

## How to foresight?

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Thank you to my friend Theo Lehner, and the other seminar organisers for the opportunity to speak with you today, and especially for accommodating my request to join you by video instead of being there in person.

Actually, my intention is that the act of giving my presentation by video will itself be part of my response to the question “How to Foresight?” I’ll talk more about this at the end of the presentation.

Before I focus on Theo’s very practical question of “How to Foresight?”, I think there are two background questions that I should first address.

These questions are:

- 1) What is foresight anyway, and what does it have to do with metals recycling? And;
- 2) Why me? Why should *I* speak to you about this?

I’ll start with the second question first, by saying a little about my background, and from this you will hopefully see some links emerging.

First, some relevant personal history. In the winter of 1992 to 1993 I worked at Boliden’s Rönnskär Smelter, doing research into the blending of copper concentrate and flux. This project was for work experience as part of my mechanical engineering studies in Australia.

You can see to the left of this plant diagram where it is that I spent my time...and as you can see it is off the edge of the official map—which was perhaps a sign of things to come.

And this is a photo of my office, which I hear is nice in summer, but quite chilly in winter when I was there. Theo took this photo last week, and it is good to see that the feed seems to be quite well blended these days.

And then for the first ten years of my career I worked in metallurgical technology development with Ausmelt, and I guess some of you here today know of this company. For those of you who are familiar with the other Floyd involved with that company, you might also guess that my less formal involvement with metallurgical technology started much earlier, in fact in the early 1970s as soon as I was old enough to ask my father what he did when he went off to work each day. Here I am helping to set up an early Sirosmelt demonstration plant.

But even though I have been involved in this area for a long time, my interest has never been in technology alone—I am really more interested in the deeper social context for this.

Exploring this deeper social context meant asking questions such as “Why do we want this technology in the first place, and what are the most fundamental aims that we are trying to achieve with it?”

I wasn't very satisfied with answers to these questions that were given only in terms of “tonnes per annum produced”, or even in terms of “tonnes per annum recycled”.

Also, I didn't find people working on the technology side had much time for these questions, so I decided to see if there might be other places where these questions were being taken more seriously.

A few years ago I discovered a field where these questions were seen as critically important and as a result I now have a Master of Science degree in Strategic Foresight.

Around the same time I started teaching in a new post-graduate course in sustainability, alongside a colleague who started out in this area in the 1970s through the International Master's Program in Environmental Science at Lund University.

The approach that we take in our sustainability course has some close parallels with the Lund University program, and so you could say that the Swedish connection continues for me.

My work now mostly involves bringing a strategic foresight approach to teaching sustainability thinking and practice, and also assisting organisations to develop their capacity for navigating increasingly complex operating environments.

So this brings me to the other background question that I started with: What is foresight, and what does it have to do with recycling?

Firstly, what is “foresight”? The everyday use of this term relates to the capacity of individual human beings to think about the future, originally for the purposes of meeting survival needs and avoiding dangers, and then later in our history for the purpose of exerting some level of control over our environment.

This is the foundation on which the concept of foresight is based, but *strategic* foresight goes much further.

For most of us as individuals, foresight capacity is innate—it is a raw capacity of our brain-mind system that we use without much reflection. Strategic foresight involves development of this individual, raw capacity into a more methodical collective capacity to create coherent, high-quality forward views that are applied in organisationally useful ways.

In particular, its development involves the cultivation of at least three layers of collective capacity, with each subsequent layer incorporating and then building on the previous layer.

The three layers are:

- 1) Rigorous concepts and language for thinking together about a shared future.
- 2) Methodologies and tools for creating a shared forward view.

- 3) Organisationally embedded processes for continuously recreating the forward view and using it as the basis for making decisions and taking actions in the present.

When I talk about “organisation” here, I mean any situation where a group of people comes together for a shared purpose, so this could be a formal organisation such as a business, a government body, or an NGO, but it could also be an informal group. The main point is that strategic foresight becomes part of the group’s cultural norms, that it’s the focus of reflective attention and ongoing development, and that it’s linked intimately with the group’s pursuit of its core purpose.

The concept of strategic foresight as an organisational capacity was first proposed by Richard Slaughter, and it has its origins in the field of futures studies. Slaughter was interested in how futures studies methodologies could be integrated with strategic management approaches to allow organisations to thrive better in increasingly dynamic environments.

But Slaughter has also proposed that the ultimate goal of organisational or strategic foresight should be to cultivate *social* foresight. I usually distinguish now between strategic foresight and social foresight on the basis of the ends that are served.

If the foresight focus is primarily on “what is good for our particular organisation”, then I would describe the approach as strategic foresight.

