Speech to National Power Conference

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Title Slide

Thank you and good morning.

Unfortunately other commitments have prevented Mark from making this presentation and he has asked me to pass on his apologies.

Those of you who live and work in Auckland will know first hand that Auckland is outgrowing its support infrastructure.

What used to be tracts of farmland and open spaces has succumbed to urban sprawl as population growth spurs commercial and industrial expansion and, seemingly endless demand for new housing.

New residential and light industrial subdivisions continue to be developed and an aversion by many for long and arduous commuting is beginning to drive increased population density in established areas close to the city hub.

We need to acknowledge that Auckland is not just one city; that this region is becoming more and more characterised as cities within cities.

From an energy demand perspective, apart from the physical growth of the region, increased energy use is also being driven by consumers embracing a broad range of modern appliances.

Slide: Auckland Infrastructure Quote

Auckland's planners are highlighting the region's infrastructure requirements. Since 1 January 2004, 12 new schools have opened in the Auckland region. They include two secondary schools that have the distinction of being the first new secondary schools to be built in New Zealand for 20 years.

Together, population, urban growth, and changing lifestyle patterns are placing enormous pressure on all aspects of the region's infrastructure – transport, schools, hospitals, water supply and – what I'm here to talk about – energy supplies.

Slide: This Presentation

I'd like to approach the topic by firstly summarising our view of Auckland's energy supply position.

…… I'll then touch a little more on upper North Island growth …..

….. the implications this has for security of supply ….

….. how demand side management can help ….

….. the influence of the regulatory environment on investment

Slide: How We See It

As the owner of infrastructure networks in the Auckland region – and with our own obligations for security of supply to customers – it shouldn't be surprising that Vector has more than a passing interest in energy supply capabilities into Auckland.

I'm referring here to the capacity of other infrastructure to feed sufficient energy into our networks so that we in turn can meet consumer requirements for secure and continuous supply. I believe this is a reasonable and realistic expectation for consumers in a modern city.

We acknowledge and accept the responsibility Vector has to ensure our own networks are maintained and developed so that we can properly fulfil our role as a utility service provider. Recognising our responsibility in the supply chain, Vector is forecasting to invest in excess of $240 million in development and maintenance capital expenditure this financial year.

I think we are all agreed that new electricity capacity is required to cater for Auckland's ongoing growth. The crux of the matter, as we see it, is risk tolerance. Firstly, do we have the appropriate solutions in place to address short term issues when the timing of longer term solutions remains uncertain? And secondly, is the targeted mix of transmission capacity and generation appropriate given changing demand patterns and the operating risks of the various options?

I know some of you are reasonably comfortable with current timeframes and I am conscious of industry processes to monitor security – particularly through the operational group co-ordinating upper North Island security and the System Security Forecast framework. Moreover, I understand there are remedial transmission capacity upgrades available to provide some relief until the larger scale investments are made.

I also grant that so far there haven't been visible supply problems and that, given favourable growth patterns, favourable weather, outstanding operating performance and on-schedule system development, there may not be a significant outage.

However, as these are unpredictable variables, the risk of an outage increases daily and may be greater than consumers are prepared to tolerate.

As each hour passes, another house is built, another air conditioning unit is installed, a new business opens its doors – and the electricity supply capacity headroom shrinks.

It is reaching a point, that if Auckland were to experience generator outage at the time of high demand, the current security criteria would be breached with potential flow on effects to consumers. Specifically, a sustained generation outage at Otahuhu, combined with a transmission line failure, an N –G – 1 event, could, depending on timing, see forced reduction of consumer demand, something that we believe is unacceptable.

Resource is currently being applied across the industry to ensure that the current grid constraints do not impact on consumers. Whilst it is pleasing that the industry can cooperate in this way it is concerning that this is required.

It may not happen. But its about risk management and, as an industry, we owe it to consumers to build solutions which match their reasonable expectations.

As such we believe it is essential that the industry takes a common approach in identifying and implementing solutions.

