

DELIVERING ON THE BROADBAND ASPIRATION: A RECOMMENDED PATHWAY TO FIBRE FOR NEW ZEALAND

The New Zealand Institute

April 2008

www.nzinstitute.org

This document is being released to stimulate discussion. We welcome feedback or comments on this document to broadband@nzinstitute.org

THIS PRESENTATION IS THE FINAL RELEASE IN THE INSTITUTE'S BROADBAND PROJECT

	Questions	Outputs
Setting the context	<ul style="list-style-type: none"> How can New Zealand most effectively compete in global markets? 	<ul style="list-style-type: none"> 'So far yet so close', New Zealand Institute discussion paper released in March 2007 'Creating a weightless economy: Positioning New Zealand to compete in the global economy', presentation released in September 2007
Part One	<ul style="list-style-type: none"> How much does world class communications matter to New Zealand? Do we need to get there sooner rather than later? 	<ul style="list-style-type: none"> 'Defining a broadband aspiration: How much does broadband matter and what does New Zealand need?', presentation released in September 2007
Part Two	<ul style="list-style-type: none"> Will recent announcements deliver on the broadband aspiration? 	<ul style="list-style-type: none"> 'Assessing New Zealand's current broadband path: The need for change', presentation released in March 2008
Part Three	<ul style="list-style-type: none"> What regulatory framework and funding model is required to deliver on the aspiration? 	<ul style="list-style-type: none"> 'Delivering on the broadband aspiration: A recommended pathway to fibre for New Zealand', presentation released in April 2008

THE FIRST PART OF THE PROJECT RECOMMENDED THAT NEW ZEALAND DEVELOP A FAST PATH TO FIBRE TO CAPTURE ECONOMIC BENEFITS

Summary of findings

The New Zealand Institute has identified national economic benefits from broadband in the range of \$2.7-4.4 billion year with further upside potential possible

Capturing many of these economic benefits increasingly requires high speeds and so New Zealand's policy focus should shift from encouraging penetration to increasing the speed of the network. This means investing in a fibre network

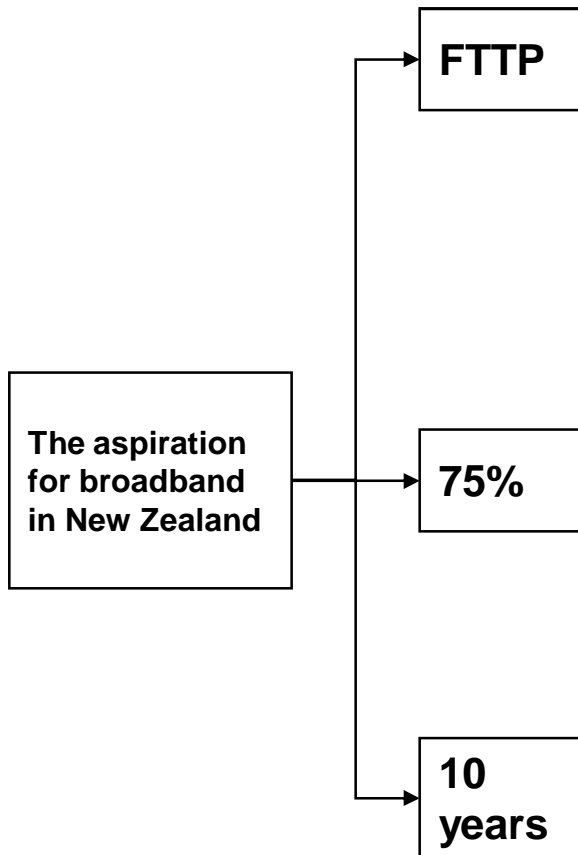
There is a significant cost to waiting. The longer that New Zealand waits, the more economic value it will forego and so New Zealand should approach the investment in fibre with urgency

Conclusion

The New Zealand Institute recommends:

- New Zealand should develop a fast and efficient national path to the rollout of fibre
- The high cost of delay means New Zealand should focus on a path that supports rapid progress in high-value segments from which benefits can be realised rapidly

WE PROPOSED THE FOLLOWING BROADBAND ASPIRATION FOR NEW ZEALAND



Justification / comments

Speed: there is a need for FTTP (fibre to the premises)

- Capturing the economic value requires speeds in excess of those achievable with copper. Fibre has greater capacity than copper, cable, wireless or satellite and is future-proof
- The speeds generated by FTTP allow the full potential economic value to be captured
- Backhaul and offshore links also need to be upgraded as part of this process

Reach: at least 75% of the population

- A rollout to 75% of the population will reach towns with populations greater than about 20,000
- Some parts of New Zealand are disproportionately expensive to serve

Timing: achieve this within 10 years, by 2018

- This investment in fibre must commence with urgency. The aim should be to front-load the investments so as to capture economic value quickly
- New Zealand must move quickly or much of the economic value will be foregone
- This full aspiration should be achieved by 2018 at the latest

THE CURRENT INVESTMENT PATHWAY IS INADEQUATE TO DELIVER AGAINST THE INSTITUTE'S PROPOSED ASPIRATION

Current Situation

The New Zealand Institute has identified three important issues that lead us to conclude that the current pathway is insufficient for New Zealand:

- **Progress is too slow:** Currently announced investments will not take New Zealand far enough fast enough
- **The dominant investor has weak incentives to invest:** Telecom is the only company likely to make significant investments in fibre, but has weak incentives to roll it out rapidly
- **Options are closing off:** Continuing along the current pathway will make it increasingly difficult to achieve the rapid roll out of fibre

- The current investment pathway is inadequate
- A new funding and regulatory model is required to overcome the issues identified and deliver on the broadband aspiration

OUR FOCUS IS ON INCREASING INVESTMENT IN THE LAST MILE, AS THIS IS THE GREATEST BARRIER TO ACHIEVING THE ASPIRATION

	<u>Description</u>	<u>Issues</u>
Last mile	<ul style="list-style-type: none"> • The link between the exchange and the premises • Currently comprises copper links that average 2.5km in length 	<ul style="list-style-type: none"> • Highest cost per premise in the investment chain • Significant impediment to access speed even with upgraded xDSL or wireless technology
Backhaul	<ul style="list-style-type: none"> • Link between the exchange and the core 	<ul style="list-style-type: none"> • Increasingly competitive market, e.g. Vector reselling backhaul to Vodafone, with investment responding to emerging demand
Core	<ul style="list-style-type: none"> • Backbone of the system between major centres e.g. links between Auckland and Wellington 	<ul style="list-style-type: none"> • Increasingly competitive market (5+ competitors), with investment responding to emerging demand
International connections	<ul style="list-style-type: none"> • Cable and satellite connections between New Zealand and the world • Most capacity is provided by the Southern Cross Cable 	<ul style="list-style-type: none"> • Currently this is not a competitive market and prices are high • Low cost per connection to upgrade (\$50-\$100 per premise) • Investment currently being discussed

