

Dr Kevin Matthews, Oxonica

Oxonica

Spun-out from Oxford University in 1999, Nanox changed its name to Oxonica early in 2001, selling the name Nanox to the UK company Elementis for a six figure amount. The company originated in the University's engineering department, its academic founders being Professor Peter Dobson and Dr Gareth Wakefield. The original aim was to develop and market phosphor technology for field emission displays, and the company raised a total of about £750,000 from Richard Farleigh and a private investment company, Seighford Investment.

Dr Bob Reid was quickly brought in as part-time CEO and Chairman. After about 12 months commercial realities became clear. The phosphor market was largely controlled in the Far East, while the displays market had too many competing technologies. Indeed, no company's field emission system is being marketed in 2004.

Oxonica decided to change direction and, having used most of the £750,000 initial funding, had an angel finance round of £100,000 in 2000 and invested in broadening its technology base. Dr. Reid, due to other commitments, was unable to commit himself full time to Oxonica, and Edward Mott joined in Q3 2000 as Chairman of Oxonica.

Kevin Matthews continues: "Oxonica had other technologies – eg for sunscreens - and spent substantial research time trying to develop them. To succeed, Oxonica needed to refocus its management and Ted started to change the company culture, brought in a finance person and hired me, as full-time CEO. I joined in April 2001 while, unfortunately, due to personal reasons Ted left Oxonica."

"So I joined with an interesting role. My challenges as CEO were, to refocus a large operational board into a strategic body focused on ensuring the company remained funded with a clear direction and with the appropriate policies and reporting in place; and to convert a business with no real product focus, lots of research but no real commercial focus, and low morale into a dynamic successful team."



Kevin Matthews

With an Oxford Ph D in chemistry and post-doctoral work in Bristol, Kevin went into industrial research in ICI. Moving on to Albright & Wilson (A&W), he says, "I first set up their safety evaluation facility, and was then a technical manager first of new product development, and later of an operational plant." In 1995 he took the plunge to move into the commercial environment. "Moving through business analysis into growing a business, I maintained my interest in developing technology, and was responsible for starting new businesses by analysing existing A&W businesses, many with elderly technologies, and divesting them where appropriate. So I gained expertise in restructuring businesses, taking products to market and, especially, understanding their technological development, marketing and sales."

"Then Rhodia, the French multinational, acquired A&W and I joined their integration team - investigating synergies in technology, and transferring them between A&W and Rhodia. I was also a global business director, with P and L responsibilities over three continents, and a heavy interest in maintaining and extending technological development. I was developing businesses producing, especially, new surface technologies, pharmaceutical intermediates and catalysts. So I closed several commercial deals, plus directing a £3 million R&D budget – a good basis for moving to Oxonica."

"Personally, I found the challenge of a career in a large commodity company not very appealing. So I looked for an SME opportunity, and applied for the Oxonica post thinking our interests and skills complementary."

Tackling urgent issues

"I probably didn't fully appreciate the risk I was taking, but felt reasonably confident, since Rhodia had said: 'If it doesn't work out, give us a call.' So it was a mitigated risk. Indeed, the biggest risk for me was that when I joined Oxonica it had only eight weeks' cash left."

"One reason I wanted to move was to experience taking technology to market without the cushion of a large company, and to get direct investor relations experience of doing this in a small company. Of course, one issue is always cash. Run out of cash, and you're dead. So another angel financing round was organised by director Charles Eld who had actually done some pre-work, before I had joined the board, and had pulled together a business plan. So everything was ready for me to market the company as soon as I arrived. A third angel round raised about £540,000, to keep us alive."

"Three things were clear when I joined. First, Oxonica had to focus on some commercial opportunities very quickly. We could not continue burning money as a research house which still had a 'university' approach. Second, we must change the focus of the board. Third, we must soon raise a substantial amount of cash, to allow us to develop a real business. To do this in materials science unlike, say, software you typically require a substantial amount of investment, though the board agreed that the £540,000 would last through 2001."

"So we focussed on three areas. First, we decided to take a risk, and in-license a fuel-saving technology. Second, we continued to pursue the clear opportunity in sunscreens. Third, we kept our bio-diagnostics activity alive, but spent very little on it."

