 million people.* Circulation 2009 ; 119:515–523.

8 2011 – *Eurotransplant statistics*

9 Stewart S et al.. *More 'malignant' than cancer? Five-year survival following a first admission for heart failure*. Eur J Heart Fail 2001 ; 3:315–322.

10 Milliman Report 2011 - Table 2 : *Estimated U.S Average 2011 Billed Charges Per Transplant*

The point of view of the shareholder - clinician:
a long-term partnership

An interview with Professor Philippe Dartevelle, Medical Director at the Centre Chirurgical Marie Lannelongue hospital, and Mr Arnaud Guyader, CEO

Could you tell us a little bit about the Centre Chirurgical Marie Lannelongue (CCML) hospital ?
A. Guyader: The Centre Chirurgical Marie Lannelongue hospital was founded in 1953 and is located in the southern Paris suburb of Plessis-Robinson. It's a non-profit facility run by an association under the law of 1901. One of its characteristics is that it only operates on thoracic organs (heart, lungs, large blood vessels, etc.). The CCML has a university status, and is one of the Paris-Sud medical school's teaching sites. It has an experimental surgery laboratory and a joint medical research unit in association with INSERM, CNRS and the Paris-Sud medical school.

In what circumstances did you first hear about CARMAT and what appealed to you?
Prof. Dartevelle: Dr Rémi Nottin is the Head of our heart surgery division and is a former student of Prof. Carpentier. His son is an engineer at EADS, so there is a double connection that enabled him to discover the project. He spoke to me about it in late 2008, and the two of us went to visit CARMAT's offices in Vélizy and speak to Patrick Coulombier, who was in charge of the project. We were very interested in the quality of this new approach, which is different from all other artificial hearts: combine Prof. Carpentier's tried-and-tested technologies in terms of treating biological tissue with the technological back-up of a major industrial company such as EADS. For us, this project clearly had a brighter future than other projects in this field, and was clearly ahead of its rivals. I immediately talked to Henri Lachmann, the Chairman of our Supervisory Board, about the CARMAT project. We decided to become involved by making our experimental means available, but also by taking part in the Company's IPO and its subsequent rights issue.
A. Guyader: The CARMAT file was at "the top of the pile" when I joined the CCML some 18 months ago. It is very unusual for a non-profit association devoted to health services to invest in innovation through the financial markets. Employees therefore had to be told exactly why we were doing this. Our investment in CARMAT is our only industrial investment, and it's first and foremost a long-term scientific and clinical partnership in line with the CCML's field of activity.

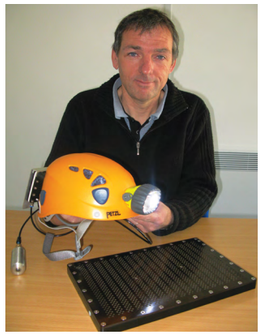
So why did you become a shareholder? You could have just formed a clinical partnership?
A. Guyader: Acquiring a stake in CARMAT shows that we believe in the project and want to lead by example. We are pioneers in the scientific and clinical field, and therefore we are quite naturally also pioneers in supporting research and innovation.
Prof. Dartevelle: During a surgical career, if you don't believe in anything then you don't do anything. If you believe in something then you should really get involved and work, work and work some more. We carried out animal research for over five years before we established our cardiopulmonary and then bi-pulmonary transplant technique. It was therefore natural that we should offer CARMAT our collaboration, in order to validate the procedure in-vivo, and then to participate into the first implants. The most difficult aspect is organising a multidisciplinary team, used to working together, and we have substantial experience in this domain.

Do you think that it will be difficult to find patients for CARMAT's first clinical trials?
Prof. Dartevelle: The first transplants will be carried out on patients who have no other choice. Unfortunately, there are a lot of such people. Indeed, Dr Nottin carried out an emergency heart transplant operation only yesterday. If we had been unable to find a suitable heart, then there would have been nothing that we could have done. The CARMAT heart would provide a solution in such circumstances, as well as for the many patients who are not eligible for heart transplants.

** Centre hospitalier universitaire (University hospital)*

Focus on technology:
innovative energy to help the heart

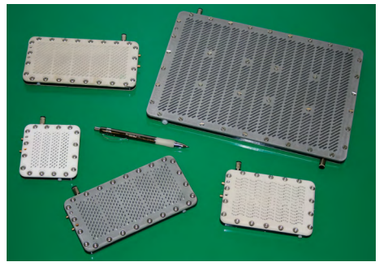
An interview with Renaut Mosdale, CEO of PaxiTech



Could you tell us how the PaxiTech fuel cell and the CARMAT heart crossed paths?
R. Mosdale : I founded PaxiTech in 2003, and at that time it was the first CEA-Grenoble spinoff in the field of renewable energy. With a degree and PhD in electrochemical engineering, I was already working at the *Commissariat à l'Énergie Atomique* (Atomic Energy Commission) on fuel cell designs, a topic that I have been fascinated by ever since my PhD research.It was around the same time that Patrick Coulombier asked me to team up with CARMAT. He was looking for technology that could not only supply the necessary power to the CARMAT heart, but could also guarantee patients a high level of autonomy to enable them to return to an almost-normal lifestyle.