THIS PRESENTATION OUTLINES A PROPOSAL TO DELIVER THE BROADBAND ASPIRATION

Create FibreCo, a price regulated monopoly investor in the fibre access network

- A price regulated investment vehicle, called FibreCo, is granted a monopoly over the fibre access network
- FibreCo is required to roll out fibre at a pre-determined rate so as to deliver FTTP to 75% of the population within 10 years
- FibreCo grants equal and open access to the network at a regulated price

FibreCo is structured to maximise the amount of private capital invested

- FibreCo is structured to provide commercially attractive returns for private shareholders, with the government providing funding if needed
- Seek to attract investors comfortable with the risk, return, and time horizon properties of passive fibre infrastructure
- The sequencing of investment allows for higher return areas to be served first, with early investors getting a right of first refusal on further capital rounds

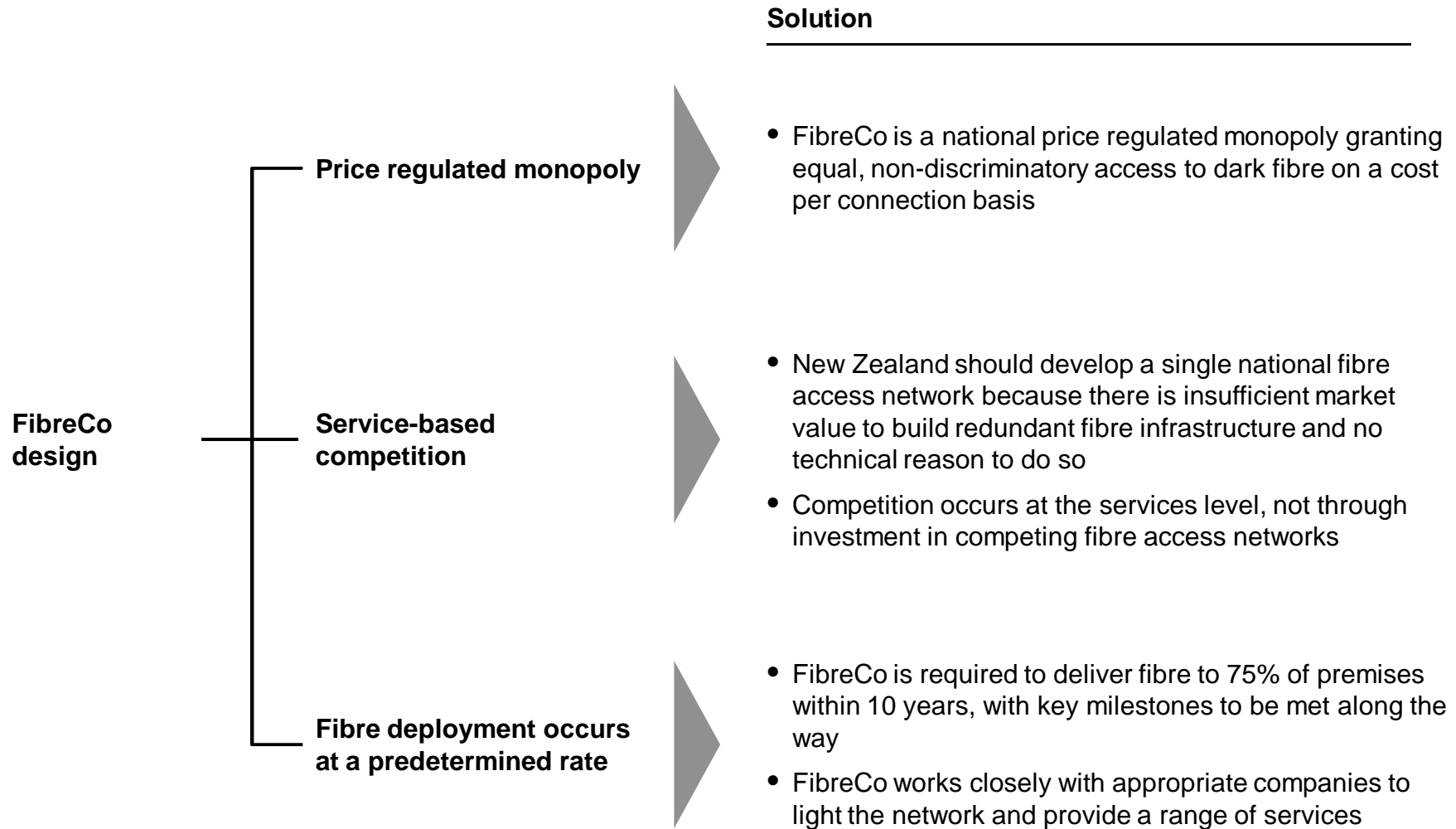
Provide a wide range of industry participants with value creating roles in FibreCo

- There are important roles in FibreCo for key stakeholders, including telcos, utilities, central and local government, and private investors
- Some parties contribute funding, others provide assets or expertise (e.g. access to ducting) and others facilitate investment (e.g. the consenting process)
- Owners of existing (copper and fibre) networks can sell these assets to FibreCo on a commercial basis

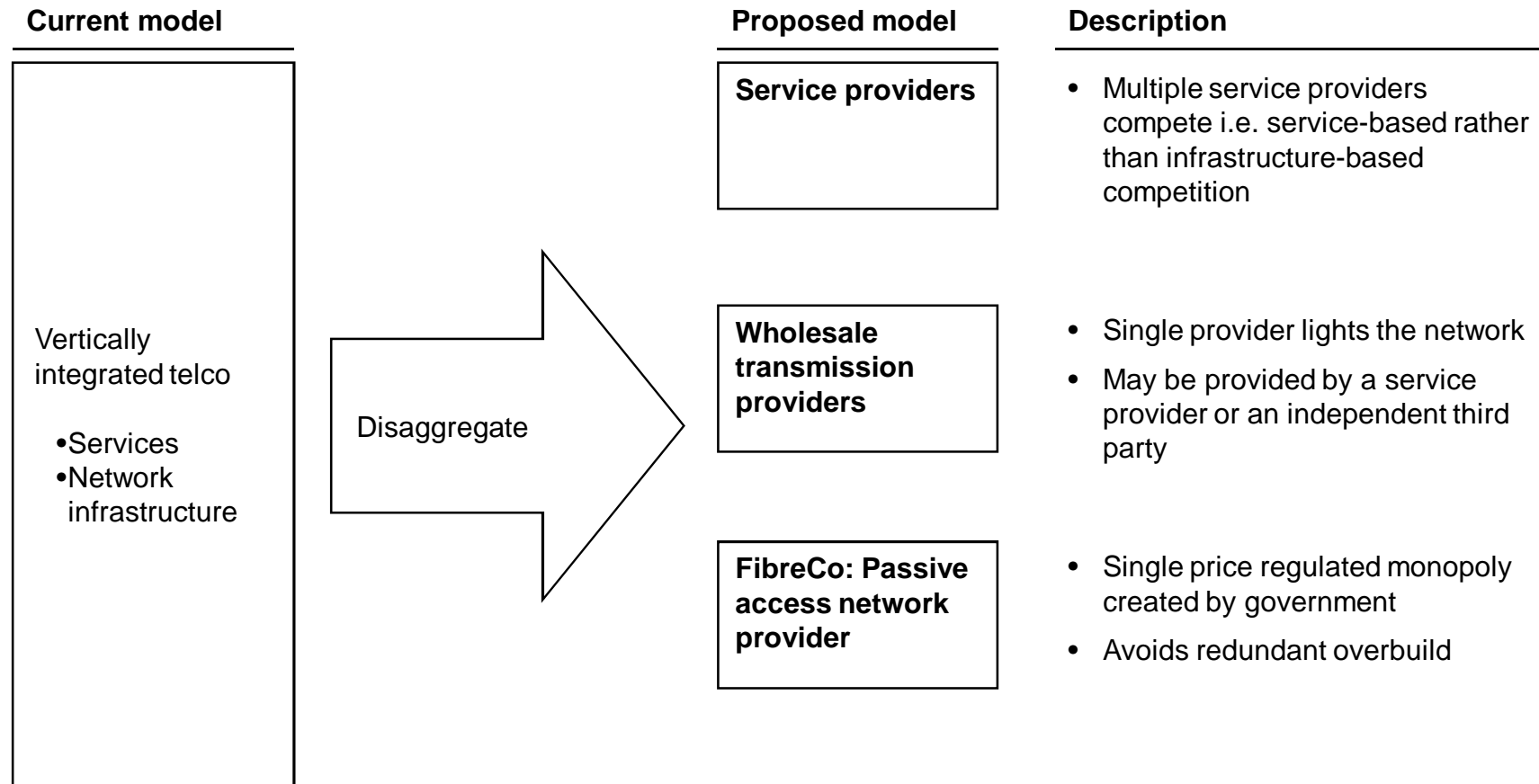
Commence a rapid programme of action to move towards the launch of FibreCo

