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Overview:

This paper is written in two parts. Part One looks at a case study of how one Australian water agency, Central Highlands Water (CHW) has evolved its approach to thinking about and managing water assets, having been negatively exposed due to the limitations in forecasting methodologies for preparing for its future. Part Two is a truncated 'how to manual' – a step by step guide of the process undertaken by CHW which aims to guide other Water Agencies seeking a far more effective approach at planning for and managing their water assets.

Introduction

If it is reasonable to believe a large body of thinking that there is an increasing likelihood of water shortages around the world in the near future, then we can expect that those organisations charged with the management of water resources, water infrastructure and water access will find themselves at the centre of public attention.

Long before the rise of oil, water was the key factor for the prosperity or otherwise of villages, cities and empires. Water flows from the great rivers replenished fields with nutrient rich silt helping to ensure harvests for next year; rain quenched dry landscapes and delivered feed for wildlife; seas provided passage to new lands and trade exchange, as well as a resource for food stocks for growing populations. Water enabled or denied access to new countries and landscapes. Water was used (and still is) for mineral extraction, powering machines and urban renewal. It plays the single most important factor in agriculture and the ability for the world to feed itself.

With rising population rates, wide scale deforestation, climatic impacts, consumption of expendable resources, the manufacture of products and ever changing social pressures, water agencies around the world are increasingly discovering that they are a critical aspect of social cohesion.

Indeed it is water, and we would argue not oil, that is the foremost social stressor on the planet. Poor rainfall leads to droughts which leads to parched landscapes which leads to stock losses, no crop yields, poverty and famine. All too common is the social upheaval and mass migration that emerges. In more urbanised environments in developed nations, lack of water changes social structures and community cohesiveness as water agencies (in a defacto role) are called to play 'water umpire' by allocating dwindling resources to those areas that provide the greatest good to their local environments. In times of flood water courses are overwhelmed, top soils washed away and then redeposited as silt plugs in rivers and streams with long term (often negative) future impacts, vital infrastructure is submerged leading to potential and real water borne diseases and whole communities disappearing for periods or being washed away entirely.

And it is in such operating conditions that Water Agencies are being asked to navigate their strategic

thinking in order to maximise the benefits to the societies on behalf of whom they manage water infrastructure and assets. Given the challenging strategic conditions, it is becoming clear to many, that a reliance on a forecasting approach (the habit of choice in many water agencies around the world) no longer offers the level of beneficial utility it may have had in times of ongoing stability and predictability.

History is a cold blanket and forecasting is a concrete pillow

Knowing what happened in the past can be a useful input to thinking about the future. The critical mistake made by Water Agencies (and for that matter, most organisations) is when the organisation uses the historical perspective as its sole input in thinking about the future. In doing so, the organisation makes an assumption that its future will be just like its past.

And that is as invalid an assumption as anyone could make.

Whilst there are likely to be strong connections and similarities between our past and future (indeed many things would give the impression that they are unchanged from yesterday or yesteryear) holding onto the belief that tomorrow will be just like yesterday is a high risk strategy when it comes to Water Management. 20/20 hindsight is of little value when whole societies have been negatively impacted by a future that is not matched to what was expected from history.

When tomorrow does not turn out like yesterday, History is cold comfort when you are unprepared for the difference. And one of the key traps water agencies make is using 'history as future' in the guise of forecasting.

Part One

Forecasting as Oracle

If history is a cold blanket, forecasting is surely the concrete pillow upon which we lay our heads. It may feel familiar and comfortable to start with but in a very short time, we will be forced to face our growing discomfort. Forecasting is by design, an attempt to extend our history into the future.

The Forecasting Principles website (www.forecastingprinciples.com) states : '...the field of forecasting is concerned with approaches to determining what the future holds. It is also concerned with the proper presentation and use of forecasts. The terms “forecast,” “prediction,” “projection,” and “prognosis” are typically used interchangeably. Forecasts may be conditional. That is, if policy A is adopted then X will occur...'

And therein lies the first hurdle – the ability of an organisation to predict or project what the future will look like, is directly impacted by the degree of organisational awareness to potential change, as well as the degree of change in their operating conditions.

Done well, forecasting provides a useful input into potential variations of what we have today. In steady state or steady change conditions, forecasting is a reliable input into strategic thinking. Consistently organisations that use forecasting in stable operating conditions will test their thinking using a medium (expected forecast) with 'slightly more' or 'slightly less' variables used as the alternative views. People crave certainty so most attempts to ‘predict the future’ rely on the extrapolation of existing trends with perhaps some plus/minus variation just to be ‘safe’.

It must be remembered that typically the main (and often sole) input used for forecasting is history. In water agencies this would usually be seen in the 'inflows' averages and the 'outflows' averages.

The variations to forecast predictions are often drawn from an assessment of either a low or high water flow (using the historical event average) or a low or higher population (and therein demand) increases, and occasionally combinations of both factors.

In this sense, forecasting acts as the Oracle of Delphi – the predictor of a future set of conditions upon which water agencies establish their strategic framework for coming years. As Central Highlands Water (CHW) discovered (along with most other water agencies in Australia), forecasts derived from rigid planning schemes endorsed/practised by regulatory agencies were so far from reality, CHW faced insolvency and their customer base of over one hundred thousand people came within weeks of having no water at all. The key lesson we that emerges is that forecasting offers its greatest value in stable environments.

The value of forecasting however, diminishes in inverse proportion to the extent and rate of change in operating conditions.

In the diagram below, we've highlighted a visual guide as to the value of forecasting not based on any given time period (i.e.three months or five years), choosing instead to use the rate in which change is happening in your operating conditions. Time becomes less relevant as a scale of utility for across industries and sectors, it is the rate of change that acts as the criteria against which the value of forecasting is to be assessed. One need only identify the degree of stability to determine whether or not forecasting is likely to provide value to your strategic decision making.