If on the other hand the work is carried out with an explicit understanding that organisational boundaries are quite arbitrary constructs, and that what is good for my particular organisation is intimately interdependent with what is good for humanity, other species and the planet, then I would tend to characterise this as an example of social foresight. A long term goal would be for social foresight to be embedded as a cultural norm throughout the global community.

So this gives some background on what I mean by the concept of foresight. But the other part of my question was “What does foresight have to do with metals recycling?”

In order to understand this, my suggestion is that we need to consider the technological dimension of metals recycling within the broader social and cultural contexts in which recycling is carried out.

And what I mean by this is that the technological aspects of metal recycling are obviously very important, but they are really only one part of the overall picture—recycling is not something that happens on its own, in isolation from other human activity systems, and in order to understand those activity systems we need to take a much broader view. This can be illustrated very simply via an example from my time at the Rönnskär smelter in 1992.

One of the first things that I was shown at the plant when I arrived was how E-waste was being processed as a regular feed stream in parallel with the concentrate. So 16 years ago, the technical challenges of recycling metals from discarded electronic equipment were being accommodated very nicely in Sweden.

Roll forward to today, and in Australia, we find that while a significant proportion of E-waste is eventually recycled by sending it to other countries, a vast amount of valuable material is simply dumped in landfill.

In fact, it is estimated that 1.6 million personal computers are dumped in Australia each year.

So what is the difference between Sweden in 1992 and Australia in 2008, in technological terms?

I think the answer to that is clear—there is no fundamental technological difference. Rather, the difference relates to our ways of organising our human affairs and activities together.

In order to understand why the valuable materials contained in Australian citizens' discarded electronic equipment are not recovered and reused locally, we need to look at the social arrangements, political systems and cultural norms prevalent in Australia.

This means considering our purposes, goals, interests and values, and asking questions such as “what is important to us?” Foresight practice, at its best, means engaging with these sorts of questions.

And so with this background to set the scene, I think I can now return to Theo's question, “How to foresight?”

Theo's phrasing of this question is very important, because it emphasises the active, practical nature of “foresighting”. Foresight is not just something we can “have”, it is something that we can do, by engaging in certain practices with other people.

And this is quite different from less sophisticated understanding of foresight in the past, where foresight was seen as some special gift possessed by oracles and fortune tellers in pre-modern cultures, or by so-called “genius forecasters” in modern cultures.

Earlier I mentioned that foresight practice has its foundations in the 20<sup>th</sup> century futures studies field. This often prompts people to draw associations with high-profile futurists such as Alvin Toffler and Herman Kahn and popular writers such as “Megatrends” author John Naisbitt.

Recognising foresight as something that we do, rather than as a natural gift or talent available only to special individuals, lays the foundations for seeing foresight culture as something that can be nurtured and grown within organisations. Growing such a culture offers very significant benefits to organisations in terms of more responsive and proactive engagement with challenges emerging in the organisation's environment.

A fundamental principle relating to this is that the strength of a culture is dependent on the basic philosophical foundations that it rests on, and this is no different for foresight culture in organisations.

There are three basic principles that are very important in this regard. These principles were proposed by the futurist Roy Amara in the early 1980s. The three principles are closely interrelated.

- 1) First, the future is not predetermined.

The future state of any real system is dependent on complex interactions within the system and between the system and its environment. These complex interactions are characterised by emergent processes producing novel outcomes, and so the present state of a system does not fully determine all possible future states.

In other words, there are multiple possible futures for any real system. Any system for which the future state is subject to decision-dependent behaviour of human beings illustrates this principle very clearly.

- 2) Second, the future is not predictable.

Following from the first principle, if the future is not predetermined, then our knowledge of future states must always be incomplete and hence we could not describe the future state of any system with complete certainty from the present. In other words, our knowledge of the future is characterised by irreducible uncertainty.

Of course, we can make predictions within certain narrowly defined boundaries, but the actual outcomes to which these predictions relate might always turn out to be different due to unforeseen influences and novel emergences, so nothing is guaranteed.

- 3) And thirdly, future situations can be influenced by individual decisions and actions.

This follows closely from the first principle, and leads to the second principle. If the future *is* predetermined, then knowledge about the future is of no value as we can't change a predetermined outcome—to do so would mean that it was not in fact predetermined.

And if the future *is* predictable with no residual uncertainty, then we could know in advance exactly what will happen. We could then take action that would change that outcome—making the original prediction invalid.

To summarise, in a world where the future is not predetermined, future outcomes are open to the influence of individual decisions and actions, and these future outcomes are hence not predictable in advance. So these are the basic foundations for effective foresighting.

With these foundations to stand on, I'll now talk a little about three distinct modes of futures thinking and practice, and how these relate to organisational foresight practice. To link this discussion with our current focus on metals recycling, I will also suggest some characteristic foresighting questions that might be asked in each mode of futures thinking.