"Each one of those was a gamble, but I wanted to go forward with a portfolio and also to keep the bio-diagnosis capability alive. The first two activities, on any listing, could be labelled as specialty chemicals, and be given a specialty chemicals price/earnings ratio. If you have a bio-component and vision, however, you have a very different opportunity for future P/E valuation. Also I wanted to ensure we had balance for both operational and corporate reasons, so we streamlined the portfolio and limited the time the board spent talking about operations, to focus on strategy."

Raising more finance

"We appointed First Stage Capital as our corporate finance advisers, and launched a new venture capital financing two days before the attack on New York on September 11 2001. After that, the market immediately turned extremely risk-averse. We realised that some funds would withdraw from financing early-stage technology companies but were not clear which. So we went for a broad approach."

"In the event, about 90 venture capital groups reviewed our business plan. I met with some 55 of them, 36 twice, and all that activity coalesced to a single term sheet. Despite all that interest from venture capital groups, only one wanted to lead our financing."

"Our forecast had been that we would finish 2001 with £40,000 in the bank, and we did. Our burn rate was still £80,000 a month, but we'd already taken action to generate cash and were able to continue until June 2002 without further capital-raising. For example, we got a government R&D tax credit, did contract work, took a loan underwritten by the DTI - anything to bring in cash. But we kept going and were able to close the venture capital round. We'd been selective over who came in, and had attracted companies like BASF, and Ngen, a Californian fund of funds whose investors are DuPont, Unilever, Boeing etc. - big multinationals interested in material science."

"The lead was taken by VCF Partners, a UK fund representing two VCTs, Trivest and Foresight. Northern Venture Managers came in, as did Generics Asset Management - a solid group of investors, with capacity to follow on."

"We started the financing round in September 2001, with too little time to do much preparatory work, but initially only one thing mattered. Short-term cash was more important to our future survival relative to working on our core projects. It was a difficult time for many people in Oxonica, because we kept changing priorities. If something else could generate immediate cash, we switched to doing it. Yet we didn't lose a single employee, of the twelve we then employed, through the whole of that difficult year. We closed the financing in June 2002, and could really drive things forward. From those twelve people we are now 30, three of them in Hong Kong."

"That 2002 VC round bought in £4.2 million. Another rights issue at the beginning of 2004, raised another £4 million. The majority of that was from the existing investors., and Quester came in."

Our current work is in the following

1) Greater fuel efficiency

"In fuels, Envirox, a product developed by Oxonica based on un-licensed technology, changes the combustion process in a diesel engine. With little initial evidence to support its claims, we banked on an instinctive feeling about Envirox and have now demonstrated a clear fuel efficiency benefit in heavy diesel engines both in laboratory and field trials. It is between 5% and 10%, depending on the customer environment."

"We are going directly for big fleets, specifically buses, which have their own fuel tanks in their depots, where we can put our additive. (One litre treats 4000 litres of fuel.) We are also approaching oil-marketing companies, but not yet. Our commercial focus is on validating the product at the end users' sites and generating short-term revenues which will support our approach to oil companies and their lengthy due diligence processes."

"Our price takes between a quarter and a third of a customer's saving from using Envirox, and that is economically attractive to fleet operators. But Envirox also reduces particulate emissions from diesel engines, so giving environmental benefit – and PR value - too. Transport companies are under great pressure to reduce emissions, not least when seeking franchised routes, so what we've done is quite neat. We sell Envirox on the economic argument, but there's a strong environmental argument as well."

"All is patent-protected, with about 17 years to run, and to push forward commercialisation we're running field trials. An extensive year-long UK trial, with Stagecoach, on 1000 of its buses, will soon end and its results, we believe, will be attractive to Stagecoach."

"Another fifteen trials are running in Asia. It's taken time both to organise the logistics of the trials themselves, and also to bring potential customers to a point where they're comfortable with the product, and with the idea of putting it into their vehicle fleets. That has meant quite substantial engine testing."

"The catalyst is contract-manufactured in Australia, since our business model concentrates on marketing and technology, with integration forward through distribution or partnership deals. We focus on adding value – matching market need to new technology. Cash flow is not positive yet, with full adoption still to occur, but 80% of our revenue is coming from Envirox."