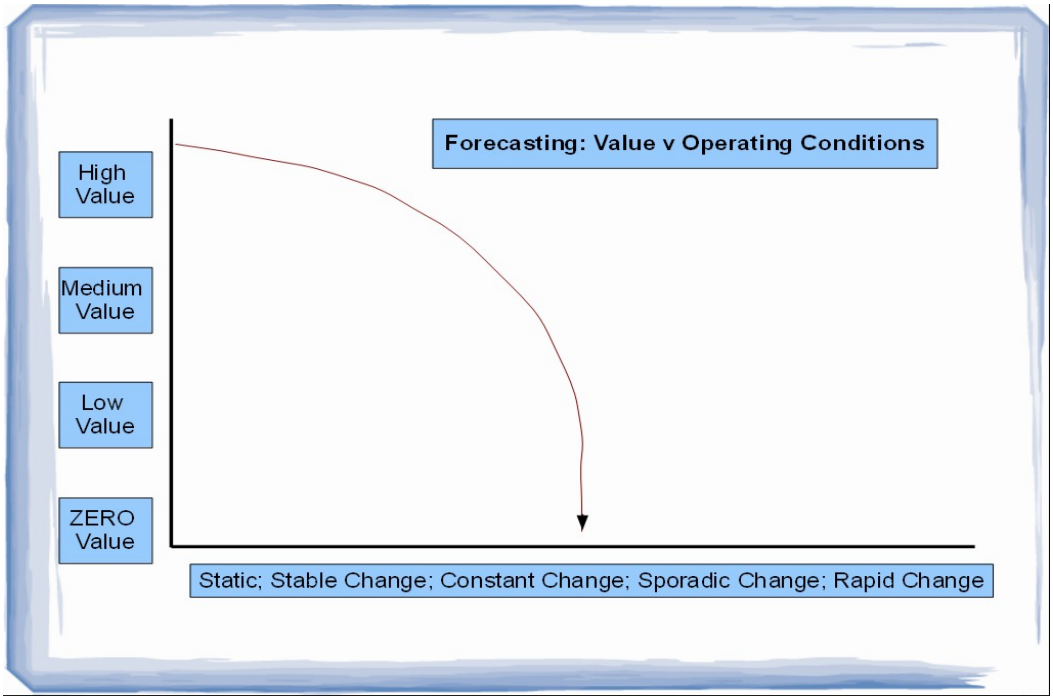


Diagram One – Forecasting Value v Operating Conditions

You can see in the diagram that we hold the view that when operating conditions move from a steady or stable state of affairs into a period of increasing change, the value of forecasting drops to zero. It could be argued that relying on outdated forecasting could in fact shift its strategic value into negative territory for it would likely entice an organisation to rely upon a set of flawed assumptions based on invalid attempts to predict the future.

In 1996 utilising forecasting as the typical approach CHW made some entirely understandable

future ‘predictions’ given the history of reliable water supply and anticipated future in regards to water resources:

CHW Prediction:

> *Alternate sources of water could be required by 2015 for Ballarat*
>
> *However, demand management is expected to extend this period by up to 10 years* (ie 2025*).*

The risk of predicting a ‘single point future’ is that invariably it does not occur . This can be put down to the influence of unpredictable occurrences like wildcard events or the emergence of new uncertainties but Marcus Barber's experience has shown that more often than not, the main cause of an expected future (forecast prediction) not being met is due to the invalid assumptions that shaped the forecast from the outset.

Within a year the 1996 CHW prediction suggesting that there was a window of almost thirty years before action was needed proved to be fundamentally flawed.

Since July 1997 the CHW catchment experienced such dire rainfall inflows that the previously 'non conceived methods of water access' became increasingly urgent as the drought intensified. Yet due to the time frame for planning and building infrastructure, they were not able to be introduced until 2008. You'll note that the introduction of these new water sources came online **seven years prior** to when it **was anticipated** that the City of Ballarat ***could require*** **alternate sources** of water. Further we see that the expected extension of the time frame out to 2025 through effective water management, reliant on expected *average* rainfalls collapsed. The CHW catchment area had a need for new water resources and assets around **25 years prior** to when it was thought they would need to be brought online.

Some of the key assumptions relied upon by CHW (and arguably almost every other agency thinking about Victoria's water future) were
- An assumption that reservoirs would ‘fill and spill’ every year
- Always expected the drought could not and would not extend past the worst ever recorded of five consecutive years of below average rainfall
- An expectation that the drought would break every year (the drought actually extended to 13 consecutive years of below average rainfall)
- The assumption there would be additional local reserves of water to utilise (but over time these would also become constrained)
- Never thought in terms of variability – only in continuation of straight line extrapolation

The impact of the limitations in thinking was that CHW held onto (or was unable to change) its previously established 'habits of behaviour' in terms of how it managed its water assets. This placed the organisation and its water customers in the precarious position of not only running out of water supplies, but also impacted the financial ability for CHW to manage infrastructure requirements. Despite a recent breaking of the drought and a return to significant water availability, the lagging impact of fixed decision-making models means that fiscal challenges remain significant due to changed consumer behaviours.

There are four important things to note here:
a) that every other water agency in Victoria and most within Australia faced extensive water shortages across the past ten to fifteen years;
b) that water management strategies, based upon the flawed forecasting model, locked in place operational approaches that proved unhelpful;

c) that expected revenue streams from water provision collapsed; and
d) that bringing online new sources of water, required a fundamental shift in how CHW managed its infrastructure and assets.

Some of the key factors facing CHW across the time frame of this case study have been:

- Massive overhaul of the water industry regulatory environment
- In 2006 just 300 ML of water flowed into Ballarat's reservoirs, compared to the long-term average of 14,000 ML pa
- In March of 2008, Ballarat's reservoirs had declined to be storing just 8% of full capacity
- Fast-tracked construction of a $180 million pipeline, dubbed the 'superpipe' connecting Ballarat to a neighbouring water catchment. This was not a 'predictable' option until just a few years ago!
- The global financial crisis

Other water agencies in Victoria have arguably been less successful at managing the transition forced upon them through the long term drought, and having barely scraped through, CHW sought out a more effective method at planning for their water future. While business strategy is about setting plans for the future and resourcing those plans, how do water agencies plan with certainty for a future that is full of uncertainty? Perhaps the phrase that best sums up this dilemma is:

"Strategy is about the future and therefore involves uncertainty."