On this point, we are actively supporting the CEO's Forum initiatives, but we remain concerned that the current regulatory framework will result in aspects of the supply debate occurring in isolation from, or as alternatives to one another.

And if this is the case, then we believe the Electricity Commission is uniquely placed to take a holistic view and lead the development of an enduring solution.

For our part, we are committed to working with all industry participants so that we can form a common view about electricity supply security into Auckland, and the risks arising if security is compromised.

Specifically, we are working with the Electricity Commission and others to put forward, discuss and develop a strategy to address Auckland's energy supply needs in the period between now and 2010, the earliest we are likely to see commissioning of the transmission upgrade proposed by Transpower.

Vector recognises that alternative solutions to the transmission upgrades or replacement would enhance Auckland's energy security, however they would not replace the need for transmission capacity reinforcement.

Generation is also an important component of any solution, but we believe generation-dependent options will be significantly less reliable because of the time a generation plant is likely to be out of action.

Moreover, if gas-fired generation alternatives are sought in the Auckland region, gas transmission system upgrades become necessary. Vector has been proactive and reduced the lead times by working through the consenting process for a new pipeline over the last three years, however, financial commitments are required as early as possible to ensure the development lead time is minimised.

Whilst perhaps not ideal, temporary generation may be required to help improve security in a timely and efficient way, and provide some breathing space while competing permanent solutions can be fully appraised and compared.

In my opening remarks I commented on the obvious – Auckland and the wider upper North Island region is growing.

Slide: Upper North Island Growth

Statistics tell us at a glance that Auckland is far and away ahead of any other New Zealand city in anticipated population growth.

At Vector's interim results briefing last week we set out electricity network development projects completed or required in the near future. It is evidence of a vibrant and growing region.

- In Albany seven reticulation developments have been constructed, supplying over 1,000 residential lots.

- The first three stages of the Mt Wellington Quarry development have been reticulated. When completed it will comprise 2,500 to 3,000 dwellings.

- We have completed the first two stages of our long-term project to upgrade the 11kV distribution network in the Auckland CBD.

Slide: Albany City

- Coming up also is reticulation of Albany City, a 40 hectare commercial development. It is estimated that 6,000 residents and 15,000 employees will live in or commute to the centre.

- A new town centre is under construction at Flat Bush in Manukau and also in south Auckland, the Highbrook development in East Tamaki will create an industrial park of over 150 hectares.

- To the north of the city, new developments will see significant commercial and residential growth at Westgate and in the Silverdale/Orewa regions.

As I noted earlier, it's not just demand from new homes and businesses. Shifting lifestyle and consumer behaviour is creating additional demand from existing consumers. Some of these shifts, like increasing adoption of small air-conditioning units, can be quite sudden; others such as home computer installations are more gradual.

Then there's increased connection density. There is a discernible trend towards medium to high density developments along key transport corridors as local bodies strive to balance demand with limited land availability.

And we shouldn't ignore the influence on peak demand of the weather. Demand varies significantly from year to year, depending on temperatures and the speed of the transition between seasons.

Slide: Graph: Peak Demand by Month (Auckland Region)

This chart plots the year-on-year change in peak demand by month for the Auckland region over the years 2002 to 2005, and illustrates just how volatile the demand profile can be.

Forecasting year-on-year peak capacity requirements therefore is difficult. In our experience, system peaks tend to grow more erratically than long run energy demand or GDP, and the increasing volatility in peak demand is leading us to a view that supply capacity estimates should include a larger margin for variations over and above steady state growth.

Slide: Energy Supply Security

Naturally, all this growth reinforces the view that energy supply will remain an ongoing issue for this region.

Vector believes there are short term issues that need to be addressed to ensure industry readiness ahead of longer term solutions.

We see significant transmission investment in some form as inevitable in the medium term, although in that timeframe we can start doing more on demand management.