- Establish the FibreCo vehicle
- Commence a rapid work programme to confirm the regulatory arrangements and the funding mechanism, to transfer existing networks, and to bring the key stakeholders on board
- Commence Phase 1 of fibre deployment

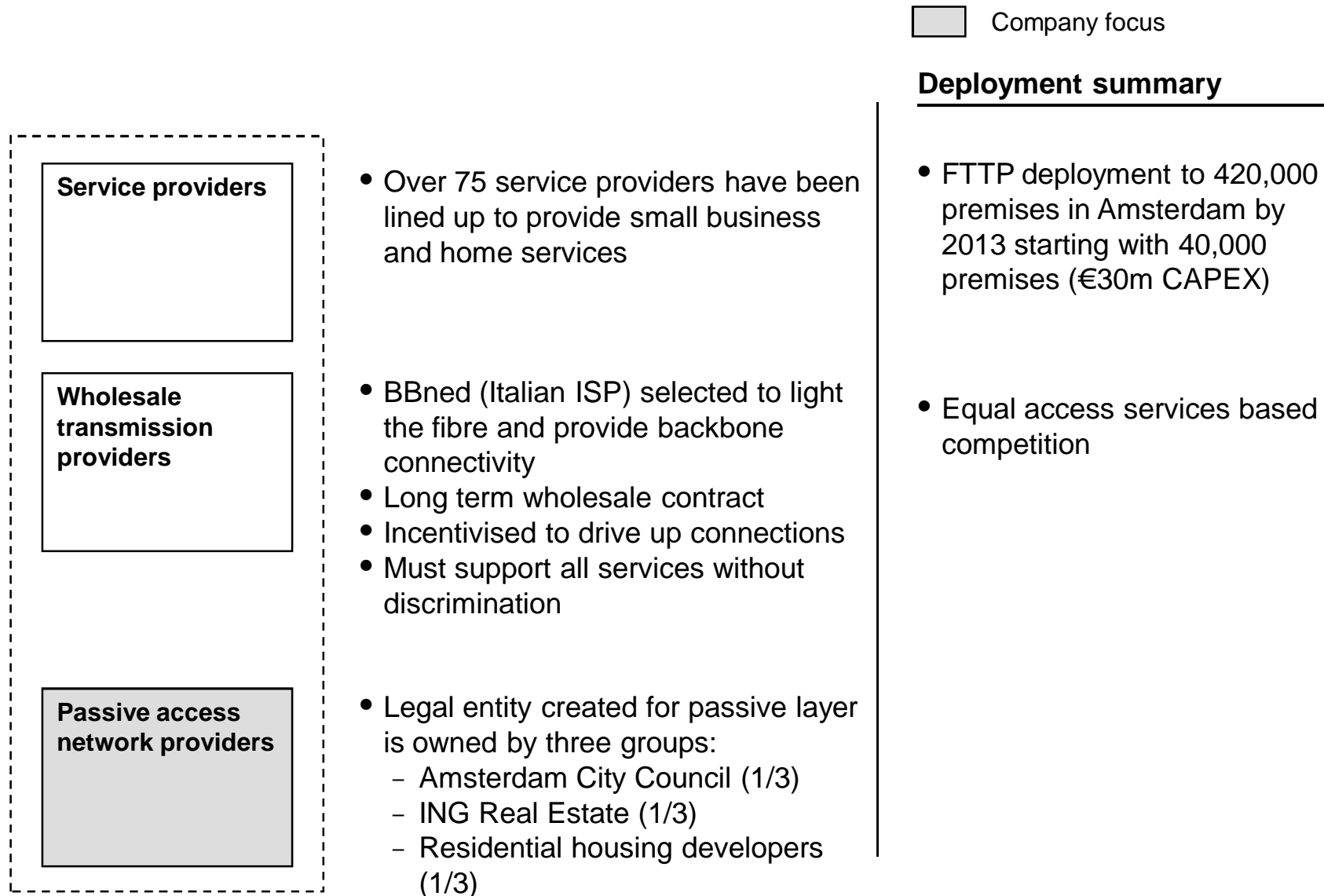
THERE ARE A FEW KEY DESIGN ELEMENTS OF FIBRECO



DISAGGREGATION TO SEPARATE INFRASTRUCTURE INVESTORS AND SERVICE PROVIDERS SHOULD OCCUR



A SIMILAR MODEL HAS BEEN DEPLOYED IN AMSTERDAM



THIS PRESENTATION OUTLINES A PROPOSAL TO DELIVER THE BROADBAND ASPIRATION

Create FibreCo, a price regulated monopoly investor in the fibre access network

- A price regulated investment vehicle, called FibreCo, is granted a monopoly over the fibre access network
- FibreCo is required to roll out fibre at a pre-determined rate so as to deliver FTTP to 75% of the population within 10 years
- FibreCo grants equal and open access to the network at a regulated price

FibreCo is structured to maximise the amount of private capital invested

- FibreCo is structured to provide commercially attractive returns for private shareholders, with the government as the investor of last resort
- Seek to attract investors comfortable with the risk, return, and time horizon properties of passive fibre infrastructure
- The sequencing of investment allows for higher return areas to be served first, with early investors getting a right of first refusal on further capital rounds

