



The Bigger, Better Network.

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25 October 2013

Mr. Charles Punaha
Chief Executive Officer
NICTA
Frangipani Street, Hohola
PO Box 8444, Boroko
National Capital District

Dear Mr. Punaha,

Re: Public Inquiry into the declaration of certain Wholesale Mobile Services

Please find attached our Submission in response to the Discussion Paper of 2 August 2013 on the Public Inquiry into the declaration of certain wholesale mobile services.

Yours sincerely

John Mangos
CEO

SUBMISSION

GENERAL

- 1 Digicel welcomes the opportunity to participate in NICTA's public inquiry into the need for the declaration of certain wholesale mobile services ("**Public Inquiry**") and an opportunity to comment on its discussion paper ("**Discussion Paper**").
- 2 The Public Inquiry is the second declaration inquiry held by NICTA under the *National Information and Communication Technology Act 2009* ("**Act**"), including the first review of the declaration criteria established by Section 128 of the Act. Digicel encourages NICTA to make Section 128 of the Act the starting point for its methodology and analysis as statutorily required of it. In the event that NICTA does draw on international precedents, we submit that NICTA has a duty to ensure that such approach does not mean that this inquiry becomes detached from the language of the Act itself.
- 3 The Act outlines a three-stage process for NICTA to adopt for the wholesale access regime in PNG.
 - The first stage of the process is for NICTA to determine whether or not to recommend to the Minister of Communication and Information ("**Minister**") that one or more defined wholesale services should be declared services based on the application of the declaration criteria, the objectives and the regulatory principles of the Act.
 - If NICTA recommends that a declaration be made, the Minister must then, based on his own independent analysis and having regard to the recommendation of NICTA, make a decision to either accept or reject NICTA's recommendation to declare the service. In the event that a service is declared, access rights and obligations are imposed on access seekers and access providers. However, determination of the terms and conditions upon which the declared service is to be supplied is, in the first instance, a matter between the access provider and the access seeker.
 - The third stage of the process is for NICTA, in the event that it is notified of an access dispute between an access provider and an access seeker, to conduct an arbitration of that.
 - In between these last two stages, but only after the declaration of a service in accordance with the Act, NICTA may adopt a determination of model non-price terms and conditions relating to access to a declared service and must determine service-specific pricing principles relating to the price of access to a particular declared service.
- 4 Having regard to the first stage, Digicel submits that all of the declaration criteria of Section 128 of the Act are not met by the declaration of the wholesale mobile services in question and that, consequently, NICTA must

not recommend declaration of the domestic mobile roaming services and facilities access services associated with passive mobile network facilities. Our reasoning is detailed below.

BENEFITS OF COMPETITION AND INVESTMENT IN INFRASTRUCTURE TO DATE

- 5 The threat to impose wholesale regulation on certain wholesale mobile services, which NICTA describes as being domestic mobile roaming services and facilities access services, endangers the positive outcomes that have been achieved to date following Digicel's entry into the market and the relatively recent liberalisation of the telecommunications sector at the end of 2010. There is a real risk of a declaration discouraging efforts to continue increasing investment in infrastructure in Papua New Guinea and thereby depriving Papua New Guinea of the benefits of competition going forward.

Digicel's investments in Papua New Guinea

- 6 Digicel's investments in Papua New Guinea can be summarised as follows:
- (a) Digicel is one of the largest foreign investors in Papua New Guinea, having invested in excess of PGK 1 Billion since it launched its telecommunications services in July 2007.
 - (b) Since then, Digicel has rolled out its voice and data network to all provinces in Papua New Guinea and now covers in excess of 4 million (72%) of the population of Papua New Guinea. Several of these areas had no telecommunications networks or services at all before the arrival of Digicel, including most parts of the Western Province and Bougainville.

Indeed, we stress that although Digicel is the most recent entrant into the mobile telecommunications sector (having been granted the relevant licence/s and commenced operations many years after the incumbents Telikom and bemoBILE had been in operation in the country), Digicel is the only operator in Papua New Guinea to have satisfied all of its network coverage and network rollout licence obligations, including to each of the main centres, mid-sized centres, administrative district centres and small population centres detailed in its licence. This is also despite the fact that Telikom and bemoBILE have been granted concessions by NICTA in the form of reduced rollout obligations. Digicel has taken all the risk of its rollout above and beyond its licence obligations.

- (c) To ensure its consumers are provided with the best quality of service, Digicel also established a world class backhaul transmission network

across Papua New Guinea, has invested in the launch of a new 3G network, and is now investing in a 4G network.

- 7 Digicel's investments, including its investments in infrastructure, have contributed to social development (both tangible and intangible) as well as economic development in Papua New Guinea.

Progressing social development

Direct

- 8 The impact of Digicel's entry into Papua New Guinea has been striking and two-fold:
- (a) First, the impact on coverage, penetration, and expanded range of services and other market outcomes. This is documented in Table 1 below. International call charges have fallen significantly. For many significant destinations such as Australia, NZ, Malaysia, Singapore and the UK, call rates have fallen by between 45% and 67%. Domestic calls have also seen significant reductions, up to 44% depending on the type of call (e.g., peak vs off-peak).
- (b) Second, the impact on investment in Papua New Guinea and the long-term contribution that this makes to enhancing the physical capital base of Papua New Guinea's economy.

	Pre-Digicel (2007)	Post-Digicel (2011)	Difference
Mobile penetration (% population with a mobile service)	2.6%	37% ¹	1,423% increase
Mobile coverage (% population covered by a mobile network)	12.5%	72%	576% increase
Handset prices – entry level	PGK 125 for SIM (start-up kit including call credit of PGK 100), plus handset cost between PGK 200-400 Total cost: PGK 325	Free SIM with a phone. (PGK 10 for SIM alone including PGK 3 call credit). Handset as low as PGK30 (e.g., ZTE's "Coral" handset) Total cost: PGK 40	88% reduction in handset & upfront cost

¹Digicel's currently has around 2.37 million end users. PNG's current population is estimated to be 6.4 million.

	Pre-Digicel (2007)	Post-Digicel (2011)	Difference
Services		<ul style="list-style-type: none"> ▪ 24 Hour free customer care ▪ Per second billing ▪ Free International 'Call Me' texts ▪ Credit me requests ▪ Free Voicemail retrieval ▪ Prepaid access to Internet ▪ Mobile web (GPRS) ▪ SMS banking ▪ BlackBerry ▪ Electricity vending system on mobile phones (EasiPay). 	
Mobile banking	None	Launched in 2011	
Customer Care	Free but operates 9 hours a day (8am to 5pm) only	FREE and available 24 days x 7 days a week.	

Table 1: Digicel's entry in Papua New Guinea – impact on coverage, penetration, prices, services and other market outcomes

Indirect

9 **Long-term productivity and wellbeing:** In the context of a developing economy such as Papua New Guinea's, it is important not to focus only on the highly visible outcomes achieved in the mobile market and the investments in physical infrastructure. At least as significant (if not more) is the contribution that mobile services and technology makes to:

- (a) raising the long-term productivity of the other sectors of the Papua New Guinea economy; and
- (b) improving the well-being of the people in Papua New Guinea that would not have real and substantive access to mobile services. Such well-being includes social networking and cohesion, improved health, greater security and increased level of education (e.g., through access to the Internet). They are tangible and measurable outcomes (in principle) that have as much significance and importance as the increase in economic activity (for example, as measured by Papua New Guinea's gross domestic product).

Digicel in the community

10 Digicel has actively participated in the Papua New Guinea community, making significant contributions to Papua New Guinea's social capital base.

- (a) Digicel is actively involved in the Papua New Guinea community. It runs a host of community-based initiatives and has set up a Digicel PNG Foundation in Papua New Guinea which focus on educational, cultural and social development programmes. The Digicel PNG Foundation was officially launched on 15th October 2008 as a non-profit charitable organization with the aim to empower people by working with communities to develop and build sustainable and meaningful projects and programs focusing on the areas of education and health in Papua New Guinea.
- (b) During its three years of operations the Digicel Foundation has funded more than 131 community projects across 20 provinces, in the areas of basic education and health in rural areas, at a total cost of K 10 million. These projects have been rolled out in partnership with Government, NGO, churches and the private sector. To date the following milestones have been achieved:
- i Construction of 44 primary school classrooms (including water & sanitation facilities through water tanks, toilets &a showers) in rural areas giving more than 1500 students access to a much improved and healthier learning environment
 - ii Construction of 58 elementary classrooms in rural areas providing more than 1000 children with access to basic education and a much improved learning environment
 - iii 31 Community Learning Centres operational nationwide providing more than 2,000 vulnerable children with a basic education through numeracy and literacy skills
 - iv Funding and operations of 8 new mobile clinic ambulances in 7 different provinces, in partnership with Churches and Provincial Health, providing free outreach and health services to more than 22,000 people to date in rural areas
 - v Funding of 6 Family Support Centres in partnership with Provincial Health and UNICEF offering free services to victims of domestic violence
 - vi Construction of 4 new Womens Resource Centres in partnership with Churches, NGO's and Provincial Health providing shelter and counseling as well as skill based training for victims of violence
 - vii Funding of capacity building programs in partnership with churches and local NGO's addressing the quality of learning in the Community Learning Centers in the settlements of Port Moresby by training and mentoring community based volunteer teachers, developing the skills of community leaders in these

settlement communities and providing women in the settlements with basic life skills training

- viii Providing basic services (shelter, food, care and education) to up to 500 vulnerable children and funding school fees for over 600 vulnerable primary school aged children through WeCARE Foundation, a local NGO focusing on supporting young vulnerable women and children living in the settlements of Port Moresby.
- (c) Over the next one to three years, the Foundation is committed to maintaining (and even increasing) its current level of investment to give back to Papua New Guinea communities by supporting community projects in the areas of basic education and health, with a special focus on improving the access and quality of these services in rural Papua New Guinea communities.
- (d) Digicel has been working with the Office of Climate Control to develop an early warning system for national emergencies. In the wake of the major earthquake in March in Japan, Digicel played a key role in alerting and updating Papua New Guinea's coastal population of the potential tsunami threat. The National Disaster Centre (**NDC**) and Digicel, working jointly, identified the areas that were at risk and quickly issued an SMS tsunami alert to over 300,000 people along the northern coastal areas of Papua New Guinea. Digicel's management, technical and customer care teams worked throughout the night to ensure communications remained operational and were on standby to provide customers with updates through the free customer care hotline via 123. Once the official confirmation was given by the NDC that the risk had passed and the warning had been removed, Digicel issued a SMS to the same numbers in the coastal areas giving the all clear.
- (e) Digicel is a strong supporter of Papua New Guinea's sports community. It sponsors Papua New Guinea's premier rugby league tournament and works closely with the Papua New Guinea Sports Federation and Olympic Committee to support Team PNG.

Progressing economic development

- 11 The Papua New Guinea economy has greatly benefited from the launch of Digicel. For example, the Treasurer reported that Digicel contributed to 0.7% of Papua New Guinea's GDP growth (which grew by 6.5%) in 2007².

Direct contribution from investment in physical infrastructure

- 12 The economic growth flows directly from the increase in economic activity from the investments in physical infrastructure that Digicel has made. The

²<http://www.digicelpng.com/en/about/news/digicel-contributes-07-growth-to-national-gdp-of-papua-new-guinea>

physical infrastructure put in place in turns contributes to an increase in the productivity of the other sectors of the Papua New Guinea economy, thereby raising economic growth even further.

Direct contribution that mobile services make to the productivity of other sectors of the Papua New Guinea economy

- 13 There are a number of transmission mechanisms linking mobile diffusion to economic growth:
- (a) Mobile communications in the hands of households and firms can help overcome the information deficit. As a result, markets become less exploitative and more competitive. Incentives to produce and sell output grow.
 - (b) Mobile communications reduce transaction costs. Telephone calls replace face-to-face contact. As a result, costs are saved and business and personal contact speeded up.
 - (c) Better mobile communications can make a country more attractive to tourists.
 - (d) There is some evidence that roll-out of mobile services is linked with higher levels of foreign direct investment.
 - (e) Mobile communications can assist in delivery of health care and education, by improving access to expertise.
- 14 The contribution that ICT services in general, and mobile services in particular, makes to the long-term productivity of a developing economy such as Papua New Guinea's is well documented.

Direct contribution to employment and human capital development

- 15 Digicel employs in excess of 900 persons directly, of which in excess of 95% are Papua New Guineans. Each of these individuals benefits from the extensive training and skills transfer processes of Digicel, including the Digicel University. Thousands more Papua New Guineans benefit indirectly from Digicel's activities, including its construction, security, distribution and retail activities.
- 16 The human talent that is created from working directly or indirectly with Digicel is a significant contribution to human capital development in Papua New Guinea. This is not only reflected in the increase in income enjoyed by staff employed by Digicel, it is also reflected in the diffusion of human talent as staff employed in Digicel join other firms both in the ICT sector (including Digicel's competitors) as well as other sectors such as banking and retail which compete for the same pool of talent.
- 17 Importantly, Digicel's investments in PNG and the benefits that have arisen from them have been privately funded. The PNG Government has not subsidised or supported Digicel's endeavours and, in fact, Digicel faces

higher regulatory costs than any other operator in PNG. This is because Digicel is subject to significantly higher regulatory fees than any other operator (including an annual fee of US\$800,000 payable to the State until 2016) and is also constrained in its decision making and commercial operation by virtue of the Retail Services Determination made by the Minister in 2012.

- 18 In contrast, Digicel's competitors have had the benefits of much earlier establishment than Digicel (first mover advantage) public funding and lower licence and regulatory fees. Despite this they have consistently failed to meet their network roll-out obligations and owned stated investment timetables. Instead of being brought to task for this by NICTA, rollout obligations have been relaxed and now NICTA is considering the imposition of further regulation on Digicel that could only be intended to have the effect of requiring Digicel to provide a regulated "subsidy" to its competitors.

RISKS ASSOCIATED WITH WHOLESALE REGULATION

- 19 Regulatory intervention for wholesale services is a very serious matter and can have significant downstream impacts on investment, innovation and competition. This is particularly the case in markets that are subject to competition and where entry has been relatively recent, i.e. markets are still growing and developing, as is the case in Papua New Guinea. Presumably this why the legislators made the declaration of wholesale services subject to very strict criteria and provided a two-step "approval" process (NICTA makes a recommendation for that Minister may either accept or reject), both of which steps are subject to appeals processes.
- 20 One of the risks with ill-advised or inappropriate wholesale regulation is that the regulation becomes a disincentive to investment. For example, in competitive and nascent markets, minimal penetration acts as an incentive to rivals to seek or increase market share by entering un-served or underserved areas by, inter alia, investing in infrastructure. If a regulator prematurely regulates wholesale access, it removes the incentive to invest in infrastructure both from the perspective of an access provider and an access seeker.
- 21 NICTA is proposing to regulate wholesale access to only Digicel's network. Not only is this discriminatory and out of step with the wholesale declaration criteria("WDC") set out in section 128 of the Act, this asymmetric approach would inevitably create competitive distortions. This type of regulation would result in a situation where only Digicel would be compelled to provide access to any access seeker notwithstanding bemoobile and Telikom might be in a position to also provide access to the wholesale service; for example, access in main centres and many regional centres where all operators have infrastructure. Not only is this against the Act and Government Policy, Digicel submits that it would be particularly inappropriate to use wholesale

regulation to attempt to protect or help a poor performing market participant from the effects of competition.

- 22 Inappropriate regulation or regulatory proceedings can have serious impacts in the industry and the firms that have invested in it. This is because such proceedings or regulation carry with them significant direct and indirect costs and serve to undermine the confidence of investors which in turn risks delays in or cancellation of future investment. This is regardless of the final outcome of such proceedings. Digicel submits that, given the emerging status of the telecommunications industry and the fragile nature of the investment environment in Papua New Guinea, this consideration alone should have caused NICTA to ensure that there was a very high threshold of evidentiary support for this regulatory proceeding.
- 23 Any recommendation in favour of regulating wholesale mobile services will have serious long-term implications for Digicel, for investment in ICT markets and for end users of ICT services.
- 24 There will be an **adverse financial and commercial impact on Digicel**. Digicel will no longer be free to make commercial rollout and investment decisions. It follows from this that Digicel is not free to make optimal decisions that maximise the profitability of Digicel's business. Digicel's financial position will therefore be undermined.
- 25 There will be an **adverse impact on investment in ICT markets**. It would send a bad signal to existing and potential ICT investors which would chill investment (as any investment decision would have to be considered in light of the threat of regulation). In fact, Digicel's rollout plans have already been re-considered due to this inquiry alone, let alone what would happen if regulation was actually implemented.
- 26 It may also be the case that recommending such regulation would also have an adverse impact on private investment in other sectors as it would create a risk that any investor in any sector could be regulated in order to give state owned enterprises a "leg up" in the markets in which they operate.
- 27 Finally, any adverse impact on investment incentives will also lead to **adverse long-term impact on end users of ICT services** in Papua New Guinea, both current and future end users. The central role that ICT services play in the lives of Papua New Guinea's people is obvious. Just as important is the significant contribution that ICT services make to the long-term productivity of other sectors of the Papua New Guinea economy. These long-term benefits will be adversely affected if NICTA wrongly recommends subjecting a wholesale service to declaration.

THRESHOLDS FOR WHOLESALE REGULATION

Introduction

28 NICTA must meet a number of thresholds before it can recommend declaring certain wholesale services. The thresholds concern:

- (a) First, meeting the **requirements of the Act**. Specifically, **all** the WDC set out in section 128 of the Act for recommending wholesale regulation must be met;
- (b) Second, articulating a coherent and comprehensive **analytical framework** that is consistent with the WDC. The framework links the requirements of the Act to the factual data that NICTA must obtain, and helps determine what factual data is relevant to the WDC, and what factual data is irrelevant to the WDC;
- (c) Third, ensuring that the data collected does in fact meet the requisite **standard of proof**. For the reasons set out below, Digicel submits that the proof beyond reasonable doubt is the requisite standard that NICTA must meet before recommending wholesale regulation;
- (d) Fourth, fully discharging the **burden of proof**. Digicel submits that unless the requisite standard of proof has been met in respect of each of the WDC, NICTA cannot recommend wholesale regulation. For example, it is impermissible for NICTA to conclude that a WDC is met based merely on an asserted presumption that has not been rebutted;
- (e) Finally, ensuring that the **means of proof** employed meet the minimum standards of evidence that include relevance, reliability, objectivity and accuracy. Conjecture, speculation, non-expert opinion, suppositions, guesswork and mere theoretical propositions do not meet the minimum criteria of evidence.

29 At clause 5 of the Discussion Paper, NICTA also states that:

“The internationally recognised test for determining whether a market is susceptible to ex ante regulation of market failures involves three criteria. A market is considered susceptible to ex ante regulation in cases where:

- (a) there are high and non–transitory barriers to market entry;
- (b) there is no tendency towards competition behind such barriers; and
- (c) ex post control by competition law alone is insufficient to address adequately the market failures concerned.

Although the application of the three criteria test is not a statutory requirement in PNG as it is within European Union countries, NICTA considers it to be an important filter

for determining whether a market is susceptible to ex ante regulation of dominance and thus an important (if non-mandatory) part of NICTA's process for determining whether it is necessary to consider ex ante regulation in the form of a recommended service declaration under Part VI of the Act. NICTA regards the application of the three criteria test in such circumstances as a regulatory best practice even though it is not specifically required of NICTA under the Act.”

- 30 Digicel notes that this is international practice but also submits that the consideration of such factors should be considered on an ‘inquiry by inquiry’ basis and in any event cannot override the consideration of the criteria in section 128 of the Act. For example, it is not relevant or necessary (and the Act does not require) that NICTA consider whether a participant in the relevant market has SMP or not before it considers the WDC. The requirements of section 128 are very clear and provide a prescriptive approach that NICTA must follow in reaching a decision on whether to recommend the declaration of a particular service.
- 31 In addition to the foregoing thresholds that go to the substantive decision in question – i.e., whether to recommend declaring a wholesale service – NICTA must also meet minimum procedural requirements as well as minimum standards for regulatory decision-making under Papua New Guinea’s administrative law. The principles of natural justice are enshrined in the Constitution of the Independent State of Papua New Guinea (in Division 4 of Part IV).

Wholesale Declaration Criteria

- 32 NICTA rightly states in the Discussion Paper it may only recommend that the Minister declare a particular wholesale service if NICTA is satisfied that such a declaration would satisfy **all** of the declaration criteria set out in section 128 of the Act which provides:

“128. Declaration criteria.

The "declaration criteria" are as follows —

- (a) that declaration of the wholesale service will further the achievement of the objective of this Part as set out in Section 124; **and**
- (b) specifically, in relation to the competition objective, that —
 - (i) access or increased access to the wholesale service (as a consequence of declaration) is necessary for the promotion of effective competition in at least one market other than the market for the wholesale service; **and**
 - (ii) the wholesale service is supplied in whole or in part via a facility that cannot feasibly be substituted, as a matter of commercial reality, via another facility in order to supply that wholesale service; **and**
- (c) specifically, in relation to the efficiency objective, that —

- (i) declaration would not materially compromise the incentives for efficient investment in any facility over which the wholesale service may be supplied; **and**
- (ii) access or increased access to the wholesale service (as a consequence of declaration) is technically feasible having regard to the specific factors identified in Section 124(2)(a); **and**
- (iii) in the case of wholesale services that are facilities access services, increased access to the wholesale service would avoid inefficient replication of underlying facilities that may be efficiently shared.”
(Emphasis added)

33 Section 124 of the Act provides:

“124. Objective of this Part.

- (1) The objective of this Part and Part VII of this Act is to —
 - (a) promote effective competition in markets for ICT services in Papua New Guinea, to be known as the "competition objective", subject to—
 - (b) promoting the economically efficient use of, and the economically efficient investment in, the facilities by which ICT services may be supplied, to be known as the "efficiency objective".
- (2) In determining the extent to which a particular thing is likely to further the achievement of the efficiency objective, regard shall be had (without limitation) to all of the following matters —
 - (a) whether it is technically feasible for the relevant ICT services to be supplied, having regard to —
 - (i) the technology available or likely to become available; and
 - (ii) the reasonableness of the costs involved; and
 - (iii) the effect of supplying the ICT services on the integrity, operation or performance of other ICT services or facilities; and
 - (b) the legitimate commercial interests of the access provider in supplying the ICT services, including the ability of the access provider to exploit economies of scale and scope; and
 - (c) the incentives for investment in the facilities by which the ICT services may be supplied, including the risks involved in making the investment.”