2) Sunscreen cosmetics

"With the sunscreen cosmetics, our technology provides ultra-violet absorbers to protect people, certainly in sunscreens, and extends into anti-ageing. There are two types of current UV absorber - organic and inorganic. There are also two types of radiation – UVB and UVA – and there is growing concern about UVA, which may damage the skin. Conventional organic absorbers are not

particularly efficient in absorbing UVA and Boots has introduced a star rating, which shows how good a product's UVA protection is."

"Inorganics, however, can also have disadvantages because they are photoactive, and when absorbing light form highly-reactive chemicals - free radicals - which themselves age and damage skin. Oxonica has therefore developed a technology that changes the solid state physics of inorganic materials, so that they absorb UVA radiation and don't form highly reactive chemicals. We can therefore develop effective and stable products, formulating 5-star additives to sunscreens that have good, stable formulations."

"We launched this product in April 2004, made our first sale in October, and are discussing the product with major cosmetics companies in order to get access to the market through conventional brand names. And we've agreed that a large Belgian company will manufacture our basic material. All this is a global issue, so there is interest in Asia, Australia, and the USA."

"The patent for this technology belongs to Oxford University, with Professor Peter Dobson the lead academic. We are not aware of a competitor that has an equally effective product. and our anti-ageing facial cream could be out next year."

3) Bio-diagnosis

"On bio-diagnostics, we decided our in-house technology wasn't sufficiently differentiated, and in-licensed some technologies from Strathclyde University, hoping to tackle three challenges." "First, diagnostic capabilities are lagging so there's a huge technology requirement there. Second, pharmaceutical companies are recognising the need to develop drugs linked to diagnostics tests. Third, adverse drug reaction is very significant – the fourth largest killer in the US - leading to a need to screen out those at risk."

"The technology is based on silver nanoparticles which, in combination with dyes, lead to an immense amplification of a normally weak spectroscopic technique called RAMAN. The enhancement is such that the marker is 1,000 times more sensitive than conventional fluorescent labels. In addition each dye is unique and hence we can carry out multiple simultaneous analysis at the same time."

"These are still research issues, which is why we in-licensed the Strathclyde technology. We also secured a substantial DTI Exceptional Smart Award early this year, to part fund the research - £450,000 over two years. So we intend - by early 2005 – to demonstrate a performance benefit from developing the Strathclyde technology."

4) Other research

"We are also researching an area where we can develop our cosmetics technology, namely to stabilise polymers in coatings and in other materials."

Further finance

"Our cash will last until early 2005 and we are already working on a plan to raise more. The situation is stable because our burn rate is still manageable."

"We plan, at some point in the next couple of years, to do an IPO, to raise substantial cash, to really strengthen the company and broaden our pipeline of opportunities. Because we're in nanomaterials globally, levels of research investment by governments and industry are significant with lots of science being developed. So I'd like to position Oxonica as a technology developer that can match market opportunities, moving on to focus especially on health care and on environmental areas, like alternative energies or improved energy use."

Kevin's lessons from Oxonica

Kevin reflects on what Oxonica has taught him. "I've thoroughly enjoyed my job. Money-raising can get concerning but provided you believe in the company and in what you're doing, you must give it your best shot. Ultimately, you'll succeed. Trying to drive through a new technology is extremely difficult, whether in a large or a small company, but I am sure our team and investor base are both good. I believe all markets are conservative; nobody likes change. So if you want to introduce new technology to a market you need to get an individual within a customer organisation who will support you - a champion. Otherwise, the best you get is somebody who's passive. The worst is somebody actively against you."

"When you're trying to introduce a new product technology, the number of hurdles you must jump is high. So you have to motivate the team and keep them driving forward in the face of the odds. That's an interesting part of the leadership challenge."

"My recipe is this. First get everybody bought into what you're trying to achieve - to feel ownership. That's true for the whole company, not just one function, or research process or product. All must feel ownership of company success. Provided you give everybody transparency about the aspiration, and involve them in conversations about how to achieve it, you create a motivated team."

"My biggest challenge when I joined Oxonica was to stop people doing research and accept the need to look outside, and to be more inventive in application of the technology. If a particular technology wasn't good enough to satisfy an application, we should not immediately kill that project but seek another technology. Only if we can't find a better technology do we kill the project. It is all about giving people the opportunity to influence their own future."

Douglas Hague and Christine Holmes, December 2004