In order to develop business strategy that recognises this, CHW realised that a new approach was needed and adopted a strategic foresight technique known as 'scenario planning'.

This technique is based on developing a broader understanding of the variables and uncertainties that impact on an organisation. Its core purpose is to enable an organisation to expand its strategic awareness and to make better plans today.

As this planning approach encompasses uncertainty, complexity, dilemmas and discontinuities it is less reliant on trends, extrapolation, forecasts and indicators. You can see the challenge (and the risk) this immediately represents to any organisation that relies on predicting the continuation of a steady upward annual trend of reliable indicators.

'Trends are Not Your Friends'

What we have learned through the Scenario methodology we used is that we should avoid the habit of reliance on a trend as our core indicator. Barber insists that there is no such thing as a future trend and that all trends are historically derived. All trends are merely forecasting based extrapolations of things that are already known or believed. BUT, that does NOT automatically make them reliable indicators of a future operating environment. In working with clients Barber encourages people to drop the letter 'R' from the word 'trend' for this creates a sense of caution and triggers a search for more information. CHW now think in terms of *tendencies*, rather than trends.

From Forecasting to Scenario Planning

The aim of scenario planning is to develop several potential alternative futures based on a unique combination of the key uncertainties the organisation faces. Because the occurrence of these future uncertainties is unpredictable, the futures described are very different yet – (and here's the interesting part) - ***equally plausible***. This is many worlds away from the prediction of a single point (one-future) world so commonly relied upon with forecasting approaches.

It is critical for organisations wanting to expand the way they development their strategy, and are considering scenarios as a means to do so, to understand that there are multiple methods of scenario development that can be undertaken. Some have more utility than others depending on the needs of the Organisation.

Table 1[i] lists 'Scenario Types' briefly explaining process options. Their ratings (out of five) are suggestive of the level of 'benefit' likely to accrue to the organisation or 'resource commitment' levels required to undertake the process. As all scenarios provide different levels of benefit and also hold inherent limitation, a mismatch of process to organisational needs means a higher probability of a poor outcome. The ratings provided are a guideline across the six domains identified as common issues facing an organisation when considering strategic development via scenarios.

The '**Coffee Cup**' is a scenario generated by two or three people in about 30 minutes over a 'cup of coffee' where they consider 'the future of 'x' and often start with a question along the lines of 'what do you think would happen to us if 'x' event happened?' or 'If we undertook the following actions, what sort of results might occur?'; '**Incremental'** scenarios typically have predetermined preferred cores with 'slightly better' and 'slightly worse' alternatives offered for show. Incremental scenarios are favoured by Government agencies suggesting true depth has been undertaken and share significant similarity to the way in which forecasting is often presented.

An '**Inductive**' scenario requires a starting point and a question 'what might emerge if 'X' happened?'. This is a highly creative method and participants need only provide additional 'x' events for the scenario to continue unfolding; '**Off the Shelf**' uses pre-designed scenario(s) to which the organisation is asked to assess how it would respond in the circumstances and shares a strong similarity to 'gaming'; '**Normative'** are 'Big Visions' that demand an explanation of how the world looks (and developed) given achievement of the vision and are commonly seen in local council settings or when a new CEO is appointed to a company following a period of instability; '**Accelerated Scenario process**'(ASp) attempts to combine Coffee Cup speed with Deep Scenarios depth – based on a deductive model it is targeted specifically at Corporate and Government Departments where 'pragmatic outcomes' are mandatory; '**Deep Scenarios**' are high cost, time and resource commitment, extensively researched, tested and 'grounded' and best suited to larger (pan-national) assessments.

Scenario Type / Aspect	Time	Costs	Depth of Inquiry	Contingency Planning	Team Building & Creativity	Strategic Value
Coffee Cup	0.5	0.5	0.5	0.5	3	0.5
Incremental	1.5	2	1	1	1	1
Inductive	1.5	1	1.5	1.5	3	1
Off the Shelf	1.5	1	1	1.5	2.5	2
Normative	2	2	1	0	1.5	2.5
Deductive	2.5	2	2	2	1.5	3
ASp	3	2	3.5	2	3	3.5
Deep	5	5	4.5	4	2	5

This table originally appeared in '*Questioning Scenarios*' published in the Journal of Future Studies in 2009. A fuller explanation of the scenario methods can be found at the www.lufg.com.au website in the paper '*Which Scenario Process is Right for You*?' downloadable from the Free Articles and Papers section.

Given the importance of the strategic development and considering available people resources, time and costs, Central Highlands Water were guided through an Accelerated Scenario process (ASp).

What separates the ASp from other scenario methods is the application of a Backcasting stage following the conclusion of the scenario stories being developed. The Backcasting stage is the single most important factor of effective and pragmatic futures work, for it grounds any future assessment in the reality of day to day operational choices. Without Backcasting (explained in more detail toward the end of this paper), almost all scenario development and futures work remains fixed in the theoretical realm of futures thinking.

Scenario Planning at CHW

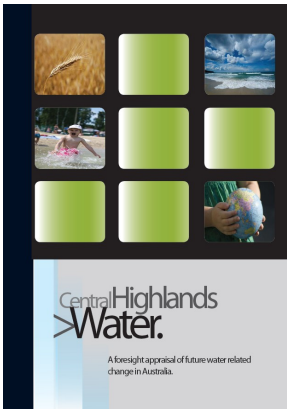
At CHW, we undertook a detailed scenario planning process late in 2009 and early 2010 facilitated by Marcus Barber and his team from Melbourne firm, Looking Up Feeling Good P/L.