34 It is clear that the threshold for declaring a wholesale service is high. If any one of the WDC are not met, NICTA cannot recommend that the wholesale service be declared. The WDC are discussed in further detail below and in the expert reports of Mr. Alex Sundakov and Professor Henry Ergas which are **attached** to and form part of this Submission.

Analytical framework

35 NICTA must apply an analytical framework to ensure that its consideration of all of the WDC is rigorous and convincing. The analytical framework should be:

- (a) comprehensive – it must address **all** of the WDC; and
- (b) coherent – it must be relevant to the WDC, be in line with Government Policy and the objective of the Act which is -

“to ensure that the ICT industry contributes to the greatest extent possible to the long-term economic and social development of Papua New Guinea, by means that include:

- (a) providing a regulatory framework consistent with the regulatory principles ... that promotes:
 - (i) the long-term interests of Papua New Guinea and its people ...; and
 - (ii) the efficiency and competitiveness of the ICT industry in Papua New Guinea;
- (b) ensuring that ICT services ... are supplied as efficiently and economically as practicable and supplied at performance standards that reasonably meet the social, industrial and commercial needs of Papua New Guinea and its people;
- (c) promoting the development of an ICT industry in Papua New Guinea that is efficient, competitive and responsive to the needs of Papua New Guinea and its people;
- (d) promoting and maintaining fair and efficient market conduct and effective competition ...;
- (h) ... encouraging, facilitating and promoting sustainable investment in, and the establishment, development and expansion of, the ICT industry in Papua New Guinea, including via the exercise of facilities rights.”

36 Unless and until NICTA has undertaken coherent and comprehensive analysis and satisfied itself that all of the legislative and procedural requirements have been met, Digicel submits that it is not open to NICTA to recommend the declaration of a wholesale service.

Standard of proof is proof beyond reasonable doubt

37 The standard of proof is proof beyond reasonable doubt in respect of each matter that NICTA must be satisfied of, including proving beyond reasonable doubt that all of the WDC have been met. The requirement to be “satisfied” must be based on **cogent and compelling evidence**.

38 Before NICTA can recommend to the Minister that a wholesale service should be recommended for declaration, section 129 requires NICTA to be:

“satisfied that all of the declaration criteria would be met by the declaration, or continued declaration, of a wholesale service on particular terms.”(Emphasis added)

- 39 The requirement to be “satisfied” that all of the WDC would be met is a high threshold particularly given the uncertainties associated with predicting how markets will evolve with and without a regulation, and what this implies for competition and efficiency. This goes to the nature and level of evidence that NICTA must have before it can be satisfied that the WDC are met. The burden of showing that the evidence obtained is sufficient to meet the requisite standards on cogency rests with NICTA. This makes sense given the interventionist nature of wholesale service regulation and the harmful impact it could have on the industry and on Papua New Guinea if not done properly.
- 40 Because of the serious nature of a wholesale declaration and the consequences that follow, the law requires a very high standard of proof before NICTA can be satisfied that all of the WDC are met. That standard for practical purposes equates to **proof beyond reasonable doubt** – *i.e.* the criminal standard in respect of each and every one of the matters requiring consideration by NICTA.

Burden of Proof – on NICTA

- 41 If the evidence before NICTA falls short, NICTA cannot require Digicel to prove that there is no evidence available that would enable NICTA to be satisfied that each of the WDC are met. Rather, the burden lies on NICTA to be satisfied that it has gathered all the information and evidence relevant to the matter and is therefore in a position to reach a conclusion that all of the WDC would be satisfied. This burden flows from the nature of NICTA’s regulatory function, which is to make a decision in relation to a matter based on evidence.

Means of Proof

- 42 Digicel does not wish to instruct NICTA as to how it should discharge its responsibilities, but some comment on the means by which a proposed wholesale regulation should be assessed is appropriate. Without suggesting this is a complete description, at least four distinct tasks can be identified.
- (a) First, markets must be defined properly. This must be a fact-based analysis, drawing on information and data from the actual markets in Papua New Guinea. For example, primary survey data, data showing usage patterns, econometric estimates of price elasticities, and documented interviews with market participants could all be useful inputs.
 - (b) Secondly, an actual proposed declaration needs to be described in detail. It is impossible to properly analyse the merits of a declaration in the abstract.

- (c) Third, the future evolution of the relevant markets must be compared with and without the specific declaration in place. This is a predictive analysis, and requires that NICTA consider how consumer and operator behaviour will change as a consequence of the declaration.
 - (d) Fourth, the outcome of the predictive analysis must then be translated back to the variables of interest, which in this case means determining what the predictive analysis implies for competition and efficiency in the future.
- 43 Digicel emphasises that the above is not a complete prescription of NICTA's obligations. In addition, we note that it is clearly not sufficient for NICTA to base its views on conjecture, speculation, its own unsupported opinion, or on un-referenced claims about what others have found. Such an approach does not meet the minimum criteria of evidence (e.g., relevance, reliability, objectivity, accuracy).
- 44 There are minimum standards of evidence that NICTA (along with any regulator) should meet to ensure that its decisions are based on reliable and accurate information.
- (a) Evidence may be quantitative or qualitative. Quantitative evidence includes quantitative estimates of demand elasticity and regression analysis. Qualitative evidence may include customer surveys, expert opinion and written testimony from individuals who have actual knowledge of a matter.
 - (b) Conjecture, speculation or opinion (other than expert opinion) is not evidence. They do not meet minimum criteria of evidence, for example, relevance, timeliness, reliability, objectivity and accuracy.
 - (c) Where the issue at hand concerns a future matter – for example, the likely state of competition over the next five years – the quality of the evidence is important. It must not be assumed that historical evidence is an unbiased predictor of the future. Historical evidence has to be assessed critically to determine to what extent they are relevant to the future. The quality of evidence required to reach a view on a future matter is likely to be higher than the evidence required to establish a current or past matter.

Natural justice

- 45 The public inquiry is governed by the rules of natural justice. Section 59(2) of the Constitution of the PNG state provides that:

The minimum requirement of natural justice is the duty to act fairly and, in principle, to be seen to act fairly.

- 46 The Constitution emphasises the central role of the principles of natural justice and administrative law in the development of rules of the “underlying law”. Section 60 provides:

In the development of the rules of the underlying law in accordance with Schedule 2 (adoption, etc., of certain laws) particular attention shall be given to the development of a system of principles of natural justice and of administrative law specifically designed for Papua New Guinea, taking special account of the National Goals and Directive Principles and of the Basic Social Obligations, and also of typically Papua New Guinean procedures and forms of organization

- 47 The “underlying law” refers to the unwritten law of Papua New Guinea based on the decisions of Papua New Guinea courts. While decisions made by NICTA are not part of the underlying law, they are subject to the principles of natural justice and administrative law, which form part of the underlying law of Papua New Guinea.

- 48 There are two requirements that NICTA must observe:

- (a) **Due process:** NICTA must give Digicel a reasonable opportunity to be heard at every step of the public inquiry process; and
- (b) **Impartiality& non-discrimination:** NICTA’s conduct of the public inquiry must not give rise to an apprehension of bias or discriminatory application or regulatory measures. It is not sufficient for NICTA to be impartial; NICTA’s conduct of the inquiry must also not create an appearance of bias and must be non-discriminatory.

- 49 **Apprehended failure to be impartial:** As stated above, NICTA proposes to only regulate access to Digicel’s network. This gives rise to an apprehension of bias or that NICTA is applying regulation in a discriminatory manner. This falls foul of the regulatory principles in section 3 of the Act and does not align with the requirements of the WDC.

THE CANDIDATE WHOLESALE SERVICES

- 50 Before considering each WDC, Digicel agrees with NICTA that it is necessary to identify those wholesale services which should be subject to the declaration test or as NICTA states in its Discussion Paper “suitable candidate services for consideration”.

- 51 Section 4(1) of the Act provides the following definition of “wholesale service”:

““wholesale service” means –

- (a) an ICT service that is supplied to a wholesale customer; and

- (b) for the purposes of Part VI of this Act only, includes –
 - (i) a service that facilitates the supply of such an ICT service (excluding intellectual property where it is not an integral but subsidiary part of that ICT service), where that service is supplied, or is capable of being supplied, by an operator licensee to a wholesale customer; and
 - (ii) the supply of access to, or use of, a site on which any facility is located, but only to the extent –
 - (a) that the site is owned, occupied or controlled by the network licensee that has the facilities right in respect of that facility; and
 - (b) that network licensee has a legal right (whether conditional or unconditional) to use that site; and
 - (c) the facility may be used to supply a network service”.

52 Section 4(1) of the Act further provides the following associated definitions:

- “ICT service” means –
 - (a) a facilities access service; and/or
 - (b) a network service; and/or
 - (c) an applications service; and/or
 - (d) a content service”;
- “a wholesale customer” means an operator licensee, but excluding circumstances where that operator licensee acquires an ICT service for that operator licensee’s own personal use rather than to facilitate the supply of an ICT service by that operator licensee”;
- ““site” means –
 - (a) land; or
 - (b) a building or other structure on land”;
- ““facility” means any element or combination of elements of physical infrastructure (including any line, equipment, apparatus, tower, mast, antenna, tunnel, duct, pit, pole or other structure or thing) used principally for, or in connection with, the provision of a network service, but excluding any customer equipment”;
- “facilities right” means the right to construct, maintain, own, operate and/or otherwise make available one or more facilities.

53 It is clear that the starting point for this Public Inquiry is those wholesale services identified in Section 131(7) of the Act, namely:

- (a) domestic mobile roaming services;

- (b) facilities access services associated with mobile network facilities (including telecommunications transmission towers).
 - (c) facilities access services associated with fixed network facilities (including exchanges);
 - (d) domestic inter-exchange transmission services;
 - (e) domestic transmission tail services;
 - (f) domestic digital data and/or voice resale services (whether access tails or end-to-end services), such as xDSL services and/or Ethernet services; and
 - (g) unbundling of specified facilities located between a local exchange and the network boundary, whether unconditioned and/or conditioned (including spectrum sharing).
- 54 Digicel questions whether it is appropriate for NICTA to have decided to “roll up” inquiries in relation to two services into one proceeding while apparently leaving the fixed network services that are provided by Telikom “untouched”. It is not clear and has not been explained why inquiries into the potential declaration of mobile services would have any greater priority than inquiries into the declaration of fixed services.
- 55 In any case, even if two inquiries are held concurrently as appears to be the case here, Digicel submits that each of the services must be dealt with separately and on its own merits. Digicel is concerned that bundling the inquiries together may bias the analysis towards reaching a conclusion that “problems” exist when in reality they do not and that at least one of the services should be recommended to be declared which would not have been the case had the inquiries been held separately.

PROCESS - INTERNATIONALLY RECOGNISED TEST FOR DETERMINING WHETHER A MARKET IS SUSCEPTIBLE TO EX ANTE REGULATION

56 At clause 5 of the Discussion Paper, NICTA states that:

“The internationally recognised test for determining whether a market is susceptible to ex ante regulation of market failures involves three criteria. A market is considered susceptible to ex ante regulation in cases where:

- (a) there are high and non-transitory barriers to market entry;
- (b) there is no tendency towards competition behind such barriers; and
- (c) ex post control by competition law alone is insufficient to address adequately the market failures concerned.”

- 57 As Digicel noted above, this test is not part of the WDC and while it may be an interesting filter to use to decide whether or not to embark on an inquiry an adverse finding in relation to any of the three criteria cannot be used as a basis for supporting the recommendation for declaring a service.
- 58 Nevertheless, in relation to each of the three criteria Digicel observes that:
- (a) Barriers to entry (or expansion) are no higher than in any other similar market anywhere in the world. On the contrary, PNG's relatively low mobile service penetration provides ample opportunity for other operators to invest in and expand their networks, even in areas that are currently only served by Digicel. This is due to Digicel having already paved the way to introducing modern telecommunications services in such areas and the potential for other operators to seek to "leap frog" the technology that is currently deployed by Digicel or to find new and lower cost ways to establish and provide services.
 - (b) Given Digicel's views in relation to the existence of entry and expansion barriers, Digicel does not consider that this criteria can be met. In any case, Digicel disagrees that the market is either not effectively competitive now or is not at least tending towards effective competition. Digicel understands that Telikom recently signed a deal with Huawei for K600 million to invest in infrastructure³. Digicel also understands that the Government, through the Independent Public Business Corporation, has recently invested US\$85 million into bemobile and there are plans for further investment to invest in infrastructure⁴. Digicel also notes that the Minister has made a Retail Services Determination that was intended to address any competition concerns that may have existed in the mobile services market.
 - (c) In any case, even if competition issues did arise, Digicel believes that ex post competition law action is sufficient to address those issues.

PROCESS – WHOLESALE DECLARATION CRITERIA (Section 128 of the Act)

A. THE COMPETITION OBJECTIVE IS NOT SATISFIED

- 59 The declaration of each of the declared wholesale services will further the achievement of the "*competition objective*" to promote effective competition in markets for ICT services in PNG.

A.1. Necessary for the Promotion of Effective Competition in a Market

³<http://www.businessadvantagepng.com/telikom-papua-new-guinea-rings-the-changes/>

⁴<http://www.businessadvantagepng.com/bemobile-acquires-new-majority-shareholder-public-float-foreshadowed/>

- 60 Specifically, having regard to the obligations of Section 128(b)(i) of the Act, access or increased access to each of the declared wholesale services is **necessary** for the promotion of effective competition in at least one market other than the market for the Declared Wholesale Services.
- 61 Once the relevant market has been defined, it is necessary to examine the effective competitiveness of this market, including an examination of:
- the appropriate metrics of the market in question;
 - sunk investment, proposed investment and investment incentives;
 - the conditions for rivalry;
 - the rivalry itself; and
 - other related factors affecting the relevant market.
- 62 The 'other' market which NICTA refers to is the "retail mobile services market".
- 63 For the purposes of the above criterion and each of the declared wholesale services, Digicel notes NICTA's acknowledgement that:
- "...it is not similarly apparent that declaration is necessary to promote the development of retail competition."
- 64 NICTA must be satisfied beyond reasonable doubt that declaration would be "necessary".
- 65 Please refer to the expert report of Dr Henry Ergas for comment on this WDC.
- 66 Digicel strongly supports the opinion of Dr Ergas that being "necessary" is a very high threshold. "Necessary" is defined by the Merriam Webster dictionary as meaning:
- "1 a: of an inevitable nature : inescapable
 - b: (1) : logically unavoidable (2) : that cannot be denied without contradiction
 - c: determined or produced by the previous condition of things
 - d: compulsory
- 2: absolutely needed : required"
- 67 No evidence has been provided to suggest that the promotion of competition (in any market) will not occur absent a declaration of either of the proposed services. Accordingly, Digicel does not consider that it has been (or could be) shown that declaration of either of the proposed services is necessary for the promotion of competition in any other market. Competition can be promoted by any one of a number of things, including further investment in infrastructure and services, improved business and marketing decisions or the risk of new entry.

68 We also note that the government has recently taken over a majority of the shares in bemobile and has been reinvesting in bemobile and Telikom as stated above. These investments cannot have been predicated on an expectation that Digicel's network or services would be regulated and seems to indicate that the market is operating effectively.

69 We also note that NICTA has introduced a retail service determination in relation to Digicel's retail pricing to address concerns regarding retail pricing and competition in the retail space. Thus, Digicel submits that declaration is not necessary as there has been no evidence offered to suggest that this existing regulatory intervention is not already promoting effective competition.

70 For these reasons, this WDC is not met and NICTA cannot make any recommendation to the Minister to declare the relevant services.

A.2. Facility Cannot Feasibly be Substituted as a Matter of Commercial Reality

71 Having regard to Section 128(b)(ii) of the Act, each of the Declared Wholesale Services are supplied in whole or in part by a facility that cannot feasibly be substituted, as a matter of commercial reality, via another facility in order to supply that Declared Wholesale Service.

72 We refer you to the expert report of Mr. Alex Sundakov for comments in relation to this WDC.

73 We also note that NICTA has stated the following in the Discussion Paper:

"NICTA staff have analysed the availability of substitutable passive facilities by district but do not yet have sufficient insight into which particular areas it may be uneconomical to establish substitutable facilities. This should become clearer once the existing MNOs have fulfilled their mandatory coverage licence conditions, the network plans/strategy of the new owners and management of bemobile become apparent, and the new Universal Access and Service Regime is implemented."

74 It is clear from the statement that NICTA is not satisfied to the required standard of proof that this WDC has been met. In fact, NICTA acknowledges that things will become "clearer" at a future time thus any regulation is clearly premature at this nascent stage of the markets development.

75 For these reasons, this WDC is not met and NICTA cannot make any recommendation to the Minister to declare the relevant services.

B. THE EFFICIENCY OBJECTIVE IS SATISFIED

76 The declaration of each of the Declared Wholesale Services will further the achievement of the "*efficiency objective*" of promoting the economically efficient use of, and the economically efficient investment in the facilities by the ICT services may be supplied in PNG.

B.1. No Material Compromise of the Incentives for Efficient Investment

77 Having regard to the obligations of Section 128(c)(i) of the Act, declaration of the Declared Wholesale Services would not materially compromise the incentives for efficient investment in any facility over which the Declared Wholesale Service may be supplied.

78 We refer you to the expert report of Professor Henry Ergas for comments in relation to this WDC.

79 We note NICTA's comment that:

"Declaration of these services has the potential to affect the investment incentives of Digicel, particularly in relation to new deployments of telecommunications transmission towers. Digicel uses its superior network coverage as a key differentiator in the retail mobile services markets. However, as declaration of either of these services would potentially neutralise that differentiator (at least in the short to medium term duration of any declaration), declaration risks softening Digicel's incentives to continue investing in new tower infrastructure, particularly in unserved areas. Whether or not such a softening of investment incentives would constitute a —material compromise of those incentives is currently unclear.

80 As stated above, Digicel agrees that any declaration would be a disincentive to investment for both Digicel and any access seekers to its network. In fact, Digicel is already re-evaluation its rollout plans based on the threat of regulation alone.

81 Importantly, Digicel submits that a declaration of either of the proposed services, even for a limited period, would create a serious disincentive for investment by Digicel and would also remove any incentive for other operators to continue to expand their networks, an outcome that would be likely to decrease competitive pressure and be unequivocally bad for the people of PNG.

82 For these reasons, this WDC is not met and NICTA cannot make any recommendation to the Minister to declare the relevant services.

B.2. Access to the Declared Wholesale Services is Technically Feasible

83 Having regard to Section 128(c)(ii) of the Act, access or increased access to the Declared Wholesale Services (as a consequence of declaration) is technically feasible having regard to:

- (a) the technology available or likely to become available;
- (b) the reasonableness of the costs involved; and
- (c) the effect of supplying the Declared Wholesale Services on the integrity, operation or performance of other ICT services or facilities.

- 84 Digicel notes that, due to the other WDC not having been met, it is unnecessary to demonstrate whether or not this criteria has also been met. Nevertheless, Digicel notes the following.
- 85 National roaming is a complex and costly service to implement. The extent of that complexity and those costs is dependent on the exact nature and quality of service that is provide, e.g. the types of technology that have been deployed by the access seeker and the access provider, whether or not “in call handover” is required, whether roaming services are limited to voice and messaging services, inwhat areas the national roaming is required to be provided, what billing information is required to be provided, what potential capacity demands might be, etc. Until this information is known it is impossible to make a reasonable assessment of whether this WDC is met.
- 86 Similarly, unless more detail is provided it is not possible to make a reasonable assessment in relation to passive mobile network facilities. Digicel notes further that an assessment would need to be made with respect to each and every facility that is being considered to be covered by the declaration. For example, Digicel has not designed and deployed its network facilities with the intention that they would be shared. This means that many sites are unlikely to be able to support additional operators. It would also be unreasonable to expect Digicel to design future network deployment on the basis that access to it may or may not be sought by other operators.
- 87 For these reasons, Digicel considers that this WDC is unlikely to bemet and NICTA cannot make any recommendation to the Minister to declare the relevant services

B.3. The Inefficient Replication of Facilities is Avoided

- 88 Having regard to Section 128(c)(iii) of the Act, increased access to the Declared Wholesale Services would avoid inefficient replication of underlying facilities that may be efficiently shared.
- 89 We refer you to the expert report of Mr. Alex Sundakov for comments in relation to this WDC.
- 90 Digicel also notes that given the nascent state of the market in PNG and the relatively limited available of network infrastructure generally, that replication of infrastructure is highly desirable. This is to ensure continuity of communications in the event of natural disasters or other outages and to promote the development of new and innovative technologies and services.
- 91 For these and the reasons set out in Mr Sundakov’s report, this WDC is not met and NICTA cannot make any recommendation to the Minister to declare the relevant services

GOVERNMENT POLICY & THE OBJECTIVES OF THE ACT

- 92 We refer you to the expert reports of both Mr Alex Sundakov and Professor Henry Ergas on whether the declaration of the relevant wholesale services would align with Government Policy and the Objectives of the Act.
- 93 Digicel also notes that it was the clear intention of the Government at the time the Act was passed into law that PNG was to benefit from the introduction of infrastructure based competition in telecommunications. This was reflected by the imposition of roll out obligations on all of the operators. Unfortunately these obligations have not been enforced in the case of Telikom and bemobile.
- 94 To the extent that there are parts of PNG that are truly uneconomic to serve and which are outside of the coverage areas that were mandated in each of the operators' licences, the Government clearly expected that they would be covered by the Universal Access and Service Regime under Part V of the Act.
- 95 Digicel submits that it would be contrary to this clear intention of Government to now remove incentives for infrastructure based competition and to undermine the integrity of the national telecommunications network by making it reliant on the network of a single operator.

CONCLUSION

- 96 In conclusion, it is clear that the WDC have not been met and NICTA cannot make any recommendation to the Minister to declare the wholesale services in question.
- 97 Accordingly, Digicel respectfully requests that NICTA, after taking into account the issues raised in this submission, terminates the Inquiry and permits the industry to continue to develop in accordance with the incentives and constraints that are imposed by normal commercial market forces.