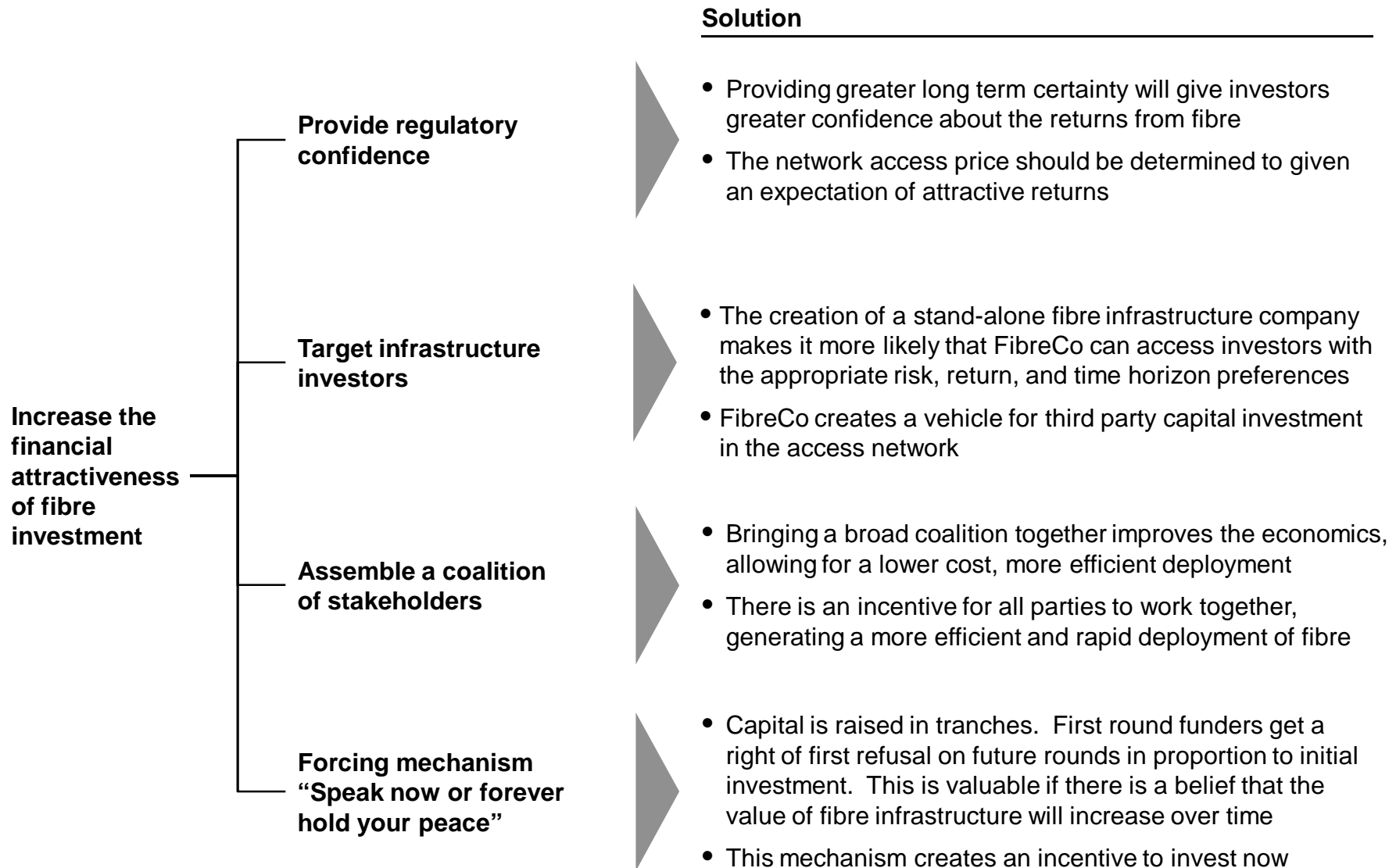
Provide a wide range of industry participants with value creating roles in FibreCo

- There are important roles in FibreCo for key stakeholders, including telcos, utilities, central and local government, and private investors
- Some parties contribute funding, others provide assets or expertise (e.g. access to ducting) and others facilitate investment (e.g. the consenting process)
- Owners of existing (copper and fibre) networks can sell these assets to FibreCo on a commercial basis

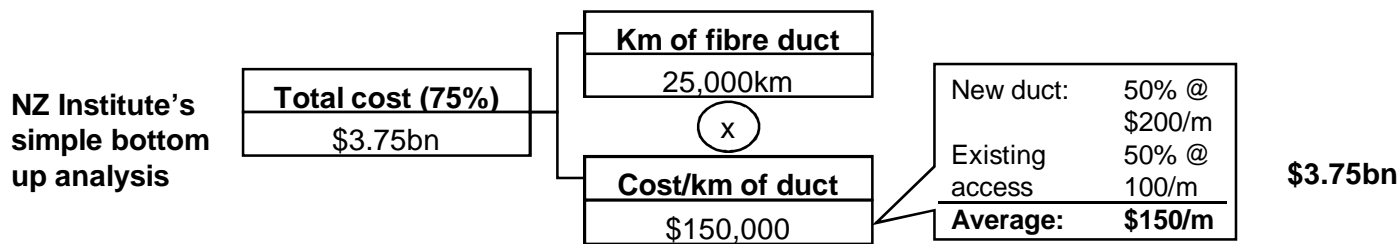
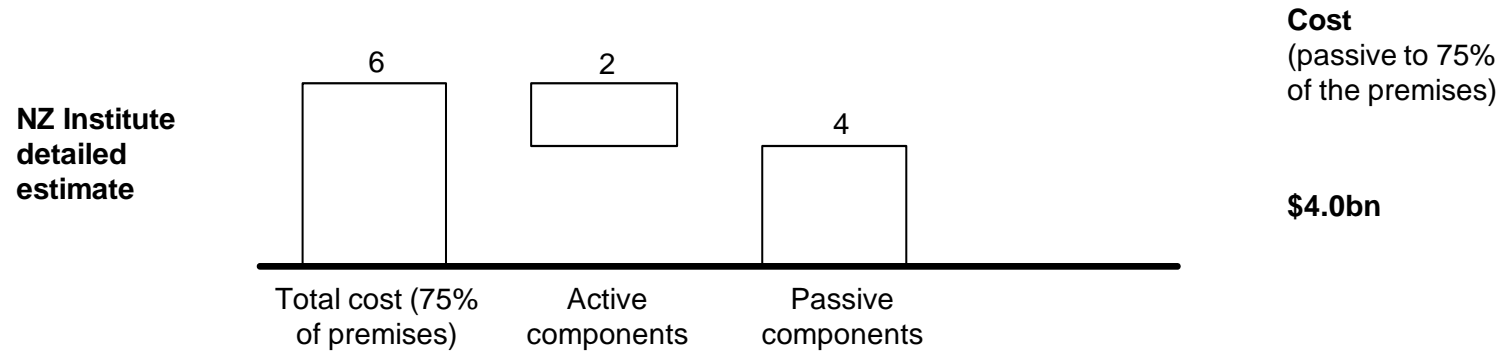
Commence a rapid programme of action to move towards the launch of FibreCo