This process involved the Board, senior management, a number of staff, major clients and suppliers whose insights were likely to provide value to our understanding of our operating environment. We developed future scenarios across a three-day face to face time frame with additional research and further development being undertaken prior to, in between and after our face to face sessions. A DVD was produced which chronicles the events and the subsequent future worlds developed in which CHW might find itself one day soon.

So, for several days, thoughts turned to 2030, just 20 years away, which is as close as 1990 is to today.

Exploring the CHW Future

The first step to assessing our future was the deliberate ramping up of our awareness of the variety of factors having an influence on, or likely to have an influence on the way our operating environment would unfold in the future.



The process commenced with the undertaking of an extensive Environmental Scan (ES) which was captured in the following document developed by Looking Up Feeling Good:

'***A foresight appraisal of future water related change in Australia***'

http://www.lufg.com.au/files/media/chw_exec_summary_es.pdf You can freely download this document which identified the following future key themes and drivers of change:

Key themes

- **Distribution and regulation** – Who decides what's the right approach – customers/community/CHW/industry/regulators/government??
- **Societal impacts** – Will it come down to 'life versus lifestyle' re water availability?
- **Emerging solutions** – Non-traditional approaches to water management
- **Changing climatic conditions** – Adaptation is the key; but is the change (both climate and adaptation) temporary or permanent?
- **Changing water attitudes** – What is socially acceptable water use and who determines this?
- **Methods of operation** – Collective vs localised vs individual responsibility?

- **Economic commodity** – Value of water is increasing
- **Security** – Water availability forms the base of stable society – is this at risk?
- **Increasing water requirements** – Who will be seeking more water and why?

The **key drivers for change** being identified as:

- **Population growth** – Continuing to increase
- **Increasing immigration** – Will new attitudes to water evolve?
- **Changing social attitudes** – How can we stay aware of changing attitudes?
- **Urbanisation** – Will increasing urban populations add pressure to regional water sources?
- **Ageing** – Are there different water requirements for an ageing society?
- **Increasing governance** – Governance on principles or outcomes?

In other words, there's many drivers and influencers of change, with plenty of opportunity to impact in an unpredictable way on our operating environment.

You will also note the large number of questions raised rather than absolute answers provided which is a key feature of scenario planning. The development of future strategy will be best shaped by the quality of our questions rather than the quality of our answers. The better our questions the more fully we can understand the potential future environments and there in better able to develop an appropriate strategic response.

The scanning data was built around the 'Very STEEP' (VSTEEP)– model[ii] which specifically adds the 'Value Systems' framework to the other components, such that the 'human-ness' implications became explicit. Too often organisations ignore the idea of 'agency' or choice available to individuals and collectives and the Values lens brings that back into sharp focus and understanding.

What do we do?

With the ES having primed the organisation's understanding of the various factors impacting on its future, CHW's first face to face session commenced with a critical question: 'What does CHW actually do?'

Having a shared understanding of 'what we do' helped put thinking about the future in the right context. The point was made that *what* organisations do is different from *how* they do it. Organisations with a strong focus on 'how' they do things are likely to be very Operationally focused; have less adaptability to emerging change; and be more likely to be surprised by changes in operating conditions that do not meet their entrenched assumptions. Almost all organisations fixed on the 'how' face increased risks due to a lower level of Strategic Awareness.

It was emphasised that the 'how' is the process by which the 'what' (outcomes) are achieved. Where 'how' is about activity, 'what' is about productivity. Our responses are clustered below, with three example statements of what CHW does provided on the right hand side of the page:

Understanding the critical outcomes generated by an organisation as a result of its activities provides an insight into downstream impacts. Organisations can explore this thinking by asking the following question: 'what are the outcomes that your customers or stakeholders obtain, as a result of the ways in which you choose to do business?'

Importantly, understanding the difference between 'How we do it' and 'What we do' provides a context for seeking operational flexibility in changing circumstances. This flexibility is typically lacking in organisations who are fixated on the process of their actions for they often insist on continuing those processes even when the operational conditions render them of less value or even of harm to, an organisation's core purpose.

With a clearer understanding of what CHW did as an organisation, we shifted our attention back to those things shaping or with the potential to shape our operational conditions. The ES formed the basis of identifying future drivers of change and over 40 future uncertainties we face were identified by the team. These were then tested and explored to identify which were considered likely to have the most significant impact on the way CHW operated in the future. After much debate the key uncertainties emerged as:

- The nature of the political decision-making environment (party-driven influence versus more community-driven influence)
- The extent of climate change with regard to the rate of change (constant rate of change versus chaotic and worsening) ; and
- Beliefs of the community

Being based on a deductive scenario process, the ASp also uses a two by two matrix using what are deemed to be the two most critical drivers shaping the organisation's future. **As an X & Y axis, the two key uncertainties form four alternative futures shaped by extremities of each uncertainty.** The third remained as a core influencer across all scenarios developed by the teams.

Each of the four scenarios developed by the CHW teams were therefore based on the key uncertainties forming the framework upon which everything else would depend -
Scenario 1: A world in which there was Chaotic and Worsening Climate Change with a

Community Driven Political environment.
Scenario 2: A world in which there was Constant and Steady Climate Change with a Community Driven Political environment.
Scenario 3: A world in which there was Constant and Steady Climate Change with a Party Driven Political environment.
Scenario 4: A world in which there was Chaotic and Worsening Climate Change with a Party Driven Political environment.

Back 20 Forward

Before commencing the development of the 2030 scenarios (a forward view of around twenty years), the CHW group was asked to consider the variety of changes that had occurred since 1990. This last 'prompt' enabled the group to understand that significant change in a short period is not only possible, it has proven to be the case. In bringing the group's attention to understanding how quickly we forget the development of significant events, the group was prodded toward allowing themselves some creative license in thinking about how the future could evolve, and what it would look like given the key uncertainties that had been assigned to their teams.