Economic Analysis of the Proposal to Declare Certain Wholesale Mobile Telecommunications Services in Papua New Guinea

24 October 2013

1 Introduction

My name is Alex Sundakov. I am Executive Director of Castalia Strategic Advisors. As an independent economist I have provided expert evidence in numerous access matters. This includes acting on behalf of the National Competition Council before the Australian Competition Tribunal in the litigation regarding declaration of access to the Pilbara specialist iron ore railways. My full CV is attached to this submission.

I have been asked by Young & Williams Lawyers, acting for Digicel (PNG) Limited in Papua New Guinea, to prepare an expert opinion. The National Information and Communications Technology Authority (NICTA) is conducting a Public Inquiry to consider the potential declaration of certain wholesale mobile telecommunications services, in particular domestic mobile roaming services and facilities access services associated with mobile network facilities. For NICTA to recommend declaring the wholesale services, all of the criteria set forth in section 128 of the Act must be satisfied.

I have been asked for an expert opinion regarding the following questions:

- ss128(b)(ii) – whether “the wholesale service is supplied in whole or in part via a **facility that cannot feasibly be substituted, as a matter of commercial reality, via another facility** in order to supply that wholesale service”. (emphasis added)

Digicel requests your view on the interpretation of this section and whether it is, in effect, equivalent to the standard for regulatory intervention that applies in Australia. In particular, Digicel wishes to understand whether in your view the test would effectively be the same as the “private profitability test” that was recently applied in Australia in the “Pilbara” case and, if so, how such a test might be applied in the context of the current regulatory proceeding.

- ss128(c)(iii) – “access or increased access to the wholesale service (as a consequence of declaration) is technically feasible having regard to the specific factors identified in Section 124(2)(a); and in the case of wholesale services that are facilities access services, **increased access to the wholesale service would avoid inefficient replication of underlying facilities that may be efficiently shared.** (emphasis added)

Digicel considers that in a developing country with limited infrastructure and challenging operation conditions that it would be desirable to encourage the deployment of diverse infrastructure that provides a safeguard against network outages and other failures (including, but not limited to natural disasters, acts of sabotage or operational or economic failure of an infrastructure provider). It also seems likely that infrastructure competition is likely to drive innovation which may provide greater economic benefit than any potential inefficiencies arising from duplication. Digicel requests your opinion on this question and whether Declaration of the services proposed by NICTA would satisfy the test set out above.

- Digicel requests your opinion as to whether Declaration of the services proposed by NICTA would be likely to satisfy the objectives of the Act set out in section 2, specifically ss2(a)(i) (long-term interests of PNG) and ss2(h) (encouraging, facilitating, and promoting sustainable investment in and the establishment, development and expansion of, the ICT industry in PNG, including via the exercise of facilities rights).

2 NICTA's Public Inquiry

NICTA is considering recommending that wholesale mobile access and call origination services (hereinafter MACO) be made “declared services”. NICTA staffs’ preliminary view expressed in the Discussion Paper is that Digicel has significant market power (hereinafter SMP) for the wholesale MACO market and therefore that the wholesale MACO market is not effectively competitive, is not trending competitive, and is susceptible to ex ante regulation.¹

The criteria that NICTA must follow in recommending that a declaration be made are found in ss128 of the Act. Each and every criterion in ss128 must hold true to enable NICTA to recommend declaring wholesale MACO services. Digicel has asked for an expert opinion regarding whether two specific criteria hold true: ss128(b)(ii) and ss128(c)(iii) and also whether the stated objectives of the Act would be met by a declaration of MACO services. The specific criteria I have been asked about deal with related but distinct questions: whether it is feasible commercially for another provider to supply the facilities that provide the wholesale services, and whether having another operator supply those facilities would be inefficient replication.

3 The Economic Framework

Before applying the tests required under sections 128(b)(ii) and 128(c)(iii) to the specific circumstances of the telecommunications market in PNG I considered the economic framework that sits behind the legal tests. As an economist, I am conscious that the purpose of the legislation is to ensure that access to a service is only declared in situations when doing so would be likely, on balance, to lead to an increase in economic welfare. This is by no means a simple matter.

Economists recognise that under some circumstances owners of existing bottleneck infrastructure will have an incentive to lock out other potential users to the detriment of the overall economic welfare and despite the availability of spare capacity. Access regimes

¹ *Discussion Paper* at 18.

have evolved in various jurisdictions to enforce access where it would not occur voluntarily and where such access would clearly enhance welfare.

At the same time, economists also recognise that economic processes are dynamic. Incentives to invest and innovate can be easily undermined by forced third-party access to privately owned infrastructure. In many sectors, apparent bottlenecks are temporary in nature and represent the results of the successful outcomes from the initial risk-taking. The problem with enforcing access—declaring a service—even for a short period, is that the effects on investment incentives are long-lasting. Investors will fear that their future investments will also be declared to enable their competitors to “catch up” again. This makes risk-taking and dynamic innovation considerably less attractive.

Hence, access regimes take great care to avoid making the error of enforcing access in situations where it would reduce economic welfare. This would happen where any benefit from lowering the average cost of infrastructure to users would be more than offset by the higher economic costs caused by reduction in the incentive to invest and innovate.

In general, access regimes, such as the regime applied in Australia set a high hurdle for the introduction of regulation. For example, the Australian access regimes (embodied in different legislation for different sectors) generally envisage a 15 year exemption for access declarations for greenfields infrastructure investments in order to preserve the incentive to invest. For example, the gas pipelines which are currently being built in various locations across Australia to support the emerging LNG export industry all enjoy such initial exemption.

To use a well-recognised concept in the theory of decision-making under uncertainty, a decision-maker under a legislated access regime could hypothetically make two types of error. Type I error is the possibility of declaring access when such a declaration leads to reduced efficiency. Type II error is the possibility of not declaring access, when a declaration would have led to increased efficiency. The more dynamic and potentially competitive a sector is (particularly in terms of changing technologies and consumer preferences, which increase the likelihood that any bottlenecks are temporary) the greater the likelihood that that Type I error will always be more costly than Type II error. Hence, when information is imperfect in applying legislative tests to a sector such as mobile telecommunications—one of the most dynamic industries in the world—it would be appropriate to apply them in a way which would minimise the possibility of Type I error occurring, even if it would slightly increase the probability of Type II error.

An important further consideration is that in contemplating any form of compulsory access, a regulator should carefully consider why voluntary access has not occurred previously. For example, in his submission on the Pilbara case in Australia, Professor Robert Willig made the point that if it is privately profitable for a party to develop an alternative facility, but it would be socially optimal to share infrastructure (that is, the joint demand can be supplied at less cost by the existing facility), then the parties would have an incentive to come to a private deal. This is because the joint profit from the private infrastructure sharing deal is going to be higher than letting the alternative facility go ahead, while the fact that an alternative facility is privately profitable means that the access seeker will have leverage over the incumbent owner. If the incumbent owner does not agree to come to a private deal, it would be acquiescing to a competing investment which could undermine its own profitability, and would therefore punish itself. It would be in a worse position than if it had agreed to come to a deal.

In general, given the relative risks of Type I and Type II error, it would be socially undesirable to enforce access if there is an incentive for the parties to come to a private

deal. In dynamic sectors such as mobile telecommunications, whenever there is such private incentive to reach an agreement over access, but no agreement exists, the outcome should be interpreted as strong evidence that the incumbent has genuine efficiency reasons to deny access. In other words, under these conditions the authority should not declare access and should instead rely on voluntary deals to be reached. If the authority should nevertheless proceed and declare access, the probability of committing a Type I error is high because of the uncertainty as to whether joint demand really can be supplied at less cost by the existing facility. However, when there is a private incentive to reach an agreement and the authority refrains from declaring access, the probability of committing a Type II error is low because the parties have incentives to reach voluntary deals without a declaration.

Legal tests, such as the tests to be applied by NICTA, have evolved to balance the risks of Type I and Type II error in the context of the specific sectors to which they must be applied. In this context, it is important to consider the fact that *all* relevant legislative tests must be satisfied for the service to be declared. In other words, under sections 128(b)(ii) and 128(c)(iii) both must hold true simultaneously:

- Declaration would avoid inefficient replication
- The facility cannot be feasibly substituted (i.e. replicated) as a matter of commercial reality.

I now consider the economic framework for these tests.

Inefficient replication of underlying facilities

What should be the standard for evaluating whether it is inefficient to replicate underlying facilities? One possible answer is that inefficiency of replication could be evaluated in terms of whether the costs of two networks serving an area are greater than the costs of one network to serve the same area. NICTA's staff appear to have relied on this kind of standard. The staff emphasise that mobile telephony involves large sunk costs and significant economies of scale, scope, and density.²

However, the existence of sunk costs and economies of scale, scope, and density in a market cannot be sufficient to indicate that it is inefficient to replicate the underlying facilities. Why is that so?

- Efficiency is more than a question of costs, and involves consideration of what will foster vigorous competition and the benefits competition brings both to supply and demand.
- If the standard for compelling infrastructure sharing were the presence of large sunk costs and significant economies of scale, scope and density, then much economic activity in many sectors of the economy should be subject to compulsory sharing, but it would be absurd to consider doing that.

Consider these reasons one by one in more detail. An example will help show the point to be made. Looking at passive infrastructure, it is likely to be the case generally that two towers cost more to build than one tower would cost for service provision in a specific coverage area, and that the costs of tower construction are largely sunk costs. What would these particular facts mean as far as efficiency of replication?

Would it mean that it is inefficient to construct two towers in one area? In other words, could it be commercially feasible and yet inefficient to duplicate infrastructure? Perhaps it

² *Discussion Paper* at 15.

may seem at first glance that this is the case. Two towers cost more than one tower after all so why not compel sharing and go with just one tower? However, a complete analysis of efficiency cannot and should not be limited to static considerations of cost alone. The effects of increased competition on costs over time and on consumers should also be taken into account. When two or more mobile network operators are competing using their own network infrastructure, there are significant beneficial effects, and those should be part of the efficiency analysis:

- The mobile network operators that build competing physical networks will compete to achieve lower costs. While the total costs of building two towers may be greater than the cost to build just one, the costs of each tower when mobile network operators are competing would likely be lower than the cost of one tower when there are not competing networks. The logic behind this proposition is simple. If infrastructure access is declared, and there is no incentive to build further facilities, the cost of existing facilities stops being a factor in competition. The owner of the facility needs to recover that cost from both its own downstream operators and from those of its competitors, but it has no particular interest in reducing those costs: its own downstream services gain no advantage from such cost reductions compared to their competitors. Hence, there is every incentive to relax and stop taking risks to cut costs
- The mobile network operators with competing physical networks will be competing and innovating in terms of the types of services offered and the features included, service quality, signal quality and coverage, reliability and price. Operators that share a network through roaming are confined to the service quality, signal quality and coverage of the hosting network. While tower sharing enables innovation at the network level, it limits innovation implicit in cell site positioning and the optimisation of coverage. Most countries (as I discuss in a separate section later) expressly seek the benefits of competing networks by imposing, and enforcing, network build out and coverage requirements when mobile licenses are issued. Many national regulators have looked sceptically at some voluntary infrastructure sharing and roaming agreements and have insisted on build out obligations being defined as a condition of a licence, and on enforcing those requirements. An exception illustrates the general principle involved. In the European Union, some infrastructure sharing and roaming ended up being allowed between national operators as a temporary exception in lieu of meeting their own network build out requirements more quickly because of the relatively high prices paid for 3G spectrum and because it had been demonstrated to be impossible commercially, in light of those licencing fees, to meet the build out requirements. However, in this case there were already multiple competing nationally deployed 2G networks in place.

To reiterate the point, rather than seeking to impose compulsory infrastructure sharing, regulators whose objective is to promote competition in the telecommunications sector have tended to focus on whether it is appropriate to prevent such sharing from taking place

- Competing networks provide important public benefits from the diversity that competing networks bring. In case of natural disaster, sabotage or some other catastrophe, or even more ordinary network failures, having diverse networks increases the possibility of having some communications capability continue.

If the standard for requiring compulsory sharing of facilities or services were simply the presence of large sunk costs and economies of scale, scope and density, then following that standard, compulsory sharing could be imposed on much of the economy.

Take the example of a restaurant. There are significant costs to construct and operate a restaurant kitchen, including sunk costs. If that were enough to define a barrier to entry, then building a new restaurant should be precluded and one would never see a new restaurant open its doors. Also, if the standard to be able to compel sharing of infrastructure from an existing restaurant to a new entrant were the presence of large sunk costs and economies of scale, scope and density, then almost any restaurant could be compelled to share its kitchen with a new neighbour restaurant. Sometimes neighbouring restaurants do share kitchens, to be sure, but they undertake such arrangements voluntarily, especially under common ownership, and not as a matter of regulatory intervention.

While the restaurant example may appear to be extreme, it illustrates my key point: that it makes no economic sense to consider efficiency of replication simply from the perspective of minimising static costs. If that were the case, then centrally planned economies consisting of sector-by-sector monopolies producing one type of each good would indeed be the most efficient economies.

In the next section, I will discuss the relevance of the private profitability test which has been applied to the Australian access regime following the recent High Court decision in the Pilbara rail access case. However, it is important to emphasise that the social benefit test which the Australian Competition Tribunal had sought to apply prior to the High Court decision, should not be confused with the static cost test proposed by NICTA staff.

The Tribunal had consistently ruled that the appropriate social benefit test must take into account the full economic effects of declaration, not just the upfront costs of investment. For example, in *Re Duke Eastern Gas Pipeline Pty Ltd [2001] ACompT 2; (2001)* the Tribunal took the view that if a single piece of infrastructure is able to meet market demand at less cost than two or more pieces of infrastructure, ***after taking into account productive, allocative and dynamic effects*** [my emphasis added], it would be uneconomic to duplicate the infrastructure. In other words, a proper social benefit test would take into account the loss of competition, reliability and customer service effects that would result from infrastructure sharing, and would only support a declaration if the net social benefit was still positive.

Overall, the concept of efficiency of replication cannot—and must not—be reduced to a mechanical analysis of static costs.

Feasibility of substitution as a matter of commercial reality

Under what circumstances would it be infeasible—as a matter of commercial reality—to substitute (i.e. replicate) the required facility? For example, does the presence of sunk costs and economies of scale, scope and density make it commercially infeasible to build a second mobile tower in an area? That cannot generally be true, since many areas of Papua New Guinea (PNG) and elsewhere throughout the world, including many rural areas, are served by multiple operators, where each has built its own passive infrastructure that includes towers. The existence of sunk costs and significant economies of scope, scale and density does not in and of itself represent a barrier to entry since entry regularly occurs.

Equally important is that the absence of entry does not necessarily demonstrate that it is commercially infeasible to substitute the underlying facility—in other words, that it is the

underlying facility which serves as the key barrier to entry. Entry happens all the time in markets where there are large sunk costs and significant economies of scale, scope and density. Entry into mobile telecommunications has occurred in many countries with similar circumstances to those faced in PNG and with the same hypothetical barriers to entry.

So, how do economists assess the feasibility of substitution of underlying facilities? In Australia, the basis for assessment has recently been the subject of much debate in the context of the "Pilbara" case³ involving mining operators in the Pilbara region of Western Australia and certain railroad facilities that are owned and operated by some of the mining operators that other mining operators wanted access to under a declaration process very similar to the one in PNG that is the subject of NICTA's Public Inquiry. This debate was between a private profitability test based on the US-style essential facilities doctrine and a natural monopoly test. My reading of the Public Inquiry document suggests that NICTA staff appear to come out on the side of a natural monopoly test.

However, in my view, the Australian debate is irrelevant to PNG's circumstances and the only logical economic interpretation for the test in ss128(b)(ii) is that it asks us to determine whether it would be privately profitable for an entrant to substitute (replicate) the underlying facility.

There are two reasons for my conclusion. First, as I pointed out earlier in the report, the PNG legislative scheme requires that all tests be satisfied before a service is declared. By putting more than one test into the legislation, the legislators must have had in mind that these tests were distinct and applied to different aspects of the economic questions and circumstances. In other words, the questions of whether it is efficient to replicate and whether it is commercially feasible to replicate must be logically distinct.

However, if we adopt the natural monopoly approach to answering whether it is feasible to substitute an alternative facility, we will essentially be asking the same question under both sections 128(b)(ii) and 128(c)(iii)—a question of national economic efficiency. A natural monopoly test is that replication of the facility would impose net economic costs on the society, after taking into account the productive, allocative and dynamic effects of replication. In other words, if we conclude that a facility is a natural monopoly, then we also conclude that it would be inefficient to replicate.

If concluding that a facility is a natural monopoly also automatically meant that it would be infeasible to replicate, there would be no need for a separate feasibility test. Hence, if in addition to asking whether it is inefficient to replicate a facility the legislation is also separately asking whether it is feasible to replicate it, it cannot be asking in both cases whether the facility is a natural monopoly.

The debate in Australia was around a somewhat different legislative scheme. It was around deciding whether the criterion of being "uneconomic to duplicate" a facility was an efficiency test or a feasibility test. The PNG legislation, by contrast, requires the efficiency test and the feasibility test to be carried out separately.

Nevertheless, in considering how to apply the feasibility test in the PNG context it is instructive to consider the lessons from the Australian Pilbara case. The High Court decided that the standard for declaring facilities to be subject to compelled sharing is whether it would be privately profitable for someone to establish a second facility to

³ *The Pilbara Infrastructure Pty Ltd v Australian Competition Tribunal* [2012] HCA 36 (French CJ, Gummow, Hayne, Crennan, Kiefel and Bell JJ).

provide the service. In other words, would a banker or investor, seeking profit, back such a venture? If that is so, the facility should not be declared. The High Court rejected the use of a social benefit test that would look at whether a single facility could meet demand at less cost than two or more facilities, which had been the prevailing interpretation of the criteria to be used in declarations prior to this High Court ruling.

I participated in the Pilbara case as an expert witness before the Australian Competition Tribunal on behalf of the National Competition Council. The principal issue I was asked to address is whether the appropriate test for declaration under the national access regime should be a social benefit analysis or private profitability. This distinction was critically important in the Pilbara case, and the view I presented to the Australian Competition Tribunal was that the social benefit analysis was more appropriate. The Tribunal agreed with that view.

The Australian High Court overturned the Tribunal's and lower courts' decisions, and imposed the private profitability standard. But my support for the social benefit test in the Australian context—the context where both efficiency and feasibility tests are collapsed into a single criterion—should not be confused with my conclusions in relation to the PNG legislation. The private profitability standard that the Australian High Court defined in the Pilbara case supplies a valid and functionally equivalent interpretation for the commercially feasible language found in ss128(b)(ii) of PNG's Act and the appropriate test in this case.

I would like to explain why my views expressed in the Pilbara case and my conclusion on the private profitability test in this case are consistent. Even more importantly, I would like to show that the social benefit test and the private profitability test would produce identical results under most circumstances. The difference would arise only when there are further monopoly profits that arise from bottlenecks other than the infrastructure under consideration.

To imagine circumstances in which it would be privately profitable to develop an alternative facility even if it were more costly and relatively wasteful compared to being granted access to the existing facility, one has to imagine the circumstances where there is an ability to earn monopoly rents over and above any rents that can be derived from controlling the bottleneck infrastructure. For example, if the price of iron ore is sufficiently high, it may be privately profitable to use any means of transport to get that ore to the market. The fact that some operators truck iron ore to the port is not necessarily an indication of the relative efficiency of this mode of transport. It is simply an indication of the infra-marginal position of the Australian mining operators in the global iron ore market. The relatively low mining costs in Australia compared to other global suppliers would enable Australian miners to waste resources at other points in the delivery chain, and still be profitable.

So, if “uneconomical to develop another facility” were interpreted as asking whether it is privately profitable to construct an alternative facility, the test could result in situations where it is profitable to duplicate a facility—or, in the language of the PNG legislation, to feasibly substitute, as a matter of commercial reality, via another facility—even when such duplication is inefficient. It would simply be a test of whether sufficient economic rent can be recovered from the price of the final output to enable producers to remain profitable even if they cannot get access to a more efficient facility.

Since the Australian legislation collapses the efficiency and feasibility components into a single criterion, my view was that it was important to adopt an efficiency-based interpretation to capture those rare situations when it was feasible but inefficient to replicate a facility. The iron ore case fell into such a rare set of circumstances.

But my second reason for interpreting the “feasible to substitute” test as a private profitability test is that, in the telecommunications sector, it is impossible to imagine a situation where it would be feasible to replicate a facility but inefficient to do so. In the case of mobile telecommunications, it is simply implausible to suggest that it may be privately profitable to duplicate the infrastructure simply because there are sufficient economic rents that can be wasted. If the infrastructure were duplicated, any rents that may accrue from sole ownership of what appears to be a bottleneck would disappear, since they would be competed away. This is the fundamental difference between mobile telecommunications and the Pilbara case. In the iron ore example, duplication of facilities means that some of the rents are wasted on a higher cost input, but it does not affect the availability of economic rents.

In mobile telecommunications, any duplication of facility would instantly create greater competitive pressure, and hence lead to the dissipation of the rents. In most situations outside the resources sector, from an economics point of view, a social benefit test would in fact be indistinguishable from the private profitability test.

This conclusion is critical. In the specific circumstances of the Australian iron ore market, I was concerned that the evidence which showed that it was privately profitable to replicate the facility (by building an alternative rail system) did not prove that it was efficient to carry out such a replication. By contrast, in the circumstances of the PNG mobile telecommunications market, evidence that it is privately profitable to replicate the underlying mobile network infrastructure is likely to indicate that replication is also socially efficient. Moreover, the PNG legislation examines the efficiency question separately. Hence, it makes logical sense to interpret the “feasibility” test as being a “private profitability” test.

I would also like to emphasise that the private profitability test must be applied to the network as a whole, rather than to any single asset on that network. From an economics point of view, the reason for this network-wide approach is simple. In any sector with network effects—and mobile telecommunications clearly falls into such a category—the value of such assets cannot be assessed on a stand-alone basis. The value depends on the network as a whole. Within a network, any attempt to assess the economics of replicating any particular part of that network on a stand-alone basis would lead to distorted outcomes.