- Establish the FibreCo vehicle
- Commence a rapid work programme to confirm the regulatory arrangements and the funding mechanism, to transfer existing networks, and to bring the key stakeholders on board
- Commence Phase 1 of fibre deployment

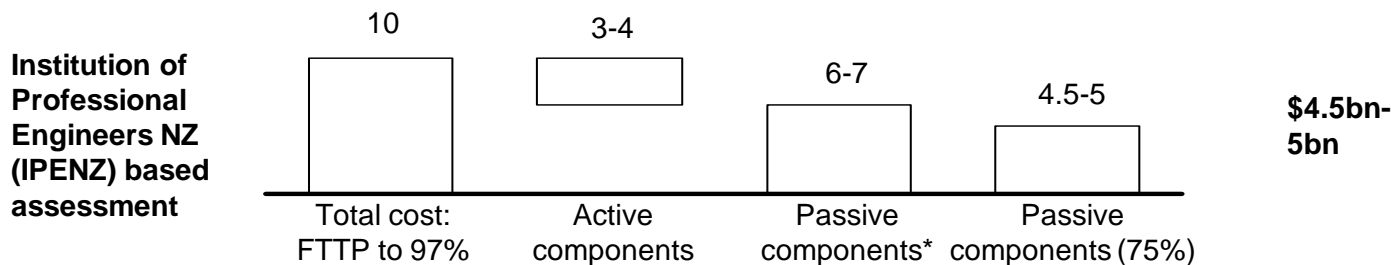
FIBRECO IS STRUCTURED TO ATTRACT A SUBSTANTIAL AMOUNT OF PRIVATE CAPITAL INTO FIBRE INVESTMENT



FIBRECO CAN DELIVER FTTP TO 75% OF THE POPULATION FOR \$4-5BN



The New Zealand Institute estimates the cost of reaching 75% of the population lies between \$4bn and \$5bn

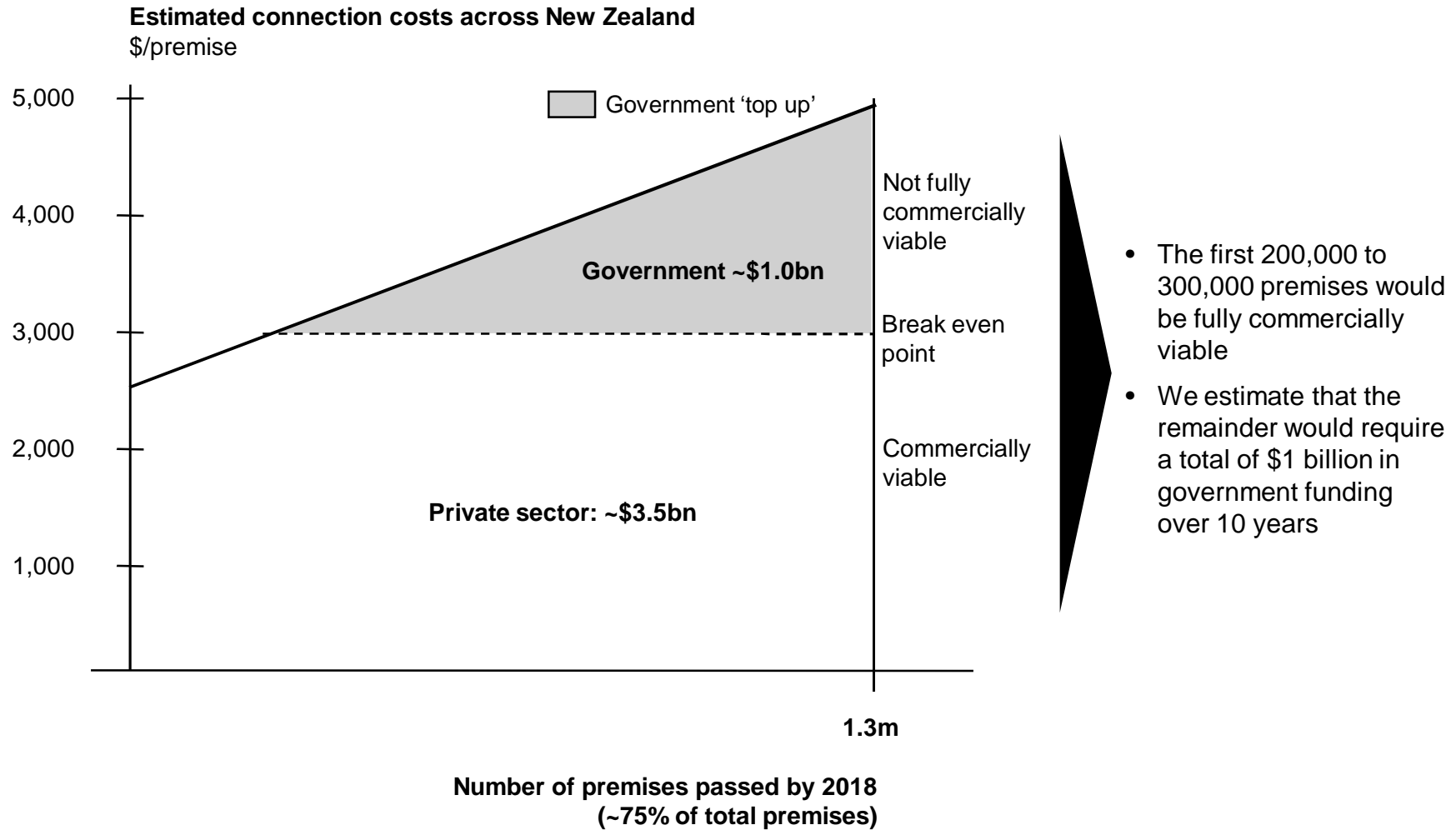


Note: Institute detailed estimate is based on costings for individual components of the network, based on interviews with industry experts and international estimates, scaled for the NZ environment. Passive components include fibre, duct, equipment location sites and supporting non-electronic elements; active components include switching and amplification equipment. Source: Industry experts, IPENZ, Allen, Azimuth, Institute analysis.