- 1) The first mode is the predictive mode, and as you might suspect, this mode has some problems on the basis of the second principle that I just described.

The aim of this mode is to “know *THE* future”. In other words, if the aim is to predict with certainty, then there can only be one possibility.

This mode places attention firmly on the exterior environment. Because the emphasis is on what *WILL* happen, there is not much need to consider the relationship between the person who makes the prediction and the actual content of the prediction.

On the other hand, if the prediction turns out to be wrong, there is usually much attention given to that person, including accusations of incompetence and laying of blame for all the problems that follow!

In terms of specific methodologies, this is the realm of forecasting, although outputs from forecasting work are often specified in terms of a range of magnitude, rather than as a single point. In other words, forecasting aims to pin down the most *PROBABLE* future, but allowance might be made for error in identifying this future.

Even so, forecasting tends to take a very narrow view in that the future is considered in terms of some assumed set of parameters, often only one parameter—but *how* do we decide which parameters to forecast? And *who* decides? Why are these parameters the most important ones? These questions are not usually asked.

In terms of metals recycling, the predictive mode would be characterised by questions such as “How much E-waste will be available as feed for our smelter in 5 years?” or perhaps “What materials separation technology will be required for recycling car bodies 10 years from now?”

- 2) This brings us to the second mode of futures thinking, which can be called the anticipatory mode.

The aim of this mode is to pre-empt multiple *POSSIBLE* futures. The future is understood here in terms of degrees of uncertainty. For some aspects of the future, uncertainty is relatively low and the aspect under consideration can effectively be assumed as predetermined.

An example of this might be the relative proportions of steel and aluminium in automobile bodies that will be recycled 10 years from now. We know what this proportion is for cars being manufactured today, and we know that in 10 years so many of these will be recycled, so there is relatively low uncertainty about this.

But overall, the future is characterised by irreducible uncertainty. For example, the amounts of battery materials from hybrid cars that will be available for recycling 10 years from now would be far less certain.

The emphasis in this mode is on what *MIGHT* happen, but more importantly, the focus is on the underlying structures influencing what might happen, and on identifying the most significant causal drivers of possible outcomes.

The characteristic methodology here is scenario planning, and it is usually supported by environmental scanning. The focus is still on the organisation’s exterior environment, but now it is more likely that practitioners will recognise that the possibilities they see in

relation to the exterior environment are shaped by their own interior maps of reality. In the anticipatory mode, the best foresight practice involves deeper reflection on our own biases, mental models and world views.

In terms of metals recycling, the anticipatory mode would be characterised by questions such as “What are the possible mixes of materials that might be available for processing in 10 years time?”

But a more important question might be “What are some of the fundamental determinants of metal availability for recycling in 10 years and how might these determinants interact to shape our operating environment?”

Other questions that could be explored in the anticipatory mode include “How might community attitudes affect the demand for recycling services on one hand, and the acceptability of current processing technologies on the other?” Or perhaps you might ask: “How might metals recycling be affected by greater use of bio-materials or bio-processing technologies?”

### 3) The third mode of futures thinking is the normative mode.

The aim of this mode is to imagine, define and create *PREFERRED* futures. In this mode there is deeper understanding of the relationship between our external reality and our internal world of values, aspirations, intentions and cultural norms.

The characteristic methodologies of this mode are visioning and design. But these are not sufficient on their own—in order to work effectively towards preferred futures, vision and design must be tightly coupled to committed action, and this means that our ways of organising human activity systems must be sufficiently responsive and adaptive.

Best practice in this mode will also be characterised by a deep understanding of social construction. This means that we need to understand how the things that we create in the world around us are intimately linked with our cultural myths, our norms and beliefs, our language and concepts, and our underlying philosophical systems.

And moreover, we need to understand how the things that we create in the world—including not only our built environment, but also our institutional systems—come in turn to shape our norms, beliefs, language and concepts.

In other words, effective foresight work requires that we see our own role in creating these internal drivers, and hence opening them up to examination and renewal.

In terms of metals recycling, the normative mode would be characterised by questions like “How can we use autonomous systems based on robotics and nanotechnology to maximise our profits from metals recycling?”

Or maybe your question would be something like “How would we like metals recycling to contribute to a harmonious relationship between human activity systems and biospheric systems?”



Or taking it even further, maybe you will ask “What role should metals recycling play in a society where *BEING* needs are emphasised over *HAVING* needs?”

Now just in case this last question sounds irrelevant for your situation, this is the book in which I found specific reference to exactly this matter—I think some of you may be familiar with this book, so perhaps this isn’t so distant from metals recycling after all.