What does it mean for both tests to be satisfied?

I now return to the question of what it means—from an economic point of view—for both the “feasibility” and “efficiency” tests to be satisfied separately. Under what circumstances would one be satisfied and the other not?

First, let us consider whether it is possible that it would not be privately profitable (not feasible) to build an alternative facility but it would be economically efficient to replicate it. Such circumstances would only arise if investment was not privately profitable due to external factors—such as very high cost of capital, or unacceptably high investment risk or extreme difficulty in entering into private agreements for access to suitable land.

In my view, it would clearly not be in the public interest to attempt to overcome such external factors through enforced access to privately owned infrastructure. It is clear that the private party who owns this infrastructure has been able to overcome such factors and has been able to take the necessary risks. An attempt to insulate its rivals from the same level of commercial risk would distort the competitive process and would have a strong negative effect on the incentive to invest and innovate. Any investor who has to take risks and work hard to open up new markets in PNG would now expect that its

rivals would be able to free ride on its first-mover efforts. This is not a winning formula to attract investment.

In fact, I think this may be one of the reasons why the PNG legislation contemplates “feasibility” and “efficiency” as separate tests. From the public policy point of view, there are good reasons to decline compulsory access to a service if it is efficient but not currently commercially feasible to replicate.

Second, let us consider the circumstances where it is commercially feasible to build another facility but is inefficient to duplicate. As I explained above, such circumstances are possible under a very narrow range of market conditions—such as those that may apply in the natural resources market—but are not relevant to the mobile telecommunications market. But in any case, such circumstances define when there is an incentive for a private deal. The commercial feasibility of building an alternative network gives the access seeker leverage over the incumbent owner. The incumbent owner would seek to capture for itself some of the inefficiencies of an alternative facility that a sharing deal would avoid. Under these conditions the authority should not declare access and should instead rely on voluntary deals to be reached. When there is a private incentive to reach an agreement and the authority refrains from declaring access, the probability of committing a Type II error is low because the parties have incentives to reach voluntary deals without a declaration.

Under normal market conditions, such as those in the telecommunications sector, if it is commercially feasible to substitute a facility, it must also be efficient to replicate it. This suggests to me that in the case of mobile telecommunications the key test is the feasibility test—is it privately profitable to replicate? If it is privately profitable, we do not need to investigate further whether it is economically efficient to do so. From the economic point of view, private profitability in the mobile telecommunications market demonstrates the economic efficiency of replication, and from the legal point of view, failing one of the tests means that the service cannot be declared. That is, the economic and legal logic are perfectly aligned. Under these conditions, an access seeker should build its own network and the authority should not declare access.

If we find that it is not privately profitable to replicate, then—and only then—we must ask whether it is economically efficient to do so. This is because just by observing that something is not privately profitable we cannot be assured that it is also inefficient. Again, the need for the declaration to pass the second—efficiency—test on top of the feasibility test perfectly aligns the economic and legal logic of the process.

4 Lessons from International Experience

National mobile roaming and infrastructure sharing have been addressed by many other regulators around the world. I present here some of the important cases where this has been addressed and what lessons we can draw from how other regulators have looked at mobile roaming and infrastructure sharing. When other regulators have permitted these practices, it has been under circumstances markedly different than those that are present in Papua New Guinea.

In general, other regulators have placed significant weight in their regulatory actions on achieving the goal and reaping, for consumers, the benefits of having vigorous competition between competing networks.

- In most cases, they have imposed build-out requirements and minimum required investment levels when they have awarded mobile licences and have then insisted those obligations be met, often under the threat of licence

forfeiture. Build-out requirements and minimum investment requirements have been imposed to foment greater competition:

- By ensuring that a new facilities-based operator will enter the market; and
 - By preventing spectrum licences from being acquired and parked, or in other words not be productively used, thereby lessening competition.
- Where roaming and infrastructure sharing have been allowed, it has been to mitigate particular circumstances that have worked to impede the objective of having vigorous competition between competing networks.
 - Allowing mobile roaming and infrastructure sharing to happen has not released an operator from meeting agreed-to obligations to invest in network coverage and its own network infrastructure.

Let us now consider some of the important cases where regulators have addressed mobile roaming and infrastructure sharing.

- European Union. In the early 2000s, in some European countries, the 3G spectrum auctions resulted in some of the highest prices ever seen for mobile spectrum licences, greatly surpassing the previous levels. The auction winners in those countries financed their licence fees with debt and were highly leveraged. They found themselves financially unable to raise additional investment funds to meet the build-out, coverage, and investment requirements that came with their new licences. Some of the most highly-leveraged winners petitioned regulators in those countries to allow various new 3G spectrum licence holders to enter into voluntary national mobile roaming agreements amongst themselves. The purpose was to allow them each to focus on building out in a different area and to let them all market the coverage of the combined networks. Regulators in Germany, the United Kingdom, and Austria reluctantly allowed these operator-initiated mobile roaming agreements to take effect, but limited them to short periods of time. The idea of the time limits was to ensure that each operator eventually would meet its commitment to construct and operate a physical network covering the agreed parts of the national territory. PNG's contemplated declaration of MACO services is not in the context of new entrants.
- Germany. As mentioned above, Germany allowed national mobile roaming between 3G licence holders on a time-limited basis in order to facilitate them offering broad coverage while working to meet their build-out requirements. Operators are required to maintain their "competitive independence". Germany granted a temporary exemption from competition statutes that otherwise would not have allowed such collaboration between competing operators.
- United States of America. The United States has not given out national level mobile telephony licences. Instead it has given them for hundreds of smaller geographic regions throughout the country. It has ordered access to domestic roaming at commercially acceptable rates at different times for voice and, later, for data services. This has primarily been between operators authorized to operate in different regions of the country. PNG's contemplated declaration of MACO services is not in the context of operators with licences in mutually exclusive regions of the country.

- Peru. In Peru, two operators were licenced to offer mobile telephony initially: Telefónica del Perú and Tele2000. These licences were just for the area immediately surrounding the national capital of Lima. Subsequently, Telefónica was given a licence for the Rest of Peru. Tele2000 was not given a Rest of Peru licence at that time. Having a head start in the Rest of Peru was valuable to Telefónica and gave it an advantage because only it could offer mobile service that was available and worked throughout the country. Tele2000 could not offer the same coverage. Several years passed before Tele2000 was eventually able to prevail the government and obtain its own licence for the Rest of Peru. Tele2000 petitioned to have access to mobile roaming in the Rest of Peru. The regulator declared mobile roaming in the Rest of Peru, to use the terminology used in PNG, but only for a short number of years, to give Tele2000 the ability to offer national coverage while it built its own network out to catch up to Telefónica. Peru's action to declare mobile roaming in the Rest of Peru is a direct consequence of the prior discriminatory regulatory acts that gave Telefónica several years head start in building a national network. PNG's contemplated declaration of MACO services is not in the context of rectifying the imbalances suffered as a result of blatantly discriminatory regulatory actions favouring one operator over another.
- Finland. National roaming agreements were permitted in Finland subject to each operator meeting all of its mandated licence build-out commitments. Effectively, this provides for roaming only in the areas outside of where operators have agreed to provide coverage as a condition of receiving a license. PNG's contemplated declaration of MACO services is far broader than merely looking to ensure coverage in areas beyond those covered in the agreed build-out commitments.
- Latvia. In addressing the possibility of mandating roaming, Latvia decided to impose no obligation to provide roaming. Entrants are obligated to meet their investment and coverage obligations. In PNG, operators that have failed to meet their agreed build-out and coverage commitments have thus far faced no consequences.
- Brazil. The Brazilian regulator, Anatel, permits infrastructure sharing, provided that all stand-alone build-out requirements have been met. In PNG, the contemplated declaration of MACO services is not in the context of permitting voluntary infrastructure sharing between operators that have all met their stand-alone build-out requirements.
- Voluntary infrastructure sharing arrangements are common in many areas of the world. From the earliest days of fixed telephony and electrical service, electric utilities and telephone companies shared masts. These agreements were beneficial to both companies. Each had some masts, but could also benefit from access to the other provider's masts and so voluntary agreements were made. Between mobile operators, voluntary tower sharing agreements have been common, especially in sparsely populated rural areas. Voluntary agreements have been motivated by each party to the agreement having some towers that the other party wishes to use. "You get to use my towers, and I get to use your towers" is the premise and so deals have been struck. NICTA's contemplated declaration of MACO is instead in the context of operators that have failed to abide by the coverage obligations they agreed to.

Overall, I conclude that in other jurisdictions:

- Infrastructure sharing was compelled in rare cases where infrastructure belonged to an incumbent that was advantaged by previous policies (typically, granting them a monopoly) and where regulated access was necessary to correct such previous distortions
- In situations where there were no previous distortions, regulators lean the other way—they not only do not compel infrastructure sharing, but tend to look suspiciously on voluntary infrastructure sharing arrangements
- Where voluntary arrangements have been permitted, they were permitted reluctantly and temporarily to enable faster roll out of competing infrastructure, rather than as a substitute for such roll out. Tight conditions were imposed to ensure that, where sharing was indeed needed, roll out would eventually occur.

As I explain next, none of these circumstances exist in PNG.

5 Context of Digicel's Entry

Digicel faced the same sunk costs and economies of scale, scope and density when it evaluated whether to build the network and serve the communities it now serves in PNG. The fact that Digicel has entered and offers service demonstrates that such sunk costs and economies are not a barrier to entry.

In the Discussion Paper, NICTA's staff describe Digicel as possessing a first mover advantage. It is important and relevant to the central questions posed in the Public Inquiry to understand the nature of Digicel's entry and any advantage that it may have as a result.

First, it is clearly factually wrong to suggest that Digicel was a first mover in the PNG mobile telecommunications market. Digicel was a late entrant. If anything the first mover advantage lay with Telikom and Bemobile—government owned entities that were in the market prior to deregulation.

Digicel's move as the first operator to build a better network with greater coverage in the communities it serves was not a result of having been licenced earlier than the other two operators or from having been given a legal exclusivity or other discriminatory advantage. It determined a business plan to undertake risky investments in building network facilities in the communities it serves, rolled out the network faster than other providers, and was successful in attracting capital to make those investments. Its offerings have proven popular in the marketplace and it has successfully gained customers and the traffic they generate as a result.

All three operators have national licences and assumed coverage obligations as a condition of obtaining those licences. I understand that Digicel is complying with the coverage obligation it assumed when it received its licence. I also understand that the other two operators have yet to comply with the coverage obligations they agreed to.

In the Discussion Paper, NICTA staff define MACO as being a market at a national level in which Digicel has significant market power. This MACO wholesale market is one in which there is no external marketplace – all transactions are within vertically-integrated entities. In PNG, all three operators have built their own networks and they each self-supply MACO services. No operator has an obligation to supply passive infrastructure or to offer mobile roaming to any other operator.

The MACO market is defined as being national in scope. However, the existence of alternatives to Digicel's facilities varies considerably in different areas of the country.

- Looking at the ss128(b)(ii) standard, the Discussion Paper states that “[w]holesale mobile roaming on Digicel’s network is a service that could be supplied wholly by means of mobile network facilities that are owned and operated by Digicel. There appear to be no substitutable facilities that would enable roaming on Digicel’s network.”⁴ In a tautological sense, it is true that only Digicel could offer roaming on Digicel’s network. NICTA staff could copy and paste Bemobile or Telikom into the quote and make an equally valid statement concluding that only Bemobile could offer roaming on Bemobile’s network or only Telikom could offer roaming on Telikom’s network. The tautologies are irrelevant to the questions posed in the Public Inquiry. The definition of the MACO market NICTA proposed is national in scope, but the availability of mobile network on which roaming could take place varies across the country. There are areas of the country where Digicel is the only mobile network operator today. In those areas, there are **now** no substitute facilities that could offer roaming except for Digicel’s. What ss128(b)(ii) asks is not just whether there are substitute facilities but also whether it would be commercially feasible to build substitute facilities. NICTA’s staff are silent on that point
- As far as passive facilities are concerned, the ss128(b)(ii) condition results in a different evaluation for different areas of the country. First, there are areas where more than one mobile network operator has network facilities, or where broadcasters have towers that could be used, or where there are open access towers. In these areas, the ss128(b)(ii) condition clearly does not hold true. Yet the proposed market definition is national and the declaration of wholesale MACO services would apply throughout the nation. Second, in those areas of the country where only Digicel has constructed network facilities, there would be costs incurred for someone else to build network facilities. As discussed earlier, that there are costs, and even sunk costs, to build network infrastructure does not constitute a barrier to entry. There are always costs to enter. What ss128(b)(ii) asks is whether it would be commercially feasible for someone to build facilities.

The Discussion Paper describes Digicel as having significant market power in the MACO market presumably because it could offer MACO services to other operators that the other operators might be interested in buying but Digicel has so far chosen not to do so. Because of taking this position, Digicel is described as having “refused to deal”, “raised its rivals’ costs” and “denied access”.⁵

Digicel does not raise its rivals’ costs by choosing not to offer passive infrastructure or mobile roaming services to its rivals. The rivals’ costs of building their own network facilities are not affected by Digicel’s choice. So in what sense might the staff be thinking that Digicel’s rivals’ costs are higher? Since Digicel’s rivals’ costs of building their own networks are not higher, it must mean that NICTA staff are saying that the rivals’ costs would be lower if Digicel would only agree to sell MACO services to the rivals at some price that is less than Digicel would wish to charge for this service on a

⁴ *Discussion Paper* at 22.

⁵ *Discussion Paper* at 20.

commercial basis or that might otherwise be below the cost that would have been incurred by Digicel's rivals had they chosen to build their own networks.

Otherwise, the rivals' costs are essentially the same as what Digicel faced when it built and continues to face as it continues to evaluate where and when to expand its network. In fact, there is every reason to expect that rivals' costs could be lower than Digicel's costs. The first mover in any area faces the initial burden of convincing land owners that they could earn reliable income from agreeing to place a tower on their land. Once the concept is established in the local community, and once the first mover has figured out solutions for ensuring physical security and secure power supply, it becomes much easier for the next party to follow.

Overall, it is important to note that Digicel was a late entrant that chose to take risks that the incumbents were unwilling to take. This risk taking has paid off in terms of market share. Penalising such success by providing enforced access to Digicel's infrastructure to lazy incumbents, who had every first mover advantage but chose not to pursue it, would have a chilling effect on the incentive to invest and innovate not just in the telecommunications sector, but throughout Papua New Guinea's economy.

6 Investment Risk and the Climate for Future Investments

Digicel and its competitors were licenced and commenced to build mobile networks and compete against each other. The investments are risky in nature. There is no guarantee that by expanding one's network to a particular place, that there will be subscribers and traffic using those facilities to warrant having made the investment. In expanding its network beyond what the other two operators have thus far done, Digicel has assumed even more risk. Sometimes the risks are borne out by what the market is seeking and the investors are rewarded with a return of, and a return on, their investments. However, other times the risks seem to not have been wise, at least looking back in hindsight. Investors achieve only a minimal or sometimes even a negative return.

Risks are far less for the renter or tenant of shared infrastructure. If the tenant's order of shared infrastructure or services turns out to have been too ambitious for the demand that results, he can cut his losses relatively quickly and easily by reducing his order. The investor in the host network is still bearing the risk of losing the capital invested. As NICTA's staffs point out in the Discussion Paper, the investments are substantially sunk costs. The tenant's risk exposure is minimal at best in comparison.

This situation of unbalanced risks is compounded by the rate setting process that regulators often undertake to set maximum prices for shared infrastructure or shared services. The process typically will look at hypothetical network costs that assume perfect foresight where all investments turn out to be successful. The resulting rates do not reflect adequately the risks that were taken on by the network investors. The result of such rates is a reduction in the incentives to continue to invest in network infrastructure in PNG. Investors will simply look elsewhere for opportunities to invest in networks, or in anything else. It is not in PNG's interest to erode investment incentives in this way. Rather, it should be encouraging investment, especially in cases such as Digicel's, where marketplace success came as a result of finding an attractive business model offering services in attractive ways to consumers in the localities where they wanted to use them, and not from artificial advantages or anticompetitive acts.

7 Does Declaration of National Roaming Satisfy the Tests in the Act?

I now turn to applying the economics framework I discussed previously to the specific proposals made by NICTA. I first ask whether the declaration of national roaming would satisfy the efficiency and feasibility tests in the Act.

In my view, there are three crucial factual contexts to answering this question:

- First, all three current mobile telecommunications operators in PNG have signed on to the license conditions which—until subsequent weakening of enforcement—obliged them to roll out their own national networks. In other words, the owners and management of all mobile carriers expected that it would be profitable for them to comply with such build-out conditions. The evidence I have been able to observe suggests that the failure to comply with the build-out conditions by some carriers has more to do with corporate and governance failures than with a fundamental reassessment of the profitability of replicating all network facilities
- Second, evidence exists that capital providers—such as the Government or the international development institutions—remain willing to provide debt and equity necessary to fund the replication of the underlying infrastructure
- Third, there is clear evidence from other countries with market conditions similar to PNG—in terms of market size and the ability to pay—that roll out of multiple competing mobile infrastructures is commercially feasible.

Given these observations, I conclude that NICTA have not demonstrated, and are unlikely to be able to demonstrate, that it would be infeasible as a matter of commercial reality to substitute the underlying facilities.

Since both legislative tests must be satisfied for the declaration to proceed, and since the ss128(b)(ii) is likely to fail, we do not need to consider the efficiency test in ss128(c)(iii). However, I would note that the national roaming proposal would likely also fail the efficiency test.

At its most basic, mandated national roaming would most likely have a severe effect on dampening investment both in competing infrastructure in areas where Digicel is already present and any further roll-out of mobile infrastructure in areas yet to receive coverage. New Zealand's experience with the introduction of mandated access to wholesale copper based services in the late 1990s provides a salutary example of market response to such interventions.

Prior to the introduction of regulated access to wholesale services—which, for land lines, parallels mandated national roaming—a significant competitor (Clear Communications) to the incumbent (Telecom) was rolling a competing national hybrid fibre-coaxial (HFC) network. HFC cables provide significant additional functionality to the copper network, as well as competing directly with copper based services. The market was evolving towards strong facilities-based competition.

The introduction of mandated access to incumbent wholesale services instantly stopped the competitive roll out. Only those geographic areas where roll-out occurred prior to the introduction of regulation continue to enjoy a competitive selection of offerings. For the rest of the country, the only competition available in the market is competition over the retail margin—which has a very insignificant effect on consumer welfare.

In this context, it is also important to address the fallacy that temporary mandated national roaming could provide the bootstraps needed to enable Digicel's competitors to develop their own infrastructure. This theory suggests that national roaming would enable other providers to increase their market share, and that would then enable them to fund infrastructure build out.

However, this theory is implausible from the perspective of commercial incentives:

- Once competitors use roaming to win additional market share, what would be the incentive to invest in infrastructure? Such infrastructure would not add to their revenues (unless the existence of infrastructure *per se*, rather than nationwide coverage, lead to more customers), but would increase their costs
- Since there is clear evidence that debt and equity providers are willing to fund infrastructure investment prior to the capture of market share, why is prior market share bootstrapping via roaming necessary?

A more plausible—and inefficient—outcome of temporary mandated national roaming is that operators would delay their own investment, and would seek to extend the time of roaming access.

8 Does Declaration of Infrastructure Sharing Satisfy the Tests in the Act?

I now turn to the declaration of infrastructure sharing. The scope of such declaration would be somewhat more narrow than the scope of national roaming—that is, the competitor would be required to undertake some of its own investment—but it would still reduce the scope of competition between service providers.

While the range of infrastructure facilities to which access would be granted under such a declaration is limited to cell sites, the question still remains: would it be privately profitable for an operator to replicate these facilities.

In my view, just as in response to the previous question about national roaming, the answer remains yes. The same evidence for the private profitability of the national roll out of competing networks suggests that it will be privately profitable to replicate the underlying infrastructure, such as mobile towers.

In particular, I would like to quote from Bemobile's own analysis presented to the ADB in the context of securing debt and equity from the ADB:

Tower sharing is not undertaken in PNG or the Solomon Islands as these markets are shared by a few highly competitive operators. Companies aim to maximise their customer base, which largely occurs by "churning" (winning) the competitor's customers and by providing services where their competitors do not have cover, therefore it is not in the Bemobile's commercial interest to share towers, nor is it in the interests of competitors to lease space on their towers. The other advantages of operating separate towers is the ability to establish trouble-free structures (e.g. with a low chance of landowner disputes) and to maintain these structures as per Bemobile's standard practices, thereby ensuring it has full control over the operational reliability of its facilities.⁶

⁶ Bemobile Ltd, Proposed Equity Investment and Loan Bemobile Expansion Project (Papua New Guinea and Solomon Islands), project number 44937, March 2011, from IPBC website

Hence, yet again I conclude that NICTA have not demonstrated, and are unlikely to be able to demonstrate, that it would be infeasible as a matter of commercial reality to substitute the underlying facilities.

Since the feasibility test for declaration fails, there is no need to consider efficiency. But again, it is useful to note that enforced infrastructure sharing is likely to reduce efficiency. In particular, I understand that due to PNG's terrain, different tower sites are not just pure substitutes. Each site has its own signal "shades". Hence, there is significant national interest in increasing the number of cell sites and diversifying their "shades".

9 Conclusion

As a matter of economic logic, I conclude that the only valid interpretation that can be given to the condition in ss128(c)(iii) is a private profitability test such as defined recently by Australia's High Court in the Pilbara case. Any other approach would make this test indistinguishable from the test in ss 128(b)(ii) and hence would render the legislative scheme void. As I demonstrate, the private profitability test is appropriate for understanding why each and every test in section 128 must be satisfied.

I also show that the test in ss128(b)(ii) cannot be validly interpreted as a static cost test. Economic efficiency is a dynamic concept, and hence the "efficiency" test in this section should take into consideration the full impact of replication of infrastructure on the productive, allocative and dynamic efficiencies.

Finally, I demonstrate that there is an implied hierarchy in these tests. Given the circumstances of the mobile telecommunications market, the feasibility test in ss128(c)(iii)—whether it is privately profitable to replicate the underlying facility—is the primary test. If it is privately profitable to replicate, it is very unlikely that circumstances would exist in the mobile telecommunications sector where it would not be economically efficient to do so.