Some of the key past events included the rise of the internet, collapse of the Berlin Wall, significant water supplies available in almost all catchments across Australia, development of mobile phones, along with the appearance and disappearance of various world leaders, economies and social fads. The group were encouraged and cajoled to allow themselves to err on the side of creativity in thinking about what their 2030 world would look like, given the state of the two key uncertainties in their world.

Across three days, and using a series of prompting questions and inputs from the facilitators, each group produced a significant assessment of what their scenario would look like, including strategic options that CHW would benefit from, given the suggested operating conditions. A summary of each of the scenarios developed follows:

World 1 **Hot & Fast in Nimbin - Working together to stay cool**

Chaotic climate change with community-driven political environment

In this hot world the extreme effects of rapid climate change and service failure has resulted in the collapse of State Governments. The Federal Government consists of issues-based elected Independent members. Climate refugees and the failure of traditional infrastructure is the impetus to develop local cooperative solutions to water, energy and food. Everyone is e-connected to share vital information and continuously vote on the latest issue.

World 2 **Barry's World - Using technology to adapt**

Steady climate change with community-driven political environment

The community is environmentally informed and active. There is strong local community decision making with stronger local governments which have replaced non-responsive State Governments. The rate of climate change is stable enough to have a sense of control which is further enhanced through community cooperation and adoption of technology. Renewable energies present great economic opportunities. Residents can openly trade their capped water entitlements.

World 3 **Barry's Party - Taking advantage**

Steady climate change with party-driven political environment

Population, environmental and energy pressures have seen Barry's Party unite Australia, New Zealand and Antarctica as one republic under strong centralised Government. There is plenty of money to be made from global climate change which has created demand for water, energy and food, all of which the Party control. Hopefully, the commercial exploitation of a thawing Antarctica is not far away…

World 4 **Make My Day (Hot) Punk! - Struggling to respond**

Chaotic climate change with party-driven political environment

Wild extreme weather events result in constant interruptions to basic services. The Government governs with a heavy hand although are struggling to respond to the challenges posed by the extreme conditions. Rising costs and taxes are an attempt to respond to the crisis but there is increasing civil unrest. Rising sea levels and additional climate refugees add to the daily struggle in this difficult world.

The scenario worlds reflect the polar ends of the key uncertainties and aim to emphasise the differences in each world. So while the worlds are plausible representations of a future at 2030, we recognise the emergence of any of one of these worlds in the state described to be unlikely. It is possible however that some elements of them will emerge in response to the uncertainties and that parts of each scenario are likely to be represented in whatever 2030 operating conditions CHW will ultimately face.

Understanding these extreme worlds enables us to answer the next very important question:

'What would CHW have to do to be successful in each of these worlds?'

Again, the scenario build teams went back to their worlds and crafted strategies that would enable CHW to be successful in each of these challenging worlds.

The result is the development of what are labelled as 'Optimal Strategies' - actions that have specific application and benefit to CHW given the very specific operating conditions listed in the scenario. The Top 5 for each world is indicated below:

World 1 **Hot & Fast in Nimbin - Working together to stay cool**

- Develop strategic alliances
- Organisation become commercially savvy
- Diversify supply sources and extend innovations re water quality
- Real time data
- Smaller flexible decentralised water supply systems

World 2 **Barry's World - Using technology to adapt**

- Develop culture of alignment and engagement
- Develop new IT and energy technology
- Provide choice of products and services
- Diversify supplies
- Develop strategic alliances

World 3 **Barry's Party - Taking advantage**

- Review business model
- Develop culture of culture of alignment and engagement
- Build scanning capacity
- Company branding and positioning
- Model expansion within our mandated region and beyond

World 4 **Make My Day (Hot) Punk! - Struggling to respond**

- Business development strategies
- Systems flexibility/redundancy
- Water resource diversification strategy
- Organisational culture alignment / skills
- Community acceptance – communication strategy

In other words, these strategies are 'optimal' or 'best' for each alternative world. It's obvious that different strategies are required where there are fundamentally different drivers at work. It should also be obvious that CHW had begun to extend its thinking beyond a forecasting approach which would by default, lock in its commitment to strategic choices, whilst failing to question the assumptions upon which those choices are made.

From Fixed to Flexible – the shift toward adaptive strategic thinking

In its contribution toward strategy development, forecasting aims to identify the most probable future conditions such that decisions can be made and organisational resources and actions allocated and determined. To that end, forecasting stands alone from the ASp scenario development relying on the idea of being able to accurately and effectively predict the future based on a set of assumptions coming true. There are many reasons why assumptions are made within organisations and we have no desire to explore them in depth here, other than to say that assumptions can be based as much on a poor collection, assessment and testing of available data ,as on the preferences or leanings of key stakeholders.

Given the four scenarios developed by CHW, making an (untested) assumption that any one of them is more likely than another, would drag the thinking back into the forecasting approach. If using this approach within your own Water Agency, such thinking might be (for whatever reasons) preferred as the way to develop Strategic Plans, Operating budgets and resource allocations. To that end, what this requires an organisation to do is 'bet the farm' on its ability to accurately predict the future. Using the four scenarios developed by CHW as an example, in such instances where there is a belief of being able to accurately predict the future, the use of a set of 'Optimal Strategies' taken from one specific scenario is the most likely approach to be undertaken.

We flag that 'betting the farm' is not an uncommon approach, whether within a Water Agency or some other Government or Corporate enterprise. And what we would like to emphasise is that the variability of influencing factors shaping operating conditions tends to suggest that no organisation can lock in its approach to the future, based on a belief that the future can be accurately predicted.

What emerges from the ASp is the identification of a path toward greater strategic adaptability. To that end the Optimal Strategies specific to each scenario are filtered to identify the strategies that are present in EACH of the scenarios. These Strategies are referred to as 'Robust Strategies' for even if CHW's operating environment was one more or less community driven (or party driven) or more or less chaotic climate change, allocating CHW resources towards a Robust Strategy is a smart play.

