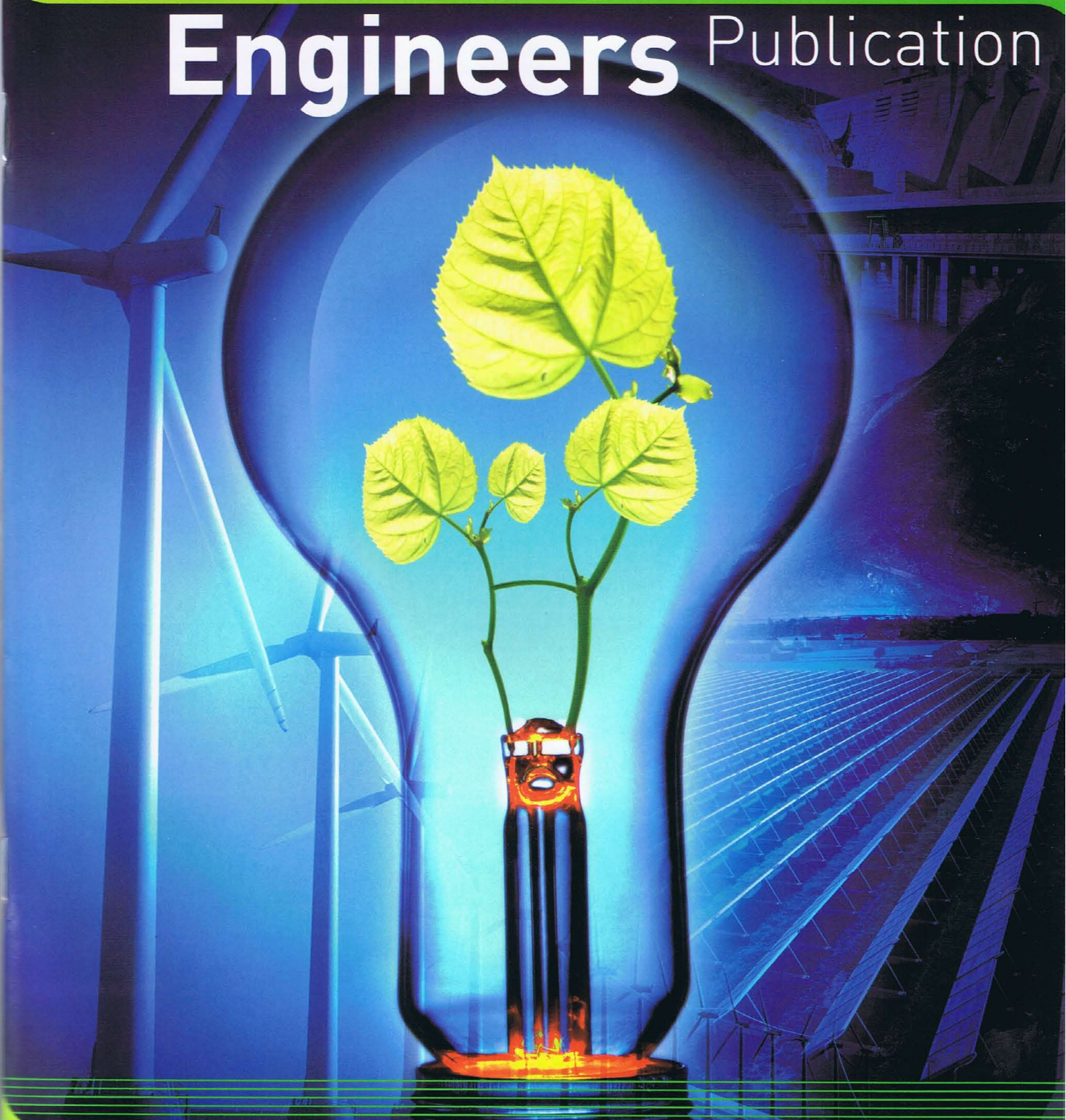


# The **EUROPEAN** Engineers Publication



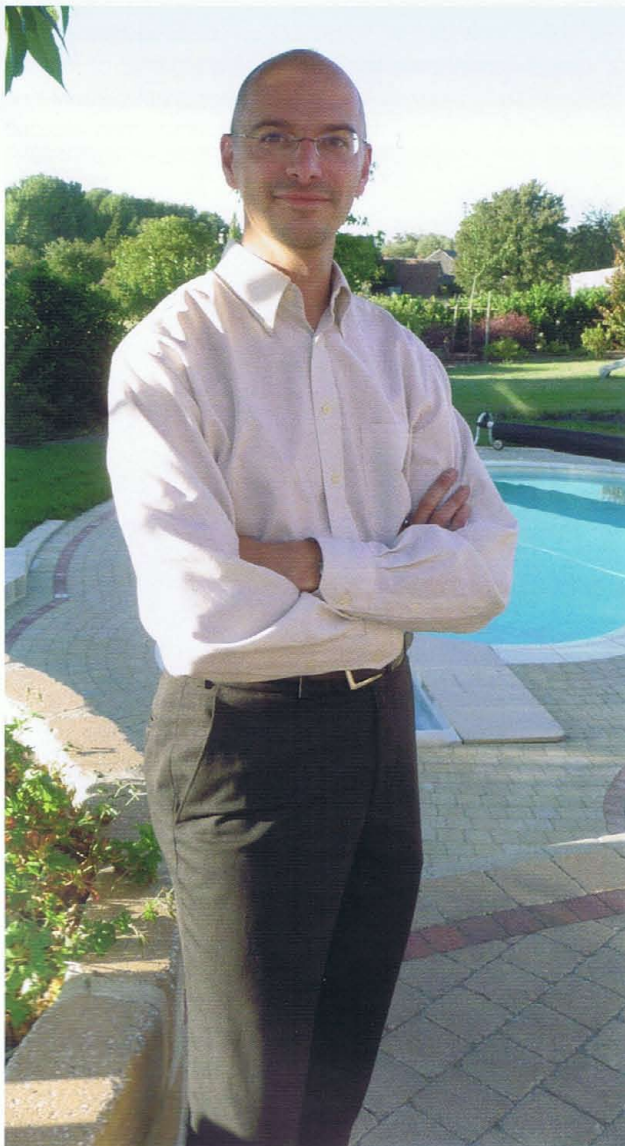


# From **ENGINEER** to **ENTREPRENEUR**

## The birth of SOLARIS-PAC

Author: Vincent Colard

**Vincent Colard created SOLARIS-PAC in November 2008, after 13 years of professional experience in the industry. SOLARIS-PAC is currently developing its first product, a heat pump dedicated to the production of domestic hot water, using a natural – or static – air heat exchanger as heat source.**



Vincent Colard

Vincent Colard graduated in 1995 as an Electro Mechanics Engineer from the Université Libre de Liège (ULG, Belgium) and has a master degree from Cranfield University (UK). His technical training was completed by management training from the Solvay Business School (SBS, Belgium) and INSEAD (France).

### Natural born entrepreneur?

As far as I remember, I always wanted to be an entrepreneur but in my case, I was not ready at age 20. After 13 years of experience in the industry in various positions, which were necessary to prepare myself – professionally and mentally – for this adventure, the need for entrepreneurship came back. The project was still very unclear until I followed a course in heat pump technology by pure curiosity, it then appeared obvious to me that this technology had an incredible unused potential in Belgium and in most of its surrounding countries.

### Take the risk!

The “wise” solution was to keep working and refine the project until I could start in a perfectly controlled situation but I decided to leave the security of a good job in November 2007 and started to fully concentrate on the project that would soon be called SOLARIS-PAC.

Options were still numerous, and ranged from heat pumps installation to industrial production. After a market analysis conducted with the support of Solvay Entrepreneurs, we decided to concentrate on an industrial project.