When I apply these tests to the proposed declarations of the domestic mobile roaming services and facilities access services associated with mobile network facilities, I find that NICTA have not demonstrated, and are unlikely to demonstrate, that the declaration criteria would be satisfied. Market evidence available to me suggests that the test in ss 128(c)(iii) will not be satisfied for both services—there is clear evidence that it is privately profitable to roll out competing network services and that all operators, as well as their providers of debt and equity, remain committed to such a roll-out.

Given this finding, it is not necessary to consider whether the efficiency test in ss128(b)(ii) would be satisfied. Under the conditions of the mobile telecommunications market, the failure to satisfy the test in ss128(c)(iii) is not only legally sufficient to render the declaration impossible, but is also sufficient evidence in itself to predict that it would be efficient to replicate the underlying facilities, and hence, that the test in ss128(b)(ii) would also not be satisfied.

In addition, however, I note that it is not just a matter of the declaration not being likely to satisfy the test in ss128(b)(ii). More importantly, enforced infrastructure sharing would likely lead to reduced efficiency and reduced economic welfare.

The benefits of increased competition between facilities-based operators will lead to benefits from innovation in services, competition for quality, signal coverage, and price and those benefits need to be considered when asking whether replication is efficient. Diversity in network facilities also provides benefits of assuring continued connectivity in cases of catastrophe, sabotage, or even ordinary network faults.

As an emerging market with significant need for further investment in telecommunications infrastructure, the risks to PNG from the unintended consequences of declaring wholesale mobile services are likely to be significant. In this report, I emphasised that in the absence of perfect information, the regulator has to balance the risks of Type I and Type II errors. Type I error is the possibility of declaring access when such a declaration leads to reduced efficiency. Type II error is the possibility of not declaring access, when a declaration would have led to increased efficiency.

All the evidence I have been able to review indicates that in the PNG telecommunications sector, the consequences of Type I error are considerably more significant than the consequences of Type II error. In fact, it seems to me that the design of the legislative scheme of the Act implicitly acknowledges this:

- Unlike the Australian legislation which conflates the efficiency and feasibility considerations into a single “uneconomic to duplicate” criterion, the PNG legislation sets two distinct hurdles for declaration: the feasibility hurdle and the efficiency hurdle
- The Act requires NICTA to take the Government’s policy objectives into consideration. The PNG Government has clearly articulated a preference for facilities based completion in the mobile telecommunications sector.

This is not surprising. A jurisdiction which needs to encourage major investment in new infrastructure would be expected to set the threshold for compulsory access much higher than a jurisdiction that is focused on efficient utilisation of legacy infrastructure, where historical investments were undertaken by firms provided with significant incumbency advantages.



Alex Sundakov

Key Qualifications

Alex Sundakov is the Executive Director of Castalia Ltd, a specialist international consultancy on infrastructure regulation and competition policy issues. Mr. Sundakov is based in Sydney, and runs Castalia's Asia-Pacific practice. He is also a member of the New Zealand Government Infrastructure Advisory Board.

Prior to becoming a partner in Castalia, he was Director of the New Zealand Institute of Economic Research, New Zealand's premier economics think tank. Before that, he spent five years on the staff of the International Monetary Fund, and ten years with the New Zealand Treasury.

Mr. Sundakov has been called as an expert witness in numerous competition cases before the High Court of New Zealand, the New Zealand Commerce Commission and the Australian Competition Tribunal. He has appeared before regulatory and commercial arbitration hearings in a number of jurisdictions.

Mr. Sundakov was educated at the London School of Economics. During 1999-2002 he served as a Board member of the New Zealand Competition Law and Policy Institute.

Mr. Sundakov combines authoritative presentation style and an ability to communicate complex theoretical concepts in clear language with a strong practical background in a number of economic sectors, including energy, transport, telecommunications, insurance, health and agricultural sectors.

Education

1989	London School of Economics (England), MSc. Economics
1984	Victoria University (New Zealand), BCA. Economics (Hons.)

Employment Record

From 2003	To Present
Employer	Castalia (Sydney)
Position Held and Description of Duties	Executive Director Responsible for co-managing the firm and providing overall strategic direction for projects. Specialises in competition policy, infrastructure regulation, PPP contract development
From 1997	To 2003
Employer	New Zealand Institute of Economic Research (New Zealand)
Position Held and Description of Duties	Chief Executive Responsible for managing the Institute and providing overall strategic direction for projects. Specialised in advice on competition and regulatory issues, public policy, and economic research and analysis
From 1992	To 1997
Employer	International Monetary Fund (Washington, DC)
Position Held and Description of Duties	Economist, then Resident Representative to Ukraine Responsible for maintaining the dialogue between the Government of Ukraine and its main creditors. Advised on public policy and public private partnerships. Advised on the role of the central bank, the relationship between monetary policy and banking supervision, and financial regulation
From 1984	To 1992
Employer	New Zealand Treasury (New Zealand)
Position Held and Description of Duties	Policy Manager Played a key role in New Zealand's far-reaching micro-economic reforms, including responsibility for development of the regulatory framework. Helped to develop New Zealand's competition law, the Commerce Act. Advised on health policy issues and health markets.

Relevant Experience

Competition Policy and Regulation

- **AER Expenditure Review Guidelines, Australia, 2013**—The Australian Energy Regulator (AER) was required by changes in legislation to develop guidelines for expenditure assessment of regulated businesses and as a first step in their published an issues paper which Castalia reviewed for a consortium of the five Victoria distribution businesses. Mr Sundakov directed the project that evaluated a number of best practice guidelines issued by regulators to identify their characteristics, evaluated the Issues Paper against those characteristics and carried out a gap analysis. Under Mr.Sundakov's guidance, the team suggested how the AER could best utilise economic benchmarking tools them and put forward evaluation criteria for their introduction.
- **IPARTWACC Review, Australia, 2013**—The Independent Pricing and Regulatory Tribunal (IPART) announced a review of its methodology for calculating the Weighted Average Cost of Capital (WACC) for regulated businesses. The review was prompted by the historically low Risk Free Rate (RFR) on Government bonds since the Global Financial Crisis resulting in the

estimated cost of equity as calculated by the Capital Asset Pricing Model (CAPM). Castalia reviewed IPART's Discussion Paper for Sydney Desalination Plant Ltd. Mr. Sundakov directed the project and proposed a new approach to the cost of equity by using the CAPM as a sense check on market observations of the total cost of equity. Mr. Sundakov also suggested changes to the calculation of the cost of debt to account for the costs and risks of re-financing.

- **Competition Effects of the Proposed Acquisition of Contact Energy's Gas Metering Assets, New Zealand 2012**— Castalia was approached by Vector to consider the competition effects of the proposed merger between the gas metering businesses owned by Vector and Contact. The proposed transaction would result in Vector owning approximately 75 percent of the gas meters in New Zealand. Mr. Sundakov directed the project and examined the nature of competition between the owners of gas metering assets and asked whether—given the features of competition in the relevant markets—the proposed aggregation of meter asset ownership was likely to substantially lessen competition. The conclusion drawn was that the unique circumstances of gas meter asset ownership meant that the proposed acquisition would not have material effects on competition, despite a significant increase in market concentration.
- **Regulatory Due Diligence of NSW Ports, Australia 2012**—Port Botany and Port Kembla are the first port assets to be privatized by the New South Wales Government. The Government is auctioning 99 year-year leases that are expected to raise more than US\$2 billion. Castalia is engaged by a consortium bidding for these assets. Mr. Sundakov directed the project that provided regulatory advice on the current and likely future regulatory environment for a buyer of the ports, and identifying the key regulatory risks and opportunities with private ownership of the ports.
- **Price Regulation of Wholesale Copper Services in a Market Transitioning to Fibre, New Zealand, 2012**—The Commerce Commission (“the Commission”) is proposing to set prices for unbundled copper local loop service (UCLL) and unbundled bitstream access (UBA) using forward-looking cost benchmarks. Chorus, the largest local fibre company in New Zealand, is concerned that the Commission's proposals impact on its investment incentives in the transition to fibre-to-the-home (FTTH). Mr. Sundakov is leading the Castalia team that reviewed the Commission's benchmarking proposals and prepared a report covering: (i) Analysis of why tight pricing coordination between fibre and copper is necessary and the evidence from other countries; and (ii) How the Commission should adjust its benchmarks to reflect the transition to a fibre network
- **NSW Treasury submission to Senate Select Committee on Electricity Prices, Australia 2012**—NSW Treasury asked Castalia to prepare a submission to the Senate Select Committee on Electricity Prices. The purpose of the submission was to counter criticism that NSW Government ownership of the electricity distribution companies had been a major factor in recent large price rises. The submission also put forward the positive actions taken by the Government to reduce upward pressure on electricity prices. The submission addressed the myths surrounding Government ownership of the businesses—that they are simultaneously inefficient yet highly profitable with

incentives to gold plate infrastructure and that payment of dividends to the Government increases prices that are set by an independent regulator

- **The Impact of Pivotal Events on Power Prices, New Zealand, 2012**—Castalia assisted the client in making a regulatory submission to New Zealand’s Energy Authority on the frequency and impacts of pivotal events; where the load cannot be met without a particular generator, so that generator has market power to set the price. Mr. Sundakov supervised the collation and analysis of data over a ten year period including half-hourly data load, price, generation and transmission data to identify pivotal situations at the national, island, regional and nodal level. This information was overlaid with prices to identify whether and how pivotal generators were using their market power to recover economic rents
- **Regulatory Submission on the Definition of Local Supermarket Markets in Suburban Sydney, Australia, 2012**—Castalia assisted a large retailer in making a submission to the Australian Competition and Consumer Commission (ACCC) in response to an issues paper identifying concerns surrounding the development of a new retail site in suburban Sydney. Mr. Sundakov oversaw the regression analysis on sales and promotions data to understand whether and how the impact of sales varied with distance from competitors and the production of the final report
- **Snowy Hydro Transmission Frameworks submission, Australia, 2012**—Castalia was engaged by Snowy Hydro, a major generation company, to draft a public policy report to be submitted to the AEMC’s Transmission Frameworks Review. One of the options proposed by the AEMC is a radical change to the electricity market that would see generators able to pay for firm access to the transmission system and be compensated if transmission constraints reduced their generation. The Castalia report shows that the proposed solution is out of scale with the problems that it purports to solve—the co-optimisation of new generation and transmission investment. It also shows that the proposal will create incentives for generators and transmission businesses that are likely to lead to inefficient over building of the network
- **ElectraNet Regulatory Due Diligence, Australia, 2012**—Castalia was engaged by Hastings Fund Management to provide regulatory advice on the current and likely future regulatory environment affecting ElectraNet, an electricity transmission business operating in South Australia. As an existing shareholder, Hastings was evaluating the purchase of additional equity in the company. The analysis includes advice on the risks posed by the regulatory framework and the likely future ranges of regulated returns allowed by the regulator. Mr. Sundakov provided a due diligence report that analysed the regulatory framework providing context for the large number of reviews and rule change proposals applying to the sector
- **Transpower treatment of price variations, New Zealand, 2012**—Transpower, the New Zealand transmission system owner and operator is subject to a regulatory regime where expenditure on major capital projects is approved by the regulator—the Commerce Commission—prior to project commencement. At project completion the approved cost forecast is escalated and compared with actual costs to assess prudence. The principle is efficient risk allocation—that Transpower should not be exposed to the risk of cost escalation on these projects that it cannot control—that are changes in input

prices. Castalia prepared a submission to the Commerce Commission on behalf of Transpower which analysed the performance of the escalation process against the objective of efficient risk management

- **Vertical Integration Study, Australia, 2012**—Castalia was engaged by Origin Energy, a major Australian energy business, to analyse the impacts of vertical integration in the National Electricity Market. The study involved developing new methodologies to assess the degree of vertical integration in the market and also analysis of Sydney Futures Exchange electricity derivative spread data to assess the impact of vertical integration on contract market liquidity. The study concluded that vertical integration was not of itself likely to result in market inefficiencies or misuse of market power
- **Economic Advice on Airport Regulation, Singapore, 2012**—The Civil Aviation Authority of Singapore (CAAS) recently appointed Castalia to its panel of external advisors. Mr. Sundakov is leading the Castalia team contracted to provide a range of services in a number of areas: (i) policy and regulation, regulatory impact analysis, and analysis of infrastructure investment and capital financing; (ii) benchmarking, market studies and trend analysis; (iii) pricing and price regulation frameworks; and (iv) competition and enforcement, including access to facilities, investigations into allegations of anti-competitive agreements, abuse of dominance, and merger and acquisitions
- **Review of Proposed Changes to Dairy Industry Regulation, New Zealand, 2012**—The New Zealand Government planned to introduce a number of changes to the regulatory regime governing Fonterra—the co-operative that collects and processes more than 90 percent of dairy products in New Zealand. The regulatory changes were proposed for the Dairy Industry Restructuring Act (DIRA) and were required to enable changes to Fonterra’s capital structure to be implemented. The changes were also designed to increase competition in the market for dairy processing
- **NSW Liquor Store Acquisition, Australia, 2012**—In considering the application for the merger, the ACCC raised concerns about the reduction in competition in retail markets for the sale of liquor for on-site and off-site consumption. Castalia was commissioned by the supermarket to examine whether the stylised facts identified by the ACCC, as well as other available evidence, support the regulator’s approach to geographic market definition. Mr. Sundakov assisted Mr. Saadat in helping to critique the approach adopted by the ACCC
- **Investigation into Petrol Information Sharing Arrangements and Discount Schemes, Australia, 2012**—The ACCC was investigating how petroleum price information sharing arrangements and, separately, fuel savings offers have the potential to reduce price competition. A major supermarket chain received separate notices from the ACCC to furnish information and produce documents. For each notice Mr. Sundakov examined the theories of harm that the ACCC is likely to consider in its investigation, possible rationales for the timing of the investigation, and what the ACCC may be expecting to see in the information provided
- **The Impact of Wage Costs on Australian Port Competitiveness, Australia 2012**—Castalia was approached by the client to evaluate the extent

to which port wage costs were impacting on Australian port competitiveness. This involved both benchmarking Australian wage costs and productivity internationally and looking at productivity changes within the sector over time. Mr. Sundakov supervised and assisted Mr. Cheong-Holdaway in designing the methodology, conducting the majority of the research and drafting the main report

- **Critique of Productivity Commission recommendation for ex post reviews of capital expenditure, Australia, 2012**—The Productivity Commission in a review of the electricity network regulatory framework recommended an ex post prudency review to ensure only efficient capital expenditure was added to the regulatory asset base. Castalia was engaged by Jemena, a major Australian electricity and gas network company, to critique the recommendations. Mr. Sundakov found that contrary to the Productivity Commission’s findings, the theoretical and empirical evidence for the need for such a review was at best weak and would have a chilling effect on network investment with damaging consequences for reliability and service standards
- **Commerce Commission Gas Price Reset 2012 to 2017, New Zealand, 2012**—Castalia was engaged by Vector, a major New Zealand gas and electricity distributor to comment on the Commerce Commission draft decision for the 2013-2017 price path for gas pipeline businesses. Castalia identified a number of possible improvements to the way that future costs and revenues were modeled by the Commission. Castalia also recommended a sliding scale approach to regulatory incentives for efficient capital expenditure that would allow companies to make higher returns in exchange for greater accuracy of expenditure forecasts
- **Regulatory Advisor for Sydney Desalination Plant Refinancing, Australia, 2012**—Castalia was engaged by a bidder in this privatisation to provide regulatory advice on the current and future regulatory environment and issues for a buyer of the plant. The analysis includes advice on the regulatory risks and mitigation strategies as well as identifying potential opportunities for increased value for the bidder that arises from the regulatory framework. Castalia’s client was the successful bidder
- **Regulatory Submission on behalf of NSW Treasury, Australia, 2012**—Castalia was engaged by NSW Treasury to prepare a submission to the Australian Energy Markets Commission on a possible rule change that would materially reduce the regulatory allowances for the cost of debt for Government owned transmission and distribution businesses. The Castalia submission showed that on a risk adjusted basis borrowing costs were similar and that reducing debt allowances would result in a subsidy from taxpayers to electricity customers
- **Impacts of Regulatory Incentives to Improve Efficiency and Service Quality, New Zealand, 2012**—The Commerce Commission was finalizing the input methodologies that will define the price-quality path for electricity distribution businesses and gas pipelines in New Zealand. Vector, an electricity distributor, engaged Castalia to evaluate the available evidence on how the model of price-quality regulation being implemented by the Commission can create appropriate incentives for regulated suppliers to improve performance

- **IPART submission on financeability issues for regulatory determinations, Australia, 2012**—Castalia was engaged by the Sydney Desalination Plant to prepare a submission to the regulator of the plant in response to an issues paper on financeability. The Castalia submission detailed the different circumstances in which a regulator might make adjustments to price paths to ensure that their decisions could be financed. Castalia also outlined why such decisions should be based on a nominal regulatory capital structure and not the actual capital structure to avoid the moral hazard of businesses creating unsustainable capital structures and relying on regulatory support to remain solvent
- **NSW Electricity Privatisation, Australia 2010**—Assistance and preparation of expert reports for ACCC clearance of bid combinations by one of the bidders for the NSW electricity assets
- **Wine Processing Merger, Australia 2010**—Assistance in gaining a clearance for the merger of two wine processing companies, affecting processing in Victoria and South Australia
- **AMP/AXA Merger, New Zealand 2010**—Prepared expert reports on behalf of NAB regarding the competition effects of the proposed AMP/AXA merger in the New Zealand market
- **Access Pricing of Telecommunications Ducts, Australia 2010**—Expert evidence on behalf of Telstra to the ACCC arbitration over access to Telstra duct infrastructure by PIPE Ltd
- **National Competition Council, Australia 2009**—Expert witness on behalf of the NCC before the Australian Competition Tribunal regarding access to iron ore rail infrastructure in the Pilbara region of Western Australia. Mr. Sundakov's evidence was substantially quoted in the judgment
- **Merger of Ports of Littleton and Otago 2009**—Advised on competition policy implications of the proposed merger of two main container terminals in the South Island of New Zealand
- **Merger of Power Utilities, New Zealand 2008**—Advised on regulatory and competition policy strategy for the proposed merger of two medium sized electricity distribution utilities in New Zealand
- **Competition Commission of Singapore Credit Cards Case, Singapore 2006**—Led a team which studied the Singapore market to determine whether the Multilateral Exchange Fee (MIF) agreement between banks participating in credit card schemes was being used for anti-competitive purposes.
- **Merger of Port Companies, New Zealand 2006**—Facilitated negotiations between Ports of Auckland and Port of Tauranga for a proposed merger, performed economic analysis of the benefits and the detriments of a proposed merger between the two ports in order to secure all the necessary government, regulatory, and shareholder approvals for the merger
- **Competition Effects of Physiotherapy Contracts, New Zealand 2005**—Advised the Accident Compensation Corporation on anti-trust issues. Reviewed the economic consequences of exclusive contracts that the ACC wanted to sign with groups of physiotherapists

- **Competition Advice for Wharf Facility Dispute, New Zealand 2004**—Advised Pacific Ferries Limited on competition issues in a dispute with ARTNL and another ferry operator to gain adequate access to wharf facilities to operate a Waihiki Island vehicle ferry
- **Advice on Increased Contestability in the Kiwifruit Industry, New Zealand 2004**—Advised one of the largest kiwifruit supply companies on further deregulation of the industry. Export of kiwifruit from New Zealand is undertaken under a single desk regime. This project included advising on how to open more of the value chain to contestability within the limits of single desk exports
- **Alleged Anti-Competitive Conduct in Electricity Transmission and Distribution Services, New Zealand 2004**—Expert witness on behalf of Transpower in litigation on allegations that it was abusing its market power. Provided expert evidence against the case brought by Todd Energy that Transpower and the distribution company Powerco had acted anti-competitively in refusing to charge a Todd Energy facility as though it was connected directly to the transmission grid
- **Competition Analysis for Targeted Pricing in Electricity, New Zealand 2004**—Expert witness on behalf of Unison in a judicial review of a decision by the Commerce Commission, New Zealand's anti-trust authority. Provided economic analysis and expert evidence on implementation of targeted price thresholds for electricity lines companies
- **Clearance Application under the Commerce Act, New Zealand 2004**—Assisted dairy cooperative Fonterra in obtaining Commerce Commission clearance for a possible acquisition of National Foods Ltd. Assessed the market and provided economic analysis and advice on competition issues under the Commerce Act, New Zealand's competition law
- **Gasfield Divestment and Contracting for Output, New Zealand 2003**—Genesis wished to sell its equity stake in the Kupe gas field and contract with new owners to take the entire supply from the field. Mr. Sundakov led the analysis of the competitive effects of the proposed transaction, and found that it would not increase Genesis' market power
- **Ophthalmology Exclusionary Conduct Prosecution, New Zealand 2003**—Retained by the Commerce Commission (New Zealand's antitrust authority) to provide expert advice on the economic aspects of the behaviour of the Ophthalmologic Society of New Zealand and to provide an economic opinion on relevant market definition and whether the Society's behaviour had the effect of lessening competition in a market. Mr. Sundakov gave expert evidence to the High Court, and was cross-examined on it
- **Sanitarium Predatory Pricing Allegation, New Zealand 2003**—Reviewed the issues involved in the Commerce Commission (New Zealand's antitrust authority) investigation of allegations that the Sanitarium Food Company (Sanitarium) may have engaged in anti-competitive behaviour in breach of the Commerce Act
- **Competition between Credit Card Issuers and Acquirers, New Zealand 2002**—The Reserve Bank of New Zealand wanted to promote a sound and efficient financial system. Mr. Sundakov led a study to determine what is

meant by efficiency in the banking system, and how this can be observed and achieved through competition. This study included an in-depth analysis of competition in credit card provision, rates of interest and other associated charges. It took into account the New Zealand banking environment and competition policy, as well as related policy on multilateral interchange fees in Australia