From within the variety of Optimal Strategies, CHW identified a set of Robust Strategies. **This**

means that there is a set of strategies that will position CHW to cope no matter which future world evolves. Importantly, because none of these strategies requires CHW to accurately predict the future (instead understanding that they have utility across a variety of operational conditions), CHW management can have greater confidence that their strategic decisions will be sufficient for a variety of conditions, regardless of how the ultimate 2030 world turns out.

Equally as important, it means that CHW DOES NOT have to allocate resources to actions that provide minimal value to what it might require in the future. However because it has undertaken some pre assessment and identification of Optimal Strategic plays should a set of conditions emerge in the future, it has available to it, a decision framework based on paying attention to changes in its operating environment. Should CHW identify a shift toward operating conditions which might be say, more party driven or more climatically stable, it can consider some of the Optimal Strategies specific to those conditions, and THEN allocate the resources required for enacting them.

Readers should not underestimate the significant difference this provides to Government Water agencies. Robust Strategies prevent the waste of resources and effort in betting the farm on being able to predict the future. Robust Strategies avoid the loss of financial resources that are allocated to actions being started in the belief that they may be required some time.

By paying attention through ongoing ES activities, CHW can 'press go' on any of the pre designed Optimal Strategies should it identify the emerging operating conditions demand they do so. In the meantime, CHW can keep its 'powder dry' and pursue the Robust Strategies likely to stand it in good stead regardless.

Following discussion and refinement, **nine robust strategies** were identified as:

1. **Adaptable Business Model** – building a capital structure that provides ability for business systems to be responsive to future industry reforms

2. **Responsive to Customers and Community** – understanding and responding to changing customer expectations, attitudes and beliefs

3. **Scanning Capability** – business intelligence systems to ensure CHW can identify and react to changes in the business environment

4. **Resource Smart** – optimise use of total resources used or developed by CHW

5. **High Performance** – continuous improvement to enhance individual and organisation performance

6. **Partnerships and Strategic Alliances** – maximise leverage and minimise risk exposure to gain competitive advantage

7. **Information Communication Technologies** – seamless connectivity enables transfer of ideas, experiences and information while building organisation effectiveness and efficiency

8. **Commercial Acumen** – understanding financial pressures and identifying opportunities for improvement

9. **Water Resource Adaptability** – water resources systems that remain flexible and reliable despite an uncertain future

CHW is now pursuing each of these nine strategies across the organisation, based on an assessment of key priorities. The impact of undertaking this approach to managing its water assets has seen a fundamental shift in strategic thinking:

- Now think in terms of *variability of the future* eg rainfall, inflows, reservoir levels, customer demand for water rather than absolutes
- Future plans and o*perational ideas are 'stress tested'* against each of the potential future worlds to assess their utility
- Much more *attuned to changes in the operating environment* and on a broader scale – particularly changes in social behaviours which was previously not 'on the radar' to an engineering-based organisation
  - Talking about robust strategies has become part of the normal language and conversations at CHW and this adds to our *ability to maintain and agile and adaptable organisational capability.*

The overall result is a greatly enhanced ability to question CHW's assumptions about its current understanding of its operating environment and therefore establish more realistic expectations of CHW's future.

And so…
The world is certainly unpredictable and full of uncertainty. It may start raining again or it may stop, or most likely somewhere in between. No-one knows for certain. By identifying key uncertainties and key drivers of change, CHW is in a better position to respond to those most unpredictable events of rapid change.

And by further developing these robust strategies, CHW is building capability to be confident about embracing the future and be in the best position to be successful – whatever the future may hold.

Part Two

How To undertake a Scenario Planning process within your own Water Agency

Note to Readers: As you work your way through each of the steps outlined here, we recommend you return to the case study to review what was produced by CHW at a similar stage.

The most important reason for undertaking a scenario planning session is to improve the quality of your organisation's Strategic Plan, and therein, better position it for the future it hopes to create. The choice of utilising Scenario Planning at CHW was based on its realisation that the old model of planning, with its heavy reliance on forecasting, had become of far less value to the Organisation.

From the outset however, there were doubts as to whether Scenario Planning could not only be a useful part of the strategic thinking process, but whether the outputs of this thinking could be directly connected to CHW's operational framework. Indeed the CEO of CHW had been informed by another consultancy, that it was virtually impossible to connect Scenarios to an organisation's

Operational framework.

It has already been suggested that there are multiple platforms for developing scenarios, each with particular value and limitations. What distinguishes the ASp (and the reason why it was chosen by CHW) is the use of a structured Backcasting Process. It is through Backcasting that an organisation's future thinking developed through scenarios, can be tested for 'reality' and 'pragmatism' as well as highlighting some key first steps towards achieving the future it seeks. The Backcasting process is what connects a future assessment to the day to day operational decisions.

Phase 1
Expand Your Strategic Awareness:

It is important to orient your Organisation toward its current operating environment and the things that are likely to shape that environment in the future. This occurs through an extensive Environmental Scan and we recommend that the 'Very STEEP' framework is of great value.

Simply, seek out the factors with potential and interest along the Values, Societal, Technological, Economic, Environmental & Political frameworks. The things sought should come from both within your industry and outside it and could be found internally or externally of your organisation.

The ES conducted for CHW occurred over an intensive six week period as well as drawing on the key facilitator's previous experience in emerging water sector issues around the world.

Phase Two
Challenge Preconceived Ideas of What Your Organisation Does:

The single most effective way to do this is to engage in a 'How v What' discussion. Far too many organisations believe 'how' and 'what' are the same when in fact they are completely different. The 'How' are the actions undertaken by your organisation to achieve an outcome. The 'What' is the Outcome that is achieved.

