

Sustainable Roof Coatings – An Interview With Rex Lehmann SkyCool CEO

Interview conducted by G.P. Thomas

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insights from industry

Rex LEHMANN

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In this 'insights from industry' article, G.P. Thomas talks to Rex Lehmann, CEO of SkyCool, about energy efficiency and innovative roof coating solutions.

GT: Could you please provide a brief introduction to the industry that SkyCool works within and outline the key drivers?

RL: Well above and beyond the media & political crescendo that has been building over the saving of energy there is a growing need across the whole of society to drastically reduce our electrical energy needs – both here and overseas. Gone are the days of electricity costing 5 to 10 cents per kilowatt hour, even in Australia with its once relatively low cost coal-fired generation. The main driver for the dramatic price hikes over the past few years has been the refurbishment of aged and failing infrastructure for generation and distribution.

One of the greatest demands for this energy is in peak load air conditioning. Generally, it takes 3 to 5 times more electricity to cool a building that it does to warm it. This is especially true for metal roofed buildings with very large roofs like shopping malls, airports, warehouses, etc. It is estimated that in Australia there is about 400 million square metres of these types of structures. If only 25% of that is air conditioned, then that creates a huge demand for air-con energy. Typically, these buildings spend up to 60% of their total energy on cooling – many amounting to more than \$1 million per year.

It is this pain which SkyCool addresses directly; and in a completely maintenance-free manner.

GT: Could you please give a brief overview and company history of SkyCool?

RL: After working with a very talented industrial chemist from Perth, the principals of SkyCool Pty Ltd and I commenced the marketing and PCT patenting of the coating after a detailed examination from the Chair of Applied Physics at UTS in 2001. Extensive field trials with national blue-chip companies confirmed the UTS findings that the coating will lead to air-con energy savings of around 50%.

Taking the usual self-funding sources – mortgages, family & friends – plus a small amount of angel funding (which has since been repaid) the company commenced marketing. Although the limited funds restricted it to mostly organic growth, it did buck the trend of many others (large & small) and came through the GFC to produce growth in the year just past of 80% and EBIT of 122%.

There are now around 500,000 sqm of SkyCool roofs in Australia.

The company has also established a foothold in South East Asia through its Singapore subsidiary, SkyCool Pte Ltd. Conservative optimism has us expecting some global blue-chip business in that region within the next several months; but it has taken quite some time and effort to get there.

GT: Could you briefly explain how your roof coating technology works?

RL: SkyCool has a 2-stage performance:

1. It exhibits a very high solar thermal reflectance of 85-90%; and that combines with,
2. A very high thermal emittance – 94% - which works both day and night to produce a building interior which is considerably cooler than the external shade temperature.

The combination of these factors to such a high degree has been described by both CSIRO and QUT (as well as UTS) as being quite rare for a single paint coating. It is this uniqueness which has enabled a successful series of patent applications.

Another important factor is the robustness of SkyCool in the harsh high UV environment of an Australian summer. Many other coatings lose up to 30% of their thermal performance within the first 2 years. UTS re-measured the SkyCool after 7 years and found no more than a 2% reduction in its reflectance and 0% reduction in its emittance (or radiating) power.

On top of its powerful thermal properties, UNSW also tested its water (and methane) resistance and found it to be waterproof. This means that the coating will protect roof assets thereby significantly extending effective life and reducing maintenance, to the point that Melbourne Airport reported that its coating has saved them in excess of \$1.5million – on top of the considerable energy savings.

GT: What benefits does your roof coating have over traditional insulating materials?

RL: Insulation does not actually stop heat transfer, it only slows it down. Very heavy (& expensive) roof insulation can slow solar heating so that the sun has set before its full load has entered the building, hence it feels cooler. However, the heat which has passed through, plus internal heat cannot escape overnight.