- **Competition Advice on Supermarkets Merger, New Zealand 2002**— Provided advice on competition issues in a proposed supermarkets merger. This included evaluating price competition models, defining and quantifying the market
- **Power Station Divestment by International Investor Regulatory Clearance, New Zealand 2002**—A conglomerate energy company was selling out of the electricity generation market and required a report on the effect of the sale of its last significant generation plant to one of the four major incumbent generators. The report was provided to the competition regulator, the Commerce Commission, and the sale was eventually authorised
- **Advice to Vodafone, New Zealand 2002**—Advised on an application to the Commerce Commission regarding competition effects of recovering the costs of the Telecommunications Service Obligation in New Zealand. Appearance before the Commerce Commission
- **Advice to Telecom, New Zealand 2001**—Advised on a complaint against the company alleging misuse of dominant position in the pricing of internet access. Independent report to competition authorities
- **Expert Witness on behalf of Southern Cross Ltd, New Zealand 2001**— Provided expert advice in a High Court case appealing the refusal of competition authorities to grant consent to Southern Cross merger with Aetna
- **Advice to Livestock Improvement Corporation, New Zealand 2001**— Advised on competition issues regarding pricing and access to intellectual property
- **Competition in the Market for Retailing Electricity, New Zealand 2001**—Advised an anti-trust inquiry into the proposed merger of two major electricity retailers. Analysis of vertical integration of retailers and generators
- **Dairy Industry Co-operative Mergers, 2000–2001**—Provided advice on a series of dairy co-operative mergers, leading to the formation of Fonterra, one of the world's largest agricultural co-operative accounting for 20 percent of New Zealand exports
- **Generation Company Acquisition Regulatory Clearance, New Zealand 1999**—TransAlta proposed to purchase Contact (a large privately owned generating company) but required a clearance from the national anti-trust authority (Commerce Commission). We developed a commentary on the competitive effects of the acquisition, showing no creation of market dominance. The result was a successful application; the acquisition was cleared by the Commerce Commission
- **Gas Sector Acquisitions, New Zealand 1999**—Advised Shell Ltd on the regulatory and competition issues involved in the acquisition of a number of

key New Zealand gas assets. Presentations on behalf of the company to the Government on resolution of regulatory obstacles to the transaction

- **Anti-trust and Regulatory Review 1991**—Led the Treasury’s input to a review of the Commerce Act, New Zealand’s law on anti-trust and utility regulation. Included consideration of the appropriate limits on mergers and restrictive trade practices, as well as regulation of telecommunications interconnection and common carriage provisions for electricity transmission and distribution companies

Infrastructure Access Pricing and Regulation

- **Mobil Exploration and Development Inc., Sucursal Argentina and Mobil Argentina S.A. v. Argentina (ICSID Case. No. ARB/04/16) 2013**—(Advisor) Castalia was retained by the tribunal at the International Centre for Settlement of Investment Disputes, as economic and financial expert in this arbitration. Subsidiaries of ExxonMobil had explored, produced, and market gas in Argentina. ExxonMobil alleged that Argentina unfairly treated its investments following the economic crisis of 2001, breaching the US-Argentine Bilateral Investment Treaty. Mr Sundakov advised on an approach to developing an estimate for gas prices that would have prevailed but-for the government action
- **Due Diligence of NSW Ports, Australia 2012**—Port Botany and Port Kembla are the first port assets to be privatized by the New South Wales Government. The Government was auctioning 99 year-year leases that are expected to raise more than US\$2 billion. Castalia was engaged by a consortium bidding for these assets. Mr. Sundakov directed the project that provided advice on the possible future pricing strategy, taking into account the future regulatory environment for a buyer of the ports, and identifying the key regulatory risks and opportunities with private ownership of the ports
- **Vertical Integration Study, Australia, 2012**—Castalia was engaged by Origin Energy, a major Australian energy business, to analyse the impacts of vertical integration in the National Electricity Market. The study involved developing new methodologies to assess the degree of vertical integration in the market and also analysis of Sydney Futures Exchange electricity derivative spread data to assess the impact of vertical integration on contract market liquidity and prices
- **The Impact of Pivotal Events on Power Prices, New Zealand, 2012**—Castalia was commissioned to undertake analysis of the effects of the frequency of pivotal events on electricity prices. Mr. Sundakov led the review of half-hourly load, price, generation and transmission data over ten year period to identify pivotal situations at the national, island, regional and nodal level. This information was overlaid with prices to identify whether and how pivotal generators were using their market power
- **Treatment of price variations, New Zealand, 2012**—Transpower, the New Zealand transmission system owner and operator is subject to a regulatory regime where expenditure on major capital projects is approved by the regulator—the Commerce Commission—prior to project commencement. At project completion the approved cost forecast is escalated and compared with actual costs to assess prudence. The principle is efficient risk allocation—that Transpower should not be exposed to the risk of cost escalation on these

projects that it cannot control—that are changes in input prices. Castalia prepared a submission to the Commerce Commission on behalf of Transpower which analysed the performance of the escalation process against the objective of efficient risk management

- **Integrated Public Transport Ticketing, New Zealand 2010**—Advised a provider of integrated ticketing systems on access pricing and competitive neutrality issues
- **Christchurch Airport Pricing Strategy 2010**—Advised Christchurch International Airport on its pricing strategy, including international benchmarking and the application of a cost-of-service model
- **Rio Tinto and SouthPort, New Zealand 2010**—Acted as an expert witness on behalf of Rio Tinto in commercial arbitration over port access charges for its New Zealand aluminium smelter
- **Civil Aviation Authority of Singapore 2009**—Development of competition and access code for the Changi Airport in Singapore. Under the recently promulgated regulatory regime, CAAS is responsible for regulating airport pricing and for promoting competition in the provision of aeronautical and non-aeronautical services. Mr Sundakov was asked to provide economics and policy analysis to the legal team drafting the Code
- **Airport Pricing, New Zealand 2008**—Airlines operating in New Zealand negotiate collectively with each airport over facilities and charges. Castalia was asked to assist in developing submissions to the airports. Mr. Sundakov advised on how the airports, although unregulated, should be encouraged to adopt the pricing principles used by the New Zealand Commerce Commission in regulating other infrastructure services
- **Auckland Airport Judicial Review, 2007**—Air New Zealand had challenged the prices set by the privately operated Auckland International Airport (AIA) through a judicial review. Russell McVeagh, AIA’s legal advisors, engaged Mr. Sundakov as economic expert. Mr. Sundakov converted the legal concept of a “professionally tenable” approach to pricing into an economic test. He then applied that test to AIA’s pricing, as well as the individual inputs of the pricing methodology. His work focused on: single till versus dual till pricing, the weighted average cost of capital (WACC), the asset valuation approach, and allocation of common costs
- **Review of Infrastructure Sectors in Nauru 2008**—AusAid commissioned Castalia to review the issues facing the infrastructure sectors in Nauru as an input into negotiations with the Government of Nauru on a 5 year support program. Mr. Sundakov led the Castalia team
- **Tonga Electricity Commission 2008–Ongoing**—Mr. Sundakov leads a team which provides on-going advice to the Tonga Electricity Commission. During 2008, Castalia undertook a review of the non-fuel part of the electricity tariff
- **Reform of Electricity Distribution Regulation, New Zealand 2008**—Mr. Sundakov led a team which prepared influential submissions on the reform of regulation for electricity distribution companies in New Zealand. As a result of this work, the new legislation exempts consumer owned distribution utilities

from regulation, and introduces greater accountability for the regulation of investor owned utilities

- **Indonesia Geothermal Power Development Strategy 2006–2007**—The Government of Indonesia wants to make better use of its renewable energy resources. Castalia was engaged to assist in developing a strategy for private investment in geothermal power generation. Mr. Sundakov led a team that identified 74 technically viable geothermal power generation sites, with a total potential of 7,000 to 8,000 MW. The team’s analysis showed that of these around 1,500 to 2,000 MW were commercially viable without any carbon credit benefit, while a further 2,000 MW would be commercially viable if they could capture the benefit of carbon emissions at prevailing world prices (using Clean Development Mechanism (CDM) CER trading). Mr. Sundakov developed a policy and regulatory regime to encourage private investment in the geothermal resource. He also advised on the advantages of multi-lateral backed carbon reduction funds over simple CDM-CER trading, taking into account the better terms and up-front financing available
- **Public Transport Procurement Review, New Zealand 2006–2007**—(Economic Adviser) For Stagecoach NZ, developed an improvement regime for government procurement of public transport services. Recommended inclusion of Euro 4 standards for buses to control emissions, and other mechanisms to increase the attractiveness of public transport over cars and so reduce total transport-related emissions
- **Gas Industry Development of Co-Regulatory Regime, New Zealand 2005**—Led a team developing a comprehensive regulatory regime for the gas processing, transport, distribution and retail, including pricing, market arrangements and customer-switching protocols. Under an innovative co-regulatory system the regime was developed by the gas industry itself, and will be proposed to the Government for review, after which the government may adopt the recommendations, or instead impose a conventional independent regulator on the industry
- **Developed Options for Increasing Access to Electricity in Rural Areas, Indonesia 2005**—The Government of Indonesia has set a 90 percent electrification target by 2020. Existing models for increasing access to electricity are not having the impact needed to meet the government’s target. Mr. Sundakov was retained by the World Bank to develop innovative business models that could rapidly increase the rate of electrification in rural areas. These models were developed based on a comprehensive review of the existing models (including PLN, cooperatives, private providers and captive generation), the legal and regulatory framework and the available financing vehicles, as well as international experience. These models will be presented to government officials during a workshop in August
- **Explanatory Notes on Key Topics in the Regulation of Water and Sanitation Services (WSS), 2005**—There is a significant amount of debate and confusion about regulation in the WSS sector. This arises because people often do not have a common vocabulary and conceptual framework. Castalia was engaged to write a set of six Explanatory Notes on key topics in WSS sector regulation to clear up confusion over the meaning of key terms and concepts, and to provide a foundation from which to develop cohesive and effective regulatory approaches. Mr. Sundakov contributed to these notes,

providing input on economic theory, regulatory frameworks and the application of theory in the water sector

- **Regulatory Framework for Small Private Power Providers in Remote Areas, Philippines 2004**—Led the development of a regulatory and policy framework under which areas not served by an existing power distributor will be opened to supply by micro- and mini-grid operators, which will be awarded contracts to supply specified areas, and receive subsidies where necessary, using a regulatory process. Specific responsibilities included working with the Department of Energy (DOE) and Electricity Regulatory Commission to agree the regulatory and subsidy framework, and ensure it is consistent with DOE policy objectives
- **Governance of Infrastructure, East Asia and Pacific 2004**—Developed a framework for analysis of governance issues in infrastructure in East Asia and Pacific. Carried out a number of case studies, in order to make practical recommendations to improve infrastructure governance in the region, as an input to a flagship report on infrastructure financing and provision developed jointly by the World Bank, the Asian Development Bank and the Japan Bank for International Cooperation
- **Valuation of a Major Energy Company, New Zealand 2004**—Acted for an overseas buyer on a valuation of a major electricity generator and retailer. Our responsibilities included forecasts of demand, wholesale and retail prices, analysis of wholesale market hedge premiums, advice on valuation of the retail business and regulatory and political risk analysis
- **Training of the Electricity Regulatory Commission, Philippines 2004**—Provided training in regulation of regional electricity distribution co-operatives, the transition from cost-plus to performance-based rate-making, and subsidy and regulatory regimes to promote electrification of isolated areas
- **Transpower Regulatory Strategy, New Zealand 2004**—Advised the national transmission company on the approach it should take to regulation following establishment of a new Electricity Commission. Mr. Sundakov led this work to develop the company's overall corporate strategy, and ensure that the regulatory strategy supported this. We advocated a regime which linked service levels to investments and tariffs, providing for revenue security
- **Infrastructure Stocktake, New Zealand 2004**—The Ministry of Economic Development in New Zealand wanted to review the performance of infrastructure in the economy, understand whether infrastructure might become a constraint on growth and competitiveness, and develop policy responses to ensure adequate supply and coordination of infrastructure services. Mr. Sundakov assisted the Ministry in synthesising work prepared on discrete aspects of infrastructure provision into a useable whole, and recommended further policy developments

Economic Policy Advice

- **Review of Banking Regulation, New Zealand 2008**—Mr. Sundakov led a team which worked with a group of major trading banks to review the existing approach to the regulation of the banking sector, and to recommend improvements

- **Pharmaceutical Regulation, Canada 2008**—Undertook a detailed review of the differences and similarities between pharmaceutical regulations in Canada, Australia and New Zealand, and to provide advice on the effects of the regulatory regimes on patient outcomes and on public health expenditure
- **Funding of High Cost Pharmaceuticals, New Zealand 2008**—Undertook a review of New Zealand policies for the funding of high cost pharmaceuticals, and to recommend an approach better suited to patient needs
- **Impacts of Kyoto Protocol on Energy Sector and Economy, New Zealand 2003–2004**—Engaged by a major energy company to provide evidence on the likely impacts on growth, income and energy sector development of New Zealand’s ratification of the Kyoto protocol
- **Strategy for Development of the “Cervena” Venison Appellation, New Zealand 2003–2004**—Reviewed the Cervena appellation to assess what it has achieved and what is needed to make the most of the industry’s investment in the appellation. The overall objective of the review was to enable the Cervena Trust to make a decision about the future ownership structure, funding and scope of the brand from the perspective of the deer industry in New Zealand. Recommended a change in ownership and governance of the appellation
- **Transmission and Distribution Price Regulation, New Zealand 2003**—Provision of economic advice related to definition of price control thresholds in the definition of transmission and distribution markets; and the means for demonstrating contestability of system operator services. Commented on the Commerce Commission's draft Assessment and Inquiry guidelines
- **Submission on Providing Security of Supply in Wholesale Electricity Market, New Zealand 2003**—Assisted Contact Energy, a major electricity generator and retailer in developing submissions on a proposed new generation market regime and security of supply proposals. In particular, assisted with a feasibility study and analysis of Contact’s proposal to Government and an approach to quantifying the costs and benefits of Contact’s proposal as well as their incidence. Reviewed the work of US consultants to ensure it reflected a comprehension of local conditions
- **Submission on Dry Year Reserve Proposal, New Zealand 2003**—The government proposed to improve New Zealand’s security of electricity supply by establishing an Electricity Commission which would, among other things, contract for stand-by capacity to operate in years in which low rainfall led to a shortage of hydro-generation. Mr. Sundakov assisted Solid Energy, New Zealand’s leading coal-mining company, with the preparation of the submission on the Government’s dry year reserve purchasing proposal
- **Regulatory Framework for Private Participation in Rural Electrification, Philippines 2003**—Developed a regulatory framework and Model Contracts for private investment and management in rural electrification cooperatives and in new minitrid projects. Advised a Government-owned rural electricity generating company on privatisation. Developed a regulatory and subsidy framework to promote efficiency and private participation in the sector
- **Electricity Market Reform, New Zealand 2003**—The Government announced its intention to establish an Electricity Commission charged with

overseeing development and operation of the electricity industry and with contracting for reserve capacity to prevent electricity shortages in dry years (New Zealand gets 60% of its electricity from hydro). Transpower, as the system operator, sought advice on the development of substantive policies to achieve the Government objectives. Mr. Sundakov advised on policy and regulatory approaches to address the problem of underinvestment in New Zealand non-hydro electricity generation. Developed a proposed approach to address the fundamental issues with the least possible regulatory intervention

- **Regulatory and Investment Advice to Coal Mining Company, New Zealand 2003**—A state-owned coal mining company sought opportunity to build a coal powered generation plant. Commercial viability of the plant depended on the ability to substitute generation for transmission investment, and to contract with the grid owner
- **New Models for State-owned Enterprises, New Zealand 2003**—After the Minister of Finance announced that the Government would retain its ownership of existing state-owned enterprises (SOEs), rather than seeing them as candidates for privatisation, we worked with a number of SOEs to review what this policy change meant for the appropriate corporate form, strategy and governance of SOEs
- **Optimising Transmission Investments, New Zealand 2003**—Commissioned by Transpower to advise on creating appropriate incentives for investment in new electricity transmission assets in New Zealand
- **LIC Share Structure, New Zealand 2003**—LIC is an agricultural cooperative involved in artificial breeding and associated services. It maintains one of the largest dairy animal databases in the world giving it a strong competitive advantage in the development of biotechnology. LIC believed that its traditional cooperative share structure was at odds with its growth strategy. Mr. Sundakov assisted in developing an alternative share structure involving both tradable and non-tradable shares which better achieved its members' objectives. The tradable shares are listed on the New Zealand Stock Exchange
- **Foreign Direct Investment Strategy, Malaysia 2002**—Advised Malaysian Industrial Development Agency on development of policies to encourage Malaysian companies to invest internationally, as part of an overall Government strategy of diversifying Malaysia away from labour intensive manufacturing toward higher value areas
- **Regulatory Strengthening for Telecommunications, Ukraine 2002**—Advised on strengthening regulatory capabilities within the State Committee. Provided functional analysis of regulatory tasks, and advice on new structure
- **Strategic Issues for Co-operatives, 2002**—Advised the New Zealand Association of Co-operatives
- **Transmission Regulation Advice to Transpower New Zealand 2002**—Transpower is New Zealand's electricity system operator and transmission provider. Provided advice to the Transpower on its strategic positioning on the setting up of the Electricity Industry Governance Board, a proposed industry self-regulatory organisation. Submission to Government hearings on the process, and expert evidence to a committee of inquiry

- **Foreign Direct Investment Strategy, Brunei 2002**—Advised the Economic Development Board of Brunei on the development of policies to facilitate foreign direct investment in Brunei infrastructure industries
- **Telecommunications Regulatory Advice, Vodafone, 2002**—Advised Vodafone on an appropriate methodology for estimating the cost of the Telecommunications Service Obligation in New Zealand (New Zealand's equivalent of a universal service obligation). This project included consideration of the incentives on telecommunications operators to invest in rural areas. Presented evidence to hearings of the regulatory authorities
- **Dairy Industry Co-operative Mergers, 2000–2001**—Advised a series of dairy co-operative mergers, leading to the formation of Fonterra, one of the world's largest agricultural co-operative accounting for 20 percent of New Zealand exports.
- **Transmission Pricing Methodology Advice to Transpower New Zealand, 2001**—On the transmission pricing methodology. In the context of this work, facilitated a series of industry forums bringing together transmission users and the provider
- **Development of Universal Service Obligation, New Zealand 2001**—Advised the incumbent telecommunications provider, on how to measure the cost of meeting its social obligations in rural areas. Telecom has a substantial existing rural network, primarily based on conventional twisted copper pair technology, and in some areas utilising multi-access radio. Advised on cost modelling and allocation of losses
- **Telecommunications Regulatory Advice, Australia 2000**—Advised Telstra (the incumbent telecommunications services provider) on the cost model for the resale of telecommunications services to other operators
- **International Telecom Tariff Benchmarking, New Zealand 2000**—Provided Advice to the New Zealand Government on benchmarking prices for telephone services across countries. This included consideration of the implications differences in rural networks (e.g. in relation to penetration rates and population distribution) have for the extent to which you can compare telecommunications costs across countries
- **Restructuring of Ministries of Finance and Economy, Ukraine 1999**—Functional review and restructured the Ukrainian Ministries of Finance and Economy, funded by the United States Agency for International Development
- **Privatisation of Ukrtelecom, 1999–2000**—Actedas an advisor to the Board of Ukrtelecom, Ukraine's incumbent telecommunications operator on preparing the company for eventual privatisation. This advice included both the strategy for privatisation, and helping the company negotiate with Government on the design of the post-privatisation regulatory regime
- **Advice on Creation of Wholesale Power Market, Ukraine 1995**—Advised on issues in establishment of a wholesale power market for Ukraine. Cautioned about the risk of moving toward market arrangements in conditions in which payment discipline would be hard to enforce

- **Coal Sector Restructuring, Ukraine 1995**—Participated in World Bank project to develop a coal sector restructuring plan for Ukraine. Focused on ways to reduce the quasi-fiscal burden of the coal sector
- **Mediated Settlement of Energy Debts to Russia and Turkmenistan, 1995**—Mediated an inter-government settlement to clear Ukraine’s gas and electricity related debts to Russia and Turkmenistan. Assisted in developing new regime for gas and electricity trade, including advice on pricing, payment terms and metering arrangements
- **Regulatory and Fiscal Aspects of Reform, Ukraine 1993**—As part of the development of the IMF program for Ukraine, negotiated with the Government of Ukraine an agreed privatisation strategy, and program of regulatory reform, including reform of the energy sector and legal and institutional changes to promote foreign direct investment
- **Macro-economic Policy and Strategy Advice 1992**—Advised Government on fiscal management and suggestions for reducing the budget deficit
- **Reform of Labour Market Regulation 1990–1991**—Helped Government to design and implement a far-reaching liberalisation of New Zealand’s labour laws, with the intention and effect of increasing the country’s competitiveness and attractiveness to international investors, as well as reducing unemployment and boosting growth.

Languages

	<i>Speaking</i>	<i>Reading</i>	<i>Writing</i>
English	Excellent	Excellent	Excellent
Russian	Excellent	Excellent	Excellent

Comments on whether domestic roaming and mobile network facilities access services meet declaration criteria in Papua New Guinea

25th October, 2013

HENRY ERGAS

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1 Introduction and context

1. The National Information and Communications Technology Authority (“NICTA”) has commenced a public inquiry to consider the potential for declaring: (1) domestic mobile roaming services; and (2) facilities access services associated with mobile network facilities. On 2nd August 2013, NICTA published a discussion paper entitled “Public inquiry into the potential declaration of certain wholesale mobile telecommunications services” (the “Discussion Paper”).
2. I have been asked by Digicel to provide an expert opinion on whether:
 - service declaration would meet the criteria in section 128(b)(i) of the National Information and Communications Technology Act 2009 (“the Act”);
 - service declaration would meet the criteria in section 128(c)(i) of the Act;
 - a recommendation to the Minister for declaration would align with the objectives of the Act; and
 - a recommendation for declaration would be consistent with current Government Policy.
3. I examine each of these matters in turn below in Sections 4 to 6 of this expert report.