### The birth of SOLARIS-PAC




The mission of SOLARIS-PAC was defined as becoming the leader in the market of heat pumps using natural air exchange. In other words, we use air as heat source, instead of the ground, and we do not use a ventilator to force the air to pass through a heat exchanger, like in most air heat pumps - quite a challenging target!

The core business would be the development, production, and commercialization of these heat pumps through a network of installers in Belgium, and distributors in the export markets.

We also decided that our first product would be dedicated to the production of domestic hot water (DHW). This first product has several advantages:

- This is a niche that appears to be below the “radar line” of the big players.
- The product is adapted to the renovation market.
- The market is fairly big, and even a small percentage of market share would be sufficient to support our growth.

In addition, our solution had potentially clear advantages compared to the other technologies:

Electricity		300 to 400 EUR / year, 7 to 10 years ROI
Solar panels		Easier to install Limited technical risks No roof orientation constraints Investment twice lower
Ground heat pump		Simplicity and cost Limited technical risks No space constraints outdoor
Forced air heat pump		No fan noise No freezing issue Doubled performances Aesthetics

Of course, there is a downside: the heat exchanger surface is bigger than the one used in the forced air heat pump. Still, we managed to keep it in a 1 by 2 meter flat panel placed on an outdoor wall.

This looked great only on paper. The constraints were huge. One of the conclusions of the market analysis was also that everyone wants to be “green”... provided that it doesn't cost, and that there is no effect on our comfort level.