'How' is activity orientated, 'What' is productivity orientated. Though connected, they are distinct. Organisations fixated on the 'How' will invariably rely on ever decreasing 'efficiency' approaches for operational management whereas organisations focused on 'What' will always assess for effectiveness of their outcomes when determining productivity.

Be aware that this discussion can be quite challenging for members of your organisation and must be facilitated with care and appropriate levels of firmness where needed.

Phase Three
Identify key factors influencing or likely to influence your Organisation's future:

The ASp is based on a deductive approach, that is, from all that we know and can perceive is possible, what can we 'deduce' (understand?) of how the future could evolve. CHW identified a wide number of factors having an influence on and likely to shape its future operating environment. There were three identified as likely to have the biggest influence, but in ways not clear, that were chosen – the type of political environment; the scale and degree of climate change, and the beliefs of the community.

Once you have identified the array of factors shaping your operational environment (these factors

are also referred to as drivers), identify the two most critical as the ones to form your matrix. It is important that the drivers you select have distinct poles, or opposite ends of their spectrum. For instance in CHW's case, the Political Environment was then identified as having a 'Community Driven' approach versus a singular Party Driven approach. This might also be worded as a 'broad group' versus 'top down' approaches to decision making.

Be careful not to select factors that are a subset of one another. For instance it might be that an organisation selects 'Operational Resources' as one core driver and then 'Sources of Income' as another. With a fuller assessment, it is likely that these two drivers are part of the same thread and issue and using them will render the scenarios less useful as the narrative takes shape.

Once you have generated the matrix, participants need to understand that the two factors shaping the world they will develop are not open to question. Even if those building the scenario story do not like the factors they are asked to assess, they must use them to define the world they see.

Phase Four
Set a Future Time:

Within almost all industry sectors, barring perhaps less than a handful, it is recommended that the minimum time frame used in terms of the future is ten years. Anything shorter than that poses the problem of people being able to 'let go' of their current thinking and what will be generated is more likely to be a forecast of today's understanding. For pragmatic reasons, time frames beyond thirty years are also problematic and are best suited to a handful of industry sectors. Picking an appropriate future time frame allows participants to understand that change is possible and that the world could look very different from what it does today.

Some industry exceptions might be software development and even some mobile technologies that have far shorter lifespans, and therefore could enable a shorter time view, and long lasting infrastructure might be one sector that would benefit from a longer view of the future.

Phase Five
Use History as one Guide to Change:

History can provide a useful reality check for people who believe that things cannot change much in a future time frame. By considering some of the significant events that have occurred in the recent decade or more, we remind people not only of the array of changing circumstances, we also alert them to how quickly we adjust to the new and even unexpected.

It is a fact of human nature that we often worry about potential change or even complain about being forced to adapt to change we are going through. What the 'looking back' process underscores, is just how quickly we move on. This step is also important for it provides a 'permission slip' for those creating their scenarios, to not have to make an immediate link to how something came to be – this is explored in later part of the process.

Phase Six
Create a Future Narrative:

Each of the Four scenarios should now be written up by the teams assigned to do so. It is important that the people understand that they are required to write their future scenario as if it existed right

now, as if they were there in that future environment. They should consider thinking that if they were to explain to a friend about a recent overseas trip they took to a place their friend had never visited, what would they include in that story? They do not need to worry about how that world developed over time – jump straight to the 'horizon year' (the future date selected for eg: 2025) and begin identifying how that world would look.

The groups will use their two core drivers to hold the scenario together; and use each of the other drivers that were initially identified, to colour and shade the way the scenario unfolds. Ideally, their scenario narrative should explain what the world looks like, the core areas of stress or enjoyment for the majority of the people, insights into the way society operates and any key factor that would likely exist, in the world they perceive. Often major institutions are represented, technological change is discussed and people's live are included.

What each group would be aiming to produce, is a scenario narrative that is plausible to an audience, given all that is now understood about what is shaping that scenario.

Phase Seven
Generate Strategic Actions:

Once each scenario narrative has been sufficiently detailed, the group should consider what they would do as an organisation, in the environment that has been created, to deal effectively with what they are tasked to do.

Each action would likely be a suggested strategy, specific to the particular operating conditions seen in the scenario narrative. They are intended to place the organisation in the best possible position, all things considered, to deal with their operational environment as explained in the scenario.

These strategic actions are noted as 'Optimal Strategies', that is, they are designed specifically for the one specific scenario environment and are said to be optimal, for the set of conditions seen in that scenario.

Phase Eight
Backcasting:

Backcasting is the process of working from the future back to the present. It is the reverse of forecasting which works from the present and stretches out to some point in the future.

Backcasting however generates significantly more beneficial insights. Where forecasting takes known factors and pushes that thinking (along with all of the assumptions that have been made) into the future, Backcasting pulls insight from our assessment and forces us to test how logical and grounded our future thinking is. Backcasting exposes the assumptions we have made and expectations for what they are – critical risk factors.

My recommended process for Backcasting is to work backwards in chronological chunks of about 25-30%. So from an horizon year of around 2030, you would have a date of about 2023 and another date of about 2016 before reaching 'today'.

Using the dates above you would start at your horizon year of 2030 and identify some of the key events / key infrastructure / key political groups etc and then ask, 'Would this item/event/social movement etc have existed in 2023? And if so, at what level?'

You want your scenario team to identify whether the item was new/old, or in construction. Whether the law existed or was being called for; whether the political body was in place, being challenged or on the way out and so on. Was the technology widespread, fading or in its infancy?

Your next step is to ask 'If this was the state of item X in 2023, what signals or clues would we need to be seeing in our operating environment around 2023 that would suggest it it going to grow/shrink/shift etc, like it has done, seven years later in 2030?' You'll want to capture as many of the possible signals as you can for this will form the basis of your ongoing adaptability framework.

You then ask the similar question for the shift between say 2023 and 2016 and do this for every significant item. What you will uncover in this process are cognitive gaps in your thinking, potential areas of high risk and challenges to previously held assumptions and expectations.