Gas can continue to play a longer term role. With importation options providing an effective risk management tool, supply of gas is not an issue, developments in carbon capture and storage will ensure gas fired thermal generation can continue to play its part in an environmentally sustainable manner.

I have to admit that we don't have all of the information that others have in assessing all of the upper North Island demand growth however, demand trends on Vector's networks, we believe, serve as a good indicator.

Historically, peak demand growth in the Auckland region has averaged about 60 megawatts a year. Averaged annual growth is projected to continue at this rate, driven by a near linear population increase and generally strong economic growth.

And for our own business that means:

Slide: Graph: Vector Networks Connections – Auckland & Northern

Over the past four years we have been connecting on average close to 10,000 new electricity customers a year.

We now have over 500,000 total connections to our Auckland and Northern networks.

Slide: Graph: Vector Networks System Length

Vector itself is doing much to accommodate this growth, both extending and reinforcing our delivery capability. I mentioned earlier our $240 million forecast capex spend this financial year.

In Auckland, we have also invested in improving our transformer capacity by about 12% since 2001, and in the last three years we have extended our networks by over 2,300 kilometres. End to end, that's a line from here to Brisbane.

In the last five years we installed four zone substations in this region. We're looking at 16 substations in the next five years and, looking a further three years out, 22 of them by 2014.

Slide: Graph Upper NI Security - Summer

Taking a wider look at upper North Island security, we have prepared a series of charts from a desk-top study based on publicly available information. We are aware that updated information is making its way into the public domain including additional upgrades and this will impact on the timing of any issue. The intention here is simply to share our thinking, analyses and assumptions to encourage healthy debate.

There appears to be general agreement that a supply security issue exists, if not now, then not too far into the future. I believe the most telling reference point is our customers, who continue to list energy supply as a key concern.

The industry's operational group to coordinate upper North Island summer security, which has been convened in each of the last six years, and the System Security Forecast process demonstrate that the industry is taking the issue seriously.

However, there are different views on the detail and, in putting forward our view, I invite you to let us know where you think we may be wrong. We're as keen as the next person to be as accurate as possible in our own modeling and ensure that the appropriate debate is occurring.

This first chart shows the voltage stability and the thermal limit of the transmission system under various regional generation scenarios, with the system in a secure N-1 state.

As we interpret this, the lower of the thermal limit or the voltage stability limit is the binding constraint if we wish to retain an N-1 security.

The three horizontal blue lines represent the region's summer 2005 peak demand and the forecast peak demand for summers 2006 and 2007 based on an annual growth rate of 4%. This may appear to be a high end growth forecast against long term historical averages. However demand growth tends to occur in spurts over a few years followed by a flatter period. Which part of the cycle we are currently in will become clearer with time.

Of interest in considering demand forecasts is that Queensland experienced peak demand growth of 9% in the period immediately prior to their system failure in 2004. We are aware that a contributor to that growth was increased use of low cost, small-scale air-conditioners that can now be purchased in Auckland for under $500.

Recent media reports have indicated significant uptake of air-conditioning. One article described air-conditioning as one of the hottest consumer products, with a sales increase of 35%.

The chart suggests that with all upper North Island generation running there is likely to be 100 megawatts of headroom in 2007 before the voltage stability limit means the N-1 security threshold may be reached.

However, for the reasons I've touched on previously about the variable factors influencing peak demand, we believe that basing long run electricity demand on linear population or forecast GDP growth may understate peak growth.

Slide: Graph: Upper NI Security – Summer (without Southdown and Otahuhu B)

In all our scenarios, a secure supply above thresholds during peak demand depends on the availability of Otahuhu B.

In the event that this plant trips and is unable to generate during peak demand, there appears to be insufficient secure capacity to meet the region's current peak demand and maintain an N-1 level of system security.

Upgrades by Transpower and other measures will alleviate in the short term any potential threat to breaching the N-1 security threshold. However whilst incremental management of upgrades and system development will buy some time, any headroom we have available is rapidly being utilized.