THE BREAK EVEN POINT FOR FIBRECO IS ABOUT \$3,000 PER PREMISE

			<u>Assumptions/comments</u>
Typical revenues generated	Revenue/premise/month	\$50	<ul style="list-style-type: none"> • Telecom average is \$80-100 per premise • New Zealand will reach similar penetration rates to leading nations • Reasonable given that copper will be retired as fibre is rolled out
	Penetration (% of homes passed)	x 67%	
	Months/year	x 12 mths/yr	
	Revenues/year/premise passed	<u>\$400/year</u>	
Gross return requirements	Required rate of return	10%	<ul style="list-style-type: none"> • Assumed return for an infrastructure investor • Low maintenance cost for passive asset • Assumes 40 year life
	Opex/premise (% of capex)	+ 1%	
	Depreciation of asset (%/year)	+ 2.5%	
	Gross revenues/year (% of capex)	<u>13.5%</u>	
Breakeven costs	Revenues/year/premise	\$400/year	<ul style="list-style-type: none"> • Based on these assumptions we expect premises costing less than ~\$3,000 to connect will be fully commercially viable
	Gross revenues/year - % of capex	÷ 13.5%	
	Breakeven cost per premise	<u>~\$3,000</u>	

A GOVERNMENT COMMITMENT OF ~\$1BN OVER 10 YEARS WOULD BE REQUIRED TO COVER THE INVESTMENTS THAT ARE NOT FULLY VIABLE



Note: Assumes ~\$4.5bn to reach 75% of New Zealand premises (passive layer), numbers may not add exactly due to rounding.


AGGREGATING GOVERNMENT DEMAND AND IMPROVED ECONOMICS OF DEPLOYMENT WOULD REDUCE REQUIRED TAXPAYER FUNDING

Aggregated government demand

- Government currently spends over \$200m a year on communications across multiple suppliers
- By aggregating this spend and committing it to service providers operating on the FibreCo network, the government could play an important role as an anchor tenant and improve the penetration rates of FibreCo

Improved economics

- Increased value: As additional services are offered, and demand for high speed broadband increases, FibreCo's penetration rates are also likely to increase
- Decreased costs: The advent of new fibre deployment technologies and lower technology costs will lead to lower cost per premise



The economics of FibreCo
are likely to improve over time

THERE ARE SEVERAL TECHNIQUES THAT HAVE BEEN USED EFFECTIVELY TO INCREASE PENETRATION RATES

Comparable services

- Provision of entry level services at a comparable cost to existing services, e.g. phone and 1 Mbps internet, can drive rapid switching from copper to fibre

Opt out trials

- Neunen, a small town in the Netherlands has deployed an FTTP network. For the first ten months, residents were given free internet @ 10 Mb/s. Following this honeymoon period, fees were charged and additional services offered. In the end 80% stayed with the fibre network

Required switch to fibre

- Require a switch from copper to fibre to 'retire' the copper network as the fibre network is deployed

THIS PRESENTATION OUTLINES A PROPOSAL TO DELIVER THE BROADBAND ASPIRATION

Create FibreCo, a price regulated monopoly investor in the fibre access network

- A price regulated investment vehicle, called FibreCo, is granted a monopoly over the fibre access network
- FibreCo is required to roll out fibre at a pre-determined rate so as to deliver FTTP to 75% of the population within 10 years
- FibreCo grants equal and open access to the network at a regulated price

FibreCo is structured to maximise the amount of private capital invested

- FibreCo is structured to provide commercially attractive returns for private shareholders, with the government as the investor of last resort
- Seek to attract investors comfortable with the risk, return, and time horizon properties of passive fibre infrastructure
- The sequencing of investment allows for higher return areas to be served first, with early investors getting a right of first refusal on further capital rounds

Provide a wide range of industry participants with value creating roles in FibreCo

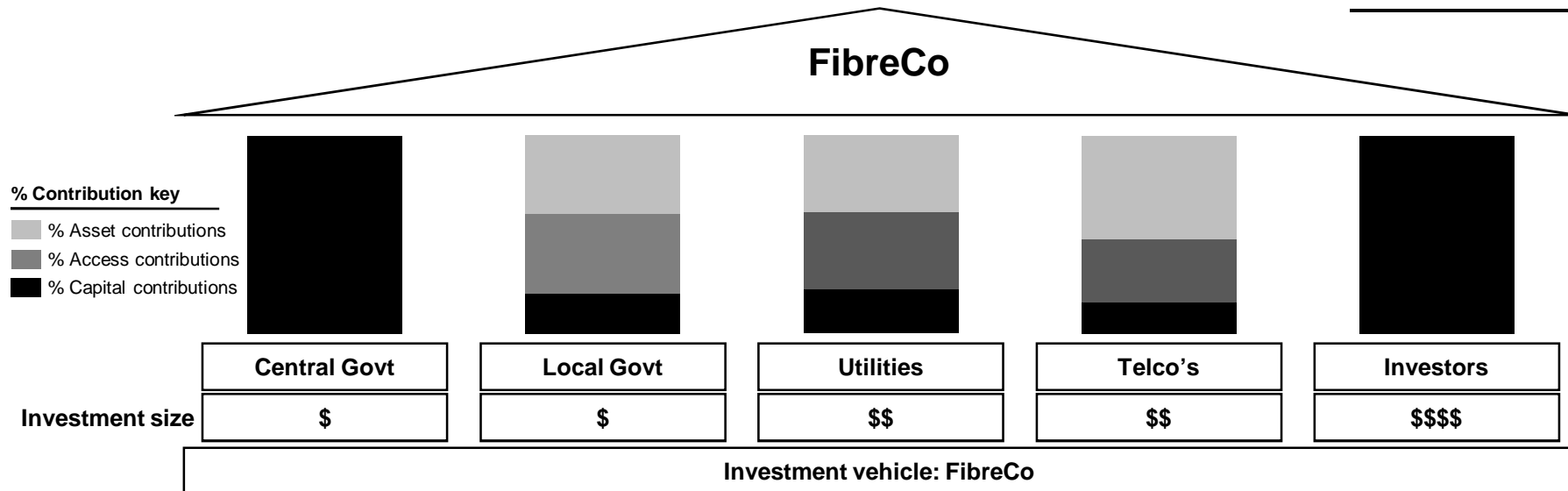
- There are important roles in FibreCo for key stakeholders, including telcos, utilities, central and local government, and private investors
- Some parties contribute funding, others provide assets or expertise (e.g. access to ducting) and others facilitate investment (e.g. the consenting process)
- Owners of existing (copper and fibre) networks can sell these assets to FibreCo on a commercial basis

Commence a rapid programme of action to move towards the launch of FibreCo

- Establish the FibreCo vehicle
- Commence a rapid work programme to confirm the regulatory arrangements and the funding mechanism, to transfer existing networks, and to bring the key stakeholders on board
- Commence Phase 1 of fibre deployment