After you have completed working backwards from the future, you will have in effect created an additional two sub scenarios or chapters, with the difference being that these chapters are aimed at explaining how your future scenario came to be. When you read your scenario chapters from one to the next, everything should flow logically together and still maintain a high level of plausibility. If not, you've made an unfounded assumption and you'll need to rethink your future assessment. One of the most common assumptions is the existence in the scenario of a piece of highly advanced technology, major piece of infrastructure or significant organisation.

When you 'run forward' there must be signals that lead from state to the next in a plausible manner. And if there are not, then either you've made an invalid assumption or your expectations of the future are not realistic – you'll need to go back and rethink how advanced the technology is, or how effective the 'institution' is or how fully built the infrastructure is. The place to intervene in your future thinking is at the 2030 scenario, not your earlier iterations, and this then leads you to reconsider the strategic choices you will be able to make (at phase seven).

If everything does flows logically from one stage to the next, then you will likely have created a well grounded and plausible map toward a particular future, that will include possible signals that act to inform you of the direction the future is taking.

You now have a forward game plan, though holding four of them (each of the four scenarios).

Phase Nine
Shifting from Optimal to Robust Strategies.

At this point you will have generated a large number of potential strategic actions. Trying to prepare for them or allocating resources to each of the suggested actions is as equally risky for an organisation as when the organisation 'bets the farm' on its ability to accurately predict the future through forecasting.

Where forecasting forces a limited planning view, scenarios can generate a multiple view that is almost impossible to cater for. So instead, we seek out from across our four scenarios, those actions that seem to be recommended or useful for all of them. You can see from the CHW case study how the Optimal Strategies were refined into Robust strategies.

A Robust Strategy is one that will stand the organisation in good stead, no matter how the world starts to evolve – will it get drier or wetter; slower or faster; more hands on or less hands on? No matter, the organisation can be confident that a robust strategy will keep things generally on track

and managers should be able to plan with far greater confidence to allocate resources to those strategies because they provide flexibility and adaptability across varying operational conditions..

Simply, they will have stopped betting everything on a single future forecast.

The question often arises – 'what do we do with all of the other Optimal Strategies'? The answer is 'nothing – for now!'. Instead, the organisation uses its environmental scanning skills to look for 'signals *like*' the ones that were identified in the Backcasting phase. If the business identifies a series of signals suggesting a shift toward a more resource strained future, it can simply pull out its Optimal Strategies that are matched to a 'Resource Restrained Future' (or whatever the drivers were that defined the scenario matrix) and begin allocating resources and bringing online, the actions more suited to the shifting conditions.

When a scenario process is combined with a Backcasting process, the organisation generates a well defined and matched operational plan, that retains robustness to shifts in its operating conditions, whilst also enabling it to stay flexible for and alert to shifts in those conditions.

The process also prevents significant waste of resources into sunk costs spent on a forecast prediction, which when wrong, places the water agency into a higher area of risk.

Summary

This brief case study and step by step process is intended to alert you to the limitations of a reliance on forecasting, whilst offering a more useful alternative for creating operational strategy. This paper should not be seen as conclusive an additional reading, such as that suggested, will add greater depth than what is covered briefly here.

Feel free to contact either of the authors for further details regarding the process and outcomes and we would encourage you to read the suggested resources indicated within this paper.

Notes:

The full version of this table, along with overviews of each of the methods can be freely downloaded from Marcus Barber's website at www.lufg.com.au in the free articles and papers section or via http://www.lookingupfeelinggood.com/uploads/Which_Scenario_Process_is_Right_for_you.pdf

The 'Very STEEP' (VSTEEP) model of Environmental Scanning extends the widely adopted STEEP framework (Social, Technological, Economic, Environmental & Political) to incorporate the idea of human agency. Other frameworks include PEST and PESTLE and even the generational typology markers 'Boomers', 'Gen X', 'Gen Y' are category framing process for seeking and assigning data. The VSTEEP model requires a 'crash course' in the Spiral Dynamics (Human Value Systems) model developed by Don Beck and Chris Cowan in extending the work of Prof. Clare W Graves (see www.clarewgraves.com) and assists the scanning analyst to consider the way in which particular Value Systems would conceive of and approach an 'issue' or item' sited within one of the other categories. In particular it helps the analyst ensure that the 'Political' or 'Social' frameworks are seen as human constructs (actions) and not noted as being 'things' (nouns) that cannot be changed. I highly recommend all organisations conducting ES to include the V component and for a quick assessment consider reading the Value Systems paper marked in the recommended reading section

The Environmental Scanning summary generated as part of the Central Highlands Water Scenarios project can be downloaded via http://www.lufg.com.au/files/media/chw_exec_summary_es.pdf

Recommended Reading:

Human Values & Sustainability initiatives:
http://www.lufg.com.au/files/media/Values%20for%20Sustainability.pdf
Human Values and Approaches to the future:
http://www.lookingupfeelinggood.com/uploads/Values_Systems_as_Foresight_Frameworks_2006.pdf
Human Values and Approaches to Water:
http://www.lookingupfeelinggood.com/uploads/A_Drop_in_the_Ocean_web.pdf

Strategic Awareness & Wildcard Events:
http://www.lookingupfeelinggood.com/uploads/Wild_Cards_Updated__Feb_06.pdf

An Assessment of Scenarios:
http://www.lufg.com.au/files/media/questioning_scenarios.pdf

Overcoming 'Tunnel Vision' in Organisations:
http://www.lookingupfeelinggood.com/uploads/A_Hammer___3_Chisels_or_a_Trowel.pdf

Enhancing your Organisation's Innovation capacity:
http://www.lookingupfeelinggood.com/uploads/Ideas_Piece_-_ES___Innovation.pdf and
http://www.lookingupfeelinggood.com/uploads/MPB_Fast_Thinking_-_XX_Billion_Dollar.pdf

iNOTES:

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