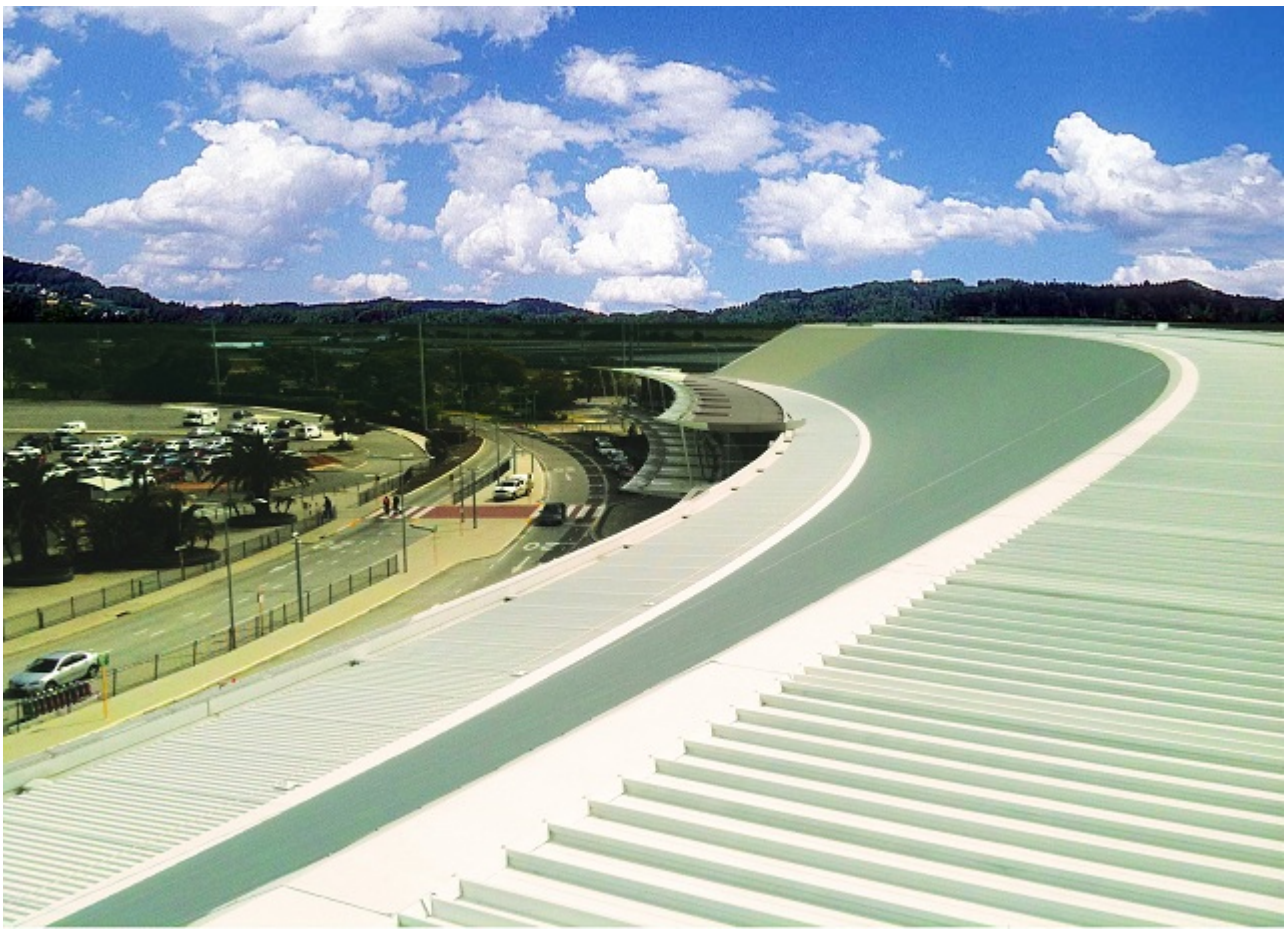
This is where the SkyCool advantage excels. It prevents the heat from even contacting the roof substrate in the first place, and it encourages internal heat to exit the building day and night. Thus, it is, in the words of UTS, a “passive heat pump.”

Of course we can add in the roof protection qualities which traditional insulation actually makes worse if moisture becomes trapped between the roof metal and the insulation layer.

GT: What are the environmental benefits of the SkyCool technology?

RL: There is extensive knowledge (from IPCC and many other scientific bodies) of the “heat island” effect produced by our increased urbanisation. This is deemed to have a very negative effect on the global environment. The heating arises from pavements and building roofs.

But, when SkyCool cools a roof (in some measured cases from 87°C to 30°C) it creates a cool oasis in the middle of the heat island. In 2010 Lend Lease engineers (in conjunction with UTS) examined this effect and concluded that it was so powerful that they recommended to an international forum that industry standard building modelling tool must be revised to account for this effect.



SkyCool is used at Perth Airport, Australia

GT: Does the SkyCool technology work in a range of climates and environments?

RL: No membrane, including SkyCool, which is only 1mm thick – or less – can insulate. This is contrary to some other coatings marketing claims. Thus, SkyCool is not an insulating coating and, therefore, not applicable for cooler climates. 12 years of experience has instructed us that the coating works best between the latitudes of 40° North and South.

GT: What are some of the applications of the SkyCool technology?