2 Summary of opinion

Promotion of competition criterion - ss128(b)(i)

4. The promotion of competition criterion requires that a service only be declared if declaration is necessary for the promotion of effective competition. The use of the word “necessary” implies that only services that are required for effective competition justify declaration. In the current context this means that declaration would only meet ss128(b)(i) of the Act in geographic locations where it can be shown that duplication of mobile network facilities is not viable. In order to declare one or both of the wholesale services at issue, NICTA would also need to be satisfied that: (1) commercial negotiation would not deliver the required access in identified geographic areas where duplication is not viable; and (2) there are no alternative means for rivals to compete effectively.
5. That declaration would bring forward services-based competition (that is, competition at the retail level which relies on access to wholesale services) is not sufficient to determine that declaration is necessary for effective competition. Indeed, if declaration encourages a reliance on wholesale services in areas where efficient duplication of facilities is feasible, consumers will miss out on the benefits of full infrastructure competition which

include more intense competition on: price levels, price structures, network quality and coverage.

6. It seems most likely that areas where duplication of facilities is not viable are primarily in Band 4. Given that bemo has already deployed sites in around 35% of the Band 4 areas where Digicel has coverage and that there may well be other Band 4 areas where efficient duplication is also possible, only a sub-set of Band 4 areas would be potential candidates for satisfying the promotion of effective competition criterion. Domestic roaming would only satisfy the criterion where neither new network deployment nor tower access were efficient. It seems likely this would only be the case in a relatively small number of Band 4 sites.
7. Given that there is not yet complete mobile coverage of the PNG population, a strategy open to Digicel's rivals is to compete on coverage by building sites in areas of population that are outside of Digicel's coverage areas as an alternative to replicating Digicel's exact network footprint. If this approach provides a feasible alternative to providing service in the areas where Digicel has network infrastructure that cannot be viably duplicated and this strategy allows rival networks to offer a coverage proposition to retail customers that is as attractive as Digicel's coverage, then access to Digicel's network is not necessary for effective competition to eventuate and declaration is not justified.

Efficient investment criterion – ss128(c)(i)

8. In the event of declaration there is a risk that prices set by a regulator for the declared wholesale services will be below the efficient level. This would lead to an under-recovery of costs by the access provider and in turn this has the effect of reducing the access supplier's incentives for further investment in expanding coverage or upgrading existing network facilities.
9. A second negative investment impact derives from the fact that if the services at issue are declared, the competitive benefit of becoming a more attractive network by investing in increased coverage or improved service levels is lost. This is because competitors will gain access to new coverage or improved network services through either domestic roaming or mobile network facilities access. The loss of this benefit to a network owner can fundamentally change the business case for investing in marginal areas. As a result, the access provider is likely to invest less in coverage expansion and network upgrades in remote areas than would happen in the absence of service declaration.

Consistency with the objectives of the Act

10. Access to reliable telecommunications services is a crucial part of PNG's continued economic development. Mobile network services are particularly relevant in PNG due to its geography and significant areas of sparse population, and have the potential to substantially improve productivity and enhance economic growth. Given this, actions which foster investment in the expansion of mobile networks and in the upkeep and upgrade of those networks will be in the long-term interests of PNG.

11. As explained above, declaration has the potential to curtail network investment particularly in the construction of high-cost sites because networks no longer have the incentive to compete for coverage. The implication is that total mobile network coverage in PNG will likely be lower under declaration than it would otherwise be. Similar reasoning means that it is likely that service levels are likely to be lower in remote areas than they would otherwise be because there is less incentive to invest in network upgrades in those areas. These outcomes would be inconsistent with the objectives of the Act set out in ss2(a)(i) (long-term interests of PNG) and ss2(h) (encouraging, facilitating, and promoting sustainable investment in and the establishment, development and expansion of, the ICT industry in PNG, including via the exercise of facilities rights).

Consistency with PNG Government ICT policy

12. Reform 3.2 clarifies that the wholesale services being considered by NICTA should only be declared in areas where duplication is not viable:

Absent commercial arrangements, potential competition benefits can be secured from declared facility sharing and mobile roaming to the extent it is uneconomic to duplicate infrastructure.

13. This is consistent with the opinion I have expressed above on the application of the promotion of competition test.

14. A matter on which there is an inconsistency between NICTA's Discussion Paper and Government policy is that while the policy specifies that declarations should be for a service, NICTA expresses the view in the Discussion Paper that the declaration should apply to Digicel's services only.

3 Qualifications

15. I hold a number of positions, including:

- a. Professor of Infrastructure Economics at the SMART Infrastructure Facility at the University of Wollongong in Australia;
- b. Adjunct Professor in the Faculty of Economics at Monash University (Melbourne);
- c. Senior Economic Adviser to Deloitte Access Economics, based in their Canberra office;
- d. Member of the Australian Urban Research Infrastructure Network (AURIN) Expert Lens Group 6 (Energy and water supply and consumption);
- e. Member of the Deakin Policy Forum Advisory Council;
- f. Lay Member of the New Zealand High Court.

16. I previously worked as a consultant economist and principal at NECG, CRA International and Concept Economics. I historically founded both NECG and Concept Economics in Australia.

17. During 2008 and 2009, while at Concept Economics, I was engaged by the Department of Communication and Information of the Government of the Independent State of Papua New Guinea (PNG) as the principal economic expert to provide advice to the Minister and Department in relation to the continued liberalisation of the telecommunications sector in PNG. Relevantly:
- a. as part of that advisory role, I was involved in preparing a comprehensive report of some 500 pages that set out a series of recommendations for telecommunications policy reform in PNG, titled the *Experts' Report on National ICT Policy Phase 2 Reforms*;
 - b. those recommendations involved the creation of a new telecommunications regulator, NICTA, as well as the creation of a telecommunications access regime in PNG based on the equivalent telecommunications access regime in Australia at that time;
 - c. I was involved in meeting with Government Ministers in PNG to outline and refine the various policy recommendations, as well as assisting with the public consultation process in PNG;
 - d. I was involved in the drafting of the final set of recommendations provided by the Department to the National Executive Council; and
 - e. following the endorsement by the National Executive Council of those recommendations, I was involved in the drafting of legislation to give effect to those recommendations, such legislation subsequently enacted as the National Information and Communications Technology Act 2009.
18. As well as my previous role as expert advisor to the Government of PNG, I have extensive experience working with government. For example:
- a. I chaired the Intellectual Property and Competition Policy Review Committee for the Australian Government in 1999-2000, and was a member of the Prime Minister's Export Infrastructure Task Force in 2005 and of the Defence Industry Consultative Group in 2006;
 - b. prior to that, I was an economist at the Organisation for Economic Cooperation and Development (OECD) in Paris from the late 1970s until the early 1990s; and
 - c. at the OECD, I headed the Secretary-General's Task Force on Structural Adjustment which concentrated on improving the efficiency of government policies in a wide range of areas. I was subsequently Counsellor for Structural Policy in the Economics Department.
19. A copy of my curriculum vitae is attached in Annex A, further outlining my background and experience.

4 Is declaration of the domestic roaming and/or mobile facilities access services necessary for the promotion of effective competition?

20. Section 128 of the Act sets out a number of criteria that must be satisfied in order for a service to be declared. The following discussion focuses on the 'promotion of effective competition' declaration criterion described in ss128(b)(i) which requires that:

access or increased access to the wholesale service (as a consequence of declaration) is necessary for the promotion of effective competition in at least one market other than the market for the wholesale service.

4.1 Interpretation

21. The criterion that declaration is necessary for the promotion of effective competition implies that to satisfy ss128(b)(i), duplication of the facilities required to provide the service is not economic such that without declaration effective competition in one or more other markets cannot be achieved. In other words, as expressed in the Hilmer Review of National Competition Policy in Australia, a service should only be declared where access to that service is "essential to permit effective competition" rather than "merely convenient".¹²
22. Telecommunications networks are often characterised by high fixed costs. This means that there may be a natural monopoly for some network facilities where only a single firm can achieve the economies of scale necessary for efficient supply. This natural monopoly characteristic of some telecommunications network facilities leads to the situation where access to the facility for which duplication is not economic is a necessary input for the supply of downstream services.
23. To determine that declaration of either one or both of domestic roaming and access to passive mobile network infrastructure facilities is necessary for the promotion of effective competition in one or more other markets would require that efficient duplication of the service (or services) could not be achieved and that there are not any other means for competing effectively (for example, through alternative network deployment strategies or through commercially negotiated access to facilities).

¹ National Competition Policy Review (25 August 1993), p. 251.

²The legislation in PNG uses the term "necessary" rather than "essential." While "necessary" is not identical to "essential" it is far, far stronger than merely "convenient" or "useful".

24. I note that the test in ss128(b)(i) sets a relatively high threshold for intervention as compared with the promotion of competition declaration criterion in other jurisdictions. For example, subsections 152AB(2) and 152AL(3)(d) of the Competition and Consumer Act 2010 Act require the Australian Competition and Consumer Commission (ACCC) to have regard to whether declaration is “likely to achieve the objective of promoting competition in markets for listed services” rather than whether declaration is necessary to achieve that objective.

4.2 NICTA’s analysis

25. NICTA states in the Discussion Paper (p. 22) that declaration of these services could help to promote competition in the retail mobile services market by “facilitating the prompt expansion of the network coverage of the other two existing MNOs and any potential new entrants.”

26. NICTA’s use of the term “facilitate” implies that the availability of the service or services could assist the development of competition but as NICTA acknowledges this does not imply that the declaration is necessary.³ As discussed above, in order to conclude that service declaration is necessary to promote effective competition it would need to be demonstrated that the facilities used to provide the service could not be efficiently duplicated. To evaluate this NICTA would need to conduct an empirical investigation of which mobile network facilities (ie, active and/or passive) are not efficiently duplicable and in which locations.

27. It appears from NICTA’s analysis that NICTA may view that the promotion of effective competition criterion would be satisfied if declaration had the effect of bringing forward coverage expansion by mobile operators that acquire the declared wholesale service(s). However, there are at least two flaws with this reasoning.

28. Firstly, if the declaration simply has the effect of bringing forward effective competition that would otherwise still have been achieved, albeit at a later date, then declaration is not necessary to achieve effective competition.

29. Secondly, if the “prompt coverage expansion” referred to by NICTA is a simply a reference to the ability of mobile service providers to more quickly provide coverage to retail customers through the use of the declared services, even in areas where the facilities used to supply the declared services can be efficiently duplicated, then this effect on its own would not satisfy section 128(b)(i). The use of domestic roaming services provided by Digicel, for example, would allow customers a choice of retail suppliers earlier than if they had to wait for network entry by Digicel’s rivals. However, it

³As NICTA explains: “A wholesale declaration could probably facilitate or assist competition, but may not be necessary in the sense that effective competition cannot result without it.”

is quite possible that availability of domestic roaming would delay network-based competition if declaration is not contained to cases where network infrastructure is not duplicable. This is because with access to domestic roaming services there is a substantially reduced incentive for the access seeker (a mobile network that acquires the declared domestic roaming service) to deploy its own facilities.

30. While domestic roaming would allow competition on retailing functions in an extended geographic area as compared with a scenario under which domestic roaming is not declared, the trade-off is that infrastructure competition would be delayed. Infrastructure competition, that is, where a mobile network deploys its own mobile network facilities rather than relying on wholesale services provided by other networks, allows for more effective competition and at a much deeper level. For example, infrastructure competition enables firms to compete more effectively on:

- a. **price levels** – The Experts' Report on National ICT Policy Phase 2 Reforms recommended that prices for domestic roaming services would be set on the basis of the retail price minus 10%. Under this type of pricing construct, the ability of access seekers to compete on price would be constrained to efficiencies that they can achieve on retailing. Infrastructure based competition would enable networks to compete effectively on the basis of the efficiencies they achieve in both the network and retail layers and to also compete away monopoly rents through more aggressive price competition than would occur where wholesale services are relied on;
- b. **price structures** - Firms that supply services using their own network facilities would have high fixed costs and low marginal costs whereas firms that rely on wholesale services would have high marginal costs. The implication is that infrastructure based competitors have more flexibility in the way that they set pricing structures to recover costs. This allows for more varied and innovative competition in price offerings.
- c. **network quality**- Mobile operators that use domestic roaming have little control over the quality of service provided (eg, the data speeds available and network reliability) because they are effectively reselling the access provider's services. In contrast, infrastructure competition allows firms to compete on network quality through investment in network upgrades; and
- d. **differentiated coverage**—In areas where domestic roaming is used, all operators would have identical coverage and any additional coverage deployed would be available to all networks as a result of declaration. As a result there is no incentive to compete through deploying additional sites if wholesale services can be used.

31. It can therefore be concluded that encouraging infrastructure competition (where it is viable) is more consistent with promoting effective competition than competition that is

reliant on domestic roaming services. Again this implies that the promotion of competition objective is only satisfied if infrastructure duplication is uneconomic.

32. The above discussion focussed on the declaration of domestic roaming services. Declaration of access to passive network facilities would allow deeper network competition than domestic roaming, although competition that occurs through the use of facilities access is less intense than full infrastructure competition. Firms that use mobile tower access, for example, will have control over the quality of their network service levels but will not compete on coverage and their ability to compete aggressively on price will depend on the pricing of the mobile tower access service. As a result, with regard to declaration of passive mobile network facilities access services, ss128(b)(i) will only be satisfied where duplication of those network facilities is not efficient.
33. It could be argued that declaration would promote competition on the basis that there are very significant investments required in order for a new or small network to expand, and temporary access to the facilities and services of other larger networks would assist with entry and expansion. However, wholesale services are only necessary for the development of effective competition if there is a reason why it is not possible for the entrant/smaller network to access sufficient capital to deploy network and compete using its own facilities. Absent a compelling argument along these lines, the only situation in which the declaration is necessary for effective competition is if it can be demonstrated that the service duplication is uneconomic.

4.3 Does access to passive mobile network facilities satisfy the promotion of effective competition criterion?

34. To determine whether declaration of access to passive mobile network facilities satisfies ss128(b)(i) involves identifying which facilities cannot be efficiently duplicated, whether there would be demand for access to those facilities, whether access to those facilities would be provided in the absence of declaration on commercially negotiated terms and whether there are alternative network deployment strategies that would lead to effective competition.⁴
35. The Discussion Paper identifies a total of 229 areas across Bands 1 to 4 and sets out how many of those geographic areas are covered by each network (see Table 1 for a summary of that information). The Discussion Paper notes that in addition to the areas identified, Digicel has a further 58 towers in the Western Province that are open access.

⁴This would need to be assessed in conjunction with the domestic roaming declaration assessment. Only declaration of one of domestic roaming or passive mobile network infrastructure access service would likely be necessary for effective competition.

Table 1: Coverage of each network by band

	Total areas	Bemobile	Digicel	Telikom
Band 1	8	8	8	Appears to cover all areas
Band 2	14	14	14	(at least 14 by 30 Oct 2013)
Band 3	87	48	87	(at least 56 by 30 Oct 2014)
Band 4	120	42	120	(at least 69 by 30 Oct 2016)
	229	112	229	

Source: NICTA Discussion Paper.

36. The question of how many sites would be technically capable of co-location of network equipment and also satisfy ss128(b)(i) would require detailed analysis of costs and demand but it seems most likely that any sites that satisfy that criterion would lie in only Band 4. Furthermore, the sites which would satisfy ss128(b)(i) would be only a sub-set of Band 4 given that 42 of the 120 areas in Band 4 already have bemobile coverage. Identification of non-duplicable sites would involve considering whether the incremental revenues that can be earned exceed the costs of network deployment. Importantly in this assessment, incremental revenues would not only include the revenue that would be earned directly from customers utilising the new area of coverage who would not otherwise have been served, but should also include the additional revenues that can be earned from increasing the firm's market share of customers in other areas due to the network becoming more attractive as a whole when coverage increases.
37. It is possible that some sites that have already been duplicated by bemobile could not be efficiently duplicated by a third network. However, given the presence of two networks and the low traffic volumes of bemobile, there would seem to be strong incentives for existing networks to engage in the supply of passive infrastructure facilities to a third network.
38. Consideration of whether declaration of the services at issue would be necessary for the promotion of effective competition would also require an assessment of whether an alternative means for competing effectively against Digicel is to deploy sites in other locations where Digicel does not yet have coverage. If investment in areas when Digicel had not yet deployed its network provides a feasible alternative to providing service in the areas duplication is uneconomic and this strategy allows rival networks to offer a similar total percentage coverage of population then access to Digicel's network is not necessary for effective competition to eventuate and declaration is not justified.
39. More generally, the promotion of effective competition criterion would only be satisfied if it was considered that commercial negotiation would not lead to sufficient access to the services.

4.4 Does domestic roaming satisfy the promotion of effective competition criterion?

40. The promotion of effective competition criteria is such that declaration of domestic roaming would only be justified where the deployment of active network equipment and facilities either on the network's own site or using tower access (where available) is not efficient. Consequently it would only be in the most remote areas of coverage that domestic roaming would satisfy ss128(b)(i). This likely means that a very small subset of Band 4 sites could meet the promotion of competition criterion. Identification of that subset of sites would require empirical analysis of costs and demand using a similar methodology to that discussed above in the context of facilities access services.

5 Would declaration materially compromise the incentives for efficient investment?

41. Sub-section 128(c)(i) of the Act requires that "declaration would not materially compromise the incentives for efficient investment in any facility over which the wholesale service may be supplied." Declaration of the proposed wholesale mobile services carries a risk that the incentive for efficient investment could be materially compromised through at least two key means: (1) the risk of regulatory error in wholesale price intervention; and (2) as a result of benefits from coverage expansion and network upgrades being passed directly to the access provider's downstream competitors. While the first of these factors is clearly important, the effect of the second factor is likely to be particularly strong.

5.1 Regulatory error and cost recovery

42. When intervening on the level of wholesale pricing, regulators may inadvertently set prices such that they either under or over recover costs. Estimating the costs of telecommunications services is by nature complex and involves a number of assumptions and decisions on methodology – for example, in cost allocation. A consequence of this is that there is a risk that prices set by a regulator for declared wholesale services will sometimes be set below the efficient level which leads to an under-recovery of costs by the access supplier and in turn has the effect of reducing the access supplier's incentives for further investment.

43. In the specific context of a declaration of domestic roaming services and access to passive mobile facilities, the risk of under-recovery of costs will likely reduce the incentive for the access provider in respect of investment on existing and new infrastructure. That is, the risk that wholesale prices will be set below cost may reduce the likelihood that Digicel (or any other network owner) will:

(a) upgrade its existing towers and other mobile network assets that are subject to regulation; and

(b) invest in expanding coverage by building new sites which will come under the realm of the service declaration.

44. *The Experts' Report on National ICT Policy Phase 2 Reforms* recommended that domestic roaming be treated as a resale product in respect of wholesale pricing and that the price be set using a Retail Minus Avoided Cost (RMAC) methodology, for example at Retail Minus 10%. While the use of a Retail Minus methodology to some extent mitigates against the possibility of pricing below cost, in some of the highest-cost and most sparsely populated areas of coverage (in particular, where the incentive to provide coverage is driven primarily due to the demand for customers nationally for extended coverage) it is conceivable that costs could exceed the RMAC price. This is especially so if retail prices are geographically averaged, in which case access seekers would use the declared service to 'cherry pick':

- in low cost areas, they would use their own infrastructure, thereby securing the benefit of those low costs;
- in high cost areas, they would use Digicel's infrastructure at prices that reflected averaged costs, and hence were potentially well below real costs.

45. *The Experts' Report on National ICT Policy Phase 2 Reforms* Government policy recommended the use of cost-based pricing for Interim determination on tower sharing. The cost of mobile towers can vary markedly with costs dependent, for example, on:

- a. the type of tower;
- b. the type of foundations required which is determined by a range of factors including the soil type and location and exposure to wind;
- c. the costs of building an access road (where required);
- d. landowner rentals; and
- e. the costs of servicing the site with power.

46. The wide variation in costs increases the potential for regulated pricing to lead to under-recovery of costs at the highest cost sites. This is compounded by the lack of available information on benchmarks of regulated pricing from other countries for comparison.

5.2 Removal of ability to compete on coverage

47. When a network makes an investment in order to extend coverage, it does so for the purposes of both: (a) gaining the ability to serve customers in the extended coverage area; and (b) increasing the attractiveness of its network to customers that live in other areas but who place a high value on being connected to a network that has extensive coverage. In remote areas where there are few customers, purpose (b) will have a significant effect on coverage investment decisions because a business case based on purpose (a) alone is less likely to be viable than in more heavily populated areas.

48. If the services at issue (domestic roaming and access to facilities) are declared, the benefit of becoming a more attractive network by offering increased coverage through network investment is lost. This is because competitors will gain access to the new coverage through either domestic roaming or mobile network facilities access. The removal of that competitive benefit of coverage expansion will alter the business case for investment in sites and active network facilities in remote areas, with the effect that there will be less coverage expansion than in the absence of declaration. Given that there are significant areas of PNG that do not have mobile coverage the entire surplus (consumer plus producer surplus) that could be gained in those areas through the provision of mobile access is lost when incentives to invest in coverage expansion by all networks (including Digicel and its rivals) are reduced. Importantly, the effect may not only be to reduce the quantum of investment or extent of rollout but also to delay the investment that does occur.
49. Similar effects would occur with regard to upgrades of services and facilities within the access provider's existing mobile network footprint. As a result, there are less incentives to invest in service levels – for example, the incentives to allow fewer dropped calls, and invest in other similar service improvements and in capacity expansion are reduced.

6 Would declaration satisfy the objectives of the Act?

50. Digicel has requested my opinion as to whether Declaration of the services proposed by NICTA would be likely to satisfy the objectives of the Act set out in section 2, specifically ss2(a)(i) (long-term interests of PNG) and ss2(h) (encouraging, facilitating, and promoting sustainable investment in and the establishment, development and expansion of, the ICT industry in PNG, including via the exercise of facilities rights).
51. Access to reliable telecommunications services has a crucial role to play in PNG's continued economic development. Mobile network services are particularly relevant in PNG because the geography and significant areas of sparse population render mobile networks the most efficient means by which to deliver telecommunications access and services in many locations. In addition it is well recognised that mobile broadband networks have the potential to substantially improve productivity and enhance economic growth. Given this, actions which foster investment in the expansion of mobile networks and in the upkeep and upgrade of those networks will be in the long-term interests of PNG.
52. As described above in section 5.2, declaration of the mobile services at issue (domestic roaming and access to mobile network facilities) has substantial potential to materially reduce and delay investment in both the expansion of and upgrades to mobile networks in PNG. It is difficult to see how the resulting reduced access to telecommunications networks in PNG and lower quality and innovation could be in the long-term interests of

PNG. Instead, it seems highly likely that declaration of domestic roaming and access to network facilities will be to the detriment of PNG in contravention of ss2(a)(i).