I also understand that there is now an intention to move towards an N-1 standard following an Otahuhu outage, an N-G-1 standard. Vector welcomes this as an essential step forward, and believes early adoption is important. However it is concerning that adopting an appropriate security standard which recognises the dependence of Auckland on Otahuhu has not occurred earlier.

We also note and welcome the initiatives currently being undertaken by Transpower to progress up-ratings and other system upgrades as quickly as possible. It is essential that these continue to occur and we do not allow ourselves to become distracted by the parallel debate on longer term solutions.

Slide: Graph: Upper NI - Summer Load Duration

This next chart is an approximation of the upper North Island region's load duration curve and on the face of it suggests that with Otahuhu B offline, load will need to be reduced to maintain a secure N-1 system during the summer of 2006. However, we know that, in practice with appropriate planning and cooperation this situation is manageable.

However it does mean that we will need to be comfortable operating at or slightly below an N-1 threshold for certain periods. In addition as demand increases against relatively stable supply it is a concern that we are getting closer to the flatter part of the load duration curve.
As earlier noted, we also understand that additional upgrades have now been identified which may serve, alongside additional generation, to significantly improve the transmission capacity. These initiatives need to be understood and assessed by the industry so a clear and consistent message can be provided to our stakeholders and consumers.

Supply security could also be mitigated by using the controllable load such as hot water controls, to reduce load during the peak periods. However, this has the additional effect of flattening the load duration curve with a consequential increase in the potential impact of any outage of significant duration.

Vector does not believe it is appropriate for enforced demand side measures to be used as a tool for deferring investment in capacity, as enforced reductions undermine customer choice and service.

We recognize the potential efficiency benefits of demand side management and are investing in our business to ensure the tools are available to customers. It is an essential and inevitable market development which will allow the deferral of capital investment to be offered as a genuine incentive to customers.

However enforced demand side management is a significantly different position from customer-driven solutions. We must avoid transferring value from customers to the supply side of the industry, with no regard for the impact on consumer behavior. Commercial solutions are always preferable to imposed penalties. I will shortly discuss some of the consumer solutions we see as potentially assisting in demand side management.

Let's now look at the winter security position.

Slide: Graph: Upper NI Security - Winter

The winter story is similar. Safety margins have reduced and we have become increasingly reliant on the robustness of the operation of the N-

1 security threshold. I can only reiterate our belief that N-1 is not consistent with the reasonable expectations of consumers, and it is also not consistent with the standards being targeted in other major urban centres.

This chart from data provided by Transpower suggests that, at a growth rate of 3%, with currently installed generation plant and transmission capacity, there is minimal spare capacity available by 2007. Again, I note that this does not include new generation plant or upgrades of the transmission system capacity which may have come online in recent months.

Slide: Upper NI Security - Winter Load Duration

This winter load duration curve highlights that the steeper winter demand profile does not create the same issues as the flatter summer curve.

However, a potential issue remains which must be managed.

My previous comments about the inherent uncertainties in year-on-year peak demand growth, and the masking effect of long term growth rates on weather-related spikes, apply here, but to a lesser degree.

In addition Power plants have been known to fail in the past. To help avoid failure, they must have regular maintenance downtime, but has the annual demand profile in the upper North Island region reached, or is it reaching, the point where there is no longer an adequate low demand window to allow the scheduled maintenance of generation capacity to be carried out without degrading security.

All of this brings me back to risk tolerance and the risk that arises from the dependence on a single plant for the upper North Island peak demand supply security. I don't think we at Vector are alone in believing that a more appropriate security level for this region excludes Otahuhu. I have no doubt that if such an approach were to be taken there would be a sense of urgency around solutions to supply security.

Slide: Demand Management

As previously noted, an important dimension is to remind consumers that they, too, can contribute by managing electricity usage.

Vector is well positioned in Auckland to help demand side management initiatives. And we are already doing so.

Aside from the residential water heating control, there is other demand-side potential.

The level of stand-by generation in Auckland is estimated at 40 to 60 megawatts, and non-essential load is currently not utilised for peak demand management.