I was rather surprised, as at that time I had not been thinking about medical applications but rather about products for the general public, principally for portable lighting and multimedia energy supplies. The CARMAT project opened up new prospects for us and made it possible for our two young companies to move forward simultaneously, notably thanks to the support of OSEO. Since then, CARMAT and PaxiTech have developed a close partnership in the development of this project that would see the first use of a fuel cell in a medical device.

What breakthrough does PaxiTech's technology provide?
R. Mosdale : PaxiTech's technology is innovative and unique on the market. It consists of a process that only uses hydrogen and oxygen from the surrounding air and only discharges water vapor, in order to generate energy. It is therefore ecological, robust and less polluting than existing batteries. Unlike the large fuel cells considered in the car industry, PaxiTech uses a passive system that limits the number of auxiliaries. One of the main breakthroughs of this new type of fuel cell is that the battery's voltage can be adapted to the application it is to be used for, without the mechanical limitations of stacking high-powered fuel cells. The first generation of our CARMAT heart battery will incorporate an electric generator and a small hydrogen tank. Three working models will be ready by the end of the year. A second generation is already in the research stage – this more advanced system will not use stored hydrogen but will generate it on demand by mixing hydride powder with a solvent. This second generation fuel cell could enable the energy produced by unit weight to be doubled.



What can PaxiTech bring to patients who receive a CARMAT system?
R. Mosdale : The PaxiTech battery provides a lot more energy per unit weight than traditional batteries. The first generation, the size of a small notebook, will weigh no more than 3 kg and will be integrated within the power and monitoring system of the CARMAT heart worn by the patient, who will therefore be able to leave his or her home for up to 12 hours at a time, i.e. a real workday or day out. The patient will not be subjected to the peaks of stress resulting from having to change the battery every three or four hours, which is the case with current technologies. Contrary to existing batteries, the PaxiTech battery is an open system where electricity is produced thanks to simple interaction between the battery and the surrounding air. There is therefore no waste and little in the way of energy loss. Operating passively, it should even allow patients to take a shower normally, albeit with a few precautions, which is not possible with most batteries that must not come into contact with water. Our batteries are already used, for example, in tough and humid conditions such as during potholing and mountain rescue operations.

How do you envision the future of the partnership between PaxiTech and CARMAT?
R. Mosdale : Very enthusiastically! We will have to unite our core businesses and pool our know-how in order to complete the development of an optimized battery for the CARMAT artificial heart. The prospects for improving it from one generation to the next are substantial. Contrary to battery technologies that have reached maturity and generate almost no improvements in their energy performance, our fuel cell technology is currently providing an annual improvement in its performance of over 50%. And these are improvements from which CARMAT's patients will be able to benefit.

Photo of Renaut Mosdale:
Photo credit: O. Pentier - Le Dauphiné Libéré.

Focus on integration: industrial innovation

an interview with Marion Melot, Head of CARMAT's Integration department

What characterizes the CARMAT artificial heart's integration process?
M. Melot: As it is an active implantable medical device (AIMD), the entire process is ruled by the ISO 13485 standard: the flow of elements and operations in the clean room is closely controlled, from the entry of validated components to the exit of a sterile prosthesis. The operations of each certified technician are tested at every stage by a very strict protocol. However, these constraints, which are sizeable, are the same for any AIMD. The biggest challenge for CARMAT lies in our totally new process: there were no benchmarks to guide us, as we had to integrate then validate the integration of materials rarely or never before used together, such as biological tissue and polymers, invent proprietary processes and tools, create and validate a multipurpose clean room with an aseptic environment (with no microbes) for the biological and intra-ventricular aspects and an environment with no dust, fibers or particles for all of the mechanical and electronic aspects.

How did you validate the implementation of this unique integration?
M. Melot: We learned as we progressed, gradually implementing solutions and validating procedures as we manufactured systems. For example, hydraulic fluid is usually filled under a vacuum, but this was impossible to do because of our flexible biological membranes. Another example is that natural ventricular cavities have very tight angles with the large blood vessels. As the CARMAT heart's ventricular volumes were anatomical, we had to invent a totally innovative process to meet this compatibility objective. These constraints ended up creating new intellectual property for CARMAT: numerous innovative manufacturing procedures were patented, such as the anchoring of biological tissue onto a polymer, or the thermoforming of haemocompatible material.

You talk about the project with a real passion; how long have you worked for CARMAT?
M. Melot: My first contact was through an atypical internship in Professor Carpentier's team in 2002.