53. The significant negative impacts on investment are also at odds with ss2(h) because rather than encouraging, facilitating, and promoting sustainable investment in and the establishment, development and expansion of, the ICT industry in PNG, declaration would discourage investments that would otherwise be made by Digicel and its rivals in increasing overall mobile network coverage and service levels available to consumers of retail mobile services in PNG.

7 Would declaration be in accordance with PNG Government Policy?

54. Section 11 of the Act requires that NICTA must ensure that Government Policy is carried out and it must not perform its functions and exercise its powers in a manner inconsistent with Government Policy. Digicel has instructed me to refer to the document entitled “National Information & Communications Technology (ICT) Policy, National ICT Policy Phase 2 Reforms, Final Report” published by the Department of Communication and Information in March 2009 (“the Government ICT Policy Paper”). That document, which I was involved in preparing, sets out a large number of reforms across diverse aspects of the telecommunications sector. A number of the reforms are directly reflected in the Act.

55. Reform 3.2 makes it clear that the wholesale services being considered by NICTA should only be declared in areas where duplication is uneconomic:

Absent commercial arrangements, potential competition benefits can be secured from declared facility sharing and mobile roaming to the extent it is uneconomic to duplicate infrastructure.

56. I have identified a specific issue on which there seems to be inconsistency between the Government ICT Policy Paper and the NICTA Discussion Paper. While the policy specifies that declarations should be for a service, NICTA expresses the view in the Discussion Paper that the declaration should apply to Digicel's services only:

As only Digicel was found to have SMP in the wholesale MACO market, only the declaration of Digicel's supply of the candidate services is being considered.⁵

57. NICTA's reasoning for this view is as follows:

⁵NICTA Discussion Paper, p. 21.

As per the terms of reference NICTA will only consider a wholesale service against the declaration criteria if the relevant wholesale market is not found to be effectively competitive—that is, if there are one or more participants in that market that have significant market power (SMP). Where SMP is found to exist, consistent with international regulatory best practice only the supply of the relevant wholesale service by the licensee(s) with SMP will be considered for declaration.

58. NICTA's approach conflicts with Reform 3.1 of the Government ICT Policy Paper which states that:

Wholesale access and interconnection obligations will be applied to regulated 'declared' services and facilities, not particular regulated entities. All relevant licensees will be subject to, and benefit from, such regulation.

59. It would appear that NICTA's SMP-based approach which it refers to as international regulatory best practice is simply the application of a regime from a different jurisdiction, whereas NICTA is in fact required to adhere to the PNG regime as prescribed in the Act and Government Policy.

Annex A: Curriculum Vitae of Henry Ergas

PROFESSIONAL QUALIFICATIONS

M.Ec.Stud. (High Distinction), University of Queensland

B.A. (Econ) First-Class Honours, Sussex University

EMPLOYMENT HISTORY

- 2010– Professor of Infrastructure Economics, SMART Infrastructure Facility, University of Wollongong
- 2009– Senior Economic Adviser, Deloitte Australia
- 2008–2009 Chairman, Concept Economics
- 2004–2007 Vice President and Regional Head, Asia Pacific, CRA International
- 1996–2004 Managing Director, Network Economics Consulting Group (NECG), Australia
- 1995–1997 BellSouth NZ Visiting Professor of Network Economics and Communications, The University of Auckland, New Zealand
- 1994–1995 Visiting Professor, Kennedy School of Government, Harvard University
- 1993–1997 Advisor, Trade Practices Commission, Canberra, Australia
- 1991–1993 Counsellor for Structural Policy, Economics Department, OECD, Paris
- 1987–1991 Professor, Graduate School of Management, Monash University, Melbourne
- 1978–1987 Administrator, Principal Administrator, and subsequently Counsellor, OECD, Paris and Head of the Secretary-General’s Task Force on Structural Adjustment.

EXTERNAL APPOINTMENTS

- 2012 Member, Australian Urban Research Infrastructure Network (AURIN) Expert Lens Group 6 (Energy and water supply and consumption)
Member, Deakin Policy Forum Advisory Council
- 2010– Lay Member, New Zealand High Court
- 2009 *Editorial Board*, Telecommunications Policy, Elsevier
- 2008– *Editorial Board*, Agenda, Journal of the ANU College of Business and Economics, Australian National University
- 2007– *Adjunct Professor*, Department of Economics, Monash University

- 2006 *Member, Defence Industry Consultative Group reporting to the Australian Minister for Defence*
- 2005 *Member, Prime Minister's Taskforce on Exports and Infrastructure*
- 2004– *Adjunct Professor, School of Economics, National University of Singapore*
Member, Australian Centre of Regulatory Economics (ACORE) Advisory Board
Member, French Ordre Nationale du Merite
- 2002– *Editorial Board, The Review of Network Economics at www.rnejournal.com*
- 2001 *Lay Member, New Zealand High Court*
- 1999–2000 *Chairman, Intellectual Property and Competition Review Committee, Attorney-General's Department, Australia*
- 1998–2004 *Member, Commissione Scientifica, Telecom Italia, Rome, Italy*
- 1997 *Member, Advisory Panel on Telecommunications Reform to the Minister for Communications and the Arts, Australia*

PAPERS AND PUBLICATIONS

Books, Chapters in Books, Journal Articles

- 2013 (With Jonathan Pincus) 'Have Mining Royalties been beneficial to Australia?'
Forthcoming in *Economic Papers*.
- 'Why Johnny Can't Regulate: The Case of Natural Monopoly', *Agenda, A Journal of Policy Analysis and Reform*, Vol.20, No. 1.
- 2012
- (With Alex Robson) 'Revenue Allocation under the MRRT', *Journal of Australian Taxation*, Vol. 15, NO. 1.
- (With Joe Owen) 'Rebooting the boom: Unfinished business on the supply side', A public policy analysis produced by the Minerals Council of Australia, December.
- 'For a Charter of Modelling Honesty: The theory of modelling, and fitness for purpose', *Agenda: A Journal of Policy Analysis and Reform*, Vol.19, No. 2.
- 'Modelling as Agit-prop: The Treasury's Role in Australia's Carbon Tax Debate' (with Alex Robson), *Agenda: A Journal of Policy Analysis and Reform*, Vol.19, No. 2.
- Australia's Defence: A Review of the 'Reviews', *Agenda: A Journal of Policy Analysis and Reform*, Vol.19, No. 1.
- 'Funding and Providing Aged Care: Lessons from the Last Decade', *Australian Economic Review*, Vol 45, No. 3, September.
- 'Modelling the Excess Burden of Royalties', (with Jonathan Pincus) Research paper 2012-03, School of Economics, University of Adelaide
- 'Urban infrastructure and land use' in the Committee for Economic Development of Australia research report "A Greater Australia: Population, Policies and Governance", March.
- Policy Forum: *Designing a Carbon Price Policy: 'Using Market-Based Mechanisms for Emission Abatement: Are the Assumptions Plausible?'*, *Australian Economic Review*, Vol 45, No. 1, March.
- 2011
- 'More Guns Without Less Butter: Improving Australian Defence Efficiency' (with Mark Thompson) *Agenda: A Journal of Policy Analysis and Reform*, Vol.18, No. 3.
- 'The Analytics of the Australian Private Health Insurance Rebate and the Medicare Levy Surcharge' (Robson, Ergas and Paolucci) *Agenda: A Journal of Policy Analysis and Reform*, Vol.18, No. 2.

“Some Economic Aspects of Mining Taxation” (Ergas, Pincus and Harrison)
Economic Papers of the Economic Society of Australia, 29(4) 369-389. Winner of the 2011 prize for the best paper in the Economic Papers of the Economic Society

“The Economics of Defence Efficiency” (with Mark Thomson) *Agenda: A Journal of Policy Analysis and Reform*; Vol. 17, No.4

2010 ‘Utility Regulation in Competitive Markets: Problems and Progress’, *Economic Record*, Vol 86, No. 275, December.

‘The Effectiveness of Health Informatics’,(with Francesco Paolucci, Terry Hannan and Jos Aarts) in *Healthcare and the Effect of Technology: Developments, Challenges and Advancements*, Stefane M. Kabene (Ed.), pp 13-37.

“New policies create a new politics: issues of institutional design in climate change policy” *Australian Journal of Agricultural and Resource Economics*, April

2009 ‘An Excess of Access’, *Agenda: A Journal of Policy Analysis and Reform*, vol 16, no 4.

‘Is Government the Best Risk Manager?’,*Policy Magazine*, vol 25, no 3,

‘The Fate of Progress at a Time of Crisis’, *Quadrant Magazine*, vol LIII, no 10, October.

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- 'Why Do Some Countries Innovate More than Others?', Centre for European Policy Studies, CEPS Papers No. 5. Also available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1430184

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- 2010 'Mining Taxation: Some Economic Issues' (with Mark Harrison and Jonathan Pincus) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1713534
- 2009 'The Social Losses from Inefficient Infrastructure Projects: Recent Australian Experience' (with Alex Robson) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1465226
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Opinion Pieces

- 2007-2012 Weekly op-ed column in *The Australian* – see complete series at www.greenwhiskers.com.au
- 2006 'NSW Needs Dose of Clear Thinking', *Australian Financial Review*, 31 May, p. 63.
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 'New Fund is a Step in the Right Direction', (with Ric Simes), *Australian Financial Review*, 16 May, p. 63.
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- 'Kyoto Now - or Never?', *Business Review Weekly*, 5 September, p. 26.
- 'Does Everyone get a Fair Deal?', *Business Review Weekly*, 8 August, p. 24.
- 'Two Cheers for Privatisation', *Business Review Weekly*, 11 July, p. 30.
- 'No Easy Separation for Telstra', *Business Review Weekly*, 13 June, p. 28.
- 'Power is not Perfect, but it is Fair', *Business Review Weekly*, 9 May, p. 24.
- 'Insurance Premiums? No Problem', *Business Review Weekly*, 11 April, p. 24.
- 'The Fault With Liability Claims', *Business Review Weekly*, 14 March, p. 24.
- 'Competition Policy Needs Work', *Business Review Weekly*, 14 February, p. 24.
- 'Destroy the DVD Divide', *Business Review Weekly*, 17 January, p. 22.
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- 1995 'Sorry, Wrong Number: Austel's Phoney Phone Accusations', *Australian Financial Review*, 22 June, p. 18.
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- 1988 'Telecommunications Reform an Opportunity to Grab', *Australian Financial Review*, 27 May, p. 14.
- 'The Case for Timing Local Telephone Calls', *Australian Financial Review*, 28 January, p. 6.

Presentations, panel memberships and participation

2012

Guest presenter: Contemporary Theories for Policy - Patents and network economics, Australian National University, 9 August.

Speaker: Turmoil or complexity: interpreting Australia's political and economic landscape, Chief Financial Officer's Annual Forum, Melbourne, 23 July.

Panel speaker: Competition Policy and Business Regulation, Australian Conference of Economists Business Symposium, 12 July.

Discussant: Special interest policy session: 'Economic Policy Challenges for 2012 and beyond', Australian Conference of Economists, 10 Jul.

Panel Member: CEDA State of the Nation Conference - "Dare to Care: Are recent age and health care reforms adequate?", 18 June.

Presentation: 'Economic theories of Regulation' to Regulation and Regulators course, Sydney Law School, 3 May.

Presentation: 'Balancing Sector-specific Regulation with National Competition Policy – perspectives and issues in Telecommunication sector', ASEAN Experts Group on Competition Policy Capacity Building Workshop "Aligning and Coordinating Competition Policy and Enforcement between Different Government Entities – Case Studies from ASEAN to ASEAN, Brunei, 25-26 April.

Panel member: 'Media Wars and Digital Laws – Facts, Fears and Finkelstein', Deakin Policy Forum, 24 April.

Participant: Productivity Commission Carbon Assistance Technical Workshop, 18 April.

'Dealing with Industrial Change', Presentation to Business Council of Australia Annual Forum, 13 April.

Presentation: University of Wollongong, School of Economics Public Lecture - 'Where did the Euro come from and where is it going?', 11 April.

Lunchtime seminar for Economic Society NSW on "Applying Cost-Benefit Appraisal to the NBN: Does it Pass the Test?" at the Reserve Bank of Australia, 4 April.

Address CEDA Launch: 'A Greater Australia: Population, Policies and Governance Report', 23 March

'Should Australia build Warships' (Andrew Davies, Henry Ergas and Mark Thomson), Sea Power Conference, Sydney, Australia, 20 January

- 2011** 'Efficient Prices and Activity-based Funding. The Implications and Interactions – an Economic Perspective', Deloitte Conference 'Future Directions in Health', 17 October
- 'Regulatory reforms to assist manufacturing', Menzies Research Centre Industry Roundtable, 7 November
- 'Population aging, economic growth and productivity', Menzies Research Centre Productivity & Ageing Conference, 14 April
- 'Funding an Older Australia', Melbourne Institute/The Australian 2011 Economic and Social Outlook Conference, 1 July
- Discussant, 'Dealing with congestion efficiently' and Panel discussant: 'Implications for policy directions', Productivity Commission Roundtable 'A Sustainable Population? - Key Policy Issues', 22 March
- 'Unmet Need – The Drivers for new thinking' Transport Development and Solutions Alliance Annual Conference, 18 August
- 'Information and Insurance', Australian Strategic Policy Institute Disaster Resilience Workshop, 28 April
- Panel discussion member, Crawford School Policy Forum on Climate Change Policy, 5 September
- 'Aged Care Funding', 7th Annual Australia's Ageing Population Summit, 28 September
- 'From the RSPT to the MRRT and beyond', Tax Reform: Results and Prospects conference, 5 December
- Panel discussion member, 'Taxation reform', Business Council of Australia annual forum, 17 March
- 2010** 'Policy funding challenges for Government', 6th Annual Australia's Ageing Population Summit, 10 November
- 2009** 'Is Government the Best Risk Manager - for the affirmative', The Great Debate – Is Government the Best Risk Manager?', Economics Alumni Association, University of Queensland, 5 May, <http://www.uq.edu.au/economics/index.html?page=108727&pid=100638>.
- Developing and regulating a market for Option C, *Strengthening the governance of Australia's healthcare system: Option C – how others do it and how could we do it?*, Public Forum, The Menzies Centre for Health Policy & The Australian Centre for Economic Research on Health, Canberra, 15 April.

- National Fibre Plans, *International WIK Conference – Challenges for FTTB/H in Europe*, Berlin, 24 March.
- 2008** Commercial Implications of the Birdsville Amendments - Issues for Clients and Practitioners, *2008 Competition Law Conference*, 24 May.
- ‘Dealing with the Regulatory Burden’, *Economic and Social Outlook Conference*, Melbourne Institute of Applied Economics and Social Research, The University of Melbourne, 28 March.
- ‘Ageing and the Intergenerational Report: A policy perspective’, *ACERH Policy Forum 2008*, 22 February.
- 2007** Future Funds and Infrastructure Investments: What Role, If Any?, Comments at the *ANU/Lowy Institute Conference on and Intergenerational Financial Funds*, Sydney, August 24th, 2007.
- Behavioral economics and consumer policy, *Productivity Commission Roundtable on Behavioral Economics and Public Policy*, 9 August.
- ‘The Economics of Alternative Infrastructure Funding Arrangements’, *2007 Residential Development Leaders Summit*, 18 June.
- ‘The Competition Policy Experiment’, *Australian Law and Economics Conference*, 2 June.
- ‘State of the States’, Presentation to *Menzies Research Centre State Policy Conference*, available at http://www.statewatch.com.au/state_of_the_states_HenryErgas.pdf 1 June.
- ‘Strategies for the Future’, *Aged Care Queensland State Conference*, 22 March.
- 2006** ‘Tanks versus Helicopters: Defence Decision-Making: The Conceptual Approach’, *CRA/ASPI Defence Economics Short Course*, 2 November.
- ‘Should Trucks Pay More?’, *CRA Seminar on Implications of the Productivity Commission’s preliminary findings on road and rail freight*, 29 September.
- ‘Achieving Market Oriented Outcomes in Aged Care’, Presentation to *CRA Seminar on The Economics of Aged Care*, 31 October.
- ‘Light Handed Regulation?’, Presentation to *Bureau of Transport & Regional Economics’ Annual Colloquium*, June 14 available at <http://www.btre.gov.au/Info.aspx?ResourceId=35&NodeId=88>
- 2006** ‘Road pricing and modal choice’, Presentation to *CRA Seminar on Freight Infrastructure: What are the Challenges in Achieving Efficient Pricing?*, 28 April.
- ‘Identifying the areas where the current regulatory framework needs reform and where improvements can be made’, Presentation to *DCN Summit on Transport and Infrastructure Regulation*, 8 March.
- 2005** ‘Is Competition Feasible in Defense Procurement?’ Presentation (with Flavio Menezes) to *CRA Asia Pacific Summit*, 10 December.

'Implementing the Recommendations of the Prime Ministerial Taskforce on Export Infrastructure - 6 months on', Presentation to *Transport Victoria Conference*, 29 November.

'The Transition to an IP World: Key Commercial and Regulatory Issues', Presentation to *Australian Telecommunications Conference*, 21 November.

'Level Playing Fields and Competition', Presentation to *National Insurance Outlook Conference*, 11 November.

'Mapping the Future of Transport Infrastructure Investment', Presentation to *Investment for Transport Infrastructure Conference*, 31 October.

Productivity Commission - Roundtable on Productive Reform in a Federal System, 28 October, Discussant comments available at <http://www.pc.gov.au/research/confproc/productivereform>

'Economic Issues in Telstra's Privatisation', *Industry Economics Conference*, La Trobe University, 29 September.

Discussant, *Federal Reserve Bank of New York - Antitrust Activity in Card-Based Payment Systems: Causes & Consequences*, New York, 15 September.
http://www.rnejournal.com/artman2/uploads/1/ergas_RNE_deco5.pdf

'Tort Reform', Presentation to *NSW Bar Association Conference*, 30 August.

'Prime Minister's Infrastructure Taskforce Report', Presentation to *National Australia Bank - Infrastructure Forum*, Canberra, 24 August.

'Translating Forecast Demand into Growth Strategies for Australian Ports and Rail', Presentation to *Transport Infrastructure for Export Commodities Conference*, 22 August.

'Investment in Bulk Transport Infrastructure: Regulatory Hurdles and Competition', *Ausintermodal Conference*, 26 July.

'Delivering a Competitive and Robust Electricity and Gas Sector', *5th Annual Western Australian Energy Outlook Conference*, 23 June.

2004

'Telecommunications: Competition Regulation and Communication via the Internet', *ACCC Regulation Conference – Evaluating the effectiveness of Regulation*, July, available at <http://www.greenwhiskers.com.au/index.php/telecommunications/414-305>

'Price Caps — How Useful Are They?', presentation to the *Forum on Price Cap Regulation in Australia*, Australian Centre of Regulatory Economics, The Australian National University, Canberra, 27 August.

- 2002 Discussant Remarks on 'Competitive Neutrality: Regulating Interconnection Disputes in the transition to competition' *ACCC Regulation & Competition Conference*, July 2
<http://www.accc.gov.au/content/item.phtml?itemId=259730&nodeId=2c5b219151e6cf1foa18407676fae22d&fn=Session+2+-+Mr+Henry+Ergas.pdf>
- 1999 'Annuity and Levelisation Issues in Forward Looking Cost Models: the Case of Telecommunications', paper presented for the *ACCC Depreciation Forum*, 30 September (with Alexis Hardin).

'Economic Depreciation in Telecommunications Cost Models', paper presented to the *1999 Industry Economics Conference on Regulation, Competition and Industry Structure*, 12–13 July (with Alexis Hardin and John Small), available at
<http://conceptnews.com.au/artman2/uploads/1/papers-hardin-ergas-small-IECecondepreciation-jul99.pdf>
- 'Providing a Right of Access to Essential Facilities: The Australian Experience', (with Linda Evans), paper presented at the *CRNEC Policy Conference*, Auckland 1999.
- 1998 'TSLRIC, TELRIC and other Forms of Forward-Looking Cost Models in Telecommunications: a Curmudgeon's Guide', paper to the *EU Competition Workshop*, available at
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1430248
- 1995 'Managing Interconnection: Issues of Institutional Design', delivered to the *ITS Conference on Interconnect*, Wellington, New Zealand, April 10–12.
- 1994 H. Ergas, Comment on "Appropriate Regulatory Technology: The Interplay of Economics and Institutional Conditions," by L. Jones in *Proceedings of the World Bank Annual Conference on Development Economics 1993* (Washington, D.C.: World Bank, 1994).
- 1992 'France Telecommunication: Has the Model Worked?' Paper for the workshop on *International Experiences in Telecommunications Reform and its Relevance to India*, New Delhi.
- 1983 'Transborder Data Flows and the International Firm', Paper presented at OECD Conference, December.

PROJECTS

- 2012** Public Funding, Telstra Corporation Limited
Expert Witness - Economic Analysis, ASHURST AUSTRALIA
- 2011** TabcorpBetbox Victorian proceedings, Freehills
Tabcorp Harness Racing Vict NY Proceedings, Freehills
Economic Advisory Panel, Department of Treasury and Finance
Economic Impact Study, Australian Broadcasting Corporation
Advise on Sovereign Wealth Fund, Minerals Council of Australia
Analysis-Preventing parallel imports into NZ, Ministry of Economic Development
Australian Retail Industry economic impact assessment, Woolworths Ltd
Prepare submission on Horizontal Fiscal Equalisation, Department of Treasury and Finance
- 2010** Cost of excluding Telstra from spectrum, Telstra Corporation Limited
Performance based contracting assessment, Department of Defence
Assist Uniting Care to prepare a submission to the Productivity Commission
Profit cost model, Department of Defence
Provide general economic advice and assistance, Telstra Corporation Limited