So this is a basic introduction to the three general modes of futures thinking, and the important point to note from all this is that foresight practice draws on all three modes.

Forecasting provides basic inputs about future trends, based on the way things have been organised in the past and the way we are acting in the present.

The main difference with high-quality foresighting is that forecasts are not taken at face value alone—they are always treated critically, with attention given to how the forecasts were created, by whom and according to what agenda.

In this way, forecasts are taken as possibilities, rather than concrete predictions. They are an input to the environmental scanning process for building up a picture of what *seems* to be happening in the world.

But foresighting aims to move well beyond “what *seems* to be happening”.

Before talking about what might happen in the future, and where we would like to go, foresight practitioners try to understand the deeper structures that are shaping the world around them. For the practitioner, this also means looking “inside” her or himself, to examine why it is that we see things in a particular way. So good foresight work asks questions about the relationship between ourselves as practitioners and what we think is going on around us.

In foresighting, most emphasis is placed on weaving together the anticipatory mode and the normative mode.

High-quality foresight work is based on recognising that our anticipations will shape where we would like to go, and our preferred futures will help to focus and direct our “organs of anticipation” themselves.

So we continuously adjust our goals to accommodate conditions outside our control that we see unfolding in our environment, and our continuously adjusted goals take us towards new territory that needs renewed anticipation.

Navigation is an important metaphor that it often used to understand this interplay.

And this navigation is characterised by ideas such as real-time sensing, continuous adaptation, response-ability and intentional innovation.

There are four very fundamental principles that flow out of the approach to foresighting that I have just described, and I would like to emphasise these before closing.

The first principle is that effective foresight practice requires collaboration, participation and integration of the greatest diversity of perspectives possible. This is the most authentic way for



embracing those aspects of reality and sources of creativity that would otherwise remain outside our own fields of vision.

This means that foresighting is not an activity just for the elite leaders of an organisation. Good foresighting practice will involve contributions from throughout the organisation, and from the organisation's wider ecosystem. It permeates the organisation's culture, systems and community.

The second principle is that effective foresighting is a continuous process. It is not something that is carried out during weekend retreats once or twice a year. Foresighting takes place during conversations over coffee as well as in regular, more formal events, and it is not switched on and off.

As such, there is no end-point with foresight practice, and its value cannot be adequately captured in formal documents alone—good foresight practice is alive, and it lives in continuously evolving, informal networks.

The third principle is that foresight is action-oriented. We engage with ideas about the future specifically to make better decisions and take more effective action in the present.

The fourth principle is that effective foresight practice requires practitioners and participants to “look within”.

We need to develop insight into the limitations of our own ways of viewing the world, and we need to better understand how our ways of knowing shape the possibilities we see and the actions that we subsequently take. In other words, we need to embody the understanding that transformations in external circumstances flow from transformations in our own interiors.

In relation to this last principle, I mentioned at the start that I would say a little more about how giving this presentation by video is itself a part of my response to the question of “How to foresight”.

As a foresight and sustainability practitioner, I personally regard it as very important to embody the principles that I promote in my work.

In practical terms, this involves constantly looking for opportunities to re-perceive ways of acting in the world in response to my emerging understanding of our circumstances.

Human induced climate change is for me now an important part of this understanding of reality. Given my area of work, I feel I have a responsibility to explore new ways of acting in response to this understanding.

So speaking to you today by video is a way of actively exploring other ways of living that are responsive to a reality characterised by anthropogenic climate change.

Even though some of my teaching is now done online, I have never given a presentation by video, mainly because ideally I would always like to meet in person. But if I start with this as an unquestionable assumption, then there is no opportunity to explore new ways of meeting together that use fewer resources.

Right now, the technology for doing this is quite basic. Also, it would be better if I could be with you for the whole seminar. But by suggesting this approach, perhaps I can contribute to a broader groundswell of support for developing better ways for virtual conferencing. The greater the demand for this way of meeting, hopefully the better will be the experience for everyone as our expectations, our social practices and the technology develops.

Incidentally, I recently heard Jeremy Leggett who is the founder of the UK company SolarCentury and author of a book about peak oil called *Half Gone* describe a situation where he was invited to speak at an environmental conference in the United States. He offered to speak via video, and the conference organisers refused!

So again, thank you for accommodating my personal research project, you have already demonstrated that you are very open to the foresight approach.

So this is my very general response to the question of “How to foresight”.

In closing, it’s my understanding that, in a global environment evolving in the direction of more and more complex interconnection, individuals and organisations that are able to successfully enact these principles and practices will have greatly improved sustainability and increased opportunities to thrive.

Thank you again for the opportunity to speak to you today. I hope that this might provide you with some food for thought in relation to exploring future directions for metals recycling.