THE FIBRECO MODEL ENCOURAGES PARTICIPANTS TO WORK TOGETHER IN A COOPERATIVE FASHION TO ACCELERATE INVESTMENT

ILLUSTRATIVE



What do they contribute?	<ul style="list-style-type: none"> \$ equity (cornerstone) Anchor tenant. Commit government comms spend (\$200m + p.a.) to FibreCo 	<ul style="list-style-type: none"> \$ equity Alignment with civil works e.g. footpaths and roads 	<ul style="list-style-type: none"> \$ equity Alignment with capital programs Use of existing ducting, access agreements e.g. non-notified RMA 	<ul style="list-style-type: none"> \$ equity Alignment with capital programs Use of existing ducting, access agreements Existing fibre access 	<ul style="list-style-type: none"> \$ equity
What do they get?	<ul style="list-style-type: none"> Stake in FibreCo \$ 	<ul style="list-style-type: none"> Stake in FibreCo \$ 	<ul style="list-style-type: none"> Stake in FibreCo \$ Stake in FibreCo for alignment of assets <u>or</u> revenues for access 	<ul style="list-style-type: none"> Stake in FibreCo \$ Stake in FibreCo for alignment of assets <u>or</u> revenues for access 	<ul style="list-style-type: none"> Stake in FibreCo \$
What to resolve	<ul style="list-style-type: none"> — 	<ul style="list-style-type: none"> — 	<ul style="list-style-type: none"> Valuation of non-cash (assume commercial terms) 	<ul style="list-style-type: none"> Valuation of non-cash (assume commercial terms) 	<ul style="list-style-type: none"> —

THERE ARE IMPORTANT ROLES FOR A BROAD RANGE OF STAKEHOLDERS

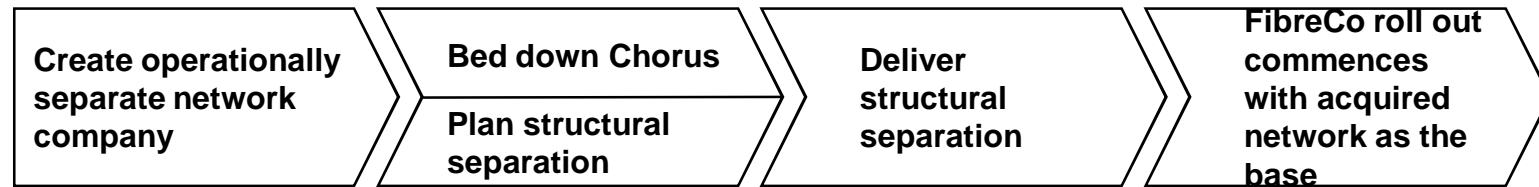
<p>Central government</p>	<ul style="list-style-type: none"> • Acts as the leading change driver through regulatory and funding leadership • Can also play an important role by aggregating government demand and acting as an anchor tenant for FibreCo e.g. current communications spend amounts to over \$200 million a year. This will increase the income stream and reduce the risk profile of FibreCo
<p>Local government</p>	<ul style="list-style-type: none"> • Should do everything possible to reduce cost in particular around RMA and infrastructure investment. Possibly a funding role, but doesn't have the balance sheet to be a major player • Work to aggregate demand for the new network
<p>Telco's</p>	<ul style="list-style-type: none"> • Support integration of existing network into FibreCo • Potential contributors to active layers, providing services to consumers over the open access network • Potential investor in FibreCo
<p>Utilities</p>	<ul style="list-style-type: none"> • Good skills in the deployment and ongoing management of infrastructure assets • Some experience in this sector in New Zealand e.g. Vector Communications, Counties Power • Access experience rights and assets that reduce deployment costs e.g. existing ducting • Potential investor
<p>Passive Investors</p>	<ul style="list-style-type: none"> • Passive infrastructure owners with long term business models can take a stake in the passive components of the network (similar to investing in assets like toll roads) • It is expected that passive investors will comprise the largest cash investor base
<p>Service providers</p>	<ul style="list-style-type: none"> • Important to assemble service providers to operate on the open access network; this will be a key driver of uptake and consumer willingness to pay

ONCE FIBRECO IS ESTABLISHED, THE HIGHEST VALUE OPTION IS TO STRUCTURALLY SEPARATE TELECOM

 Preferred

	<u>Description</u>	<u>Discussion</u>
<p>Option One: Structural separation and purchase by FibreCo</p>	<ul style="list-style-type: none"> • FibreCo pays fair price for the existing fibre and copper networks • Telecom (and others) agree to sell its access network to FibreCo • FibreCo takes over management of copper and optimises maintenance and migration as fibre rolls out e.g. copper switched off as fibre rolls out 	<ul style="list-style-type: none"> • Highest value options for asset owner(s) as no competitive pricing to damage margins and no redundant overbuild • The existing network provides revenues for FibreCo from day one
<p>Option Two: Infrastructure competition</p>	<ul style="list-style-type: none"> • Telecom retains its copper and fibre access network and competes against FibreCo service providers 	<ul style="list-style-type: none"> • Net value destroying versus Option One • May see significant reduction in access pricing, taking ~\$20/month off price. This reduces the value of FibreCo.
<p>Option Three: Regulated sale</p>	<ul style="list-style-type: none"> • Government regulates sale of copper access network to FibreCo • FibreCo takes over management of copper and optimises maintenance and switch off as fibre rolls out 	<ul style="list-style-type: none"> • Requires significant intervention by government • May be unpalatable given recent regulatory interventions

STRUCTURAL SEPARATION CAN BE SEEN AS THE NEXT STEP AFTER THE OPERATIONAL SEPARATION OF TELECOM



	Now	12+ months	6+ months	Next 10 years
Duration	• Now	• 12+ months	• 6+ months	• Next 10 years
Description	<ul style="list-style-type: none"> • Government stipulates the creation of an operationally separated network company ('Chorus') • Telecom starts to separate Chorus from wholesale and retail functions in accordance with operational separation obligations 	<ul style="list-style-type: none"> • Changes to Chorus are locked in i.e. ensure that the operationally separated business is running effectively • Changes required to structurally separate Chorus, e.g. IT, are identified and a separation plan is completed • Valuation/sale of Chorus assets are addressed including definition of assets in and out of sale* • Where necessary, programmes to allow structural separation commence 	<ul style="list-style-type: none"> • FibreCo acquires Chorus assets for an agreed price from Telecom • Relevant network assets are migrated to FibreCo • Revenues currently going to Chorus for relevant assets migrate to FibreCo • FibreCo continues to serve customers who are using these assets 	<ul style="list-style-type: none"> • Tranche 1 of the FibreCo roll out commences with fibre deployed to ~300,000 premises • Investment continues until FTTP reaches 75% of the population • Alignment between fibre access rollout and copper retirement is undertaken

* Some non-access assets currently in Chorus may not be sold to FibreCo. Some active elements may be transferred to Telecom or a third party

THIS PRESENTATION OUTLINES A PROPOSAL TO DELIVER THE BROADBAND ASPIRATION

Create FibreCo, a price regulated monopoly investor in the fibre access network

- A price regulated investment vehicle, called FibreCo, is granted a monopoly over the fibre access network
- FibreCo is required to roll out fibre at a pre-determined rate so as to deliver FTTP to 75% of the population within 10 years
- FibreCo grants equal and open access to the network at a regulated price

FibreCo is structured to maximise the amount of private capital invested

- FibreCo is structured to provide commercially attractive returns for private shareholders, with the government as the investor of last resort
- Seek to attract investors comfortable with the risk, return, and time horizon properties of passive fibre infrastructure
- The sequencing of investment allows for higher return areas to be served first, with early investors getting a right of first refusal on further capital rounds