Through our natural gas interests we are able to encourage electricity substitution and we have an active campaign to increase connections to our gas networks.

Switching heating and cooking in a home to gas can reduce electricity demand. However we require some 92,000 conversions a year to achieve a reduction in electricity demand sufficient to offset normal annual growth.

We currently have around 78,000 connections to our Auckland gas network, and our annual connection rate is around 2,500. Lifting this to 92,000 a year is quite an ask.

Solar heating can also provide an alternative and I note a comment from the Solar Industries Association that solar water systems are capable of reducing electricity consumption by between 50 and 75%.

It should be noted, however, that on cloudy days many solar water systems use electric boost elements, which may or may not be controlled at peak times. Thus, the peak demand will shift and become steeper rather than decrease.

Vector has also participated in the launch of energy efficient light bulbs. The aim is to get a million of these bulbs into homes, with a demand reduction equivalent to almost one year's electricity growth.

In addition, through our energy metering business, we are working to assist the introduction of smart metering technology which allows customers to actively monitor and control their energy use.

So, demand side alternatives can clearly contribute to demand reduction and should be pursued with appropriate commercial incentives.

Slide: Industry Response

As I've mentioned, we fully appreciate that issues around supply security for the upper North Island are receiving attention and being addressed, with a range of security processes and various physical proposals all on the table for consideration.

Our concern is over whether the wheels are turning fast enough and that, despite the best of intentions, industry deliberations to arrive at optimum solutions may be overtaken by a physical problem.

The continuing deliberations are perhaps a reflection of an acceptance that sufficient activity is occurring to meet a 2010 deadline.

That may turn out to be the case, but the risk tolerance of our consumers should drive appropriate security standards at higher levels than we believe may be the case.

And how ready will the proposed solutions be come 2010? There is much to be done between now and then, including running the full RMA process for new transmission and generation developments.

On any timeline, the horizon for investment into new transmission capacity, or alternatives such as generation, is looming.

Given planning, resource consent, construction and commissioning lead times, perhaps more projects should be underway to maintain the current levels of security of supply.

We believe we are contributing by obtaining a route designation for a new gas transmission pipeline. However, we have yet to build it and that will require the appropriate commercial and regulatory framework to be in place.

That brings me to another concern, which is whether there are the appropriate regulatory settings to incentivise the investment required.

As a provider of essential utility services, Vector is not opposed to appropriate quality regulatory oversight.

However, we strongly believe that good regulation should look beyond just the delivery of cost effective services and create an environment that encourages high service standards and ongoing infrastructure investment to ensure consumers' interests are served when it comes to future security of supply.

In this respect we concur with comments yesterday from Roy Hemmingway that in the long run the interest of consumers and investors should be aligned we certainly believe a quality regulatory regime should recognise this.

Slide: Investment Policy Issues

I set out here some questions which in the interest of time I will not read out but instead I put it to you that, if investment is to be encouraged, then the answers to these questions must be yes, and achieving this in the current regulatory climate may be challenging.

Slide: Conclusions

Which brings us back to finding a robust and durable solution to meeting Auckland's energy needs.

In summary, the position as we see it is:

The ongoing demand growth continues to erode the headroom between peak regional electricity demand and supply.

A sustained generation outage or transmission line failure in some situations would leave the region unable to meet peak demand and maintain security of N-1. We do not believe it is appropriate to expect to operate below a security threshold of N-1.

Demand-side alternatives can reduce electricity demand, but will only defer the inevitable requirement for transmission upgrade alongside additional generation.

The longer we delay identifying and implementing transmission solutions, the greater the risk of an inability to supply.

This is an asymmetric risk and whilst incremental gains in security can and are being made, the step change developments should not be delayed. These step changes will ensure that consumers expectations are meet.

Vector remains committed to working with you all to help ensure that, collectively, we achieve that purpose.

Thank you – I'd be happy to answer any questions.

Slide: Questions