The biggest problem was cost control. To solve this issue I got the support of a heat pump specialist who assisted me in the design phase and the choice of suppliers. It took us close to six months to find a good product nomenclature and get decent prices from key suppliers. This was not so obvious: it is extremely difficult, when you are a startup, to convince large international groups that your project is worth their time but at least the big ones can afford to bet on a startup.

As good engineers, we then built a wonderful computer simulation of our future product based on the suppliers' technical data. It all seemed to fit; we were – theoretically – well above the minimum required performance levels. It was time to prove it!

SOLARIS-PAC SPRL was founded in November 2008 with a very limited capital – all my financial resources – and one

simple target: build a prototype and have it tested by a renowned and independent laboratory. SOLARIS-PAC had resources for approximately 10 months. Such a risk was fundamental to convince the other actors of this project as they expect you to take the biggest part of the risk.

### Murphy's Law applied to entrepreneurship

I quickly learned one of the most basic lessons of entrepreneurship: Murphy's Law is right. Anything that can go wrong will go wrong.

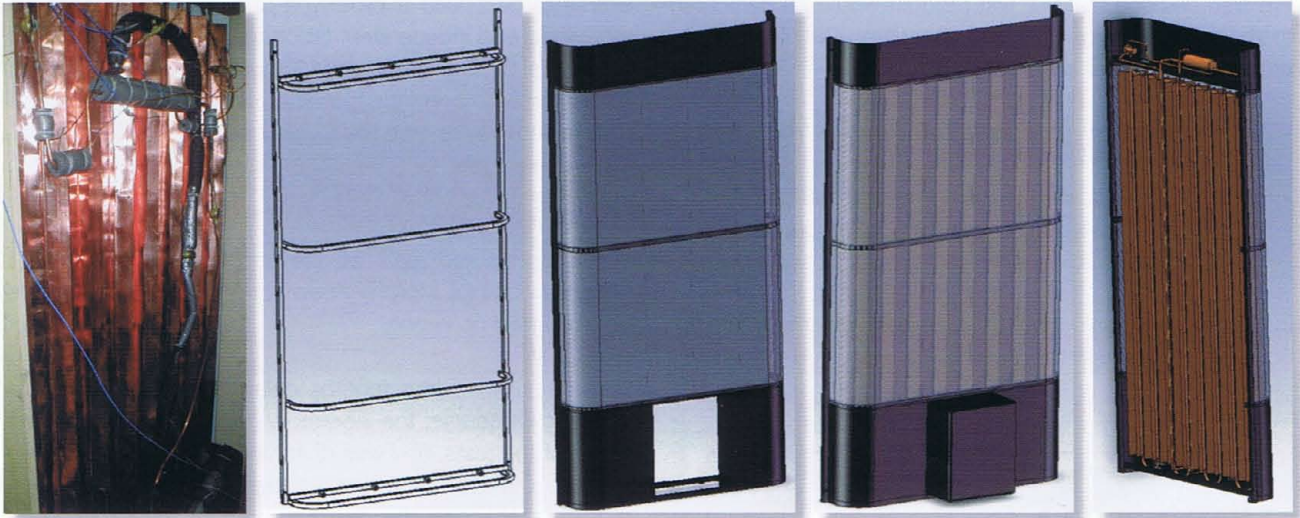
It started with a four months delay due to an unreliable supplier. Of course, the laboratory had booked its climatic room for the tests, and was quite unhappy. When we finally installed our prototype and all its sensors in the climatic room, we reached the decisive moment where the heat pump was started for the first time. The pump was switched on, and... nothing. More precisely, nothing happened on the heat pump. However, we heard an ugly noise behind us, accompanied with a smell of burned electrical components. We had just destroyed several high precision measurement equipments because of an error in an electrical circuit.



After an additional month of delay to get the measurement equipment back, we started the prototype and found out that the performances were way too low. It took days and days to find the right settings.

Just a precision on our objective: we wanted to prove that we would reach a Coefficient of Performance (COP) of at least 2.6 in clearly defined conditions. A COP of 2.6 means that if I get 2.6 units of 'useful energy' (in other words heat in the water), I used 1 unit of 'paid energy' (electricity in our case). The test conditions were:

- Water tank temperature rising from 15 °C to 45 °C.
- Dry environment temperature of 2°C
- Humid environment temperature 1°C (it means a relatively humidity level of approx. 85% to 90%).
- Wind level below 1.5 meter per second. As a comparison, the average wind speed in Belgium is 3.5 m/s.



Heat pumps using natural air exchange

To catch up on delays, we decided also to perform tests during the night, without human presence. In the morning, the next set of data showed second by second the slow death of our heat pump compressor due to a minor issue on another part of the thermodynamic circuit.