Inspection of a biomembrane in a sterile isolator

I joined GIE CARMAT (EADS) in 2004, straight after my studies. At that time, the first prototypes didn't contain any biological tissue, so I was hired to "biologize" the prosthesis. It is proving to be a fantastic adventure, with exceptional teamwork between biologists and engineers. Everything centers on Professor Carpentier's exacting demands in terms of anatomical and physiological compatibility: we have to continually innovate in the patient's best interest.

CARMAT and the stock market
at June 30st 2012

Share price (closing price): **€107.84**
Number of shares: **4,138,224**
Free float: **26.4%**

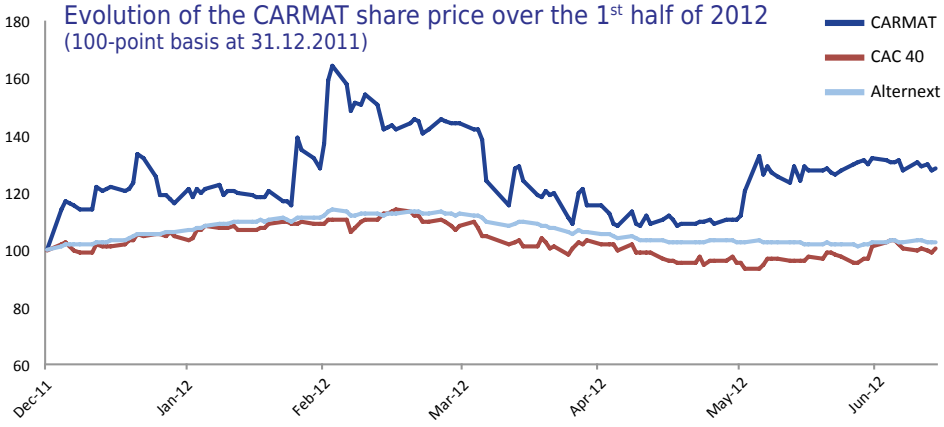
Name: **CARMAT**
Ticker: **ALCAR**
ISIN code: **FR0010907956**

ALCAR
LISTED
NYSE
ALTERNEXT.

Share performance over the 1st half of 2012

Change in share price: **+31.9%** (Alternext: +2.5% / CAC 40: +1.2%)

Liquidity: 1**0,993 shares a day** on average over the 1st half of 2012



Shareholders' questions

Could you tell us when the endurance tests will be completed and the report given to the ANSM?
The aim of the endurance tests is to validate that the CARMAT artificial heart works in the living conditions of an actual human body, which are simulated by our test benches. As well as their ability to imitate the natural environment, these very sophisticated benches allow an acceleration, within the limits of real physiological conditions. For example, we can carry out tests up to 150 heartbeats a minute, which represents a sustained effort, but not continuously, and of course not at 300 heartbeats a minute, as that would lead to fatal tachycardia. The prostheses entered the test phase at different times, and the report depends on the completion of the last prosthesis' tests. We remain confident, but cannot give a specific date, as there are a number of factors that could affect this. However, as things stand, these tests are progressing satisfactorily.

Do you know the approximate date of the OSEO payment of €6.7m associated with key milestone n°4, initially scheduled for January 2012?
Milestone n°4, on which the OSEO payment depends, will be reached when the report on the in-vitro preclinical tests is finalized, i.e. once the endurance tests.

Assuming the clinical tests are a success and CE marking is granted, how long would it take for the CARMAT heart to be reimbursed by healthcare systems?
Obtaining CE marking would immediately give us the possibility of launching sales and marketing activities in all European Union countries. It is the essential prerequisite for any reimbursement request, although each European country then has different procedures for obtaining the reimbursement of a medical device, within variable periods. Intermediate financing systems, for innovative products, whilst awaiting official reimbursement authorization, exist in most countries. The lack of reimbursement during the period immediately following CE marking being granted will therefore not stop the Company from generating revenue thanks to these systems for financing innovation.

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Financial Agenda

Half-year results and a progress update will be published on **September 17th, 2012**

CARMAT in the media

LE FIGARO

March 15th, 2012
"With the first artificial heart transplant yet to be carried out, the company is already worth 490 million euros."

wansquare

April 2nd, 2012
"CARMAT is becoming one of the biggest success stories in French biotech history."

Le Point

May 31st, 2012
"Alain Carpentier, surgeon and President of France's Académie des Sciences, has revolutionised cardiology several times. Thanks to CARMAT, his invention, patients won't need a heart donor to survive."

LE FIGARO.fr

June 25th, 2012
"The designer and developer of the artificial heart project has won the Best Technology category at the 10th European Mediscience Awards."

Capital

July 1st, 2012
"The project, which was launched in the early 1990s under the leadership of professor Alain Carpentier, inventor of the first heart valves, is today at a very advanced stage."