



Australian Government

Chief Scientist

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The Chief Scientist was invited to address the 'Australia Now' Innovation Forum in Berlin, as the head of the Australian Innovation Delegation to Europe.

The German Way

When Australians say that something is “German design”, we mean it’s elegant.

When we say that it’s “German engineered”, we mean it’s reliable.

When we say that it’s got “German precision”, we mean it’s efficient.

Volumes could be written about how Germany’s reputation was achieved. With typical German efficiency, the Leopoldina sums it up, in just two finely calibrated words.

Its motto is simply *nunquam otiosus*: “never idle”.

There is a corresponding mantra in German industry: *Wer rastet, der rostet*. Loosely translated: “If you rest, you rust”.

And there you have it: how to become a science super-power, and supplier of choice to the world.

Never rest. No matter how good you are, there is always a better way. And there will always be people striving to find it.

Just make sure those people are well trained, and working for you.

“If you rest, you rust”

This logic has not just built the German innovation engine – it has made Germany the partner of choice for the realistic dreamers of the world. Those with big vision, and clear eyes.

And that’s a rare combination, particularly when it comes to the most intractable problems humanity has to face.

Rising to the energy imperative

So it’s no wonder we Australians keep returning to Germany.

I was here myself in February, working on my own intractable problem: designing the blueprint for the future of Australian electricity supply.

Our National Electricity Market is big: the longest interconnected power system in the world. And, of course, it’s uniquely Australian.

I was enormously impressed by everything I saw in Germany; and found many ideas with practical applications to our grid.

For all our differences, our goal, and the German goal, is the same. Make energy secure, affordable and reliable for consumers – but do so in ways the planet can sustain.

And *ride* the technology wave – don't be caught in its rip current.

A goal that's easy to say, but hard to fathom.

The energy sector is huge, it accounts for some 10% of global GDP. That's the supertanker we're trying to turn around – with more than seven billion humans on board.

Turning the ship isn't easy and doesn't always go to plan. Surprisingly, despite all the investment in renewable energy, the percentage of coal in the global energy mix is, perversely, growing: from 25% in 2000 to 29% in 2015.

The cost of batteries is certainly plummeting, on a similar curve to solar and wind – but if we took the total global battery production of all types in 2014, we could meet the global electricity demand for a mere eleven and a half minutes.

So where can you possibly begin?

Now there's a long and complicated answer to that question. But since I'm in Germany, let me answer it efficiently instead.

Here's my formula:

*Research turns money into knowledge
Innovation turns knowledge into solutions*

Science. Ingenuity. Potential.

We've often seen this combination deliver solutions to huge problems.

Think of the eradication of smallpox, by the spread of vaccination. Or the empowerment of the poor, by the spread of the mobile phone.

These were revolutions that played out in our lifetimes: in public health and ICT.

I firmly believe that the transition to the low-emissions planet can also be solved – and life will be better for all of us as a result.

All we have to do is to take the basic formula. Study its dynamics. Then calibrate the inputs from government to unleash the industry-led returns.

Tritium: a case study in Australian strengths

We know something about that process in this delegation.

It's the curse of travelling with leaders as interesting and determined as these: too many examples and not nearly enough time.

So let me pick out one company's story instead, one that I was incidentally involved with when it started its growth spurt. In Germany's honour, it's a story about cars.

What's the annual carbon dioxide output of a standard petrol car? About 5 metric tonnes.

How many cars do we make globally in a year? More than 80 million.

How many of those cars are electric (or hydrogen)? Fewer than half a percent.

So every year we make enough new cars to produce almost as much carbon dioxide as the whole of Australia. And that does not count all the existing cars on the road.

If we want to break the back of carbon dioxide emissions we need more electric cars.

So, we've got a problem to address.

The problem is not the look, acceleration or sophistication of the cars. Trust me, I drive a Tesla: it drives as well as it looks.

The big barrier to take-up is keeping it charged, particularly for owners who do not have off-street parking. A problem! And here's where a journey to progress begins.

Start with a group of engineering students at a university in Queensland.

Set them a challenge: build a solar car to race across the Australian desert, all the way from Darwin to Alice Springs.

Nurture their ideas in hubs for cutting-edge science and research.

Challenge them to do things they haven't done before.

Take their technology through proof-of-concept, in collaboration with established firms.

Support them through the Valley of Death with public seed funding, and government support for market-scale demonstration projects.

Then watch them sell their technology across the world: with a gold-standard product for the global market; and a business model proven to work.

The name of this particular Australian company is Tritium. It's exhibiting at the Hannover industrial fair this week. And its product will soon be very familiar on European roads.

It's not a car, but a fast-charge station: capable of charging an electric vehicle battery twenty times faster than plugging in to a standard socket. In just ten minutes, it can add 50 kilometres to the dial.

It's smaller, runs cooler, and is more efficient than the competition.

Tritium is now the supplier of choice to the German company E-WALD, with its network of charging stations across the country.

And it is well-positioned to support Germany's push to re-wire for electric cars.

The official German ambition is one million electric cars on the road by 2020.

The Bundestag has spoken of going further – with a ban on the sale of combustion engine cars as early as 2030.

With a German foot on the pedal, we can be confident that the technology will improve, production will become more efficient, and costs for the consumer will fall.

So our electric transport revolution moves into sight: with science, skills, innovation, a bit of strategic support, and global partners to enable action at scale.

Conclusion

Tritium is just one company, making inroads on one challenge. Right across our countries, there are countless more.

They won't all succeed – but some of them will. Especially if we approach the task in the best tradition of German engineers.

Wer rastet, der rostet.

If you rest, you rust.

In any language, the answer is clear.

Thank you.