RL: In addition to what we have already gone through, SkyCool can also eliminate the solar thermal shock on concrete roofing. That is, when a concrete surface is subjected to large temperature changes it tends to develop fine cracks. These cracks permit the ingress of moisture which further impacts the integrity of the concrete and can even penetrate to the reinforcing steel, causing expanding corrosion.

SkyCool, applied to a concrete surface will eliminate this solar generated “thermal shock”

and help maintain the primary integrity of the concrete. Applied to and already damaged surface, the coating will seal up the fine cracks against moisture as well as prevent further deterioration.

One interesting use of SkyCool water & methane resistance was in combining it with “geotech” fabric to create a sub-floor methane barrier for a retirement village build on reclaimed land.

GT: Is the SkyCool technology easy to install in a building?

RL: SkyCool is water-based and 70% solids. Thus, it is very eco-friendly to apply, having no VOCs. The company maintains tight control over all applications to ensure that the customer receives the energy savings it has bought. There are no primers required on a correctly prepared roof substrate; and that is usually prepared with plain water and our own purpose developed nylon scrubber.

Properly equipped, trained and certified applicators can complete a project at around 1,000 square metres a day for a two man team for most standard unobstructed roof.

GT: SkyCool has recently been selected as a finalist in the Australian Clean Technologies Competition 2012- could you tell us a little bit more about this and what it means to the company?

RL: I have to say that we have been very pleasantly surprised by our success to date in this competition. It probably could not have come at a better time as we feel that we have possibly come to the limit of organic growth under the current sales resource. If the company is able to eventually realise the investment it seeks, then it will move into an entirely new paradigm with accelerated growth built upon its current customer base, market penetration and proven delivery profile.

We also appreciate that the publicity of the competition also significantly enhances even the current market exposure for the company.

Very importantly, the competition has opened doors to high value expertise at low (to zero) cost enabling us to build our corporate pitch. A vital effect of this is the reflective examination of the company, its current operation and where it should be in the near term. Several existing stockholders are very interested in the progress and might be stimulated to join others in moving the company (and their investment) rapidly towards those goals.

GT: Do you feel enough is being done to promote growing cleantech companies in Australia?

RL: For far too long Australia has been dependent upon its natural resources – from “the sheep’s back” to iron ore – and needs to seriously invest much more in local secondary and tertiary manufacture as well. My personal background in Information Technology saw clearly just how much the US governments as well as industry were prepared to pay a premium to build the local industry instead of following the “cheapest is always best” mentality. Australia’s lack of that drive at different times in our history is now costing us dearly.

Therefore, anything and everything we can do promote the development of local cleantech is vital. In SkyCool’s case, we believe we have been able to develop a manufacturing model which can service the global market from Australia very cost effectively in overseas markets. Of course, this produces an export stream which is not under threat from jumping off-shore at the first opportunity – providing our tax regime does not undercut these efforts.

The help and support we have enjoyed recently is excellent; and that comes after seeing so many government programs start up, then close down (very suddenly in some cases) before real traction had developed within the industry at large. The effort right now is great, but it needs to be sustained and build upon by all of us. That requires courage (probably a dangerous word in investment circles) in both government encouragement (not just hand-outs) and amongst us all.

GT: What does the future hold for SkyCool? Do you have plans to expand your range of products?

RL: SkyCool recently won a million dollar grant from the Singapore government for R&D enhancement of its coating to incorporate nanotechnology. This is in conjunction with their universities, and is managed through our Singapore office. It will give us three important advantages:

1. Excellent exposure within the SG government and industry at large.
2. Patent enhancement potential for extending it another 20 years in the US, Australia, Singapore, China, Philippines, Indonesia & South Africa.
3. A product which is ever more contaminant shedding for a much longer time without having to resort to large amounts of traditional chemical solutions.

The near to mid term focus for the company is to capture a significant portion of the global market for the existing / developing product. A 1% global market penetration would mean

\$2 billion in turnover, and \$20 million in Australia. Clearly, the exercise is to go global leveraging from a solid local platform. There are multiple vertical global markets for which SkyCool has an established local launch pad: airports, shopping centres, warehouses and temperature sensitive large storage centres.

Movement into other products would not be at the expense of the current core product.

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SkyCool Pty Ltd is a company of the new millennium, formed specifically to bring the SkyCool heat reflective thermal cool roof coating to the world community. We are very proud of the fact that SkyCool was developed in Australia and is attracting interest from around the world. Since its' establishment the company has had the opportunity to prove both the uniqueness and the roof cooling effectiveness of SkyCool from the tropical north of the country to the temperate zones 3,000 km to the south.