After the replacement of the compressor, we also had the opportunity to check that our hydraulic circuit could withstand freezing after a problem on the climatic room's regulation. The room temperature went down to  $-4^{\circ}\text{C}$  during the weekend. It was good to know, but it also took one day to unfreeze everything.

At the end, the official tests were finally performed with only two months delay and we were extremely pleased to receive a nice official report stating that we had reached a COP of 3.0, well above the minimal requirements. In addition, the results were coherent with our theoretical model with a margin of less than 5%.

This opened the way to the next step: finalizing the financing part of the project.

One problem with nice industrial projects is the need of financing. In addition to my own financial participation, we would need approximately 400,000 EURO to finance the project. This was impossible to obtain without the help of Business Angels, banks and support from the Walloon region.

Each of these financing sources had very different priorities, and it was necessary to adapt our presentation to immediately catch their interest. In a few extremely simplified words, Angels want return on investment, banks want security, and public supports want jobs creation.

### When the banker is your friend

We started very early with the banks. We could not have chosen a worse time to start: we were in October 2008, and most of the big Belgian banks were hit by the credit crisis.

We expected to have serious difficulties getting a loan. We, therefore decided to contact more banks than expected, a total of six of them. Two of them quickly declined. To our surprise, three of the remaining ones agreed immediately to make a loan proposal. However, several of these proposals included very high risk coverage by the founder's personal assets and lots of conditions. We finally decided to work with FORTIS, which became since then BNP PARIBAS FORTIS.

The banker was the first in line for the financing of SOLARIS-PAC and this would prove critical for the rest of the financing.

### Meet your angel

Meeting business angels is an extremely interesting and difficult experience. I met them mainly through the BeAngels<sup>1</sup> association in Belgium. After proving the interest of the project to the local representative, I had the opportunity to present it to a business angels forum. This is impressive! Most of them are experienced entrepreneurs, and you have 15 minutes to convince them to pursue the discussion. This is one of the moments where you really understand that you are more important than your project. I can't remember who said that we would rather invest in a lousy project with a good entrepreneur, than in a good project with a bad entrepreneur. When you only have 15 minutes, you will be judged, not the project.

Many business angels showed interest in the project. However, I expected them to enter the project very early, but most of them initially requested the test results of the prototype. In the meantime, I had discussions with former bosses and colleagues, and signed a shareholders agreement. It was much faster than with other angels of course since the most important factor is the entrepreneur. Working with me for several years and knowing my strengths and weaknesses, it was easier for them to make a decision.

## Public support

Startups have several options to get public support, either by providing capital, or through subordinated loans. Public authorities were met at the same time as the banks, and showed interest in the project, but decided to wait until the prototype tests were completed before analyzing it any further. This was quite a disappointment, but fortunately it did not deter the other players – business angels and banks. We finally got an agreement with them, that still has to be formalized through a contract.

## The team

There is no way you will succeed in entrepreneurship alone – either you will burn out, or you will fail at attracting financing sources. Since I was alone at the beginning of the project, I had to find this support somewhere else. I found it in two ways.

First of all, I started seeking the support of what I call 'external structures'. These are groups specialized in supporting entrepreneurs. The most critical ones were SOLVAY ENTREPRENEURS and HERACLES, a center specialized in the coaching of startups located in Charleroi, Belgium.

Another source of support for young entrepreneurs is experienced entrepreneurs. We tend to think that they are unreachable, while they are usually very open to new ideas and ready to help the newbie. I contacted four of them, and created an Advisory Board. Each one having a long track record in a field that I did not have the opportunity to develop fully during my careers, which were as follows:

- A specialist in startups financing,
- A former marketing and sales forces manager.
- A renowned specialist in renewable energies (and in heat pump technology more specifically),
- And an entrepreneur in the building sector.

The presence of these structures proved essential during the development of the project, mainly when looking for financial support or by using their personal network. I will always be grateful for their support and I would recommend every young entrepreneur to look for such a support.

## What next?

Well, in a few words, after more than a year without stable incomes and most of my financial resources gone, I almost have a commercializable product and the financial means to commercialize it. From now on, it should be very fast. SOLARIS-PAC SPRL<sup>2</sup> has become a SA<sup>3</sup> at the end of June 2009, with a capital increase and the creation of a board of directors.

This financing will be used to complete the industrial development. Supposing that Murphy's Law gives us a break, we expect this phase to be completed by the end of the year, with a commercial launch at the beginning of 2010, financed with the public and banks support.

<sup>2</sup> Private Company with Limited Liability

<sup>3</sup> Company Limited by Shares

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