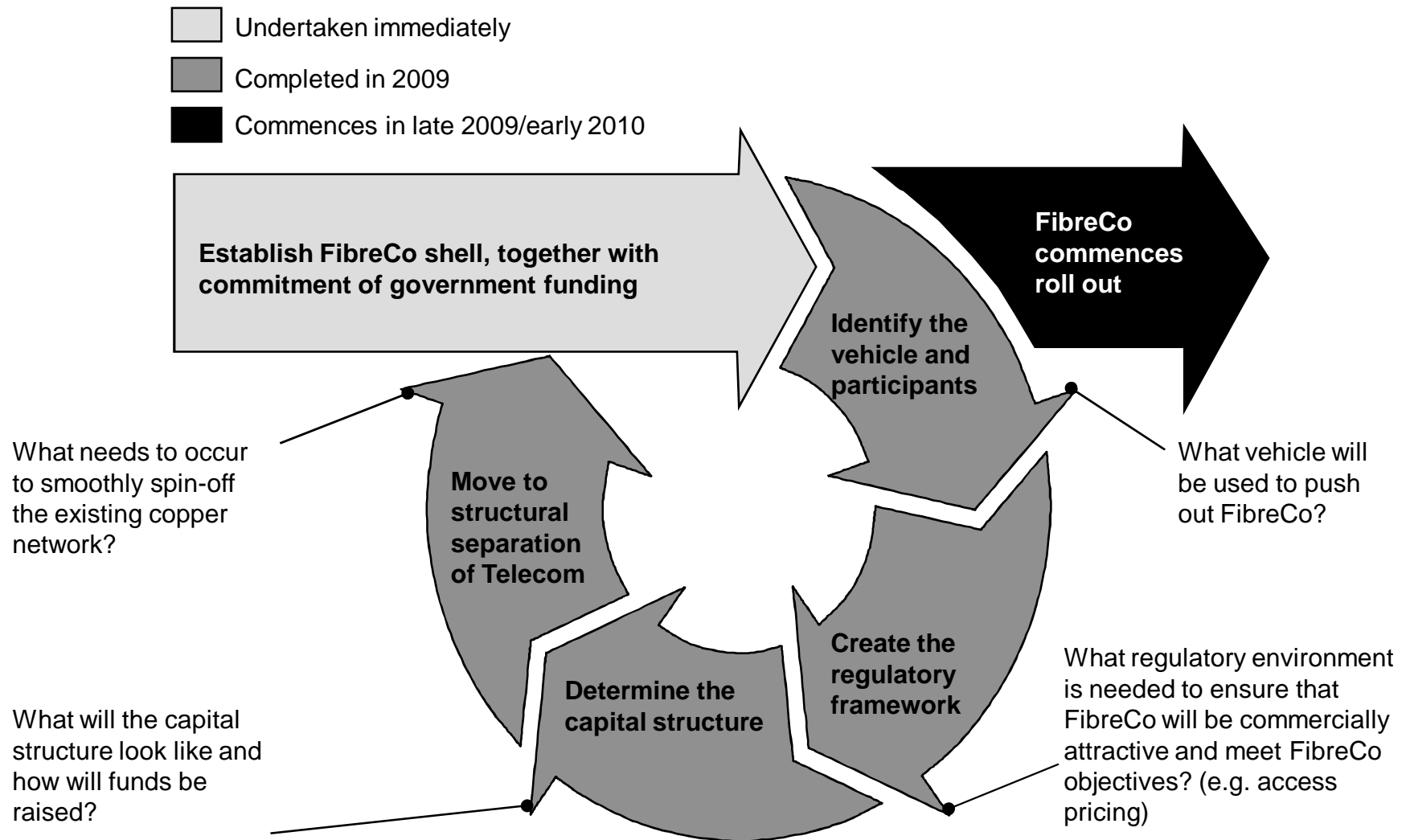
Provide a wide range of industry participants with value creating roles in FibreCo

- There are important roles in FibreCo for key stakeholders, including telcos, utilities, central and local government, and private investors
- Some parties contribute funding, others provide assets or expertise (e.g. access to ducting) and others facilitate investment (e.g. the consenting process)
- Owners of existing (copper and fibre) networks can sell these assets to FibreCo on a commercial basis

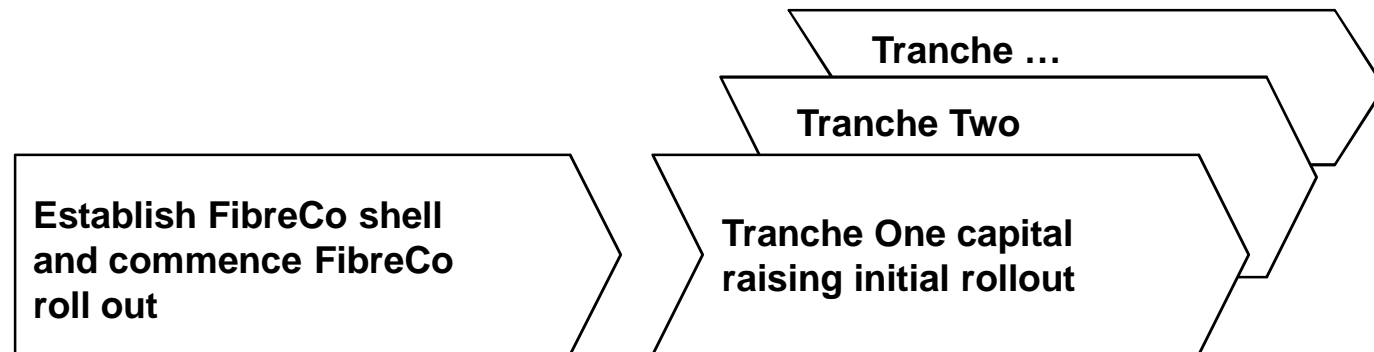
Commence a rapid programme of action to move towards the launch of FibreCo

- Establish the FibreCo vehicle
- Commence a rapid work programme to confirm the regulatory arrangements and the funding mechanism, to transfer existing networks, and to bring the key stakeholders on board
- Commence Phase 1 of fibre deployment

A PROGRAMME OF WORK SHOULD BE COMMENCED IMMEDIATELY TO ENSURE THAT FIBRECO CAN BE LAUNCHED AS SOON AS POSSIBLE



THE FIRST PHASE OF THE FIBRECO ROLL OUT SHOULD FOCUS ON 200,000-300,000 HIGH VALUE PREMISES



Description

- Establish FibreCo shell and commit government funding to demonstrate intent
- Government commissions detailed workplan (participants, regulatory, capital structure, structural separation) led by private sector
- Capital raised from private sector
- Commence roll out of first round of premises (~200,000 to 300,000) to highest value areas
- First tranche of funding will focus on the highest value premises/high value areas

Timing

- Commences in 2008, complete in late 2009
- Commences late 2009 or early 2010 and rolls out over 2-4 years

Contribution

- \$200-300 million from government
- Up to \$1 billion from the private sector (cash and in-kind)

Leader

- Central government
- FibreCo and private sector